ATTACHMENT A

King County Road Services Division

Operational Master Plan
Phase I

August 2009

King County
Department of Transportation
Road Services Division

Acknowledgements

This Road Services Division Operational Master Plan (ROMP) Phase I would not have been possible without the insights, guidance and support provided by numerous King County staff members.

The ROMP Advisory Committee met throughout this process to guide and oversee the Work Group and consultants in formulating Phase I of the operational master plan. The Advisory Committee was ably led by co-chairs Laurie Brown, deputy director of the Department of Transportation and by Robert Cowan, director of the Office of Management and Budget (OMB). Beth Goldberg, deputy director of the OMB; Tom Koney, special projects, OMB, and Joe Miles, special projects, OMB, stepped in when Robert Cowan was absent. We sincerely thank each and every Advisory Committee member for their thoughtful insights and willingness to come to the table ready for an open and honest discussion.

Advisory committee members and their surrogates are listed below:

ROMP Advisory Committee members

Name	Title, affiliation
Laurie Brown, *Co-Chair*	Deputy director, King County Department of Transportation
Robert Cowan, *Co-Chair*	Director, King County Office of Management and Budget
The Honorable Dow Constantine	Member, Metropolitan King County Council, District 8
The Honorable Reagan Dunn	Member, Metropolitan King County Council, District 9
Chris Arkills	Legislative Aide, King County Council, District 8
Kathy Brown	Director, Facilities Management Division, Department of Executive Services
Linda Dougherty	Director, Road Services Division, Department of Transportation
Neil Strege	Legislative Aide, Metropolitan King County Council, District 9

Employees from the King County Road Services Division and the King County Office of Strategic Planning and Performance Management staffed the ROMP process and led the Work Group. The Work Group provided input, data and documentation used to carry out the activities necessary for completing the ROMP. The Work Group also reviewed and discussed in detail all documents and working papers prior to presentation to the Advisory Committee for approval. We thank them for their support, guidance and their time.

Work group members are listed below:

Work group members

Name	Affiliation
Justin Anderson	Project manager, Facilities Management Division
Paul Carlson	Legislative analyst, King County Council
Gwendolyn Clemens	Senior policy analyst, Office of Strategic Planning and Performance Management
Jennifer Lehman	Budget analyst, Office of Management and Budget
Jennifer Lindwall	Capital Improvement Program and Planning Section manager, Road Services Division
Mark Melroy	Legislative analyst, King County Council
John Resha	Legislative analyst, King County Council

The ROMP Phase I truly was a collaborative process and everyone involved played an important role in the development of policy recommendations. We sincerely thank all of you for your support and look forward to working with you in Phase II.

Contents

1. Executive summary

Operational master plans are designed to inform long term operational planning for an agency. The overall goal of the Road Services Division Operational Master Plan (ROMP) work plan is to develop a common vision for how Road Services will build, operate and maintain the unincorporated-areas road system now and in the future. Phase I of the ROMP is intended to provide a deeper understanding of Road Services' challenges and opportunities. Many events have affected the division's ability to build, operate, and maintain the King County road network. It provides a policy framework for meeting these responsibilities and recommends policies to guide budgetary and operational strategies in ROMP Phase II.

The ROMP examines the following topics:

- Road Services' mission, budget and staffing requirements for serving unincorporated areas following annexation of the majority of the Urban Growth Area. The areas that remain will consist of rural, resources lands, and one Urban Planned Development.
- The unmet funding needs—including new capacity projects not currently in the budget—and options for addressing them.
- Integration of Road Services' internal strategic plan with the countywide effort to implement performance measures.

Process

In the ordinance adopting the 2008 King County Budget, the County Council included a proviso requiring Road Services to submit to the council a work plan for a Road Services Division Operational Master Plan (ROMP). In response, the King County Executive submitted a work plan (Motion 12786) incorporating county guidelines for operational master plans and the expectations identified in the council's budget proviso.

The council approved work plan identified a two phase process: Phase I of the ROMP provides a policy framework for meeting these responsibilities and recommends policies to guide the budgetary and operational strategies in ROMP Phase II. The Phase II product will be a recommended operational master plan consistent with the Phase I framework. Budget and operational strategies will be developed taking into account the financial implications of potential annexations and other change drivers.

Phase I of the ROMP was guided and overseen by an advisory committee comprising elected officials and other King County representatives. The ROMP Advisory Committee was co-chaired by the deputy director of the King County Department of Transportation and by the director of the Office of Management and Budget. The Advisory Committee agreed on recommendations by consensus.

Employees from the Road Services Division and the Office of Strategic Planning and Performance Management staffed the ROMP process and led a Work Group.

Three consulting companies provided input to the ROMP. They produced the following products:

- A series of working papers that informed the policy recommendations included in the ROMP
- A survey of county residents in unincorporated areas
- A survey of representatives of cities with which Road Services has service contracts.

Results

The Advisory Committee made the following findings:

- **Road Services revenues are decreasing.**
  Several occurrences are contributing to a decrease in revenues for Road Services. A statewide initiative (which failed in King County) eliminated the county's $15 vehicle license fee (VLF).The Road Levy has reached the maximum level allowed by statutory limits on property taxes. The county's share of state gas-tax revenue may decline as a result of decreased fuel consumption and other factors. Grant funding opportunities are limited because county projects do not compete well in grant programs that focus on urban areas. Bonding is essential to Road Services' financial strategy, but bonds will not buy as much as originally anticipated because of increasing costs. The county's policy decision to use a portion of Road Levy revenue to fund the traffic enforcement activities of the King County Sheriff's Office has had a steadily growing impact on the division's budget as well.

- **The costs of business and demands for services are increasing.**
  Construction costs have risen faster than the Consumer Price Index in recent years. At the same time, Road Services has identified significant new infrastructure preservation needs. These include the need to maintain and replace failing short span bridges, road segments and seawalls as well as Road Services facilities. New environmental regulations have added to projects' cost and complexity.

- **Annexation and incorporation of urban areas impact Road Services.**
  Annexations and incorporations of urban unincorporated areas have complicated Road Services' strategic planning and budget development. The division must find the right balance between investing in roads in urban unincorporated areas to encourage annexation and avoiding the creation of long-term financial burdens and infrastructure deficits on remaining unincorporated areas. This delicate balancing act is made more difficult by the uncertainty about when annexations and incorporations will occur.

The Phase I analysis suggests that these issues are more urgent than previously understood, and that new capital projects in particular are very problematic.

The ROMP consultants found that current budget practices make Road Services' budget unsustainable. Opportunities to sell assets to balance the budget have been exhausted. In 2009, revenues will fall short of the budgeted amount by 15 percent. This shortfall will

affect not only Road Services' ability to compensate for the shortfall for capital programs identified in the Transportation Needs Report, but also will affect the division's ability to retain current staff and services.

The Phase I work improved our understanding of the need to preserve existing roads, bridges, and related assets. It provides the context to understand that preservation encompasses maintenance activities in the operations budget as well as capital projects such as the overlay program. Phase I suggests a new way of thinking about the operating and capital budgets that emphasizes the linkages between them. It begins to explain how this translates into Road Services' work program. Preservation encompasses maintenance activities in the operations budget as well as capital projects such as the Overlay Program. If a roadway segment deteriorates enough, maintenance and overlay cannot save it: A separate capital project will be required to replace it. This progression is fairly apparent for bridges, which are inspected, rated, maintained, and eventually replaced or decommissioned. Road Services is learning more about vulnerable road segments and the costs of keeping them as functional parts of the county road network.

Road Services must carefully plan its preservation activities to maximize the viability of county roadways. Even with the most careful balance between maintenance work and reconstruction, some bridges and road segments might not be viable for the long term. This report is a first step in identifying the nature of this problem and provides the basis for additional work in Phase II.

The ROMP Advisory Committee agreed by consensus on the following seven policy recommendations. Upon approval by the King County Executive and County Council, these recommendations will become the foundation for ROMP Phase II.

Recommendations

The ROMP Advisory Committee agreed by consensus on the following seven policy recommendations to serve as the broad policy framework to prioritize and guide decision making regarding the provision of road services in King County. Upon approval by the King County Executive and County Council, these recommendations will become the foundation for ROMP Phase II.

The first two recommendations provide the policy framework for meeting these responsibilities. Recommendation 1 recognizes that safety and legal mandates are a foundation of all of the division's projects and programs. As priorities are set for the division's work, enhancing the safety of users of King County's roadway network, while meeting local, state and federal standards, should be viewed as inherent in all of the Road Services Division's program areas and deliverables. Neither mobility nor capacity can be adequately or equitably advanced without functioning road assets. Therefore, preservation remains as the first priority of the Road Services Division.

Recommendation 1: **Prioritization of responsibilities**

The following outcomes shall be prioritized for the Road Services program areas and deliverables:

1. ***Preservation*** of the existing roadway facilities network
2. Managing and enhancing ***mobility*** through system efficiencies
3. Addressing concurrency-driven roadway ***capacity*** needs

In the accomplishment of these prioritized outcomes, enhancing the safety of the users of King County's roadway network while meeting local, state and federal standards is inherent in all of the Road Services Division's program areas and deliverables, as a function of how roadway facilities are designed, built, maintained, and managed.

King County acknowledges that while the King County Road Fund is constrained by funding and resources, the underlying issues of safety, standards and legal requirements will be considered in the prioritization of all Road Services program areas and deliverables.

Furthermore, Road Services will continue to plan for methodically addressing the prioritized road-related safety issues that transcend its current budget and six-year planned financial capacity.

Contracting is beneficial for the Road Fund and for the county. Recommendation 2 reflects this mutually beneficial relationship between Road Services and contract jurisdictions and agencies. It is recommended that the county continue as a road service provider to jurisdictions within the county under this policy framework.

Recommendation 2: Contracting

The Road Services Division will pursue contracting opportunities when those services provide mutual benefit to King County and the jurisdiction.

The first two recommendations generate the need for Road Services to review and update the vision, mission, goals, targets and performance measures. Phase I recommends Road Services complete this review and revision process upon approval of Phase I by council to be incorporated in Phase II:

Recommendation 3: Road Services mission and vision

Following the King County Executive and County Council Approval of the Phase I recommendations, the Road Services Division will update its vision and mission to reflect the recommendations identified in ROMP Phase I.

The revised vision and mission statements will serve as the foundation of ROMP Phase II.

Recommendation 4: Road Services goals, performance measures, and targets

Following the King County Executive and County Council approval of the Phase I recommendations, the Road Services Division will develop new goals and appropriate performance measures and targets for each goal consistent with the Countywide Strategic Plan, relevant department strategic plans, and the Performance and Accountability Act.

The last recommendations provide guidelines to develop the budgetary and operational strategies in ROMP Phase II. The recommendations addressing levy rate assumptions and the transfer of funds to the Sheriff for traffic enforcement provide guidelines for addressing funding strategies resulting in a sustainable Road Fund. Recommendation 6 will need to be carried out in collaboration with the King County Sheriff's Office.

Recommendation 5: Levy rate

The Phase II fiscal impact analysis should include the following:

1. Future-year property tax revenue forecasts based on the statutorily allowable levy amounts, calculated by increasing the preceding year levy amount by 101% plus new construction.
2. Future-year property tax revenue forecasts based on levy amounts that are constrained to an amount equal to the 2009 road levy tax rate applied to the current year's assessed valuation plus new construction.

Recommendation 6: Transfer of funds to the Sheriff's Office for the Selective Traffic Enforcement Program (STEP) and other traffic enforcement

A decision concerning the transfer of funds from the county Roads Fund to the Sheriff's Office, for the Selective Traffic Enforcement Program (STEP) and other traffic enforcement, will remain a topic of discussion in the King County Executive's and County Council's budget processes. However, the Phase II Impact Analysis will include further exploration, in collaboration with the Sheriff's Office, of issues related to the fund transfer, including the performance and/or results associated with the transfer.

Finally, the advisory committee considered three operational models. The decision to recommend an operational model that prioritizes asset life cycle in the rural areas is a logical outcome to the preceding recommendations. It builds on the Advisory Committees' understanding that once a road asset is allowed to deteriorate, maintenance and overlay cannot save it. Maximizing the life cycle uses the best practice methods and resources to maximize the life cycle assets through maintenance and overlay programs.

It recognizes Road Services primary responsibilities will be to the rural areas. Acknowledging the Road Fund is insufficient to maximize asset life cycle management, the final recommendation includes guidelines to bookend the possibilities for this operational model by identifying the gap between prioritizing asset life cycle in the rural areas within current revenues and the requirements to maximize life cycle costs.

Recommendation 7: Operational model options

Of the three operational models evaluated, the Advisory Committee recommends "Prioritize Asset Life Cycle in Rural Areas". The Phase II work plan will need to identify the gap between current revenues and what would be required to maximize life cycle costs.

The Phase II work plan will identify backlog of work plan will use this recommended model as the foundation for impact analysis. Analysis of service levels and backlog of work and the cost of providing these services and funding the backlog will be developed. Analysis of service delivery models within this recommendation will be developed, including options for potential efficiencies and methodology for year-to-year balancing of Road Services Operating and Capital Budgets. The ROMP will identify the revenue requirements for the options and evaluate revenue options.

2. Purpose and background—Phase I policy framework

This Road Services Division Operational Master Plan (ROMP) Phase I report documents the first of two phases in the ROMP. Phase I is intended to establish a broad policy framework that will set priorities and guide decision-making regarding the provision of road services in King County. Phase II will begin after the County Council has approved this document and the Phase II work plan.

Background

In the 1990s, the Road Services Division had a robust capital improvement program (CIP) and was developing options for debt financing to accelerate capacity projects. The division used flexible-response budgeting to speed up work on shovel-ready projects while maintaining a balance in the six-year CIP. The division funded asset preservation work through both the operations budget and capital projects such as the Overlay, Bridge Seismic Retrofit and Priority Maintenance programs. Revenue sources, including the Road Levy, vehicle license fee (VLF), and a share of state gas tax revenues, were relatively stable. With its mix of capital projects, Road Services was well positioned to compete for grant funding. The division's mission, vision, and goals reflected an agency that was aware of its challenges and confident in its ability to meet them.

In 2004, the division adopted a strategic plan that helped clarify and focus its decisions and priorities. Since that time, budgetary shortfalls, uncertainties regarding the timing of annexations, issues concerning current and future maintenance facilities as well as other developments have occurred. These have highlighted the need for an examination of the current environment.

In light of these developments, the County Council decided to use the county's established operational master plan (OMP) process to gain a deeper understanding of Road Services' challenges and opportunities as well as the consequences of failure to respond adequately. The ordinance adopting the 2008 King County budget included a proviso requiring the division to submit to the council a work plan for a Road Services Division Operational Master Plan (ROMP).

The proviso stated that the framework should include:

1. The mission and goals for Road Services Division (RSD).
2. The roles and responsibilities of RSD, including legal mandates, environmental requirements and minimum safety standards.
3. Policy guidelines addressing practices such as performance measurement, evaluation, budget and financial accountability.
4. Policy guidelines regarding funding, contracting and road responsibilities.
5. Policy guidelines regarding the balance of operational and maintenance responsibilities with roads infrastructure and capital improvements.[1]

The overall goal of the ROMP is to develop a common vision for how the Road Services Division will build, operate and maintain the unincorporated-areas road system now and in the future. Phase I of the ROMP is intended to provide a policy framework for meeting these responsibilities, to recommend policies that will guide budgetary and operational strategies in Phase II of the ROMP, and to review existing maintenance facilities if the division seeks to replace them.

Project participants

Phase I has been guided and overseen by an Advisory Committee, comprising elected officials and other King County representatives. The ROMP Advisory Committee was co-chaired by the Deputy Director of the Department of Transportation and the Director of the Office of Management and Budget. The Advisory Committee agreed on recommendations through consensus.

Employees from the King County Road Services Division and the King County Office of Strategic Planning and Performance Management staffed the ROMP process and led the Work Group. The Work Group provided input, data and documentation used to carry out the activities necessary for completing the OMP. The Work Group also reviewed and discussed in detail all documents and working papers prior to presentation to the Advisory Committee for approval. Participants included staff representatives from the Road Services Division, the King County Council, the Facilities Management Division, the Office of Management and Budget and the Office of Strategic Planning and Performance Management.

Three consulting companies provided input to the ROMP. They produced the following products:

- A series of working papers that informed the policy recommendations included in the ROMP.
- A survey of county residents in unincorporated areas.
- A survey of representatives of cities with which Road Services has service contracts.

[1] King County Motion 12786, Attachment A, Work Plan, page 2.

Process

The ROMP process produced a series of working papers that served as the building blocks for the final plan. The working papers were produced by the ROMP consultants with guidance provided by the Advisory Committee and in conjunction with reviews by the Work Group and Road Services staff.

The consultants' working papers are organized around the tasks contained in the County Council approved work plan: framework development, funding analysis, and Service Levels. King County staff members provided additional reports and data analysis. These documents are included as appendices.

The ROMP Work Group reviewed and analyzed this data in preparation for presentations to the Advisory Committee. The Advisory Committee met regularly between September 2008 and July 2009, ultimately agreeing on a series of recommendations for the establishment of a board policy framework that would set priorities and guide decision-making for the provision of roads services in King County.

Report structure

This report is the culmination of ROMP Phase I. The report is organized to address the framework topics identified in the ROMP Phase I work plan:

1. The mission and goals for the Road Services Division.
2. The roles and responsibilities of the division, including legal mandates, environmental requirements and minimum safety standards.
3. Policy guidelines addressing practices such as performance measurement, evaluation, budget, and financial accountability.
4. Policy guidelines regarding funding, contracting and road responsibilities.
5. Policy guidelines regarding the balance of operational and maintenance responsibilities with roads infrastructure and capital improvements.[2]

Each section in the report does the following:

- Identifies the work plan item(s) addressed in the section.
- Identifies any guidelines or assumptions used in the analysis.
- Identifies the Advisory Committee's final recommendation(s) or policy statement(s).
- Identifies Washington State or King County policies pertinent to the topic; see Appendix E for the full text of the referenced King County policies.
- Explains the Advisory Committee's final recommendations or policy statements.
- Identifies steps to be included in the ROMP Phase II work plan.

[2] King County Motion 12786, Attachment A, Work Plan, page 2.

3. Roles and responsibilities of the Road Services Division

The framework will include:

> ***(2) The roles and responsibilities of RSD, including legal mandates, environmental requirements and minimum safety standards.***[3]

Advisory Committee guidelines:
Analysis and recommendations for the ROMP will be based on the assumption of annexation or incorporation of all urban areas by 2012.

Recommendation 1: Prioritization of responsibilities

The following outcomes shall be prioritized for the Road Services program areas and deliverables:

1. ***Preservation*** of the existing roadway facilities network.
2. Managing and enhancing ***mobility*** through system efficiencies.
3. Addressing concurrency-driven roadway ***capacity*** needs.

In the accomplishment of these prioritized outcomes, enhancing the safety of the users of King County's roadway network while meeting local, state and federal standards is inherent in all of the Road Services Division's program areas and deliverables, as a function of how roadway facilities are designed, built, maintained, and managed.

King County acknowledges that while the King County Road Fund is constrained by funding and resources, the underlying issues of safety, standards and legal requirements will be considered in the prioritization of all Road Services program areas and deliverables.

Furthermore, Road Services will continue to plan for methodically addressing the prioritized road-related safety issues that transcend its current budget and six-year planned financial capacity.

Washington State or King County policies addressed in this section:

- Countywide Planning Policies: FW-20, T-1
- King County Comprehensive Plan: T-111, T-202, T-306, T-307, T-308, T-309, T-332, T-334, T-335, T-336, T-403

The Road Services Division is one of five divisions in the King County Department of Transportation. It is responsible for supporting safe and efficient movement of people, goods, and delivery of services through the design, construction, maintenance, and operation of a comprehensive system of roadways and other transportation facilities and

[3] King County Motion 12786, Attachment A, Work Plan, page 2.

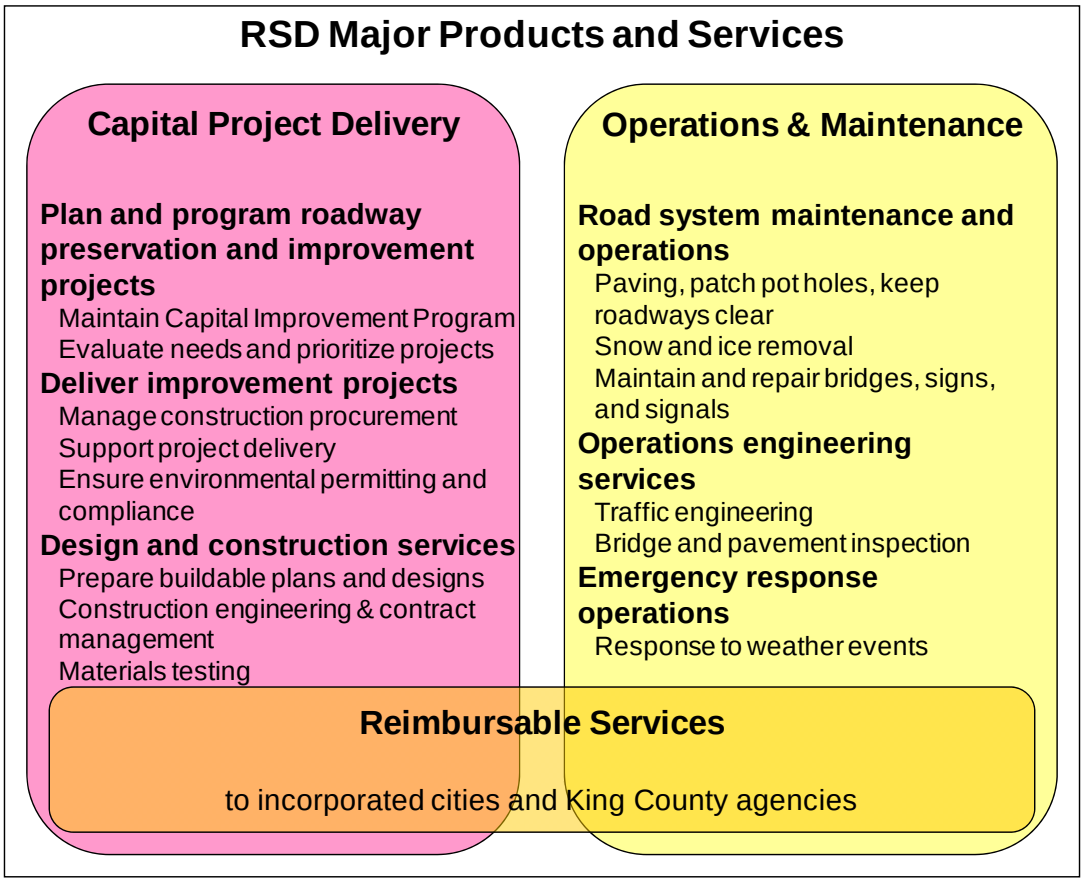
services. It is responsible for all county-owned assets within the right-of-way, including 1,745 centerline miles of roadway and 180 bridges, in addition to unpaved roads and pathways. Greater detail regarding geography and urban/rural characteristics can be found in Appendix B.

Through its review, the Advisory Committee agreed that the division's core business is to build, operate, and maintain the unincorporated King County road network.

Road Services Division deliverables

The Road Services Division's products and services fall into two primary categories: Capital Project Delivery, and Operations and Maintenance. Many of the division's products and services are provided to other King County departments or to jurisdictions throughout the county, identified as Reimbursable Services in Exhibit 3-1 below.

Exhibit 3-1: Road Services Division business summary



Capital project delivery

Road Services' capital project work is simplified into three categories: planning and programming, project delivery, and design and construction services. Some elements of capital project work are performed by all sections in the division. Major work products

and services are the following:

- ***Planning and programming*** is capital planning analysis to define and set priorities for preservation and improvement projects. The analysis identifies improvements that will contribute most effectively to meeting the goals set for King County roadways. Planning and programming products and services include the Capital Improvement Program, the Roads Strategic Plan, the Transportation Needs Report, the Annual Bridge Report, travel forecasting and performance measures.

- ***Project delivery*** is management of the process through which projects in the capital improvement program are designed and built. This involves coordinating a well-defined process that results in a set of construction specifications that are biddable and buildable. Major work products and services include project management and coordination, contract management, and environmental permitting, compliance, and mitigation.

- ***Design and construction*** services include design engineering and other professional services necessary to develop design and construction specifications as well as the construction engineering necessary to manage construction contractors. Major work products and services include biddable and buildable plans; design and construction specifications; professional engineering, survey, and right-of-way services; environmental engineering and analysis; construction management; materials and geotechnical testing; and pavement and bridge inspections.

Operations and maintenance

Road Services is responsible for maintaining and operating all assets within the right-of-way. These include the roadway, roadside assets such as drainage systems, and traffic control and management features such as signs, striping, and signals. An important area of service addresses the impacts of weather events and other emergencies to keep the road system safe and operational. This includes performing winter maintenance, removing downed trees, and managing flood-related road closures.

Operations and maintenance work is performed primarily by the Traffic Engineering Section and by the Roads Maintenance Section. Major work products and services are the following:

- ***Road system maintenance and operations*** includes maintenance of roads, drainage systems, vegetation, and other assets in the King County right-of-way; maintenance of signs, signals, guardrails, striping and other traffic control devices; winter maintenance including snow and ice removal; bridge maintenance; and environmental and regulatory compliance.

- ***Specialized engineering services*** support the optimal operation of the transportation system. Specific products and services include traffic engineering, intelligent transportation systems support; and bridge and pavement inspections.

- ***Emergency response*** work is maintenance and operations conducted as a result of severe weather events or other emergencies.

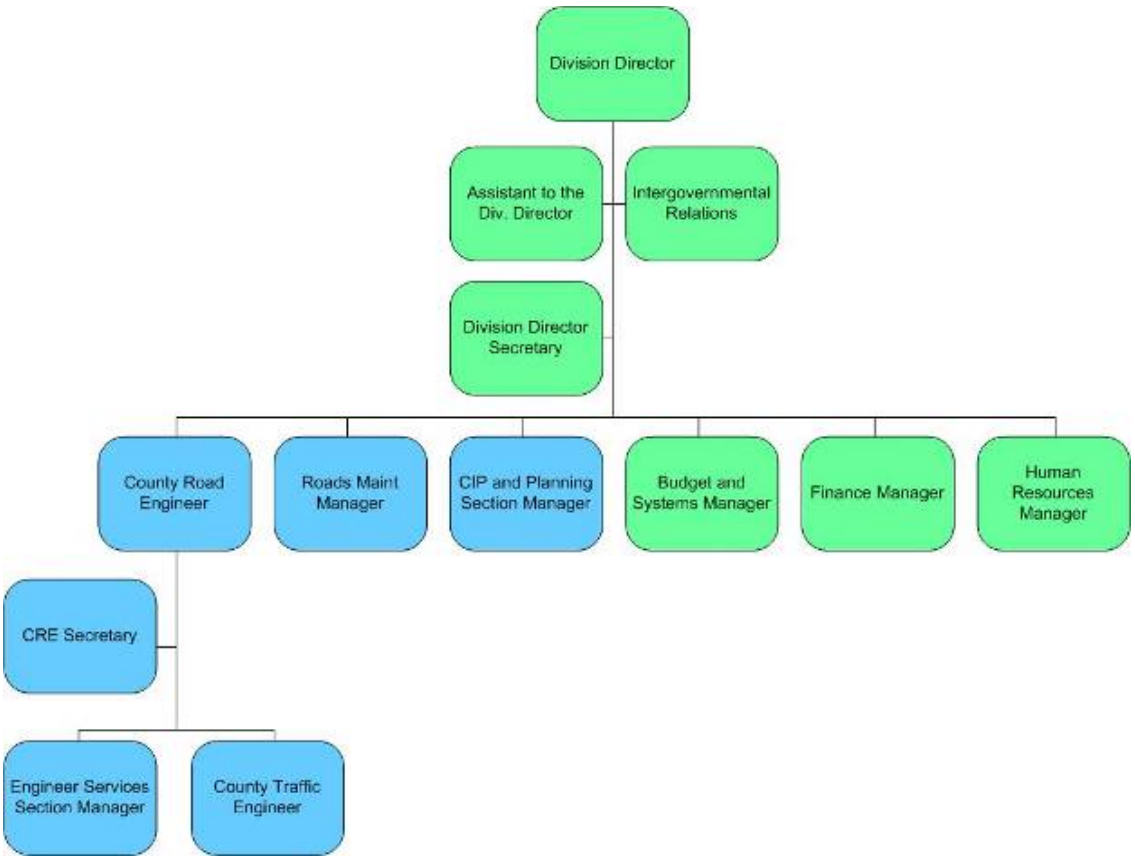
Reimbursable services

Road Services provides a broad range of services to other King County departments and jurisdictions. This program poses both opportunities and challenges for the division and is fully discussed in Section 4: Contracting.

Organizational structure

More than 600 employees or full-time equivalent (FTE) and term-limited temporary (TLT) employees design, build, operate and maintain roads and bridges in unincorporated King County. In addition, Road Services contracts with cities, Pierce County, other King County agencies, special districts, non-profit organizations, and other governmental agencies for road-related services. Contract services are fully discussed in Section 4 and Appendix F. Exhibit 3-2 shows the Road Services Division organizational structure.

Exhibit 3-2**: Road Services Division organizational chart**

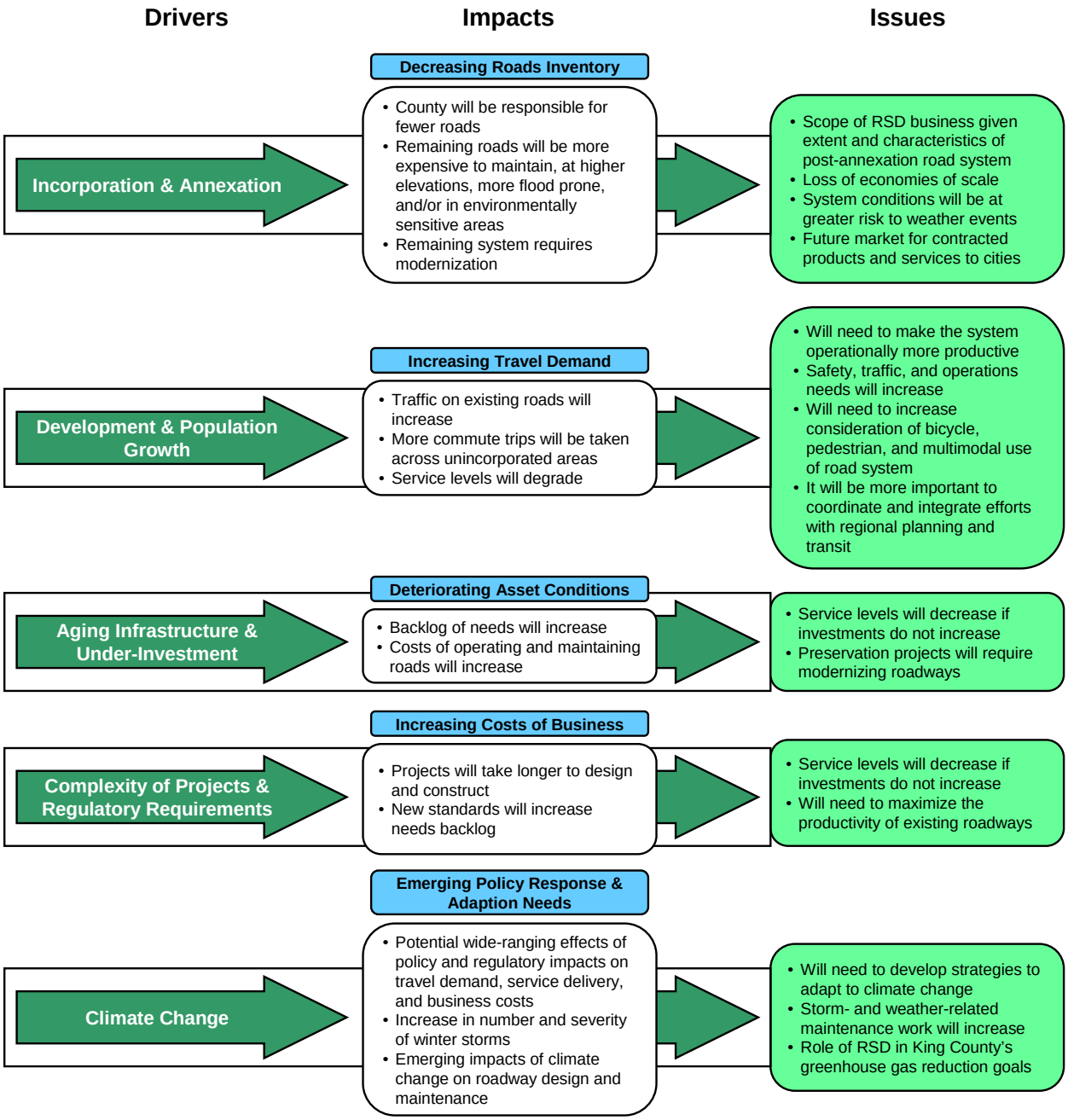


As part of ROMP Phase II, the Advisory Committee will review potential structural changes that might be made to best support the delivery of products and services by the division.

Drivers, impacts and issues

Road Services is a complex organization that provides services in a large and diverse geographic area. The “change drivers” presented in Exhibit 3-3 are the principal factors that will impact the division’s operations in both the short term and the long term. The details of these change drivers and their impacts on the division are addressed in detail in Appendix B. Exhibit 3-3 summarizes the drivers, impacts and issues that were reviewed by the Advisory Committee and that will be addressed in ROMP Phase II.

Exhibit 3-3: drivers, impacts, and issues affecting the Road Services Division[4]



[4] Dye Management Group, Working paper 1.

Setting **priorities** for **outcomes**

As the Advisory Committee reviewed Road Services' roles and responsibilities as well as the change drivers, impacts and issues affecting roads, it identified and prioritized the following three outcomes that result from the division's core business:

- ***Preservation*** preserves and enhances the conditions of roads, bridges and associated transportation facilities in the existing unincorporated King County system, without adding capacity. Examples of preservation activities include pavement overlay, bridge rehabilitation or replacement, replacement of road culverts and drainage system components, rebuilding of seawalls to support roads, reconstruction of roadways, and repair of damage caused by flooding or drainage problems.
- ***Mobility*** enhances transportation mobility by enabling traffic to move more efficiently on existing roads. Mobility may increase capacity where appropriate and feasible—for example by adding turn pockets to an existing intersection. Mobility also provides pedestrian facilities to meet ADA accessibility requirements. Examples of mobility activities include intelligent transportation system (ITS) technology, traffic cameras providing real-time data to inform both travel choices and remote adjustment of signal timing for incident management, and enhancements to mitigate congestion at intersections such as signals, turn lanes and round-a-bouts.
- ***Capacity*** increases vehicle carrying capacity along the length of a corridor, often by adding general-purpose lanes to a roadway.

The Advisory Committee noted that the goals of public safety and compliance with legal mandates are inherent in all the Road Services program areas and deliverables described above. Legal mandates include local, state and federal standards. Compliance is measured in a variety of ways, including condition ratings, bridge inspections, accident investigations, and environmental requirements.

Historically, Road Services has prioritized projects as safety, preservation, mobility and capacity projects. In reviewing the core business and outcomes, however, it became clear that safety and legal mandates are a foundation of all of the division's projects and programs, and not necessarily independent project categories. As a result of this finding, combined with an awareness of Road Services' funding and resource constraints, the Advisory Committee concluded that a new way of setting priorities for the division's outcomes is necessary. The Advisory Committee recommended that as priorities are set for the division's work, enhancing the safety of users of King County's roadway network while meeting local, state and federal standards should be viewed as inherent in all of the Road Services Division's program areas and deliverables.

The Advisory Committee also found that neither mobility nor capacity could be adequately or equitably advanced without functioning road assets. Therefore, preservation remains as the first priority of the Road Services Division.

Recommendation 1 serves as the foundation for the remaining recommendations and the Phase II work plan. The changing scope of Road Services business given the extent and

characteristics of the post annexation road system will need to be considered in Phase II work addressing potential structural changes. The final ROMP will include a work plan for the review and update of the Road Services Facilities Master Plan (See Roads Maintenance Facilities Study, Appendix M).

4. Policy guidelines: contracting

The framework will include:

(3) Policy guidelines regarding funding, <u>contracting</u> and road responsibilities.[5]

Recommendation 2: Contracting

King County will pursue contracting opportunities when those services provide mutual benefit to King County and the jurisdiction

Washington State or King County policies addressed in this section:

- King County Comprehensive Plan: T-406

Road Services provides engineering, maintenance, and construction services to cities in King County and to other King County agencies. These services include the following:

- Design and construction
- Traffic and roads operations and maintenance
- Emergency response
- Engineering expertise.

All services are provided on a reimbursable basis. They are invoiced at cost; Road Services does not earn a profit. Reimbursable services accounted for $19 million of the division's proposed budget for FY 2009. Providing these services benefits the division through economies of scale: having a larger staff to do work for contract cities allows the county to maintain specialized expertise and makes more experienced staff members available during emergencies. This arrangement also allows the county to make greater, and thus more efficient, use of county-owned equipment.

Contracts with cities also provide an opportunity for collaboration. Through contract agreements, the Traffic Engineering Section currently operates two multi-jurisdictional Intelligent Transportation System (ITS) corridors, allowing the division to deploy sophisticated travel demand management across unincorporated and incorporated areas of King County.

[5] King County Motion 12786, Attachment A, Work Plan, page 2.

The services Road Services provides to contract cities and to other county agencies varies from contract to contract. The following are examples:

- The Traffic Engineering Section is currently the largest provider of contract traffic signal support services in King County.
- The Engineering Services Section is a major provider of survey services to King County agencies, including the Parks, Airport, and Transit divisions.
- The Roads Maintenance Section has provided wide-ranging services to newly incorporated cities—a role that evolves into more technically specialized services as cities mature and gain experience with routine maintenance.[6]

Challenges include volatility in staffing levels that can occur because other jurisdictions' budgeting processes often occur after the King County budget has been adopted. The projects that Road Services has agreed to perform under contract may change after Road Services' budget has been approved.

Currently, Road Services does not have policy guidelines for contracting; the approach has evolved over time. Through the ROMP the Advisory Committee recognized both the benefits and challenges described above and agreed that contracting is beneficial for the Road Fund and the county. The Advisory Committee recommended a policy that reflects this mutually beneficial relationship between Road Services and contract jurisdictions and agencies.

The Phase II work plan includes the development of guidelines for the Road Services Contracting program business plan.

[6]Appendix B, Dye Management Group Inc., Framework Development, Working Paper 1.

5. Road Services Division mission and vision

The framework will include:

(1) The mission and goals for Road Services Division.[7]

Recommendation 3: Road Services Division mission and vision

Following the King County Executive and County Council Approval of the Phase I recommendations, the Road Services Division will update its vision and mission to reflect the recommendations identified in ROMP Phase I.

The revised vision and mission statements will serve as the foundation of ROMP Phase II.

Washington State or King County policies addressed in this section:

- **Countywide Planning Policies (CPPs):** The CPPs provide a countywide vision and serve as a framework for each jurisdiction to develop its own comprehensive plan, which must be consistent with the overall vision for the future of King County. Road Services' mission and vision should be consistent with the CPPs.
- **King County Comprehensive Plan:** T-201, T-202, T-203, T-306, T-308, T-312, T-313, T-332, T-506.

The ROMP Phase I, Recommendation I (Chapter 3) prioritizes Road Services responsibilities. The Advisory Committee reviewed the Road Services Divisions' current mission and vision and agreed they do not reflect the priorities in Recommendation 1. The mission and vision need to be adjusted as Road Services focus shifts to a rural centered mission.

King County Code, K.C.C. 2.10.020, Section H defines the "Mission Statement" as a statement of the organizations purpose. According to the code, the mission is to be defined in terms of the outcomes the organization intends to achieve.

The Road Services Division's current mission statement

To identify and implement roadway and other related transportation system solutions for the safe and efficient movement of people, goods and services to support a high quality of life in King County.

A vision statement describes what the division "would like to achieve by delivering on the stated mission. The vision should be stable and can be very long-term and difficult to achieve."[8]

[7] King County Motion 12786, Attachment A, Work Plan, page 2.
[8] KCC 2.10.020.

The Road Services Division's current vision statement

To be a leader, partner, and provider of local and regional transportation services; to have a significant role in shaping regional transportation policy; and to be an organization our employees are proud to work for. We will lead, partner or provide a full menu of planning, engineering, construction, maintenance, and traffic services in unincorporated King County and to other jurisdictions on a contractual basis.

After the King County Executive and County Council approve the ROMP Phase I recommendations, Road Services will update its mission and vision statements to reflect the recommendations identified in Phase I. The Advisory Committee will review the statements, and these revised statements will serve as the foundation for ROMP Phase II.

6. Policy guidelines: goals, performance measures, and evaluation

The framework will include:

(1) The mission and goals for the Road Services Division.[9]
(3) Policy guidelines addressing practices such as performance measurement, evaluation, budget and financial accountability.[10]

Advisory Committee guidelines:
Analysis and recommendations of the ROMP will be based on adherence to King County Code in performance measurement, evaluation, and budget and financial accountability.

Recommendation 4: Road Services goals, performance measures and targets

Following King County Executive and County Council approval of the Phase I Recommendations, the Road Services Division will develop new goals and appropriate performance measures and targets for each goal consistent with the Countywide Strategic Plan, relevant department strategic plans, and the Performance and Accountability Act.

Washington State or King County policies addressed in this section:

- **Countywide Planning Policies (CPPs):** The CPPs provide a countywide vision and serve as a framework for each jurisdiction to develop its own comprehensive plan, which must be consistent with the overall vision for the future of King County. Road Services' mission and vision should be consistent with the CPPs.

Goals are typically identified as the results an organization plans to achieve within a defined period of time. They are usually the next step after the organization establishes its mission and vision statements. The ROMP Advisory Committee found that the division's current goals, listed below, do not reflect the deliverables or priorities identified in the ROMP recommendations. They recommend the division develop new goals to reflect the -priorities identified in ROMP Phase I, Recommendation 1.

[9] King County Motion 12786, Attachment A, Work Plan, page 2.
[10] King County Motion 12786, Attachment A, Work Plan, page 2.

Current goals of the Road Services Division

Transportation Solutions
Be a leader and active partner in planning and carrying out local and regional transportation solutions that support mobility, accessibility and growth management.

Travel Safety
Provide a high level of safety to the traveling public through effective planning, design, engineering, construction, operations, preservation and maintenance of roadways and other transportation facilities throughout King County.

Customer Service and Satisfaction
Achieve high levels of customer satisfaction through the identification and timely response to roadway and other transportation facilities service needs; and provide timely, consistent and clear two-way communication tailored to the transportation needs of the customers and citizens we serve.

Efficiency and Cost Effectiveness
Deliver roadway and related transportation system infrastructure projects and services on time and within budget through efficient and cost effective management of resources.

Environmental Responsibility
Ensure the planning, design, engineering, construction, operations, preservation and maintenance of roadways and other transportation facilities are implemented in an environmentally responsible manner.

Employee Motivation and Pride
Be a highly skilled professional organization by attracting and retaining a qualified, diverse, and motivated workforce, encouraging teamwork, recognizing high performance, and fostering creativity.

Integration with countywide strategic planning

King County has been working for many years to implement a strong performance management system. The system, codified via the Performance Management and Accountability Act, is designed to use performance data to provide public accountability and oversight and to inform decision-making in King County.

As the countywide strategic planning work is currently underway, the Advisory Committee found it crucial that any new Road Services Division goals should reflect advancing county-wide goals. Therefore, Phase II will align Road Services goals with county-wide goals and values.

Measurement of results in the Road Services Division

Road Services has a significant amount of measured data. These measurements have evolved over the years along with the county's approach to performance measurement. The division has tracked more than 40 separate measures, including basic outputs such as miles of pavement overlay; outcome or effectiveness measures such as the percentage of bridges that have load limits; efficiency measures such as the average road maintenance cost per mile; customer service measures such as the average number of days to complete requests for pothole repair; and high-level community indicators over which Road Services has only limited influence, such as the pedestrian fatality rate per 100,000 population. The Dye Management Group Inc.'s Working Paper 3, Service Levels (Appendix D), contains data for many of these measures and provides comparisons to other jurisdictions where available. Appendix G shows the full suite of division performance measures currently in use.

This data is valuable and some of the measures may align with current goals or goals developed in Phase II. The Advisory Committee recommends that Road Services review the measures for consistency with revised goals, the county-wide strategic plan, and relevant department strategic planning documents. Measures should be revised or developed to indicate whether or not desired outcomes have been achieved.

After the King County Executive and County Council approve the Phase I recommendations, the Road Services Division will develop new goals and appropriate performance measures and targets for each goal to reflect the priorities identified in Phase I. These measures and targets will be consistent with the Performance and Accountability Ordinance.

7. Policy guidelines: funding

The framework will include:

(4) Policy guidelines regarding <u>funding</u>, contracting and road responsibilities.[11]

Advisory Committee guidelines:
Analysis and recommendations of the ROMP will prioritize items within Current Revenues

Recommendation 5: Levy rate

The Phase II fiscal impact analysis should include the following:
1. Future-year property tax revenue forecasts based on the statutorily allowable levy amounts, calculated by increasing the preceding year levy amount by 101% plus new construction.
2. Future-year property tax revenue forecasts based on levy amounts that are constrained to an amount equal to the 2009 road levy tax rate applied to the current year's assessed valuation plus new construction.

Recommendation 6: Sheriff transfer for the Selective Traffic Enforcement Program (STEP) and other traffic enforcement

A decision concerning the transfer of funds from the county Roads Fund to the Sheriff's Office, for the Selective Traffic Enforcement Program (STEP) and other traffic enforcement, will remain a topic of discussion in the King County Executive's and County Council's budget processes. However, the Phase II Impact Analysis will include further exploration, in collaboration with the Sheriff's Office, of issues related to the fund transfer, including the performance and/or results associated with the transfer.

Washington State or King County policies addressed in this section:
- **RCWs:** 36.33.220; 36.40; 36.79.140; 36.82.020; 36.82.040
- **King County Comprehensive Plan:** T-327, T-401, T-402, T-403, T-404, T-405.

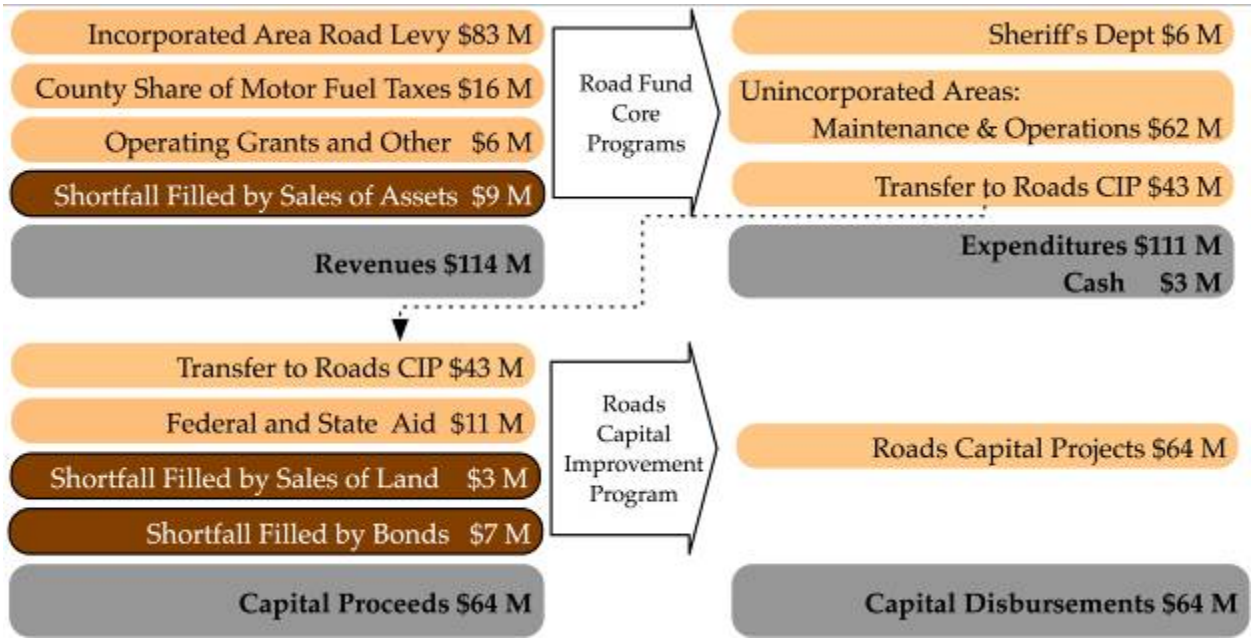
Analysis of the 2009 adopted budget shows that Road Services' sustainable revenues are not sufficient for current operations and service levels. Revenues fall short of expenses by about $21 million, almost 15% of total expenditures and disbursements. Road Services is making up the shortfall with about $14 million from sales of assets and about $7 million from bond issues - a stop-gap strategy that cannot be sustained in the long run.

Exhibit 7-1 provides a summary of Road Services finances using data from the 2009 adopted budget. This summary shows only programs that support the road system in

[11] King County Motion 12786, Attachment A, Work Plan, page 2.

unincorporated areas; it excludes the cost-reimbursable services the division performs for other jurisdictions and other county departments.

Exhibit 7-1: Road Services Division 2009 Financial Summary



Note: Adding the revenues and capital proceeds yields $178 million. Subtracting the Road Fund transfer of $43 million to the CIP and the $6 million transfer to the Sheriff's Office leaves $129 million in proceeds available for core Road Services programs. The Road Fund revenue budget for 2009 is $128 million. The net proceeds of $129 million exclude about $20 million of Road Fund revenues: the $6 million transferred to the Sheriff's Office and about $14 million of reimbursements to the Road Fund for road maintenance services provided to municipalities, utility inspection fees, and stormwater disposal. Road Fund revenues of $128 million exclude $21 million of capital proceeds from outside the Road Fund: $11 million in federal and state aid, $3 million from land sales and $7 million from bonds.

Annexations and incorporations in urban unincorporated areas have complicated the Road Services Division's strategic planning and budget development. Annexations produce a loss of revenue. In addition, the potential for annexations and incorporations creates a delicate balancing act between investing in road facilities for urban unincorporated areas to encourage annexation and avoiding the creation of long-term burdens on the remaining unincorporated areas. This effort is made all the more difficult by the uncertain timing of annexations and incorporations.

A 20-year analysis of the effects of annexation on the Roads Fund, which assumes the maximum allowable levy amount, identifies a problem (see appendix H) that will continue unless intervention occurs. This model does not include unfunded liabilities for reconstruction of assets, which have not been fully identified but are likely to have a significant impact on the fund.

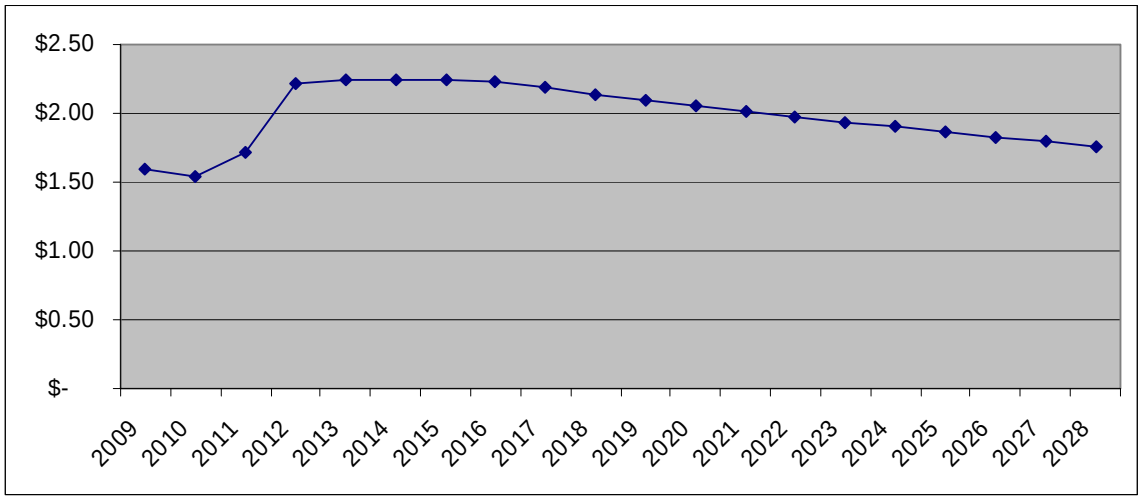
In its review of the 20-year analysis (Appendix H), the Advisory Committee identified three policy issues: Contracting decisions; levy rate approaches; and Sheriff Transfer

guidelines. Contracting decisions are addressed in Recommendation 2 (Section 4, Road Services Contracting).

The 20-year analysis shows levy rates for property owners in the remaining unincorporated area rising, beginning in 2012 (see Exhibit 7-2), due to annexation assumptions. Under the assumption of all urban unincorporated areas annexing by 2012, the unincorporated road levy for will grow significantly to continue at the statutory 1% revenue growth. The levy will hit the maximum rate of $2.25 in 2013 and gradually decline as assessed values rise in the rural area.

The Advisory Committee acknowledged that in the past, the County Council has adopted maximum allowable levy amounts. The ROMP provides an opportunity to consider the options for this revenue source. The Advisory Committee recommends that Phase II Impact Analysis forecast revenues based on levy amounts that are constrained to an amount equal to the 2009 road levy tax rate as well as forecasting with a maximum levy rate.

Exhibit 7-2: estimated levy rates 2009–2028, assuming adoption of maximum allowable levy, 101% plus new construction



The 2009 revised budget also includes a $5.7 million transfer to the Sheriff's Office, including $1.4 million for full cost recovery of the Selective Traffic Enforcement Program (STEP) and $4.3 million for traffic enforcement. The Advisory Committee also acknowledges the Road Fund transfer to the Sheriff's Office as a policy issue (additional information can be found in Appendix J). The 20-year analysis (Appendix H) identifies the impacts of decreasing the Sheriff Transfer as annexations occur. Other options could include reductions of the transfer if the county is successful in pursuit of other revenue sources (ie utility tax).

There has been no policy guidance on this transfer, and the Advisory Committee is not prepared to make a recommendation on whether this transfer should continue. The

Advisory Committee acknowledges that the decision on this transfer will remain a topic of discussion in the budget processes of the King County Executive and County Council. However, the Advisory Committee recommends further exploration of the benefits of this expenditure in collaboration with the King County Sheriff's Office.

Revenue options

It is clear the current strategy for filling the revenue shortfall, selling off assets no longer required for servicing the road system, is not sustainable in the long run.[12] The two primary methods for resolving the Road Fund problem are managing significant declines in levels of service or securing additional sources of revenue. Recommendation 1, prioritizing responsibilities, and the recommended operational model to manage within current revenues (see Section 8) provide a foundation for guidelines and strategies to manage declines.

Recognizing the need to secure additional sources of revenue for the Road Fund, the Advisory Committee identified and rated options for additional revenue for the Road Fund (see the full list in Appendix K). Three criteria were considered in the analysis:

- **Efficiency:** The capacity or *yield* of the revenue source over time, and the *utility* and flexibility with which those new funds can be applied across different projects and jurisdictions.
- **Equity:** How fairly the burden is distributed across people and business in the county.
- **Simplicity:** The *public's ability to understand* it and the ease with which the county can *collect it and administer it.*

Options considered included: Vehicle license or registration fees, general fund property tax levy; local option motor fuel taxes; tolling, and vehicle miles travelled fees. Phase II will include further exploration and recommendations for new revenue sources.

It is the county's intention to pursue additional revenue sources. Phase II will identify stable funding options for the Road Fund. The impacts of levy rate decisions, alternatives for reducing the transfer to the Sheriff for traffic enforcement and new revenue sources should be addressed in the final recommendations.

[12] Dye Management Group, Inc. Funding Analysis: Working Paper 2

8. Policy guidelines: balance of responsibilities

The framework will include:

(5) Policy guidelines regarding the balance of operational and maintenance responsibilities with roads infrastructure and capital improvements.[13]

Advisory Committee guidelines:
Analysis and recommendations of the ROMP will prioritize items within Current Revenues

Recommendation 7: Operational Model Options

Of the three operational models evaluated, the Advisory Committee recommends "Prioritize Asset Life Cycle in Rural Areas". The Phase II work plan will need to identify the gap between current revenues and what would be required to maximize life cycle costs.

Washington State or King County policies addressed in this section:

- **RCW: 36 70A –** State Growth Management Act
- **King County Comprehensive Plan:** U-107, U-110, T-203, T-306, T-307.T-313, T-401, T-402, T-403, T-404, T-405, T-406

The ROMP Phase I work improves our understanding of the need to preserve existing roads, bridges and related assets. The Advisory Committee acknowledges that, according to the county's 2008 road inventory, a significant proportion of the county's assets of this type are failing or at risk of failing. At-risk assets require significantly escalating maintenance costs if left alone. Failing assets require rehabilitation and/or reconstruction. They also place the road infrastructure at risk for more costly repairs; wholesale loss of a road and related closures and detours; increased probability of damage to persons and property due to flooding and other failures; and decreased federal revenues for future repairs in the event of another federally declared storm disaster. If failing and at-risk assets are left unaddressed, their number will rise significantly, increasing the need for rehabilitation and/or reconstruction. Moving into Phase II, it will be important to understand the links between maintenance, rehabilitation, and reconstruction so we can balance operational and maintenance responsibilities for roads infrastructure and capital improvements.

Dye Management Group, Inc. identified three broad policy options for approaching the balance between operational and maintenance responsibilities for roads infrastructure and capital improvements:

[13] King County Motion 12786, Attachment A, Work Plan, page 2.

- Current revenue management: Define essential services and priorities, starting with minimum statutory requirements, safety-related risk management and manage to decreased service levels.
- Asset management emphasis: Optimize use of funds to meet asset management goals while addressing essentials. To achieve lowest life cycle costs will require increased revenue.
- Meet current service level goals: Meet currently defined service level objectives and standards for mobility, safety, preservation, operation and maintenance with new revenue sources.

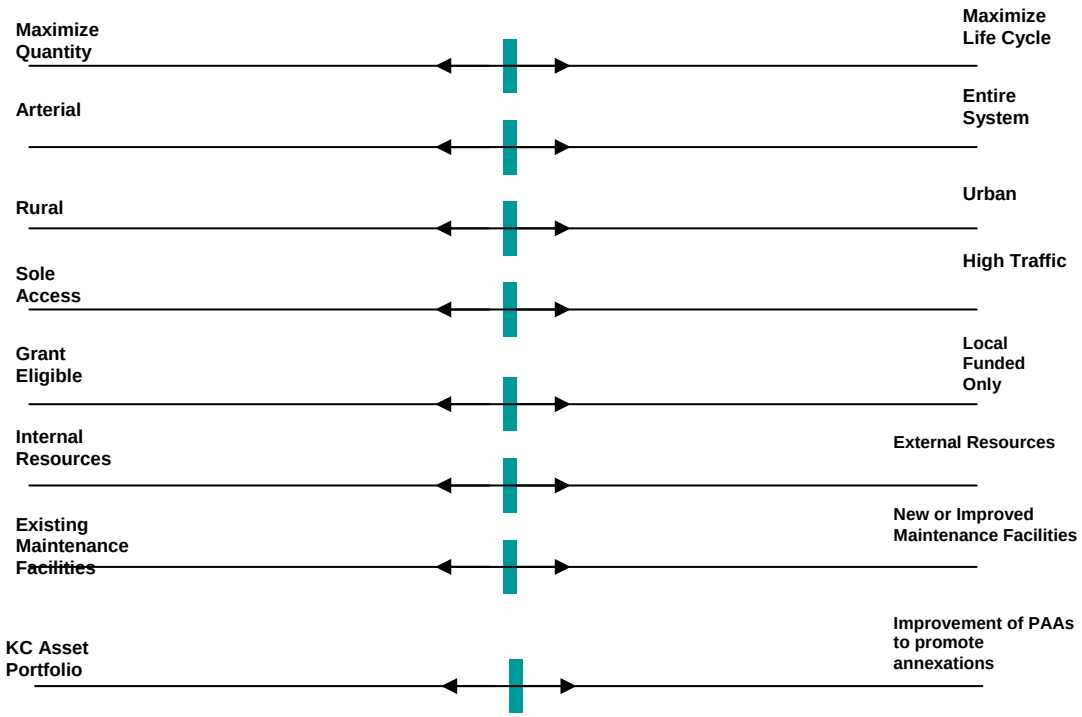
These options are based on the analysis of current service levels provided in Working Paper 3 and the implications of the change drivers presented in Working Paper 1 for future service levels. The options and their impacts are detailed in Appendix A.

The Advisory Committee determined it is unlikely additional revenues will be in place in the near term. Therefore, options were further refined to prioritize continuing operations in the near term, in the absence of additional revenues. The Advisory Committee took a multi-step approach:

- Defined key policy choices that are impacted by any operational model or prioritization of programs and projects (Exhibit 8-1 and Exhibit 8-2);
- Developed possible operational models; and
- Identified the impacts of the options through the lenses of the policy choice impacts and operational impacts.

Exhibit 8-1 is the generic decision-making model used by the Advisory Committee in developing the Recommended Operational Model.

Exhibit 8-1: ROMP decision making model



The model identifies eight policy choices that are affected by any operational model or by the prioritization of programs or projects. Exhibit 8-2 provides a description of these policy choices. They are generally not mutually exclusive; policy impacts will fall somewhere along each continuum.

Exhibit 8-2: policy choices affected by operational models

Maximize Quantity: Provide maintenance to the most assets possible (may include lower-quality overlay methods).	**Maximize Life Cycle:** Use the best practice methods and resources to maximize each asset's life span.
Arterial: A moderate or high-capacity road; connector roads between local residential streets and state highways.	**Entire System:** All arterials and local roads. Includes lower-capacity and lower-volume roads and low-volume roads that provide sole access to the areas they serve.
Rural: Unincorporated areas to the east of the Urban Growth Boundary and Vashon Island.	**Urban:** Unincorporated areas to the west of the Urban Growth Boundary.
Sole Access: Roads that provide the only access to an area. Often in the rural areas of King County.	**High Traffic:** Roads that serve or provide connections to areas of high population.

Grant Eligible: Projects eligible for grants—generally, capacity projects serving urban centers.	**Local Funded Only:** Projects with local funding (either current Road Services Division revenues or new revenue sources).
Internal Staff: Full-time permanent FTEs (county employees).	**External Staffing Resources:** Private-industry contractors and temporary employees.
Existing Maintenance Facilities: Current maintenance facilities.	**New or Improved Maintenance Facilities:** New facilities or required updates to current facilities (assumes Summit Pit replacement).
King County Asset Portfolio: Preserve and improve long-term King County assets in the rural unincorporated areas.	**Improve PAA Infrastructure to Promote Annexation:** Preserve and improve assets in the urban unincorporated areas.

The foundation of the operational models is a current status scenario (Appendix L, Exhibit L-3). This scenario represents the 2009 Adopted Budget and Financial Plan (see 20-year analysis, discussed in Section 7, Funding and Appendix H, to identify policy issues and boundaries for analysis and decisions). The committee incorporated the analysis and conclusions documented in Working Paper 2, as well as the impacts of projected annexations and incorporations, into the current status scenario.

Under this scenario, activities were downsized significantly in response to declining revenue projections. Capacity, mobility, and preservation all face cutbacks, and the division faces higher reconstruction costs in the long term as maintenance is decreased and asset deterioration accelerates. This results in adverse effects for rural, urban, high-volume, and sole-access roadways.

The Advisory Committee developed and evaluated three operational model options:

- Option A: Across-the-Board Reduction: Proportional reductions are made across current services to meet current revenues. This accounts for a reduction of approximately 15%.
- Option B: Prioritize Asset Life Cycle in the Rural Areas: Recognizes the rural area roads will be the county's long term assets and prioritizes preservation of the rural areas roadway system. Two options were pursued within this model.
    - Prioritize Asset Life Cycle in the Rural Areas – Within Current Revenue: This option recognizes the current funding constraints and develops a model to prioritize asset management within current revenues.
    - Prioritize Asset Life Cycle in the Rural Areas – Maximize Asset Life: This option will require additional revenues to maximize asset life of the county's rural area roadway system.

- Option C: Grant Eligible: Current assets are leveraged to pursue grant funding. This option increases capacity projects in the urban corridors.

The full Road Services Division Operational Model Impact Analysis is attached in Appendix L. The analysis explains each option, includes a decision making model (Exhibit 8-1) for each option; and provides preliminary analysis of the options impacts on the CIP, traffic maintenance, and roadway maintenance.

After evaluating the likely affects and implications of these three options, the Advisory Committee selected Option B, Prioritization of Asset Life Cycle in the Rural Areas, as the most responsive for going forward into Phase II. The committee recognizes that further analysis is needed to fully determine the appropriate balance between funding the CIP and maintenance.

Following approval of the ROMP Phase I and Phase II Work Plan by the King County Executive and County Council, Phase II will provide more analysis of the recommended option, Prioritize Asset Life Cycle in the Rural Areas. Evaluation and recommendations concerning the service level required to optimize the asset life cycle, and the revenues and other resources required to achieve that goal, will be part of Phase II.

9. Phase II Work Plan

Phase II – budgetary and operational strategies

The outcome of Phase II will be a recommended operational master plan consistent with the Phase I framework. Budget and operational strategies will be developed taking into account the financial implications of potential annexations and other change drivers.

The recommended operational master plan will be developed based on programmatic options regarding:

1. Service levels and service alternatives, including comparative analysis of other jurisdictions' approaches to providing roads services;
2. Roads services delivery, organizational structure, contracting, budgetary and financial accountability; and performance measurement;
3. Stable funding options for roads services, including existing sources, new funding sources, and options for addressing the transfer[14] of funds to the Sheriff's Office; and
4. Operational and service priorities in the event of funding challenges.

The following deliverables will be developed and used to craft the final operational master plan, based on the Phase I recommendations and the preferred options developed in Phase II:

1. RSD Mission, Vision, Goals, Performance Measures and Targets
2. Service Delivery Model
   a. Service levels and backlog of work
   b. Analysis of service delivery for potential efficiencies including options and methodology for year-to-year balancing the division's operating and capital budgets
   c. Cost of services and cost of the backlog of work
   d. Fiscal Impact Analysis including funding options, opportunities to decrease or eliminate the Sheriff transfer, and impacts of levy rate options
3. Guidelines for a King County Road Services Division Contract Service Provision Business Plan
4. Communications plan (for ongoing customer and stakeholder communication)
5. Work plan for the review and update of the Road Services Division Facilities Master Plan (FMP)[15].

[14] Development of options for the Sheriff transfer should be addressed through a collaborative process with the King County Sheriff's Office and other partners as appropriate.
[15] Road Services Division Facilities Master Plan, Appendix M

Additionally, the Phase II process will include the development of a work plan for stakeholder communications including:

1. Communication objectives; and
2. Implementation of an Advisory Committee-approved communication plan.

Phase II schedule and milestones

Phase II, which will follow and build upon Phase I, is scheduled for completion in the summer or fall of 2010. Road Services will develop the schedule and milestones for Phase II and submit them to the County Council along with the Phase I policy framework. The division will review and reconfirm specific tasks associated with Phase II as that phase commences.

Milestone	Schedule Estimate
RSD review and revision of vision, mission, goals	Fall 2009
ROMP Phase II Planning	Fall 2009
Identification of opportunities to advocate for utility tax or other revenue sources for local services legislation	*Fall 2009*
Convene ROMP Advisory Committee	December 2009
ROMP Workwork and development	Winter/Spring 2010
Executive transmits ROMP Phase II to County Council Transmittal of Countywide Strategic Plan to Council	*May 2010*
Executive transmits OMP Phase II to County Council	Spring/Summer 2010
Consideration of ROMP Phase II by County Council	Summer/Fall 2010

ROMP oversight, development, and expert involvement

Advisory Committee

The Advisory Committee will provide oversight to the consultant and staff team and guide the development of the Road Services Division Operational Master Plan.

Co-chairs:

- Director, Office of Strategic Planning and Performance Management
- Laurie Brown, Deputy Director, Department of Transportation

Members:

- The Honorable Dow Constantine, Metropolitan King County Council
- The Honorable Reagan Dunn, Metropolitan King County Council
- Kathy Brown, Facilities Management Division
- Bob Cowan, Director, Office of Management and Budget
- Linda Dougherty, Road Services Division Director, Department of Transportation

Primary project staff

This staff group will support plan development and ensure coordination between the Road Services Division, the Department of Transportation Director's Office, the Office of Management and Budget (OMB), the Office of Strategic Planning and Performance Management (OSPPM), and the County Council. Other Transportation, OMB, OSPPM, Sheriff's Office, and County Council staff members will be involved and provide input as needed. The primary staff group will include:

- Paul Carlson, Legislative analyst, Metropolitan King County Council
- Gwen Clemens, Senior policy analyst, Office of Strategic Planning and Performance Management
- Jennifer Lehman, Budget analystbudget analyst, Office of Management and Budget
- Jennifer Lindwall, CIP and Planning Section manager, Road Services Division
- Mark Melroy, Legislative analystlegislative analyst, Metropolitan King County Council
- John Resha, Legislative analystlegislative analyst, Metropolitan King County Council

10. Appendices

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King County

King County Road Services Division

Final Report and Options

Roads Operational Master Plan

June 30, 2009

King County Road Services Division

Final Report and Options

Table of Contents

■

King County Road Services Division

Operational Master Plan, Phase I

Final Report and Options

■

I. Introduction

The King County Road Services Division Operational Master Plan (ROMP) is a comprehensive plan that presents how the Road Services Division (RSD) will operate and provide services in the future. The ROMP process has two phases; Phase One will produce a series of working papers that will serve as the building blocks for the final plan.

This report is the final deliverable for Phase One of the ROMP development. It presents the conclusions of the current business framework, change drivers, service levels, revenue situation, and options, and presents the implications of those options for the future business of RSD. It is organized into the following sections:

Sections II-V: Work Performed, Change Drivers, Service Levels, and Financing County Roads summarize the conclusions of ROMP Phase One analysis.

Section VI: Options and Implications analyzes the options for the future of RSD and their implications on RSD's business, organization, and revenues.

A. Working Papers

This report presents service level options based on three working papers prepared to enable ROMP analysis. These working papers are included as attachments to this final report.

Working Paper 1: Framework Development presents the Road Services Division's organizational structure, business functions, products, and services, and provides an analysis of the trends affecting the Division's business in the future.

Working Paper 2: Funding Analysis contains an analysis of current and future sources of funds with which the Road Services Division (RSD) can fulfill its mission.

Working Paper 3: Service Levels summarizes the use of service levels in managing the business of RSD and provides a policy-level analysis of the service levels and

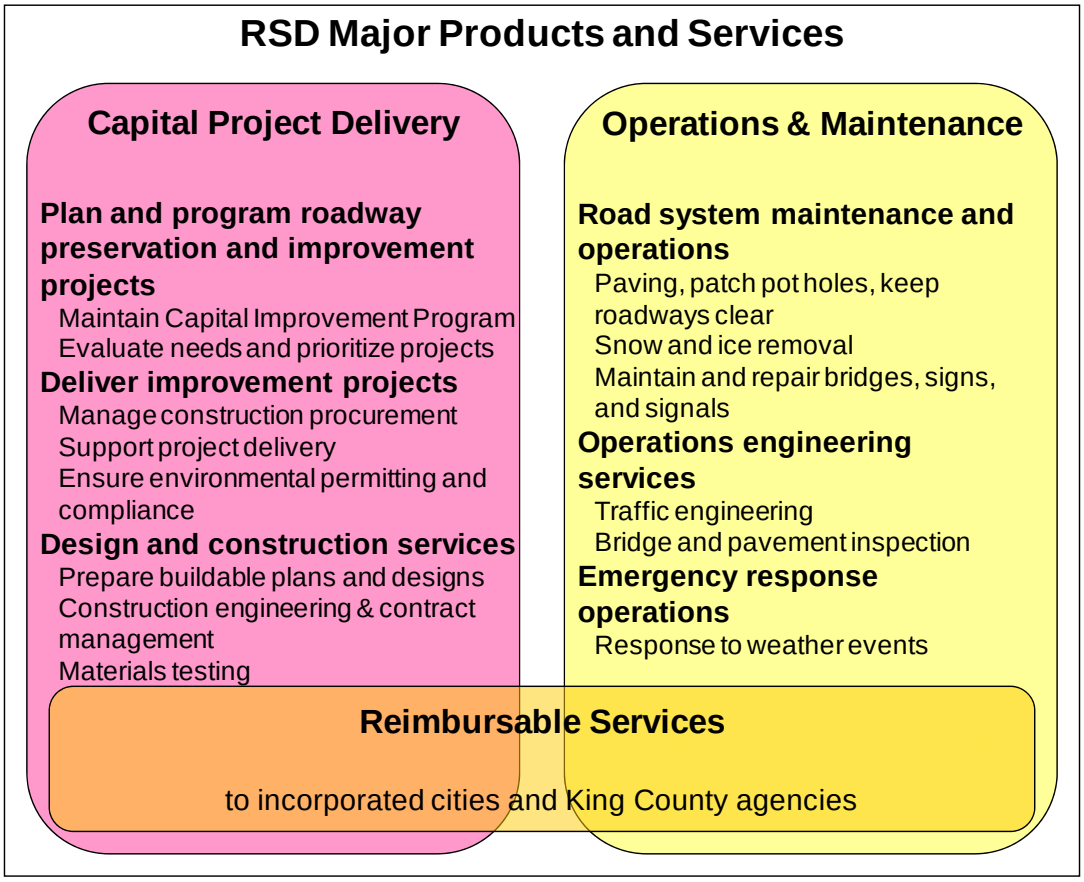
standards that are used to define the work requirements and needs of the Road Services Division.

II. Work Performed by the Road Services Division

The Road Services Division (RSD) is responsible for enabling the safe and efficient movement of people and goods on roadways in the unincorporated areas of King County. The unincorporated area road network includes a total of 1,745 centerline miles of roadway and 180 bridges, in addition to unpaved roads and pathways.

RSD exercises King County's responsibilities as the owner and operator of county roads in unincorporated King County. It is responsible for all County-owned assets within the right-of-way. These responsibilities entail the planning, design, construction, maintenance, and operation of a comprehensive system of roadways, bridges, and other transportation facilities and services. The work performed in meeting these responsibilities is summarized in Exhibit II-1, which provides a business-based view of RSD that identifies the principal products and services provided.

Exhibit II-1: Road Services Division Business Summary



The work performed by RSD falls into two categories:

Capital program management and project delivery. This involves the capital planning work to identify the most effective use of capital funds to preserve and improve roads. This defines individual improvement projects. RSD is responsible for the delivery of these projects which involves managing the process and performing design and some of the construction work. Other construction work is performed by contractors.

- *Planning and programming* products and services include:
  - Capital Improvement Program
  - Roads Strategic Plan
  - Transportation Needs Report
  - Annual Bridge Report
  - Travel forecasting
  - Performance measures
- *Project delivery* work products and services are:
  - Project management and coordination
  - Contract management
  - Environmental permitting, compliance, and mitigation
- *Design and Construction* work products and services are:
  - Prepare biddable and buildable plans
  - Design and construction specifications
  - Professional engineering, survey, right-of-way services
  - Environmental engineering and analysis
  - Construction management
  - Materials and geotechnical testing
  - Pavement and bridge inspections

Operations and maintenance. This involves maintaining roads, ensuring they are open for traffic, and performing routine maintenance within the roadway right-of-way. As part of this work, RSD performs construction and maintenance work. This includes performing inspections and collecting data needed for RSD to efficiently execute its responsibilities.

- *Road system maintenance and operations* includes:

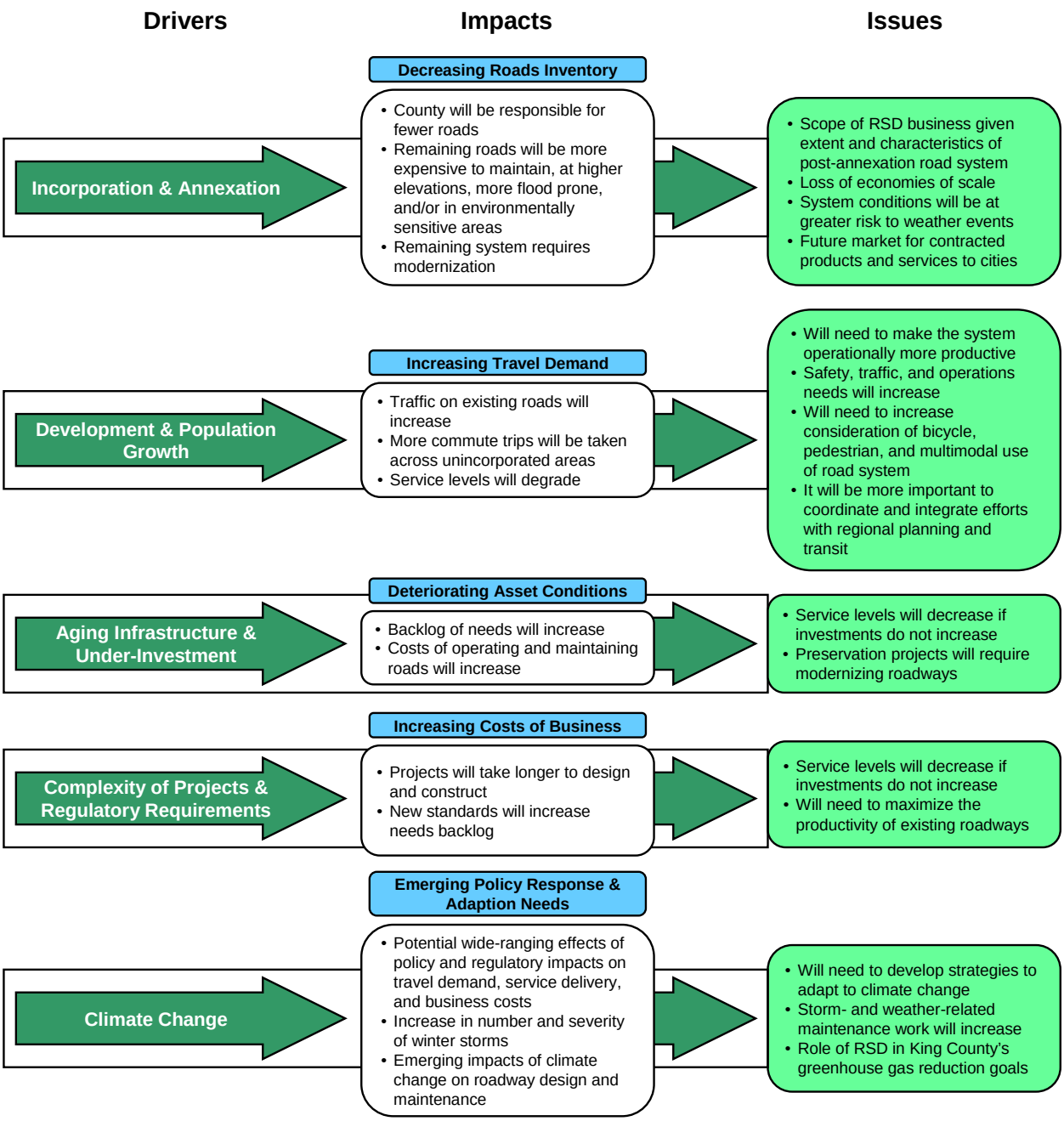
  - Maintenance of roads, drainage systems, vegetation, and other assets in the King County right-of-way
  - Maintenance of signs, signals, guardrail, striping and other traffic control devices
  - Winter maintenance, snow and ice removal
  - Bridge maintenance
  - Environmental and regulatory compliance
- *Specialized engineering services* support the optimal operation of the transportation system; specific products and services include:
  - Traffic engineering services such as signal coordination and timing, traffic impact analysis, safety reports and investigations, and other application of traffic engineering expertise
  - Intelligent Transportation Systems support
  - Bridge and pavement inspections
- *Emergency response* work is maintenance and operations conducted as a result of severe weather events or other emergencies

The products and services that RSD performs on county roads are also provided as reimbursable services to other County agencies and cities in King County. Reimbursable services accounted for $19 million of RSD's FY 2009 proposed budget. The extent of services provided to contract cities and other County agencies varies on a contract-to-contract basis.

III. Change Drivers

This section describes the principal change drivers that will impact the future work of the Road Services Division in meeting the County's mission and addressing its responsibilities as the owner of roads in unincorporated King County. The drivers, their impacts, and resulting policy issues are summarized in Exhibit III-1 below.

Exhibit III-1: Drivers, Impacts, and Issues Affecting RSD



These drivers and their impacts are summarized below and described in detail in subsequent sections.

Driver: Incorporation and Annexation

The Road Services Division anticipates a 32% reduction in road miles by 2028. If all planned annexation and incorporations occur, the unincorporated road network will

shrink to 1,090 road miles, while the Roads Maintenance Section also anticipates up to 114 new lane-miles added through new development. This change impacts the future volume, type, and location of work to be performed by RSD. The major impact of incorporation and annexation will be a decreasing roads inventory:

- RSD will be responsible for fewer roads; while some mileage will be added as subdivision roads are transferred to the county, there are no plans to grow the unincorporated area road system
- A higher proportion of the remaining roads will be at higher elevations, in flood prone areas, and require modernization work to bring them up to current standards
- RSD's customer base, cities that may contract with the Division for reimbursable services, will have larger roads networks

Policy Issues: The main issue is the extent to which the impacts of a decreasing road inventory are offset by the increased work required to provide current service levels on the remaining roads in unincorporated King County. The remaining roads will be at greater risk from weather events as a higher proportion are in at-risk areas and subject to the drivers listed below which affect service levels. If incorporations and annexations proceed as planned, there will be an increased level of effort required to provide a given service level on the remaining system. There will be some loss of economies of scale; with a smaller system there will be fewer roads to distribute fixed costs across. This suggests that increasing contracted work could be a strategy for lowering costs of providing services. A further issue is the size and type of the future market for contracted services. Some cities will choose to develop their own capabilities overtime after annexation others to benefit from the economies of scale and specialized services RSD offers.

Driver: Development and Population Growth

The population of King County's unincorporated areas is projected to increase at a rate of 2,000 to 3,000 persons per year post-annexation. Development in unincorporated King County and incorporated areas in eastern King County will increase travel demand on the road system. VMT in King County as a whole is projected to increase 1.3-1.4% per year, for a total growth of 30% by 2028.[1] The impacts of this increased travel demand will be:

- Increased traffic on King County's roads and a degradation of operational performance resulting in some congestion
- Increased use of County roads for commuting from eastern King County to population and employment centers

Policy Issues: The extent of the degradation of service levels that RSD currently provides if additional investments are not made. Increase in traffic volumes, will trigger the need for safety, capacity, and operational improvements. Implications of these impacts for

[1] Puget Sound Regional Council: "Puget Sound Trends: Vehicle Miles Traveled" August 2007

multimodal use of the roadways, and coordination and integration with regional and transit planning to address mobility needs.

Driver: Aging Infrastructure and Under-Investment

Currently, there is a large, unfunded, and unprogrammed list of high priority safety and preservation needs of at least $255 million through 2018[2]. The County has an aging infrastructure some of which needs to be modernized. Over time under investment in the preservation and maintenance of roads increases the costs of ownership. The impacts of these deteriorating conditions are:

- A growing backlog of needs
- Increasing costs of maintenance and preservation if lifecycle management is not optimized

Policy Issues: Under-investment in maintenance and preservation increases the lifecycle costs of infrastructure. A key issue is how to preserve the value of King County roads under anticipated revenue constraints. There is limited availability of data, tools, and procedures for asset management. Many preservation improvements will also require modernizing or reconstructing roadways to current standards.

Driver: Complexity of Projects and Regulatory Requirements

Recent years have seen a large increase in the cost of transportation projects due to rising commodity costs and the impacts of new regulatory requirements. Meeting greenhouse gas reduction goals and compliance with any future statutory requirements will impact how roads are designed, built, maintained, and used. New projects will be built to address ever-evolving standards. The impacts of these drivers will increase the costs of owning and operating County roads:

- A constrained ability to meet needs combined with rising commodity costs creates a backlog of projects that are increasingly expensive to complete
- New environmental and safety regulations, pavement and bridge standards, and traffic signal and sign standards require increased investment to meet mandates, driving up cost and increasing the backlog of projects

Policy Issues: If investments in the system do not increase, service levels will decrease. RSD will need to account for the fiscal impacts of County policy decisions on the Division's ability to provide service at current levels. With limited ability to add capacity, it will be even more important to maximize the productivity of remaining roadways.

[2] 2008 Transportation Needs Report. The Roads Services Division estimates a backlog of at least $255 million in high priority, unprogrammed safety, and preservation needs over the next ten years: $130 million for the County's estimated share of the South Park Bridge replacement, and $125 million for 79 other projects.

Driver: Climate Change

Policy adaptations to climate change are a major priority of King County government. There is an emerging consensus among scientists that climate change will increase the number and severity of winter storms, which in turn will accelerate the impacts of deteriorating asset conditions and increasing costs of business. The major impacts of climate change will be twofold: First, how King County's policy response and the emerging state and national response will affect future travel demand, the provision of transportation services on King County roads, and RSD's business practices as the owner and operator of roadway assets; second, planning for changing infrastructure needs as the County adapts to the impact of a changing climate. The impacts are:

- The number and severity of winter storms will increase, resulting in increased storm related work and affecting roadway lifecycle management costs
- Policy and regulatory responses to climate change will have wide-ranging effects on RSD management of travel demand, service delivery, and business costs
- Changes in roadway design, maintenance, and construction practices to adapt to climate change

Policy Issues: The Road Services Division will need to develop strategies to adapt to climate change impacts on the design, construction maintenance, and perhaps location of roads. Storm- and weather-related maintenance work will increase. A further policy issue is defining the future role of RSD in meeting the County's greenhouse gas reduction goals.

IV. Service Levels

King County differs in the specificity of the service level objectives that have been set for the operational performance, conditions, and safety of county roads. There are measurable objectives set for bridge and pavement condition but none for mobility and safety. In the case of safety, this is for good reason; no level of fatality is acceptable as a target. Specifying mobility objectives and priorities will be helpful for future phases of the OMP.

Service levels on County roads are summarized below for RSD's major program category. It is important to note that many project fulfill several categories; in particular, safety is a priority for RSD and programs and projects at all levels of the organization are designed with safety as a goal.

A. Safety

Improving safety is a significant goal for RSD, although there is no defined service level goal for the safety program area. RSD has set the goal of addressing High Accident Locations and Road Segments (HAL/HARS), which are identified in annual Traffic Safety Reports. Safety is addressed with standards rather than service

levels, and is addressed in the design, construction, maintenance, and operation of the roadway. The current service level is not formally specified, although some programs and accident-related data are tracked. Comparison to neighboring Counties indicates comparable crash and fatality rates.

Safety improvements were reported as the #1 priority of surveyed residents. Safety needs are a project category in the TNR and reported in annual Traffic Safety Reports. RSD staff identifies $28 million in need to correct all currently identified HAL/HARS locations.

B. Mobility

King County has no articulated service level goal for mobility, although RSD does seek to address capacity needs. Mobility and increased capacity are high priorities of residents. Capacity needs are reported in the TNR, though RSD does not currently have the revenue available to undertake capacity improvement projects and has no such projects planned. There is a travel time service level reported by the County only for concurrency purposes. It is not intended for nor is used to determine mobility service levels in King County roads. King County AIMS High reports travel times in King County as a whole, which are lower than other large counties in the United States. Projects that install modern traffic signals enable improved signal timing and coordination which reduces travel times on arterials and improves mobility.

C. Pavement Preservation and Reconstruction

The service level goals for pavement preservation and reconstruction are to meet the pavement condition standard set by RSD and construction and design standards mandated by the state and federal governments. RSD is currently meeting its target condition rating for pavement, which is for 80% of roads to be rated at a PCS of 40 or better.

Paved roadways were reported as the top asset priority of residents. The current annual budgeted need to meet service level targets is approximately $7.8 million in 2007 dollars. Revenue constraints currently limit RSD to preservation activities, namely overlay and chip seal. It is possible to benchmark pavement condition, understanding the many differences between agencies' data collection and analysis procedures. King County's average pavement condition is similar to the statewide average in Washington, as well as that of neighboring Pierce and Clark Counties.

D. Bridge Preservation and Reconstruction

RSD's service level goal for bridge preservation and reconstruction is twofold: To meet bridge sufficiency ratings and to minimize the structural deficiency, functional obsolescence, and load limits on bridges. These goals are achieved by meeting

standards for design and construction that are set by RSD bridge unit, state requirements for load and width, and federal guidelines.

Condition ratings are closely tied to federal funding eligibility; bridge maintenance and preservation activities are reactive. The Short Span Bridge program allocates funding to replace those bridges that are under 20 feet in length and therefore do not qualify for federal funding.

RSD is currently meeting all service level targets:

- Average annual sufficiency rating of 57 for timber bridges (Targets for 2007)
- Average annual sufficiency rating of 75 for non-timber bridges (Targets for 2007)
- Number/percent bridges structurally deficient = 14 bridges or 7% (Target for 2009)
- Number/percent bridges functionally obsolete = 40 bridges or 21% (Target for 2009)
- Number/percent limited bridges 3 bridges or 2% (Target for 2009)

Bridge condition can be benchmarked against other counties in Washington based on industry-wide criteria such as structural deficiency. Currently, 8.6 percent of King County's bridges are classified as structurally deficient, which is the second-highest percentage in the state.

Bridge repair or replacement was reported the second highest asset priority of residents. Current annual budget of $700,000 is adequate to accomplish highest priority reactive maintenance work orders. Need is reported in the Annual Bridge Report.

E. Traffic Operations and Maintenance

The service level goals for traffic operations activities are to improve safety and mobility through the maintenance and operation of traffic control devices. The FHWA Manual of Uniform Traffic Control Devices (MUTCD) provides the industry standard, with associated compliance dates, for guardrail, signals, and ITS projects. In addition, guardrail projects must comply with MUTCD and state standards, and ITS projects must comply with MUTCD, state, and federal standards. The MUTCD industry standard provides a benchmark for the condition of RSD's traffic assets.

Traffic Engineering reports a large and growing backlog to meet current standards and/or planned service levels, including:

- $5 million for new and retrofitted guardrail to meet Washington State requirements
- $4 million to comply with FHWA ITS standards
- $23 million to replace obsolete signals

F. Roads Maintenance

The roadway maintenance service level goal is to maintain and improve the condition of the current transportation system in King County. Much of the maintenance work performed is not governed by standards or mandates; rather, most Roads Maintenance activities are conducted under "standards of good practice." Roads Maintenance activities are conducted in support of road and bridge standards, environmental standards and regulations, mobility goals, safety standards.

King County currently uses three measures to track maintenance activities' performance: Total annual cost per unit of work accomplished, total annual labor hour per unit of work accomplished, and level of effort for maintenance activities. Service levels are currently set by level of effort in the Maintenance Management System (MMS). Outcome-related service levels are being established with the goal of the roadway system condition being rated a 4.0 or better on a scale of 1.0 to 5.0. Data was not available at this time to benchmark against other counties. A full discussion of benchmarks for maintenance is included in Working Paper 3.

G. Nonmotorized

The service level goal for nonmotorized programs, such as bicycle and pedestrian projects, is to improve safety and mobility on roads, pathways, and other RSD assets. There is no current specified service level for nonmotorized assets, and benchmarking is not applicable. Project needs are listed in the TNR and costs are estimated by Traffic Engineering. Walkway maintenance and pedestrian improvements were a relatively low priority reported by residents.

V. Financing County Roads

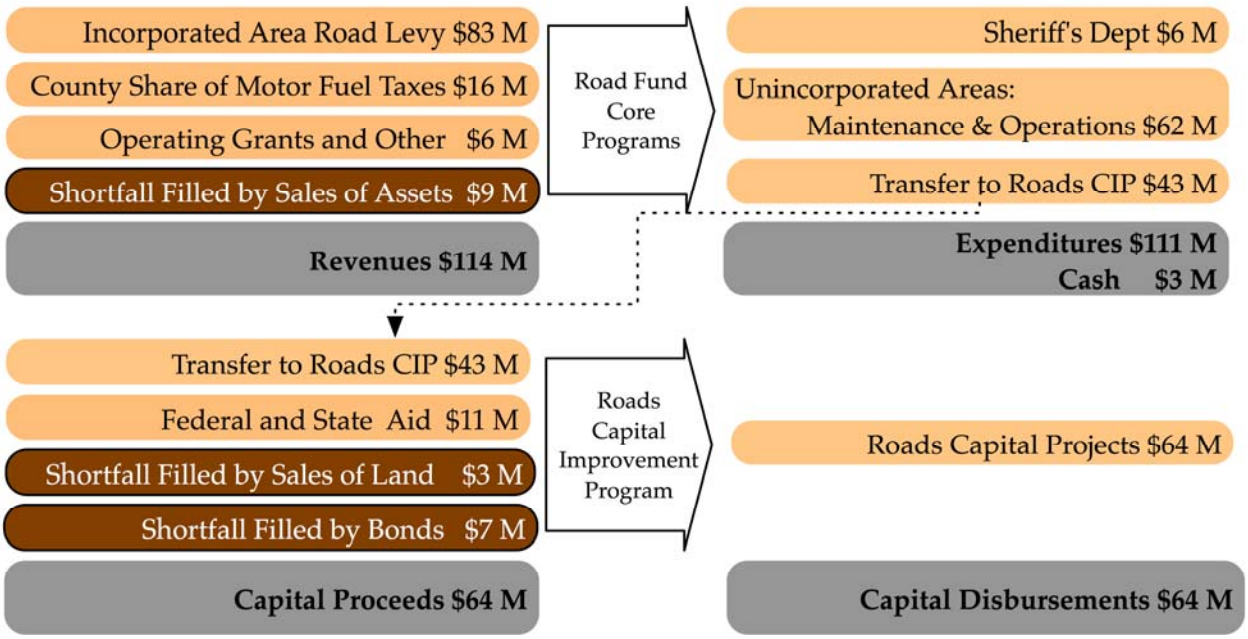
RSD's principal sources of revenue are:

- The unincorporated area property tax levy, sometimes called the road levy, that yields $83 million in 2009. The road levy grew by over 6% annually from 2002 to 2007 as costs resulted in the use of the remaining levy capacity allowed under Initiative 747. Now at its maximum allowed level, this levy is forecast to grow by about 2% annually as new housing development is limited by legislation and an economic recession.
- The county's share of the state motor fuel tax that yields $16 million in 2009. Motor fuel tax revenue is not forecast to grow significantly as volatile fuel prices and more

fuel-efficient vehicles limit vehicle-miles travelled and in the long run could decline in terms of its purchasing power because it is a fixed rate tax.

Exhibit V-1 provides a financial summary of RSD using 2009 adopted budget data. This summary shows only programs that support the road system in unincorporated areas; it excludes cost reimbursable service RSD performs for other jurisdictions and for other King County departments.

Exhibit V-1: Road Services Division 2009 Financial Summary



Note: Adding together the revenues and capital proceeds to a sum of $181 million, then subtracting the Road Fund transfer of $44 million to the CIP and the $4 million transfer to the sheriff's department leaves $137 million of proceeds available for core RSD programs. The Road Fund revenue budget for 2009 is $128 million. The net proceeds of $137 million exclude about $20 million of Road Fund revenues: the $6 million transferred to the sheriff's department and about $14 million of reimbursements to the Road Fund for road maintenance services provided to municipalities, utility inspection fees and storm water disposal. Road Fund revenues of $128 million exclude $21 million of capital proceeds from outside the Road Fund: $11 million in federal and state aid, $3 million from land sales and $7 million from bonds.

Current Revenues

The financial summary shows that RSD's sustainable revenues are not sufficient for current operations and service levels. They fall short of expenses by about $21 million in 2009, almost 15% of total expenditures and disbursements. RSD is making up the shortfall with about $14 million from sales of assets and about $7 million from bond issues, a stop-gap strategy that cannot be sustained in the long run.

RSD must secure additional sources of revenue or manage significant declines in its levels of service. The current strategy for filling the revenue shortfall, selling off assets no longer required in the service of the road system in the shrinking unincorporated areas of the county, is not sustainable in the long run.

King County's fiscal position has taken a dramatic turn for the worse over the past 12 months as the U.S. economic growth stalled and the national economy moved into recession. The increase in the General Fund deficit from $25 million to $93 million in 2009 required King County to take budget reduction measures totaling $72.4 million that reduce county services across the board.[3]

The current cyclical factors are well-known and need no further explanation here. The structural factors, on the other hand, have had a more deleterious effect on RSD core revenues than the economic cycle. RSD staff estimate that the Road Fund has lost about $10 million in annual revenues due to citizen initiatives that eliminated the Vehicle License Fee and capped property tax increases; and about $3 million per year in property taxes lost to annexation.[4]

VI. Options for OMP Consideration

Across RSD's business areas – capital project delivery, operations, and maintenance there is a growing gap between the County's service level goals and actual conditions. The ROMP working papers demonstrate trends that will result in decreasing service levels for roads in unincorporated King County in coming years. This situation has arisen due to increased demand for services, increased costs in delivering services, an aging rural road network, and the unsustainable practice of funding RSD's budget shortfall by sales of assets and bond issues.

The major implications of RSD's current situation are:

- Revenue constraints, particularly:
  - A $21 million funding gap between revenues and expenditures in the 2009 budget
  - The limitations of current revenue sources to fund RSD's business over time
  - The need to secure additional sources of sustainable revenues or manage large declines in service levels
- Increased, changing needs facing RSD, with respect to:
  - Decreasing roads inventory
  - Increasing travel demand
  - Deteriorating asset conditions
  - Increasing costs of business
  - The emerging policy response to climate change

[3] http://your.kingcounty.gov/exec/news/2008/1013budget.aspx
[4] RSD Staff Notes, Executive Budget Briefing, 13 June 2008.

- Service level constraints:
  - For many aspects of RSD's business, there is a large and growing gap between service levels and associated standards and the work performed
  - The inability to meet current mandated or policy-driven service levels with current revenues
  - The inability to meet citizens' expectations with current revenues and service levels

In this context, three broad policy options regarding the framework for the development of the ROMP are identified these are:

- Option 1: Current revenue management – meet the essentials
- Option 2: Asset management emphasis
- Option 3: Meet current service level goals

The options are based on the analysis of current service levels provided in Working Paper 3 and the implications of the change drivers presented in Working Paper 1 for future service levels. These options and their impacts are highlighted in Exhibit VI-1 below.

Exhibit VI-1: Options and Impacts

Options	Impacts					
	Revenue Impact	**Service Levels**	**Backlog**	**Travel Times**	**Resident Satisfaction**	**Implementation Steps**
Option 1 ***Current Revenue Management:*** Define essential services and priorities, starting with minimum statutory requirements, safety-related risk management and manage to decreased service levels	None or increase to meet defined essential services	Decrease - Reactive	Increase	Increase	Likely decrease	Prioritize essential services
Option 2 ***Asset Management Emphasis:*** *Optimize use of funds to* meet asset management goals while addressing essentials. To achieve lowest life cycle costs will require increased revenue.	New revenues required	Decrease to mobility and safety-related improvements	Dependent on funding level	Increase	Not Addressed - Likely decrease	Identify potential revenue sources. Optimize allocation between and within program areas
Option 3 ***Current Service Level Maintenance:*** Meet currently defined service level objectives and standards for mobility, safety, preservation, operation and maintenance with new revenue sources	New revenues required	Increase	Decrease	Not Addressed - No change or decrease likely	Not Addressed - potential increase	Identify potential revenue sources

Under each option, it is important to note that policy decisions will be required to bridge the gap between forecast revenue and the funds required to provide the service levels associated with that option. These policy decisions will involve some combination of one or more of the following: setting priorities between different business areas within RSD, planning for lower levels of service in some business areas, reducing costs of service delivery, and increasing revenue.

A. Option 1: Current Revenue Management – Meet the Essentials

This option involves recognizing that, under current funding levels, RSD cannot meet the service level goals and other business objectives set for County roads. The County will need to define the essentials and incorporate decreased service levels into its business practices. The results of Working Paper 2: Funding Analysis indicates that, depending on how policy makers define essential priorities, a revenue increase may be required to meet the essentials. The service level analysis presented in Working Paper 3, shows that at recent budget levels the County has struggled to meet the essentials. Without increased revenue, under this option, there will be deterioration in the condition of the roadways and a growing backlog of preservation and reconstruction needs.

The likely outcome from this service level option is:

- Focus on reactive safety-related capital and maintenance work. Resources will be applied to address winter maintenance and respond to emergency events.
- Growing backlog of system preservation and maintenance work that results in the deterioration of the physical condition of county roads and infrastructure. The backlog of reconstruction needs will grow and the lifecycle costs to the county will increase due to underinvestment. For example, RSD estimates that if the Capital Improvement Project (CIP) bridge replacement plan was not implemented, the annual resources needed for bridge maintenance work would double in the next five to ten years and increase at a far greater rate thereafter.
- Increased travel times on principal arterials in unincorporated King County
- Increased claims for damage

Exhibit VI-2 below summarizes the impact of this option.

Exhibit VI-2: Option 1 Current Revenue Management – Meet the Essentials

Option 1: Current Revenue Management

Define minimum essential service level needs for each program area based on i) statutory requirements ii) risk mitigation iii) establish policy priorities between and within program areas to guide budgeting

Program Area	Service Level Goals	Program Areas	Service Level Implications	Implementation
Mobility	Address Concurrency	Concurrency management	Travel times on arterials will increase	Establish County service level objectives for mobility
	Address Capacity Needs	Capacity projects in Transportation needs report (TNR)	CIP does not include TNR capacity projects	Work with other units of government to address regional mobility
	Improve Signalization	Intelligent transportation systems, signal modernization		Develop plans, programs to maximize productivity of the current system
	Note: no formal, quantified goals or service objectives			Based on the above County capacity/mobility needs - redefined resulting in different and greatly reduced needs in the TNR
Safety	Address High Accident Locations and Roadway Segments (HAL/HARS)	HAL/HARS program	Fewer HAL/HARS projects funded	Identify and prioritize essential safety activities
	Implement engineering standards to ensure safe operating conditions	Sign, signal, guardrail replacement and improvements	Focus on addressing greatest risks - especially legal liability	Prioritize maintenance activities that reduce safety risks
	Ensure safe operations	Various maintenance activities - including winter maintenance, storm response	Reduced service levels -	Conduct risk analysis to define reduced service levels
	Maintain roads to ensure safe operating conditions	Safe Routes to Schools		

Option 1: Current Revenue Management

Define minimum essential service level needs for each program area based on i) statutory requirements ii) risk mitigation iii) establish policy priorities between and within program areas to guide budgeting

Program Area	Service Level Goals	Program Areas	Service Level Implications	Implementation
Safety (cont.)	*Note: no formal, quantified goals or service objectives*	Bicycle and pedestrian improvements		Only implement as part of HAL/HARS
Pavement Preservation and Reconstruction	80% of roads at a Pavement Condition Standard (PCS) of 40 or better	Pavement preservation work - crack sealing, patching, overlays	To meet goal will need to continue to fund preservation at current levels	Assumes Roads budget allocates resources to this work category to meet the goal
		Reconstruction	Preservation project scope only addresses pavement does not include, safety or other modernization work	Requires defining pave only or pave mainly projects Reconstruction work will be reactive
			Anticipate a growing backlog of reconstruction needs	Will likely need to tier roads and adjust goals given revenue constraints
			Roads that have low PCS will not be reconstructed	Best practice will involve optimizing pavement treatments based on the budget constraint. This will involve doing little work on the roads with the poorest pavement because it is not cost effective
Bridge Preservation	Meet sufficient rating targets	Bridge preservation and maintenance	Address high priority preservation and maintenance	Will need to optimize bridge preservation and maintenance work based on budget constraint
	for structural deficiency, functional obsolescence, and load limits	Bridge inspection Bridge replacement	Limited bridge replacement dependent on prioritization between other categories of need	Postpone replacement of low-volume bridges

Option 1: Current Revenue Management **Define minimum essential service level needs for each program area based on i) statutory requirements ii) risk mitigation iii) establish policy priorities between and within program areas to guide budgeting**				
Program Area	**Service Level Goals**	**Program Areas**	**Service Level Implications**	**Implementation**
Operations	Ensure safe operating conditions	Snow removal	Need to revisit snow and ice control plans and policies - to target safety versus mobility	Define winter maintenance service levels by functional class of roadway
	(no quantified goals or service objectives)	Storm and other emergency response	Likely target signals and other operations improvements on safety versus mobility	Need to budget for winter maintenance and emergency response differently
		ITS and traffic management		
Routine Maintenance Traffic and roads	Maintain and improve the current condition of the transportation system	Roads maintenance	Maintenance will focus on safety and legal requirements	Establish new goals and service objectives that focus on essential activities for safety and legal requirements
	(no quantified goals or service objectives)	Traffic maintenance	Levels of service for some activities will decrease	
		Environmental and regulatory compliance		

B. Option 2: Asset Management Emphasis

This option describes a scenario in which as a policy decision, King County emphasizes asset management with the objective of reducing the lifecycle costs of County roads. This involves performing maintenance and preservation work at the appropriate levels and times that reduce costs. With the emphasis on asset management, system development is limited and the County works on preserving the existing system and maximizing its productivity. This option will require an increase in revenue. Regardless of revenue level under this option RSD's resources are targeted on asset management – which involves optimizing the performance of the existing roadways for that level of funding to reduce lifecycle management costs.

The likely outcome from this service level option is:

- A program of rehabilitation and reconstruction of older roadways that are structurally and functionally obsolete. Such a program is necessary for those roads where simple resurfacing treatments do not effectively (or efficiently) prolong pavement life. RSD has analyzed 56.7 miles of its arterial roadway system and of these identified 39.8 miles that currently require rehabilitation or reconstruction at a cost of $77M in 2007 dollars to meet current load standards and life cycle performance.
- An optimized pavement preservation program in which overlays and other preservation treatments are made to extend the service life of the County's roads. Under the asset management option, the long-term outcome would be lower lifecycle costs for county roads.
- The current 2009 level of bridge replacement work in the CIP and bridge maintenance is sustained. An asset management emphasis for King County's bridges requires the replacement of structures as currently planned due to their age and structural conditions.
- Maintenance activities will be performed at a frequency that enables optimized asset management of roadway assets such as drainage systems, signs, signals, guardrail, and striping among others. This involves investments above current levels.

Exhibit VI-3 below summarizes the impact of this option

Exhibit VI-3: Option 2 Asset Management Emphasis

Option 2 ***Addresses asset preservation as the overriding priority above service levels in option 1 Asset Management***				
Program Area	**Service Level Goals**	**Program Areas**	**Service Level Implications**	**Implementation**
Mobility	A minimum or essential level of service is defined		Travel times on arterials will increase	Define a minimum or essential level of service
Safety	Address High Accident Locations and Roadway Segments (HAL/HARS)	HAL/HARS program	HAL/HARS needs addressed using balance of budget after asset management and other essentials met	
	Implement engineering standards to ensure safe operating conditions	Sign, signal, guardrail replacement and improvements		

Option 2
Addresses asset preservation as the overriding priority above service levels in option 1 Asset Management

Program Area	Service Level Goals	Program Areas	Service Level Implications	Implementation
Safety (cont.)	Ensure safe operations	Various maintenance activities - including winter maintenance, storm response		
	Maintain roads to ensure safe operating conditions	Safe Routes to Schools		
	Note: no formal, quantified goals or service objectives	Bicycle and pedestrian improvements		Only addressed as part of HAL/HARS projects
Pavement Preservation and Reconstruction	Manage roadways to lowest lifecycle costs	Pavement preservation and reconstruction	PCS goals are met	Backlog of reconstruction needs are addressed so that roads can be cost effectively managed
			Program of capital improvements to reconstruct vulnerable roads	Optimize pavement preservation treatments for lowest lifecycle costs
Bridge Preservation	Manage roadways to lowest lifecycle costs	Bridge preservation and reconstruction	Quantitative goals are met	Sustain current level of bridge replacement work in CIP and bridge maintenance work
Routine Maintenance	Manage roadways to lowest lifecycle costs	Roads maintenance	Roads and traffic maintenance is performed at a service level that reduces lifecycle costs - e.g. culverts un blocked, cracks sealed etc	Define levels of service and work effort required to meet option goal
		Traffic maintenance	Likely requires budgets above current levels in maintenance of assets and management of system	

C. Option 3: Current Service Level Maintenance

This option involves affirming the County's commitment to meeting the service levels set in RSD's plans and related documents. This will require increased revenue. This option establishes for RSD the objective of meeting the county's current service level objectives and standards for mobility, safety, preservation, operation, and maintenance of county roads. These standards and the associated services levels are described in detail in Working Paper 3. Meeting this policy objective for many of RSD's activities would require a large sustained increase in revenue.

The likely outcome from this service level option is:

- Current service levels and standards for pavement and bridge preservation are met. This will require continuing the bridge replacement programs at current levels.
- Roadway and traffic maintenance is funded at a higher level so that the backlog does not grow and a condition rating of 4, as measured by the RSD maintenance section's service level rating system, is attained.
- A capital program that includes roadway development projects that address safety improvements and changes to roadways to allow the safe efficient movement of increased traffic volumes.

Exhibit VI-4 below summarizes the impact of this option.

Exhibit VI-4: Option 3 Meet Current Service Level Goals

Option 3 Meet Currently Defined Service Levels				
Program Area	**Service Level Goals**	**Program Areas**	**Service Level Implications**	**Implementation**
Mobility	Address concurrency objectives, establish arterial development plan and address capacity needs		Mobility on arterials across unincorporated King County preserved	Define mobility service levels
Safety	Address High Accident Locations and Roadway Segments (HAL/HARS) Implement engineering standards to ensure safe operating conditions Ensure safe operations	HAL/HARS program	HAL/HARS needs backlog addressed	Current service levels and standards meet across all program areas

Option 3 Meet Currently Defined Service Levels				
Program Area	**Service Level Goals**	**Program Areas**	**Service Level Implications**	**Implementation**
Safety (cont.)		Sign, signal, guardrail replacement and improvements Various maintenance activities - including winter maintenance, storm response Safe Routes to Schools Bicycle and pedestrian improvements		
Pavement Preservation and Reconstruction	80% of roads at a Pavement Condition Standard (PCS) of 40 or better	Pavement preservation and reconstruction	PCS goals met Reconstruction needs for vulnerable roads addressed	
Bridge Preservation	Meet sufficient rating targets for structural deficiency, functional obsolescence, and load limits	Bridge preservation and reconstruction	Goals met	
Routine Maintenance Traffic and roads	Maintain and improve the current condition of the transportation system	Traffic and roads maintenance activities	Maintenance service level objectives met Backlog of deficient signs, guardrail, etc addressed	Requires larger maintenance program

VII. Organizational Implications

The policy decisions that King County makes regarding the service level goals set for RSD's program areas, the planned service level, and the budget priorities for future years will drive operational master plan decisions. The planned service levels will directly determine the volume and type of RSD's work in coming years. This will impact the future size of the organization and the competencies required for it to be successful.

The drivers affecting the future work of RSD indicate that the demand for services will grow on a reduced road inventory. The costs of providing services will increase. These drivers will result in a growing gap between today's service level goals and King County's ability to meet them.

The organizational implications for each of the options are discussed in turn. These implications will be the subject of more detailed study and analysis in Phase II of the OMP which will address the difficult questions regarding service level priorities and King County's future organizational requirements.

The general implications are highlighted below.

A. Option 1: Current Revenue Management – Meet the Essentials

This option establishes the service level priority of meeting the essentials. This involves identifying work activities that meet statutory requirements, minimize risk, and that address the essentials in each program area. Under this option RSD has to make immediate organizational changes due to an initial decrease in budget in nominal terms of about $21 million, almost 15% of total expenditures and disbursements. Further, over time revenue will increase at a slower rate than the cost of meeting service level goals.

Under current revenue management there will be a large impact on the type of organization that King County requires to meet its service level goals for roads. Also, given the time lag between policy decisions and revenue collection, in the near term regardless of policy decisions regarding revenue, King County will need a current revenue management approach. This option recognizes that there are immediate policy decisions to be made regarding County priorities to guide current and future expenditures.

The implications of current revenue management are:

- RSD's work load will decrease in line with the budget and the increased costs of performing work
- Work will focus more on small projects and reactive maintenance
- There will be limited preconstruction work as most projects will involve limited design and other preconstruction disciplines
- Construction management and inspection work will decrease
- Priorities need to be set to guide the management of current revenue
- Based on the priorities set, analysis will be required to rebalance and right size the RSD organization and staffing competencies to align them with the County's priorities

As a first step under this option, policy direction is required to prioritize the essentials to be addressed. An approach to this is to direct Phase 2 analysis to determine the service levels that can be accomplished if the priority is to preserve and maintain the safe operation of the system with the following guidance:

- No capacity is added to the system all preservation projects repave or resurface within the existing roadway
- Risk analysis is done to identify high risk areas to address as part of any preservation projects
- RSD tiers the road system and reduces standards and services levels on the second tier. For example, bridges on low volume roads are not replaced and potentially weight limited. Routine maintenance and snow removal service levels are similarly tiered.

B. Option 2: Asset Management Emphasis

This option establishes the service level goal of emphasizing asset preservation and lifecycle management for County roads. The organizational implications would largely depend on the strategy taken to accomplish these objectives. Overall it would target maintenance and preservation on the types of projects needed to ensure the lowest lifecycle costs based on the revenue constraints. To lower lifecycle costs, will require an initial increase in capital expenditures to reconstruct at risk roads and other facilities that it is not cost-effective to perform preservation work on. The organizational implications beyond those for Option 1 are:

- RSD's retains capability to mange and oversee major reconstruction projects
- Routine maintenance work is targeted on activities that address lifecycle management

C. Option 3: Meet Currently Defined Service Levels

- RSD's organization likely remains at its current size

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King County

King County Road Services Division

Framework Development

Roads Operational Master Plan: Working Paper 1

December 11, 2008

King County Road Services Division

ROMP Working Paper 1: Framework Development

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King County Road Services Division

ROMP Working Paper 1: Framework Development

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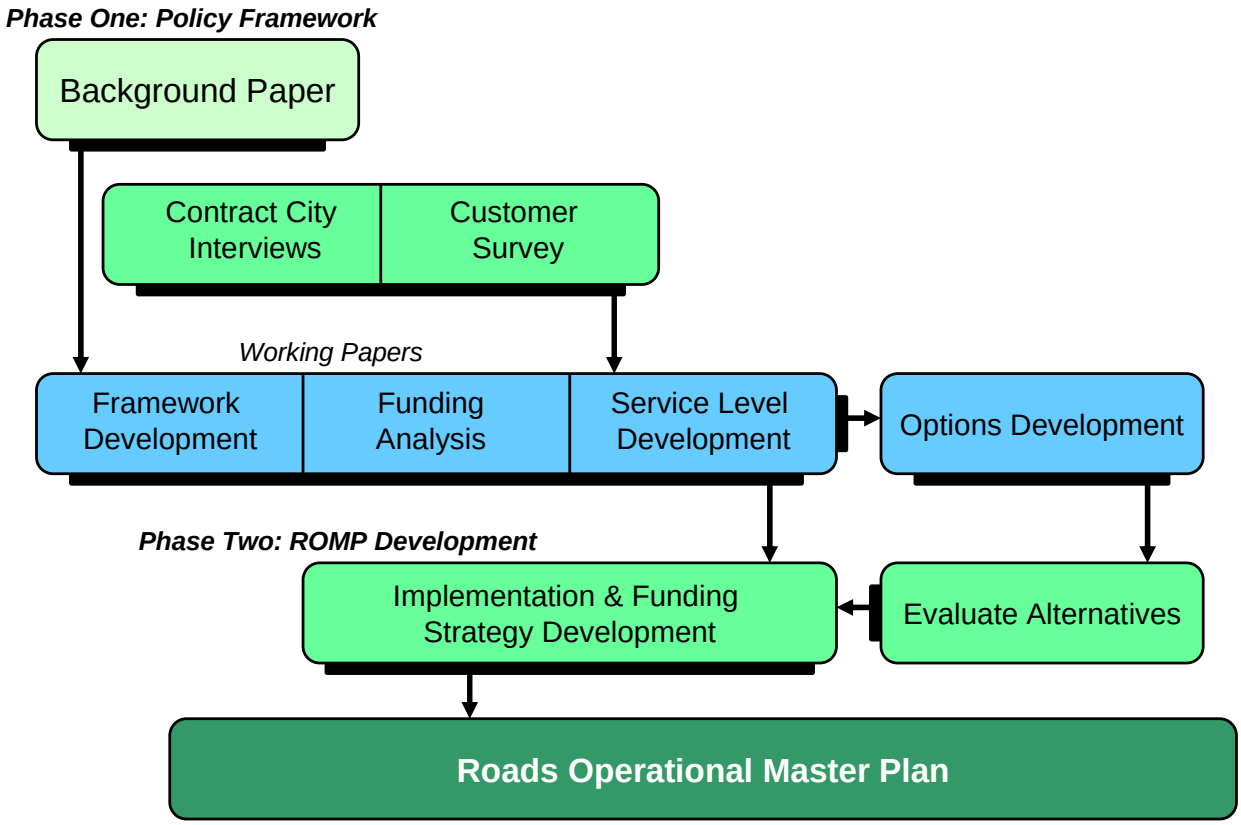
I. Introduction and Organizational Framework

The King County Road Services Division Operational Master Plan (ROMP) is a comprehensive plan that presents how the Road Services Division will operate and provide services in the future. The ROMP process has two phases; Phase One will produce a series of working papers that will serve as the policy framework building blocks for the Phase II, as shown in Exhibit I-1 below. The working papers will be produced by both King County staff and consultants, with structured customer input, reviewed by the ROMP Working Group and used by the Advisory Committee to create the policy framework for Phase II.

Exhibit I-1: ROMP Development Process



Upon completion of the ROMP Phase One, the Advisory Committee will submit a document to the Executive recommending adoption of comprehensive policies to guide future budgetary and operational strategies that will be developed in Phase II. King County Road Services Division and Office of Management and Budget staff members will develop this document based on the Advisory Committee collaborative efforts. Ultimately, the ROMP is a product of the Advisory Committee, transmitted to the King County Council by the King County Executive.

This document, Working Paper One: Framework Development, presents the Road Services Division's organizational structure, business functions, products, and services, and provides an analysis of the trends affecting the Division's business in the future. This working paper is divided into five sections:

Section I: Introduction and Organizational Framework

Section II: Business Summary

Section III: Trends and Change Drivers

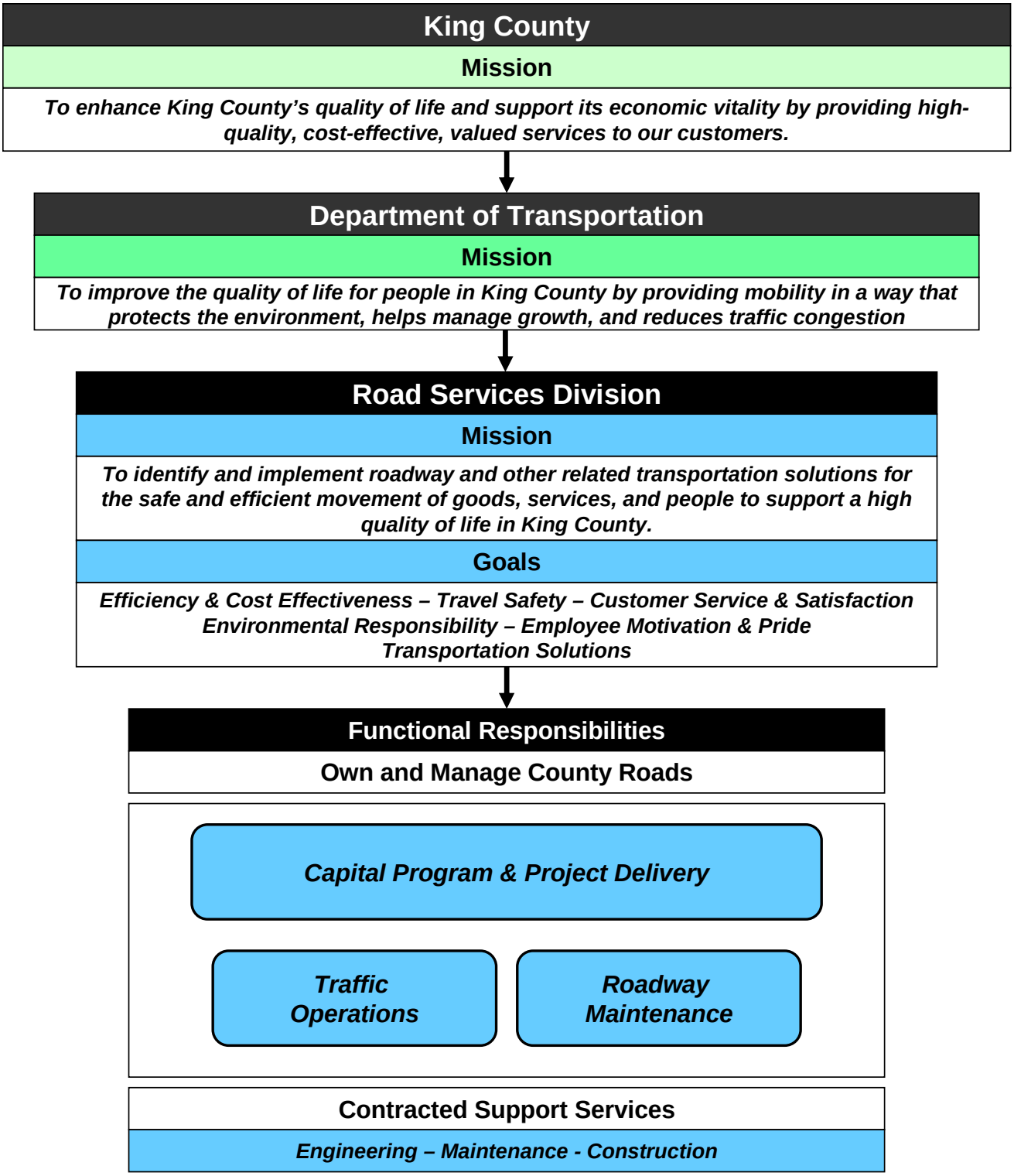
Section IV: Comparison to Other Counties

A. Organizational Framework

The Road Services Division (RSD) is responsible for enabling the safe and efficient movement of people and goods on roadways in the unincorporated areas of King County. RSD exercises the responsibilities for in King County as the owner of all assets within the County-owned right of way. These responsibilities entail the planning, design, construction, maintenance, and operation of a comprehensive system of roadways, bridges, and other transportation facilities and services. The unincorporated area road network, which covers 82% of the county's land area, includes a total of 1,745 centerline miles of roadway and 180 bridges, in addition to unpaved roads and pathways.

RSD is a division of the King County Department of Transportation (DOT), and its activities support both the DOT and County operating missions, visions, and goals. The Road Services Division's responsibilities are a function of the missions of King County and DOT, as shown below in Exhibit I-2.

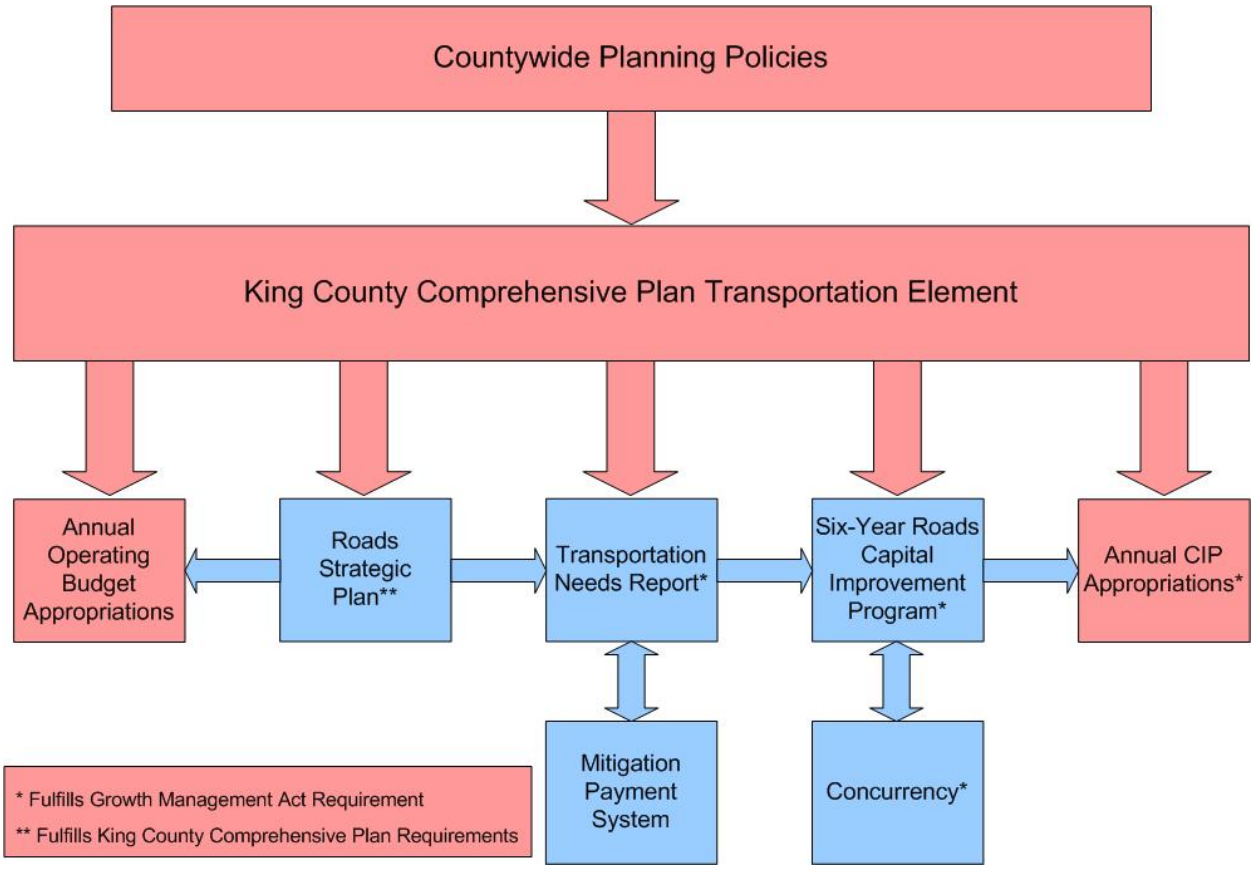
Exhibit I-2: Road Services Division Mission and Functions



In addition to the missions and functions detailed in Exhibit I-1 above, the Road Services Division's role, products, and services are also determined by a series of

county- and division-level plans and policies. These include the King County Comprehensive Plan and the Roads Strategic Plan. The County's comprehensive planning process is to a large extent prescribed by Washington State's Growth Management Act and related planning laws. These plans and documents and their relationship to one another are shown in Exhibit I-3 below. Elements shaded red are policies set forth by King County; elements shaded blue are produced by the Road Services Division.

Exhibit I-3: Road Services Division Organizational Framework



The King County plans and policies that provide a framework for RSD activities are the Countywide Planning Policies and the Comprehensive Plan. Countywide Planning Policies, which are mandated by the State of Washington Growth Management Act, provide a high-level policy framework for long-term planning and development across King County.[1] The transportation element of the King County Comprehensive Plan uses this guidance to set long-range policies and service levels for the unincorporated area road system that in turn impact the Roads Strategic Plan planning process and the needs identification and prioritization processes of the Transportation Needs Report and the Capital Improvement

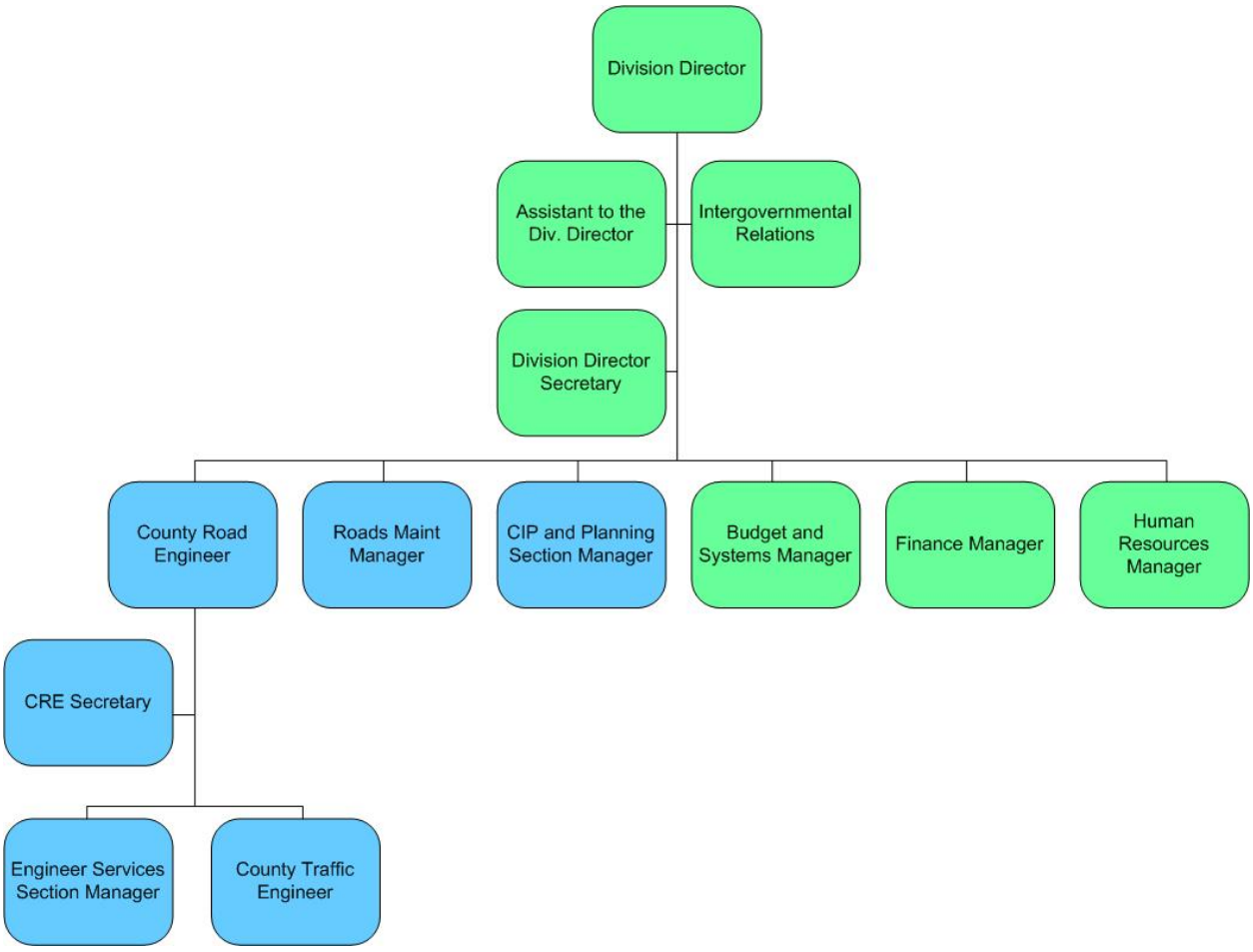
[1] RCW 36.70A.210

Program. These and other Road Services Division policies, plans, and products are discussed in detail in Section II and Appendix A below.

II. Business Summary

Exhibit II-1 below shows the organizational structure of the Road Services Division, which is organized into six sections. Units shaded green are administrative in nature, while units shaded blue have line management responsibilities for the delivery of the Division's products and services. Each section is discussed in detail in Appendix A: Products and Services.

Exhibit II-1: Road Services Division Organizational Chart



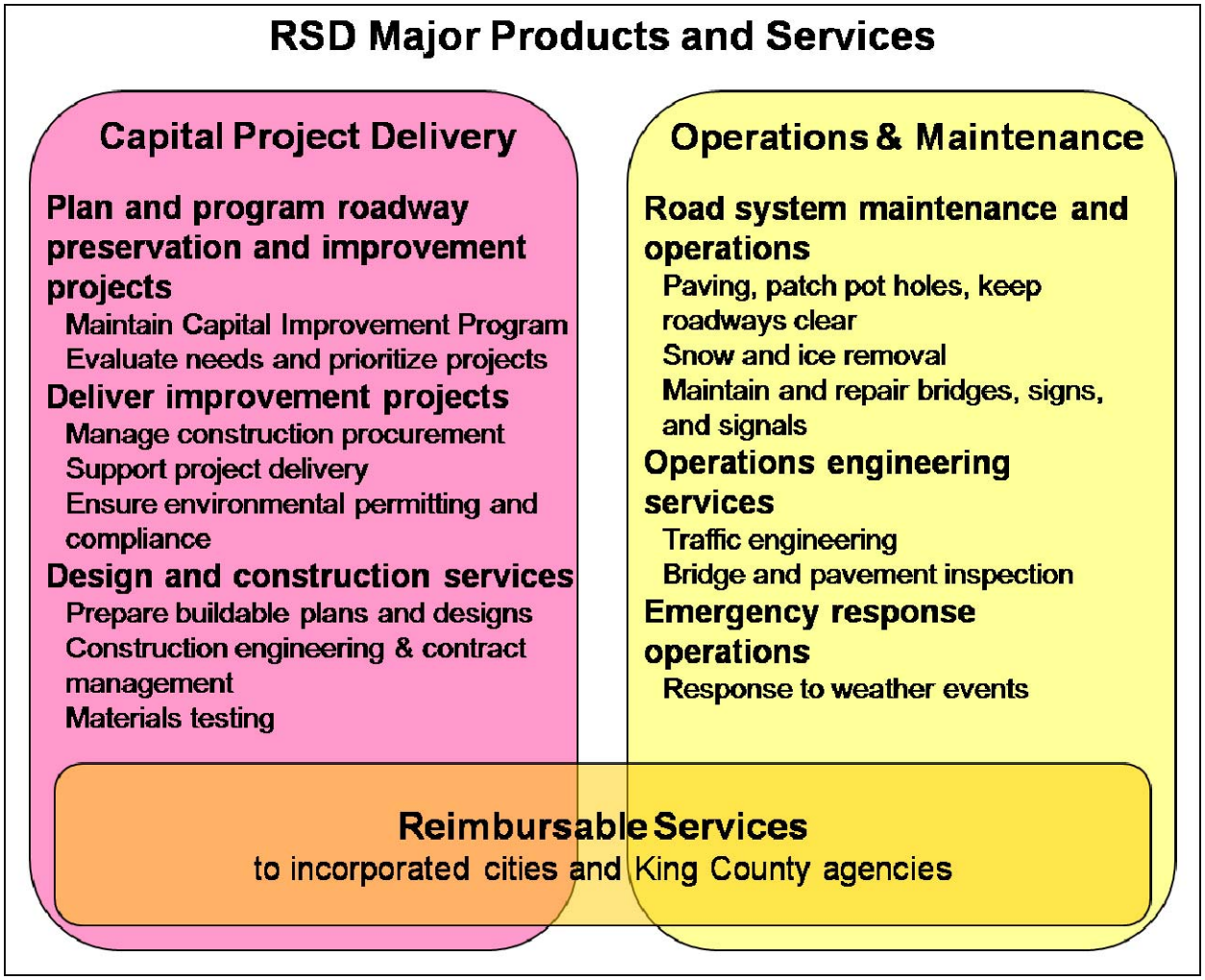
RSD exercises King County's responsibilities as the owner and operator of county roads in unincorporated King County. These responsibilities include managing, planning, improving, operating, and maintaining County roads. The work performed in meeting these responsibilities is summarized in Exhibit II-2, which provides a business-based view of RSD that identifies the principal products and services provided.

The work performed by RSD falls into two categories:

- **Capital program management and project delivery.** This involves the capital planning work to identify the most effective use of capital funds to preserve and improve roads. This defines individual improvement projects. RSD is responsible for the delivery of these projects which involves managing the process and performing design and some of the construction work. Other construction work is performed by contractors.
- **Operations and maintenance.** This involves maintaining roads, ensuring they are open for traffic, and performing routine maintenance within the roadway right of way. As part of this work, RSD performs construction and maintenance work. This includes performing inspections and collecting data needed for RSD to efficiently execute its responsibilities.

The products and services that RSD performs on county roads are also provided as reimbursable services to other County agencies and cities in King County.

Exhibit II-2: Road Services Division Business Summary



A. Capital Project Delivery

Capital project delivery work is simplified into three categories: planning and programming, project delivery, and design and construction services. The proposed FY 2009 budget for the capital program and projects is $65 million. Some elements of capital project delivery work is performed by all sections in RSD. Major work products and services are:

- *Planning and programming* work involves the capital planning analysis necessary to define and prioritize preservation and improvement projects. The analysis involves the application of various analytical procedures to identify improvements that will make the most effective contribution to meeting the goals set for King County roadways. The major product is the Capital Improvement Program (CIP), a program of transportation improvements that

provides a blueprint for RSD's capital expenditures. Planning and programming products and services include:

- Capital Improvement Program
- Roads Strategic Plan
- Transportation Needs Report
- Annual Bridge Report
- Travel forecasting
- Performance measures

- *Project delivery* work involves managing the process through which projects identified in the capital improvement program are designed and built. This involves coordinating a well-defined process that results in a set of construction specifications that are biddable and buildable. Major work products and services are:
  - Project management and coordination
  - Contract management
  - Environmental permitting, compliance, and mitigation
- *Design and Construction* Services work conducted by RSD includes performing design engineering and providing the other professional services necessary to develop design and construction specifications. RSD allows performs the construction engineering necessary to managing construction contractors. For small work projects, RSD employees perform the construction work for traffic signal projects, drainage projects, and some pavement preservation projects Major work products and services are:
  - Prepare biddable and buildable plans
  - Design and construction specifications
  - Professional engineering, survey, right of way services
  - Environmental engineering and analysis
  - Construction management
  - Materials and geotechnical testing
  - Pavement and bridge inspections

B. Operations and Maintenance

RSD performs the work required to maintain and operate all assets within the right-of-way. This includes the roadway; roadside assets such as drainage systems; and traffic control and management features such as signs, striping, and signals. A significant area of service provision addresses the impacts of weather events and other emergencies so that the road system is safe and operational. This includes winter maintenance, removing downed trees, managing flood-related road closures, and other activities.

Operations and maintenance work is chiefly performed by the Traffic Engineering Section and the Roads Maintenance Section. The proposed FY 2009 budget for operations and maintenance is $64 million; it is important to note that these sections perform construction work that is funded through the capital program. Major work products and services are:

- *Road system maintenance and operations* includes:
  - Maintenance of roads, drainage systems, vegetation, and other assets in the King County right of way
  - Maintenance of signs, signals, guardrail, striping and other traffic control devices
  - Winter maintenance, snow and ice removal
  - Bridge maintenance
  - Environmental and regulatory compliance
- *Specialized engineering services* support the optimal operation of the transportation system; specific products and services include:
  - Traffic engineering
  - Intelligent Transportation Systems support
  - Bridge and pavement inspections
- *Emergency response* work is maintenance and operations conducted as a result of severe weather events or other emergencies

C. Reimbursable Services

RSD provides engineering, maintenance, and construction services to incorporated cities within King County and non-RSD King County agencies. These services include, broadly: design and construction; traffic and roads operations and maintenance; emergency response; and engineering expertise. Reimbursable services accounted for $19 million of RSD's FY 2009 proposed budget.

Cities that contract with RSD sections are referred to as "contract cities." All services are provided on a reimbursable basis; they are invoiced at cost and RSD does not earn a profit.[2] Providing these services is beneficial to RSD's in terms of economies of scale: the larger staff that is on hand to perform work for contract cities allows the County to maintain specialized expertise and take advantage of a greater number of experienced staff members during emergency events. Efficiencies are also gained through greater use of County-owned equipment.

Contracts with cities also allow for multi-jurisdictional collaboration for mutual benefits. Through contracted operations agreements, Traffic Engineering currently operates two multi-jurisdictional Intelligent Transportation System (ITS) corridors. These ITS corridors enable sophisticated travel demand management in unincorporated and incorporated areas of King County.

The extent of services provided to contract cities and other County agencies varies on a contract-to-contract basis. For example:

- The Traffic Engineering Section is currently the largest provider of contract traffic signal support services within King County
- The Engineering Services Section is a major provider of survey services to King County divisions, including Parks, Airport, and Transit
- Historically, the Roads Maintenance Section provides wide-ranging services to newly incorporated cities, a role that evolves into more technically specialized services as cities mature and gain routine maintenance expertise

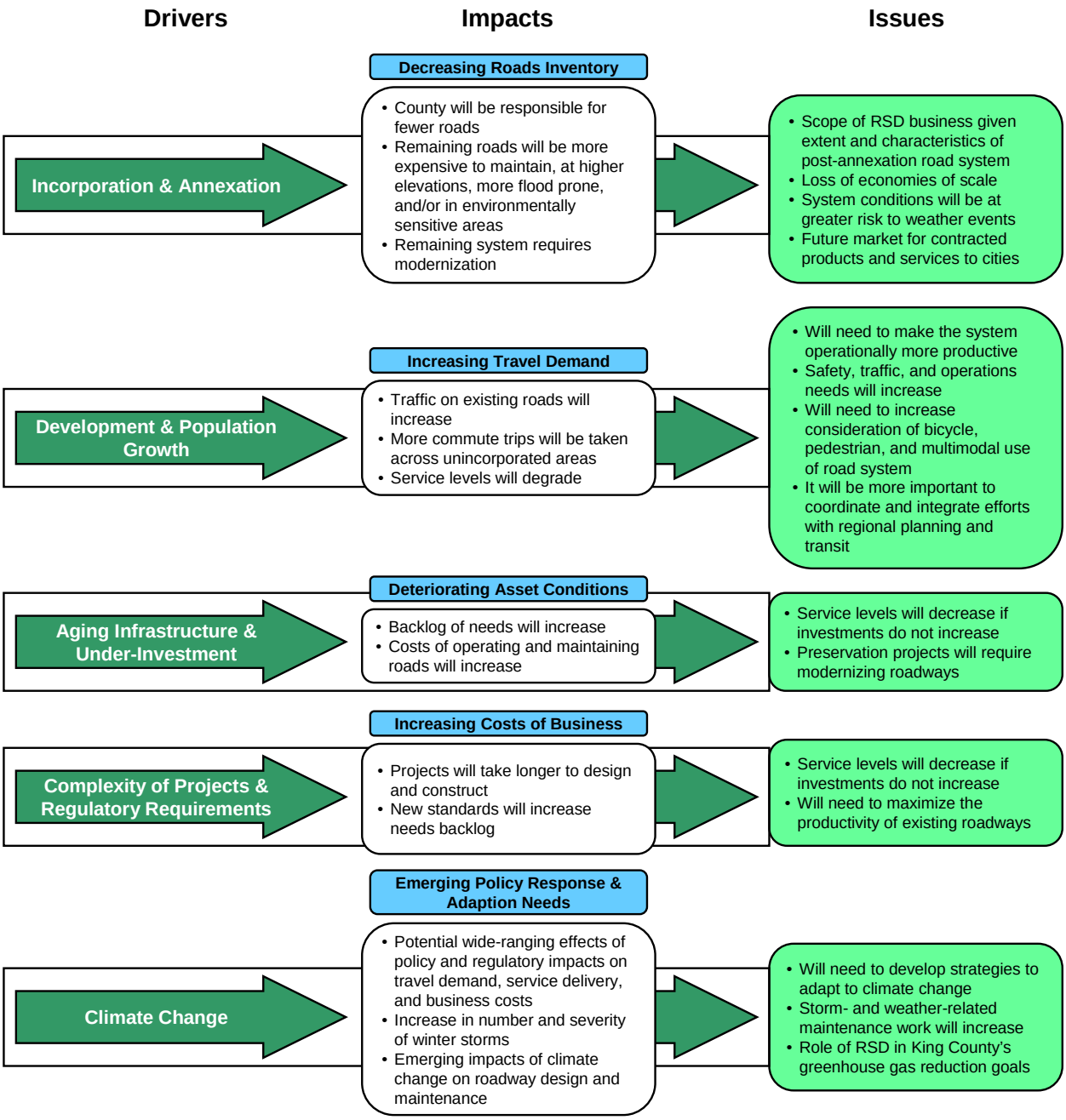
Specific reimbursable services within each RSD section are discussed in Appendix A.

III. Change Drivers, Impacts, and Issues

This section describes the principal change drivers that will impact the future work of the Road Services Division in meeting the County's mission and addressing its responsibilities as the owner of roads in unincorporated King County. The drivers, their impacts, and resulting policy issues are summarized in Exhibit III-1 below.

[2] Results from a survey of contract cities will be presented in Working Paper Three: Service Level Development

Exhibit III-1: Drivers, Impacts, and Issues Affecting RSD



These drivers and their impacts are summarized below and described in detail in subsequent sections.

Driver: Incorporation and Annexation

The Road Services Division anticipates a 32% reduction in road miles by 2028. If all planned annexation and incorporations occur, the unincorporated road network will

shrink to 1,090 road miles, while the Roads Maintenance Section also anticipates up to 114 new lane-miles added through new development. This change impacts the future volume, type, and location of work to be performed by RSD. The major impact of incorporation and annexation will be a decreasing roads inventory:

- RSD will be responsible for fewer roads; while some mileage will be added as subdivision roads are transferred to the county, there are no plans to grow the unincorporated area road system
- A higher proportion of the remaining roads will be at higher elevations, in flood prone areas, and require modernization work to bring them up to current standards
- RSD's customer base, cities that may contract with the Division for reimbursable services, will have larger roads networks

Policy Issues: The main issue is the extent to which the impacts of a decreasing road inventory are offset by the increased work required to provide current service levels on the remaining roads in unincorporated King County. The remaining roads will be at greater risk from weather events as a higher proportion are in at-risk areas and subject to the drivers listed below which affect service levels. If incorporations and annexations proceed as planned, there will be an increased level of effort required to provide a given service level on the remaining system. There will be some loss of economies of scale; with a smaller system there will be fewer roads to distribute fixed costs across. This suggests that increasing contracted work could be a strategy for lowering costs of providing services. A further issue is the size and type of the future market for contracted services. Some cities will choose to develop their own capabilities overtime after annexation others to benefit from the economies of scale and specialized services RSD offers.

Driver: Development and Population Growth

The population of King County's unincorporated areas is projected to increase at a rate of 2,000 to 3,000 persons per year post-annexation. Development in unincorporated King County and incorporated areas in eastern King County will increase travel demand on the road system. VMT in King County as a whole is projected to increase 1.3-1.4% per year, for a total growth of 30% by 2028.[3] The impacts of this increased travel demand will be:

- Increased traffic on King County's roads and a degradation of operational performance resulting in some congestion
- Increased use of County roads for commuting from eastern King County to population and employment centers

Policy Issues: The extent of the degradation of service levels that RSD currently provides if additional investments are not made. Increase in traffic volumes, will trigger the need for safety, capacity, and operational improvements. Implications of these impacts include

[3] Puget Sound Regional Council: "Puget Sound Trends: Vehicle Miles Traveled" August 2007

those impacting multimodal use of the roadways and coordination and integration with regional and transit planning to address mobility needs.

Driver: Aging Infrastructure and Under-Investment

Currently, there is a large, unfunded, and unprogrammed list of high priority safety and preservation needs of at least $255 million through 2018. The County has an aging infrastructure some of which needs to be modernized. Over time under investment in the preservation and maintenance of roads increases the costs of ownership. The impacts of these deteriorating conditions are:

- A growing backlog of needs
- Increasing costs of maintenance and preservation if lifecycle management is not optimized

Policy Issues: Under-investment in maintenance and preservation increases the lifecycle costs of infrastructure. A key issue is how to preserve the value of King County roads under anticipated revenue constraints. Availability of data, tools, and procedures for asset management. Many preservation improvements will also require modernizing or reconstructing roadways to current standards.

Driver: Complexity of Projects and Regulatory Requirements

Recent years have seen a large increase in the cost of transportation projects due to rising commodity costs and the impacts of new regulatory requirements. Meeting greenhouse gas reduction goals and compliance with any future statutory requirements will impact how roads are designed, built, maintained, and used. While commodity prices have decreased recently, new projects must still be built to ever-evolving standards. The impacts of these drivers will increase the costs of owning and operating County roads:

- A constrained ability to meet needs combined with rising commodity costs creates a backlog of projects that are increasingly expensive to complete
- New environmental and safety regulations, pavement and bridge standards, and traffic signal and sign standards require increased investment to meet mandates, driving up cost and increasing the backlog of projects

Policy Issues: If investments in the system do not increase, service levels will decrease. RSD will need to account for the fiscal impacts of County policy decisions on the Division's ability to provide service at current levels. In this environment, it will be even more important to maximize the productivity of remaining roadways.

Driver: Climate Change

Policy adaptations to climate change are a major priority of King County government. There is an emerging consensus among scientists that climate change will increase the number and severity of winter storms, which in turn will accelerate the impacts of

deteriorating asset conditions and increasing costs of business. The major impacts of climate change will be twofold: First, how King County's policy response and the emerging state and national response will affect future travel demand, the provision of transportation services on King County roads, and RSD's business practices as the owner and operator of roadway assets; second, planning for changing infrastructure needs as the County adapts to the impact of a changing climate. The impacts are:

- The number and severity of winter storms will increase, resulting in increased storm related work and affecting roadway lifecycle management costs
- Policy and regulatory responses to climate change will have wide-ranging effects on RSD management of travel demand, service delivery, and business costs
- Changes in roadway design, maintenance, and construction practices to adapt to climate change

Policy Issues: The Road Services Division will need to develop strategies to adapt to climate change impacts on the design, construction maintenance, and perhaps location of roads. Storm- and weather-related maintenance work will increase, and the role of RSD in meeting the County's greenhouse gas reduction goals.

A detailed analysis of each driver is presented below.

A. Incorporation and Annexation

By 2012, the county assumes that cities will annex all land within the Urban Growth Area (UGA) as mandated by the Growth Management Act. Although the county can encourage annexations and incorporations, they are largely beyond the control of the county. Yet potential annexations and incorporations are critical to understanding and evaluating future responsibilities of the Roads Services Division. Annexations directly reduce the assets for which the Roads Division is responsible as cities take over their own road maintenance responsibilities. Voter approval is generally necessary for an unincorporated area to become annexed by a city and political support and exact timelines can be difficult to assess with any certainty. Nonetheless, the Countywide Planning Policies (CPP) developed jointly by the cities and King County in the early 1990s as required by the state Growth Management Act (GMA) state the goal that all unincorporated areas of King County within the urban-designated areas be annexed by neighboring cities by 2012. If all annexations and incorporations proceed as planned, the number of road miles in unincorporated King County for which the Road Services Division is directly responsible is expected to decrease by 38%, from 1768.3 miles in 2008 to 1090.4 road miles in 2028.

- By 2028, RSD will be responsible for 1,090 road miles, a reduction of 38% from 1,745 unincorporated area road miles in 2008[4]
- The county will provide support to these assets on a contractual basis as requested by cities. The extent and duration of these contracts is uncertain
- An additional 114 new lane-miles due to increasing development in the post-annexation unincorporated areas will be added to the current road system over the next 20 years. This represents a 10% increase in road miles from 2008 levels
- Post-annexation, the number of bridges owned by King County will decrease to 176; the county currently owns 180 bridges

Exhibit III-2 details the assets for which the county is responsible before and after annexations are complete.

Exhibit III-2: County Assets under Management of Roads Maintenance before and after Annexations and Incorporations

County Assets Under Management of Roads Maintenance[5]				
Description	**Measure**	**Quantity**	**Quantity (Post Annexations)**	**% change**
Total Paved Roadway (unincorporated)	Lane Miles	1768.3	1,185	-33%
Gravel Roadway	Lane Miles	104.7	102.4	-2%
Curb and Gutter	Lineal Feet	3,314,634	626,067	-81%
Catch Basin and Manhole	Each	30,505	11,860	-61%
Paved Ditch and Gutter	Linear Feet	77,729	50,533	-35%
Open Ditch	Linear Feet	6,233,462	5,407,148	-13%
Enclosed Drainage System	Linear Feet	3,963,524	1,999,069	-50%
Planter Strips	SQ YD	90,633.5	46,038	-50%
All Shoulder Miles	Road Miles	2,456.1	1,994	-19%
Mowable Slope	SQ YD	5,127,161.4	4,732,515.4	-8%

[4] This number does not include new road miles within unincorporated King County, only miles directly lost to annexation. Roads Maintenance expects 114 miles of new construction in unincorporated King County over the next twenty years for a total of 1204 miles by 2028.

[5] Information provided by Roads Maintenance and calculated by removing jurisdictions within the PAA that are currently part of Roads Maintenance assets. The PAA (Potential Annexation Areas) listed above do not have legal descriptions. Therefore the inventory numbers may change when the actual annexation occurs. The inventory numbers in this spreadsheet are estimates only, based on PAA mapping. PAA includes: Federal Way PAAs, Eastgate, Panther, Renton PAAs, North Highline, Klahanie, Kirkland, and Fairwood, This is not an exhaustive list of assets within the Roads Division right-of-way but is meant to serve as an illustration of reduced inventory post-annexations.

County Assets Under Management of Roads Maintenance[5]				
Description	**Measure**	**Quantity**	**Quantity (Post Annexations)**	**% change**
Retaining Walls	SQ YD	59,868	29,744	-50%
Bridges	Each	181	176	-3%
Traffic Signs & Control Devices	Each	Approx. 40,000	Approx. 37,000	-8%

The Roads Maintenance Section currently provides support to partner cities on a contract to contract basis as discussed in Section II. The Countywide Planning Policies (CPPs) in the King County Comprehensive Plan identify potential annexation areas designated by cities for annexation. All the potential annexation areas have been designated to cities except the North Highline Potential Annexation Area. The Growth Management Planning Council has adopted a motion to show North Highline as an overlap or contested interim potential annexation area in the CPPs. The CPPs are being amended to identify a process to resolve the Potential Annexation Area overlaps in the North Highline Area.

If assets within a particular region are in disrepair, or if a particular region has low property values, the city may delay annexation. This concentrates assets in poor condition, which require significant work and investment, within the county's jurisdiction. Roads Maintenance believes that the unincorporated areas left, and in particular the older, urban areas, are costing more to maintain and therefore are not achieving designated levels of service. Examples include West Hill and North Highline, which are some of the last to be annexed.

Geographically, annexations will progressively shift the majority of the unincorporated system to the eastern and rural part of the county, although the Road Services Division will continue to provide services across King County. Areas in eastern King County include numerous stream crossings which require more environmental considerations as well as flooding and snow and ice emergencies. Although there are fewer roads in the unincorporated King County base, Roads Maintenance experiences a disproportionate volume of work in these areas. The unincorporated King County base will still include the Snoqualmie Valley and the Wilderness Rim, a one thousand home subdivision in the rural area, and other high elevation locations. The Snoqualmie Valley is particularly prone to seasonal flooding events and the Wilderness Rim is located at a high elevation necessitating steady snow and ice removal. Exhibit III-3 below shows the potential annexation areas within King County. For King County-maintained roads after annexation, please refer to Appendix C.

Policy Issues

Amount and type of future RSD work required to provide current service levels for reduced road inventory

After annexation King County will be responsible for a more rural and less modern roadway system. The system will be concentrated in harder-to-maintain locales and require considerable work to modernize to current standards. For example, following annexation a much higher proportion of roads will not have enclosed drainage systems or curbs and gutters. In addition, when many of these roads have preservation work performed on them, they will have to be reconstructed to meet contemporary storm water management requirements.

Diseconomies of scale from a smaller road network

Following annexation there will be a smaller system to apply the fixed costs of owning and operating a road system to. This will result in some diseconomies of scale. For example, specialized equipment may not be as fully utilized. This suggests that to lower average costs for work performed, RSD would need to increase the volume of contracted services provided to other jurisdictions.

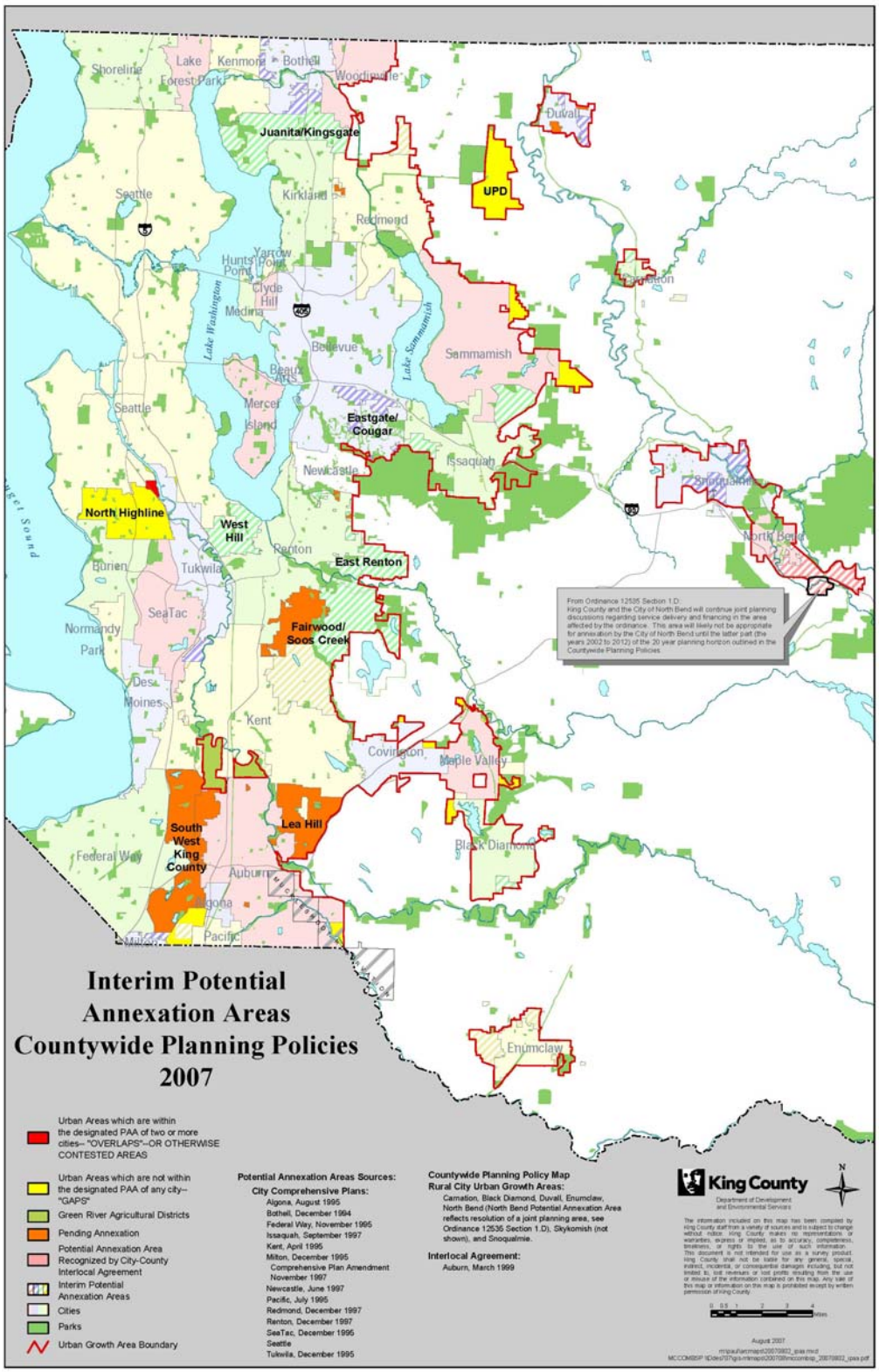
At greater risk from weather events

After annexation a higher proportion of the County's roads will be at higher elevations and in areas prone to flooding. This increases the overall exposure of RSD's business to the impacts of weather emergencies. Storms and floods require emergency response and also increase the amount of reconstruction work required.

Future market for contracted services

After annexation there will be a larger customer base for contracted services. However, the future volume and type of contracted work will depend on whether RSD maintains current levels of work for contract cities and provides additional services on the annexed roads. This will be affected by whether over time the cities develop their own capabilities.

Exhibit III-3: Interim Potential Annexation Areas



B. Development and Population Growth

Development and associated population growth, increasing VMT, and new road miles will increase workload in the unincorporated areas of King County despite reductions in total road miles due to annexation.

The following trends characterize future operational use of the Roads Division system:

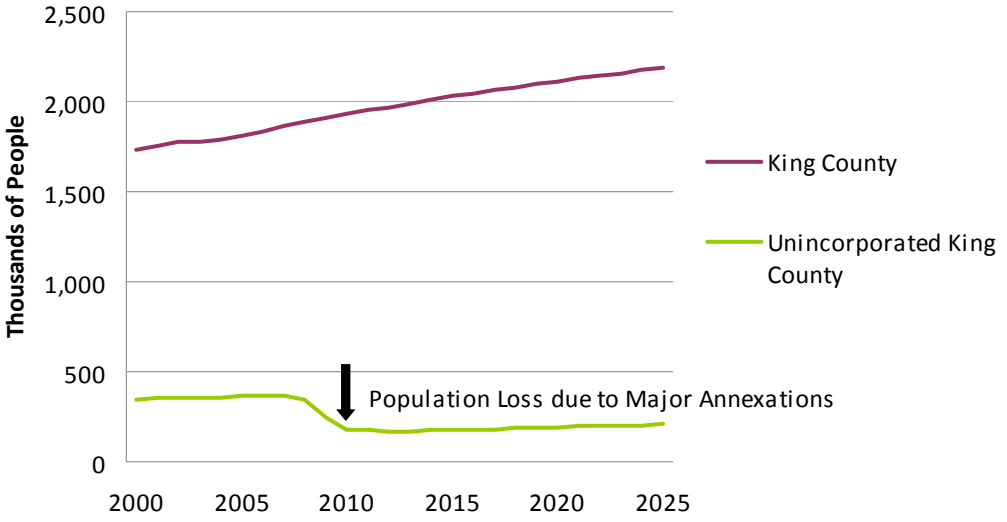
- VMT will continue to increase at 1.3-1.4% per year across King County. This translates to an absolute growth of 30% from 2008 levels
- Population Growth is projected to be less than 2,000 persons per year post-annexation or roughly 3,000 persons per year assuming there are no further annexations after 2008
- The impacts of the urban/rural interface and population growth are uncertain but will likely increase traffic operations and safety related improvement needs

Travel demand is directly linked to population growth, economic growth, and employment.[6] According to data provided by the Puget Sound Regional Council and the Washington State Department of Transportation, VMT has been growing at about 1.4% and employment at about 1.5% annually since 1980. This trend is expected to continue. By 2028, VMT in King County will have increased roughly 30% from 2008 levels.

The King County Comprehensive Plan calls for population and employment growth to be contained within the UGA. Nevertheless, some growth in the smaller incorporated areas in eastern King County and some growth in unincorporated King County is anticipated.

[6] Puget Sound Regional Council. "Puget Sound Trends: Vehicle Miles Traveled" August, 2007

Exhibit III-4: Forecast Population in Incorporated (Red) and Unincorporated King County (Green)[7]



Note: Exhibit III-4 is based on projected annexation/incorporations guides and should be used only as a very rough indication of potential population trends. King County Population Assumptions:[8] Forecast of King County total population based on WA State OFM "intermediate" projection released December 2007. Assumes annexation initiative proceeds as scheduled, with all but two PAAs annexed by 2011. Assumes last two PAAs, Eastgate and Klahanie, annex by 2012. After 2012, assumes annual growth of 2,000 persons per year in unincorporated King County, primarily rural.

The classification of subareas of unincorporated King County as "rural" is largely a misnomer, as growth distribution more closely resembles "exurbia." Exurbia is typically characterized as not fully suburban and not fully rural; low density communities located on the suburban fringe with high population growth from a low base and a high percentage of commuters who make journey-to-work trips to the suburbs or other urban districts.

This is supported by data from the Puget Sound Regional Council which found that between 1999 and 2006, the average commute in King County increased by 5%.[9] Increased commutes disproportionately affect residents of unincorporated King County, particularly residents of eastern King County. These residents have some of the longest driving distances to work within the Puget Sound region, a mean distance of 24.9 miles in 2006 for a 13% increase from 1999-2006.[10]

[7] Felt, Chandler Demographer; This figure was compiled with the assistance of Chandler Felt, King County Demographer, Office of Management and Budget
[8] Felt, Chandler, Demographer; WA State Office of Financial Management, cities of King County, King County Budget Office, 2004; updated January 2008 (very rough)
[9] Puget Sound Regional Council?
[10] Ibid.

Policy Issues

Traffic congestion and degradation of operational performance

Increased traffic volumes on County roads and in the region will result in localized congestion and service level degradation in some locations without capital investment to accommodate growth.

Need for safety and traffic operations improvements

Increased VMT on the rural road system and changing traffic patterns will require improvements to address safety and related needs that will add to the maintenance inventory. Increased volumes will require left turn bays, signals, roadway profile and alignment and grade changes, and similar improvements to ensure safety and make the road system operate efficiently with the higher volumes.

Changing use and expectations for the road system

Increases in the urban-rural interface will have significant impacts on RSD operations. Although it is difficult to quantify to what extent shifting demographics within unincorporated King County will impact RSD in terms of increased volume of maintenance work, certain safety issues, such as increased flagging for work zone safety, should be anticipated. Residents in unincorporated King County, especially adjacent to incorporated areas, and those driving through the unincorporated areas may have expectations for service levels for winter maintenance and emergency response that are more applicable to an urban area.

Need to consider bicycle, pedestrian, and multimodal use of roads

The post-annexation inventory has less curb and gutter. Development in unincorporated areas of facilities such as schools and the provision of transit services will have implications for the design of roadways. This will require addressing such issues as curb and gutter and other pedestrian improvements in areas defined as rural in the comprehensive plan.

Need for increased coordination and integration with regional planning and transit

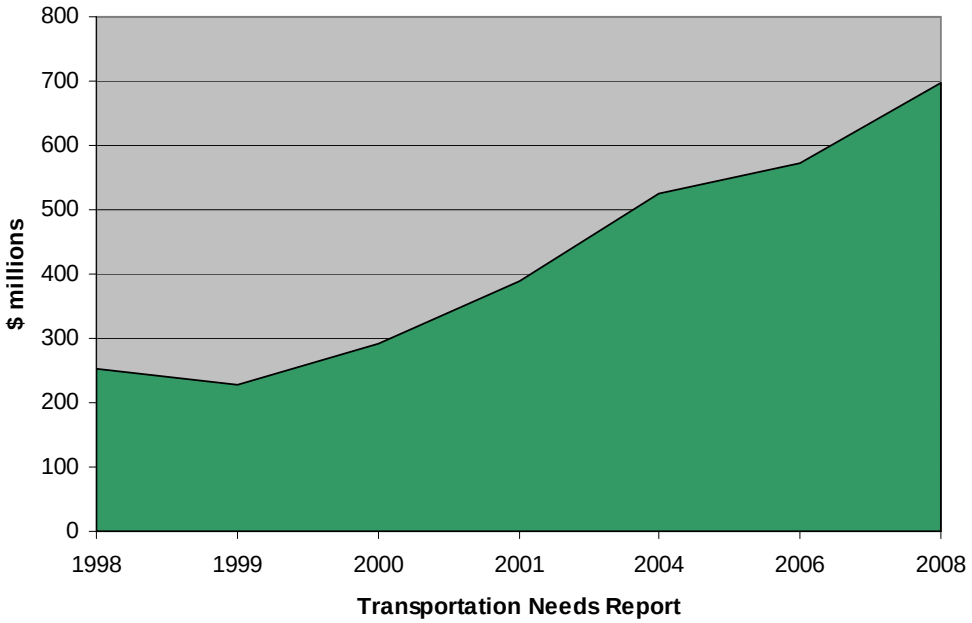
The growth in travel demand will increase the market and opportunity for multimodal transportation. There will be the potential for transit to use the roadways. This will add to the importance of coordinating the development and operation of County roads with regional and transit planning, an issue that has been raised in the Roads Strategic Plan.

C. Aging Infrastructure and Under-Investment

Given the increasingly constrained revenues available for maintenance and preservation of the County's transportation assets, an increasing backlog of projects has emerged. The Roads Services Division estimates a backlog of $59 million in high priority, unprogrammed safety, and preservation needs through 2022. In addition there is $130 million for the South Park Bridge, and $255 million for 80 other high priority projects in other need categories.

The Transportation Needs Report, which is part of the King County Comprehensive Plan and updated every four years, details long-term, comprehensive transportation needs in unincorporated areas of King County. While the needs themselves are not revenue constrained, the Transportation Needs Report includes a financial analysis that balances projected needs with anticipated revenues. The 2008 report identified a total shortfall of $697 million. Exhibit III-5 below shows the increasing financial shortfall as reported in each Transportation Needs Report since 1998:

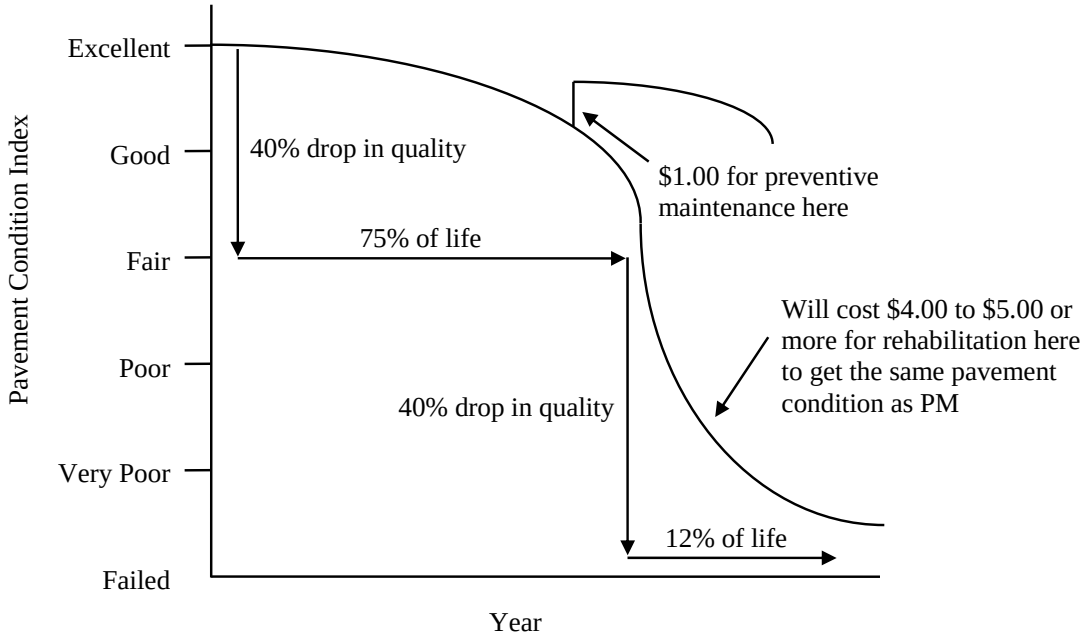
Exhibit III-5: Transportation Needs Report Shortfall, 1998-2008



A backlog of projects ultimately drives up the cost of maintenance and preservation while the quality of the asset suffers. Poor life cycle management, or the inability to perform routine maintenance and preservation activities on a roadway, can lead to faster deterioration, lessen ride quality, and ultimately require replacement much earlier, at a higher cost. The Road Services Division does not currently have the resources to budget based on life cycle management principles. Exhibit III-6

illustrates the impacts of not making pavement preservation improvements at the optimal time; namely, an increase in the costs of ownership.

Exhibit III-6: Life Cycle Management Gap: Pavement



The Vulnerable Roads Segments study was instituted by the RSD in 2005. This study identifies and addresses specific roadway funding needs throughout the County. Vulnerable road segments are prioritized to determine the best way to spend limited preservation funds. Each segment is prioritized through one or more of the following criteria:

- *Maintenance Cost per Year*: The average estimated amount spent each year conducting short-term repairs; higher annual costs take higher priority
- *Construction Cost per Vehicle*: The cost of the permanent construction fix per average daily vehicle travel; lower total cost benefiting a higher number of vehicles take higher priority
- *Impact of Failure*: The importance of correcting a problem; higher impacts take higher priority
- *Driver Inconvenience*: The overall level of driver inconvenience, including detour length and average traffic volume; higher volumes and longer detours take higher priority
- *Guardrail Needs and/or Inclusion in Future Project*: A measure of the opportunity to address two or more needs with one project; road segments with future planned guardrail, safety, or other projects are given more priority

Much of the county's infrastructure is reaching an age when repairs are no longer sufficient and replacement is necessary. Of particular concern for the Road Services Division is the escalation in costs association with maintenance and repair to older infrastructure; an older piece of infrastructure is more likely to be in deteriorated condition, less likely to meet current design standards, and more likely to be functionally inadequate. Older assets may have been built to standards that are now superseded by newer requirements such as safety and accessibility standards. In some cases, the need to upgrade may make it impossible to perform minor rehabilitation activities without upgrading the entire asset to meet the new requirement, therefore increasing the complexity and cost of maintaining that asset.

Policy Issues

Extent of decrease in service levels

A key issue is what the implications are for the condition of the road system and service levels of status quo revenue sources and levels. Deferred maintenance can reduce the life of roadways and increases the annual costs of owning and operating them.

Preservation projects will require modernizing many older roads

Much of the post-annexation inventory is aging and built to older standards. Reconstruction will require upgrading these facilities to comply with current design standards and environmental requirements.

D. Complexity of Projects and Regulatory Requirements

The cost of business for the Roads Services Division – operating, building, managing, planning for, and maintaining bridges, roads, and other facilities – has increased dramatically in recent years. Some of the factors increasing costs and affecting RSD's ability to conduct business are:

- Increased commodity costs
- Revenue constraints
- Environmental regulations and associated permitting requirements
- Changing standards and policies

These key cost factors are discussed in detail below.

1. Commodity Costs

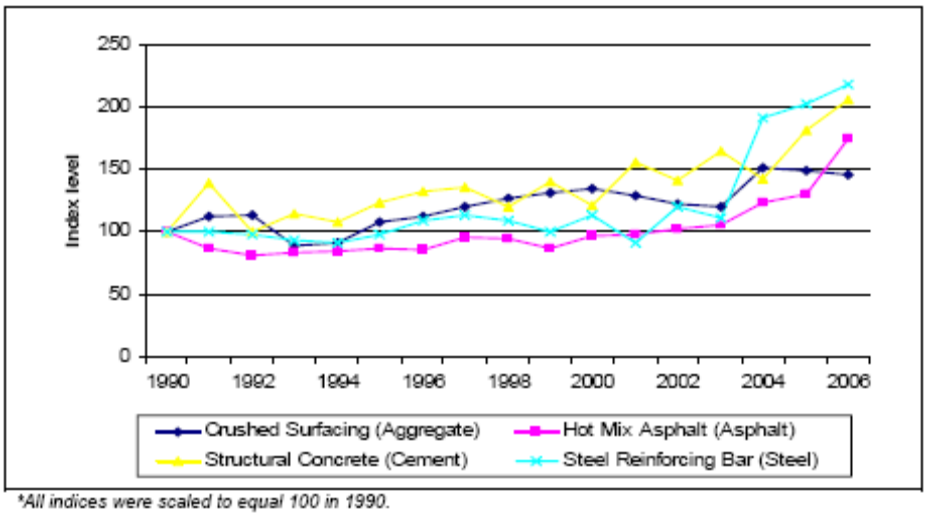
Transportation asset maintenance and construction costs have increased significantly in recent years. Although there has been a drop in costs recently;

increases in prior years greatly impacted RSD business. It is unlikely the downward trend will continue into the future and possible costs could in fact increase again with the added public work projects in the region in the coming years. For example, the Roads Services Division estimates that the costs of steel and asphalt have risen 30% since 2007. The FHWA Bid Price Index (BPI), which increased 47.7 percent from 2003 to 2006, and the Bureau of Labor Statistics bridge and highway constructions producer price index (PPI) which increased 35.3 percent over the same time period.[11]

The cost of commodity inputs has been the primary factor in recent construction and maintenance cost increases. Nationally, prices have risen dramatically since 2003 for each of the major commodity groupings used as inputs in highway projects. These include aggregate (any of various loose particulate materials, such as crushed stone or gravel), asphalt, cement, and steel. Excavation and embankment costs have also risen dramatically during this time, but have contributed less to recent highway cost growth as they constitute a smaller share of project costs than commodity inputs.[12]

Exhibit III-7 below shows the growth in selected commodity cost inputs for Washington State.

Exhibit III-7: Growth in Commodity Input Costs for Highway Construction in Washington State[13]



**All indices were scaled to equal 100 in 1990.*

Despite recent decreases in the cost of commodities due to a global economic recession, costs are expected to continue to increase in the long term. The ultimate effect of significantly increased commodity costs on RSD is the significantly decreased ability to fund all the projects necessary to meet the

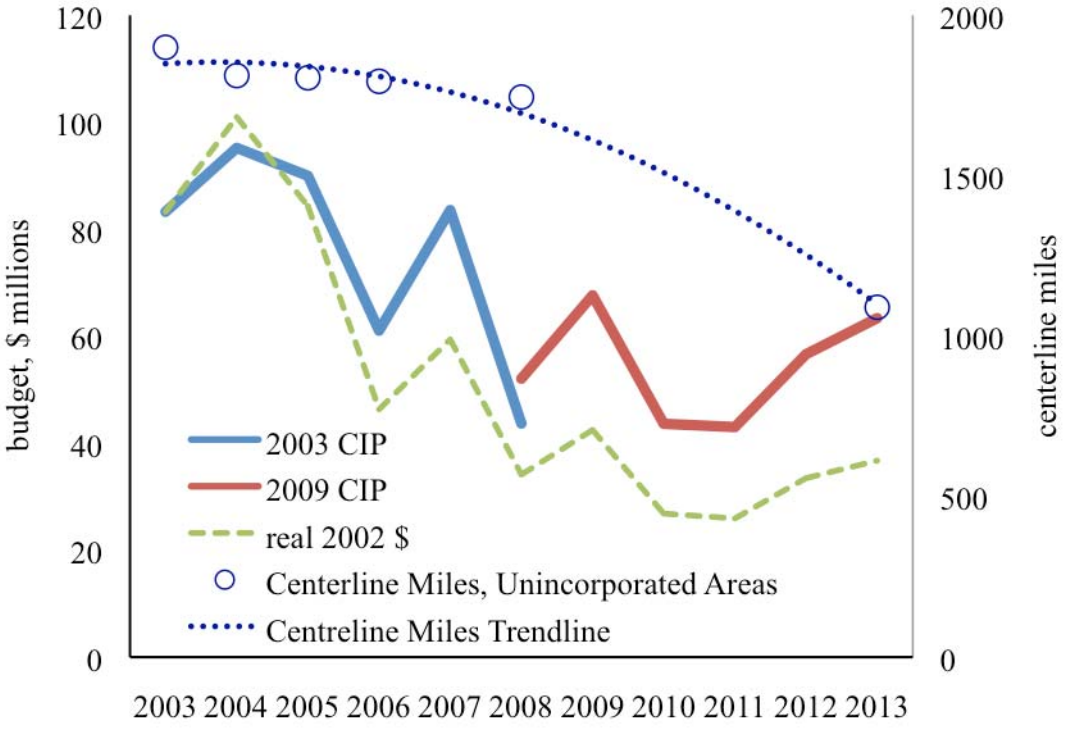
[11] FHWA Report CR-2007-079, Growth in Highway Construction and Maintenance Costs, September 2007
[12] *Ibid.*
[13] *Ibid.*

County's needs. For example, the Engineering Services Section has seen the direct effects of increased asphalt costs, which has changed the amount of work that the overlay program can do; in the coming fiscal year, the RSD will move to a chip seal-only program on non- and minor arterials. This lack of funds creates a backlog of maintenance and preservation projects, which in turn speeds the deterioration of transportation assets, as discussed above.

2. Revenue constraints

Over time, revenues to the Road Services Division have decreased substantially. Working Paper 2: Funding Analysis covers this topic in detail. Major sources of funding to the Roads Capital Fund – the state motor fuel tax, property taxes, the vehicle licensing fee, and grants – have all decreased in recent years and are projected to decrease further. In turn, Roads Capital Expenditures have decreased; Exhibit III-8 shows the decline in capital budget for roads. The 2003 and 2009 Capital Improvement Program expenditures are adjusted for inflation in highway construction costs and combined into a single series in 2002 constant dollars.

Exhibit III-8: Roads Capital Expenditures and Centerline Miles, 2003-2013



A detailed analysis of the Road Services Division's financial risks is presented in Working Paper 2: Financial Analysis. The key implication, for the purposes

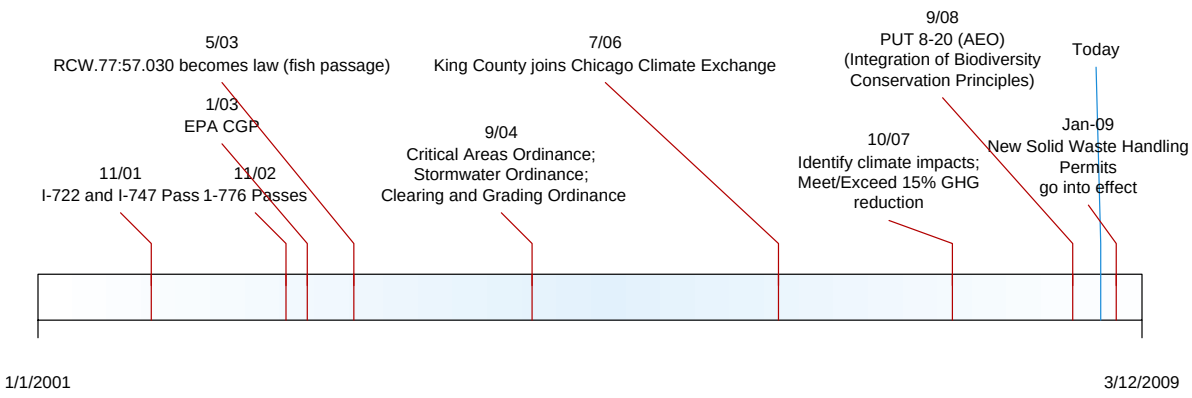
of this analysis, is that the revenue constraints make it difficult to pursue optimal lifecycle management strategies for County Roads. Over time, this increases the costs of doing business because deferred maintenance results in more costly major maintenance in future years.

3. Regulatory Requirements

The King County Road Services Division works in an increasingly complex system of state and federal environmental regulation, policy, and standards. Compliance is part of the Roads Division standard operating procedure and the impacts to workload are known; to date, the division has been able to adapt to the increased workload associated with compliance. The existing federal and state regulatory environment has been in place for a number of years. The major impact on RSD is that roads built prior to these laws must address them when they are reconstructed.

In addition, in recent years there have been new requirements that RSD must address, see Exhibit III-9 for a timeline of recent and projected environmental regulatory changes.

Exhibit III-9: Timeline of Major Financial and Regulatory changes within the past 5 years



The impacts of environmental regulation, policy, or standards that may be adopted by the county in the future are currently unknown. For example, there appears to be strong support within the county to take aggressive action against climate change, as evidenced by the County's membership in the Chicago Climate Exchange (CCX), a cap-and-trade carbon emissions and offset market. The exact implications to Roads Division as a result of this membership remain uncertain. The county may target all divisions within the Department of Transportation to make significant changes to offset carbon dioxide and other green house gas emissions, which could potentially increase the cost to complete projects.

The following list represents the principal environmental regulations and policies with which the Roads Division must comply as a part of standard operating procedures. The impact of these regulations and policies is known; increases in workload are mainly associated with retrofitting county-owned assets to achieve updated environmental standards and following best management practices in maintenance activities in compliance with new environmental policies and regulation.

- Clean Water Act (CWA): Increased National Pollutant Discharge Elimination System (NPDES) permitting requirements for the Stormwater Management Program (SWMP)
- King County Critical Areas Ordinance
- Endangered Species Act (ESA): Direct regulatory requirements on maintenance activities as well as retrofit initiatives to bring existing infrastructure into compliance, such as culvert replacement
- Regulations relating to the handling of solid waste
- Compliance with the Clean Air Act
- Redefinition of the ordinary high water mark by the ACOE
- Integrating Biodiversity Conservation Principles: Executive Order (PUT 8-20)
- Changes to regulation regarding aquifer protection in the city of Redmond

The following list represents the principal environmental regulations and policies that may have a future impact on the workload of the Roads Division. The extent of these impacts remains largely unknown.

- Physical impacts of climate change
  - Increased work associated with extreme and frequent weather events
  - Increased requirements associated with more frequent West Nile Virus outbreaks
- Regulatory impacts in response to climate change
  - King County Climate Change Action Plan (GHG Regulation) and membership in the Chicago Climate Exchange (CCX)
    - Meet target reduction of minimum 15% of GHG emissions
  - Western Climate Initiative (WCI)

– Potential for any Washington State requirements for GHG conformity requirements comparable to those recently enacted in California

4. Standards, Policies, and Other Regulations

Federal, state, and county policies, regulations, and standards drive investments in the County's transportation infrastructure. New or altered standards, policies, and regulations have wide-ranging impacts and increase costs to the County. These include but are not limited to:

- Safety
- Pavement and bridge condition
- Traffic signs and signals
- Drainage and fish passage
- Flood and severe weather repair
- ADA retrofits to facilities

Impacts of selected standards and regulations are discussed below. A detailed analysis of service levels and standards is presented in Working Paper Three.

a. Safety Standards and Regulations

The safe operation of King County's roads is of utmost importance to the Road Services Division. Failure to meet these standards can be very costly to the County, in both dollars and lives. For example, national engineering standards for guardrail create a liability for the County if they are not met; the Traffic Engineering Section estimates a ten-year backlog on arterial guardrail projects. The majority of federal, state, and county regulations do not come with increased funding to meet new safety needs.

An example of the fiscal impacts of changing safety regulations is the State of Washington code that requires the County maintain the roadway and approaches around a railroad crossing.[14] To meet state standards, the Traffic Engineering Section estimates that new signs, pavement markings, and concrete panels are needed at 19 locations, at a cost of $40,000 to $50,000 per location.

County standards and policies to achieve safety goals are also costly. The Road Services Division identifies safety needs in the annual Traffic Safety Report; the Transportation Needs Report also identifies High

[14] Washington RCW 81.53.090

Accident Locations and High Accident Road Segments. Safety analysis conducted by the Traffic Engineering Section leads to new policies to prevent crashes. For example, the Traffic Engineering Section is currently pursuing a policy of clear zones at roadsides to decrease run-off-road crashes, which requires additional mowing and roadside maintenance.

b. Pavement and Bridge Standards and Requirements

The federal government requires King County to set and maintain condition standards for roads and bridges.[15] Once these standards are set and reported to the federal government, there are serious implications for not meeting them, including liability issues, negative impacts on the County's asset valuation, and possible lowering of the County's bond rating. Currently, all King County roads meet applicable standards.

Bridge condition standards and construction and design regulations are set by the federal, state, and county governments. Given the critical nature of bridges in the safe movement of people and goods, meeting standards is particularly important to the County. If bridge condition standards are not met, bridges could be forced to close. Currently, King County bridges meet all legal requirements.

As infrastructure ages, however, the costs of compliance with standards and regulations increases dramatically, as discussed previously. Many of the County's older assets were built to standards that are now superseded by newer requirements. In some cases, the need to upgrade may make it impossible to perform minor rehabilitation activities without upgrading the entire asset to meet the new requirement, therefore increasing the complexity and cost of maintaining that asset.

c. Traffic Signal and Sign Standards

The federal government sets national standards for all traffic control devices installed on any street, highway, or bicycle trail open to the public.[16] The Manual of Uniform Traffic Control Devices is the primary mandate for traffic operations in the United States. Washington State codes and King County ordinances also set requirements for the activities of the Road Services Division. These regulations are constantly evolving with new technologies and standards. Each time a regulation is introduced or updated, the cost of compliance for the County increases as new equipment and training must be obtained and new projects must be programmed. For example, recent changes to federal reflectivity standards on traffic signs and pavement markings go into effect in 2009

[15] GASB 34
[16] 23 USC 101, 104, 109, 402

and will increase costs in the coming five years as more than 40,000 signs are upgraded to meet the new standard.

Implications

Absent more revenue, there is a need to plan for decreased service levels

The costs of business have increased and are expected to increase at a faster pace than funds. Therefore the County will not be able to provide the planned levels of service.

Need to maximize the productivity of roadways

Given financial constraints, the County will need to maximize the productivity of the road system.

E. Climate Change

Climate models produced by the University of Washington Climate Impacts Group project a broad range of changes in the Pacific Northwest in the next 20 years due to climate change.[17] In addition to the physical impacts of climate change, the county must also respond to policy impacts that stem directly from greenhouse gas regulation and other climate change mitigation efforts. The following sections analyze both the physical, political, and regulatory impacts associated with climate change in King County.

While the exact impacts of climate change are ambiguous at the local level, it is possible to predict regional trends. Temperatures in the Pacific Northwest have increased 1-3° F and annual precipitation has increased 10% since the beginning of the 20th century. Climate models indicate that by 2030 temperatures will increase another 3° Fahrenheit and by 2050, temperatures will have increased 5° Fahrenheit.[18] Climate is acutely sensitive to ostensibly small changes in temperature. For every degree of warming, the snow level rises 300 feet. Increased precipitation as rain coupled with a rising snow level translates to increased winter flooding events and increased risk for landslides throughout the Pacific Northwest.

Since it is nearly impossible to quantify increased frequency and intensity of storms with any certainty, the full potential for impacts on Roads Maintenance can not be defined. Nonetheless, the following characterizes the potential impacts of climate change in unincorporated King County:

[17] This figure is calculated based on an accumulation of knowledge about climate projections from the University of Washington Climate Impacts Group as well as review of recent weather patterns in the Puget Sound region

[18] Climate Change Impacts on the United States *The Potential Consequences of Climate Variability and Change: Pacific Northwest Region;* National Assessment Synthesis Team, US Global Change Research Program; 2000.

- *Increased storm frequency and/or intensity will contribute to a significant increase in storm and emergency response.* Climate models predict a broad range of impacts on emergency operations, anywhere from an increase of 50% to 100% in the next 20 years[19]. Increased emergency traffic response is necessary as well
- *Increased storm frequency and/or intensity will contribute to wear and tear of infrastructure.* Increased storms will also have an impact on bridge repair and maintenance. During storms, bridges suffer damages due to increased scouring and debris impact
- *Changes in precipitation patterns could increase the workload of the Roads Division.* According to projections by the University of Washington Climate Impacts Group, precipitation will become more concentrated and unevenly spread during an annual climate cycle. The Pacific Northwest will experience wetter winters and drier summers and more intense storms in general.[20]
- *Changes in peak flow of rivers and changing salmon spawning patterns could alter the "fish window" and limit the amount of work Roads Maintenance is able to perform due to the impact on labor distribution.* There would also be impacts associated with demands for higher levels of emergency response, increased liability for damages, and deterioration to the roadway infrastructure
- *Climate change could increase health concerns associated with West Nile Virus (WNV).* Increased risk for WNV would require larvacide or mechanical means of removing standing water (vactoring) in catch basins, ditches, and ponds in the event of a breakout

Roads Maintenance operations may already be experiencing the effects of climate change. Roads Maintenance reports several major abnormal flooding events in the past 5 years with five back-to-back storm events in King County between November 2006 and February 2007. The 2005-2006 storm season was also abnormally active with 58 winter storm projects, thirty of which exceeded $30,000 in repairs.[21] While it is impossible to link these events in isolation to global climate change, it is reasonable and realistic to expect an increase in storm frequency and intensity in the coming decades. What Roads Maintenance refers to as the "Season of Storms" may become a more typical Pacific Northwest winter.

The 2007 King County Climate Plan identified vulnerable infrastructure particularly prone to the impacts of increased flooding and climate change in general. Many of these vulnerable areas are located within unincorporated King County and would affect the Roads Division operations. Particularly flood prone regions include unincorporated parts of King County within the Snoqualmie Valley and the Lower Green River. These regions provide corridors to properties valued at over $1.5

[19] This figure is calculated based on an accumulation of knowledge about climate projections from the University of Washington Climate Impacts Group as well as review of recent weather patterns in the Puget Sound region
[20] 2007 King County Climate Plan
[21] King County DOT Roads Services Division "2006 Winter Storm Report" August 2006.

billion dollars.[22] Furthermore, the King County Global Warming Team has identified 500 ageing levees and revetments over 115 miles of riverbank which are at high risk of failure during increased flooding. Failure of the county's infrastructure would lead to an estimated $4 billion in losses. In response, the county has established a Flood Control Zone District (FCZD) to manage levees and purchase vulnerable property in floodplains. The implementation of the FCZD work program will generate additional work for Roads Maintenance crews that contract with WLRD for river related work.

Policy Issues

A long-term increase in storm- and emergency management-related maintenance work

The climate change analysis indicates that there will be more work responding to weather events. In addition, intense winter storms increase the lifecycle costs of roadway systems.

Policy and regulatory actions to reduce Green House Gas Emissions on travel demand and how demand is met

California is indicative of the likely policy response of state and federal agencies to reducing Green House Gas emissions. California has enacted state law that provides a Green House Gas reduction overlay to all transportation and land use planning. The transportation sector contribution to emissions is quantified and targets for reduction established. The specific requirements affect capital improvement plans and transportation system operations. These can affect future travel demand and how that demand is served by government.

RSD's role in address County Green House Gas Emissions Policy Goals

A key issue involves establishing an emissions inventory that addresses more than the use of County roads but includes how roads are built and maintained.

Strategy for adaption to the impacts of climate change

Climate changes will have impacts on the location, design, maintenance, and operation of roadways.

IV. Comparison to Other Counties

King County's Operations Master Plan work programs typically involve some comparison of County agencies to their peers. The purpose of this comparison is to identify whether King County's practices or responsibilities generally similar to those in

[22] 2007 King County Climate Plan

other jurisdictions. The comparison also is used to identify lessons learned from other counties that might be appropriate for application in King County. For the ROMP, the comparison addresses 3 other counties; this is not a large sample and therefore should only be used for illustrative purposes.

The comparison counties selected are Sacramento County, CA, Baltimore County, MD, and Miami-Dade County, FL. Information was obtained from these counties by targeted interviews and reviewing public documents.

The following characterizes the scope of services available in other counties:

- Baltimore and Miami-Dade counties provide services as a regional authority and do not have specific contracts with cities; Sacramento County provides contracted services to the City of Cordova

- The scope of services provided by equivalent roads divisions in other counties is consistent and comparable to services provided by the King County Roads Division. However, the responsibilities for roads are not necessarily centralized and are spread among various departments and divisions. In Miami-Dade County for example, equivalent road services are located within 17 divisions of the Department of Public Works.

The following characterizes the revenue sources and financial health of state roads divisions in other counties:

- Counties utilize a wide range of revenue mechanisms to fund their operating and capital budgets. The surveyed counties have more revenue sources, and more varied revenue sources, than King County. Revenue sources include: general funds, road impact fees, transit development fees, a variety of state and federal funds, general obligation bonds, and metropolitan bonds among others. Each of these revenue sources is described in greater detail in Appendix D.

- Despite the variety of funding sources available, the surveyed counties all have a growing backlog of both routine maintenance and priority needs capital projects. Sacramento County estimates their backlog at $300M as of 2008.

- Rising commodity costs and decreasing revenue streams were named as limiting the ability for counties to complete projects.

- Counties identified future climate change regulation and compliance as a trend that may negatively impact both the costs and timeframes associated with project delivery. Impacts were anticipated to be in the form of additional permitting during planning and development phases of projects.

Exhibit IV-1 below summarizes the characteristics of the identified counties:

Exhibit IV-1: Summary Characteristics of King, Sacramento, Baltimore, and Miami-Dade Counties

County	Area (miles^2)	Persons (mile^2)	Annual VMT per capita	Centerline Road Miles	Bridges
King	2,126.04	817	9,175	1,745	186
Sacramento	965.65	1,266.60	9,544	2,204	6 moveable bridges, 200 vehicular bridges, 36 pedestrian bridges
Baltimore	598.59	1,259.30	9,481	2,500	423
Miami-Dade	1946	1,157.90	9,250	5,500	8 moveable bridges, 195 vehicular/pedestrian bridges

For additional information pertaining to each of the surveyed counties, please see Appendix D.

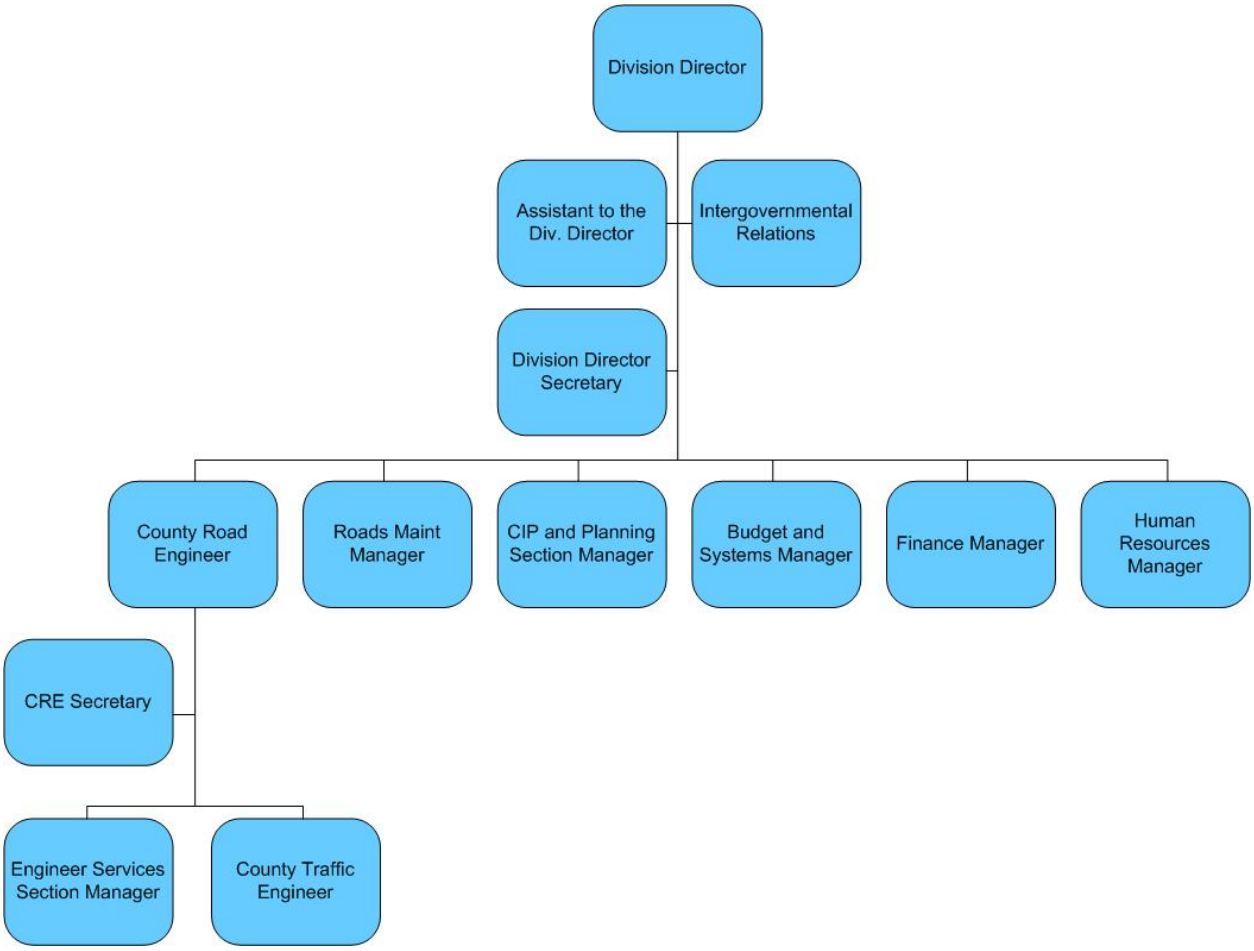
Appendix A: Products and Services

The Road Services Division is organized into six sections:

- Capital Improvement Program and Planning
- Engineering Services
- Traffic Engineering
- Roads Maintenance
- County Engineer's Office
- Administration

Exhibit A-1 below shows the organizational structure of the Road Services Division. These units are covered in detail in the following sections.

Exhibit A-1: Road Services Division Organizational Chart

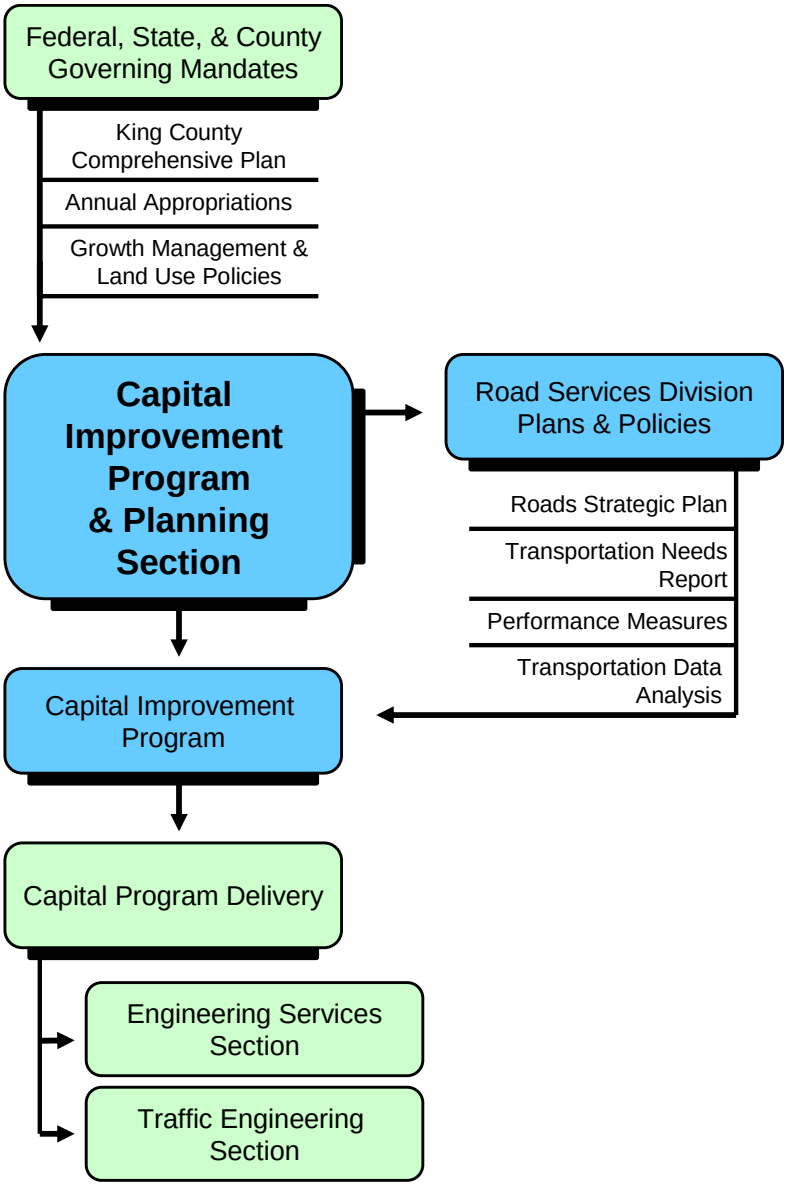


The narrative below describes the business, products, and services of these sections.

A. Capital Improvement Program and Planning

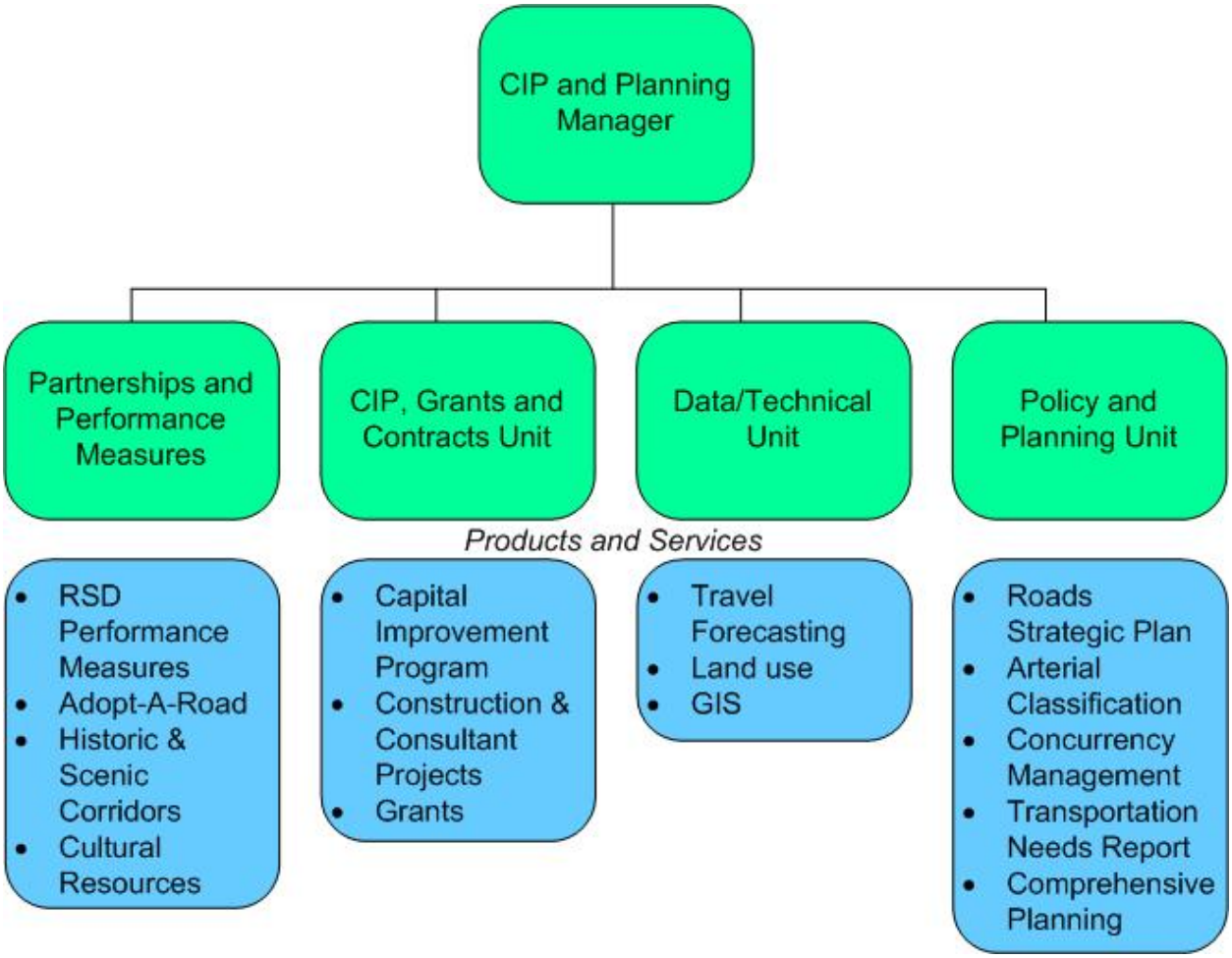
The Capital Improvement Program and Planning Section (CIP&P) is responsible for long-range transportation planning and capital program management for roadways, bridges, and other roadway assets located in unincorporated areas of the county. The business requirements of CIP&P are defined by federal, state, county, and division mandates. The relationships of these mandates to CIP&P programs and services are shown in Exhibit A-2 below.

Exhibit A-2: CIP&P Policy Framework



CIP&P is divided into four units as shown in Exhibit A-3 below. Key products, programs, and services are listed in the shaded blue boxes.

Exhibit A-3: CIP&P Organizational Chart



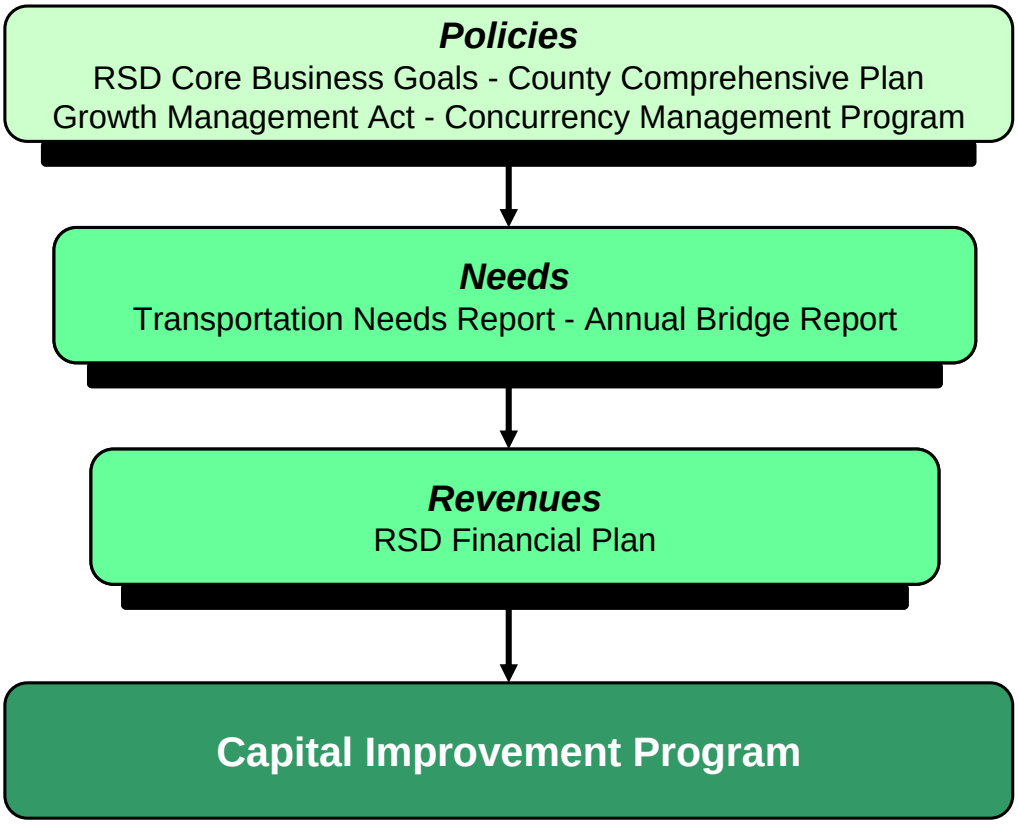
1. Capital Improvement Program

The Capital Improvement Program (CIP) is the major product of CIP&P. It is the planned budget for capital expenditures on King County roads. The CIP is a program of transportation improvement projects that provides a blueprint for RSD's capital expenditures. The primary goal of the CIP is to construct and improve roadways for improved safety and mobility in unincorporated areas of King County. The CIP is developed to provide safe roads and bridges, to be consistent with federal, state, and county land use policies and plans, and to meet identified transportation needs. CIP management and development also involves administration and oversight of consultant and construction contracts and the RSD grant program.

The CIP is planned in six-year increments and updated annually. Two reports drive the CIP prioritization process: The Transportation Needs Report and the

Annual Bridge Report. Projects are then prioritized based on safety, efficiency, and preservation, with choices informed by the transportation section of the King County Comprehensive Plan. Once a project has been programmed in the CIP, it is scoped, designed, and constructed under the oversight of the Engineering Services Section, the Traffic Engineering Section, or the Roads Maintenance Section. Exhibit A-4 below depicts the process by which the CIP is developed. The adopted 2008 – 2013 Roads CIP totals $330 million for the six-year period.

Exhibit A-4: Capital Improvement Program Process



The CIP is organized into eight categories of capital transportation projects that address functional or program responsibilities within RSD as shown in Exhibit A-5 below. It is important to note that state and federal funding sources for roadway improvements often prescribes the programmatic category of work. Therefore, RSD does not have the flexibility to allocate all funds used for capital projects between programmatic categories in the CIP. Working Paper 2: Financial Analysis addresses the source and use of funds and roads financing in general.

Within RSD different sections are responsible for the management and delivery of programmatic categories of projects within the CIP. The Engineering Services Section is responsible for the capacity and reconstruction program; the Traffic Engineering Section is responsible for the Intelligent Transportation Systems (ITS), guardrail, operations, and pedestrian programs; and the two sections are each responsible for projects under the safety program.

Projects are prioritized based on program category-specific prioritization processes and the planning and policy guidelines set forth by the County and RSD. Exhibit A-5 below shows the budget allocated to each of these categories as reported in the 2008 Transportation Needs Report.

Exhibit A-5: CIP Categories and Allocations $ Millions

Category	2008-2013 CIP
Safety	$28,000
Preservation	$59,000
Capacity (Major & Minor)	$145,000
Bridge	$61,000
Pedestrian	$33,817
Operations	$23,500
Reconstruction	$21,000
ITS	$18,000
Total	$389,317

The CIP, Grants and Contracts Unit also provides services to jurisdictions within King County on a contracted basis. One such service is certification acceptance for grants for small cities.

2. Roads Strategic Plan

The Roads Strategic Plan is mandated by both Washington State law and the King County Comprehensive Plan.[23] CIP&P is responsible for the Roads Strategic Plan, which was developed in 2004 and evaluated for potential revision and update every four years. The purpose of the Roads Strategic Plan is to provide a bridge between the King County Comprehensive Plan's high-level policy guidance and the day-to-day practices, procedures, and decision

[23] RCW 36.75.020, 36.78.020, 36.78.090

making in the Road Services Division. The plan was developed through a collaborative process with all sections within the Road Services Division and with the participation of a community advisory group.

The Roads Strategic Plan provides goals with strategies and actions to achieve these goals, as well as a framework for implementation. The goals fall under eight categories, which were informed by the King County Comprehensive Plan and the Road Services Division's business plan:

- Regional leadership, partnership, and coordination
- The urban and rural road system
- Congestion management
- Transportation alternatives (public transportation, travel demand management, and high occupancy vehicles; bicycle and pedestrian; equestrian)
- Maintenance and preservation of infrastructure
- Roads safety
- Transportation environmental stewardship
- Roads funding strategies

The full Roads Strategic Plan is available from the King County website.

3. Long-Range Transportation Planning

CIP&P conducts long-range transportation planning activities for King County. These activities include travel demand forecasting, development of a long-term transportation facilities plan, roadway classification, concurrency and mitigation payment system management, non-motorized (bicycle, pedestrian, and equestrian) planning, corridor studies, and other transportation analysis and road-related policy development. All of these long-range transportation planning activities support the development and management of the capital program.

Policy and Planning

The Policy and Planning Unit, in conjunction with the CIP, Grants, and Contracts Unit and the Data/Technical Unit as well as other Roads Services Division sections and units, produces the Transportation Needs Report. King County is required by the state to develop a Transportation Needs Report every

four years.[24] The purpose of the Transportation Needs Report is to identify system needs to meet current and future demands; the report also:

- Identifies specific actions and requirements to bring sub-standard facilities or services into compliance with standards and regulations
- Forecasts traffic for at least ten years based on adopted growth targets and the county's land use plan to provide information on the location, timing, and capacity needs in the future
- Analyzes the funding capability to judge needs against probable funding resources
- Provides a multiyear financing plan based on identified needs

The Concurrency and Mitigation Payment System, addresses Washington State growth management planning requirements, is also managed by the Policy and Planning Unit. The Concurrency Program ensures that the adopted standards for travel on county roadways are achieved concurrently with development over a six-year period. The Mitigation Payment System identifies and collects fees from new development to mitigate the impacts on the transportation system. The Concurrency Program is updated yearly in conjunction with the CIP; Mitigation Payment System fees are updated every four years in conjunction with the Transportation Needs Report.

Data and Technical Services

In support of long-range transportation planning, the Data/Technical Unit conducts travel and land use forecasting and analysis using a countywide travel demand model. This supports the development of the Countywide Planning Policies which require the development of traffic forecasts at least every ten years. The Countywide Travel Demand Model is a major tool used in long-range planning, air quality analysis, and land use management. Its development requires input and collaboration with the Puget Sound Regional Council, the King County Department of Development and Environmental Services, and the King County Department of Assessment.

Contracted Services

The Policy and Planning Unit also provides services to jurisdictions within King County on a contracted basis. These services include:

- *Transportation concurrency*: Performing analyses for transportation concurrency applications for proposed developments within the city

[24] RCW 35.70A.070

- *Transportation impact fees*: Developing a transportation impact fee program using information provided by the city, which may include the following elements:
  - Calculating capacities for the city's road improvement projects
  - Developing an impact fee model and residential fee schedule for the city
  - Calculating impact fees for commercial developments in the city
  - Updating the city's residential fee schedule and impact fee model as needed
- *Other transportation planning-related services*:
  - Providing technical support to the city, including staff support at concurrency and transportation impact fee public hearings, city council meetings, and concurrency and transportation impact fee appeals
  - Assisting the city in developing a transportation impact fee reciprocal interlocal agreement with the county

4. Performance Measurement

King County's Kingstat executive performance management program reports annual indicators and measures for all county agencies. CIP&P oversees performance measurement and reporting for RSD. These measures enable RSD and County leadership to track and evaluate service levels, programs, goal achievement, resource use, and policies. CIP&P tracks 26 indicators and their performance against targets in the following categories:

- System condition
  - *Percent of unincorporated road miles at 40 percent or better Pavement Condition Rating*
  - *Number/percent of bridges functionally obsolete as defined in the National Bridge Inventory*
- Safety
  - *Traffic fatality rate per 100,000 unincorporated population*
- Environmental
  - *Stream miles opened for fish passage by culvert replacement*
- Organizational

- *Planned versus actual CIP spending*
- *Comprehensive employee survey*

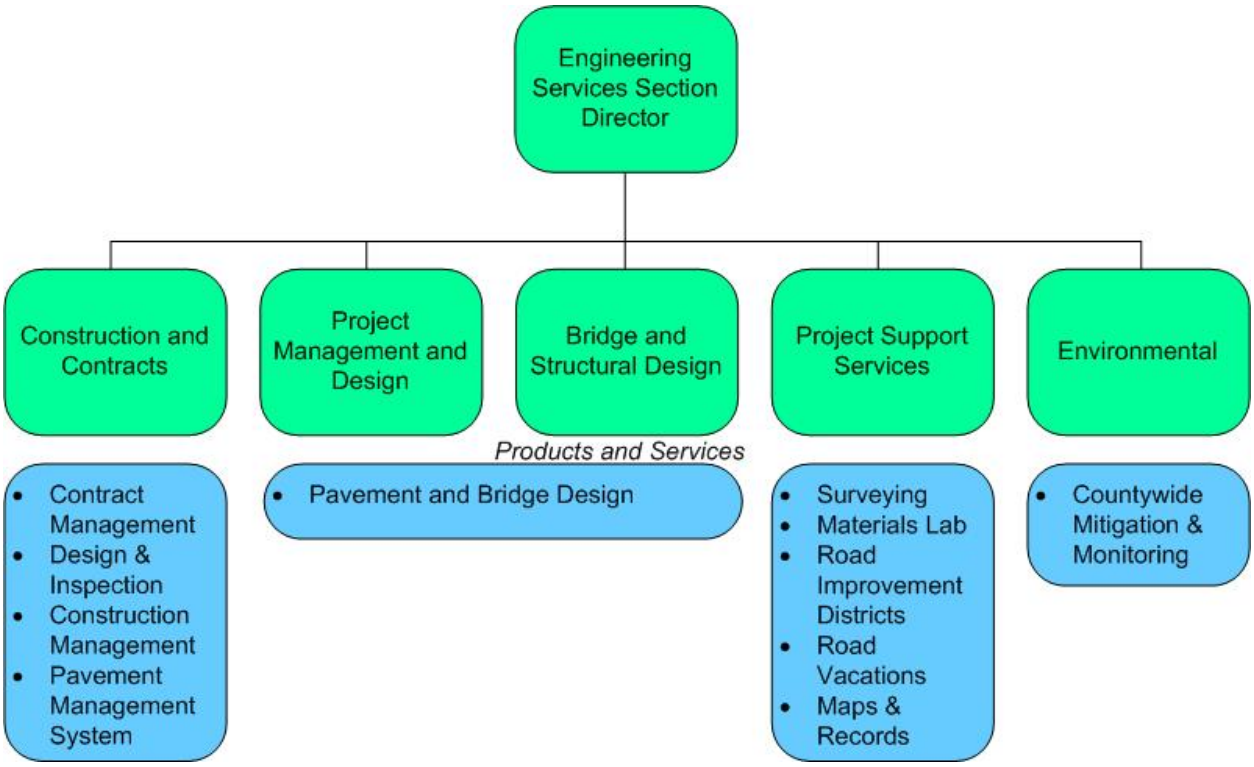
A comprehensive list of RSD performance measures is available in Appendix B.

The Partnerships and Performance Measures Unit also provides services and assistance to other King County agencies and jurisdictions on a contracted basis. These services include the Adopt-a-Road Program and Cultural Resources services.

B. Engineering Services Section

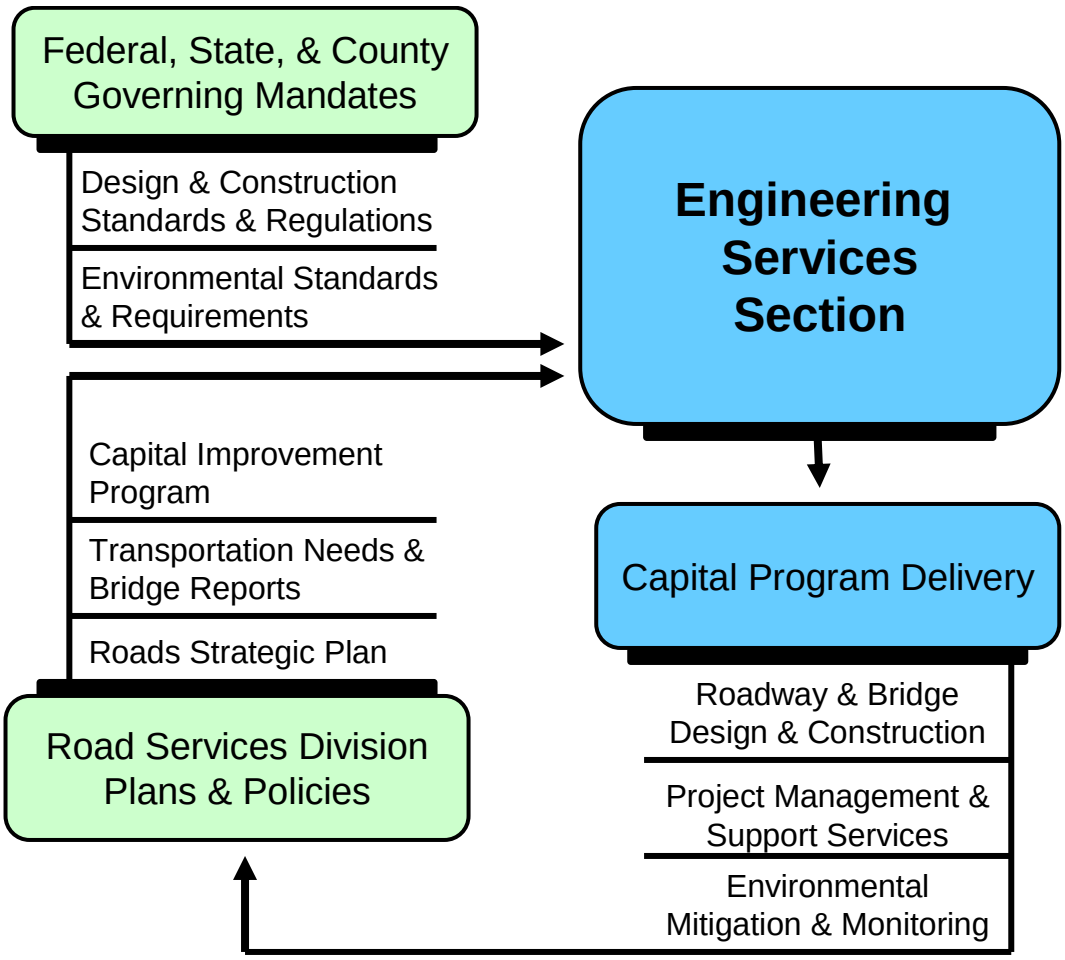
The Engineering Services Section (ESS) is responsible for the design and construction of roadways, drainage systems, and bridges located in unincorporated areas of the county, in support of the delivery of the Capital Improvement Program. The specific CIP program categories that ESS has responsibility for are capacity, reconstruction, preservation, and safety. ESS is organized into five units as shown in Exhibit A-6 below. Key products, programs, and services are listed in the shaded blue boxes.

Exhibit A-6: Engineering Services Section Organizational Chart



The mission of ESS is "to apply sound engineering principles and practices to current and future infrastructure needs in a productive, efficient, and environmentally responsible manner." The activities of ESS are driven by federal, state, county, and division policies, standards, and plans, which are shown in Exhibit A-7 below.

Exhibit A-7: Engineering Services Section Policy Framework



1. Project Management, Bridge and Roadway Design, and Construction

The chief business of ESS is to deliver projects in the Capital Improvement Program. The two major programs of ESS are the bridge program and the pavement overlay program. Specific services include road and drainage design, bridge and structural design, construction management and inspection, and project management.

Project Development and Management

The Engineering Services Section ensures that all of the county's transportation assets meet design and construction standards and regulations, and produces the Vulnerable Roads Segments study, which identifies and addresses specific high-priority roadway funding needs throughout the County. The Engineering Services Section manages the pavement overlay program, which is an ongoing effort to extend the lifecycle of County roads by overlaying the roads with an asphalt concrete mixture that protects the roadbed from compaction and erosion. The entirety of King County's unincorporated arterial system is inspected and assessed every two years. The Project Management and Design unit is also responsible for the design and development of major repairs, reconstruction, preservation projects, and capacity projects on King County roads.

The Project Management and Design and the Bridge and Structural Design Units design and manage the delivery of King County's transportation infrastructure projects, and all units within the Engineering Services Section play a role in the project development process. During the project planning phase, surveys, mapping, geotechnical testing, and environmental reviews are conducted. Federal, state, and county laws and regulations set standards for the design and construction of roads, bridges, and seawalls. Environmental and construction permits are issued during the design phase, and right-of-way is secured. Once the design is finalized, mitigation and concurrency payments and permit compliance are managed. ESS engineers and project managers oversee each phase of this process.

The type and mix of projects that ESS is responsible for delivering is determined by the allocation between programmatic categories in the CIP and the prioritization process within categories. Due to revenue constraints, the focus of ESS's design and construction units has been limited in recent years to projects focused on safety and preservation. As discussed in Section III, the Roads Services Division estimates a backlog of at least $255 million in high priority, unprogrammed safety and preservation needs over the next ten years. ESS is currently working on one major widening project, which is the only major capacity project planned in the current CIP. The Road Services Division estimates that there is at least a ten- to fifteen-year backlog in congestion relief projects to meet current demands on the system.

Bridge Program

Bridges and other structures are the responsibility of the Bridge and Structural Design Unit, which inspects each bridge at least every two years; the unit also produces the annual bridge report, an input into the Transportation Needs Report and the Capital Improvement Program. The Bridge and Structural

Design Unit manages the Short Span Bridge Program, which funds replacement of bridges that are too short to qualify for federal bridge maintenance and replacement funds. There are 57 short span bridges, which comprise most of the county's deficient bridges, and the Short Span Program enables the replacement of three bridges per year.

County Road Log and Standards

The Engineering Services Section maintains the County Road Log, a complete inventory of all county roads that is submitted annually to the County Road Administration Board (CRAB) by the County Road Engineer. The CRAB maintains the statewide inventory of county roads used as the basis for grant program eligibility and fuel tax calculations, and prepares the calculations for the annual fuel tax allocation for each county. The Section also maintains and updates road standards to comply with federal and state regulations.

Contracted Services

The Construction and Contracts, Project Management and Design, and Bridge and Structural Design Units provide specialized engineering and construction services to other King County agencies and jurisdictions within King County on a contracted basis. These services include:

- *Engineering services*: Planning and design, preliminary engineering, environmental assessment, coordination of right-of-way purchases, public involvement, writing of specifications, and advertising for bids and holding pre-construction conferences
- *Survey services*: Right-of-way location, construction and geodetic surveying and large topographic, and hydrographic and global positionary satellite surveys
- *Overlay contract management*: Overlay prep, monumentation, and traffic corridor analysis

King County agencies that use the engineering and technical support services of ESS include the Water and Land Resources Division, Transit Division, Airport Division, Wastewater Division, Parks Division, Solid Waste Division, and the Department of Development and Environmental Services.

2. Project Support Services

The Project Support Services Unit supports the delivery of projects within RSD through specialized services such as surveying, geotechnical and materials testing, and administrative activities. The Map and Records Center maintains mapping and historical survey data concerning roadway

establishments, drainage plans, plats, road construction plan and profiles and various other maps, and makes available copies of topographic maps from the USGS, engineer's maps from individual plat maps and section corner locations. The Project Support Services Unit also coordinates with King County residents to support Road Vacations and Road Improvement Districts.

Survey Unit

The Survey Unit conducts land surveys in support of infrastructure engineering projects. Survey Unit services include boundary surveys, topographic surveys, right of way surveys, horizontal and vertical control surveys for aerial photogrammetry, GPS surveys, sensitive areas mapping surveys, floodplain surveys, bathymetric surveys, construction staking of roads, and maintenance of the Public Land Survey System as authorized by Washington State Law. The Survey Unit also provides advice on King County surveying matters to the County Prosecuting Attorneys Office, reviews or prepares legal descriptions, and manages contracts with private surveying consultants who are under contract performing surveying work for the County.

Geotechnical and Materials

The Materials Lab performs geotechnical testing and testing of all materials used in construction projects to ensure they meet federal and state standards.

Geotechnical design responsibilities range from small foundation design problems to bridge replacement projects, landslide analyses and pavement design, and rehabilitation. Services are provided during four phases of a project:

- *Initial design phase services* include subsurface exploration, instrumentation installation and monitoring, field and laboratory testing, development of design recommendations and construction specifications, and review of reports completed by contract geotechnical consultants
- *Final design phase services* include review of project documents to evaluate suitability for construction, verify appropriate incorporation of geotechnical recommendations, and assist in the development of construction quality control programs
- *Construction phase services* include responding to unanticipated geotechnical conditions, implementation of quality control inspection, material sampling and testing programs, as well as review, approval and tracking of contractor submittals
- *Long-term services* include long-term geotechnical monitoring, performance evaluations, or forensic investigations

Contracted Services

The Project Support Services Unit also provides specialized services to other King County agencies and jurisdictions. These services include:

- *Soils and materials laboratory analyses*: Geotechnical investigations, roadway pavement designs, and quality control of construction materials
- *Construction management services*: Inspections, surveying, materials sampling and testing, contractor progress billings, and construction contract administration

Many King County agencies depend on the geotechnical engineering analysis and land surveying expertise of ESS staff members for their engineering projects.

3. Environmental Mitigation and Monitoring

Almost all Road Services Division projects are subject to a variety of environmental regulations from federal, state, and county agencies. The Environmental Unit of ESS supports project delivery by ensuring the Road Services Division's compliance with environmental regulations and standards, conducts monitoring of sensitive sites, and mitigates the impacts of transportation development on King County's natural environment. The Environmental Unit performs mitigation activities such as drainage design for fish passage and remediation of sensitive sites. Environmental monitoring and mitigation programs within ESS drive the environmental activities of the Roads Maintenance Section, which are discussed in detail in Section II-D below.

Environmental regulations have increased steadily and will continue to increase, which increases the staff hours and level of effort required to complete a project. King County's unique environmental characteristics, such as the number of endangered species that reside in the county, require a high number of permits to be issued; some projects have 20 to 30 associated environmental requirements and conditions.

The Environmental Unit is currently monitoring 43 sensitive area mitigation sites, and has conducted the following types of sensitive area, mitigation, and biological assessment studies:

- Stream survey
- Vegetation survey
- Culvert monitoring

- Beach elevation
- Mitigation site monitoring reports
- Amphibian survey
- Fish utilization

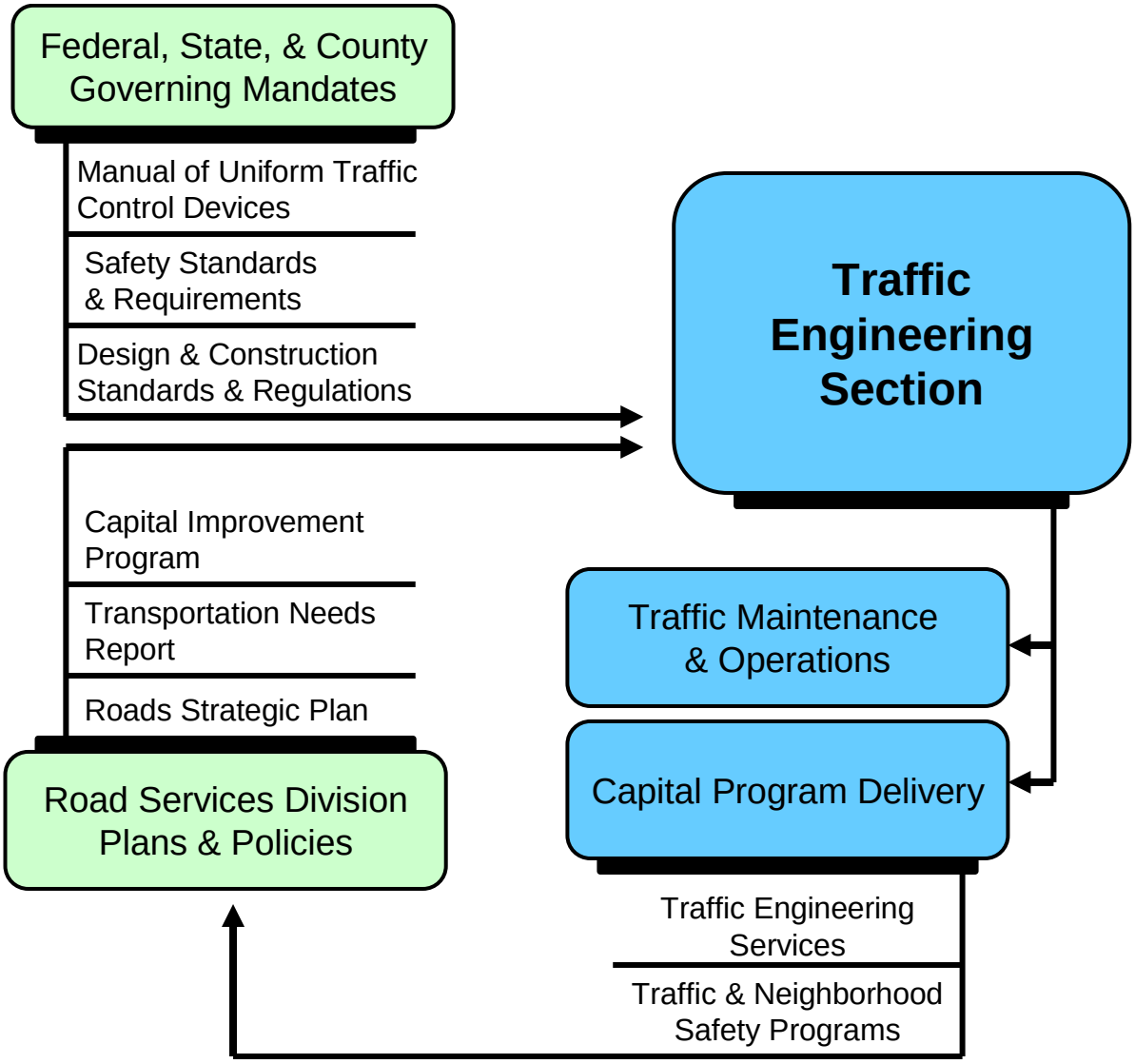
ESS's Environmental Unit provides specialized services to other King County agencies. King County agencies that use environmental support services include the Parks, Solid Waste, Facilities, and Airport Divisions. Environmental support services include permit acquisition, biological assessments/evaluations for ESA compliance, construction monitoring, fish passage design and construction, stream and wetland restoration.

C. Traffic Engineering Section

The Traffic Engineering Section has maintenance, operations, and capital project delivery responsibilities. Traffic Engineering is responsible for the operations and maintenance of traffic devices, such as signals and signs, and traffic engineering services in unincorporated areas of the county in support of the delivery of the Capital Improvement Program. This section is one of the largest providers of traffic expertise in the region, and provides on-call response in the event of emergencies as well as contracted support to several cities. Traffic Engineering is responsible for CIP program categories of safety, ITS, guardrail, operations, and pedestrian projects.

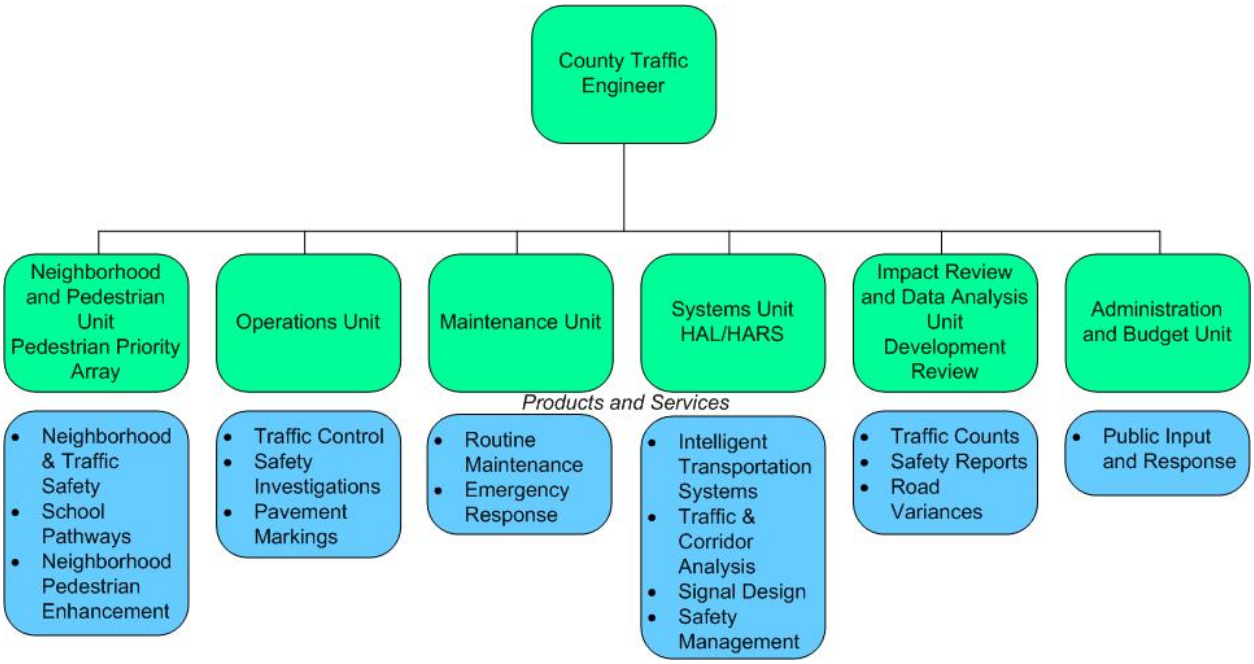
The activities of Traffic Engineering are determined by federal, state, county, and division standards, policies, and plans. These define business requirements for Traffic Engineering programs and services that are shown in Exhibit A-8 below.

Exhibit A-8: Traffic Engineering Section Policy Framework



Traffic Engineering is organized into six units. Employees are roughly evenly split between the King Street Center, where they are dedicated to operations, engineering, and CIP project construction, and the Renton Headquarters, from which maintenance is based. These units and their functions are shown in Exhibit A-9 below. Key products, programs, and services are listed in the shaded blue boxes.

Exhibit A-9: Traffic Engineering Section Organizational Chart



1. Traffic Engineering

Traffic engineering services provided by the Traffic Engineering Section directly support implementation of the Capital Improvement Program and day-to-day roadway operations. These include:

- Safety reports, management, and investigations
- Traffic counts and analysis
- Traffic control devices
- Intelligent transportation systems
- Neighborhood, school, and pedestrian safety and enhancements
- Traffic Citizen Action Request response
- Signal coordination and retiming
- Development Review and Road Variances

Capital projects managed by Traffic Engineering include Intelligent Transportation Systems, pedestrian walkways, traffic signals, and the guardrail program. The guardrail program promotes safety on county-maintained roads by installing new guardrails, repairing existing barriers and rails, and upgrading older guardrails to meet current roadway standards. Program staff

also works with other agencies to clear hazards such as trees and mailboxes from roadside shoulders that pose hazards due to their close proximity to roadways. Guardrail replacement and installation is an ongoing countywide program; standards for guardrail design are constantly improving and the Road Services Division estimates there is a ten-year backlog on arterial guardrail replacement.

Traffic Signals

The Traffic Signal CIP category consists of projects for new or upgraded signalization. Traffic Engineering maintains a list of intersections in unincorporated King County that would benefit from further design or are in need of improvement as a result of projected development. These locations are evaluated and prioritized using federal and state criteria; factors driving improvement needs are traffic volume and accident data, pedestrian activity, and proximity to parks or schools. Traffic signal solutions may include traffic signals, pedestrian signals, actuated flashers, in-pavement crosswalk flashers, and other technology. This process may also recommend physical changes to the roadway, such as roundabouts or turn lanes. There are currently 18 traffic signal projects underway, and more than 150 intersections are currently actively monitored for potential future signalization.

Safety

The Traffic Engineering Section is responsible for much of the Road Services Division's safety reporting and accountability, as mandated by the Washington State Model Traffic Ordinance. The section issues the annual Traffic Safety Report, which provides information on crashes on unincorporated King County roads. This is used by RSD and DOT leadership to allocate safety funds and to communicate to the public to improve public safety and awareness. Traffic Engineering identifies High Accident Locations and High Accident Road Segments, conducts analysis of crashes, and develops policy and programmatic solutions to improve safety. The Neighborhood and Pedestrian Unit focuses on non-roadway safety programs and projects.

ITS and Transportation Data

Intelligent transportation systems and transportation data collection are critical activities, mandated and partially funded by federal and state statutes and grants. The Intelligent Traffic Management Systems maintained by the Systems Unit in the Traffic Control Center (TCC) allow for real-time congestion management and improved mobility on unincorporated King County roads. There are four signal synchronization projects currently underway; these projects will produce a coordinated set of timing plans for a group of signals on an arterial that creates a smooth traffic flow.

Traffic Engineering data programs help to plan and program for improved mobility across the county. The section maintains traffic cameras and conducts traffic counts in unincorporated areas of King County. Two Traffic Engineering staff members work full-time with the Department of Development and Environmental Services to coordinate traffic engineering activities with new development and assist in impact analyses and other projects. The data and analysis produced by the Systems Unit and Impact Review and Data Analysis Unit provide key information to the CIP&P Section for long-range planning efforts and the Countywide Travel Demand Model. Some of the Traffic Engineering reports and programs that provide input into the Transportation Needs Report include:

- High Accident Locations and High Accident Road Segments reports
- School Pathways Program
- Signal and Intersection Priority Rankings
- Guardrail Priority Array and Report
- Annual Traffic Safety Report

Contracted Services

The Traffic Engineering Section provides specialized traffic engineering services on a contracted basis to jurisdictions within King County. These services include:

- Traffic signal maintenance and operations
- Sign and striping maintenance
- Traffic engineering
- Emergency response for signal and sign issues
- New traffic devices
- Traffic investigations
- Electrical inspections
- Three-year thermoplastic program
- Traffic counts

2. Traffic Operations and Maintenance

The Operations and Maintenance Units within Traffic Engineering are responsible for the installation, maintenance, and operation of all traffic devices in unincorporated King County. Traffic Maintenance provides 24-hour

emergency response in unincorporated King County and to contracted cities. This includes more than 90,000 traffic control signs and more than 400 traffic signals. The Manual of Uniform Traffic Control Devices from the Federal Highway Administration provides national standards for all traffic control devices installed on public roads, and the Traffic Engineering Section is responsible for ensuring all signs and signals meet national, state, and county standards.

The Traffic Engineering Section performs the following maintenance and operations services on traffic infrastructure in unincorporated King County, and to jurisdictions within King County on a contracted basis:

- *Sign Maintenance*: Replacing faded sign faces and rotten posts, straightening leaning posts, cleating uncleated posts, relocating signs for visibility or pedestrian safety, maintenance of vandalized signs or signs damaged by vehicle accidents, inspection of signs to check for reflectivity, cutting or trimming bushes or limbs blocking visibility, and removal of signs when appropriate
- *Crosswalks*: Refurbishing with thermoplastics and temporary tape, and removal when appropriate
- *Stop Bars*: Refurbishing with thermoplastics and temporary tape, and removal when appropriate
- *Arrows/Legends*: Remarking worn arrows, removing when appropriate
- *Curb Painting*: Maintenance of curbing, islands, and parking stalls
- *Raised Pavement Markers*: Removal and replacement of raised pavement markers or rumble bars
- *Striping*: Painting linear road stripes on pavement, such as centerlines, edge lines, radius and channelization, and removal of line, stripes, or symbols from the pavement
- *Street Lights*: Replacement of light bulbs in existing street lights not maintained by power companies, repair and replacement of street light heads, poles, or wiring
- *Utility Locating*: Locating underground traffic facilities for utilities or other digging operations
- *Signal Maintenance*: Replacing and cleaning light systems for signal and flasher displays and signs, installation and repair of vehicle detector loops, checking and adjusting signal timing, examining traffic signal operation to assure it is operating as intended, inspecting hardware for wear or deficiencies, testing and repairing of electronic control devices and components, repair or replacement of signal and flasher displays,

supports or wiring external to controller cabinet, modification of controller cabinets, testing of new and modified cabinets and control devices, traffic counter testing and repair and preventative maintenance

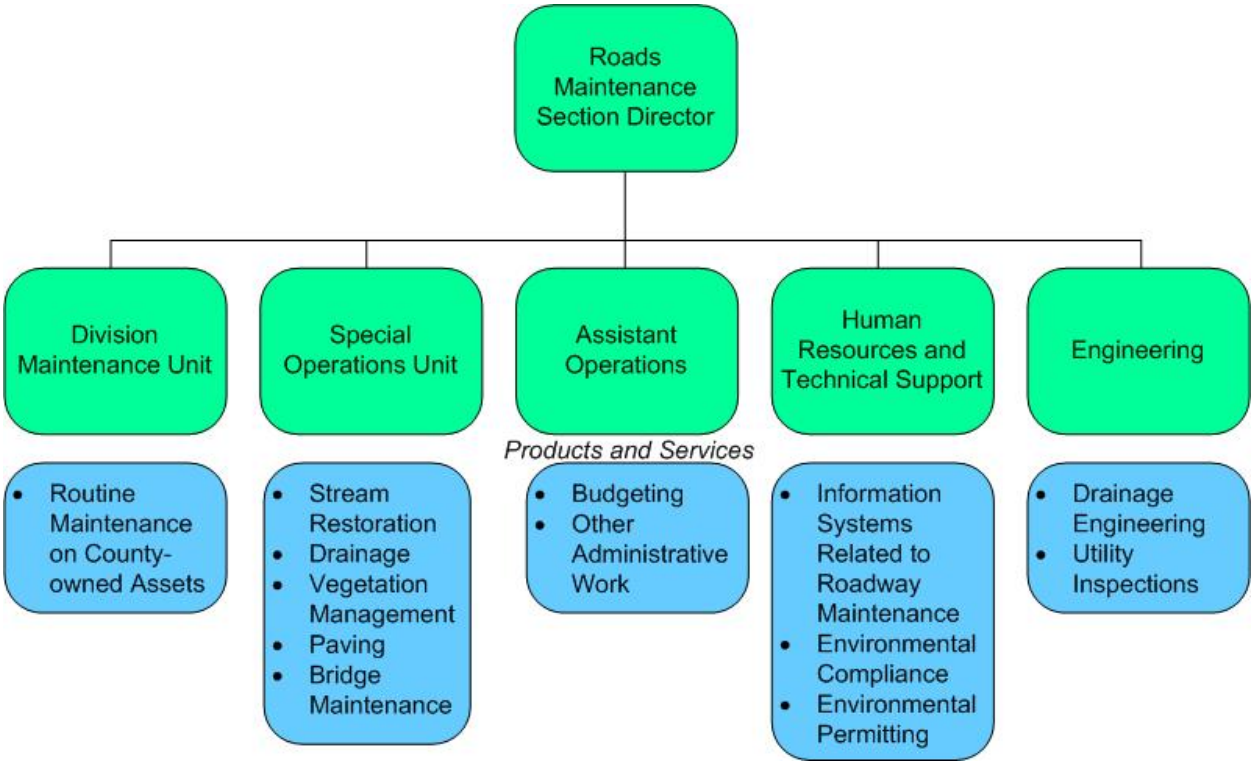
- *Flasher/Crosswalk Preventative Maintenance*: Examining to assure equipment is operating as intended and inspecting hardware for wear or deficiencies
- *Road Closures and Traffic Control*: Road closures for Roads Maintenance routine construction and emergency projects, and traffic control variable message signs and arrow boards for Roads Maintenance lane closures
- *Radar Speed Trailers*: Manage the use of radar speed trailers for communities upon request

D. Roads Maintenance Section

Maintenance of the roadway infrastructure is performed by two units in the Road Maintenance Section: the Division Maintenance Unit and the Special Operations Unit. The Division Maintenance Work Unit is responsible for maintaining, repairing, and cleaning roadway features and remaining on-call in the event of emergencies. The Special Operations Work Unit performs more unique project-related tasks such as paving, bridges, drainage and rivers management, vegetation management, facilities management, and storm water retention/detention.

Roads Maintenance is divided into five units as shown in Exhibit A-10. Key products, programs, and services are listed in the shaded blue boxes. The Division Maintenance, Special Operations, and Engineering units are responsible for emergency response work when required.

Exhibit A-10: Roads Maintenance Section Organizational Chart



Divisional Maintenance, the typical maintenance tasks for which roads maintenance is responsible, makes up the single largest component of employee time (32%) followed by engineering and administrative services (20%) and functions associated with rivers and storm water, drainage, and storm water decantation.

The following details the products, services, customers, and partners of the Roads Maintenance Division.

1. Responsibilities, Products, and Services

The Roads Maintenance Section has the following responsibilities:

- Routine maintenance on county road assets
- Emergency Response and related operations
- Contract maintenance work with cities and other agencies as requested
- Work on Roads Division CIP projects
- Services to Water and Land Resources Division (WLRD)
- Other county-wide activities including administration of the Coordinated Reduction of Waste (CROW) program, a waste recycling program, and

the Street Waste Alternatives Program (SWAP), a bioremediation program for both street waste and catch basin/storm water waste

To fulfill these responsibilities, the field crews, engineers, and management staff undertake over 400 different maintenance tasks that we group, with some simplification, into the following categories:

- *Roadway Surfaces and Shoulders:* paving and patching asphalt; gravelling and grading roads and their shoulders; street sweeping, snow and ice control; and litter control
- *Drainage*: cleaning, replacing, and repairing the ditches, culverts, catch basins, and pipes that make up the road drainage system; and maintaining stream banks and flood control devices in the county's rivers and creeks
- *Bridges and Facilities*: inspection and repair of structural and electrical components of bridges, guardrails, ADA ramps, pumphouses, storage buildings, and other specialized facilities
- *Roadside Vegetation:* slope and shoulder mowing, hand brushing, herbicide application, noxious weed control, and dangerous tree removal
- *Recycling and Waste Processing/Handling:* the Coordinated Reduction of Waste (CROW) program includes stockpiling and separating waste materials into recyclable components for temporary storage until quantities are large enough to haul efficiently to vendors and treatment sites. Materials include brush, tires, asphalt, concrete, lumber, litter, catch basin solids, street sweeping material, scrap metal, and other mixed waste. In addition, the Street Waste Alternatives Program (SWAP) includes hauling, screening, sorting, and processing street sweeping material and catch basin solids in order to allow bioremediation to remove contaminants. Clean material, after passing sampling thresholds, is either recycled or used as fill and topsoil in site reclamation

Sections 2-7 below describe the major responsibilities of the Roads Maintenance Section.

2. Routine Maintenance on County Road Assets

Roads Maintenance is responsible for the maintenance of all assets within the right-of-way including over 1,768 road-miles, 181 bridges, over 30,000 catch basins and manholes, over 3 million feet of curb and gutter, and over 5 million square yards of mowable slope among many other assets. These assets are summarized in Exhibit III-2 in Section III of this document.

It is in RSD's best interest, and the interest of the public, to not fall behind in the Division's general maintenance responsibilities. An annual cycle of

maintenance and rehabilitation provides safe and efficient conditions as well as optimal performance of county roads. Avoiding deterioration reduces the need for major reconstructions, extends the working-life of these assets, minimizes costs, and reduces risk and liability. Typical maintenance duties include: bridge maintenance, dangerous tree removal, litter control, ditch cleaning and restoration, drainage construction and maintenance, guardrail construction and maintenance, illegal dumping cleanup, mowing, grading, pothole repairs, road closures, seawall repair and construction, snow and ice removal, storm drain maintenance and vactor disposal, sweeping, and weed and vegetation control.

3. Emergency Response and Related Operations

Roads Maintenance provides 24-hour emergency response in unincorporated King County as well as emergency response to contract cities. This includes the clearance, damage control, and repair of maintenance assets in extreme weather conditions. Roads Maintenance is typically the first on-the-scene and is responsible for assessing the emergency situation and making judgments about road closure. Road Maintenance field employees are available to:

- In *heavy rains and windstorms*: close flooded roads, clear debris, clear drainage systems, remove slides, and repair bridges, washouts, roads, dikes, levees and other structures
- In *snow and ice storms*: plow, sand and de-ice roads, clear fallen trees, and free up frozen drainage systems, frost heaves, and potholes
- In *other natural disasters or emergencies:* provide emergency response for events such as earthquakes

Roads Maintenance designates certain roads as "priority routes" during inclement weather. These routes, because of location, traffic volume, and safety issues, are the first to be sanded or plowed during snow and ice events. Only after these routes are cleared are non-priority routes cleared. Priority routes are often cleared multiple times before non-priority routes are cleared, depending on the severity of a winter storm event and Roads Maintenance staffing resources.[25]

The division also has a responsibility to dedicate employees to emergency events affecting contract cities. However, unincorporated areas have priority for Roads Maintenance employees during emergencies since contract cities do not support the full spectrum of the Roads Maintenance budget. As a general rule, during a countywide event, Roads Maintenance provides support to contract cities equal to the number of FTEs funded by the city contract. For

[25] King County Department of Transportation Road Services Division Roads Maintenance Section "2007-2008 Snow and Ice Response Plan."

example, if the city budget supports 3 FTEs, then the equivalent of 3 FTEs would be available for the city during a major storm or emergency event.

Because it is not possible to predict with accuracy when major storm events will occur, Roads Maintenance budgets only minimally for unscheduled and emergency events such as snow and ice control. Funding level for this activity is based upon historical expenditures in non-event years. Typically, the budget expended annually on snow and ice control has far exceeded the budgeted amount, particularly in the past several years which experienced abnormal winter weather events.

The past 10 years have had abnormally active storm seasons. These events disrupt the regular maintenance work of the Roads Maintenance section as employees are diverted from typical duties to storm response. The winter 2006-2007 storm season, for example, included four Federal Disaster declarations and generated 120 new projects at an estimated cost of $20.7 million including construction contracts and County force expenditures.[26] In prior years, these events were not budgeted for and Roads Maintenance had a significant budget shortfall and had to request supplemental funding appropriated by the King County Council. The 2008 budget included $210,246 in deferred maintenance costs, which was only a small proportion of the overall deferred maintenance need. Over time, this backlog of deferred maintenance work adversely impacts the condition of the county's roadway assets and increases the work required to maintain them. The 2009 Adopted Budget includes a $2.5 million grant contingency to expedite emergency storm work that will be reimbursed by FEMA; this does not address the current, growing backlog of deferred maintenance.

4. Other County-Wide Activities

In addition to the responsibilities listed above, the following activities are also performed by Roads Maintenance employees:

Coordinated Reduction of Waste (CROW)

The Coordinated Reduction of Waste program facilitates energy efficiency and recycling of waste while helping to deal with large amounts of road maintenance debris and waste material generated during slide repair, asphalt grinding, storm debris cleanup, ditch digging, and culvert replacement. The CROW program sorts and consolidates waste which is eventually recycled as fill or hauled to vendors for reuse. Twenty-three Roads Maintenance sites house CROW program stations.

[26] King County Department of Transportation Roads Services Division "A Season of Storms: November 2006-February 2007 Damage Report" September 2007.

Street Waste Alternative Program (SWAP)

The Street Waste Alternative Program is a bioremediation program which manages street waste generated from sweeping and storm water drainage system cleaning. The SWAP annually treats roughly 11,000 tons of solids from unincorporated King County, contract cities, the Washington State Department of Transportation (WSDOT), and private entities.[27] Street sweepings and catch basin solids from county pit sites are taken to a central location where they are processed, bioremediated, sampled and tested, and eventually reused for site reclamation.

5. Contract Maintenance Work with Cities and Other Agencies

Incorporated cities within King County contract with the Roads Maintenance Section for the full spectrum of maintenance services the Section provides. These cities are referred to as "contract cities." All services are provided "at cost"; the Roads Maintenance Section does not make a profit on contracts.

The relationship between the contract cities and the Roads Maintenance Section is mutually beneficial; contract cities receive services from an experienced, reliable, and technically advanced provider, and the Roads Maintenance Section is able to keep a larger staff on hand to assist with contract cities which enables a larger pool of staff to assist in the unincorporated part of the county during emergency events. Additionally, efficiencies are gained as technical and expensive equipment do not need to be purchased by each city but can be used as necessary on a contractual basis.

The extent of Roads Maintenance responsibilities within the contract cities varies and is on a contract-to-contract basis. Historically, Roads Maintenance support has been a function of length of time since a city has incorporated, although some cities continue to contract with Roads Maintenance long after incorporation. King County currently contracts with ten cities, with about one-third of the current operations and maintenance workforce dedicated to reimbursable work. This adds an additional 763 road miles to the maintenance inventory; however, information on contract city miles can be misleading since cities may have partial to full service contracts for road maintenance services. The largest contract is with the City of Burien.

Beginning in 1990, many cities within King County began to incorporate and progressively annex contiguous land within the Urban Growth Area (UGA). When cities first incorporate they do not have the expertise, equipment, or facilities to provide their own road maintenance services and initially depend on King County Roads Maintenance for continued routine maintenance and

[27] King County Transportation Today "County 'SWAPS' Litter and Debris for Clean Soil." June 12, 2007.

support. The Interlocal Cooperation Act of 1967 (RCW 39.34) enables cities to contract with the county with the understanding that avoiding costly bidding processes and providing services in-house benefits all parties and the public.

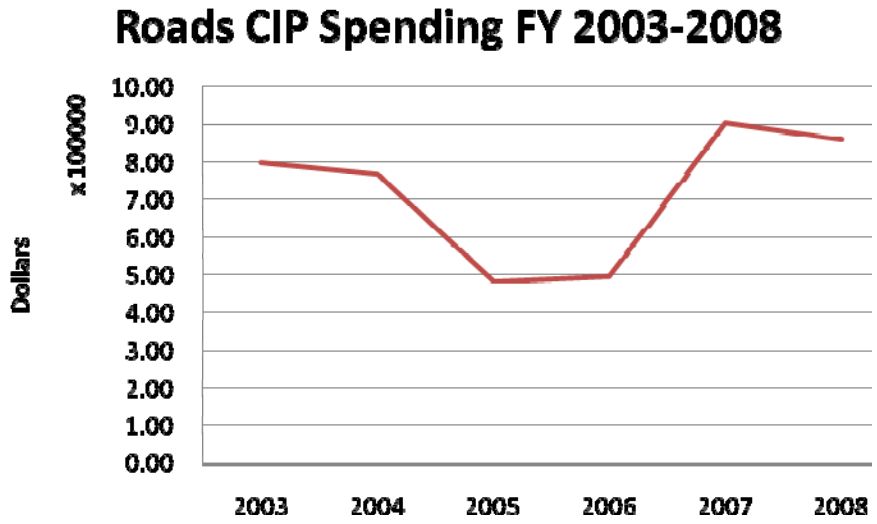
Typical contract work performed by Roads Maintenance for cities includes mowing, sweeping, vactoring, and emergency support. Historically, as newly incorporated cities mature, they take over routine maintenance operations and are more likely to contract with Roads Maintenance for technically specialized work such as hydroseeding or bridge repair, equipment intensive maintenance, and supplemental emergency response.

In the past four years, there has been an increasing trend of project work for non contract cities and other entities including Seattle Public Utilities (SPU), King County Solid Waste, the Parks Department, and Facilities Management among others. This is often technically specialized work which is seasonal and equipment intensive.

6. Work on Road Services Division CIP Projects

Road Maintenance crews provide support services to Road Services Division CIP projects. This work is usually on smaller scale construction projects in support of Roads CIP such as drainage projects, culvert replacements, ADA ramps, and the Non-Motorized Pathways Program. Other typical work for CIP Projects may include seismically retrofitting bridges, improving fish passage in rivers and streams, and small overlay projects. Typically, Roads Maintenance is involved only with the construction of these projects while the design is completed by Engineering Services Section. Exhibit A-11 below illustrates the variable amount of spending by Roads CIP on services provided by the Roads Maintenance Section from FY 2003-2008.

Exhibit A-11: Roads CIP Spending on Roads Maintenance Section Services[28]



7. Services to Water and Land Resources Division (WLRD)

Roads Maintenance has considerable expertise in the repair and maintenance of surface water management assets which it provides to WLRD by agreement. WLRD primarily utilizes Roads Maintenance Special Operations staff for projects in several areas: 1) Capital Projects and Open Space Acquisition (CPOSA), 2) Stormwater Services, and 3) Flood Control Zone District (FCZD). Support to these functions includes cleaning catchbasins and ponds, removing sediment, repairing and replacing pipes, levee/revetment repair, bank stabilization, mowing, retrofitting ditches and swales, hand and mechanical brushing, noxious weed control, bioswale, hydroseeding, slide removal, stream restoration, levee repair and reconstruction, and other emergency services.

Maintenance, repair, or improvements within watersheds where salmon spawn, must be conducted during the "fish window" in compliance with the Endangered Species Act (ESA) to minimize disruption to salmon habitat. The "fish window" is the brief period of time when salmon are not present in freshwater river systems and can be as short as 45 days. WLRD projects on salmon-inhabited rivers must be completed during this abbreviated time-frame. This uneven distribution of labor makes it challenging for Roads Maintenance to staff specifically for WLRD support.

[28] Information provided by the Roads Maintenance Section from revenue 2003-2008

E. County Road Engineer

The County Road Engineer (CRE) is a position created and defined by Washington state law to supervise, under direction of the County Road Administration Board, "establishing, laying out, constructing, altering, improving, repairing, [and] maintaining all county roads of the county."[29] The CRE is the signatory authority for all County roads and prepares standards for construction of roads and bridges, and oversees the Engineering Services Section and the Traffic Engineering Section, and provides engineering oversight of the Roads Maintenance Section.

The CRE is responsible for the Division's Annual Certification, which is submitted to the County Road Administration Board and subsequently the State Treasurer, and ensures that the County's roads are in compliance with all relevant standards, laws, and regulations.[30]

F. Administration

The Administration Section of the Roads Services Division is responsible for budgeting, financial management, and human resources and provides administrative and secretarial support to the Division Director, Linda Dougherty. The administration section fields inquiries from citizens and the media acting as the front-line with the King County community. Additionally, the administration section manages intergovernmental relations, as well as information technology program and project management.

[29] Washington Revised Code RCW 36.80.030
[30] WAC 136-04

Appendix B: Road Services Division Performance Measures

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Pavement overlay miles installed in unincorporated King County	50	43	The number of road miles of overlay in a given year is a function of the pavement condition of the road network, the price of materials, the price of labor, and the adopted budget. While the price of labor remained relatively constant, the price of materials, primarily hot asphalt mix, continued to significantly rise. In May 2006, at the time the 2007 Overlay target was established, the average price for hot asphalt was $53.88/ton. The actual price of hot asphalt for the 2007 overlay program was $60.07/ ton or an 11.5% increase. As a result, the overlay program was only able to achieve 86% of its 2007 target. 2009 target reflects the impact of the continued rise in material costs.	08 Biz Plan
Percent of unincorporated road miles at 40 or better pavement condition score (PCS): *Arterial/collector* *Local Access*	 80% or better 80% or better	 91% 87%	PCS is a standard government pavement condition measure. It has been demonstrated that keeping pavement at a PCS rating of 40 or higher optimizes lifecycle costs. The arterial/collector roadway segments are rated over a two year period and the local access segments are rated over a three year period. The values reported are adjusted to reflect the change in roadway segment condition between the time they are rated and the time of the report. The 2007 results reflect RSD's ongoing focus on pavement condition.	08 Biz Plan AIMS High KingStat 4-County
Average annual sufficiency rating for timber bridges inspected by the road services bridge unit	57	58.27	The bridge SR is a federal standard measurement that establishes eligibility and priority for replacement of bridges (20 feet or longer) with funding assistance from the Federal	08 Biz Plan AIMS High KingStat

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Average annual sufficiency rating for non-timber bridges inspected by the road services bridge unit	75	77.29	Highway Bridge Replacement Program. The SR ranges from zero to 100, with zero indicating a bridge that is closed and cannot carry traffic loads and 100 indicating a new bridge with no deficiencies. The SR is the sum of numeric values assigned for structural adequacy (condition and load carrying ability), serviceability (ability to accommodate traffic), and essentiality for public use (amount of traffic the bridge carries and availability of alternate routes). A minimum measure of 50 is generally considered satisfactory. Non-timber bridges have concrete construction and also tend to be newer, therefore they have higher ratings. Considering that the bridge inventory continues to age, maintaining the current average SR is a significant accomplishment.	08 Biz Plan AIMS High KingStat
Number/Percent Bridges Structurally Deficient	n/a	17 bridges 9%	New Measure - no target set for 2007. Bridges are considered Structurally Deficient (SD) if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge creates flooding over the bridge deck and adjacent roadway causing significant traffic interruptions. The fact that a bridge is structurally "deficient" does not immediately imply that it is likely to collapse or that it is unsafe. With hands-on inspection, unsafe conditions may be identified and, if the bridge is determined to be unsafe, the structure must be closed. A SD bridge, when left open to traffic, typically requires significant maintenance and repair to remain in service and eventual rehabilitation or replacement to address deficiencies. To remain in service, SD bridges are often posted with weight limits to restrict the gross weight of vehicles using the bridges to less than the maximum weight typically allowed by statute. By 2013, King County plans to replace, repair, or rehabilitate 13 of the 17 (76%) bridges currently identified as SD.	AIMS High KingStat

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Number/Percent Bridges Functionally Obsolete	n/a	43 bridges23%	New measure - no target was set for 2007.Functional obsolescence is a function of the geometrics (e.g., height, width, alignment) of the bridge in relation to the geometrics required by current design standards. While structural deficiencies are generally the result of deterioration of the conditions of the bridge components, functional obsolescence results from changing traffic demands on the structure. Structurally deficient bridges are the current priority for RSD. Typically, RSD does not replace or upgrade functionally obsolete bridges unless they also have structural deficiencies.	AIMS High KingStat
Number/percent of load-limited bridges	n/a	5 bridges 3%	New measure - no target was set for 2007. One indication of the effectiveness of the county's bridge programs is the declining number of load limited bridges. In 1997 there were 19 bridges with load restrictions. In 2002 there were 15 and at the close of 2007, just five bridges retained load limits. Of these five bridges, two are being replaced with new, unrestricted structures. One will be completed by mid 2008 and the second will be completed mid 2009.	AIMS High KingStat
Traffic fatality rate per 100,000 unincorporated population *# Fatalities*	See comments	4.34 16	This is a National Hwy Traffic Safety Administration standard measure and also the measure agreed upon by King, Pierce, and Snohomish and Clark County public works managers for benchmarking purposes. Many factors are out of the control of the RSD, for example, a significant portion of these fatalities are due to alcohol impairment and/or speeding. RSD has chosen not to set a numeric target for fatalities; however, the division strives to reduce accidents and injuries/fatalities through many projects and activities, for example guardrail installation and improvements at high accident locations. The KC fatality rate is historically lower than WA state and US averages. (Note: RSD has a new and improved WSDOT source for this data. 2003 - 2007 data has been revised to reflect this new data. Data represents number of fatal collisions, not necessarily total fatalities.)	08 Biz Plan AIMS High 4-County

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Pedestrian collision rate per 100,000 unincorporated population *# Ped collisions*		10.86 40	(Note: RSD has a new and improved WSDOT source for this data. 2003 - 2007 data has been revised to reflect this new data.)	KingStat
Pedestrian fatality rate per 100,000 unincorporated population *# Ped fatalities*		0.54 2	(Note: RSD has a new and improved WSDOT source for this data. 2003 - 2007 data has been revised to reflect this new data. Data represents number of fatal collisions, not necessarily total fatalities.)	KingStat
(NEW) % Reduction in accidents at high accident locations and high accident road segments	n/a	n/a see comment	New measure. RSD maintains lists of HAL/HARS and uses this information to select, prioritize, and implement safety improvements. Before/after studies are completed to assess the effectiveness of completed projects with respect to accident reduction and the societal costs of accidents. Three years of data are needed to determine the "after" statistics. The data lag is currently 2 years; therefore the most recent metric available is for 2002. As of 2002, there was a cumulative reduction in accident rate of 26% (for 1996-2002). RSD will continue to refine this measure and obtain more recent data for future reporting.	08 Biz Plan/TBD
(NEW) Run off road measure TBD			under development	
Planned vs. actual CIP major projects advertised	90%	75%	Six of eight major CIP projects originally planned for advertisement in 2007, were advertised within the year. Coal Creek Parkway (200891), led by Renton, was delayed until Jan 17, 2008. SE 208th @ 105th (400301) was not advertised because it was put on hold. For the purposes of this measure, "major project" refers to those projects (total budget => $1 million, or high profile) currently being tracked by OMB as part of the KingStat initiative.	08 Biz Plan KingStat 4-County

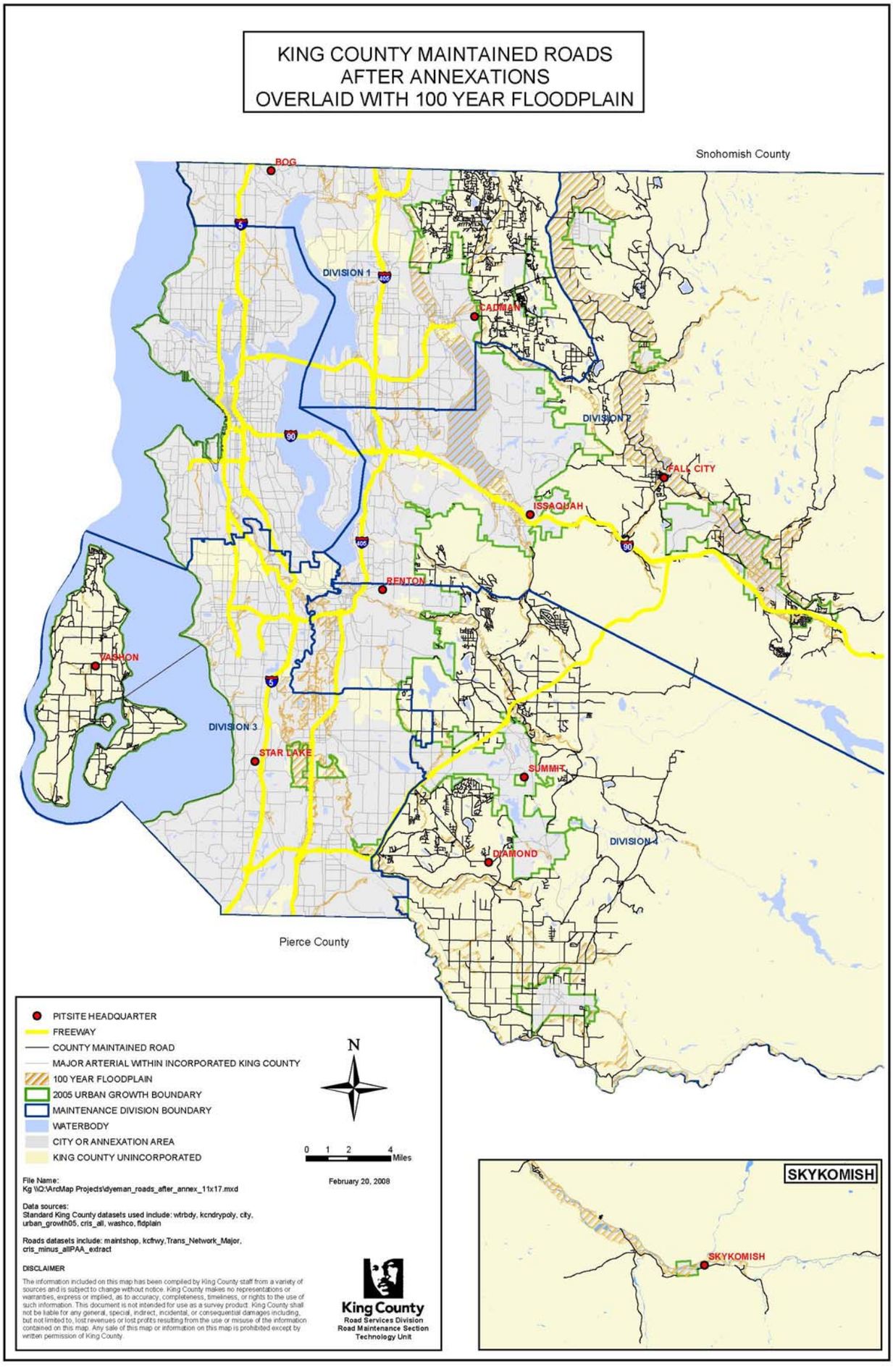
Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Planned vs. actual major CIP projects substantially completed	90%	86%	12 of 14 major CIP projects originally planned to be substantially completed in 2007, were completed within the calendar year. Concrete work on Wagoner's bridge (200604) was delayed into 2008 due to weather conditions. SE 304th @ 124th (300205) was delayed due to permitting issues and difficulty finding an available storm water mitigation site. For the purposes of this measure, "major project" refers to those projects (total budget => $1 million, or high profile) currently being tracked by OMB as part of the KingStat initiative.	08 Biz Plan/TBD 4-County
Planned vs. actual CIP spending	90%	78%	Variance from target is primarily due to three projects: Coal Creek Pkwy #200891($5 M) - City of Renton is lead and delayed start of the project; SE 304th St @ 124th Ave SE # 300205 ($2.1 M) - delayed due to permitting issue; SE 208th @ 105th Pl SE #400301 ($1.5 M) - put on hold, new development will be required to make improvements as part of their project.	08 Biz Plan KingStat 4-County
(TBD) Percent change in travel speed following corridor signal management projects	n/a	n/a	New measure. This measure will be project-based with data obtained from corridor before/after studies. Adequate data is not available to provide a metric for 2007, but data is being collected in 2008 and will be reported in 2009.	08 Biz Plan/TBD

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Number of old culverts replaced with fish passable designs *Maintenance* *CIP*	14 2	12 2	Since the backlog of aging/deteriorating culvert infrastructure is not static, this is reported as a number rather than a percentage. Large culvert replacement projects qualify as capital projects and are constructed through the RSD CIP. Smaller culverts can be replaced by the Roads Maintenance Section - numbers are reported separately for each type since the project scale is quite different. As Roads Maintenance staff has been gaining experience doing a variety of culvert projects, and as a result have become more skilled, the size and scope of the projects has grown. Actual projects completed depends on how many can be constructed during the "fish window" - which lasts 3-4 months each year and limits the number of projects that can be built. **The 2009 target is given as a range since results are dependent on funding, emergencies, other priorities that arise during the year.*	08 Biz Plan KingStat
Stream miles opened for fish passageby culvert replacementMaintenanceCIP	4.0 mi1.0 mi	4.31 mi1.3 mi	The number of miles opened is calculated based on the distance to the next upstream natural or man-made fish blockage on a particular stream. RSD has opened a total of over 68 stream miles since 1999. **Depends on funding, emergencies, priorities*	08 Biz PlanKingStat
Average annual road maintenance costs per centerline mile	$12,800	$14,633	In 2007, storm response continued to be a major issue/need, which kept maintenance expenditures at a level similar to 2006. Data source is totals for Div. Maint., Spec. Op, and Maj. Maint. (low orgs 1676 and 1679), divided by road miles from RNIS. 2009 Target is based on predicted expenditures and assumes 2.7% inflation.	08 Biz Plan 4-County

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Average annual traffic maintenance costs per centerline mile	$2,700	$3,789	This number covers traffic signs and markings, flashers and signals and traffic major maintenance. Increased costs per mile in 2007 are due to increased engineering and signal maintenance costs. The 2008 target has been adjusted to reflect expected 2008 annexations. While annexations may reduce costs somewhat, traffic services are not directly related to road miles. For example, sign maintenance and signals in particular are not able to be measured accurately per mile. There may be 3 signals in one road mile in one annexation and no signals in another. We have to maintain a staffing level sufficient to work on the number of individual items (signals and signs) in unincorporated King County and to service contract cities and others. This means RSD still has much the same maintenance labor requirements spread over a lower number of miles so the cost per mile goes up. The 2009 target is a 2% increase over 2008.	08 Biz Plan
Inflation-adjusted change in value of reimbursable contract services from prior year (using 2006 dollars)	4.50%	-7%	Data is from billing reports for 2003-2007 - an aggregate from contract and customer cities. Target for 2009 is based on 2008 city budgets, expected new work, and anticipated increase in city participation in the overlay program. The dip in 2007 was the result of a drop off in one-time discretionary service requests. Specifically, four one-time (emergency and stream restoration) projects accounted for about $500,000 in 2006 and this was not repeated in 2007. Note - we will be consulting with OMB and KingStat staff regarding possible refinements to the methodology for this measure. Numbers could change if the assumptions for inflation change.	08 Biz Plan

Performance Measure	2007 Target	2007 Actual	Comments -	Previously Reported
Comprehensive employee survey - Productivity	See comments	5.2	Based on an employee survey conducted approximately every other year, starting in 2005. The scores are baseline averages for all of the Road Services Division. The scale ranges from one (low) to seven (high). Data is used by managers to identify areas to focus on for improvement. There are no numeric targets per se. Productivity looks at how effectively employees and teams are at getting tasks accomplished.	08 Biz Plan
Comprehensive employee survey - Communication and Conflict	See comments	5	Communication and conflict looks at how employees interact with others and ability to resolve conflict in order to accomplish the organizational goals.	08 Biz Plan
Comprehensive employee survey - Satisfaction and Morale	See comments	5	Satisfaction and morale looks at how individual employees feel about working in the Road Services Division.	08 Biz Plan
Average staff days to complete requests for pothole repairs	2	2	Data is from Citizen Action Request (CARS) system. Requests typically come through RSD's 24-hour customer service hotline. Two-day average for 2007 is based on 433 pothole requests.	08 Biz Plan AIMS High KingStat

Appendix C: King County Roads After Annexation



Appendix D: County Survey

The following appendix details information on Baltimore County, MD, Sacramento County, CA, and Miami-Dade County, FL.

A. Baltimore County, MD

1. Organizational Structure

In Baltimore County, roads responsibilities lie within the Department of Public Works which is comprised of seven Bureaus. The Bureau of Highways, Traffic Engineering and Transportation Planning, Engineering and Construction, and Financing and Petitions share the majority of road-related responsibilities from maintenance of road-way assets, to design and construction of infrastructure, to traffic control and engineering.

Baltimore County is described as a mature, urban county; infrastructure dates from the Post WWII baby boom era. Consequently, priorities within the county have shifted from the construction of new roadways to the maintenance of existing infrastructure which is often over 50 years old and nearing the end of its life expectancy. Because the work of the Bureau of Highways is shifting to infrastructure reconstruction projects, rising commodity costs are of particular importance to the County. Increased costs may limit the extent of rehabilitation and new construction projects the County will be able to undertake.

The main transportation priorities of the County, as defined in the County's *Master Plan 2010,* are to ensure the following: Preservation and maintenance of the existing transportation system; Linkage of transportation strategies to land use planning; Equal consideration to non-highway projects; Provision of air quality conformance analysis; Inclusion of economic development factors in the decision-making process; Fiscal responsibility of transportation strategies; and the establishment of a legitimate citizen participation process. An additional priority of Baltimore County is to establish a Maintenance Management System to assist with pavement life cycle management.

The County roadway infrastructure is evaluated annually to assess general condition. Pavement conditions are categorized in a rating system, which ranges on a scale from "terrible" to "good." Projects are prioritized based on which roadways are in the most need of maintenance. The Bureau of Highways submits a budge request to the Office of Budget and Finance which has the final say in funding.

2. Organizational Functions

Major Products & Services

The Baltimore County Bureau of Highways is responsible for general road maintenance duties including: Street repairs; resurfacing; snow removal; curb and gutter maintenance; bridge repair; tree removal; ensuring the free flow of water in streams; roadside mowing; guardrail installation; street sweeping; and the Adopt-a-Road program.

The Bureau of Traffic Engineering and Transportation Planning Division is responsible for countywide transportation planning and traffic duties including: Calming traffic; traffic flow engineering; traffic investigation; traffic monitoring; traffic laws and legislation; street sign fabrication and installation; road painting and marking; street lighting

The Baltimore County Bureau of Engineering and Construction Division is responsible for the design of roads; sewers; water lines; public buildings; bridges; alleys; and storm drains; prequalification and selection of consultants; engineers; and contractors; performing surveys of property; topography; and construction stakeouts; and performing bridge inspections. This division is also responsible for capital budget preparation, the archival of records of survey contracts and completed infrastructure projects, and review of flood plain activities.

Customers & Partners

Baltimore County does not provide contracted services to any outside customers or partners; there are no incorporated municipalities within Baltimore County.

3. Revenue Mechanisms

Funding for roads services within the Department of Public Works comes from a variety of sources including general funds, metropolitan construction funds, general obligation bonds, and metropolitan bonds. Outside funding sources include: Federal grant programs; state waterway improvement funds and other sources of state aid, and funds contributed by developers. Capital projects within the County are funded primarily through bond revenue.

4. Notable Practices

To stabilize annual funding which is typically variable, Baltimore County has established a fund balance policy and established a Revenue Stabilization

Reserve Account. The purpose of this fund is to stabilize revenues by setting aside a target 5% of the general fund budget from unexpended and unencumbered appropriations. This money is then made available in years where there is an unexpected budget shortfall.

B. Miami-Dade County, FL

1. Organizational Structure

In Miami-Dade County, roads responsibilities lie within the Department of Public Works, which is comprised of 17 divisions. Among these divisions, the following share roads responsibilities: Highway Engineering; Traffic Engineering; Traffic Signal and Signs; Road, Bridge and Canal Maintenance; and Construction. Traffic Signal and Signs and Traffic Engineering provide service countywide and to municipalities while the other divisions provide service only to the unincorporated parts of the county. Priorities within the County must be in line with the *Countywide Strategic Plan*.

Unique to Miami-Dade County is an extensive canal/drainage system, mosquito control program, and extensive hurricane-response coordination.

2. Organizational Functions

Major Products & Services

The Highway Engineering Division is responsible for the development and administration of the Transportation Improvement Program. The division also administers and coordinates consultant design contracts for major highway and bridge improvements.

The Traffic Engineering Division is responsible for response to traffic, pedestrian and vehicular engineering issues; investigation and recommended installation of traffic control devices and signs countywide; and traffic concurrency reviews, inclusive of traffic impacts for proposed construction. The division also administers the school zone flashers program and the *Safe Paths to Schools* program.

The Traffic Signal and Signs Division is responsible for the installation, maintenance, and repair of over 300,000 traffic-related signs, traffic and pedestrian signals, school flashers and signs countywide. This division also maintains pavement markings and channelization of all county and municipal rights-of-way, oversees the maintenance and repair of all arterial street lights systems within the county, and operates the traffic control center.

The Road, Bridge, and Canal Maintenance Division provides overall bridge and road maintenance, including special mowing to all county roads and designated arterial streets, sidewalk and rights-of-way repairs, drain cleaning and guardrail repairs; and provides chemical and mechanical cleaning and overall maintenance of the county secondary canal system.

The Construction Division administers improvement bonds and issues permits, inspects construction of facilities in public right-of-way and private property, prepares contracts and specifications for construction of major infrastructure improvement projects, provides engineering technical support, and serves as emergency first responder during storms and hurricanes to facilitate routes and protect public safety.

Customers & Partners

Some divisions within the Miami-Dade Department of Public Works provide services countywide, such as Traffic and Traffic Engineering, while the remainder of the divisions provides support only to the unincorporated areas of the county. These divisions do not contract with municipalities. Other programs, such as the People's Transportation Plan, a capital construction program, share funding with municipalities through a joint participation agreement.

3. Revenue Mechanisms

The Department of Public Works uses the following sources of funding for capital improvement projects and neighborhood improvement projects within the unincorporated areas of Miami-Dade County: the QNIP (Quality Neighborhood Improvement Program) to improve neighborhood infrastructure; PTP (People's Transportation Plan) a ½ cent sales tax countywide which funds specific transportation improvements and services; bonds (to address specific infrastructure needs); Storm Water Utility Funding for drainage maintenance and other state and federal funds; Ad Valorem taxes are used mainly in support of administration.

In addition, the county collects Road Impact fees and New Building Construction Impact Fees to offset the impacts of new development and construction on county infrastructure and traffic. These fees are used for road and bridge capital projects, traffic control devices, traffic operations projects, and resurfacing within the impact fee district from which the fee was collected.

C. Sacramento County, CA

1. Organizational Structure

In Sacramento County, California, the county roads responsibilities lie within the Sacramento Department of Transportation (SACDOT). The SACDOT is comprised of the following divisions: Maintenance and Operations, Planning, Design, Financial Administration, and the Communications and Media Office.

2. Organizational Functions

Major Products & Services

The main responsibility of the Maintenance and Operations Division is to provide a well-maintained system of roadways and bridges for the unincorporated area. This includes roadway and bridge maintenance, traffic engineering and neighborhood traffic management, traffic signals (maintenance & operations), signs and markings, tree and landscape maintenance, street light maintenance, and pavement, curb, gutter, and sidewalk repair.

The Planning Division is responsible for long-range County transportation planning. This includes policy development and coordination, working with partners on regional projects, providing funding for capital improvement and roadway maintenance, and developing alternative modes of travel such as ADA, pedestrians and bicycles.

The Design Division oversees the design, planning, and development of transportation projects. These projects include the Capital Improvement Plan project implementation and compliance with ordinances for tree preservation, water conservation, and zoning codes, roadway capacity, traffic signals, bridges, sidewalks, bike lanes, and landscaping.

The Financial Administration Division is responsible for providing the full spectrum of transportation administration and finance. Activities include: financial management, administrative services, customer service, information technology, and quality assurance programs.

The Communications and Media Office provides public outreach and media support for all SACDOT staff, programs, and projects. This may include the distribution of press releases, newsletters, web pages, or any other community outreach activities.

The county is experiencing a growing backlog of work for all maintenance operations. In 2006, this backlog was estimated at nearly $250M. Because of rising commodity costs, particularly asphalt, this backlog is now estimated in 2009 to be over $300M. Regular maintenance operations are prioritized based on two year funding cycles and output from an MMS which details need and recommends treatment.

In addition to the large backlog of maintenance projects, the county has an increasing backlog of capital projects. These projects are prioritized in a two part process: 1) A technical review identifies those projects that would have the greatest impact on congestion reduction and 2) A resource analysis identifies which projects are feasible within the available revenue streams.

Of particular importance to the county are impacts from SB375. This bill requires additional transportation planning and land use analysis to address the impacts of climate change and reduce greenhouse gases. The MPO will link funding with reductions in greenhouse gases. If greenhouse gas targets are not met, SACDOT could lose funding for certain projects receiving state funds.

Customers & Partners

SACDOT provides transitional services, as requested, to areas of the county that have been recently annexed or incorporated. Currently, the county contracts with the city of Rancho Cordova. Additional annexations and incorporations are on the horizon which could have significant impacts on the workload of the county. It is unclear if or to what extent the cities will request service from SACDOT.

3. Revenue Mechanisms

Sacramento County uses the following funding sources for capital projects and general roads maintenance responsibilities: Sales Tax (Measure A) provides a ½ cent sales tax for local transportation and air quality as well as roadway maintenance and transit; the Transit Development Fee offsets the impacts of new construction and development; Financing Districts are established exclusively within the Sacramento County unincorporated areas to address infrastructure needs associated with new development. These financing districts extract fees from developers who must pay for the impacts of new developments. In other words, developers contribute money to a fund that offsets the impacts of new road construction necessary to accommodate new development. The funds also contribute to actions necessary to address traffic and safety impacts associated with new roads and increased density.

Each district has its own CIP and revenue strategy which specifically target new development; Landscape Maintenance Districts provide revenue for

landscape management within the unincorporated areas of the county; State Revenue funds capital projects included in the STIP. These projects are funded from revenues from the state highway account and are earmarked for projects on and off the state highway system including local roads, public transit, pedestrian and bicycle facilities, transportation system/demand management, sound walls, and safety;

Pavement and Maintenance rehabilitation is funded through Proposition 42, a state-wide initiative which mandates that a certain amount of General Funds be spent on transportation improvement. Proposition 42 provides roughly $8.6 million annually for improvements and maintenance to roadway features within the unincorporated areas of Sacramento County.

4. Notable Practices

The county has a large backlog of capital projects. To bridge funding gaps, the county has instituted several fee programs and community financing districts. In the future, these financing districts will also include funding for general maintenance operations, not just for capital projects. The financing districts extract a fee from permits and new development which is earmarked specifically to reduce congestion and increase capacity in areas that are impacted by new development.

Mike Penrose, the SACDOT director, cautions that linking funding to economic development is risky, particularly in times of economic downturn. In Sacramento, revenue is derived from the development process. The county is experiencing a sixty year low in new development which is significantly depressing the county's revenue stream and delaying projects. In addition, the county has a ½ cent sales tax dedicated to road improvements which is down 20% in the past year due to the economic downturn.

Figure 1: Contacts: Survey of Other Counties

County	Last Name	First Name	Position	Contact Information
Baltimore County	Burgess	Robert "Tim"	Director of Public Works	(410) 887-3560
Baltimore County	Davis	Glen "Scott"	Management Analyst	gdavis@baltimorecountymd.gov
Baltimore County	Russell	Anthony	Engineering Program Manager, Bureau of Highways	(410) 887-3932; arussell@baltimorecountymd.gov

County	Last Name	First Name	Position	Contact Information
Miami-Dade County	Hartfield	Sarah	Strategic Management of Public Works Division	(305) 375-2429; jph1@miamidade.gov
Miami-Dade County	Calas	Esther	Director of Public Works	ECalas@miamidade.gov
Sacramento County	Penrose	Mike	Interim Director-Department of Transportation	(916)874-6291 penrosem@saccounty.net
Sacramento	Mullins	Kathy		(916) 875-5819

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King County

King County Road Services Division

Funding Analysis

Roads Operational Master Plan: Working Paper 2

December 24, 2008

Division

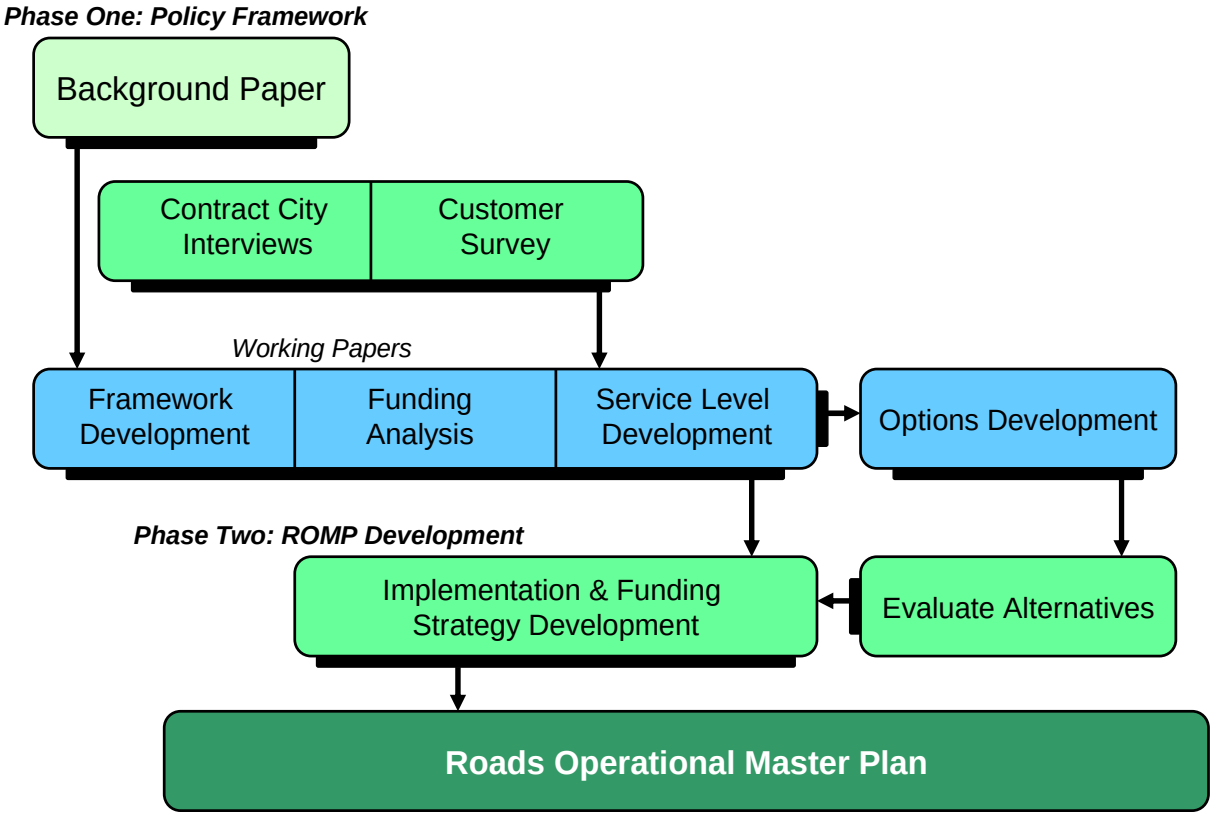
Table of Contents

■

Introduction and Approach

The King County Road Services Division Operational Master Plan (ROMP) is a comprehensive plan that presents how the Road Services Division will operate and provide services in the future. The ROMP process has two phases; Phase One will produce a series of working papers that will serve as the building blocks for the final plan, as shown in Exhibit 0–A below. The working papers will be produced by both King County staff and consultants, with structured customer input, and reviewed by the ROMP Working Group and Advisory Committee.

Exhibit 0–A: ROMP Development Process



Upon completion of Phase One, King County Road Services Division and Office of Management and Budget staff members will develop the ROMP. Ultimately, the ROMP is a product of the King County Executive and the Office of Management and Budget, and a strategic guidance document for the Road Services Division.

This document, Working Paper Two, contains an analysis of current and future sources of funds with which the Road Services Division (RSD) can fulfill its mission.

A. Approach

The basic approach of this working paper is to examine the taxes, fees, and levies that are paid by taxpayers and roadway system users that provide the revenues that fund RSD services. Mapping RSD's services to the revenues that fund them requires the consolidation and restatement of financial information across:

- *Jurisdictions*, as RSD's activities and revenues are divided among:
  - Core programs that sustain the road network in unincorporated areas of the county; and
  - Reimbursable programs, those services that RSD provides to other King County agencies and other jurisdictions.
- *Capital and operating costs*, each of which are accounted for differently in King County and in the case of RSD, are distributed across several operating funds and capital funds in the county's consolidated financial statements
- *Budgets.* The accounting entities through which King County allocates funds to RSD, including the Road Fund, the Renton Maintenance Capital Fund and the several funds dedicated to the Roads Capital Improvement and the capital improvement programs of the Water and Land Resources Division and the Parks Division.

This is an important approach to take as it ties the willingness of taxpayers and users to pay as directly as possible to the value of the RSD services for which they are paying. However, it presents information in forms that differ from those used in some King County budget and financial documents. In several exhibits, we include reconciliations of the financial information back to the more familiar bases of the county's budgets for the Road Fund and the Capital Improvement Program.

B. Organization

This working paper is organized into six sections, including this introduction and summary of the approach.

Section II: Summary distills the principal findings and conclusions from the following sections.

Section III: Current Sources and Uses of Funds summarizes the RSD cash inflows and outflows, and describes RSD's principal revenues. This section was developed with data drawn from King County budget documents and financial statements. All of the data for 2008 and future years are drawn from the King County 2009 budget as adopted by King County Council in November 2008.

Section IV: Analytical Framework for Revenue Option Evaluation describes the analytical framework used in the report. The pros and cons of different sources of funds that RSD could earn are outlined in a general way, and the criteria used to assess each potential new revenue are described.

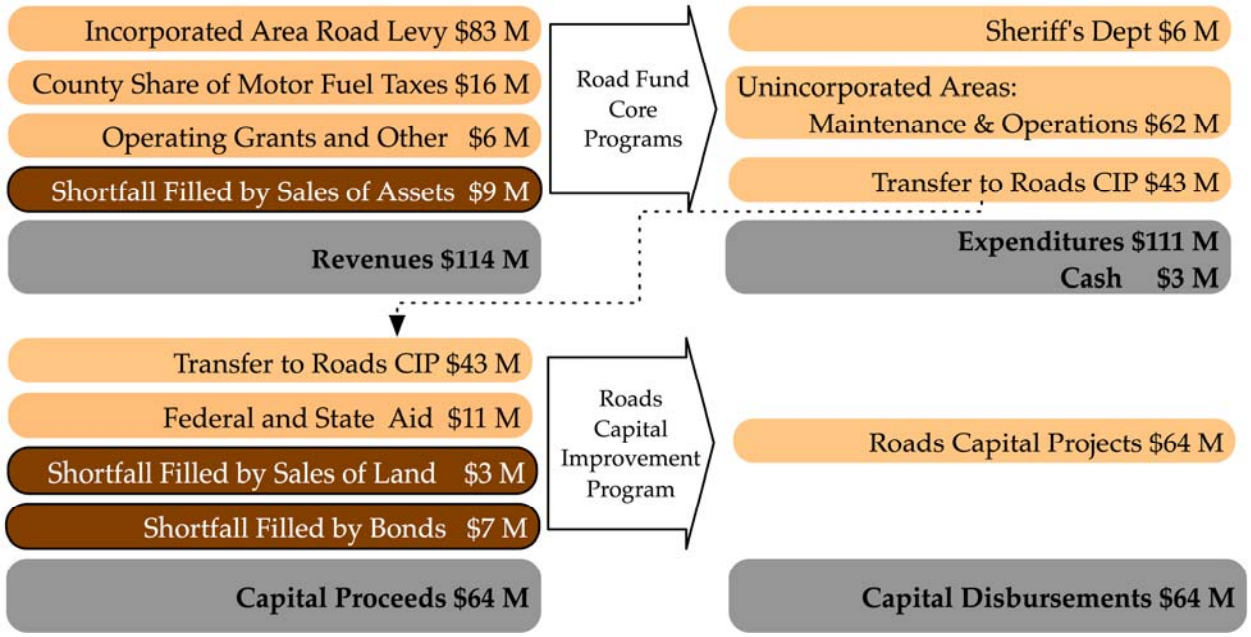
Section V: Prospects for Current Revenues describes the prospects over the next decade for the two primary sources of RSD's current revenues, motor fuel taxes, and property taxes are discussed.

Section VI: Potential New Revenues assesses each potential new source of revenue within the analytical framework, and the revenues that may be available from each source is estimated. These are policy-level estimates, using current forecasts and simplifying assumptions that are consistent with King County's forecasts and assumptions.

II. Summary

The financial summary using 2009 adopted budget data below shows only programs that support the road system in unincorporated areas; it excludes cost reimbursable service RSD performs for other jurisdictions and for other King County departments.

Exhibit II-1: Road Services Division 2009 Financial Summary



Note: Adding together the revenues and capital proceeds to a sum of $181 million, then subtracting the Road Fund transfer of $44 million to the CIP and the $6 million transfer to the sheriff's department leaves $131 million of proceeds available for core RSD programs. The Road Fund revenue budget for 2009 is $128 million. The net proceeds of $131 million exclude about $20 million of Road Fund revenues: the $6 million transferred to the sheriff's department and about $14 million of reimbursements to the Road Fund for road maintenance services provided to municipalities, utility inspection

fees and storm water disposal. Road Fund revenues of $128 million exclude $21 million of capital proceeds from outside the Road Fund: $11 million in federal and state aid, $3 million from land sales and $7 million from bonds.

Current Revenues

RSD's sustainable revenues are not sufficient for current operations and service levels. They fall short of expenses by about $21 million in 2009, almost 15% of total expenditures and disbursements. RSD is making up the shortfall with about $14 million from sales of assets and about $7 million from bond issues, a stop-gap strategy that cannot be sustained in the long run.

RSD's principal sources of revenue are:

- The unincorporated area property tax levy, sometimes called the road levy, that yields $83 million in 2009. The road levy grew by over 6% annually from 2002 to 2007 as costs resulted in the use of the remaining levy capacity allowed under Initiative 747. Now at its maximum allowed level, this levy is forecast to grow by about 2% annually as new housing development is limited by legislation and an economic recession.
- The county's share of the state motor fuel tax that yields $16 million in 2009. Motor fuel tax revenue is not forecast to grow significantly as volatile fuel prices and more fuel-efficient vehicles limit vehicle-miles travelled and in the long run could decline in terms of its purchasing power because it is a fixed rate tax.

RSD must secure additional sources of revenue or manage significant declines in its levels of service. The current strategy for filling the revenue shortfall, selling off assets no longer required in the service of the road system in the shrinking unincorporated areas of the county, is not sustainable in the long run.

Potential New Revenues

To evaluate the potential of individual sources of new revenues, we apply the three basic principles that have guided comparative tax analysis for the past thirty years: efficiency (i.e. yield), equity and simplicity.

In the main body of the working paper, these options are grouped according the strategy that King County would have to pursue to implement them. Some can be implemented unilaterally by the county without voter approval; some require voter approval within the county; and the rest require the cooperation and approval of another level of government. Not all options presented in the table are addressed in the narrative. These options were either determined to be not worth pursuing in Phase II of the ROMP, or they were added by the ROMP working group after the paper's completion and not part of the consultant analysis.

Exhibit II-2: Revenue Options

	Revenue Estimate	*Applicability in Unincorporated King County Areas*
Vehicle license and registration fees.	Each $10 per year of vehicle registration fees, applied in the unincorporated areas of the county, would raise about $3 million per year.	A vehicle license fee could also be tied to policy objectives by linking to, for example, engine size or ZIP code. The county can levy a local option vehicle fee through the creation of a Transportation Benefit District. King County can impose up to $20 per vehicle without voter approval; thereafter voter approval is required to the maximum of $100 per vehicle allowed under state law.
Increase road levy component of property tax.	An increase of 3.5% annually over 6 years would raise an additional $32 million by the 6th year, resulting in a tax rate that is about 17¢ per $1000 of assessed value higher than the current rate.	A levy lid lift requires a popular vote for approval but does not require changes to state legislation.
Local option motor fuel tax.	Each 1¢ per gallon of local option motor fuel tax would yield about $10 million per year across the county. About ¼ of these revenues would accrue to the City of Seattle, about ½ would accrue to the other municipalities in the county and about ¼ of would accrue to King County itself for roads in the unincorporated areas.	Counties can propose in an election a local option fuel tax up to 10%, by election, equal to 3.75¢ per gallon at the current state fuel tax rate of 37.5¢.
Surcharge on land used for non-residential parking.	Could yield up to $25 million per year if implemented county-wide.	They are indirectly linked to road use. It is difficult to administer.
Tax on commercial parking operations.	Likely to be small since there is little commercial parking in unincorporated areas of the county.	The county can tax commercial parking operations in unincorporated areas of the county without voter approval. Commercial parking taxes are already taxed in several cities within King County.
Vehicle-Miles Traveled fee.	A VMT charge of about 3¢ per mile for all road use in the county would approximate the current state motor fuel tax yield of 34¢ per gallon.	While superior to motor fuel taxes if implemented statewide, it is impractical to implement as a local option.

	Revenue Estimate	*Applicability in Unincorporated King County Areas*
Local arterial tolling.		With electronic collection costs around 75¢ per vehicle and urban tolls in other states at less than $2 per vehicle, it would be more efficient for King County allow Washington State Department of Transportation (WSDOT) to lead the way on tolling in the Seattle area.
Congestion fees (area tolls).	Where applied in Europe, about ½ of a $15 per day congestion fee is lost to enforcement and collection costs.	To date, there have been no attempts to collect such a fee outside a dense urban core.
Container fees at the Port of Seattle.	If applied in Seattle, the $30/TEU fee charged in Long Beach CA would yield about $50 million per year, assuming the fee caused a loss of traffic to Vancouver and Portland.	These funds are normally dedicated to improvements directly related to port traffic so little funding would accrue to county roads in unincorporated areas.
Increase in General Fund property tax levy.	Each $0.01 in the tax rate would yield an additional $3.8 million per year. The county is allowed to tax up to $1.80 per $1000 of assessed value for the General Fund levy. The current rate is $1.08864 per $1,000 of assessed value, although the factor that limits the General Fund levy is the 1% cap on year over year growth in the levy on existing housing stock.	Diverting any General Fund revenue potential into the Road Fund would divert that potential away from the pressing problem of the General Fund operating deficit.
Increase in Real Estate Excise Tax	Net of current debt service requirements, REET 1 yields up to about $3.5 million annually and REET 2 yields up to about $5.5 million annually	King County is currently collecting REET at maximum allowable rates and dedicating the proceeds to the Parks CIP. Increase is not an option, however REET 1 could be moved to provide support to Roads through a budget process; REET 2 would require a county ordinance.
SEPA mitigation fees	Net revenues available for roads from environmental impact fees collected under the *State Environmental Policy Act* are likely to be small.	King County already collects the traffic impact fees allowed under the *Growth Management Act.*
Increase in county sales taxes.		King County's sales tax rate was raised to 9.5% on retail purchases in November 2008; further increases may be unpopular. The current levy is dedicated to Metro Transit, so an increase in sales taxes for the Road Fund would divert that potential revenue away from the transit system.

	Revenue Estimate	*Applicability in Unincorporated King County Areas*
Options below added by ROMP Working Group: Analyzed in attachment		
Countywide Sales Tax on Auto Parts & Service		Small yield to unincorporated King County Washington state currently does not tax services
Revenue distribution of State Highway tolls to support roads network system		Some of the system is in place
Revenue distribution of truck licensing fee		Are trucks licensed countywide?
Portion of utility tax for electric vehicles or Bio fuels		
Loading Dock Door Fee		

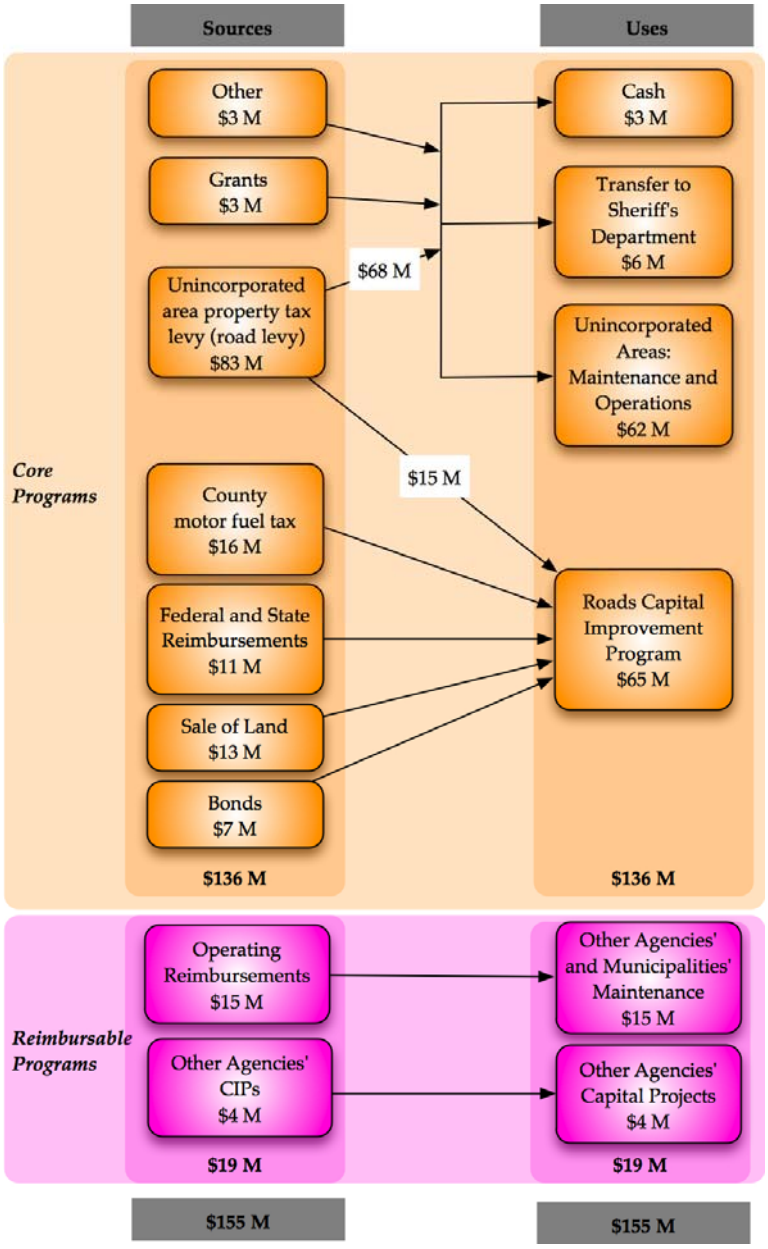
III. Current Sources and Uses of Funds

RSD is unusual among government transportation departments in that a more than 10% of its revenues are reimbursements for services provided to other agencies: municipalities within King County and other King County departments. This is recognized in this working paper by dividing RSD's activities into:

- *Core programs* that plan, construct, manage and maintain the King County road system in unincorporated areas of the County
- *Reimbursable programs* that deliver services to municipalities, other governments and other King County agencies under cost recovery agreements

This distinction is shown in Exhibit III-1 below.

Exhibit III–1: Road Services Division, Source and Use of Funds, 2009



Note: King County has considerable flexibility in the allocation of RSD revenues between operating and capital expenditures. The amount transferred each year from the Road Fund to the Roads Capital Improvement Program is discretionary and is set in the King County budget process. For the illustrative purposes of the exhibit above, we assume that the $16 million received into the Road Fund from the county portion of the Washington State Motor Fuel Tax is part of the transfer from the Road Fund to the Roads Capital Improvement Program. We also assume that the remainder of that transfer is made up from the transfer the road levy.

Note: The worked performed by RSD on projects funded from the WLRD CIP and the Parks CIP is not determined in advance of the fiscal year, i.e. in the King County budget process. During the fiscal year, as projects funded from the WLRD CIP and Parks CIP are brought to construction, those two divisions contract either with RSD or with outside contractors as the circumstances of each project indicate to be most advantageous. There is no advance estimate for how much work RSD

will receive from WLRD and Parks in 2009, so we assume that it will be equal amount of work actually done in 2007, about $4 million.

RSD's core program activities sustain the road assets for which the county is responsible through their life cycle. In this working paper, we associate *core revenues* with those activities: revenues that are levied from the county's tax base or transferred from the State of Washington's tax base toward the purpose of sustaining county roads. We also add to core revenues any fees paid by users, developers, land owners or other members of the public for services that relate directly to the county roads; for example, fees for right-of-way inspections, surveys, legal documents or development permits. The core programs draw these revenues through the Road Fund and the 3 Nonmajor Capital Projects Funds, from which expenditures of the Road Services Capital Improvement Program are paid.

RSD provides several services for which it is reimbursed:

- Municipalities pay RSD to provide traffic engineering, inspections, minor construction and to generally maintain municipal roads;
- The King County Water and Land Resources Division (WLRD) pays RSD to build and maintain surface water management, riverine and flood control assets;
- The King County Parks Division pays RSD to build and maintain park assets; and
- RSD offers a storm water disposal and vactor recycling service to private vendors and other agencies.

Reimbursements are paid by other King County divisions and municipalities for services rendered by RSD on assets other than the county's roads. RSD receives these reimbursements through the Road Fund, from which RSD operating expenditures are drawn; and any of the 10 Nonmajor Capital Projects Funds that sustain the Conservation Futures and Open Space Capital Improvement Program, the Water and Land Resources Division Capital Improvement Program or the Flood Control Capital Contract Program[1]

A more detailed estimate of the department's sources and uses of funds can be found in Appendix A.

[1] King County does not include RSD expenditures drawn from capital improvement projects managed by other King County agencies in RSD's budgets. RSD performs work on other agencies' capital improvement projects under contract and budgets for the work performed are treated as transfers from RSD operating budget to the capital budgets of the other agencies. In our presentation, however, they are shown as reimbursable RSD expenditures.

A. Summary of Revenues and Expenditures

Exhibit III–2: Road Services Division Revenues, 2009

	$ millions	
Ongoing Core Revenues: Road Fund		
Unincorporated area property tax levy	83.20	
Motor fuel tax	15.87	
Grants: Road Fund	2.69	
Other revenues[2]	2.46	
		104.22
Less transfer to Sheriff's Department		(5.70)
		98.52
Other Core Revenues: Roads CIP		
Federal aid reimbursements	8.09	
State aid reimbursements	1.80	
Mitigation fees	2.35	
Misc	0.23	
		12.46
Ongoing Reimbursements: Road Fund		
Reimbursable services: other agencies	5.86	
Road maintenance: cities	3.40	
Traffic operations: cities	3.33	
R/W utility inspection fees	1.48	
Regional storm water disposal fees	0.76	
		14.83
Contract Payments from the WLRD and Parks CIPs		4.24
		130.05
Unsustainable Revenues		
Proceeds to Road Fund from sale of land	9.36	
Proceeds to CIP from sale of land	3.17	
		12.53
Total RSD Revenues		142.58
Reconciliation to Road Fund Revenue Budget		
CIP core revenues		(12.46)
Contract payments from WLRD and Parks		(4.24)
Proceeds to CIP from sale of land		(3.17)
Add back transfer to Sheriff's Department		5.70

[2] Includes an appropriation of $259,000 from the Road Improvement District Guaranty fund to the Road fund. It is not clear that $259,000 is actually available in the RID Guaranty fund to appropriate so that amount has not been added to the Road Fund expenditure budget.

$128.41

In the 2009 budget, anticipated Road Fund revenue is $128.41 million and the Roads Capital Improvement Program Revenue is $15.63 million, excluding the transfer of $42.6 million from the Road Fund. Not all of these revenues are available on unconditional and ongoing bases to fund RSD's activities: $12.53 million is earned from the sale of assets; including RSD facilities at Covington, Lake Retreat, and the Woodinville Pit.[3] While generally accepted accounting principles require that proceeds from the sale of assets be accounted for as revenue, such proceeds are only available on a one-time basis as assets are sold.

RSD appears to have adopted a short-term strategy of selling assets to fill the gap until the county can adopt more stable sources of revenue. RSD programmed about $18 million in land sales in 2008 and 2009 to balance the Road Fund.[4] Revenues from the sales of assets are suitable for funding one-time expenditures to build distinct, individual assets. For example, the sale of surplus land might fund the construction of a county jail. Roads, however, are a system of integrated assets on which capital must be continuously expended: if sales of assets are required to fund bridges, for example, then bridges can no longer be built once the surplus assets are sold. Without bridges, none of the other components of the road are useful. Since RSD does not have an inexhaustible supply of assets to sell, we assume that core revenues from the sale of assets will not be available on an ongoing basis to fund RSD operations.

The 2009 RSD budget includes $19.07 million of fees paid by the beneficiaries of RSD's reimbursable programs. We assume that reimbursable programs are revenue-neutral, that is the revenues earned by reimbursable programs pay for those programs, requiring no contribution from core revenues to support reimbursable programs and making no contribution towards the cost of core programs.

Assumed as they are to be revenue-neutral, RSD's reimbursable services do not factor significantly into RSD's funding options or strategies. Before leaving the subject of reimbursable services, however, we note two effects of these services that are so beneficial to RSD's overall operations as to be as useful as revenue:

1. Distribution of overhead. In generally accepted accounting principles there is a distinction between operating units that earn revenues or taxes and supporting units that provide services required by the operating units. Supporting units cannot earn their own revenues and operating units need the services of supporting units to earn revenues so the costs of supporting units are allocated to the revenues earned by operating units. The cost of

[3] Revenues from the sale of the Summit Pit are not included in 2009 anticipated revenues for RSD.

[4] Including the Covington, Calhoun and Woodinville pits, Lake Retreat, parcel B at the Renton complex and 6 smaller parcels but excluding the Summit pit.

reimbursable services includes the direct costs of the crews, equipment and materiel used in providing those services plus a share of:

a. Direct overhead costs that are specific to RSD, e.g. the division's management, engineering services, survey and planning services and division facilities.

b. Indirect overhead costs of corporate services that support more than one division, e.g. King County's corporate finance, human resources, and its central agencies.

The usual practice in allocating overhead costs is to charge them at the same burden rate across all operating units, implying that reimbursable services require no more or less support services than the RSD's core services in unincorporated areas. Whether reimbursable services require support efforts that are less than, equal to or more than RSD's core services is beyond the scope of this paper.

2. Emergency response. RSD must maintain a core of staff and equipment to provide adequate response to snow, ice, wind and flood events that occur in unincorporated areas of the county. A 2008 workload analysis[5], RSD identified a need for a minimum staff of 200 qualified operators to provide adequate response; providing reimbursable services in off-peak times allows RSD to maintain that critical mass.

About $99 million of the 2009 Road Fund revenue come from two revenue sources that are dedicated on an ongoing basis to operation, maintenance, design, and construction of the King County road system in unincorporated areas: about $83 million from the unincorporated property tax levy, sometimes called the road levy, and about $16 million from the county's share of the state motor fuel tax.

[5] Dye Management Group Inc. King County Road Maintenance Facilities and Organizational Study. February 2008.

Exhibit III–3: Road Services Division 2009 Expenditures

	$ millions	
Core Programs: Operating Expenditures		
Roads in unincorporated areas	58.84	
Surface water utility payment	3.53	
		62.37
Core Programs: Capital Expenditures		
Roads in unincorporated areas	58.85	
Facilities and IT projects[6]	3.51	
		62.36
		124.73
Reimbursable Programs: Capital		
Maintenance and Operations	14.83	
WLRD Capital Improvement Program	3.75	
Parks Dept Bridges	0.49	
		19.07
		143.08
Reconciliation to Road Fund Expenditure Budget		
Less Roads Capital Improvement Program	(64.53)	
Add transfer from Road Fund to Road CIP	42.60	
Drawn through Roads CIP from other sources		(21.93)
Less WLRD and Parks CIP		(4.24)
Transfer to Sheriff's Department		5.70
Discrepancy between budget and Essbase		0.61
		123.22

Taking Exhibit III–2 and Exhibit III–3 together, the revenues and expenditures for both the core operating programs and the reimbursable operating programs are seen to be in balance:

- The core operating and capital programs, shown in orange, have ongoing revenues of about $118 million, about $10 million less than the $128 million spent on these programs. The shortfall is balanced with one-time revenues of about $10 million from the sale of assets.
- The reimbursable operating and capital programs, shown in pink, are balanced at about $19 million

[6] RCAMM project, $1.037 million of the $5.68 million budgeted not adopted by Council.

B. Context of King County's Financial Position

The principal sources of RSD core revenues, aside from one-time sales of assets, are King County property taxes, specifically the unincorporated area levy, and a transfer of motor fuel tax revenues from the State of Washington. The recent history and near-term prospects for RSD's revenue sources are best viewed in the context of the deteriorating fiscal health of King County in general and the Road Fund in particular.

King County's fiscal position has taken a dramatic turn for the worse over the past 12 months as the U.S. economic growth stalled and the national economy moved into recession. The increase in the General Fund deficit from $25 million to $93 million in 2009 required King County to take budget reduction measures totaling $72.4 million that reduce county services across the board.[7] Metro Transit, King County's public transit service provider, has been forced to increase fares by 50¢ to offset declining sales tax revenues and increased fuel costs.

The current cyclical factors are well-known and need no further explanation here. The structural factors, on the other hand, stem from the jurisdiction and governance of counties in general and may not be universally understood. Over time, these structural issues have had a more deleterious effect on RSD core revenues than the economic cycle. RSD staff estimate that the Road Fund has lost about $10 million in annual revenues due to citizen initiatives that eliminated the Vehicle License Fee and capped property tax increases; and about $3 million per year in property taxes lost to annexation.[8]

King County, like other counties in the State of Washington and in most other states, are very restricted in what economic activities they can tax or levy to raise needed revenues. Several of these restrictions arise in the state's governance of counties: the major taxes are tax retail sales and real property, for example. Other restrictions arise from citizen initiatives that curb the King County Council's discretion as to what rates they can apply to those tax bases. The case of property taxes, as it relates directly to the Road Fund, is outlined below.

King County itself is changing significantly as it becomes more urban. As areas in the county evolve from rural to urban land uses and densities, State of Washington's *Growth Management Act* directs that they either incorporate as a municipality or be annexed to an adjacent incorporated municipality. The process of incorporation and annexation of urbanizing areas has two deleterious effects on the county:

[7] http://your.kingcounty.gov/exec/news/2008/1013budget.aspx

[8] RSD Staff Notes, Executive Budget Briefing, 13 June 2008. Property taxes lost to annexation are only lost in one year, then can be recovered in subsequent years. Since the annexation reduces the total amount collected by the county in property taxes in that year, the county can adjust mill rates in subsequent years on properties remaining in the county to replace the lost revenue. Throughout, the total amounts collected cannot exceed the limited imposed by the "lesser of 1% or inflation" growth limit.

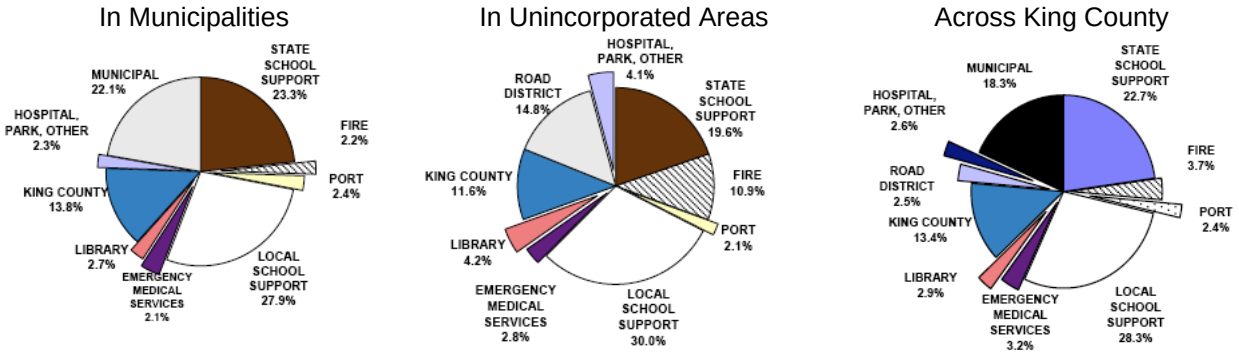
1. As urban areas are incorporated, the costs of providing services to the shrinking rural and suburban areas increases as fixed costs[9] are distributed over the smaller tax base.

2. The annexation of the county's major potential annexation areas are generally accomplished through an election process. Citizens living in these urbanized but unincorporated areas may defeat a proposal to incorporate or annex through the political means when it is placed before them in an election[10]. Incorporations or annexations are thus delayed and, while they are, the King County must provide levels of service appropriate to urban municipalities without being able to tax businesses and utilities as incorporated municipalities are permitted to do. King County staff estimate the resulting urban subsidy to be about $20 million per year.[11]

C. Property Tax

The property tax is a principal source of revenues for RSD; this section summarizes and describes trends in property tax revenues. In 2007, about $3.2 billion were collected from levies on property taxes across King County, of which the $77 million collected from the road district levy represented about 2.5% on average. The road levy is collected only on properties in unincorporated areas of the county, where it makes up almost 15% of total levies. Exhibit III-5 below shows the various distributions of property taxes across King County.

Exhibit III–5: Property Taxes Levied in King County, 2007/08[12]



[9] Most of the fixed costs incurred by RSD are support services costs, as defined in the previous section. For example, planning, budgeting, reporting, financial management, accounting and other administrative requirements do not change as the road system becomes smaller. Also, there are significant economies of scale in traffic engineering systems and in specialized equipment such as line painting and bridge inspection vehicles.

[10] In 2005 the Washington Supreme Court reinstated annexation by petition based on land value as well as implementing an annexation by petition based on acreage.

[11] King Country Proposed 2009 Budget, Summary Report.

[12] King County Department of Assessments, 2008 Annual Report.

The assessment and levy of property taxes is largely set in state law. Unlike other jurisdictions that allow for different classes of real property, for example, agricultural, residential, commercial, and industrial, Washington State law requires all real property to be one class.[13] As a result, King County cannot set different property tax rates for different classes of property.[14] State law also specifies a maximum mill rate[15], set at 5.9 (i.e. $5.90 per $1000 of assessed value)[16], with a limit of 2.25 ($2.25 per $1000 of assessed value) for road district levies. In unincorporated areas of King County, the predominant mill rate averaged 10.92 in 2008, down from 11.98 in 2007.[17] The 2009 mill rate for the road levy in unincorporated areas of King County is 1.75.

The levy on each property, i.e. the amount of tax payable on that property, is the product of the tax rate and the assessed value of the property:

Levy per property = **(**assessed value of each property **X** the tax rate**)**

In addition to the limitation of maximum tax rates, the revenue-raising capacity of a levy at any level is restricted as well. Until 2002, taxing districts were free to set levies up to the state-specified maximum rate. Initiative 747 took effect in that year,[18] limiting taxing districts to a growth rate in the total value of levies net any new construction added to the taxing district of 1% or the rate of inflation, which ever is less per year of the prior year's maximum lawful levy. Those districts whose levies were below the lawful maximum had excess levy capacity and could raise them at a higher rate until the maximum annual lawful levy was reached.

King County's road levy did not reach its maximum lawful level until 2006. As shown in Exhibit III-6 below: property tax revenues grew from about $46 million in 2000 to about $77 million in 2007, with annual growth rates consistently higher than 8% per year. Since 2006, the normal calculation of the levy has been superseded by the "lesser of 1% or inflation" growth limit: the assessed value and the tax rate cannot result in an increase of 1% or more over the prior year. Individual properties

[13] 14th Amendment, Washington State Constitution, 1929.

[14] By comparison, the Municipality of Surrey, British Columbia, is very similar to King County in its land use and economy. Its mill rates in 2008 are: residential, 4.4; utilities, 46.75; major industry, 23.58; light industry, 16.26; business, 15.68; non-profit recreational, 6.18; and farm, 9.38. It is typical of many jurisdictions that charge higher tax rates on industrial and commercial activities because they place a higher load on local government services.

[15] Property tax rates are usually expressed as dollars of tax payable per $1,000 of assessed value. This is referred to as the "mill rate"; because its units are dollars per thousand dollars, the Latin prefix *mill* is used for the same reason that 1/1000 of a meter is a millimeter.

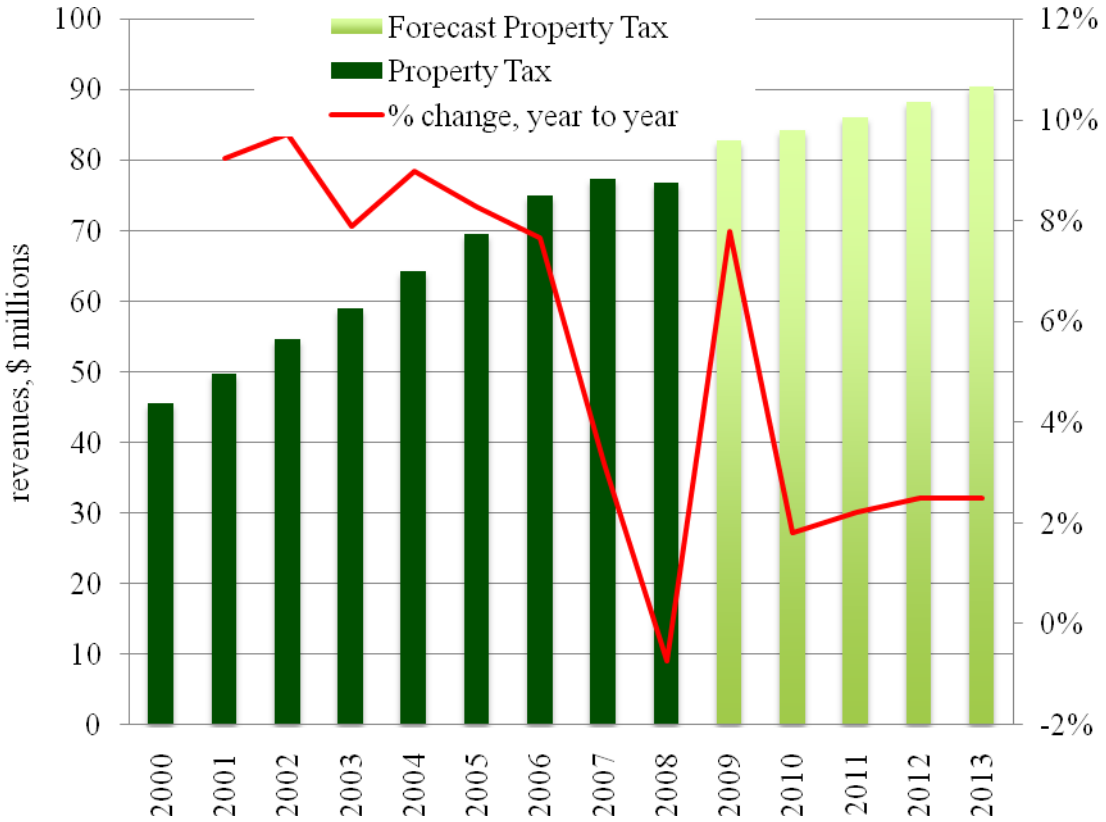
[16] State constitution, caps regular property taxes at a mill rate of 10, i.e. 1%, which is divided up between taxing districts and the state. Taxes within this 1% limit are regular levies; special levies above the 1 $ limit to fund, for example, local school operations or to service bonds require voter approval.

[17] King County Department of Assessments. Assessed Value and Taxes by City, 2008 Annual Report.

[18] Initiative 747 was invalidated by Washington State Supreme Court in 2007, but the state Legislature immediately reinstated the 1% tax cap.

can vary; the growth limit is a restriction on total property taxes that may be levied. As a result, King County's receipts from the road levy are limited to an annual growth rate that is the lesser of 1% or inflation, net of new construction[19], over future years.

Exhibit III–6: Property Taxes Received by the Road Fund



In the RSD 2009-2014 Revenue Plan, King County staff estimate property tax revenues will grow at about 2% per year with an assumption of continuing but slowing growth in housing starts.

Annexations and the "lesser of 1% or inflation" growth combine to have a curious effect on property tax levies. In the year of an annexation, the total assessed value of the unincorporated areas shrinks and King County must give up the levies in the annexed area to the annexing municipality. However, the county is permitted to raise mill rates in the unincorporated areas in the following year to recoup the lost revenues since the growth cap applies not to levies on individual properties but to the total levy in the district. This effect is shown in Exhibit III-6 above: property tax

[19] This cap on year-over-year growth in tax levies applies only to the housing stock as of that year. New construction that is added to the tax roles in any given year is exempt from the growth limitation for that year and that year only.

revenues actually decreased in 2008 by $5 million due to the loss of properties from the unincorporated areas of the county as they were annexed to municipalities but, in 2009, the mill rate in the unincorporated areas increased to compensate for the loss and total levies returned to their pre-annexation level and rate of growth.

D. State Motor Fuel Taxes

The motor fuel tax is a major source of revenues to RSD. Washington's motor fuel tax has been shared among the state, counties, and municipalities for many decades, such that portions distributed to the counties and the municipalities are widely thought of as county and municipal fuel taxes respectively. Altogether, the counties in Washington receive about 5.96 cents per gallon, about 15% of the state fuel tax of 37.5 cents per gallon.[20]

These funds are transferred to the counties through three different state programs:

- Competitive grants from the state's Rural Arterial Program,
- A direct transfer of tax revenues through the state's County Arterial Preservation Program, and
- The state's distribution of all motor fuel taxes due to counties, distributed among all counties in Washington share based on their population, their road mileage, their unit costs for road construction and maintenance, and the shortfall between their receipts of other state revenues and their needs.

These allocation formulae and the public policies that underlie them are controversial, complex and appear to have been the subject of considerable study and discussion over the years.[21] [22] [23] They have resulted in the receipts to King County shown below in Exhibit III-7; King County's entitlement tends to be around 10% of the state total of county fuel taxes.

[20] Zimmer, Don. County Fuel Tax Allocations. Washington State County Road Administration Board, June 2008.

[21] FHWA. Highway Taxes and Fees: How they are Collected and Distributed. PL-01-029.

[22] Washington Research Council. Washington's Infrastructure Needs: Current Funding and Financing Tools. PB-04-11.

[23] Washington State Transportation Commission. Long-Term Ferry Funding Study (Preliminary Report). 2008

Exhibit III–7: King County Motor Fuel Tax Receipts

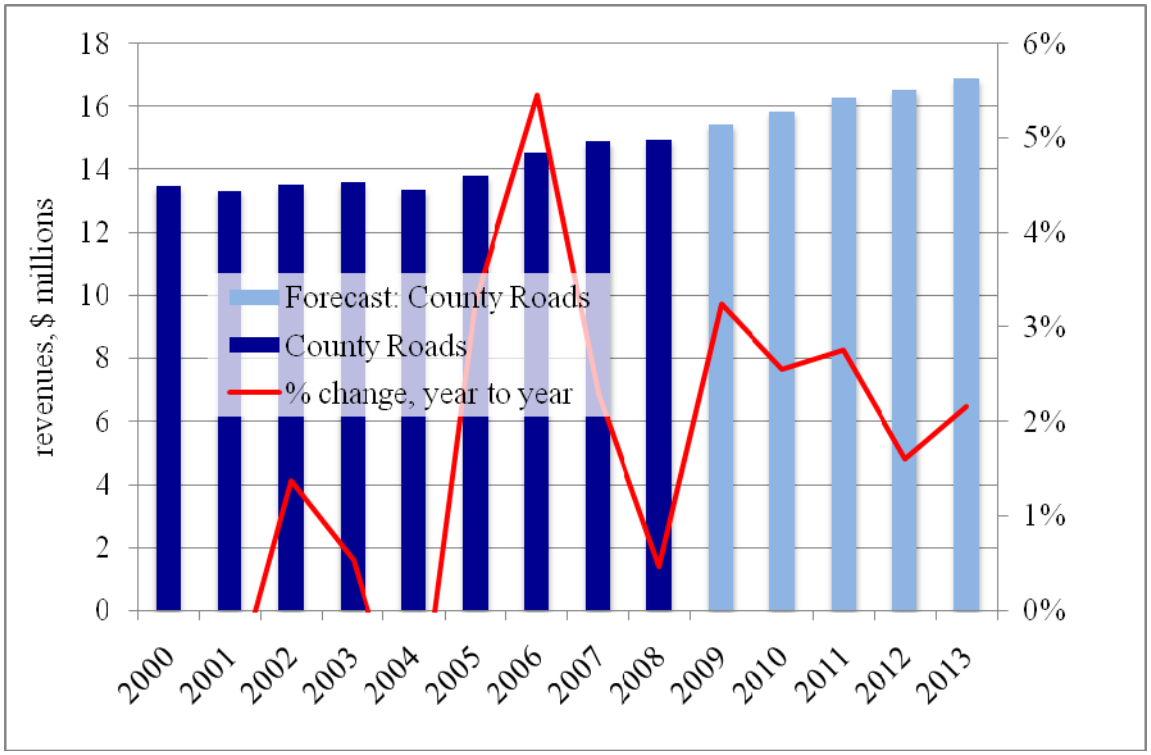
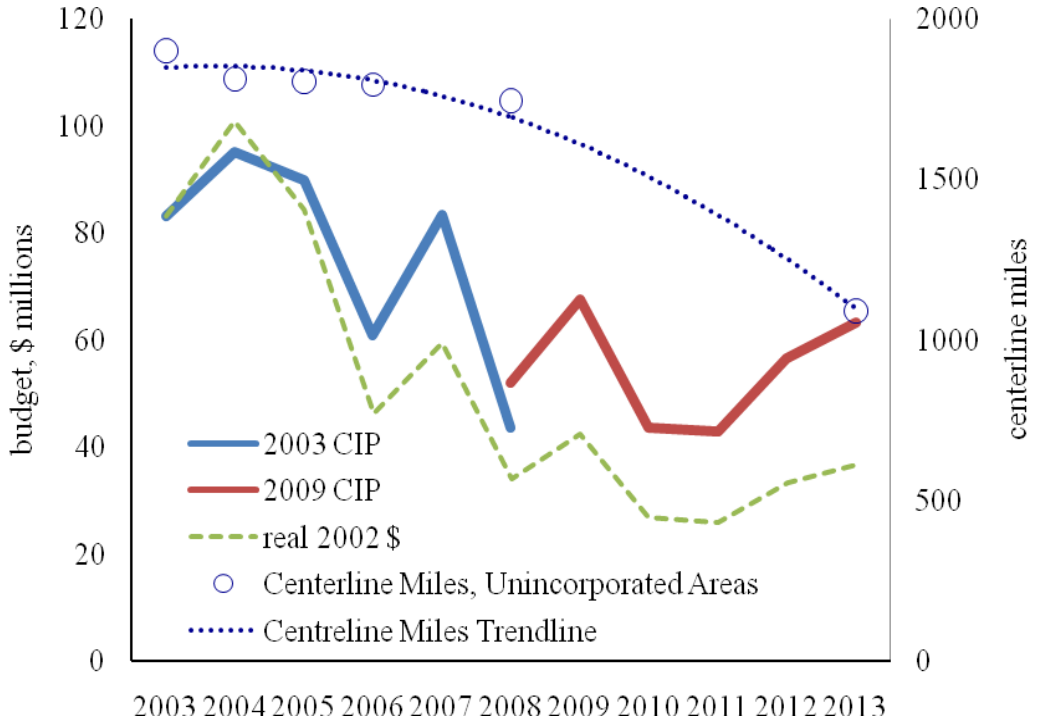


Exhibit III–7 above shows receipts into the Road Fund of motor fuel taxes, excluding about $750,000 per year that is transferred under the County Arterial Roads Preservation Program (CAPA). Other than significant increase in 2006 and 2007 that coincided with increases in the state motor fuel tax rate, these receipts have not grown significantly over the past decade. Nonetheless, Washington State Department of Transportation (WDOT) staff forecasts growth of over 2% per year over the next five years in the county share of the motor fuel tax.

E. Transfers to the Roads Capital Improvement Program

Exhibit III–3 above shows a transfer of $42.6 million in 2009 from the Road Fund to the county's Capital Improvement Program, from which almost two-thirds of all of the capital expenditures on the King County road system are funded.

Exhibit III–8: Budgeted Capital Expenditures for Roads[24]



Note: As stated in ROMP Working Paper I, Framework Development (p 35): "After annexation and incorporations, the Road Services Division will be responsible for 1,090 road miles, a reduction of 38%; the Roads Maintenance Section anticipates an increase of up to 114 new lane-miles by 2028. This change impacts the future volume, type, and location of work to be performed by RSD."

Exhibit III–8 above shows the decline in the capital budget for roads. The six years of spending in the 2009 RSD Capital Improvement Program is compared to the six years prior as they were budgeted in the 2003 RSD Capital Improvement Plan.[25] Both budget series are adjusted for inflation in highway construction costs and combined into a single series in 2002 constant dollars.

In matters of King County's capital expenditures, it is important to distinguish between the Capital Improvement Program and the Nonmajor Capital Projects Funds. Capital improvement programs are the budgeted capital expenditures and the capital projects funds are the means by which the programs are funded. The Roads CIP is funded mostly by the County Road Construction Fund plus matching contributions from various state and federal transportation grants and developer mitigation payments.

[24] King County Road Services Division Capital Improvement Program 2003-2008 and 2008-2013

[25] While the six-plan contained in the 2003 CIP was altered in its latter years, it is shown the exhibit above to directly compare two six-year plans, six years apart.

The *Capital Improvement Program* (CIP) is a budget entity that appears in King County's budget. Like any well-designed program, the CIP has a set of objectives, in other words, capital projects, and the means to obtain those objectives, that is, budgeted capital funds. The 2009 budget for King County's overall CIP is about $1.175 billion, of which about $542 million is budgeted to transit and about $64.5 million is budgeted to roads. The $565 million remaining in the total CIP budget is budgeted to other capital improvement sub-programs: wastewater, solid waste, water & lands and parks.

The sources of revenue from which Roads CIP expenditures are funded are shown in Exhibit III-9 below.

Exhibit III–9: Roads CIP Sources of Funds, 2009

		$ millions
Transfer from Road Fund		42.61
Federal Grants	8.09	
State Grants	1.80	
Mitigation Fees	2.35	
Misc	0.23	
		12.46
Bond Proceeds		7.00
Sales of Land		3.17
		65.24

The *Nonmajor Capital Projects Funds* are 33 accounting entities that appear in King County's Consolidated Annual Financial Reports (CAFR). Through each of these funds, either revenue can be directly expended on projects, as is the case with almost all road system projects, or used to service bonds for capital projects. Three of these funds contribute to road capital projects:

- The County Road Construction Fund (Fund 103)
- The Renton Maintenance Facilities Construction Fund
- The Road Improvement Districts Construction Fund[26]

The County Road Construction Fund is, in turn, funded as shown in Exhibit III-10 below:

[26] The Road Improvement Districts Construction Fund is included in the 2006/07 Consolidated Annual Financial Report of King County but it appears to be largely defunct.

Exhibit III–10: Sources and Uses of Funds in the County Road Construction Fund, 2007

	$ millions
Opening Balance, 1 January 2007	17.1
Revenue	
Taxes	-
Licenses and permits	-
Intergovernmental revenues: state grants[27]	15.6
Intergovernmental revenues: federal grants	2.5
Intergovernmental revenues: others	1.7
Charges for services	3.4
Fines and forfeits	-
Interest earnings	0.2
Rent and maintenance reimbursement	0.6
Other miscellaneous revenues	-
	24.0
Expenditures	
Current Expenses	
Transportation	28.5
Debt Service	
Redemption of long-term debt	-
Interest and other debt service costs	0.0
	0.0
Capital Outlay	
Capital projects	25.1
Capitalized expenditures	0.0
	25.1
Other Financing Sources (Uses)	
Transfers in from Road Fund: motor fuel tax	15.6
Transfers in from Road Fund: other revenues	22.2
Transfers out	(4.1)
General government debt issued	-
Premium on bonds sold	-
Sale of capital assets	-
	33.7

[27] These motor fuel tax receipts are expenditures from Washington State's local road aid program and it corresponds to the $1.80 million in Exhibit III-10 above. All U.S. states have programs under which they contribute towards the costs of eligible local projects. It is separate from the county's share of motor fuel taxes that is received into the Road Fund and, at the county's discretion from year to year, some may be included in the annual transfer from the Road Fund to the Roads CIP. In 2007, the Road Fund received $15.6 million from the county portion of state motor fuel taxes; they are shown here as part of the $37.8 million transferred from the Road Fund in that year.

Closing Balance, 31 December 2007 21.2

This exhibit, compiled from the King County 2007 CAFR, indicates that there is very little outstanding debt associated with road capital construction and that, in the main, road capital projects are expensed. The lack of debt, combined with the large expenses in this fiscal year, suggest that King County finances its road capital improvement program on a pay-as-you-go basis.[28]

To fund capital expenditures, RSD is selling land and other assets in 2008 and 2009. Further, RSD proposes to use the revenues from the sale of the Summit Pit to finance the renovation or replacement of its aging maintenance facilities.

IV. Analytical Framework for Revenue Option Evaluation

This section describes the framework recommended to RSD staff to assist in the assessment of revenue proposals. The framework is used to evaluate the options outlined in this working paper.

A. Revenues and Other Inflows

As only new and sustainable revenues will solve RSD's funding shortfall in the long run, King County should always distinguish in its financial plans for RSD between new and sustainable revenues from other inflows of cash, such as:

- Borrowing does not provide revenues; borrowing provides additional cash. Additional cash is useful in transportation programs to accelerate new construction and remediation projects. However, the interest expense and other costs associated with borrowing reduce the revenues available to fund transportation projects on a pay-as-you-go basis.
- Sales of assets provide new revenues but only once, when each asset is sold. Sooner rather than later, the supply of surplus assets is exhausted and the financial condition of the program has only worsened. While the sale of assets can be a useful bridging strategy from an old to a new revenue base, it cannot sustain King County's transportation programs for any significant length of time.

B. The Assessment of Revenue Sources

In evaluating the potential for new revenue sources for RSD, King County must consider the strengths of these revenue sources, alone and as part of a portfolio of revenues.

[28] As a general rule, debt should not be used to fund the continuous stream of capital expenditures that are required to sustain and expand a road system; debt should only be applied to specific capital projects in which the economic or financial benefits of accelerating the delivery of the project outweigh the additional cost of the interest expense.

1. Choosing Individual Revenue Sources

The tolerance of King County taxpayers for added taxes, levies, or fees is limited. The County must choose carefully from among many options which new revenues it should take forward. The evaluation criteria used in this working paper are based on the three basic principles that have guided comparative tax analysis for the past thirty years:[29]

- **Efficiency**, of which there are two aspects:
  - The capacity or the yield of the revenue source over time. Will revenues grow as population and economic activity grow? Will they keep pace with inflation? Is the price so high that it drives users away, resulting in weaker gains in revenue?
  - Utility and flexibility with which those new funds can be applied across different projects and jurisdictions. Can they be pledged as security in a bond issue? Can they be can be used to partner with other agencies?
- **Equity** which is, in general terms, the fairness of the burden distributed across people and business in the county and, particular terms:
  - Impacts on economic competitiveness. Do the additional costs paid by King County businesses change them from being less expensive to being more expensive than competing businesses in adjoining counties? Are the taxes regressive?
  - Are these revenues diverted away from sources that are usually dedicated to other King County programs?
- **Simplicity**, both in terms of the public's ability to understand it and the ease with which the county can collect it and administer it

a. Efficiency in the Context of a Shrinking Road System

Efficiency is perhaps the most important criterion in choosing revenues for any transportation program; it is very much the most important in King County because increased revenue efficiency is necessary to counter the business drivers faced by RSD: decreasing system size, increasing traffic density on the system that remains, and increasing costs of commodities and regulatory compliance. King County should relate the three main revenue evaluation criteria together by setting a revenue goal of maximum efficiency, subject to adequate equity and simplicity.

[29] US Department of the Treasury (1977) Blueprints for Basic Tax Reform. http://www.ustreas.gov/offices/tax-policy/library/blueprints

b. Simplicity in the Context of Regional Transportation

King County is one of four counties in the central Puget Sound region. While these four counties and the several cities within them plan the region's surface transportation system from a regional perspective, they don't fund all of them that way: some transit initiatives are funded regionally but, by and large, road systems are not. The Puget Sound Regional Council takes the following position on the question of regional transportation funding:

"The issue of revenue collections from and distributions to regions and sub-regions of the state will continue to be a focus of discussion and will complicate debates on regional transportation projects. Currently, there are no multi-county planning policies that relate directly to transportation finance."[30]

A regional application of mechanisms with revenue sharing by jurisdictions is logical for road user fees that are impractical to implement in a single county or in just the unincorporated areas of all four counties. However, assembling the political partnerships needed to implement regional fees is not a simple thing to do: there has been much discussion of the concept of a regional transportation authority in Puget Sound over many years[31] and voters in the region voted against the formation of a regional transportation investment district in 2006.[32]

2. Choosing a Portfolio of Revenue Sources

Future revenues from any source are uncertain and each source carries with it a risk that the revenues from it will fall over time. It is desirable to manage revenue risks and when possible minimize them. RSD's revenues sources are, taken together, a portfolio of assets; like most portfolios of financial assets, risks are reduced when the portfolio is diversified. The revenue sources in a transportation program are diversified when there is little covariance among them; that is, when business drivers cause one revenue to fall significantly, other revenues in the portfolio do not. A diversified transportation program would, for example, draw revenues from a broad range of the following types of revenues.

[30] Puget Sound Regional Council. Vision 2020 + 20 Update: Issue Paper on Transportation. January 2006.

[31] e.g., Governor Gary Locke, in a speech to the Puget Sound Regional Council, 29 March 2001.

[32] Tacoma News Tribune, 22 January 2008. *Haugen dissolves RTID, proposes regional transportation governance*.

a. Transportation-Related Revenues

Transportation-related revenues are user fees. Since the use of a transportation system is largely determined by population and economic activity, most transportation-related revenues are related to those two factors. Transportation-related revenues can be broken down into the following categories, all of which are related to one or both of population and economic activity:

- *Vehicle-mile revenues*, for example, gas tax: based on total distance traveled which, in turn, is related to the level of economic activity
- *Vehicle-count revenues*, for example, vehicle sales tax, registration and title fees: based on the total number of vehicles that, in turn, is related to economic activity and population
- *Demographic revenues*, for example, driver licenses: based on the population
- *Commercial revenues*, for example, revenues from the development of real estate opportunities on properties adjacent to the transportation system right of way

b. Revenues Not Related to Transportation

Many jurisdictions raise revenues from tax bases that are not specific to transportation and apply those revenues across many program areas, including transportation. These revenue sources, including the list below of those that are routinely used at the county level, are also largely determined by population and economic activity:

- *Property taxes*, levied on land, improvements to land and some other types of assets as ad valorem rates, such that revenues at a given mill rate are related directly to assessed property values;[33]
- *Sales taxes*, levied as an ad valorem rate on the sale of retail goods. When such taxes are levied on both goods and services and levied as a net tax at the manufacturing and wholesale levels, they are *value added taxes*
- *Business licenses*, the fees for which are often graduated with the size of the business

[33] In King County, the cap on year-over-year growth in tax revenues forces an exception to this general rule: on existing housing stock, the assessed values are divided by the maximum amounts that can be collected to arrive at an effective tax rate, up to a maximum mill rate of 2.25 for the road levy in unincorporated areas.

- *Utility surcharges,* in which the jurisdiction taxes connections to the electrical supply, either per connection or per kW-hour of energy consumed
- *Independent revenues,* for example, interest income, based on some factor independent of population or economic activity

V. Prospects for Current Revenues

This section provides prognoses for the two principal sources or revenue for King County's road program: King County's share of state motor fuel taxes and RSD's share of King County property taxes.

In summary:

- RSD's 2009 – 2014 revenue forecasts include an estimate that property taxes will yield an additional $18 million over the next four years. Over the longer run, property tax revenues may increase by as much as 2% per year but will be attenuated by annexations of urbanized areas into cities within King County, which are not taken into account in the RSD 2009 – 2014 forecast.
- WDOT forecasts that easing oil prices will allow fuel consumption to resume its historical pattern of growth over the next four years, which will contribute towards an additional $15 million in motor fuel tax receipts over that period. Motor fuel tax receipts are unlikely to growth at rates as high as the historical 2% per year over the longer run. [34]

These forecasts are based on the assumptions used in the 2009 budget adopted by King County, shown in Exhibit V-1 below.

[34] The Canadian affiliate of Dye Management Group Inc. recently completed a detailed forecast of the fuel efficiency of the 1.4 million vehicles in the metropolitan Vancouver, British Columbia area. This forecast followed best practices for fleet fuel efficiency and emissions forecasting and used detailed vehicle registration data and detailed data from the emissions inspection program in British Columbia. Fleet fuel efficiency in the metropolitan Vancouver area is expected to increase from about 10.5 litres/100 km (about 22 miles/US gallon) in 2009 to about 9.4 litres/100 km (25 about miles/US gallon) in 2019.

Exhibit V–1: Selected Economic Assumptions from the King County Budget[35]

% change over prior year	*2008*	*2009*	*2010*	*2011*
Population	1.2%	1.0%	0.8%	0.8%
Employment	0.6%	-0.3%	1.1%	1.7%
Consumer Price Index	5.0%	2.8%	3.0%	3.0%
COLA	2.49%	5.50%	4.27%	3.60%
Real Personal Income	-1.1%	0.4%	1.8%	2.4%
Housing Permits	-32.5%	1.0%	6.0%	-2.6%

A. Property Tax

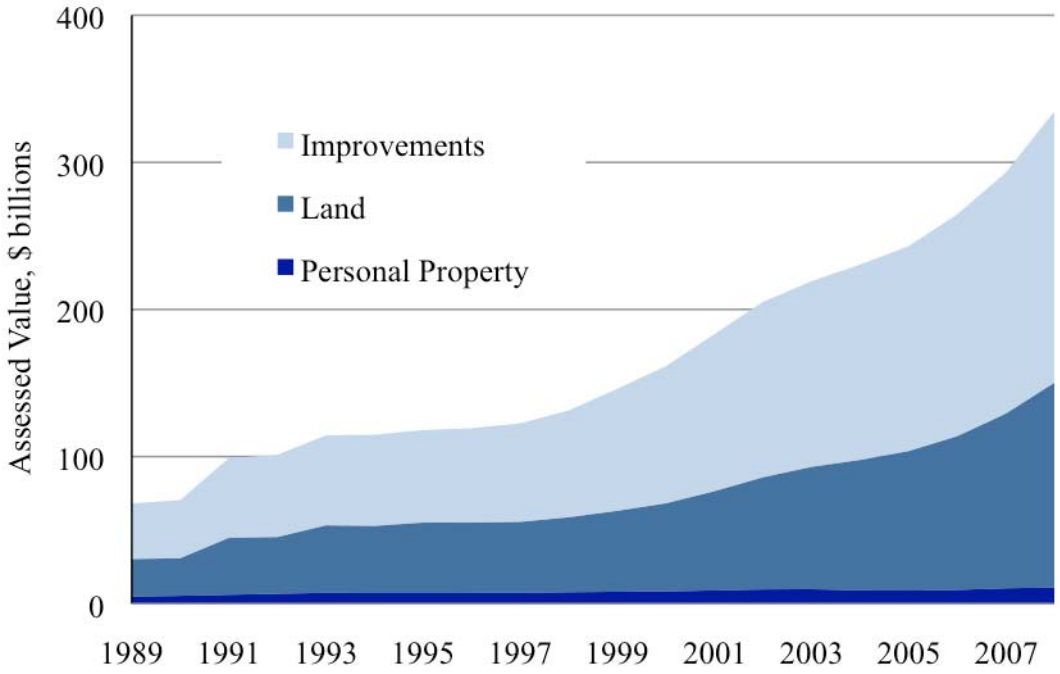
As property taxes are the largest single source of revenues for King County as a whole, the county's budget staff pays close attention to their prospects.

1. Factors and Trends

Two decades of increases in both the number of properties in King County and the averaged assessed value of those properties has quadrupled the value of the property tax base over the past two decades, as is shown in Exhibit V–2 below.

[35] King County 2009 Proposed Budget. COLA is 90% of annual growth, September to September, in national CPI subject to a minimum of 2%.

Exhibit V–2: Assessed Values in King County36



Assessed values in 2008 were 90% higher than they were in 2000; over the same period, RSD property tax receipts increased by about 55% as the property values in unincorporated areas of the county increased at a lower rate than their counterparts in urbanized areas of the county. As a result, assessed values in the unincorporated areas were at lower values when the road levy reached its lawful maximum in 2006.

2. Unfolding Issues

Several factors combine to suggest that assessed values in unincorporated areas of King County will not grow in the future as they have in the past. In the short run – the next 12 to 24 months - the current economic downturn will significantly reduce housing starts and, in some areas of the Pacific Northwest, is expected to cause a decline in the market values of all classes of property: residential, commercial and industrial.[37] Even as economic cycles allow growth to resume over the medium term – the next three to seven years – annexations of urbanized areas with relatively high assessed values by municipalities will keep the growth rate in the unincorporated area tax role at relatively low levels. These effects are just as likely to cause a decrease in the

[36] http://your.kingcounty.gov/assessor/AnnualReport/2008/TaxStats/TaxStatsIndex.htm. Excludes state properties used to provide public services.

[37] Seattle Post-Intelligencer, 7 November 2008. *Area Faces Bleak Real Estate Forecast.*

assessed values in unincorporated areas over the next five years as they are to cause an increase.

It is unlikely that the state law that limits growth in property tax levies to 1% per year, net of new construction, will be amended or repealed to allow for higher levels or higher growth rates in levies.[38] While the passage of the state legislative measure was in itself rather contentious[39] it received support from both sides of the house and both sides of the senate.

3. Forecast

King County staff forecast property tax receipts as follows:

% change over prior year	*2009*	*2010*	*2011*	*2012*	*2013*
Road Fund property tax receipts, $ M	83.2	84.7	86.6	88.8	91.0
% change in receipts from year prior	7.8%[40]	1.8%	2.2%	2.2%	2.5%
Increase in # of properties	2.4%[41]				

With about 580,000 residential properties on the 2008 King County tax roll,[42] the assumption of a 2.4% increase in the number of properties taxed suggests 14,000 new housing starts in King County during 2009. In 2007, what in retrospect was a peak year in real estate development, there were 14,000 new residential units completed in King County.[43]

That forecast estimates that increases in Road Fund property tax receipts over the 2009 estimate of $83.2 million will, over the subsequent four years 2010 to 2013, provide an additional $18 million to the Road Fund.

[38] Because the limit applies to total levies, excluding new construction, the tax rate can be increased when the total value of assessed property falls. This is how King County is able to collect an increasing amount of property tax revenue despite annexations: as annexations remove property from the calculation of the total levy, the tax rate can be raised on the smaller tax base that remains.

[39] Seattle Times, 30 November 2007. *Shouting, Name-Calling as Lawmakers Cap Property Taxes*.

[40] The road levy in 2008 was $81.1 million but the receipts were $76.3 million as King County collected on behalf of new annexations in West Hill, Lea Hill, and Benson Hill then transferred the revenues to the cities.

[41] King County proposed 2009 Budget: Economic and Revenue Forecast.

[42] 2008 Tax Roll, Account Statistics. http://your.kingcounty.gov/assessor/AnnualReport/2008/TaxStats/TaxStatsIndex.htm.

[43] King County Annual Growth Report, 2008.

B. Motor Fuel Tax

For the purposes of this working paper, it is reasonable to assume that King County's fuel tax receipts will change in proportion to the state's total fuel tax receipts.

1. Factors and Trends

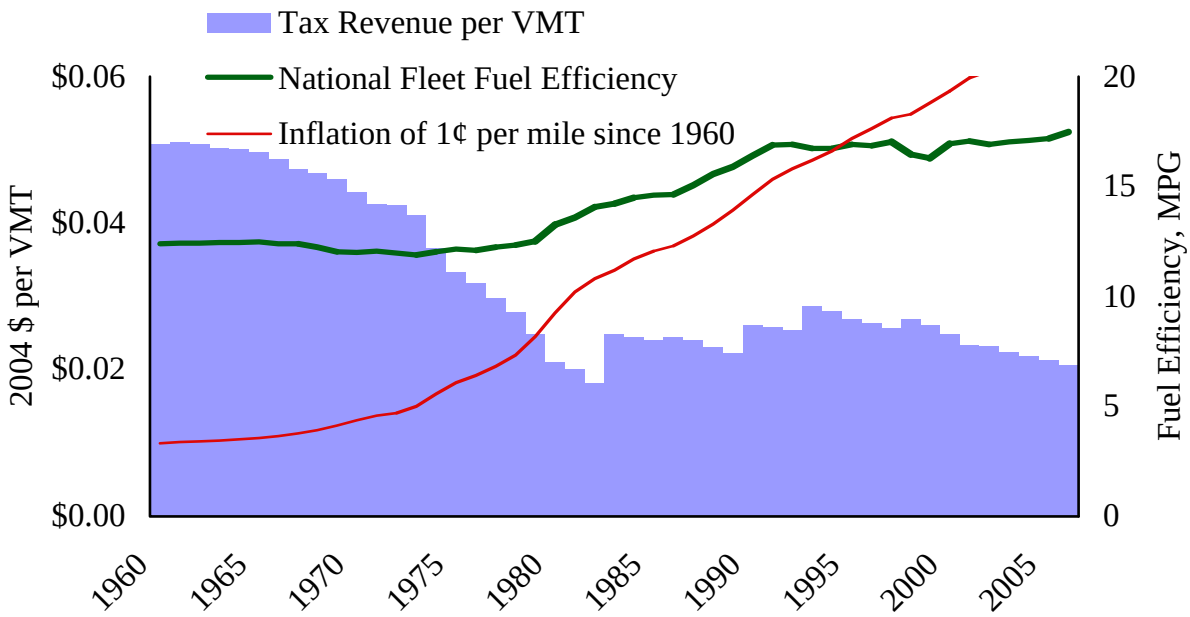
Motor fuel tax receipts are the product of taxable gallons sold and the tax rate. Assuming the tax rate is unchanged, a forecast of taxable gallons sold will suffice as a forecast of receipts. Taxable gallons, in turn, are a product of vehicle-miles travelled (VMT) and the fuel efficiency of the vehicles that drive those miles. Both VMT and fuel efficiency are determined by: population, economic activity, the price of vehicles, the price of fuel, and other travel costs.

The decisions that American motorists make are short-run decisions to take a trip or not: and long-run decisions to sell their vehicle and purchase another. They make these decisions taking the cost of highway travel into account, of which fuel prices are a major part. All other factors being equal, higher fuel prices will cause motorists to make short-run decisions to travel fewer vehicle-miles and long-run decisions to purchase more fuel-efficient vehicles.

2. Unfolding Issues

As a user fee, motor fuel taxes have been eroded over the past 35 years by the increased fuel efficiency of gasoline and diesel engines, shown in green in Exhibit V–3 below, and cost inflation, shown in red, that has outstripped increases in nominal tax rates. The combination of these two eroding factors has reduced real motor fuel tax revenues, stated in constant 2004 dollars per vehicle mile and shown in blue in Exhibit V–3 below, from about 5¢ in 1960 to a little over 2¢ in 2006.

Exhibit V–3: Motor Fuel Revenues per VMT



Officials in some jurisdictions have concluded that the increasing fuel efficiency of engines has made motor fuel taxes a poor proxy for road user charges and that a more direct levy of a road user charge is needed. If motor fuel taxes were replaced by a charge per vehicle-mile traveled, the erosive effect of fuel efficiency on road user payments would be eliminated.

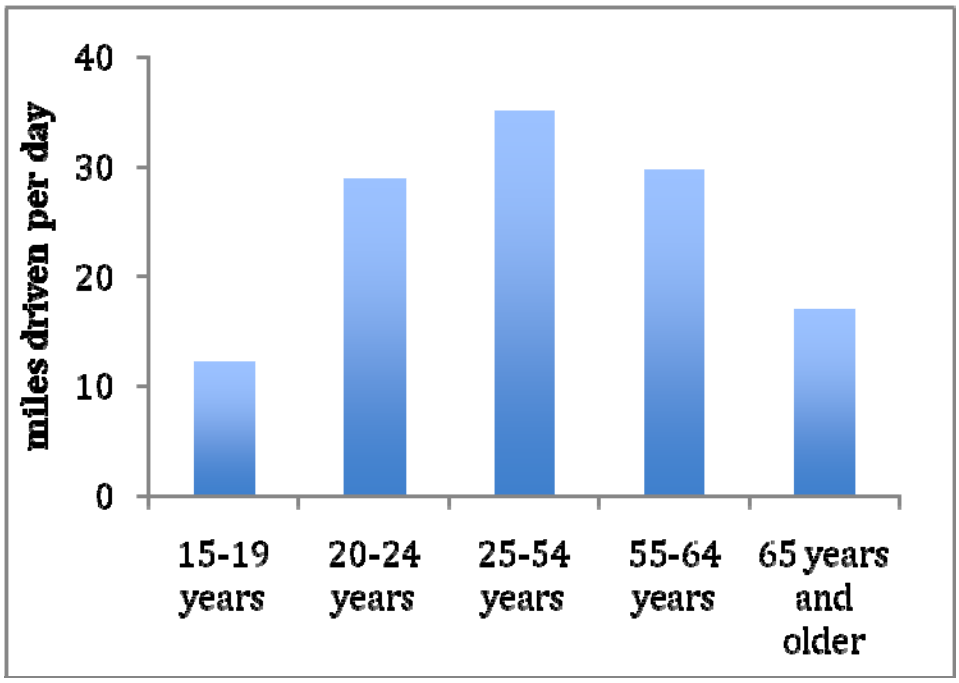
In the short run, high and volatile fuel prices have had an unprecedented effect on driving behavior in King County. The fuel supply in 2008 was unique to the American experience. The oil shocks of the 1970s not only drove up prices but were accompanied by shortfalls in supply: motorists had to wait in lineups to purchase fuel. Because current prices are not accompanied by any need for rationing or queuing, American motorists are making decisions influenced solely by fuel prices for the first time.

In the medium term, over the next decade, the fleet of private and public vehicles in Washington State will become more fuel efficient, as vehicle emission standards become more stringent. The current proposals articulated by the U.S. Environmental Protection Agency suggest a 20% reduction in vehicle emissions by 2020. This, however, is the minimum expectation. California has proposed a more stringent requirement: a 30% reduction in vehicle emissions from 2002 to 2016. The California standards have been adopted by all 11 U.S. states and Canadian provinces in the Western Climate Initiative, including Washington State, as well as 10 other provinces and states

on the northeastern seaboard.[44] If such a standard prevails, it is conceivable that the expected increase in vehicle miles travelled due to population and economic growth, about 30% in a decade, could come about with no corresponding increase in gasoline consumption.

In the long term, over a generation, vehicle miles travelled will be suppressed by the ageing population of King County. Exhibit V–4 below illustrates that older drivers tend to travel significantly less than younger drivers. The "medium" population growth forecast for King County[45] predicts that the proportion of the county's population that is over 65 years old will increase from about 11% in 2005 to almost 20% in 2030.

Exhibit V–4: National Average Mileage Driven, By Age[46]



3. Forecast

Washington State Department of Transportation staff forecast King County motor fuel tax receipts, excluding CAPA receipts, as follows:

[44] Canwest News Service, 16 September 2008. *Provinces, States Call for California-style Emission Standards.*

[45] Office of Financial Management, State of Washington. http://www.ofm.wa.gov/pop/gma/projections07.asp

[46] National Household Travel Survey, 2001.

% change over prior year	2009	2010	2011	2012	2013
Motor fuel tax receipts, $ M	15.9	16.2	16.6	16.7	17.0
% change in receipts from year prior	3.2%	2.6%	2.8%	1.6%	2.2%

VI. Potential New Revenues

This section describes potential sources of new revenues for RSD and evaluates them with the criteria outlined in section IV.B above

A. Other Efforts to Find New Revenues

Useful precedents for new revenue sources can be found in the work of other local, state, and federal government agencies.

1. Transportation for Tomorrow

This report was completed by National Surface Transportation Policy and Revenue Study Commission in December 2007. The United States Congress created the Commission as part of SAFETEA-LU legislation passed in 2005. Transportation for Tomorrow is a report of the Commission's study of the condition and future needs of the nation's surface transportation system and short- and long-term alternatives to replace or supplement the fuel tax. The report assumes that in order to maintain and expand the national transportation system over the next 50 years, investments of at least $225 billion annually are required from all sources.

The report gives short- and long-term funding options for federal, state, and local governments. The options are evaluated over six sets of criteria; the options and criteria are based on previous analysis conducted by several national entities, including the Transportation Research Board (TRB), and the National Cooperative Highway Research Program (NCHRP). Its specific recommendations with respect to additional revenues were:

- "That the Federal fuel tax be increased from 5 to 8 cents per gallon per year over the next 5 years, after which it should indexed to inflation"
- "A Federal ticket tax be levied on all transit trips to supplement revenues from the Federal fuel tax and General Fund"
- "A Federal freight fee help finance freight-related improvements as part of an overall freight program"
- Remove any federal impediments to allow states to "increase State fuel taxes and other highway user fees"
- "States and local governments should be given the flexibility to toll and/or implement congestion pricing"

- Subject to a national study of mileage-based User Fees "a fee based on VMT would be the preferred long-term alternative to the current fuel tax"

2. Washington State Blue Ribbon Commission on Transportation

In 2000, the Washington State Governor's Blue Ribbon Commission on Transportation proposed major reforms and new funding strategies for surface transportation throughout the state. The Commission made several recommendations with respect to new revenues:

- Authorize the extension of the existing gross weight fee to all vehicles that use the roadway system, including passenger cars, sport utility vehicles, and recreation vehicles
- Authorize a surcharge to the existing gross weight fee for trucks, the proceeds to be dedicated to freight mobility improvements
- Increase the motor fuel tax
- Extend the sales tax to motor fuels
- Authorize a new surcharge on the wholesale sale of new and used vehicles, auto parts, and accessories, the proceeds to be dedicated to transportation
- Authorize a local option vehicle mile traveled (VMT) charge to be used by regional entities in congested regions of the state, and to be imposed on all vehicles registered in such a region
- Authorize new multi-modal transportation taxing authority for counties or regions that have not been previously granted high capacity transportation taxing authority
- Expand the authority of counties to impose the local option motor vehicle license fee

3. Puget Sound Regional Council

The council is not a taxing authority and its principal function is planning, not funding. The council has not made specific recommendations with respect to what new revenue sources its member counties and cities should pursue. The council has, however, considered the matter of transportation financing: the council's current issue paper[47] on the subject of transportation makes the following observation with respect to transportation financing.

"In the face of inflationary pressures and alternative-fueled vehicles, the future of a fuel-tax-based approach to highway finance may be limited, and alternate

[47] Puget Sound Regional Council. Vision 2020 + 20 Update: Issue Paper on Transportation. January 2006.

approaches to collecting revenues will likely be needed. These issues and the role of congestion-based user fees should be addressed."

B. Increased Rates on Existing Revenue Sources

New revenues could be raised by increasing the rates of taxes or fees on existing revenue sources. The two significant possibilities for the Road Fund, property taxes, and motor fuel taxes are considered here.

1. Property Tax: Increase General Fund Levy

The county is allowed to tax up to $1.80 per $1000 of assessed value for the General Fund levy. The 2007 mill rate was $1.08864 per $1,000 of assessed value, although the factor that limits the General Fund levy is the 1% cap on year over year growth in the levy on existing housing stock.

a. Efficiency

What will it yield? King County staff estimate that each $0.01 in the mill rate would yield an additional $3.8 million per year. The yield would, however, always be uncertain: any funds re-directed from the General Fund to the Road Fund would be at risk of being reprogrammed to other uses in the King County budget as priorities change.

Will it grow over time? Regardless of the level at which the tax rate is set, state legislation passed to further the aims of initiative 747 would restrict subsequent growth in property tax revenues to 1% per year on existing accounts, plus the assessed value of new accounts. In the current economic cycle, growth rates of less than 2% per year are most likely.

b. Equity

Do those who enjoy the benefits pay the costs? Mostly, no. Property owners in municipalities would be subsidizing the road program in unincorporated areas of the county.

Can it be equated to roads, rather than to other county programs? Generally, no. Funds from this levy can be used for any governmental purpose and dedicating General Fund property tax revenues to the Road Fund would be seen as a diversion of revenues away from justice and social programs, for example, into the Road Fund. The King County General Fund faces a serious deficit and programs funded from it are being cut across the board to bring the fund into balance.

What legislation or voter approval is required? A simple majority in a popular vote is required for an increase in the mill rate. Counties that are

levying property taxes at a rate lower than the statutory maximum can ask the voters to lift the levy lid.

c. Simplicity

Can it be implemented by the county alone, without participation of other counties in the region or the state? Yes.

2. Property Tax: Increase Road Levy

The county is allowed to tax up to $2.25 per $1000 of assessed value for the road levy in unincorporated areas. The current mill rate is $1.75 per $1,000 of assessed value, although the factor that limits the road levy is the 1% cap on year over year growth in the levy on existing housing stock.

a. Efficiency

What will it yield? RSD staff estimate that an increase of 3.5% annually over 6 years would and raise about $50 million and result in a mill rate in the 6th year that is about 17¢ per $1000 of assessed value higher than the current mill rate.

Will it grow over time? Yes. The mill rate and the levy would be allowed to increase at a higher rate, say at 3.5% per year for 6 years, after which year-over-year growth in the levy would be limited by existing state legislation to 1%.

b. Equity

Do those who enjoy the benefits pay the costs? Yes, given that relatively little traffic on county roads in the unincorporated areas of King County is through traffic.

Can it be equated to roads, rather than to other county programs? Yes, the existing levy is dedicated to the county's Road Fund.

c. Simplicity

What legislation or voter approval is required? Popular vote required for a levy lid lift.

Can it be implemented by the county alone, without participation of other counties in the region or the state? Yes.

3. A Local Option Motor Fuel Tax

Motor fuel tax rates have increased statewide over the past five years through intense political efforts for them and against them. In 2002 voters rejected Referendum 51, a $7.8 billion statewide transportation tax package funded with a 9¢ per gallon tax increase. In 2003, the Legislature passed and the Governor approved a 10-year statewide transportation package that included a 5¢ per gallon tax increase, a 15% increase in gross weight fees, and a 0.3% vehicle sales tax. In November 2005, voters rejected Initiative 912 that would have repealed the 5¢ per gallon tax increase. At 37.5¢ per gallon, Washington fuel taxes are among the highest in the United States.

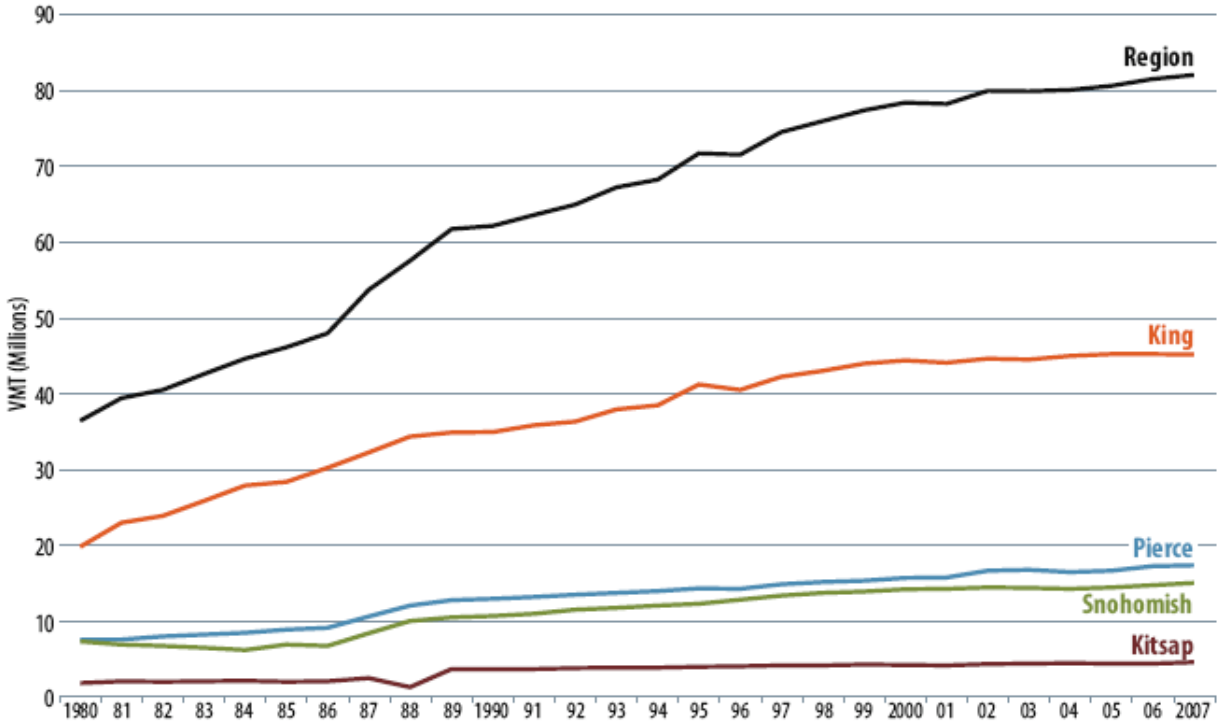
a. Efficiency

What will it yield? King County staff estimate that each 1¢ per gallon of local option motor fuel tax would yield about $10 million per year across the county.[48]

Will it grow over time? No, since vehicle miles travelled in King County are decreasing, while VMT continue to grow through Washington as a whole, as shown in Exhibit VI-1 below.

[48] King County Road Services Division 2009 Executive Office Budget Briefing, 13 June 2008: The Problem, Response in Recent Years and Options for Dealing with the Future.

Exhibit VI–1: Daily VMT in the Puget Sound Regional District[49]



b. Equity

Do those who enjoy the benefits pay the costs? Yes. About ¼ of a county-wide local option tax would accrue to the City of Seattle, about ½ would accrue to the other municipalities in the county and about ¼ of would accrue to King County itself for roads in the unincorporated areas.

Can it be equated to roads, rather than to other county programs? Yes. County motor fuel taxes, in other words, the county's portion of state motor fuel taxes, are already dedicated to the county's Road Fund.

c. Simplicity

What legislation or voter approval is required? Counties or taxing districts such the regional transportation improvement district can propose in an election a local option gas tax up to 10% by election, equal to 3.75¢ per gallon at the current state gas tax rate of 37.5¢ per gallon. The initiative must pass with a simple majority in an election held 12 months in advance of implementing the tax.

[49] Puget Sound Regional Council. Trends. No. T2, September 2008.

Can it be implemented by the county alone, without participation of other counties in the region or the state? The local option tax room allowed under state legislation would be assigned to whichever of the county or the regional transportation improvement district acted first to use it.

4. Additional Real Estate Excise Tax (REET)

Washington State collects a real estate excise tax equal to 1.28% of the proceeds from a sale of real property.[50] The funds collected are applied to state programs except:

- 6.1% of the funds collected are dedicated to the state's Public Works Assistance Account, from which the state guarantees local bonds issued to fund public works[51]; and
- 1.6% of the funds collected are distributed to cities and counties under formulae related to their application of local option sales taxes.[52]

State legislation allows counties and cities additional tax room of up to 2.5% as follows:[53]

Exhibit VI–2: Local Authorities for Real Estate Excise Tax

0.25%	"REET 1": For public works, including roads. [54]
0.25%	"REET 2": For capital projects, including roads, in a *Growth Management Act* plan.[55] [56]
0.50%	In lieu of the second 0.5% of local sales tax in unincorporated areas only.
1.00%	Purchases of land or assets for conservation.
0.50%	Social housing.[57]

[50] RCW 82.45.060: Tax on sale of property.

[51] RCW 43.155.050: Public works assistance account. (Expires June 30, 2011.)

[52] RCW 43.08.290: City-county assistance account.

[53] Washington Department of Revenue. Tax Reference Manual.

[54] RCW 82.46.010(2): "…public works projects of a local government for planning, acquisition, construction, reconstruction, repair, replacement, rehabilitation, or improvement of **streets; roads; highways; sidewalks; street and road lighting systems; traffic signals; bridges** [emphasis added]; domestic water systems; storm and sanitary sewer systems; parks; recreational facilities; law enforcement facilities; fire protection facilities; trails; libraries; administrative and/or judicial facilities."

[55] RCW 82.46.010(6): "… public works projects of a local government for planning, acquisition, construction, reconstruction, repair, replacement, rehabilitation, or improvement of **streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, bridges** [emphasis added], domestic water systems, storm and sanitary sewer systems, and planning, construction, reconstruction, repair, rehabilitation, or improvement of parks."

[56] Municipal Research and Services Center of Washington. A Revenue Guide for Washington's Cities and Towns. 1999.

[57] Only allowed if the local conservation tax was imposed in or before 2003.

King County collects both REET 1 and REET 2 in unincorporated areas of the county but is not eligible to collect the REET in lieu of sales taxes since it already collects the sales tax.[58] Since King County did not levy the 1% REET for conservation prior to 2003, and does not today, it is not eligible to levy the 0.5% REET for social housing. In summary, King County is already the collecting the maximum levies from the Real Estate Excise Tax.

King County restricts receipts from REET 1and REET 2 to capital projects in unincorporated areas of the county that are eligible under state law. King County code places an additional restriction on the use of REET 2 fund: they may "…. may only be used for parks and recreation purposes."[59]

a. Efficiency

What will it yield? REET 1 yields up to about $6 million annually, of which about $2.5 million services debt and about $3.5 million is available to fund current capital projects, i.e. only $3.5 million is available as revenue for current and future projects. REET 2 also yields up to about $5.5 million annually, of which about $0.5 million services debt.[60]

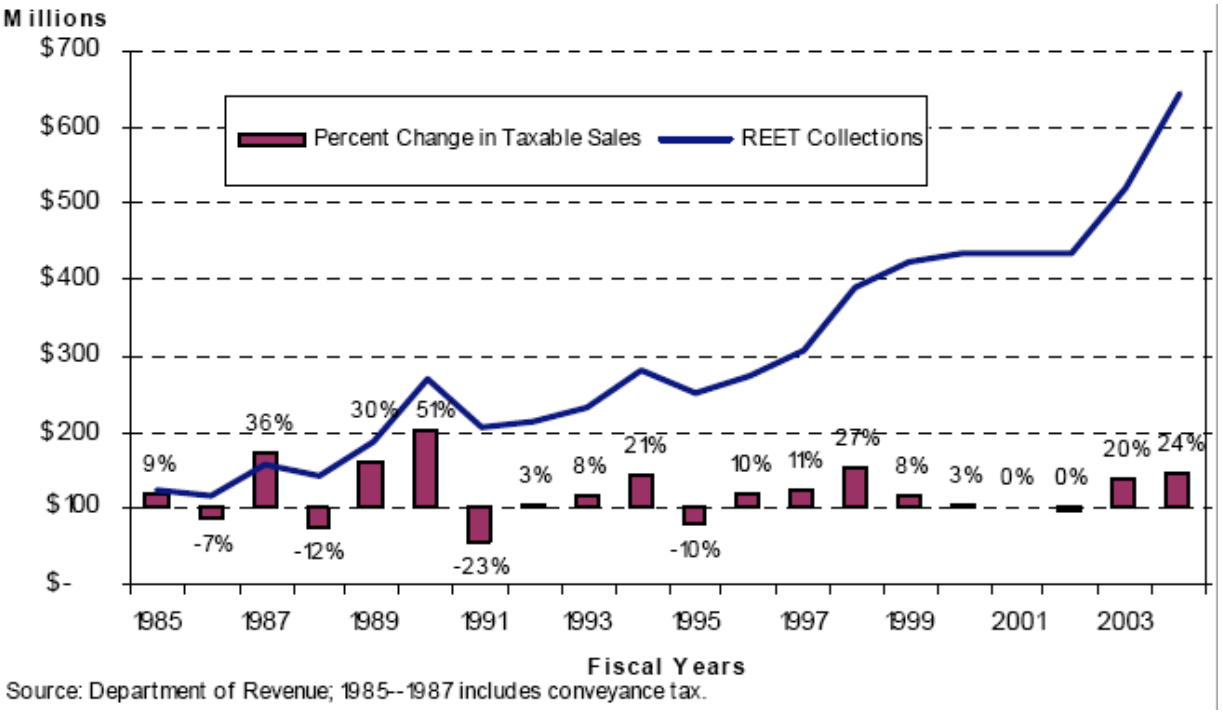
Will it grow over time? The growth of any excise tax on real estate transactions is uncertain since the value and volume of real estate transactions are among the most volatile of economic indicators. The history of the state-level REET in Washington demonstrates this volatility.

[58] Washington State Office of Financial Management. 2007 Data Book.

[59] King County Code 4.32.030(B).

[60] King County Budget Office. Funds 3681 and 3682.

Exhibit VI–3: Volatility in Washington State REET



Source: Department of Revenue; 1985--1987 includes conveyance tax.

b. Equity

Do those who enjoy the benefits pay the costs? Not necessarily. The tax is not paid by users of the road system if they live outside the county. Residents do not pay the tax as long as they do not sell their homes. REET is paid by sellers of real estate, some of who may be leaving the county. More generally, REETs are not thought of as good tax policy. From financial perspective, they are inefficient and uncertain. They also have adverse effects on economic development by raising the cost of labor mobility.

Can it be equated to roads, rather than to other county programs? Only after explaining why the funds from the REET are being diverted from parks, where they have been dedicated since 1999, to roads.

c. Simplicity

What legislation or voter approval is required? Only for REET 2. REET 1 can be dedicated to roads in King County's budget process. REET 2 would require a change of county ordinance to divert funds from parks to roads.

5. Impact Fees under the State Environmental Policy Act (SEPA)

Property developers pay impact fees are to local governments that cover all or part of the additional costs of providing the public facilities that serve the new development. In Washington State, only those counties and cities than plan under the *Growth Management Act* may charge impact fees. Also, the revenues from those fees may be used only for projects that mitigate impacts in accordance with the GMA plan in "(1) public streets and roads; (2) publicly owned parks, open space, and recreation facilities; (3) school facilities; and (4) fire protection facilities in jurisdictions that are not part of a fire district."[61] King County is included in the *Growth Management Act*. The county collects traffic impact fees under its Mitigation Payment System[62] and also collects impact fees for public schools.[63]

Impact fees are also authorized under the Washington *State Environmental Policy Act* (SEPA).[64] SEPA grants broad authority requires mitigation of project's environmental impacts "…(2) to promote efforts which will prevent or eliminate damage to the environment and biosphere…"[65] Mitigation can include fees.

A county or city cannot charge a SEPA mitigation fee to a project without fully complying with the procedures set out in the Act. Generally, the county or city must demonstrate that the mitigation fee is the best of all available alternatives to mitigate the impact on the environment. The county or city must also consult with state, federal and Canadian environmental agencies including the Washington State Environmental Commission, to obtain their views as to whether a fee is the best of the available mitigation alternative.

SEPA fees may not duplicate other impact fees. Specifically, if a developer must pay traffic or school impact fees then they cannot be charged SEPA fees also.[66]

a. Efficiency

What will it yield? SEPA fees are unlikely to yield significant revenues. Firstly, they are unlikely to be levied frequently: each individual fee must be linked to the environmental impact of a project and can only be levied

[61] RCW 82.02.090(7) for King County and other counties and cities subject to the Growth Management Act.

[62] King County Code: 14.75

[63] King County Ordinances No. 9785, No. 10162, No. 13338 and No. 14525.

[64] RCW 43.21C

[65] RCW 43.21C.010

[66] RCW 43.21C.065

if shown to be the best of all available mitigation alternatives. Secondly, they are unlikely to yield significant net revenues for the road system, above and beyond the costs of environmental mitigation that the county will have to fund from the proceeds of the fee.

Will it grow over time? No.

b. Equity

Do those who enjoy the benefits pay the costs? Generally, no: the costs are paid by projects and undertakings that have a negative impact upon the environment while the benefits are enjoyed by road users. There is some overlap in program areas such as flood control and surface water runoff management.

Can it be equated to roads, rather than to other county programs? No. SEPA fees that exceed the costs of the environmental mitigation they are intended to fund could be applied by the county to any program.

c. Simplicity

What legislation or voter approval is required? None. The county has authority to levy SEPA fees, providing it complies with all of the requirements of that Act.

C. Unilateral New Revenue Sources

This section describes revenues from new sources that King County can raise while acting alone. This section excludes options that do not yield significant new revenues or sources that are already allocated to other county programs.

1. Vehicle License Fee

A countywide vehicle registration surcharge is a new revenue source only in that King County does not collect one currently. This is analyzed as an unincorporated-only local option vehicle license fee as part of a Transportation Benefit District.

Washington State collects a vehicle license fee of $30 through the county-based registration of vehicles.[67] Until 2002, State legislation also allowed for, a "locally imposed motor vehicle excise tax," the proceeds from which are to be "strictly used for transportation purposes."[68] Until 2002, the County did collect a $15 per vehicle local option license fee levied for county road and city street

[67] RCW 46.16.021(1)

[68] RCW 82.44

purposes and a 0.3 percent motor vehicle excise tax levied by Sound Transit.[69] In 2002, Initiative 776 repealed local taxes on motor vehicles and in 2003 the State Supreme Court upheld the constitutionality of the initiative.

The loss of this revenue was particularly damaging to RSD. The vehicle license fee provided RSD with about $5 million per year prior to 2002 and this revenue stream had been pledged to repay bonds issued by the county in support of road construction efforts. Also, the revenues from vehicle license fees were pledged by the county to partner with cities on regionally significant projects.

With the approval by the state legislature of House Bill 1858 in 2007, the county has regained ability to levy a local option vehicle fee up to $100 per vehicle through the creation of a Transportation Benefit District.

a. Efficiency

What will it yield? Each $10 per year of vehicle registration fees, applied throughout the unincorporated areas of the county, would raise about $3 million per year.[70] If the fee were graduated by gross vehicle weight (GVW) the yield would be somewhat higher.

Will it grow over time? Yes, at a more rapid rate than either motor fuel taxes for vehicle-miles-travelled fees, as vehicles that drive fewer miles per year pay as much as vehicles that drive more miles per year.

b. Equity

Do those who enjoy the benefits pay the costs? Yes, it will be paid by owners of vehicles who live in unincorporated areas of the county. Implemented as a flat rate fee it is regressive. However, there are variants on vehicle registration fees that could make them less regressive.

Can it be equated to roads, rather than to other county programs? When collected prior to 2002, the revenues were dedicated to the Road Fund.

c. Simplicity

What legislation or voter approval is required? House Bill 1858 (2007) allows counties to impose a transportation benefit district to impose vehicle license fee of up to $20 without voter approval. Voter approval is

[69] King County Code 4.26

[70] There are about 1.76 million vehicles registered in King County, so this estimate implies that about 300,000 of those vehicles are registered in unincorporated areas of the county.

required for any amount of the fee above $20 per vehicle; to the maximum of $100 per vehicle allowed under state law.

2. Parking Tax

A new tax on the revenue earned from commercial parking lots or on the commercial parking lots themselves.

a. Efficiency

What will it yield? King County staff estimate that where the tax is imposed now by cities within the county the rates vary from 5% to 27%. The revenues collected are likely to be small, however, since there is little demand for commercial parking in unincorporated areas of the county.

Will it grow over time? Not appreciably: commercial parking operations are most likely to be located in those parts of the unincorporated area of the county that are heavily urbanized and subject to annexation. As the commercial parking operations are annexed, the municipalities will inherit the revenues.

b. Equity

Do those who enjoy the benefits pay the costs? Yes, the tax will be paid by people who drive on county roads. Certain types of vehicles would be exempt, for example, carpools, vehicles with handicapped decals, and government vehicles

Can it be equated to roads, rather than to other county programs? Yes.

What legislation or voter approval is required? Voter approval is not required.

c. Simplicity

Can it be implemented by the county alone, without participation of other counties in the region or the state? RCW 82.80.030 allows either the county or the regional transportation improvement district to tax commercial parking operations in unincorporated areas of the county. Commercial parking taxes are already taxed in several cities within King County.

3. Surcharge on Nonresidential Parking Spaces

A new, incremental property tax or impact fee levied on the parking spaces built as part of newly constructed or redeveloped commercial properties.

a. Efficiency

What will it yield? No numerical estimates can be made without access to the individual property assessments of commercial properties in unincorporated areas. However, research of this concept in other jurisdictions suggests that such a measure could raise about $25 million per year if implemented county-wide.[71]

Will it grow over time? Once implemented on all nonresidential parking spaces, revenues would grow in line with commercial development, i.e. the growth in the number of parking spaces. County and municipal codes specify the minimum number of parking spaces that must be provided in a new or redeveloped commercial property.

b. Equity

Do those who enjoy the benefits pay the costs? Yes, the tax will be paid business that offer parking spaces to their customers and their employees, with the added costs being passed on to those customers and employees. Special use spaces, e.g. spaces reserved for vanpools, persons with disabilities, could be exempted. Commercial parking operations would be exempt from this measure as they can be taxed separately.

This proposal was implemented in the Greater Vancouver Regional District (British Columbia) in 2005 and remained in place until 2007, when the Government of British Columbia replaced it with greater taxing authority for district across all classes of property to support transportation initiatives.[72]

Can it be equated to roads, rather than to other county programs? Yes, it must be used for transportation purposes.

What legislation or voter approval is required? Voter approval is not required. RCW 36.73.120 allows the governing board of a transportation benefit district to "impose a fee or charge on the construction or reconstruction of commercial buildings, industrial buildings, or on any other commercial or industrial building or building space or appurtenance, or on the development, subdivision, classification, or reclassification of land for commercial purposes." Such a fee could be based on the number of parking stalls included in the commercial property.

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[71] http://www.translink.bc.ca/About_TransLink/News_Releases/news09210501.asp

[72] Vancouver Sun, 1 December 2007. Liberals Shelve Translink's Parking Tax: *Businesses cheer bill that will spread levy around.*

c. Simplicity

Can it be implemented by the county alone, without participation of other counties in the region or the state? Yes. However, the surcharge is difficult to administer. Each commercial property must be assessed to determine the number of parking spaces it contains, taking care to exclude bike racks, walkways, loading bays and turn-arounds.

D. Multilateral New Revenue Sources

This section describes new revenues that King County could only raise in partnership with other governments.

1. Vehicle Miles Travelled Fee

A VMT charge is a user fee paid by drivers for each mile driven. Many transportation-related organizations have concluded that a mileage-based user fee is a superior alternative to the fuel tax. This charge would initially replace the motor fuel tax and would provide for current transportation projects.

This option is best implemented statewide, as part of a national movement toward a VMT charge as a replacement to the motor fuels tax. If GPS technology is used, local jurisdictions could collect the tax.

a. Efficiency

What will it yield? As an indication of what this type of road user fee would involve consider that a VMT charge of about 3¢ per mile for all road use in the county would approximate the current state motor fuel tax yield of 34¢ per gallon.

Will it grow over time? Increasing the VMT charge would provide net new revenues and could fund new transportation projects. Revenues will vary directly with VMT. A VMT charge is immune to erosions of revenue caused by increasing fuel efficiency; they are, however, vulnerable to cost inflation.

b. Equity

Do those who enjoy the benefits pay the costs? Yes, they would be paid by the same users that pay motor fuel taxes now.

Can it be equated to roads, rather than to other county programs? VMT comprise a source of revenue that is unlikely to be raised for purposes other than funding transportation; thus they have a low opportunity cost to other government programs.

a. Simplicity

Field trials of VMT collection systems in Oregon during 2006 and 2007 encountered significant public concern about governments being able to monitor the movements of private vehicles on the nation's roadways.[73]

What legislation or voter approval is required? VMT charges are very complex to implement and administer. Implementing the system would take a significant investment in administrative systems, education, and new technologies. It would be difficult to enforce VMT charges in border areas. The most likely path of implementation is a 20-year effort towards nationwide implementation.

2. Congestion Fees

Congestion pricing, also called zone pricing or cordon pricing, involves the application of variable fees or charges for the right to travel during peak periods in and/or around key locations. Road use charges provide incentives for users to shift some trips to off-peak times, to less congested routes, to other modes, or to cause some lower-valued trips to be combined with other trips or eliminated. A shift in a relatively small number of peak-period trips can lead to substantial reductions in overall congestion.

a. Efficiency

What will it yield? Congestion pricing is not efficient; it is designed to discourage travel and thus limit the revenue that can be collected from it. Congestion charges are viable as a local option, as they are typically charged within an urban center.

Will it grow over time? In unincorporated areas, generally not.

b. Equity

Do those who enjoy the benefits pay the costs? Since congestion pricing is location-specific, users directly benefit, but lower income users will bear a greater proportion of the burden. While they are understandable to the public for urban congestion, suburbanites – a majority of whom commute between suburbs and not into an urban core – may not view congestion charges as a solution for congestion.

Can it be equated to roads, rather than to other county programs? Congestion pricing schemes are designed to reduce congestion on a road

[73] Wall Street Journal, 10 May 2005: Soak the Green: *Oregon mulls a new tax that environmentalists and privacy advocates will hate.*

network by increasing the cost of travel and thus inhibiting the overall use of congested segments and nodes in the network.

a. Simplicity

What legislation or voter approval is required? The administration of congestion charges is complex and expensive. They have high costs of collection and compliance and would require the adoption of new technologies and legislation. They would likely require new legislation.

3. Container Fees

Container fees are charges imposed on freight containers as they move through a port, rail yard, or other facility.

a. Efficiency

What will it yield? During 2006 and 2007, a proposal for a fee of $30 per inbound twenty-foot equivalent (TEU) at Long Beach and Los Angeles was extensively debated in California. A $30 per container fee levied at the port of Seattle would generate approximately $50 million per year. [74]

Will it grow over time? This revenue is highly dependent on economic cycles and very sensitive to price changes: a small shift in the relative costs of container handling in the highly competitive market for port services can result in substantial diversions of traffic to other ports.

b. Equity

Do those who enjoy the benefits pay the costs? Fees would be used to pay for a specific list of improvements directly related to the improvement of freight movements in Washington. Such improvements are unlikely to be necessary on county roads in unincorporated areas.

Can it be equated to roads, rather than to other county programs? It is unlikely that revenues from container fees would be diverted to projects other than those sanctioned by the ports and the shippers that use them. Container fees would place the implementing ports at a significant cost disadvantage to all other ports.

[74] This implies annual traffic of about 1.7 million TEUs. This is slightly lower than 2007 peak levels of 1.8 million TEUs, reflecting an assumption that some traffic will be shifted to competing ports by a differential and additional fee. The maximum capacity to which the Port of Seattle could ultimately expand is estimated to be between 3 million and 4 million TEUs per year.

a. Simplicity

What legislation or voter approval is required? Container fees are viable exclusively as a local option; they should be collected by port authorities, and are therefore specific to port infrastructure.

Appendix A: Sources and Uses of Funds, 2009

Sources of Funds	*$ millions*	
Taxes and other Core Revenues		
Unincorporated area property tax levy	83.20	
Motor fuel tax	15.87	
Other revenues, Road Fund	2.46	
		101.53
Reimbursements for Services		
Reimbursable services: other agencies	5.86	
Road maintenance: cities	3.40	
Traffic operations: cities	3.33	
R/W utility inspection fees	1.48	
Regional storm water disposal fees	0.76	
		14.83
Proceeds from sale of land, Road Fund		9.36
Grants		2.69
Road Fund Revenues		**128.41**
Capital Improvement Program Revenues		
Federal share of capital projects	8.09	
State share of capital projects	1.80	
Traffic mitigation fees	2.35	
Other revenues, CIP	0.23	
Proceeds from sale of land, CIP	3.17	
Contracts with Parks and WLRD CIPs	4.24	
		19.87
Bond proceeds		7.00
Cash, Road Fund opening balance		0.40
		$155.68

Uses of Funds	*$ millions*	
Core Programs		
Roads in unincorporated areas	58.84	
Surface water utility payment	3.53	
Roads Capital Improvement Program	64.53	
		126.90
Reimbursable Programs		
Maintenance and Operations	14.83	
WLRD Capital Improvement Program	3.75	
Parks Dept Bridges	0.49	
		19.07
Transfer to Sheriff's Department		5.70
Cash, closing balance		4.01
		$155.68

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King County

King County Road Services Division

Service Levels

Roads Operational Master Plan: Working Paper 3

April 15, 2009

King County Road Services Division

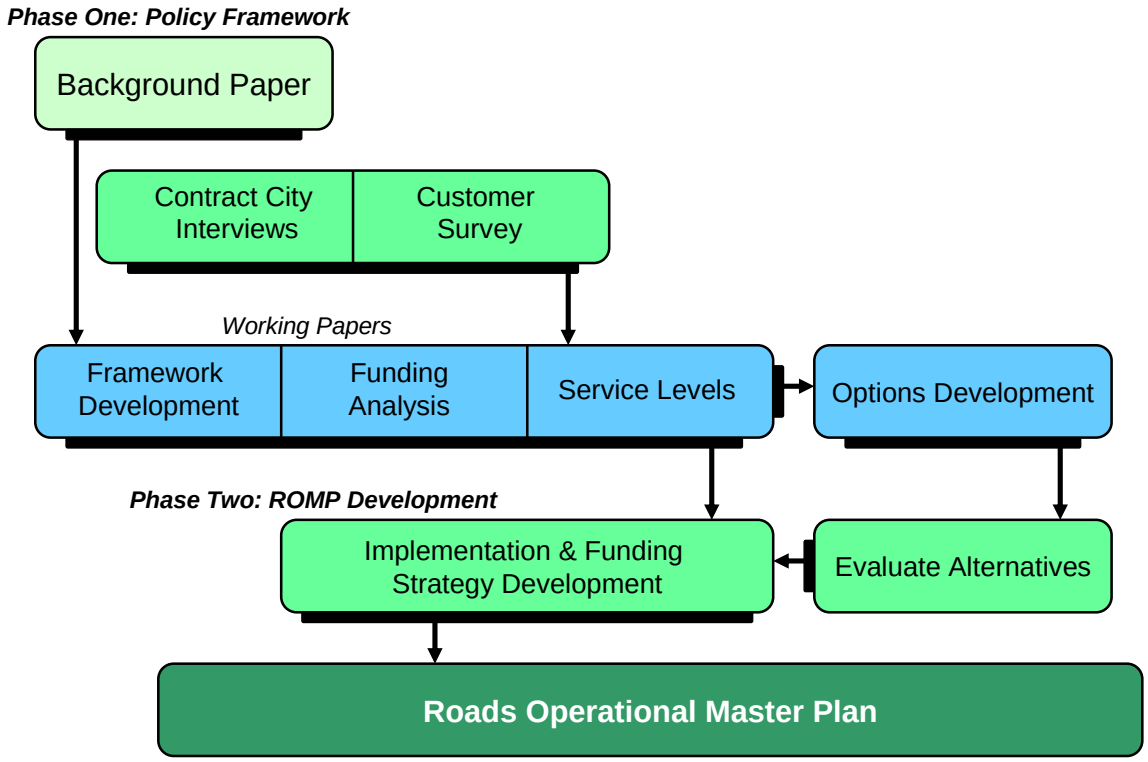
ROMP Working Paper 3: Service Levels

Table of Contents

I. Introduction

The King County Road Services Division Operational Master Plan (ROMP) is a comprehensive plan that presents how the Road Services Division (RSD) will operate and provide services in the future. The ROMP process has two phases; Phase One will produce a series of working papers that will serve as the building blocks for the final plan, as shown in Exhibit I-1 below. The working papers will be produced by both King County staff and consultants, with structured customer input, and reviewed by the ROMP Working Group and Advisory Committee.

Exhibit I-1: ROMP Development Process



Upon completion of Phase One, King County Road Services Division and Office of Management and Budget staff members will develop the ROMP. Ultimately, the ROMP is a product of the King County Executive and the Office of Management and Budget, and a strategic guidance document for the Road Services Division.

A. Organization

This document, Working Paper Three: Service Levels, summarizes the use of service levels in managing the business of RSD and provides a policy-level analysis of the service levels and standards that are used to define the work requirements and

needs of the Road Services Division. It is organized into four sections and an appendix:

Section I: Introduction

Section II: Service Level Trends and Options for County Roads describes overall service level trends on county roads and the implications of change drivers and revenue trends for future service levels.

Section III: Current Service Levels presents the standards and mandates set by county, state, and federal government agencies that drive the outcomes, activities, and level of service measures used by the Road Services Division. This section presents available information on RSD's current service levels and describes how standards and service level measures are currently used in practice.

Appendix A: List of Standards, Mandates, and Policies lists the county, state, and federal requirements that prescribe RSD's business.

B. Definitions

Throughout this analysis, we use the following terms and concepts:

Service Level

A *service level* can be used to describe the quality, condition, operations performance, or other characteristic of a transportation product or service. The Bureau of Transportation Statistics defines *level of service* as "a set of characteristics that indicate the quality and quantity of transportation service provided, including characteristics that are quantifiable and those that are difficult to quantify."[1]

King County Code defines *level of service* as a measure of traffic congestion; it is used as part of the county's concurrency management program.[2] To avoid confusion with the concurrency program, this analysis uses the term *service level* in place of *level of service.*

Standard

Standards are design or performance requirements for the products and services provided by RSD. Many of these standards are set by federal, state, and/or county

[1] Bureau of Transportation Statistics (BTS) Dictionary.

[2] 21A.06.685 Level of service ("LOS"), traffic. Level of service ("LOS") traffic: a quantitative measure of traffic congestion identified by a declining letter scale (A-F) as calculated by the methodology contained in the 1985 Highway Capacity Manual Special Report 209 or as calculated by another method approved by the department of transportation. LOS "A" indicates free flow of traffic with no delays while LOS "F" indicates jammed conditions or extensive delay. (Ord. 14199 § 231, 2001: Ord. 10870 § 177, 1993).

mandates or are drawn from professional practice and apply to many facets of RSD's business, from snow removal practices to bridge engineering.

The State of Washington requires county road agencies to abide by "standards of good practice," which it defines as "general and uniform practices formulated and adopted by the board relating to the administration of county roads and the safe and efficient movement of people and goods over county roads."[3]

The State of Washington requires level of service standards to be set for all highways and locally owned arterials "to serve as a gauge to judge performance of the system."[4] This requirement is one of the mandatory elements of county or city comprehensive plans.

Need

In general, transportation agencies define *needs* as the gap between a planned service level and the current or forecast service levels. Agencies establish plans and programs that specify the work required to be performed to provide the service level. This includes the types of capital improvements, operations practices, and maintenance activities and their costs.

Performance Measure

Performance measures (sometimes referred to as service level measures) are used to determine progress toward goals and standards. Performance measures can be operational measures, such as the flow of traffic on the system; or condition measures, such as the ride quality of a section of pavement.

Performance measurement is a priority of the King County Executive and King County Council, evidenced by the King County Performance and Accountability Act[5]. There are two major performance measure efforts in the county: KingStat and AIMs High (Annual Indicators and Measures). County agencies are required to establish performance measures and report them in business plans. Where applicable, the use of RSD performance measures is assessed in service level outcome and standards areas below. A comprehensive list of RSD performance measures is available in ROMP Working Paper 1: Framework Development.

II. Service Level Trends and Options for County Roads

This section applies the results from the prior working papers and the description of current service level trends, provided in Section III, to characterize the options available to King County policy makers regarding service levels for County roads.

[3] RCW 36.78.020
[4] RCW 36.70A.070
[5] King County Ordinance 16202.

A. Overview

Across RSD's business areas – capital project delivery, operations, and maintenance there is a growing gap between the County's service level goals and actual conditions. Working Paper 1: Framework Development and Working Paper 2: Funding Analysis demonstrate trends that will result in decreasing service levels for roads in unincorporated King County in coming years. This situation has arisen due to increased demand for services, increased costs in delivering services, an aging rural road network, and the unsustainable practice of funding RSD's budget shortfall by sales of assets and bond issues.

The following highlights the main conclusions from the prior working papers that provide the context for the consideration of service levels:

- *Working Paper 1: Framework Development* identifies a series of change drivers, their impacts, and associated issues affecting the future business of RSD. These are: decreasing roads inventory, increasing travel demand, deteriorating asset conditions, increasing costs of business, and the emerging policy response to climate change. The net impact of these drivers will be increased, changing needs facing RSD.
- *Working Paper 2: Funding Analysis* identified a $21 million funding gap between revenue and expenditures in the 2009 budget and the limitations of current roads funding sources. The funding gap amounts to almost 15% of total expenditures and disbursements. RSD is making up the shortfall with sales of assets and bond issues. RSD must secure additional sources of sustainable revenue or manage large declines in service levels.

In this context, this section describes the overall service level trends for roads in unincorporated King County under three service level options that present alternative scenarios for roads in unincorporated King County. These options are:

- Option 1 – Current Law Revenues – Define the essentials and manage to decreased service levels

This option involves recognizing that, under current funding levels, RSD cannot meet the service level goals and other business objectives set for County roads. The County will need to define the essentials and incorporate decreased service levels into its business practices. The results of Working Paper 2: Funding Analysis indicates that, depending on how policy makers define essential priorities, a revenue increase may be required to meet the essentials. The service level analysis presented in Section III, shows that at recent budget levels the County has struggled to meet the essentials. Without increased revenue, under this option, there will deterioration in the condition of the roadways and a growing backlog of preservation and reconstruction needs.

- Option 2 – Asset Management Emphasis – Prioritizes preservation while addressing safety and other priorities

This option describes a scenario in which as a policy decision, King County emphasizes asset management with the objective of reducing the lifecycle costs of County roads. This involves performing maintenance and preservation work at the appropriate levels and times that reduce costs. With the emphasis on asset management, system development is limited and the County works on preserving the existing system and maximizing its productivity. This option will require an increase in revenue.

- Option 3 – Meet Current Standards and Service Level Targets – Provides service levels that meet current policy goals, planning objectives, standards, and performance targets

This option involves, affirming the County's commitment to meeting the service levels set in RSD's plans and related documents. This will require increased revenue.

The options are based on the analysis of current service levels provided in Section III of this working paper and the implications of the change drivers presented in the prior working papers for future service levels. In each option, it is important to note that policy decisions will be required to bridge the gap between forecast revenue and the funds required to provide the service level associated with that option. These policy decisions will involve some combination of one or more of the following: setting priorities between different business areas within RSD, planning for lower levels of service in some business areas, reducing costs of service delivery, and increasing revenue.

B. Option 1: Current Law Revenues – Define the Essentials and Manage to Decreased Service Levels

This option involves a reduction below current service levels and an increasing deterioration in the condition of County roads. Under current law revenue, the service levels will decline at a progressively greater rate over the next ten years. There will be a limited capital program and primarily reactive maintenance and preservation of the existing system. In this option, RSD will need to pare back current capital and maintenance expenditures below their current levels. This will result in reduced service levels and their associated targets.

The option will require the County to define the bare essentials to be funded from current law revenues. This will require prioritization between different business areas, given that currently RSD has an unsustainable level of expenditure as documented in Working Paper 2. Further, given the revenue analysis, when considering, this option it is important to note that a revenue increase is likely required to meet what would be defined by RSD as the bare essentials.

Depending on priorities set, this will limit expenditures to preservation and maintenance work that meets pressing safety needs and facilities that have risks of failure. It will call into question the ability to meet pavement preservation standards and to continue the short span bridge program. The increased travel demand on the road network in rural King County will increase travel times and generate the need for small projects such as traffic signals, left turn lanes, and other safety and operational improvements. It is not evident that these needs would be addressed under this option. The consequence would be degradation in the operational efficiency of the road system and longer travel times.

Under this option, there will be a continuation of and likely increase in deferred maintenance due to funding levels and the impacts of emergency weather events. We anticipate that winter maintenance and emergency response activity will continue to incur expenditures above those in annual budgets, as has been the case in recent years. The 2008 budget included $210,246 in deferred maintenance costs, which was only a small proportion of the overall deferred maintenance need. Over time, this backlog of deferred maintenance work adversely impacts the condition of the county's roadway assets and increases the work required to maintain them.[6] This will continue the current trend in which the backlog of maintenance work has grown. For example, the backlog of drainage projects has grown from 49 in 2004 to 310 in 2009.

A further implication is that there will be a growing gap between citizens' service expectations and RSD's ability to meet them. RSD monitors the number of citizen work requests related to RSD's ownership and operation of roadways (citizen action requests). These requests have increased by almost 40 percent over the past ten years while population has increased by about 6 percent.

In summary, the likely outcome from this service level option is a(n):

- Focus on reactive safety-related capital and maintenance work. Resources will be applied to address winter maintenance and respond to emergency events.
- Growing backlog of system preservation and maintenance work that results in the deterioration of the physical condition of county roads and infrastructure. The backlog of reconstruction needs will grow and the lifecycle costs to the county will increase due to underinvestment. For example, RSD estimates that if the Capital Improvement Project (CIP) bridge replacement plan was not implemented, the annual resources needed for bridge maintenance work would double in the next five to ten years and increase at a far greater rate thereafter.
- Increased travel times on principal arterials in unincorporated King County.
- Increased claims for damage.

[6] Working Paper 1: Framework Development

C. Option 2: Asset Management Emphasis – Prioritizes Preservation while Addressing Safety

This option involves King County placing a policy emphasis on asset management. Under this option, the policy direction is for RSD to achieve lowest lifecycle costs while addressing safety and other priorities. An asset management emphasis requires funds to address a backlog of roadway preservation and maintenance needs so that the county can lower the lifecycle costs of ownership for county roads. Working Papers 1 and 2 indicate that to meet option 2 service level objectives will require increased revenue.

Under this option the County emphasizes maintenance and preservation investments that lower lifecycle costs. Capital projects are scoped and funded to meet lifecycle management objectives. Similarly, roadside maintenance and the management of other asset classes such as sign replacement, drainage systems, and others is funded at a level that optimizes asset preservation while lowering lifecycle costs.

With the primary emphasis on asset management, this option would result in lower service levels for operational performance and a decrease in the ability to address mobility and safety-related improvements. It would also require a new approach to budgeting for winter maintenance and RSD response to emergency events.

The likely outcome from this service level option is:

- A program of rehabilitation and reconstruction of older roadways that are structurally and functionally obsolete. Such a program is necessary for those roads where simple resurfacing treatments do not effectively (or efficiently) prolong pavement life. RSD has analyzed 56.7 miles of its arterial roadway system and of these identified 39.8 miles that currently require rehabilitation or reconstruction at a cost of $77M in 2007 dollars to meet current load standards and life cycle performance.
- An optimized pavement preservation program in which overlays and other preservation treatments are made to extend the service life of the County's roads. Under the asset management option, the long-term outcome would be lower lifecycle costs for county roads.
- The current 2009 level of bridge replacement work in the CIP and bridge maintenance is sustained. An asset management emphasis for King County's bridges requires the replacement of structures as currently planned due to their age and structural conditions
- Maintenance activities will be performed at a frequency that enables optimized asset management of roadway assets such as drainage systems, signs, signals, guardrail, and striping among others. This involves investments above current levels.

D. Option 3: Meet Current Standards and LOS Targets

This option establishes for RSD the objective of meeting the county's current service level objectives and standards for mobility, safety, preservation, operation, and maintenance of county roads. These standards and the associated services levels are described in detail in Section III. Meeting this policy objective for many of RSD's activities would require a large sustained increase in revenue.

Under this option, the service level objectives and standards described in Section III are met. For many aspects of RSD's business, there is a large and growing gap between service levels and associated standards and the work performed. Further, the results from Working Papers 1 and 2 show that this gap will continue to grow without changing the service level targets and/or additional funding.

Section III of this working paper indicates that a comprehensive analysis of the needs gap between the county's policies, plans, standards and current conditions would generate very large needs numbers that can not be addressed.

The likely outcome from this service level option is:

- Current service levels and standards for pavement and bridge preservation are met. This will require continuing the bridge replacement programs at current levels.
- Roadway and traffic maintenance is funded at a higher level so that the backlog does not grow and a condition rating of 4, as measured by the RSD maintenance section's service level rating system, is attained.
- A capital program that includes roadway development projects that address safety improvements and changes to roadways to allow the safe efficient movement of increased traffic volumes.

III. Current Service Levels

This section identifies and evaluates the gap between the service level objectives set for the unincorporated King County road system and the actual conditions or measured service levels. There is not a systematic articulation of service level objectives and service level targets for the road system. Therefore, this working paper brings together data and information from a range of sources to describe service levels. Exhibit III-1 below shows all service level objectives established in policy and planning documents and provides a summary of current RSD business functions, associated service levels, and the resulting service level needs gap. A summary of feedback from a telephone survey of

unincorporated King County residents and a series of interviews with contract cities is also included below.[7,8]

A. Overview

The King County Comprehensive Plan presents the overall plan for the development and performance of the unincorporated roads network in King County. The Comprehensive Plan defines the planned mobility and related service levels to be provided by King County's road network for new development.

It does not define mobility, preservation, or safety-related service level. The Transportation Needs Report produced by RSD provides a long-range identification of capital improvement project needs. This needs list does not fully quantify the needs "gap" between current roadway conditions and the improvements needed to meet county service level goals and standards.

In addition to the county policies listed in Exhibit III-1, federal and state regulations and professional practices provide guidance for the professional standards and practice for the operations and maintenance of the county road system.

For each service, product, or program listed below, the following are identified:

- *Policy goal and outcome* as articulated by RSD, related to the service level or standard
- *Service level or standard*, if articulated by RSD
- *Current practice*, which includes the standard or service level in practice and performance measures and targets
- *Where available benchmarks*, showing RSD's current practice related to national or state practice, and/or any data from the three counties contacted to provide comparisons[9]
- *Customer feedback* from unincorporated King County residents and contract cities

[7] Strategic Learning Resources, "Contract Cities Survey Phase 1 Final Report," December 2008
[8] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008
[9] Caution should be used in drawing conclusions from this benchmark data. They are provided as illustrative comparisons where data are readily available and could be obtained within the scope of this effort Why Explain? This should be included in the text, rather than saying "caution should be used" we suggest explaining that this data is provided for illustrative comparisons, etc.

Exhibit III-1: Service Level Summary and Needs Gap

Category	RSD Service Level Objectives	Service Level	Needs Gap: Current Practice vs. Current Standard	Customer Feedback
Mobility	Address Concurrency requirements Address capacity needs -King County AIMs High reports average commute time (no target or service level)	Travel times, only for concurrency purposes, not for overall roadway performance	Priority project needs in Transportation Needs Report (TNR)	*Resident Survey* -On a scale of 1 to 5, 69% reported 3 or better capacity to allow smooth traffic flow -"Improving intersections and signals to speed traffic control and congestion" was reported the #2 service priority -"Adding new lanes to existing roads" was reported the #3 service priority -"Road improvements that make it easier to use the bus" was reported the #5 service priority -"Adding new lanes for carpools or buses only" was reported the #6 service priority
Roads				*Resident Survey* -On a scale of 1 to 5, 81% reported 3 or better roadway and bridge surface condition -"Paved roadway surfaces" was reported the #1 asset priority -"Storm water drainage" was reported the #3 asset priority
Preservation	Meet pavement condition standard	Target: 80% of roads at pavement condition score (PCS) of 40 or better	Currently meeting service level	
Reconstruction	Not identified outside of PCS target accomplishment	Not identified	Partially identified in Vulnerable Roads Study	

Category	RSD Service Level Objectives	Service Level	Needs Gap: Current Practice vs. Current Standard	Customer Feedback
Bridges	Meet bridge sufficiency ratings Number/percent bridges structurally deficient Number/percent bridges functionally obsolete Number/percent limited bridges	Targets: -Average annual sufficiency rating of 57 for timber bridges (Targets for 2007) -Average annual sufficiency rating of 75 for non-timber bridges (Targets for 2007) Number/percent bridges structurally deficient = 14 bridges or 7% (Target for 2009) -Number/percent bridges functionally obsolete = 40 bridges or 21% (Target for 2009) -Number/percent limited bridges 3 bridges or 2% (Target for 2009)	Currently meeting service level	*Resident Survey* -On a scale of 1 to 5, 81% reported 3 or better roadway and bridge surface condition -"Bridge repair or replacement" was the #2 asset priority
Traffic Operations				*Resident Survey* -On a scale of 1 to 5, 80% reported 3 or better timing of traffic lights to allow smooth traffic flow
Guardrail	Improve safety	Comply with MUTCD and state standards	Priority project needs in TNR and documented by RSD Traffic Engineering	

Category	RSD Service Level Objectives	Service Level	Needs Gap: Current Practice vs. Current Standard	Customer Feedback
Signals	Support mobility goals	Not specified	Priority project needs in TNR and documented by RSD Traffic Engineering	*Contract Cities* -Cities reported overall satisfaction with traffic operations and maintenance services
Intelligent Transportation Systems (ITS)	Support mobility goals	Comply with MUTCD, federal, and state standards	Priority project needs in TNR and documented by RSD Traffic Engineering	
Small Scope Operational Projects	Improve safety and mobility Sidewalks near schools	Not specified	Priority project needs in TNR and documented by RSD Traffic Engineering	
Safety	Address High Accident Locations (HAL) and High Accident Road Segments (HARS)	Not specified	Priority project needs in TNR	*Resident Survey* -"Making road safety improvements to help reduce accidents" was reported the #1 service priority
Maintenance				
Traffic Control	Improve safety and mobility	Meet MUTCD standards	Actual condition vs. MUTCD standards	*Resident Survey* -On a scale of 1 to 5, 93% reported 3 or better response time to repair traffic signals and signs -"Traffic signal and sign maintenance" was reported the #4 asset priority

Category	RSD Service Level Objectives	Service Level	Needs Gap: Current Practice vs. Current Standard	Customer Feedback
				Contract Cities -Cities reported overall satisfaction with traffic operations and maintenance services
Roads Maintenance[10]	Preserve system Safety of road user	Roads Maintenance has defined service levels for: - Roadway surface - Shoulders - Bridges - Roadside - Drainage Established a condition target of 4.0 and defined the annual work required to meet these service targets	Roads maintenance has work underway to quantify the gap. It is currently large for many inventory items	*Resident Survey* -On a scale of 1 to 5, 88% reported 3 or better response to road hazards and storm conditions -On a scale of 1 to 5, 80% reported 3 or better response to ice and snow removal -"Road shoulder maintenance" was reported the #5 asset priority
				Contract Cities -Cities reported inconsistent levels of satisfaction with roads maintenance services
Nonmotorized	Improve safety and mobility	Not specified Sidewalks within ½ mile of schools	Priority project needs in TNR and estimated by RSD Traffic Engineering	*Resident Survey* -On a scale of 1 to 5, 80% reported 3 or better walkway condition -"Walkway maintenance" was reported the #6 asset priority -"Pedestrian improvements that make walking safer and more appealing" was reported the #4 service priority -"Increasing the number of walkways, sidewalks, or unpaved pathways" was reported the #7 service priority

[10] New service levels have been developed by RSD Maintenance Section as part of their maintenance management system development project

B. Standards and Service Levels

Standards drive many of the service levels for the products and services of the Road Services Division. These standards are often mandated by various agencies: King County Code, Washington State Code, and federal laws and regulations. Those standards of practice that are not articulated by a specific mandate are typically assumed by RSD management to fall under "standards of good practice," which the state defines as:

> "Standards of good practice" shall mean general and uniform practices formulated and adopted by the board relating to the administration of county roads and the safe and efficient movement of people and goods over county roads, which shall apply to engineering, design procedures, maintenance, traffic control, safety, planning, programming, road classification, road inventories, budgeting and accounting procedures, management practices, equipment policies, personnel policies, and effective use of transportation-related information technology.[11]

A series of standards can apply to several different outcomes, for example, pavement condition standards apply to mobility, asset preservation, safety, and maintenance outcomes. The standards and service level outcomes applicable to county roads are described below

1. Road Design and Construction

a. Policy Goal and Outcome

King County Code mandates RSD develop and maintain road design and construction standards.[12] The outcome of these standards is a roadway system in good condition.

b. Standard

Washington State law requires county road agencies to report asset condition in the road log, submitted annually to the County Road Administration Board (CRAB), which determines state allocation of fuel tax revenues.[13] Using the WSDOT pavement surface condition manual, RSD must conduct a survey of visual arterial pavement condition at least biennially.[14] Failure to comply with or meet these standards jeopardizes funding.

[11] RCW 36.78.020
[12] KCC 14.42
[13] WAC 136-60, RCW 46.68.124, RCW 36.86.020
[14] WAC 136-70-040

GASB 34 requires state and county road agencies to set and maintain standards for general infrastructure.[15]

The King County RSD states:

King County has adopted its road design and construction standards for a two-fold purpose:

1. *To set forth specific, consistent and acceptable road design and construction elements for developers and other private parties constructing or modifying road or right-of-way facilities which require County licenses or permits;*
2. *To establish uniform criteria to guide the County's own design and construction of new County roads or reconstruction of existing roads.*

In addition, these King County Road Design and Construction Standards, hereafter known as the Standards, are intended to support King County's goals for achieving affordable housing, providing adequate facilities for development in an efficient manner, complying with storm water management and environmental and cultural resource policies, and to balance these goals with the general safety and mobility needs of the traveling public.

The County requires standardization of road design elements where necessary for consistency and to assure so far as practical that motoring, bicycling, transit, equestrian, and pedestrian public safety needs are met. Considerations include safety, convenience, pleasant appearance, proper drainage, economical maintenance, and cultural and environmental resource protection. The Standards also provide requirements for the location and installation of utilities within the right-of-way.

The County's permitting and licensing activities require the adoption of specific identifiable standards to guide private individuals and entities in the administrative process of procuring the necessary County approval. Yet, the County must have flexibility to carry out its general duty to provide streets, roads, and highways for the diverse and changing needs of the traveling public. These Standards are not intended to represent the legal standard by which the County's duty to the traveling public is to be measured.

These Standards cannot provide for all situations. They are intended to assist but not to substitute for competent work by design professionals. It

[15] Government Accounting Standards Board (GASB) Statement 34, Basic Financial Statements for State and Local Governments

is expected that land surveyors, engineers, architects, and contractors will bring to each project the best of skills from their respective area of expertise. These Standards are not intended to limit unreasonably any economically maintained innovative or creative efforts or lower impact development alternatives that could result in equivalent or improved safety, quality, and maintainability. Environmental constraints may require more intense or rigorous design parameters than would be otherwise required. However, any proposed departure from the Standards will be judged on the likelihood that such variance will produce a compensating or comparable result, in every way safe and adequate for the public.

Pavement condition standards and bridge condition ratings are set by responsible units within the Engineering Services Section. Needs are determined based on these standards and quantified based on the level of effort required to meet the standard. Road preservation needs are reported in the *Transportation Needs Report* and bridge preservation needs are reported in the *Annual Bridge Report*. These reports are major inputs to the Capital Improvement Program.

To help prioritize structural needs, (if referring to Pavement Testing) RSD instituted the Vulnerable Roads Segments study in 2005. This study identifies and addresses specific roadway funding needs throughout the county. The preservation of other assets, such as seawalls and facilities, is not specifically mandated and falls under "standards of good practice."

The RSD standard for pavement condition is the pavement condition score (PCS), which rates the surface condition of the roadway on a scale of 0 to 100. The PCS measure is used by all counties in Washington State. It is an overall condition indicator of pavement distress.

The Construction Engineering Unit within the Engineering Services Section is responsible for developing, maintaining, and updating King county pavement standards. This unit ensures compliance with State and Local standards through an inspection program; arterials are inspected every two years, and local roads are inspected every three years.

c. Current Practice

(1) Standards in practice

RSD has determined that 80 percent of roads rated a PCS of 40 or better optimizes lifecycle costs.[16] This number is also the service level for roadway condition in King County.

To meet this target, an annual overlay program is established based on an industry-accepted general performance curve for asphalt surfaced arterials. The measured surface condition of each road segment, the PCS rating, determines the roads' appropriate pavement treatment and/or timing. The general pavement management strategy is to perform the treatments listed below in Exhibit III-2 based on the measured PCS.

Exhibit III-2: Pavement Condition Score Definitions

PCS	Condition	Action
75-100	Excellent	Seal as needed
50-74	Good	Repair as needed
30-49	Fair	Rehab or Thin Overlay
0-29	Poor	Reconstruct or Rehab

(2) Current service levels

RSD's pavement program is constrained to preservation activities. Overlay projects are designed to maintain an acceptable condition standard for a 15-year life cycle, and local access roads are designed on a 32-year life cycle. The current budgeted need to meet service level targets is approximately $7.8 million per year in 2007 dollars. This figure does not include Roads Maintenance functions in support of the pavement overlay and maintenance programs. The current fiscal year introduced further revenue constraints and RSD has moved to a chip seal program to preserve pavement condition, which is estimated to last 6 to 8 years.

(3) Performance measurement

Exhibit III-3 below shows the current pavement condition performance measure and target.

[16] King County AIMS High

Exhibit III-3: Current Pavement Condition Measure and Target[17]

Performance Measure	2007 Target	2007 Actual
Percent of unincorporated road miles at 40 or better PCS	80% or better	Arterial/collector: 91% Local access: 87%

(4) Benchmarks

The CRAB collects data on pavement condition data for counties in Washington that can be used for benchmarking. Exhibit III-4 below compares King County's pavement condition to the statewide average for all counties excluding King, Pierce, and Clark Counties.

The difference between King County's score and the statewide numbers is not considered significant because there is a margin of error due to the subjectivity of the pavement rating process itself. Unique raters might measure a visible distress such as the length and width of a longitudinal crack slightly differently. Different agencies may not collect field data in the same manner or with the same frequency, which will impact comparisons between agencies' overall PCS. Exhibit III-4 below shows that King County's average pavement condition is similar to the state average.

Exhibit III-4: King County Weighted Average Pavement Structural Condition (PSC) Ratings Compared to Statewide County Average[18,19]

	Arterial	Collector	Total
Statewide			
Miles	719.527	9946.384	10665.911
Average PSC	83	85	84
King County			
Miles	180.468	339.948	520.416
Average PSC	79	73	75
Clark County			
Miles	84.3	344.4	428.6
Average PSC	82	90.2	88.6

[17] 2007 RSD Performance Data Master List

[18] Centerline miles

[19] 2007 - 2008 statewide county average provided by CRAB; King, Pierce and Clark Counties are NOT included in statewide average since their raw data is not stored at CRAB; Clark and Pierce County data supplied by county pavement management staff in March 2009

Pierce County			
Miles	316.18	352.36	668.54
Average PSC	82	77	79

Of the Working Paper 1 comparison counties, Sacramento County was the only comparison county with available information. Sacramento County's pavement lifecycle management program is standards- and service level-based. Sacramento County uses a computerized Pavement Management System (PMS) that assists the county engineering staff in evaluating, tracking, and ranking pavement conditions. This is very similar to the system used by King County.

(5) Customer feedback

Resident survey respondents identified priorities for the county road system assets in the context of limited funds and the potential for decreasing services and service level outcomes. Paved roadway surfaces were the top priority of survey respondents. Eighty percent of respondents rated roadway and bridge surfaces at 3 or better on a scale of 1 to 5. When asked what specifically needed improvement, most respondents reported the response time to repair the surface of the roadway. [20]

Resident survey respondents identified priorities for the county road system assets in the context of limited funds and the potential for decreasing services and service level outcomes. Overall, respondents reported their priorities as:

1. Paved roadway surfaces; comments included:
   - Repairs are not made quickly enough
   - Repairs to roads do not last long enough
2. Storm water drainage; comments included:
   - Standing water and inadequate drainage leading to unsafe conditions

[20] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Questions 2, 12, 15

3. Bridge repair or replacement[21]

2. Bridge Design and Construction

a. Policy Goal and Outcome

State of Washington Code sets forth minimum load capacity and width requirements for all bridges and requires the County Road Engineer to submit construction standards for bridges for adoption by the King County Council.[22]

Standards and guidelines are in place for the design of new bridges, the rehabilitation and seismic retrofit of existing bridges, and for the inspection and load rating of in-service bridges. There are no uniform standards that set minimum maintenance intervals or service reliability – the length of time a bridge is closed for repair – for bridges.

b. Standard

Federal funding eligibility for county bridges is tied closely to condition inspection and reporting requirements. Bridge condition standards must be set and maintained in compliance with the Highway Bridge Replacement and Rehabilitation program.[23]

King County is required to use the federal standard for bridge condition ratings, sufficiency rating, which is a federal standard measurement used to rate bridges on structural adequacy, serviceability, and essentiality for public use on a scale of 0 to 100.

The Bridge and Structural Design unit within the Engineering Services Section is responsible for ensuring compliance with these standards, which require bridges to be inspected at least every two years. Bridges under 20 feet in length, which are not required to meet federal standards, are managed by King County in the same manner, which ensures that bridges under 20 feet in length operate at the same standard as all other bridges in the county.

[21] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Questions 15-17
[22] RCW 36.86.020
[23] 23 CFR 650.301-311, 401-415

c. Current Practice

(1) Standards in practice

RSD follows national standards and inspection practices as implemented through the WSDOT Highways and Local Programs Office. These standards produce sufficiency ratings and identify structural deficiencies and functional obsolescence.[24,25] The target sufficiency rating is the service level for bridge condition in King County. Structurally deficient bridges are the current priority for RSD. Typically, RSD does not replace or upgrade functionally obsolete bridges unless they also have structural deficiencies. RSD also seeks to reduce the number of load-limited bridges owned by the county.

Sufficiency ratings are used to determine federal bridge funding eligibility for replacement and rehabilitation projects. Bridge preservation and maintenance is reactive; that is, bridges are maintained or repaired on an as-needed basis. When a bridge's sufficiency rating falls below 50, it becomes eligible for funding through a competitive process overseen by WSDOT. Limited federal funding is also available for major repairs or preventive maintenance.

In compliance with state and county law, bridge needs are determined through inspection results and priority processes, which are reported annually in the *Annual Bridge Report*. The current annual bridge maintenance budget is about $700,000. This includes the Bridge Priority Maintenance projects budgeted in the CIP; in addition, approximately sixteen engineering FTEs inspect bridges and define and implement maintenance and repair work.

With the current CIP to replace bridges, RSD finds the current budget of roughly $700,000 has been adequate to accomplish the highest priority reactive maintenance work orders. High-cost bridge painting projects have received federal funding and we have every reason to believe that it will continue at least with the next authorization. Future bridge replacement projects of greater than $10 million, like Alvord T Bridge, are outside the feasible funding

[24] Bridges are considered Structurally Deficient if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge creates flooding over the bridge deck and adjacent roadway causing significant traffic interruptions. The fact that a bridge is structurally "deficient" does not immediately imply that it is likely to collapse or that it is unsafe.

[25] Functional obsolescence is a function of the geometrics (e.g., height, width, alignment) of the bridge in relation to the geometrics required by current design standards. Functional obsolescence results from changing traffic demands on the structure.

allocated for local agencies. With the current level of budgeting, RSD will be forced to close those high-cost bridges, including the South Park, Alvord T, and Berrydale bridges, in the near future.

RSD estimates that without planned bridge replacements, after about ten years, the resource requirements for maintaining the county's bridges would more than double. After ten years without bridge replacement, these needs would increase geometrically. A program of preservation without replacement is not sustainable over a long period given King County's current bridge inventory.

(2) Current service levels

Since 2005, the average sufficiency rating for all King County bridges has risen from 68.2 to 68.7 at the close of 2007. The primary means of maintaining this target level is the work-order-driven bridge maintenance program, which preserves the designed expected service life of each bridge. Capital improvements are the next most important means of keeping the sufficiency rating at the target level. Without replacing on average two bridges per year, the average sufficiency rating would steadily decline as dozens of bridges reach the end of or exceed their useful life. This situation occurred during the early 1990s as a result of inadequate bridge capital work during the prior two decades.

The amount of reactive maintenance increases in order to keep bridges in service when they are not replaced at the end of their service life. Additionally, disproportionately high engineering time is required to monitor and load-rate deficient structures. These added demands on maintenance and engineering depletes resources needed to ensure maximum service life on the remainder of the bridge inventory.

At the conclusion of the Short Span Bridge Replacement Program the average sufficiency rating will probably be in the low 70s, trending slightly upward throughout the current program of three bridges replaced per year. Thereafter, large bridges will again dominate the needed replacement list, however, in fewer number than during the 1990s and 2000s. Even as the number of projects will likely decline, the cost per project will continue to rise given past trends that resulted from increased environmental considerations and revised structural design codes.

(3) Performance measurement

Exhibit III-5 below shows the current performance measures and targets used by King County RSD to measure bridge condition.

Exhibit III-5: Current Bridge Condition Measures and Targets[26]

Performance Measure	2007 Target	2007 Actual
Average annual sufficiency rating for timber bridges	57	58.27
Average annual sufficiency rating for non-timber bridges	75	77.29
Number or percent of bridges structurally deficient	N/A	9%
Number or percent of bridges functionally obsolete	N/A	23%
Number or percent of load-limited bridges	N/A	3%

National standards for inspection, reporting, and preservation are presented in FHWA's National Bridge Inspection Standards. RSD follows these standards and practices.

(4) Benchmarks

Exhibit III-6 below shows the number and percent of structurally deficient bridges in Washington counties that own at least 100 bridges. As shown below, 8.6 percent of King County's bridges are classified as structurally deficient. This is the second-highest percentage in the state.

Exhibit III-6: Structurally Deficient County-Owned Bridges in Selected Counties[27]

County	Bridges Owned	Structurally Deficient Bridges	Percent Deficient
Grays Harbor	154	14	9.1%
King[28]	*197*	*17*	*8.6%*

[26] 2007 RSD Performance Data Master List
[27] Raw data provided by WSDOT Highways and Local Programs Bridge Engineer in May 2009 and summarized by RSD staff
[28] Note: Number of bridges and percentages shown are for general comparative purposes and will not exactly match performance measures stated elsewhere

County	Bridges Owned	Structurally Deficient Bridges	Percent Deficient
Skagit	102	8	7.8%
Snohomish	210	15	7.1%
Spokane	159	11	6.9%
Lincoln	123	7	5.7%
Adams	201	11	5.5%
Whatcom	160	8	5.0%
Yakima	359	15	4.2%
Pierce	167	5	3.0%
Walla Walla	187	5	2.7%
Whitman	307	7	2.3%
Lewis	210	3	1.4%
Franklin	104	1	1.0%
Kittatas	266	2	0.8%
Grant	257	1	0.4%
Benton	123	0	0.0%
Thurston	109	0	0.0%

(5) Customer feedback

Resident survey respondents identified priorities for the county road system assets in the context of limited funds and the potential for decreasing services and service level outcomes. Bridge repair or replacement was the second highest priority of survey respondents.[29]

3. Environmental Compliance and Mitigation

a. Policy Goal and Outcome

The goal of environmental standards and regulations is the preservation and improvement of the natural environment with respect to RSD projects and programs.

[29] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Questions 15

b. Standard

Transportation asset design, construction, and maintenance projects must comply with a large number of environmental standards. The chief regulation that affects the service level of RSD products and services is the Washington State Environmental Policy Act (SEPA).[30] Federal regulations such as the Clean Air Act, the Clean Water Act, and the Endangered Species Act also establish standards for compliance.

Drainage structures and culverts must facilitate fish passage as required by Washington State law.[31] Repairs and retrofits to existing drainage structures must "incorporate mitigation measures as necessary to achieve no-net loss of productive capacity of fish and shellfish habitat."[32] Mitigation activities must adhere to guidelines and requirements for improving habitat conditions set by the National Marine Fisheries Service.[33]

The Environmental unit within the Engineering Services Section monitors compliance with SEPA, federal environmental regulations, and achievement of county environmental goals.

c. Current Practice

(1) Standards in practice

Environmental mitigation and climate change are priorities of King County government. Many county environmental ordinances and policies, such as the Stormwater Ordinance and the Critical Areas Ordinance, determine service levels for RSD services.[34] Environmental standards do not drive needs identification; however, these standards affect the cost of meeting RSD needs. For example, if roads built to prior standards need reconstructing because they are in danger of failing, the environmental standards affect the cost of reconstructing the roadway. An analysis of the costs of compliance with environmental regulations is presented in Working Paper 1: Framework Development.

(2) Performance measurement

King County RSD performance measures track fish passage efforts. These are shown below in Exhibit III-7.

[30] RCW 43.21C, WAC 197-11
[31] RCW 77.55.060, WAC 220-110-070
[32] WAC 220-110-070
[33] U.S. Fish and Wildlife Service Endangered Species Program, Habitat Conservation Planning Handbook
[34] King County Ordinance 15051, 15052

Exhibit III-7: Current Fish Passage Measures and Targets[35]

Performance Measure	2007 Target	2007 Actual
Number of old culverts replaced with fish passable designs	Maintenance: 14 CIP: 2	Maintenance: 12 CIP: 2
Stream miles opened for fish passage by culvert replacement	Maintenance: 4.0 mi CIP: 1.0 mi	Maintenance: 4.31 mi CIP: 1.3 mi

(3) Customer feedback

None.

4. Safety

a. Policy Goal and Outcome

The goal of safety standards is to improve safety on parts of or the entire transportation system. When considering safety, it is important to recognize that safety considerations are addressed as part of how roads are designed, built, maintained, and operated. Much of the discussion here focuses on actions taken to address high accident locations. When there are clusters of accidents, improvements are made to remedy the situation.

b. Standard

Safety standards are numerous and mandated at the federal, state, and county levels of government. These standards apply to such activities as road and bridge design, traffic signs and signals, traffic enforcement, guardrails, pedestrian facilities, railway crossings, and maintenance.

c. Current Practice

(1) Standards and service levels in practice

Preservation, maintenance, and traffic engineering activities all contribute to safety goals. Safety needs are a top priority in the capital programming process and are reported in annual Traffic Safety Reports. Needs are also determined by the identification of High Accident Locations (HAL) and High Accident Road Segments

[35] 2007 RSD Performance Data Master List

(HARS), the identification of which is mandated by the Washington State Model Traffic Ordinance.[36]

RSD identifies $28 million in need to correct all currently identified HAL/HARS locations. This is a policy-driven need, as there is no standard or mandate that requires these locations to be addressed.

(2) Performance measurement

Safety performance measures in King County are generally not associated with specific programs or services; the performance measures reported as shown in Exhibit III-8 below use WSDOT crash data and are benchmarked against the National Highway Traffic Safety Administration (NHTSA) and regional performance reports.[37] RSD does not set numeric targets for safety performance measures.

Exhibit III-8: Current Safety Measures and Targets [38]

Performance Measure	2007 Target	2007 Actual
Traffic fatality rate per 100,000 unincorporated population	N/A	4.34
Number of fatalities	N/A	16
Pedestrian collision rate per 100,000 unincorporated population	N/A	10.86
Number of pedestrian collisions	N/A	40
Pedestrian fatality rate per 100,000 unincorporated population	N/A	0.54
Number of pedestrian fatalities	N/A	2
Percent reduction in accidents at HAL and HARS	N/A – new measure	N/A – new measure
Run-off-road measure	N/A – new measure	N/A – new measure

Safety measures vary widely between jurisdictions. NHTSA reports national and state fatality rates that, as noted above, are used by RSD as a benchmark.

[36] WAC 308-330-260
[37] 2007 RSD Performance Data Master List
[38] 2007 RSD Performance Data Master List

(3) Benchmarks

The most common safety benchmark is the fatality rate – number of fatalities per population or vehicle-miles traveled. The below graphs present the fatality statics using both common measures.

The fatality rate per million miles traveled for both urban and rural King County is shown in Exhibit III-9 below. WSDOT studies indentified that more than 60% of all fatal collisions occurred on rural roads, while only about 30% of total vehicle-miles traveled occur on rural roads.[39] The anticipated annexation of urban areas will leave RSD with a mainly rural road system.

Exhibit III-9: Fatality Rate Benchmarks[40]

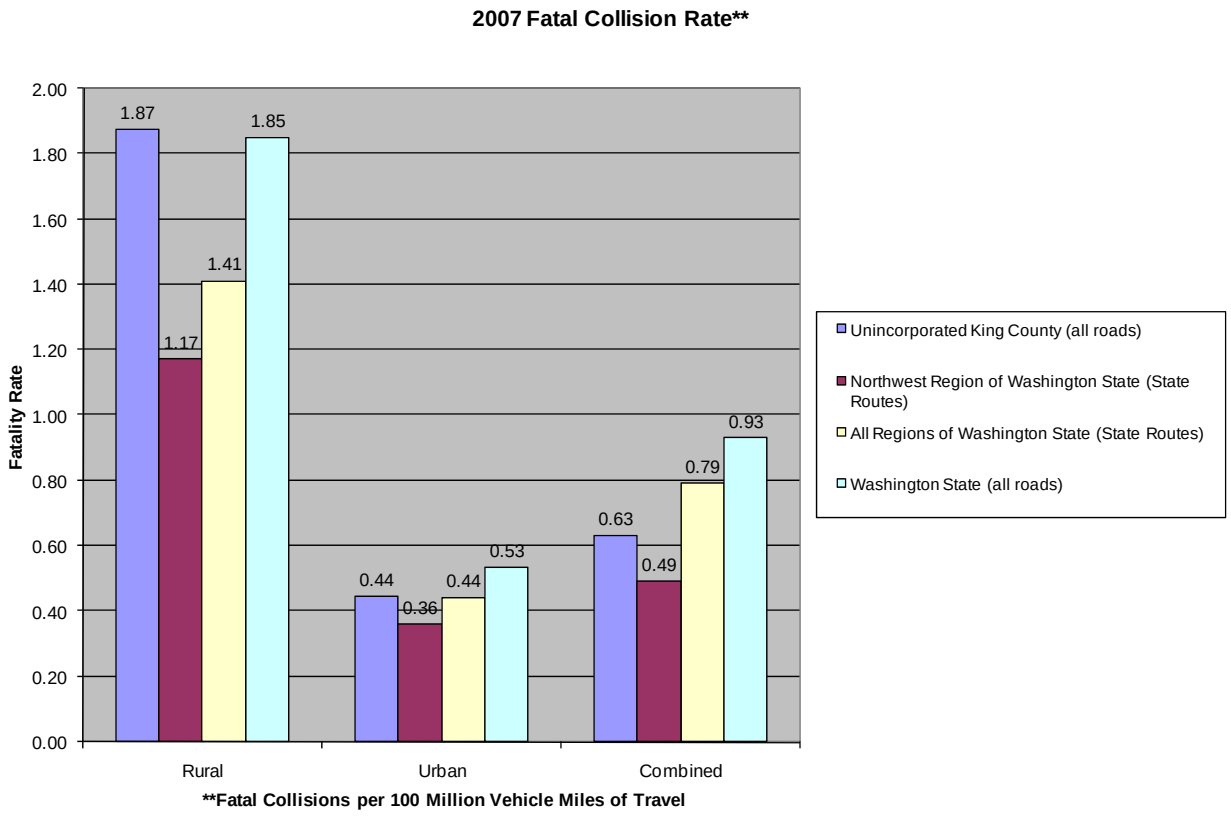
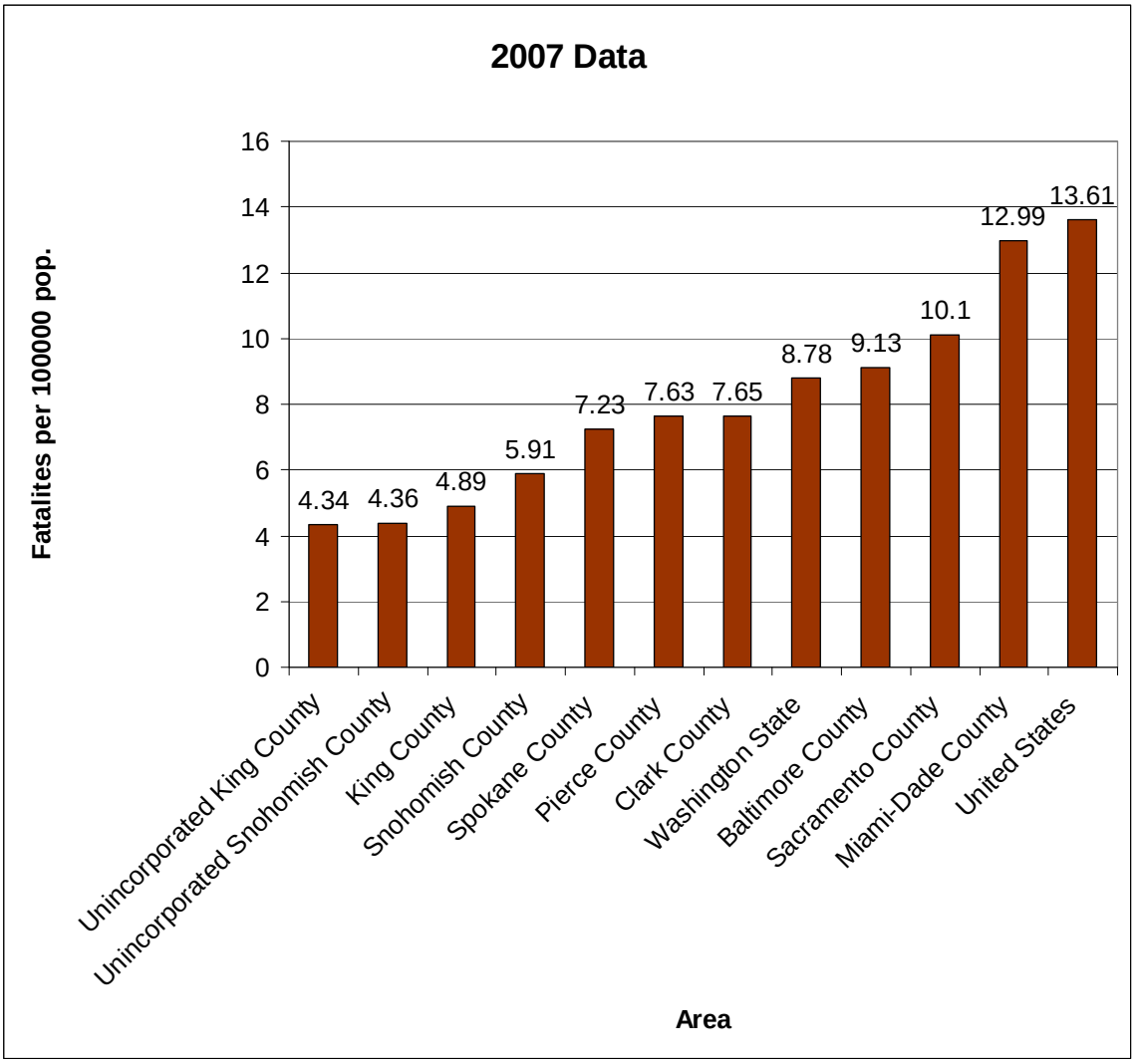


Exhibit III-10 below shows the fatality rate as reported by RSD to benchmark counties, King County as a whole, WSDOT, and nationally. RSD reports the fatality rate per population on unincorporated roads only.

[39] WA Traffic Safety Commission
[40] 2006 NHTSA State Traffic Data, Traffic Safety Facts

Exhibit III-10: Fatality Rate Benchmarks[41]



(4) Customer feedback

The survey of unincorporated residents reported safety improvements as the top service priority.[42]

[41] 2006 NHTSA State Traffic Data, Traffic Safety Facts
[42] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Questions 18-20

5. Roadway Maintenance

a. Policy Goal and Outcome

The goal of roadway maintenance programs is to maintain and improve the condition of the current transportation system in King County. In addition, under state law, road maintenance organizations must respond to emergencies.[43]

b. Standard

Roadway and roadside maintenance is conducted by the Roads Maintenance Section within RSD. Roads Maintenance activities are conducted in support of road and bridge standards, environmental standards and regulations, mobility goals, safety standards.

c. Current Practice

(1) Standards in practice

Much of the maintenance work performed is not governed by standards or mandates; rather, most Roads Maintenance activities are conducted under "standards of good practice."

Washington State requires county road agencies to develop and maintain a maintenance management system (MMS) "to ensure that cost-effective maintenance and preservation is required."[44]

Establishing service levels by level of effort rather than asset condition makes those service levels particularly vulnerable to budgetary fluctuations. Weather events that cause damage to the road system, in particular, require a significant investment in repairs, snow and ice removal, and other maintenance activities that can supplant planned maintenance activities for months.

The Roads Maintenance MMS has the ability to calculate increases and reductions in the planned level of effort of certain activities. A web-based application has recently been implemented that will better tie level of effort to budget and service levels. Additionally, condition ratings need to be improved along with updating inventory features and performance standards. This system and other MMS improvements are expected to be fully operational in 2010.

[43] WAC 197-11-880
[44] WAC 136-11

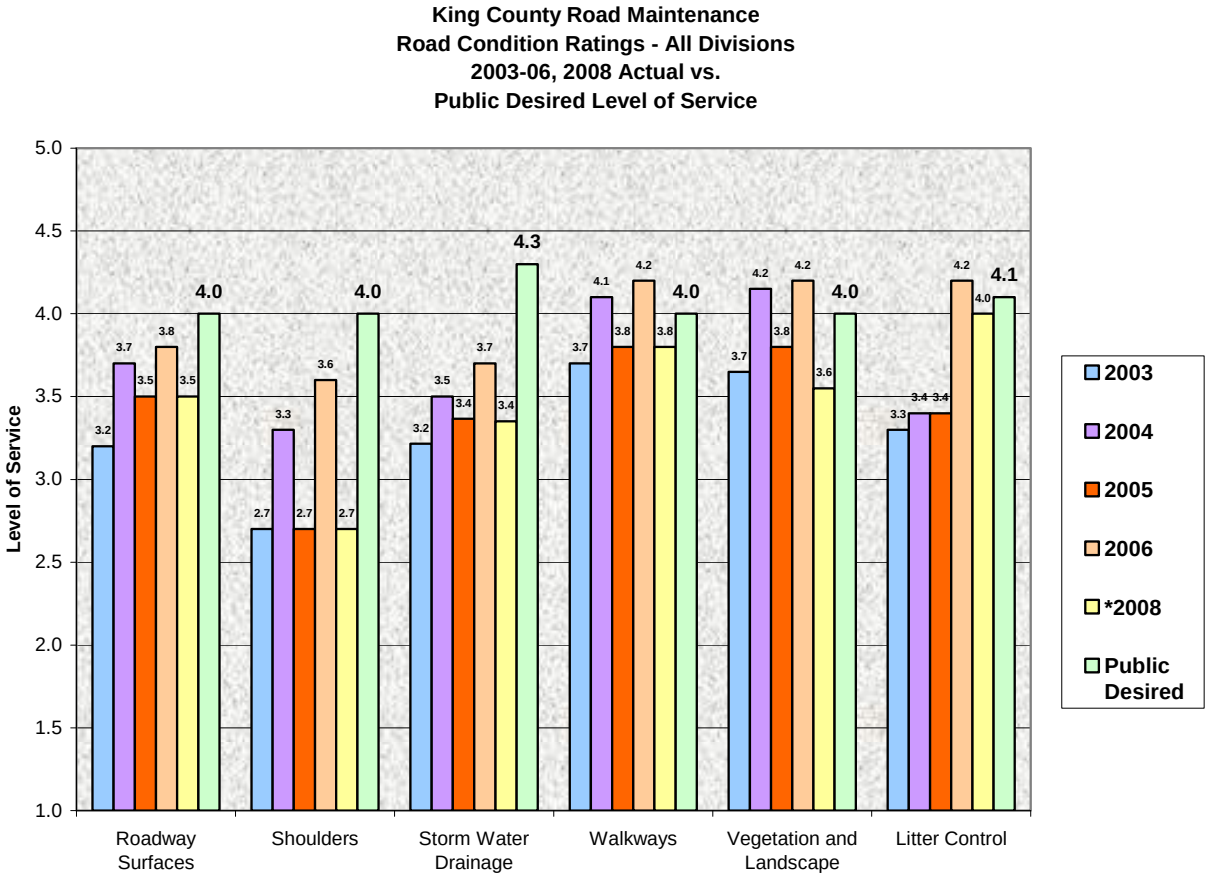
(2) Service levels

RSD's Roads Maintenance Section is implementing a new web-based version of maintenance management system. As part of this work, outcome-related service levels are being established for the different elements of the roads inventory. Across the inventory, the objective is to manage to a condition rating of 4.0 on a 1.0 to 5.0 scale For example, for shoulders, service levels have been defined for shoulder restoration, shoulder grading, shoulder mowing, shoulder herbicide, paved shoulder patching. The service level defines the work required to meet the condition target of 4.0, in the case of shoulder restoration the service level is "restore all shoulders every 8 years."

To report service level, RSD conducts field work to measure, in the form of a rating, the condition of a sample of roads. The condition of the road surfaces, shoulders, storm water drainage, walkways, and vegetation and litter control were rated. The data collected by RSD show that for half of these conditions, the public's desired service level is higher than the measured service level. For a number of categories this gap has grown.

Exhibit III-10 below shows the actual 2006 measured service level, using the 5-point scale, and compares this to citizens' desired levels of service.

Exhibit III-11: Maintenance Condition Ratings



(3) Performance measurement

RSD tracks road maintenance costs per mile as a performance measure, as shown in Exhibit III-12 below. Road maintenance targets are set each year by adjusting the previous years' predicted expenditures by inflation.

Exhibit III-12: Current Roads Maintenance Performance Measure and Target[45]

Performance Measure	2007 Target	2007 Actual
Average annual road maintenance costs per mile	$12,800	$14,633

[45] 2007 RSD Performance Data Master List

(4) Benchmarks

To develop benchmark data for maintenance, a subset of maintenance activities were identified and comparison data sought from Pierce and Clark counties. The following discusses the approach taken.

The amount of work performed each year in relation to the inventory quantity of the asset is currently used as a performance indicator. For example, the amount of asphalt patching (tons) per asphalt lane mile, the number of acres mowed per mowable acre (or number of mowing cycles per year), or amount of ditch cleaning per mile of ditch, etc. These performance indicators may have an impact on one or more agency objectives, including preservation, mobility, safety, and aesthetics in the case of litter control.

The county currently uses the following measures to track the performance of maintenance activities:

1. Total Annual Cost per Unit of Work Accomplished – this measures the efficiency with which the allocated dollars were utilized

2. Total Annual Labor Hours per Unit of Work Accomplished – measures efficiency with which labor resource was utilized

3. Level of Effort for Maintenance Activities, Measured by the Annual Work Quantity per Asset Inventory Quantity – this is an indicator that allows comparisons between jurisdictions. It measures the proportion of the inventory that is worked on. For example, for mowable slopes, this measures the ratio of slopes mowed in a given year to the total inventory of mowable slopes. Therefore, in 2008 the slopes were mowed on average 1.61 times.

Exhibit III-13 below shows eight FY 2008 maintenance activities that comprise a large amount of RSD's roadway maintenance. The table compares actual performance to the budget plan for each of the three measures.

Exhibit III-13: Planned v. Actual Maintenance Activities, FY 2008

Asset	Maintenance	2008 Budget Plan/Target	2008 Actual

		Cost per Work Unit ($)	Labor Hours per Work Unit	Level of Effort (LOE)	Cost per Work Unit ($)	Labor Hours per Work Unit	Level of Effort (LOE)
Mowable Slope (pass mi)	Slope/Shoulder Mowing (pass mi)	182.20	2.75	1.93	187.21	2.59	1.61
Gravel Shoulder (lin ft)	Shoulder Restoration (lin ft)	1.02	0.01	0.09	1.23	0.01	0.03
Encl. Drainage Sys. (lin ft)	Re/Re Drainage Pipe (lin ft)	127.29	1.54	0.001	145.21	1.47	0.003
Curb & Gutter (curb mi)	Street Sweeping (lin ft)	96.18	0.72	10.71	84.57	0.81	11.85
Mi. AC & Light Bitum. (road mi)	Square Cut Patching (ton)	142.83	1.70	3.20	260.19	2.94	2.63
Lin. Ft. Open Ditch (lin ft)	Bucket Ditching (lin ft)	5.68	0.10	0.02	6.18	0.11	0.02
Catch Basin/Manhole (each)	Clean Catch Basin (Vactor) (each)	82.33	0.92	0.14	48.32	0.64	0.15
Guardrail (lin ft)	Repair GuardRail (lin ft)	78.00	1.00	0.02	91.78	1.16	0.01

Exhibit III-14 below shows the trends for four of the six performance measures for which data were obtained over a period of three years.

Exhibit III-14: Maintenance Cost and Hours per Work Unit

Maintenance Activity	Actual Cost per Work Unit ($)			Actual Hours per Work Unit		
	FY 2006	FY 2007	FY 2008	FY 2006	FY 2007	FY 2008
Slope/Shoulder Mowing (pass mi)	179.02	161.12	187.21	2.777	2.409	2.593
Shoulder Restoration (lin ft)	1.25	1.42	1.23	0.016	0.017	0.014
Re/Re Drainage Pipe (lin ft)	97.98	119.03	145.21	1.373	1.286	1.471
Street Sweeping (lin ft)	71.17	84.03	84.57	0.703	0.813	0.813
Square Cut Patching (ton)	220.67	222.80	260.19	2.823	2.494	2.940
Bucket Ditching (lin ft)	4.78	5.40	6.18	0.094	0.097	0.105
Clean Catch Basin (Vactor) (each)	40.92	67.89	48.32	0.585	0.873	0.641
Repair Guard Rail (lin ft)	57.11	60.52	91.78	0.861	0.911	1.161

The trend data show that –

- For seven of the eight maintenance activities, the cost per work unit has increased. The largest increase is in drainage work. (Dollars not adjusted for inflation including increases in salaries and benefits, fuel, asphalt, and other road materials and supplies.)

- For four of the eight maintenance activities, the number of hours per work unit required to perform them was higher in 2008 when compared to 2006 (indicating a decrease in productivity possibly due to longer travel times, increased traffic control, environmental costs, safety measures, and project complexity).

Sacramento County, California, the only Working Paper 1 comparison county with available comparison data, currently manages maintenance activities through condition-based and level of effort-based budgeting and planning. Inventory and condition data pertaining to each type of asset – including roadsides, bridges and culverts, signals and street lights, signs and striping, and trees and landscaping – is collected at regular intervals (once in every two to three years). Projects are subsequently selected based on the importance of improving the condition of the asset. Selection of projects is based on numerous factors including but not limited to: available funding, pavement management strategy, roadway Pavement Condition Index (PCI), coordination with other projects, current maintenance needs, and maintenance history. Specific maintenance activities are defined and crews assigned for each of the projects. Such maintenance activities are either planned/preventive or responsive.

Sacramento County is participating in a statewide study currently underway to develop a comprehensive and systematic approach to quantify local streets and roads needs. The results, expected in April 2009, will be presented to the Governor and State Legislature as part of a plan to secure additional infrastructure funding and implement service level-based budgeting and planning for cities and counties.

(5) Customer feedback

In the survey of unincorporated residents, approximately two-thirds of respondents reported, on a scale of one to five with five as the best outcome, the following activities as three or better:

- Response times for repairs
- Potholes and cracks
- Response times for hazards and weather emergencies
- Response times for storm and emergency-related repairs
- Snow and ice removal

There were no maintenance activities with a majority of respondents reporting outcomes of two or below. The work referenced above by RSD to survey the public regarding their desired maintenance service level has found that the public desires a higher maintenance service level than is currently provided.

In addition, RSD monitors citizen action requests. These requests are often triggered by citizen concerns regarding maintenance activities. These requests have grown much faster than population growth. These requests have increased by almost 40 percent over the past ten years while population has increased by about 6 percent.

6. Traffic Maintenance

a. Policy Goal and Outcome

The goal of traffic maintenance programs is to maintain and improve the condition of traffic control devices on the current transportation system in King County to ensure the safe and efficient operation of roadways.

b. Standard

Traffic operations and maintenance activities are conducted in support of safety and mobility standards.

The FHWA Manual of Uniform Traffic Control Devices (MUTCD) provides standards used by RSD for the design, operation, and maintenance of traffic control devices including guardrail, striping, and signals. RSD is mandated to adhere to these standards by federal and state laws.[46] King County Code also mandates an adherence to uniform traffic laws, some of which apply to standardized traffic control devices.[47]

[46] 23 USC 109(d), 23 USC 402(a), RCW 47.36
[47] KCC 46.04.010

The federal government requires road agencies to develop and maintain Intelligent Transportation Systems (ITS) and other traffic operations equipment to minimize congestion.[48] The standards and protocols to which ITS architecture is designed, operated, and maintained are determined largely by the International Standards Organization (ISO).[49] Projects that receive federal funding must adhere to national ITS architecture standards published by ITS America and FHWA.[50]

c. Current Practice

(1) Service levels and standards in practice

Each new addition to the MUTCD has associated compliance dates. In addition, to the service level implicit in achieving these standards, the Traffic Engineering Section uses public expectations and resident feedback to determine the service levels of their operations and maintenance activities; the section stresses responsiveness and responds to each complaint in writing. Customer feedback also currently guides preventive maintenance activities.

Currently, the MMS for traffic devices is not closely linked to the budget and needs identification processes. However, the Traffic Engineering Section's MMS does apply standards to the needs assessment process. Work is underway to replace the current MMS for traffic control devices and infrastructure, with the goal of budgeting based on needs and service levels. Annual maintenance costs are reported as a performance measure.

Traffic Engineering reports that they have a large and growing backlog of work required to meet current standards and/or planned service levels. The following describes some of the components of this backlog:

- $5 million for new and retrofitted guardrail to meet Washington State requirements
- $4 million to comply with FHWA ITS standards
- $23 million to replace obsolete signals

[48] 23 USC 101, 104, 109
[49] Institute of Transportation Engineers, *An Overview of ITS Standards and Protocols*,
[50] FHWA-99-5899

(2) Performance measurement

Current maintenance-related performance measures are linked to spending rather than service levels or levels of effort. Traffic maintenance targets, as shown below in Exhibit III-15, are set each year by increasing the previous year's target by 2%.

Exhibit III-15: Current Traffic Maintenance Performance Measures and Targets[51]

Performance Measure	2007 Target	2007 Actual
Average annual traffic maintenance costs per centerline mile	$2,700	$3,789
Percent change in travel speed following corridor signal management projects	N/A – new measure	N/A – new measure

(3) Benchmarks

The MUTCD provides the industry standard against which RSD can benchmark the current condition of its assets.

(4) Customer feedback

Traffic maintenance questions included in the survey of unincorporated area residents focused on response time for repair and replacement. Ninety-three percent of respondents reported response times of 3 or better on a scale of 1 to 5.[52] When asked to prioritize services in the context of limited funds and the potential for decreasing services and service level outcomes, traffic signal and sign maintenance was not a priority of respondents; only 8 percent of respondents selected it as their top priority.[53]

7. Mobility

a. Policy Goal and Outcome

King County's mobility goal is stated as "the ability to move freely and efficiently throughout the region."[54]

[51] 2007 RSD Performance Data Master List
[52] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Question 10
[53] Gilmore Research, "KC Roads Final Frequency 1222" and "KC Roads Data File 122308," December 22, 2008, Questions 15-18
[54] King County AIMs High

b. Service Level

The King County Comprehensive Plan defines specific service levels for mobility, in terms of travel time, within King County.[55] These service levels are intended for concurrency and provide a method to measure whether the transportation system has the capacity available or planned within six years to allow development to proceed. Service levels for concurrency are reported annually.[56] This standard is not intended to nor is used for determining mobility service levels on King County roads.

c. Current Practice

(1) Standards and service levels in practice

There are no mobility service levels currently used by RSD to set priorities or determine mobility needs. The congestion service levels referenced above apply in practice only to the concurrency program.

King County AIMs High reports the average commute time for King County residents, but a service level or standard is not set.[57] This measure applies to all King County residents, not just those who live in or commute to unincorporated areas. Some mobility standards at the state and federal levels apply to design and operations and include pedestrian and non-motorized access and ADA compliance.[58,59]

(2) Performance measurement

King County does not have mobility performance measures. RSD does, however, measure travel time in some corridors. For the six corridors for which there is comparable data between 2006 and 2008, the change in travel times is shown in Exhibit III-16 below.

Exhibit III-16: Trends in PM Peak Hour Travel Times in Selected Corridors

Corridors	Percent Change In Total Travel Times 2006 to 2008			
	South Bound	North Bound	East Bound	West Bound

[55] KCC 14.70.220
[56] KCC 14.70.270
[57] King County AIMs High
[58] 28 CFR 35.150, 35.133; 28 CRR 35.151; 49 CRF 27, 37
[59] WAC 236-60

Corridors	Percent Change In Total Travel Times 2006 to 2008			
	South Bound	North Bound	East Bound	West Bound
Avondale Road NE from Woodinville-Duvall Rd. to NE 132nd St.	-6.08%	6.94%		
Issaquah-Fall City Rd from E. Lk. Sammamish Pkwy. SE to Trossachs Blvd SE			12.18%	-30.03%
Front St/Issaquah-Hobart Rd from I-90 to SR-18	6.74%	-3.68%		
SR-900 from I-90 Interchange to May Valley Rd.	-8.81%	-7.07%		
154th PL. SE / 156th Ave SE from SE 128th St. to SR-169	-22.09%	-26.76%		
140th/132nd Ave SE from SR-169 to SE 208th St	2.11%	-11.40%		

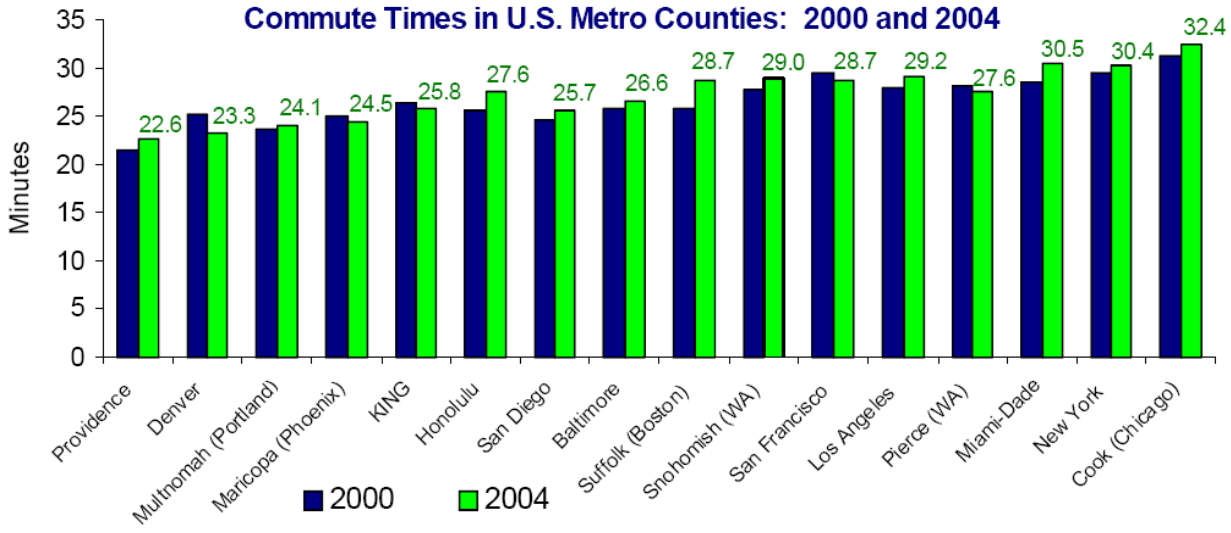
The decrease in travel times is most likely due to corridor signalization improvements.

(3) Benchmarks

Average commute time data for King County residents is reported in the US Census and presented in AIMs High.[60] Exhibit III-17 below shows these commute times compared to other metropolitan counties as reported by AIMS High.

[60] King County AIMs High

Exhibit III-17: Average Commute Times in US Metro Counties[61]



2007 average commute times in benchmark counties were:[62]

- Miami-Dade County: 30.6 minutes
- Baltimore County: 27.6 minutes
- **King County: 26.5 minutes**
- Sacramento County: 25.6 minutes

(4) Customer feedback

The survey of unincorporated residents reported mobility issues as two of the top three service priorities:

1. Improving intersections and signals to speed traffic control and congestion; comments included:
   - Repairs are not made quickly enough
   - Lights should be timed more effectively to reduce waiting time at intersections
2. Adding new lanes to existing roads; comments included:

[61] *Ibid.*
[62] U.S. Census Bureau, 2005-2007 American Community Survey

- The need for additional lanes to relieve congestion, particularly in terms of population growth[63]

[63] *Ibid*., Questions 18-20

Appendix A: List of Standards, Mandates, and Policies

Capital Program Delivery

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Road design	Road standards		King County Code 14.42	
Bridge design	CADD standards		King County Code 14.20.010	County
Safety	Fatality rate benchmark: NHTSA & regional counties	Traffic fatality rate & # of fatalities	2007 RSD performance measures data master list; WSDOT data source	Division
		Pedestrian collision rate & # of collisions	2007 RSD performance measures data master list; WSDOT data source	Division
		Pedestrian fatality rate & # of fatalities	2007 RSD performance measures data master list; WSDOT data source	Division
	Address High Accident Locations (HAL) and High Accident Road Segments (HARS)		Model Traffic Ordinance (WAC 308 330 260): "It shall be the general duty of the traffic engineer…to conduct engineering analysis of traffic accidents and to devise remedial measures"	State
		% reduction in accidents at high accident locations and high accident road segments	2007 RSD performance measures data master list	Division
		Run off road measure	2007 RSD performance measures data master list	Division
	Guardrail standards		ASTM standards	National

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
	Bicycle transportation and pedestrian walkways		23 USC 217	Federal
	Maintain railroad crossings		RCW 81.53.090	State
Asset Preservation	Set and maintain pavement condition standard		GASB 34	Federal
		80% or more of unincorporated roads at 40 or better pavement condition score (PCS)	2007 RSD performance measures data master list	County
	Conduct survey of visual pavement condition at least biennially		WAC 136-70-040; RCW 36	State
	Maintain seawalls		RCW 36.78.020	State
	Set and maintain bridge condition standards		RCW 36.86.020	State
			23 CFR 650.401-415; .301-311	Federal
		Average annual sufficiency rating for timber bridges	2007 RSD performance measures data master list	National
		Average annual sufficiency rating for non-timber bridges	2007 RSD performance measures data master list	National
		Number or percent of bridges structurally deficient	2007 RSD performance measures data master list	National
		Number or percent of bridges functionally obsolete	2007 RSD performance measures data master list	National
		Number or percent of load-limited bridges	2007 RSD performance measures data master list	National
Environmental	Maintain fish passable culverts		RCW 77.57.030; WAC 220-110-070; RCW 77.55.021	State
		Number of old culverts replaced with fish passable designs -- Maintenance and CIP	2007 RSD performance measures data master list	
		Stream miles opened for fish passage by culvert replacement -- Maintenance and CIP	2007 RSD performance measures data master list	

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Environmental (cont.)	Repair flood damage		RCW 36.78.020	State
	Comprehensive flood control management plan		RCW 86.12.200	State
Mobility	Develop & maintain Intelligent Transportation Systems		SAFETEA LU; 23 USC 101,104,109	Federal
	Traffic operations equipment to minimize congestion		23 USC 101,104,109; MUTCD	Federal
		% change in travel speed following corridor signal management projects	2007 RSD performance measures data master list	
	Protect non-motorized transportation			Federal
	Enhance and improve non-motorized transportation access		Comprehensive Plan 2008 Policies T-317 through T-322	County
	ADA compliance		ADA; 28 CFR 35.150, 35.133; 28 CRR 35.151; 49 CRF 27, 37	Federal
			WAC 236-60	State
Facilities	Maintain facilities that are up to code			Multiple
Road Log	Maintain Road Log		WAC 136-60, RCW 46.68.124	State
Engineering Maps and Records	Maintain and make available to public maps and records		RCW 58.24.040,	State
			King County Code 14.04	County
Road Vacations	Manage road vacation process		RCW 36.87, 58.17.212	State
			King County Code 14.40	County
Road Improvement Districts	Manage road improvement districts		RCW 36.88	State
Materials Lab	Operate materials lab		King County Code 14.42	County
Land surveying	Land surveying standards		WAC 196-29-110	State
	Conduct land surveys		RCW 36.75.110, 58.09.060, 36.86.050	State
SEPA	SEPA Compliance		RCW 43.21C	State

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Transportation Needs Report	Maintain TNR		RCW 36.70A.070	State
Concurrency Management Program and Mitigation Payment System	Manage concurrency management program		RCW 36.70A.070	State
			King County Code 14.70	County
			King County Comprehensive Plan 2008 T-213, 214, 215, 216, 217,218, 219	County
	Manage mitigation payment system		RCW 82.02	State
			King County Code 14.65, 75	County
Travel Forecasting	Develop travel forecasts		RCW 36.70A.070	State
			King County Code 14.70.270	County
Transportation Planning	Conduct transportation planning		RCW 36.75.020, 36.78.020, 090	State
	Capital program management	Planned vs. actual CIP major projects advertised	2007 RSD performance measures data master list	County
		Planned vs. actual CIP major projects substantially completed	2007 RSD performance measures data master list	County
		Planned vs. actual CIP spending	2007 RSD performance measures data master list	County
Capital project delivery		Council's auditor for capital programs will begin oversight of projects in 2009		County
Sheriff Transfer for STEP and traffic enforcement	Allows diversion of Road Fund monies		RCW 36.79.140, 36.78.090	State
Short Span Bridge Program	Manage Short Span Program			County

Operations and Maintenance

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Roadway maintenance	Standards of good practice		RCW 36.78.020	State
	State intervention if roads are not maintained		RCW 36.75.250	State
	Debris hazard control and cleanup		Highway safety program guideline no. 16	Federal
	Roadside improvement and beautification		RCW 40.77	State
Fish passage	Use of Road Fund for fish passage		RCW 36.82.070	State
	Facilitate fish passage		WAC 220-110-070	State
	Fish passages required		RCW 77.55.060	State
	National Marine Fisheries guidelines and requirements for improving habitat conditions			Federal
Traffic control devices	Manual of Uniform Traffic Control devices		MUTCD: http://mutcd.fhwa.dot.gov/ 23 USC 109(d) and 402(a) RCW 47.36	Federal State
	Uniform traffic laws		King County Code 46.04.010	County
	ITS standards		ITS Standards Catalog 23 USC 512	Federa006C
Office of Traffic Engineer	Traffic Engineer		WAC 308-330-260	State

Financial

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Maintenance costs	Annual maintenance costs	Average annual road maintenance costs per centerline mile	2007 RSD performance measures data master list	Division
		Average annual traffic maintenance costs per centerline mile	2007 RSD performance measures data master list	Division
	Maintenance shall be provided by county at the expense of the county road fund		RCW 36.88.350	State
Recommended Plan for Establishment, Construction and Maintenance of county roads	Annual recommended plan for laying out, construction and maintenance for fiscal year		RCW 36.81.130	State
Funding priorities	Maintenance, preservation, safety and operations should be funded prior to other costs for capital improvements		King County Comprehensive Plan 2008 T-403	County

General

Outcome or Service	Standard or Legal Mandate	LOS Measure	Source	Type
Annual Certificate of Good Practice	Compliance with provisions of law relating to county road administration and standards of good practice.	Annual review of each county's operations practices and results, assuring that standards are being considered and met.	WAC 136-04-010	State
Safety	Highway Safety Program, designed to reduce traffic accidents and deaths, injuries and property damage.		HIGHWAY SAFETY ACT (HSA), § Section 402. Highway safety programs	Federal
	Road Maintenance organization must respond immediately to emergencies to avoid: imminent threat to Public Health or safety; danger to public or private property; threat of serious environmental degradation		WAC-197-11-880	State

Appendix E: King County Policies

Comprehensive Plan

T-111 **To the extent practicable, future expansion or redevelopment of the county's road stormwater infrastructure should mimic the natural drainage system or preserve the ability to create such a system in the future.**

T-201 **Travel modes should be interconnected to form an integrated, coordinated and balanced multimodal transportation system that serves the travel needs of the county both effectively and efficiently.**

T-202 **In addition to encouraging transit and nonmotorized mobility choices, the transportation system shall address the needs of persons with disabilities pursuant to federal and state statutory requirements. The design and operation of transportation infrastructure, facilities and services should evaluate and address these needs.**

T-203 **King County shall not construct and shall oppose the construction by other agencies of any new arterials or highway or any additional arterial or highway capacity in the Rural Area or natural resource lands except for segments of certain arterials that pass through rural lands to serve the needs of urban areas. Any capacity increases to these urban connector arterials shall be designed to serve mobility and safety needs of the urban population while discouraging development in the surrounding Rural Area or natural resource lands.**

T-306 **The most cost-effective transportation improvements addressing existing and projected future needs should be considered and implemented first. Efficiency projects, such as signal timing, that support transit and other high-occupancy-vehicles (HOV) operations should be given priority over general capacity improvements.**

T-307 **Projects will be prioritized to address safety and operations. Projects that address existing capacity needs in urban unincorporated King County shall also be given priority consideration.**

T-308 **King County's road design and construction standards shall promote safe, cost-effective roads that encourage multimodal use, reflect the different needs and service levels for the Urban Growth Area and Rural Area, responding to the different needs for areawide mobility and access to abutting properties.**

T-309 **Consistent with the King County Road Design and Construction Standards, consideration shall be given to roadway safety improvements because they have the potential to reduce the number and severity of collisions by**

providing refuge for pedestrians and bicyclists, providing positive traffic control, reducing hazardous roadway conditions, and reducing unexpected situations. Improvements of this type include, but are not limited to, pathways, traffic signals, roundabouts, turn and merge lanes, provisions for sight lines, and removal of roadside obstacles. Consideration shall be given to safety improvements that lessen the likelihood and impacts of flooding.

T-312 **The nonmotorized transportation system and associated services should be improved countywide to increase safety, public health, mobility and convenience for nonmotorized modes of travel.**

T-313 **In the unincorporated area, King County shall evaluate and, where appropriate, implement nonmotorized transportation improvements in its road construction and road reconstruction. Countywide, consistent with the King County Metro transit planning process and and in collaboration with affected cities in the incorporated area, King County, should promote nonmotorized transportation improvements related to development and construction of transit services and facilities.**

T-327 **Revenue from variable tolling should be used to improve, preserve and operate the transportation system including transit and other multimodal investments, as well as to help fund improvements that address the diversionary impacts on non-tolled facilities.**

T-332 **Transportation improvements should be designed, built, and operated to minimize air, water and noise pollution and the disruption of natural surface water drainage in compliance with provisions and requirements of applicable federal, state and local environmental regulations. Natural and historic resource protection should also be considered. Particular care should be taken to minimize impacts where the location of such facilities could increase the pressure for development in critical areas or rural or resource lands.**

T-334 **Through its own actions and through regional partnerships, King County will promote strategies to reduce emissions from the transportation sector. The county will promote new vehicle technologies and fuels and strategies to reduce emissions, including land use changes, provision of transit, promotion of nonmotorized travel, and other actions to reduce vehicle travel.**

T-335 **King County will be a leader in the use of transportation fuels and technologies that reduce operational greenhouse gas emissions from its fleets by buying hybrid-electric, electric and other clean transportation technologies; using clean fuels in its fleets; implementing demonstration projects that use**

alternative fuels; purchasing locally-produced energy sources when practical; seeking local and federal support to expand the use of alternative fuels; and promoting best practices, innovations, trends and developments in transportation fuels and technologies.

T-336 **The King County Department of Transportation will incorporate climate change impacts information into construction, operations, and maintenance of infrastructure projects. In the near term, the department will incorporate climate change into its planning and design documents. In the long term, the department will develop strategies to incorporate climate change response into the design and operations of its transportation structures and services.**

T-401 **King County should develop a long-range financial component that generally evaluates and describes funding sources and strategies to carry out the transportation element. An annual six-year financial plan should be prepared that considers transportation priorities and is used in developing the Capital Improvement Program.**

T-402 **Financial resources available for transportation improvements should support a program of capital facilities needed for a multimodal transportation system.**

T-403 **Essential maintenance, preservation, safety and operations costs of the transportation system should be funded prior to other costs for capital improvements so that existing investment is protected and current mobility is not degraded.**

T-404 **During annual review of the Comprehensive Plan, King County should consider and address any potential shortfalls likely to occur between expected revenues and needed improvement costs. Such review could include a reassessment of land use, growth targets, LOS standards and revenue availability.**

T-405 **King County's urban road investments shall address the unique needs of each unincorporated area and shall target projects that facilitate redevelopment, infill, annexation, and the achievement of growth targets.**

T-406 **When funding transportation projects in areas where annexations or incorporations are expected, the Department of Transportation should seek interlocal agreements with the affected cities and other service providers to provide opportunities for joint grant applications and cooperative funding of improvements.**

T-506 **Updates to the transportation plans and Roads Strategic Plan shall involve input from the general public, unincorporated area councils, the subarea transportation forums, and other appropriate forums.**

U-107 **Most population and employment growth should locate in the contiguous Urban Growth Area in western King County, especially in cities and their Potential Annexation Areas.**

U-110 **King County should concentrate facilities and services within the Urban Growth Area to make it a desirable place to live and work, to increase the opportunities for walking and biking within the community, to more efficiently use existing infrastructure capacity and to reduce the long-term costs of infrastructure maintenance.**

Countywide Planning Policies

FW-20 In recognition of the fact that King County is the regional freight distribution hub and a major international trade gateway, and that freight transportation is one of the state's most important basic sector economic activities, goods mobility by all modes shall be included as a component of comprehensive plans.

T-1 The Countywide transportation system shall promote the mobility of people and goods and shall be a multi-modal system based on regional priorities consistent with adopted land use plans. The transportation system shall include the following:

a. An aggressive transit system, including high-capacity transit;
b. High-occupancy vehicle facilities;
c. Freight railroad networks;
d. Marine transportation facilities and navigable waterways;
e. Airports;
f. Transportation Demand Management actions;
g. Non-motorized facilities; and
h. Freeways, highways, and arterials.

Other

RCW 36 70A – State Growth Management Act
Chapter 36.70A RCW
Growth management — planning by selected counties and cities

Appendix F: Contract Cities Program Background

This information was prepared by King County Road Services Division Operational Master Plan Work Group for the County Road Services Division Operational Master Plan Advisory Committee. June 2009.

Contract Cities Program

The RSD currently provides road-related services to 11 core contract cities on a regular basis, and has agreements with other cities to provide services on an as-requested basis. RSD began providing road-related services in the 1990s as the eleven core contract cities incorporated. As these cities matured they created their own public works departments to handle some or most of the ongoing routine road maintenance activities. Cities began to contract with private vendors for some services, and continued to obtain other services from RSD at varying levels. RSD continued to enter into interlocal agreements with other cities in the county, or performs work using one-time project related contracts. Interlocal agreements are used for ongoing services and interagency agreements are used for one-time projects or services. RSD's contract city program now consists of 40 cities and agencies requesting work at varying levels.

CONTRACT CITIES	
Algona	Mercer Island
Auburn*	Milton*
Bellevue*	Normandy Park*
Black Diamond	**Newcastle**
Bothell	North Bend
Burien	Pacific
Carnation	Pierce County
Covington	Redmond
Des Moines	Renton*
Duvall	**Sammamish**
Enumclaw*****	**SeaTac**
Federal Way	Seattle Public Utilities*
Issaquah	**Shoreline**
Kenmore	Skykomish
Kent	Snoqualmie
Kirkland	Sound Transit
Lake Forest Park	Tukwila
Maple Valley	Vashon Parks District
Medina*	**Woodinville**

* No interlocal agreement; interagency is used for each work request
Core contract cities are in bold

Tracking Work Requests

RSD develops an annual maintenance work program with core contract cities, tailored to each city's needs. Work program planning begins as early as May of the preceding year. Early planning ensures there is sufficient spending authority to meet expected levels of service for cities without jeopardizing the Division's primary responsibility to unincorporated King County. Each city's work plan may also include discretionary work requests. These work requests are typically one-time projects or new installations.

Cities with an interlocal agreement with RSD can submit a discretionary request, using an on-line work request form. The request provides a space to specify scheduling requirements. If RSD can accommodate the request, the county responds with a recommended action, proposed schedule and cost estimate. If the cost estimate is over $500, the city must approve the work before the county proceeds. Requests are tracked in RSD's discretionary database.

RSD staff work with staff from each city to monitor expenditures as the program year proceeds. Work requests related to ongoing maintenance are tracked through monthly and quarterly meetings, and through reports county staff provide to cities.

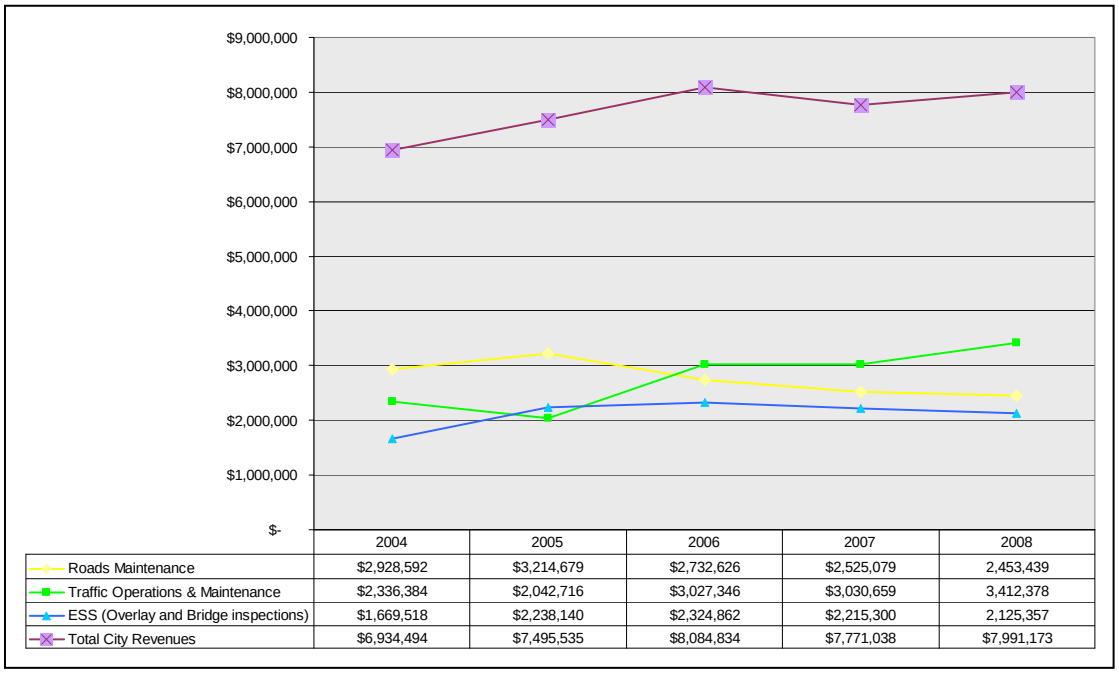
As a provider of emergency services, the Roads Maintenance Section may receive requests from cities for emergency services during a storm or other emergency. Roads Maintenance will include cities in its emergency services area if a city commits to a consistent level of service from year to year. Since reliable resource allocation is Roads Maintenance's primary objective, the level of service a city must purchase is negotiable.

Reimbursable Fees for Service

All city revenues related to the contract city program are for reimbursable work county forces perform for cities. 2008 city work comprises nearly 12.5% of the operating budget for the two primary work groups that provide services: Roads Maintenance and Traffic Engineering & Maintenance. In addition, the Engineering Services Section is receiving an increasing number of work requests from cities. The Capital Improvement Program and Planning Section also provides a limited number of services to contract cities.

Revenues have been fairly stable over the last four years, as the chart below shows. Fluctuations are typically due to one time projects such as stream restoration for Roads Maintenance, signal construction for Traffic Engineering & Maintenance, and planned variations in the overlay program. RSD's primary interest is in managing the city contracts program to complement work in unincorporated King County rather than to grow a bottom line.

Historical Trends
Contract City Revenues
Figure 2



	2004	2005	2006	2007	2008
Roads Maintenance	$2,928,592	$3,214,679	$2,732,626	$2,525,079	2,453,439
Traffic Operations & Maintenance	$2,336,384	$2,042,716	$3,027,346	$3,030,659	3,412,378
ESS (Overlay and Bridge inspections)	$1,669,518	$2,238,140	$2,324,862	$2,215,300	2,125,357
Total City Revenues	$6,934,494	$7,495,535	$8,084,834	$7,771,038	$7,991,173

Contract Options

All agreements for provision of road-related services renew automatically from year to year, unless one of the parties notifies the other in writing to terminate or make substantial changes to the agreement by April 1 of the preceding year. RSD works with core contract cities to keep informed regarding service levels. Beyond this, contract cities can use the interlocal agreement to request services, but aren't obligated. RSD can provide services, but isn't obligated. The agreement is a tool both parties can use in a mutually agreeable way.

RSD also performs work for some cities and agencies using an interagency agreement for one-time projects, as authorized by RCW 47.24.050.

Contract Cost Model

The State Accountancy Act (RCW 43.09.210) requires that one public fund not support another without full compensation. State law also says that the County Road Fund cannot be used for anything other than a proper county road purpose (RCW 36.82). RSD has determined that charging cities actual costs on a time and materials basis is the most accurate and equitable way to meet state law. RSD applies burden rates to labor to capture all costs.

RSD applies three burden rates to each regular labor hour to obtain fully burdened labor. Burden rate 1 adds the cost of benefits, payroll taxes, retirement and industrial insurance.

The 2008 rate is 47.8%. Burden rate 2 adds paid time off. The 2008 rate is 19.0% . Burden rate 3 adds the cost of administrative overhead. The 2008 rate varies from 65.6% to 75.2%, depending on the Section that is performing work.

The method the RSD uses to calculate Burden rate 3 is based on Generally Accepted Accounting Practices (GAAP) and the federal government's Office of Management and Budget guidelines, as described in Circular 87 and consistent with County Council directive. This method creates a uniform rate, and – as much as possible – matches indirect costs with the service provided. Burden Rate 3 applies only to labor – not to materials and equipment. Actual costs for material, equipment and vehicle usage are passed on to customer cities.

The two Sections that have the largest share of city contract work have set up individual cost centers (orgs) for each city. It is the total budgeted amount for city work by Section that comprises the spending authority for each Section. Flexibility within this bottom-line reimbursable amount allows RSD to respond to changes in city programs that may occur as the program year progresses. Meeting the overall city budget is an ongoing challenge for the Sections, and requires careful attention throughout the year. Control over fluctuations can be accomplished by accepting or declining discretionary work requests.

Appendix G: Road Services performance measures

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Pavement miles inspected	Output	Program management	x				x	In order to fulfill the requirements of GASB, roads are inspected every three years. RSD endeavors to inspect one third (approximately 600 miles) or more every year, however, the actual amount inspected each year is dependant on the availability of inspection crews, who also have other responsibilities.
Pavement overlay miles installed in unincorporated King County	Output	Public transparency, management oversight, program management	x					The number of road miles of overlay in a given year is a function of the pavement condition of the road network, the mix design, the price of materials, the price of labor and the adopted budget.
Percent of unincorporated road miles at 40 or better pavement condition score (PCS): Arterial/collector Local Access	Effectiveness	Public transparency, management oversight, program management	x					PCS is a standard government pavement condition measure that ranges from 1 – 100, with 100 being the condition of brand new pavement. It has been demonstrated that keeping pavement at a PCS rating of 40 or higher optimizes lifecycle costs. In compliance with GASB 34, RSD has set and is achieving a pavement management goal of keeping at least 80% of the roadway system at or above a PCS rating of 40 by means of timely road maintenance and repairs and scheduled pavement overlay. The arterial/collector roadway segments are rated over a two year period and the local access segments are rated over a three year period. The values reported are adjusted to reflect the change in roadway segment condition between the time they are rated and the time of the report.

Performance Measure	Type of Measure	Audience or Use	Category: Preservation	Mobility	Capacity	Safety	Legal mandates	Notes
Number of bridge inspections conducted and % of bridge inventory (unincorporated KC)	Output	Management oversight, Program management	x				x	Physical inspections are mandated and performed by King County's certified bridge inspectors at least every two years to determine the condition of bridges and the amount of wear and deterioration that has occurred since the previous inspection. Some bridges require more frequent inspection due to their condition. Inspections reveal deficiencies such as corrosion of the metal components, damaged guardrails, rotted timber, and stream bank erosion around bridge footings. These inspections result work orders for repairs and are also used to calculate the sufficiency ratings and (and sometimes determinations of structural deficiency or functional obsolescence). Frequent bridge inspection, careful monitoring of areas of concern, and timely repairs ensure each bridge is safe for public use.
Number of bridges replaced	Output	Public transparency, management oversight, program management	x					
Average annual sufficiency rating for timber bridges	Effectiveness	Public transparency, management oversight, program management	x					The bridge SR is a federal standard measurement that establishes eligibility and priority for replacement of bridges (20 feet or longer) with funding assistance from the Federal Highway Bridge Replacement Program. The SR ranges from zero to 100, with zero indicating a bridge that is closed and cannot carry traffic loads and 100 indicating a new bridge with no deficiencies. The SR is the sum of numeric values assigned for structural adequacy (condition and load carrying ability), serviceability (ability to accommodate traffic), and essentiality for public use (amount of traffic the bridge carries and availability of alternate routes). A minimum measure of 50 is generally considered satisfactory. Non-timber bridges have concrete construction and also tend to be newer, therefore they have higher ratings. Considering that the bridge inventory continues to age, maintaining the current average SR is a significant accomplishment.
Average annual sufficiency rating for non-timber bridges	Effectiveness	Public transparency, management oversight, program management	x					

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Number/Percent Bridges Structurally Deficient	Effectiveness	Public transparency, management oversight, program management	x					Functional obsolescence is a function of the geometrics (i.e. width, height) of the bridge in relation to the geometrics required by current design standards. For instance, the width (narrowness) of the bridge is a major factor in the determination whether the bridge is "functionally obsolete." While structural deficiencies are generally the result of deterioration of the bridge components, functional obsolescence typically results from older bridge designs that are subject to the increased traffic demands and are substandard structures as defined by the current bridge design codes.
Number/Percent Bridges Functionally Obsolete	Effectiveness	Public transparency, management oversight, program management	x	x				Bridges are considered Structurally Deficient (SD) if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge creates flooding over the bridge deck and adjacent roadway causing significant traffic interruptions. The fact that a bridge is structurally "deficient" does not immediately imply that it is likely to collapse or that it is unsafe. With hands-on inspection, unsafe conditions may be identified and, if the bridge is determined to be unsafe, the structure must be closed. A SD bridge, when left open to traffic, typically requires significant maintenance and repair to remain in service and eventual rehabilitation or replacement to address deficiencies. To remain in service, SD bridges are often posted with weight limits to restrict the gross weight of vehicles using the bridges to less than the maximum weight typically allowed by statute.
Number/percent of load-limited bridges	Effectiveness	Public transparency, management oversight, program management	x	x				

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Lane miles of roadway swept	Output	Management oversight, program management	x					Sweeping is a routine, but critical, function that helps keep roadways in safe condition, helps prevent pavement damage due to sand and de-icer used in snow and ice control, and also helps protect water quality in local water bodies by removing sediments and associated pollutants.
Number of old culverts replaced with fish passable designs	Output	Management oversight, program management	x				x	
Average annual road maintenance costs per centerline mile	Efficiency	Management oversight, program management	x					Data source is totals for Division Maintenance, Special Operations, and Major Maintenance (low orgs 1676 and 1679), divided by road miles from the RNIS database.
Average staff days to complete requests for pothole repairs	Customer Service	Public transparency, management oversight, program management	x					Data is from Citizen Action Request (CARS) system. Requests typically come through RSD's 24-hour customer service hotline.
Vehicle miles traveled	Community indicator	Program management		x				
Number of traffic cameras installed to date	Output	Management oversight, program management		x				These cameras are operated by King County, hosted by the County camera server, and published on RSD's MyCommute website (www.metrokc.gov/kcdot/mycommute). The website allows the traveling public to monitor and make route choices during typical peak hour travel as well as during major weather events such as wind/snow/ice storms and flooding. Some of the cameras are owned/maintained by another jurisdiction and represent interagency corridor partnerships.

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
(Under Development) Percent change in travel speed following corridor signal management projects	Effectiveness	Public transparency, management oversight, program management		x				
Percentage increase in number of Road Alert subscribers	Customer Service	Management oversight, program management		x				Visitors to RSD's Internet site during emergency events like floods and snow storms want quick, reliable access to information that helps them make safe, informed commuting decisions -- like the information provided by RSD's Road Alert service and traffic cameras. For example, during a week of heavy flooding in November 2006, a traffic camera in an area where residents were intermittently cut off from their homes by a submerged road received over 1,000,000 page views.
Number of ADA curb ramps constructed	Output	Management oversight, program management		x			x	Ramps increase mobility for certain segments of population
Planned vs. actual major CIP projects advertised	Output	Public transparency, management oversight, program management	x	x	x	x		Major CIP projects are defined as over $750,000 total cost or otherwise of particular interest
Planned vs. actual major CIP projects substantially completed	Output	Public transparency, management oversight, program management	x	x	x	x		

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Planned vs. actual CIP spending	Output	Public transparency, management oversight, program management	x	x	x	x		
Number of traffic investigations completed	Output	Management oversight, program management				x		Investigations are performed by traffic engineering staff in response to concerns expressed by the public via calls, emails, input from public meetings, etc. and the workload varies depending on the number of requests made for this service.
Lineal feet of guardrail installed	Output	Management oversight, program management				x		Guardrail helps to prevent serious injuries and fatalities due to run off the road collisions.
Run-off-road collisions vs. number of run-off-road fatalities	Effectiveness	Management oversight, program management				x		Run-off-road collisions occur when a vehicle leaves the roadway, encroaches onto the shoulder and beyond, and the driver is unable to safely recover the travel lane. This type of collision is responsible for a relatively large percentage of traffic fatalities, so this measure has been selected as a useful indicator of safety trends in King County.
(Under Development) Percent Reduction in accidents at high accident locations and high accident road segments	Effectiveness	Public transparency, management oversight, program management				x		RSD maintains lists of HAL/HARS and uses this information to select, prioritize, and implement safety improvements. Before/after studies are completed to assess the effectiveness of completed projects with respect to accident reduction and the societal costs of accidents. Three years of data are needed to determine the "after" statistics. The data lag is currently 2-years, therefore the most recent metric available is for 2002.

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Pedestrian collision rate per 100,000 unincorporated population	Community indicator	Management oversight, program management				x		RSD does not set a numeric target for this measure, however, the division strives to reduce collisions and injuries/fatalities through many projects and activities.
Pedestrian fatality rate per 100,000 unincorporated population	Community indicator	Management oversight, program management				x		RSD does not set a numeric target for this measure, however, the division strives to reduce collisions and injuries/fatalities through many projects and activities.
Total traffic fatality rate per 100,000 unincorporated population	Community indicator	Public transparency, management oversight, program management				x		This is a National Hwy Traffic Safety Administration standard measure and also the measure agreed upon by King, Pierce, Snohomish and Clark County public works managers for benchmarking purposes. This statistic is a broad community indicator and many factors are out of the control of the RSD. For example, a significant portion of fatalities are due to alcohol impairment and/or speeding. RSD does not set a numeric target for fatalities, however, the division strives to reduce accidents and injuries/fatalities through many projects and activities, for example guardrail installation and improvements at high accident locations.
Inflation-adjusted change in value of reimbursable contract services from prior year	Output	Management oversight, program management						

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Number of city bridges inspected	Output	Management oversight, program management						RSD provided this service to 21 cities in 2008. This mutually-beneficial arrangement helps RSD to maintain the highly-specialized staff expertise needed to perform bridge inspection work and cities benefit by having access to technical expertise that would be difficult for them to support alone. City inspections can comprise a significant portion (20% or more) of total RSD inspection work. Bridge inspection needs vary widely from year to year due to infrastructure condition and the complex method by which mandated inspection schedules are defined.
Number of city signals and flashers maintained	Output	Management oversight, program management						RSD provides this service to 14 cities. Traffic-related services are one of the fastest growing segments of reimbursable services.
Miles of contract city overlay included in county contracts	Efficiency	Management oversight, program management						This measure is provided as a proxy for efficiency since it is an example of how reimbursable services to cities help RSD achieve efficiencies that benefit unincorporated area residents. By piggybacking city pavement overlay needs onto the county's overlay contract, RSD can achieve economies of scale and mutually-beneficial cost savings. In addition, cities that participate in the county overlay program frequently also choose to purchase other related services from RSD (i.e., pavement prep work, pavement markings, and survey monument installation), creating additional economies of scale that, for example, allow RSD to own and operate state-of-the-art equipment such as a specialized pavement grinder truck, etc.
Number of new traffic signs installed	Output	Management oversight, program management						This is a routine, yet critical, function necessary to manage the county's road system for safe and efficient travel. (For context, RSD has 46,479 total signs as of Dec. 31, 2008)

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Lineal feet of striping installed	Output	Management oversight, program management						This is a routine, yet critical, function necessary to manage the county's road system for safe and efficient travel.
Average annual traffic maintenance costs per centerline mile	Efficiency	Management oversight, program management						This number covers traffic signs and markings, flashers and signals and traffic major maintenance.
Number of customers served by Maps & Records Center	Output	Management oversight, program management					x	RSD is legally mandated to retain historical and current maps and records of engineering significance. The Maps & Records Center located in the King Street Center building provides economical and easy access to these records by the public. In 2008, the Center served 1,409 walk in customers and an additional 2,263 customers by phone. Many maps and records are also made available to the public on the internet. This service is driven by customer demand, so RSD does not set numeric targets, however, RSD is prepared to serve similar numbers of customers in 2009 and 2010.
Stream miles opened for fish passageby culvert replacement	Output	Management oversight, program management					x	

			Category					
Performance Measure	**Type of Measure**	**Audience or Use**	**Preservation**	**Mobility**	**Capacity**	**Safety**	**Legal mandates**	**Notes**
Comprehensive employee survey - Productivity	Effectiveness	Management oversight, program management						Based on an employee survey conducted approximately every other year, starting in 2005. The scores are baseline averages for all of the Road Services Division. The scale ranges from one (low) to seven (high). Data is used by managers to identify areas to focus on for improvement. There are no numeric targets per se. Productivity looks at how effectively employees and teams are at getting tasks accomplished.
Comprehensive employee survey - Communication and Conflict	Effectiveness	Management oversight, program management						Communication and conflict looks at how employees interact with others and ability to resolve conflict in order to accomplish the organizational goals.
Comprehensive employee survey - Satisfaction and Morale	Effectiveness	Management oversight, program management						Satisfaction and morale looks at how individual employees feel about working in the Road Services Division.

Appendix H: Road Fund 20-year Financial Impacts

Including Annexation and Incorporations by 2012

Road Fund Financial Plan Impacts		2010	2011	2012	2013	2014	2015	2010 - 2015 Total	2016 - 2028 Total
Revenues									
Road Levy Lost Due to A/Is by Applying Statutory Levy Growth Rate of 101% (Status Quo Practice of all KC Taxing Districts without Excess Levies) **(Negative Road Fund Impact)**		-$6,329,532	-$26,300,815	-$7,508,784	-$4,937,616	-$3,313,301	-$1,577,968	-$49,968,015	-$7,441,502
Additional Road Revenue Lost by Levying Below the Statutory Allowed Amount Holding Constant at the 2009 Road District Tax Rate of $1.5888 **(Negative Road Fund Impact After 2010)**	Policy Issue	$2,853,397	-$4,289,849	-$22,322,280	-$24,049,764	-$24,964,580	-$26,044,476	-$98,817,552	-$254,156,703
New Contract Revenue from Fairwood Incorporation and North Highline Burien annexation **(Positive Road Fund Impact)**	Policy Issue	$2,441,990	$2,509,144	$2,578,146	$2,649,045	$2,721,894	$2,796,746	$15,696,964	$44,187,985
Expenditures									
Maintenance, Traffic and Surface Water Utility Expenditure Reductions Due to Lost Road Mile Inventory **(Positive Road Fund Impact)**		$1,248,757	$4,930,168	$6,620,004	$6,831,844	$7,050,463	$7,276,078	$33,957,313	$118,743,698
NET ROAD FUND IMPACT		**$214,612**	**-$23,151,351**	**-$20,632,914**	**-$19,506,492**	**-$18,505,525**	**-$17,549,620**	**-$99,131,290**	**-$98,666,522**
Percent of Expenditures		**0.2%**	**-19.1%**	**-17.0%**	**-16.1%**	**-15.3%**	**-14.5%**		
Financial impact could be mitigated through reductions in the Sheriff transfer as the traffic law enforcment requirements would be less with fewer unincoprorated road miles in the system:									
Sheriff Diversion Expenditure Reduced due to Lost Road Mile Inventory after A/Is **(Positive Road Fund Impact)**	Policy Issue	$698,365	$1,456,529	$1,850,797	$1,910,023	$1,971,144	$2,034,220	$9,921,077	$33,197,944
NET ROAD FUND IMPACT IF SHERIFF TRANSFER REDUCED WITH REDUCED ROAD SYSTEM		**$912,977**	**-$21,694,823**	**-$18,782,117**	**-$17,596,469**	**-$16,534,381**	**-$15,515,400**	**-$89,210,213**	**-$65,468,578**

Appendix I: Potential annexation area schedule

PAA	Annexing City	ANTICIPATED ANNEXATION EFFECTIVE DATE
North Highline – Area X	Burien	March 2010
Panther Lake	Kent	July 2010
Fairwood	City of Fairwood	09/2010
Juanita, Kingsgate, Finn Hill	Kirkland	Mid 2011
Eastgate	Bellevue	2011
Klahanie	Issaquah	2011
North Highline – Area Y	Seattle	Seattle 2011
West Hill	Renton	2011
East Federal Way	Federal Way	2012
East Renton	Renton	2012

Appendix J: History of Road Fund transfer to Sheriff

This information was prepared by King County Road Services Division Operational Master Plan Work Group for the County Road Services Division Operational Master Plan Advisory Committee. July 21, 2009.

RCW 36.82.040 establishes the county road fund levy and directs the process by which all funds accruing from such levy shall by deposited and budgeted. Once funds from any source are deposited into the county road fund, RCW 36.82.020 restricts their use to only "proper county road purposes."

HOWEVER, 36.33.220 states:
"The legislative authority of any county may budget, in accordance with the provisions of 36.40 RCW, and expend any portion of the county road property tax revenues for any service to be provided in the unincorporated area of the county. . ."

Diversion is not without impact and it should be remembered that even with a diversion under 36.33.220, RCW 36.79.140 clearly states that:
". . .Only those counties that during the preceding twelve months have spent all revenues collected for road purposes only for such purposes, including traffic law enforcement, . . .are eligible to receive funds from the rural arterial trust account. . ."[16]

In the 1990s, Roads paid the direct costs associated with the Selective Traffic Enforcement Plan (STEP) Unit, which consists of eight motorcycle officers and approximately one half of one sergeant who work under the operational direction of Roads. Roads uses speed volume counts and accident history to determine where to deploy the STEP Unit. There is a part of the STEP Unit that responds to citizen complaints of traffic safety issues. All of the STEP work is in unincorporated King County. In 2002, the STEP Unit cost was increased to $837,124 to cover the direct costs of the program, plus the administrative overhead costs required for full cost recovery.

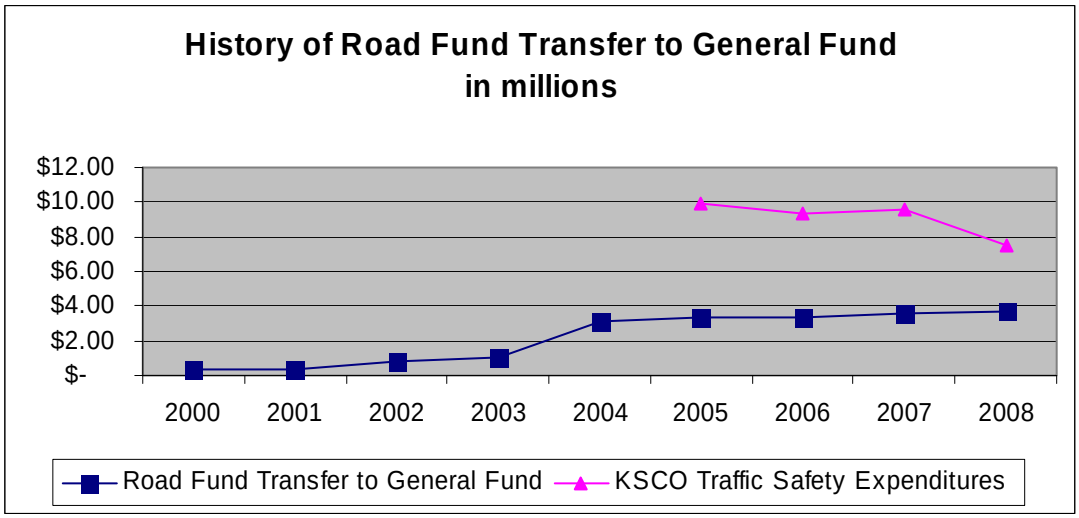
In 2003, the transfer amount was increased by Council to $1,080,128 as a General Fund balancing increment, citing the lawful use of Road Levy funds for traffic enforcement under the Road Fund Diversion RCWs. The Office of Management and Budget the Road Fund Diversion RCWs in 2004, increasing the transfer amount by $2 million.

This base transfer amount was increased by an additional $257,000 mid-year 2004 as a mechanism to transfer the Galer Street debt service budget from the Roads CIP to the General Fund. The budgeted transfer remained relatively stable from 2005 – 2008. In the 2009 budget the Council increased the transfer by an additional $2 million to $5.7 million, including $1.4 million for full cost recovery of the STEP and $4.3 million for traffic enforcement.

Each year King County estimates the amount the Sheriff spends on traffic enforcement in King County and includes this data in the annual CRAB report. The traffic enforcement data is included in the chart below.

[16] CRAB, http://www.crab.wa.gov/LibraryData/PRESENTATIONS_and_TRAINING/Training/Financial/081218RoadTaxDiversionSummary.pdf

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Road Fund Transfer to General Fund	$0.39	$0.39	$0.84	$1.08	$3.13	$3.39	$3.39	$3.55	$3.64
KSCO Traffic Safety Expenditures *						$9.92	$9.39	$9.59	$7.54



Appendix K: Revenue options exercise

ROMP Work Group rated the following revenue options utilizing three criteria:

- **Efficiency**, of which there are two aspects:
  - The capacity or the yield of the revenue source over time. Will revenues grow as population and economic activity grow? Will they keep pace with inflation? Is the price so high that it drives users away, resulting in weaker gains in revenue?
  - Utility and flexibility with which those new funds can be applied across different projects and jurisdictions. Can they be pledged as security in a bond issue? Can they be can be used to partner with other agencies?
- **Equity** which is, in general terms, the fairness of the burden distributed across people and business in the county and, particular terms:
  - Impacts on economic competitiveness. Do the additional costs paid by King County businesses change them from being less expensive to being more expensive than competing businesses in adjoining counties? Are the taxes regressive?
  - Are these revenues diverted away from sources that are usually dedicated to other King County programs?
- **Simplicity**, both in terms of the public's ability to understand it and the ease with which the county can collect it and administer it

Revenue Option	*Score (1-4 rating)*	*Efficiency*	*Equity*	*Simplicity*	*Comments*
Increase in General Fund property tax levy.	***9***	★★★★	★☆☆☆	★★★★	***Could increase volatility potential.*** ***Ultimate flexibility – could be diverted to other uses***
Vehicle license and registration fees.	***8***	★★★★	☆☆☆☆	★★★★	***Strong potential for revenue; does not recognize differences in uses or benefits that accrue; relatively easy to collect/track*** ***RSD estimates a TBD levied VLF of $20 per vehicle would generate approximately $5.5 million annually.***
Local option motor fuel tax.	***8***	★☆☆☆	★★★★	★★★★	***$2.5 million*** ***More short term solution as gas reliance decrease***
Vehicle-Miles Traveled fee.	***8***	★★★★	★★★★	☆☆☆☆	***While this may not be a viable option in the short term, long term support of this concept should be pursued and supported.*** ***Consider pursuing an allocation of state VMT rather than a King County VMT***

Revenue Option	*Score (1-4 rating)*	*Efficiency*	*Equity*	*Simplicity*	*Comments*
Increase in county sales taxes.	***8***	★★★★	☆☆☆☆	★★★★	
Increase road levy component of property tax.	***7***	☆☆☆☆	★★★★	★★★★	***Equity not tied to users of facilities***
Congestion fees (area tolls).	***7***	★★★★	★★★☆	☆☆☆☆	
Container fees at the Port of Seattle.	***7***	★☆☆☆	★★☆☆	★★★★	***We are assuming this is linked to a specific use – such as the South park Bridge*** ***Easy to collect*** ***Need to consider freight industry ramifications.*** ***May divert traffic to Tacoma***

Revenue Option	*Score (1-4 rating)*	*Efficiency*	*Equity*	*Simplicity*	*Comments*
Increase in Real Estate Excise Tax	***7***				***High concern on year to year variability***
Local arterial tolling.	***5***				***Difficult option to pursue, resulting in relatively small benefits***
SEPA mitigation fees	***3***				***Volatility of the building market*** ***Mechanisms in place, but would need to be revised***
Revenue Distribution of State Highway Tolls to Support Roads Network System	***3***				***Some of the system is in place***

Revenue Option	*Score (1-4 rating)*	*Efficiency*	*Equity*	*Simplicity*	*Comments*
Revenue Distribution of Truck Licensing Fee	***2.5***	***?***		 ***1 - 2***	***Would need to research whether trucks are licensed countywide***
Tax on commercial parking operations.	***2***				***Small source of revenue***
Countywide Sales Tax on Auto Parts & Service	***2***				***Small yield to unincorporated King County Washington state currently does not tax services***
Loading Dock Door Fee	***2***				

Revenue Option	*Score (1-4 rating)*	*Efficiency*	*Equity*	*Simplicity*	*Comments*
Surcharge on land used for non-residential parking.	***0***	☆☆☆☆	☆☆☆☆	☆☆☆☆	
Portion of Utility Tax for Electric Vehicles or Bio Fuels	***0***	***?***	***?***	***?***	

Appendix L: Operational model impact analysis

According to the Phase I ROMP Work Plan, the policy framework is to include: "Policy guidelines regarding the balance of operational and maintenance responsibilities with roads infrastructure and capital improvements."

Dye Management Group, Inc. identified three broad policy options regarding the framework for approaching the balance of operational and maintenance responsibilities with roads infrastructure and capital improvements:

- Option 1: Current revenue management – meet the essentials
- Option 2: Asset management emphasis
- Option 3: Meet current service level goals

The options are based on the analysis of current service levels provided in Dye Management Group, Inc.'s *Service Levels, Working Paper [17]3* and the implications of the change drivers presented in *Framework Development, Working Paper 1*[18] for future service levels. The options and their impacts are detailed in Dye Management Group Inc's *Final Report and Options*[19].

The Advisory Committee determined it is unlikely additional revenues will be in place in the near term (2-3 years), if at all. Therefore, options were further refined to prioritize continuing operations in the near term, in the absence of additional revenues. The Advisory Committee took a multi-step approach, defining key policy choices that are impacted by any operational model or prioritization of programs and projects; developing possible operational models; and identifying the impacts of the options through the lenses of the policy choice impacts and operational impacts.

Section One of this paper identifies the policy choices and introduces the Decision Making Model. Section 2 introduces the three Operational Models and contains a Decision Making Model for each Operational Model Option. Section 3 contains the Impact Analysis of each Operational Model Option by RSD Program Area: CIP, Road Maintenance, and Traffic Maintenance.

[17] Road Services Division Operational Master Plan (ROMP) Phase I Report, Appendix D
[18] ROMP Phase I Report, Appendix B
[19] ROMP Phase I Report, Appendix A

Section 1: Policy Choices and Decision Making Model

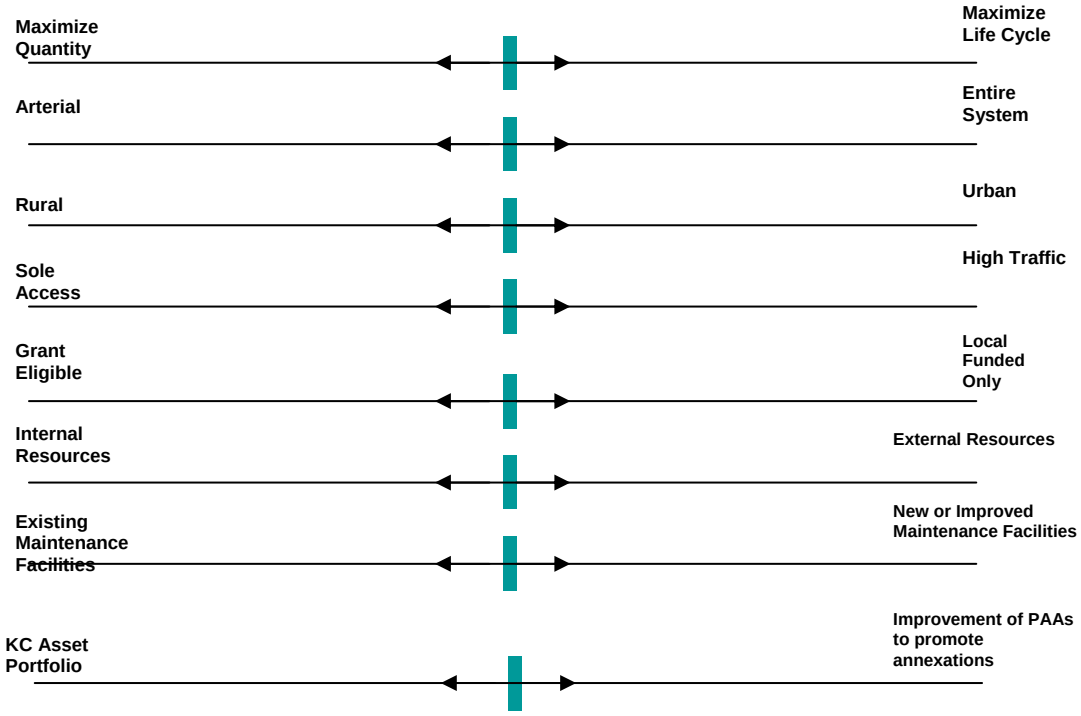
The Advisory Committee identified eight policy choices (Exhibit L-1) that are impacted by any operational model or the prioritization of programs or projects. These policy choices and the

Exhibit L-1
Policy Choices Affected by Operational Models

Maximize Quantity: *Provide maintenance to the most assets possible (may include lower-quality overlay methods).*	***Maximize Life Cycle:*** *Use the best practice methods and resources to maximize each asset's life span.*
Arterial: *A moderate or high-capacity road; connector roads between local residential streets and state highways.*	***Entire System:*** *All arterials and local roads. Includes lower-capacity and lower-volume roads and low-volume roads that provide sole access to the areas they serve.*
Rural: *Unincorporated areas to the east of the Urban Growth Boundary and Vashon Island.*	***Urban:*** *Unincorporated areas to the west of the Urban Growth Boundary.*
Sole Access: *Roads that provide the only access to an area. Often in the rural areas of King County.*	***High Traffic:*** *Roads that serve or provide connections to areas of high population.*
Grant Eligible: *Projects eligible for grants—generally, capacity projects serving urban centers.*	***Local Funded Only:*** *Projects with local funding (either current Road Services Division revenues or new revenue sources).*
Internal Staff: *Full-time permanent FTEs (county employees).*	***External Staffing Resources:*** *Private-industry contractors and temporary employees.*
Existing Maintenance Facilities: *Current maintenance facilities.*	***New or Improved Maintenance Facilities:*** *New facilities or required updates to current facilities* (assumes Summit Pit replacement)
King County Asset Portfolio: *Preserve and improve long-term King County assets in the rural unincorporated areas.*	***Improve PAA Infrastructure to Promote Annexation:*** *Preserve and improve assets in the urban unincorporated areas.*

The policy choices are generally not mutually exclusive. Policy impacts will fall somewhere along the continuum. The ROMP Decision Making Model (Exhibit L-2) was developed to consider these policy choice impacts across operational models options.

Exhibit L-2
ROMP Decision Making Model



Section 2: Operational Model Option and Decision Making Models:

Three operational model options, in addition to the identification of a current status model, were identified.

Option A "Across the Board Reduction": The Advisory Committee recognized the current status is unsustainable and additional revenues cannot be assumed. This model assumed proportional reductions across current services to meet current sustainable revenues. Using the information identified in Dye Management Group, Inc.'s *Funding Analysis*, the reduction was estimated to equal approximately 15%.

Option B "Prioritization of Asset Life Cycle in the Rural Areas": This model recognizes the rural area roads will be our long term assets and prioritizes the preservation of the rural area roadway system using an asset management approach. It recognizes that asset management is essential to minimizing life cycle costs for both operating and capital expenses. At its most simple, asset management optimizes the trade-off between maintenance and replacement to achieve a balance that is neither capital intensive nor maintenance intensive.

During the analysis of the options the Advisory Committee recognized that there is a desirable balance to strike between having adequate funding to ensure that those assets with relatively high condition ratings stay high, while infusing "one-time" monies to rehabilitate and reconstruct roads with failing and/or low condition ratings. In order to fully implement this option under current road asset conditions where there are a significant number of "failing" or "at risk" of failing assets, a major one-time investment would be required to rehabilitate and reconstruct roads and other assets that are no longer efficient to maintain. Without it, maintenance frequency and costs continue to escalate while the effectiveness and longevity of that maintenance fix decreases to a point where maintenance no longer works.

The Advisory Committee ultimately divided ***Option B "Prioritization of Asset Life Cycle in the Rural Areas"*** into two options. One continues to analyze the impacts within current revenues: ***Option B "Prioritization of Asset Life Cycle in the Rural Areas – Current Revenues***. The second option maximizes the asset life: ***Option B "Prioritization of Asset Life Cycle in the Rural Areas – Maximize Asset Life***.

Option C "Grant Eligble": The "Grant Eligible" option assumes the RSD would leverage current assets to pursue grant funding.

Impacts for each RSD program area (CIP, Road Maintenance, and Traffic Maintenance) were identified and described for each Operational Model Option in Section 3 below. Decision Making Models were created for each Operational Model to demonstrate the impacts from the prioritization decisions. The Current Status is shown in Exhibit L-3; subsequent exhibits demonstrate each of the Operational Models including the two options for Prioritization of Asset Life Cycle in the Rural Areas.

Exhibit L-3
Decision Making Model: Current Status

Current Status

A base case scenario, representing the 2009 Adopted Budget and Financial Plan, **with access to current revenues as they are projected to change in future years, incorporating the reductions resulting from completion of asset sales**

- **How was this scenario developed?**
  Activities are sized in response to revenue projections, based on current practices

- **Policy Statement regarding this scenario:**
  - Significant downsizing is required
  - Mobility, preservation all face cutbacks
  - Risk of not meeting safety standards and legal mandates
  - Higher reconstruction costs in the long term as assets face accelerated deterioration due to decreased maintenance
  - Potential adverse effects for all roadways

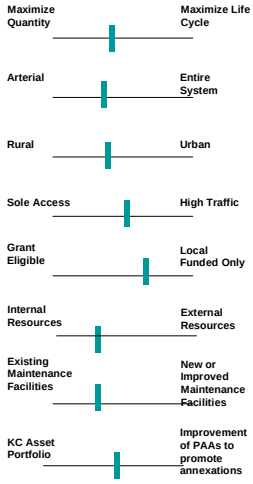


Exhibit L-4
Decision Making Model Option A

Across the Board Reduction

Proportional reductions across current services to meet current revenues

- **How was this scenario developed?**
  Provides a reduction consistently across programs

- **Policy Statement regarding this scenario**
  - Continues trend of reduced capacity investment/fewer grant opportunities, may fund some lower-cost mobility projects
  - Preservation and maintenance activities continue at lower funding level
  - Higher reconstruction costs in the long term as assets face accelerated deterioration due to decreased maintenance

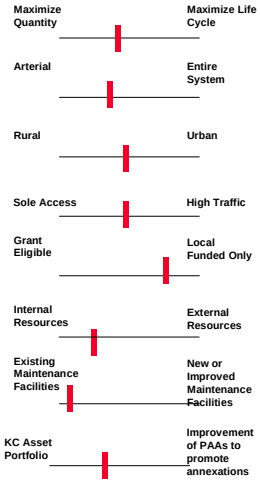


Exhibit L-5
Decision Making Model: Option B – Current Revenues Option

Prioritize Asset Life Cycle in Rural Areas - Current Revenue

Recognizes the rural area roads will be our long term assets

- **How was this scenario developed?**
  - Priority is preservation of the rural area roadway system

- **Policy Statement regarding this scenario**
  - Resources focus on rural needs, typically not grant-eligible
  - May require defunding lower priorities
  - Lower volume and sole access facilities benefit
  - Less funding for capacity, urban mobility
  - Within current revenues continues trend of reduced investments

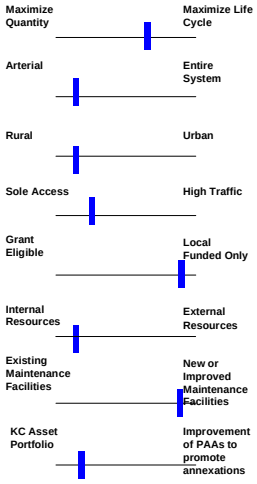


Exhibit L-5
Decision Making Model: Option B – Maximize Asset Life Option

Prioritize Asset Life Cycle in Rural Areas – Maximize Asset Life

Recognizes the rural area roads will be our long term assets

- **How was this scenario developed?**
  - Priority is preservation of the rural area roadway system, maximizing the asset life

- **Policy Statement regarding this scenario**
  - **Requires new revenues**
  - Cost to maximize asset life has not been determined
  - Resources focus on maximizing the asset life cycle, prioritizing rural needs
  - Minimizes life cycle costs
  - Requires standard condition ratings and a history of expenditure needs

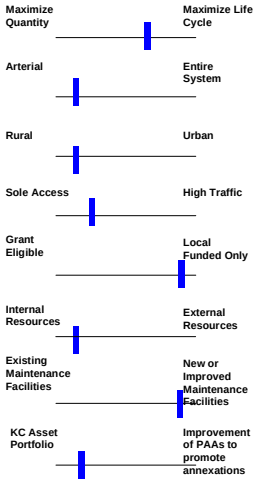


Exhibit L-6
Decision Making Model: Option C

Grant Eligible

Leverage current assets to pursue grant funding; increases capacity projects in urban corridors

- **How was this scenario developed?**
  - Priority is pursuit of grant funding as new revenue source

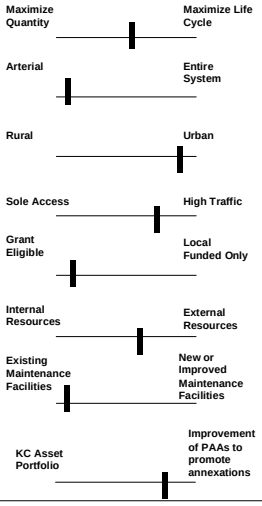
- **Policy Statement regarding this scenario**

  - Grants will most likely flow to urban unincorporated projects, some bridges (not short spans)

  - Benefits capacity and mobility, arterials

  - Less emphasis on rural needs

  - Implementation likely to require new revenue and defunding lower priorities



Section 3: Operational Model Impact Analysis by Program Area

Impacts of Operational Models to CIP Program Area

To analyze the impacts of the three proposed ROMP scenarios we selected the following projects and discussed the impacts upon the program in general and these projects specifically.

Short spans bridges
Overlay
Dockton Road Preservation
ITS projects
Culvert replacement
SE Summit Landsburg Rd. reconstruction
Issaquah Fall City road sidewalks

Option A: Across the Board Reduction

- Across the board cuts in all types of CIP projects
- The Overlay Program would likely be reduced, this would mean we would no longer be able to preserve the roadway infrastructure putting the county's GASB compliance at risk and impacting the County's bond rating.
- Roadway reconstruction projects like SE Summit Landsburg Rd. would likely be put on hold and not funded in the 20 year timeframe. The effect of deferring the needed reconstruction could be an increase in the number of roads closed due to a lack of construction and maintenance funding.
- The Short Span Bridge program would be reduced from replacing 3 bridges per year to replacing only 2 bridges per year. This would increase the length of time to complete the replacement of the high and medium priority bridges to 24 years from 12 years. The cost to maintain the bridges would increase, affecting the maintenance budget.
- Funding for ITS projects would be reduced, increasing congestion along unincorporated arterial corridors. Synchronizing signals also reduce idling at intersections and reduce greenhouse gas emissions.

Option B: Asset Life Cycle in Rural Areas

- CIP projects will focus on preserving asset life in the rural area, which the county will own in the long term.
- Only the most urgently needed safety projects will be constructed in the urban unincorporated areas.

- The short span bridge replacement projects would continue to be a high priority for funding. However, it may be necessary without a new revenue source within the next five years to slow down the reconstruction schedule to replace only two bridges per year.
- The overlay program would continue to be a high priority for funding.
- Roadway reconstruction projects, such as SE Summit Landsburg Rd. would be a priority for funding. However, without a new revenue source the number of miles requiring reconstruction will increase dramatically. It may still be necessary to close roads due to a lack of funding.
- ITS projects would be limited to the rural arterial corridors. ITS solutions would be a lower priority, and would rely heavily on obtaining grant dollars to fund the majority of the costs.

Option C: Grant Eligible

- CIP projects will be defined to maximize the use of grant funds. Most of the transportation grants tend to prioritize increasing mobility and reducing congestion along urban corridors.
- ITS projects, in either the urban or rural unincorporated areas will be a high priority as they can compete for federal transportation grant dollars.
- Projects in the urban unincorporated area that provide added capacity along arterial corridors or at major intersections would be a high priority. These areas would likely be annexed as soon as the project was completed.
- Roadway reconstruction projects would need to be de-funded to provide the local match for congestion relief projects. Projects such as the SE Summit Landsburg Rd. would likely not get funded within the next 20 years.
- The overlay program would be a lesser priority because grants do not prioritize preservation of the existing roadway system. This would mean we would no longer be able to preserve the roadway infrastructure putting the county's GASB compliance at risk and impacting the County's bond rating.
- Likewise, both the replacement of the high priority short span bridges and the replacement of the undersized culverts would not be a priority.
- In the short term, not adequately funding the preservation of the roadway system would increase the level of maintenance required to sustain a functional roadway network.
- The long term effect of deferring the needed reconstruction and replacement projects could be an increase in the number of

roads in the remaining unincorporated area closed due to a lack of both construction and maintenance funding.

- When the urban unincorporated areas have been annexed into cities, it is unlikely there will projects in the CIP that will compete for grant funding as the comprehensive plan policies prohibit wide scale addition of travel lanes in the rural area.

Legal Mandates within the cip program

To calculate the percentage of the cip dedicated to legal mandates we used the 2009 adopted cip and identified the legally mandated projects and then calculated the percentage of the road fund used to back these projects. $207,667,187 is the available road fund contribution of 2009-2014.

Project	Name	2009-2014 appropriation		
800101	Renton Bldg Bond Debt Retirement	1,296,000		
800201	CIP Bond Debt Payment	41,304,000		
800205	HUD Debt Payment	2,160,000		
MRSDA1	ADA Compliance	6,780,000		
MRSDP1	Permit Monitoring and Remediation	3,990,000		
RDCW29	Fish Passage Restoration Program	4,500,000		
		60,030,000	207,667,187	**28.91%**

Priority Safety Projects within the cip

While every cip project contains safety elements for the purpose of this exercise we are only using projects that came from the HAL/HARS study. RSD uses accident data to identify locations that are analyzed for a solution that can be either constructed through the CIP or through an operations fix. These safety projects are contained within the HAL/HARS study which is completed every three years. The last cycle was in 2007 and projects were added in at that time. These projects represented **9%** of the available road fund.

Funding problem

The Road Services Division has identified $314 million in high priority, unprogrammed safety, preservation and other needs to the year 2022. These projects are identified in the Council adopted 2009 Transportation Needs Report. In addition, there is $130 million gap in funding for the South Park Bridge. Without additional revenues projects within the adopted Roads 2009-2014 CIP may need to be delayed well beyond the six year horizon.

Impacts of Operational Models to Road Maintenance Program Area

BACKGROUND

2008 Roadway Asset Condition Ratings

The King County Department of Transportation, Road Services Division, Road Maintenance Section (RMS) is responsible for maintaining the roads and other roads-related assets in unincorporated King County in a manner which protects public safety and property, facilitates commerce, and ensures mobility to the extent practicable.

The RMS rated the condition of roads and roadway assets in 2003, 2004, 2005, 2006 and 2008, using a methodology developed by the Dye Management Group in 2003.

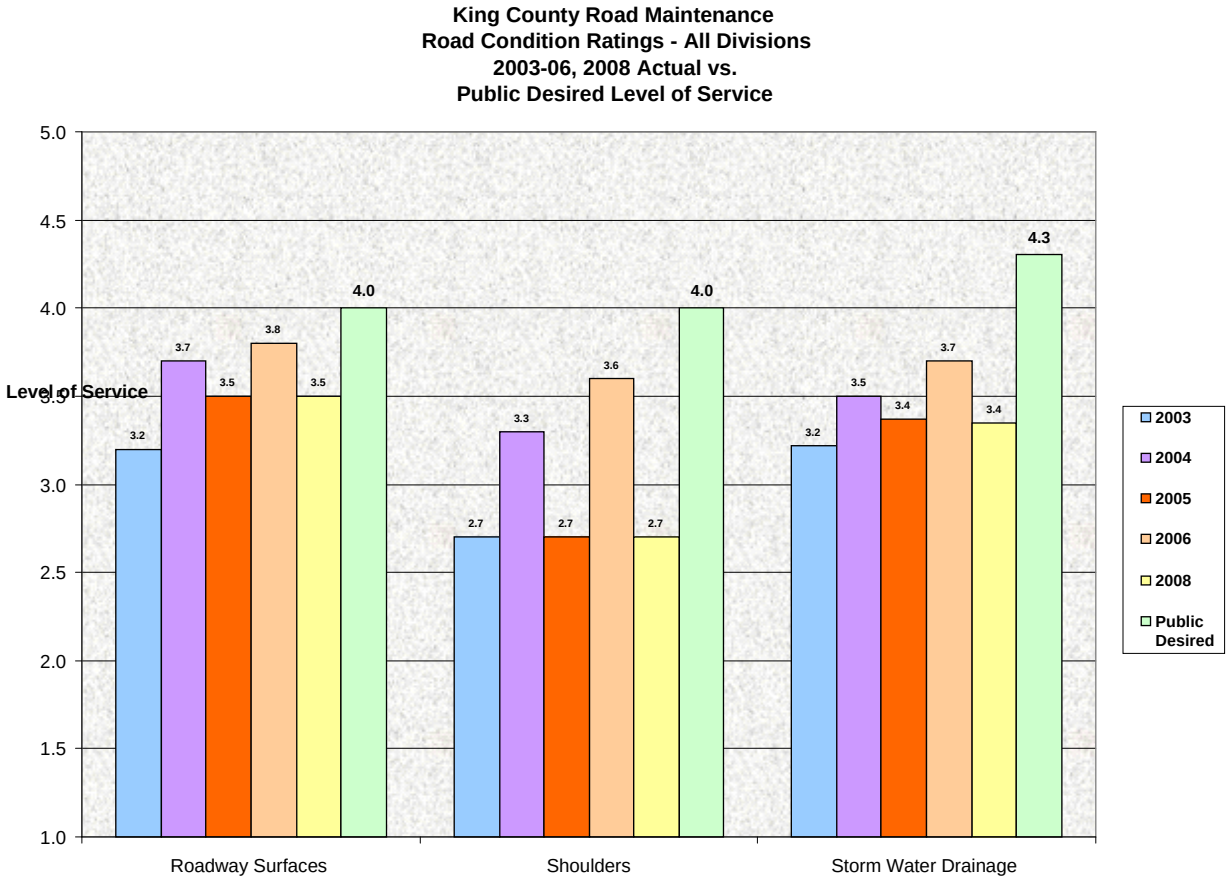
Under the Dye process, a random sample consisting of 400, 1/10th of a mile segments was identified for rating. Using tools provided by Dye Management, all roadway assets selected were rated on a scale containing five condition categories. These categories ranged from 1 (poor) to 5 (excellent).

Dye Management Condition Rating Scale	
Condition 5	Excellent
Condition 4	Good
Condition 3	Adequate
Condition 2	Fair
Condition 1	Poor

The Dye asset condition ratings were formulated based on a number of criteria, including but not limited to: amount of cracking, potholes, spalling, rutting, raveling, structural condition, and flow capacity[20]. In all cases, a rating of "1" indicates that the asset no longer functions as it was originally intended. Moreover, given the rating structure, if no maintenance is performed on assets rated "2," those assets will eventually become "1s" and so on.

The following graph summarizes the results for 2003-2006 and for 2008 which are **averages** grouped by roadway asset.

[20] Dye Management Performance Maintenance Manual, June 2003, Page 5.



The results of the asset ratings from the Dye reports[21] appeared at face value and on average to have, for the most part, overall condition ratings that are generally "adequate" for the majority of assets. A more in depth evaluation of the data acquired indicates that the opposite is true. In fact, using existing condition rating averages masks the extent of problems and additional maintenance and repair needed. Additionally, many stormwater drainage assets ranked as "adequate" do not now meet current regulatory requirements.

The results of the asset ratings for roadway surfaces, stormwater drainage, and shoulders from the Dye reports are presented in the attached chart. The results from this grouping of assets are significant because these three groups consume the overwhelming majority of road maintenance resources. This summary demonstrates that the County's 2008 road inventory has a significant sub-standard component.

[21] Dye Management rating reports were produced in 2003, 2004, 2005, 2006, and 2008

Roadway Assets Rated in 2008

	Assets "Failing"	Assets "At Risk"	% "At Risk" and "Failing"
ROAD SURFACES	103 mi	654 mi	44%
OPEN DITCHES	106 mi	673 mi	66%
GRAVEL SHOULDERS	279 mi	1,153 mi	77%

	Assets "Failing" Capacity	Assets "At Risk" Capacity	% "At Risk" & "Failing" Capacity	Assets "Failing" Structural	Assets "At Risk" Structural	% "At Risk" & "Failing" Structural
ACCESS TILES*	6,015 (ea)	9,948 (ea)	69%	1,388 (ea)	11,568 (ea)	56%
CROSS CULVERTS*	831 (ea)	3,991 (ea)	29%	499 (ea)	3,991 (ea)	27%
PIPES*	45 mi	180 mi	30%	7 mi	187 mi	26%
CATCH BASINS *	4,259 (ea)	4,562 (ea)	29%	1,521 (ea)	9,734 (ea)	37%

*Assets which have two condition scores – Capacity & Structural

Our Starting Point

A growing crisis is occurring. The County's 2008 road inventory has a significant proportion that is "failing" or "at risk" of failing. Proper emphasis should be paid to bringing the infrastructure up to standard. Failure to properly address these issues will allow "at risk" assets to fail. Failing assets will require rehabilitation and/or reconstruction. At risk assets require significantly escalating maintenance costs if left alone. Failing assets also place the road infrastructure at risk for more costly repairs, wholesale loss of the road and related closures and detours, increased probability of damage to persons and property due to flooding and other failures, and decreased federal revenues for future repairs in the event of another federally declared storm disaster. Left unchecked the number of failing and at risk assets will escalate significantly. A couple of illustrations and implications of failure are provided below for shoulders and open ditches.

Gravel Shoulders

Implications of Failure

•High possibility of flooding to private & public property
•High possibility of damage to road surface - water can't escape or sits on shoulder edge
•High possibility of road wash out
•Increased County liability & claims
•Increased cost of maintenance & repair
•Increased ice risk

2008	Gravel Shoulders
ConditionRating	
5	23
4	90
3	186
2	116
1	74
Totals	489
% Not at Risk	23%
% at Risk (Gray)	62%
%Failed (Red)	15%
Total at Risk or Failing	77%

Open Ditches

Implications of Failure

•High possibility of flooding to private & public property
•High possibility of damage to road surface from improper roadway drainage
•Potential environmental and health impacts
•Increased County liability & claims
•Increased cost of maintenance and repair
•Increased ice risk

2008	Ditches
ConditionRating	
5	41
4	122
3	145
2	133
1	43
Totals	484
% Not at Risk	34%
% at Risk (Gray)	57%
%Failed (Red)	9%
Total at Risk or Failing	66%

Transitions: Between 2009 and When A&Is Are Assumed to be Completed in 2012

In the time interval between 2008, the year for which the condition rating analysis in this report has been developed, and when all annexations and incorporations are assumed to be completed, continued deterioration of roadway assets will occur. Roadway assets are deteriorating now, under current revenues. As shown in the 2009 – 2028 Annexation Impacts for ROMP Analysis Financial Plan, funding is reduced prominently from 2010 through 2012. Furthermore, the areas that are annexed are not the ones that typically flood or have sufficient elevation to require ongoing seasonal winter snow and ice response, so these efforts take a proportionally bigger portion of the Maintenance budget, creating even more deferred maintenance.

Post A/I Inventory

The post-annexation inventory is shown in the table below:

Asset Class	***2008***	***Post-Annexation***	***Difference***
Road Surface[22]	1,722 road miles	1,249 road miles	-27.5 %
Open Ditches	1,181 lane miles	1,024 lane miles	-13.3 %
Gravel Shoulders	1,860 lane miles	1,544 lane miles	-17 %
Catch Basins	30,418 (each)	11,860 (each)	-61 %
Access Tiles	23,135 (each)	18,552 (each)	-19.8 %
Cross Culverts	16,629 (each)	9,041 (each)	-45.6 %
Enclosed Pipes	749 lane miles	379 lane miles	-49.4 %

An across-the-board reduction of roadway assets is not evident. There are particular assets which primarily remain in the rural unincorporated King County such as open ditches, while others such as enclosed drainage systems are significantly reduced because they are urban amenities.

Option A: Across the Board Reduction (Post A&I)

Financial Plan Revenue Reductions

As shown in the 2009 - 2028 Financial Plan - Annexation Impacts for ROMP Analysis, there are significant cuts over and above those to reflect direct service loss for PAA areas that are annexed. From 2010 through 2012 when A/Is are assumed to be completed, cuts to Road Maintenance are assumed to average $3 million per year (in addition to reductions made for loss of service area), with the largest hit being in 2011 in the amount of $7.3 million or a 21% reduction from the 2009 Section budget in real dollars. Between 2013 through 2020, an additional $1.2 million is added annually on average and from 2021 through 2028, reductions of $2.4 million annually are made. All told, over the 19 years, the Roads Maintenance budget would average cuts of approximately $1 million annually.

[22] Does not include gravel roads.

Budget Composition

The impacts of this Financial Plan can be evaluated by first looking at the composition of the 2009 budget and the gap that currently exists.

Legal Mandates

The Road Maintenance Section's budget can be generally divided into legal mandates, safety, and preservation. **Regulatory compliance** with the King County Surface Water Design Manual, adopted administratively by rule per King County Code, and the National Pollution Discharge Elimination System (NPDES) Municipal Stormwater Permit, is estimated to be over $20 million after A&I. King County's network of road drainage systems is the second largest stormwater drainage system in the State of Washington. Drainage includes collection, conveyance, retention/detention, infiltration, and vault systems. Its purpose is to collect, convey, hold, filter pollutants from, infiltrate and discharge water ultimately to local and regional water bodies. There is also a legal mandate, which is outcome based, for Noxious Weed control per State RCW 17.10. There are also requirements under Section 4(d) of the Endangered Species Act, that have been well integrated into Maintenance operations under the Regional Road Maintenance ESA guidelines. Facilities compliance, outlined in the Stormwater Pollution Prevention Plans for each, is also required. **Total "big picture" estimates for compliance is $25.6 million.**

Safety

Many of the operations tasks are also done for safety reasons. **Vegetation management** is performed to assure adequate sight distances; no ornamental or landscape-type of vegetation-related maintenance is performed. Overgrown vegetation can obscure sight lines along curves, and at access routes and intersections creating safety hazards. **Shoulder restoration** is done primarily to provide a recovery area for vehicles in the event they are forced or need to veer off the paved travel surface, and to provide for a safe pathway for pedestrians, bicyclists, and equestrians. Well-maintained shoulders also provide a means for road runoff to quickly drain from roads into nearby stormwater systems. Under winter conditions, water which sits on or immediately adjacent to the road because of poor shoulders, will quickly form ice, creating a driving hazard. Water will also enter the road subsurface through cracks or erosion, undermining the very structure of the road itself and necessitating costly rehabilitation or reconstruction. **De-icing and short-lived snow and ice activities** are also typical winter tasks done on high elevation roads, particularly in rural east, southeast, and northeast unincorporated King County. **Our estimate of safety-related activities exclusive of major storms and legal mandates is around $3.5 million**. Most of the drainage-related legal mandates described above are also safety-related, as good drainage protects the road and nearby private property from flooding.

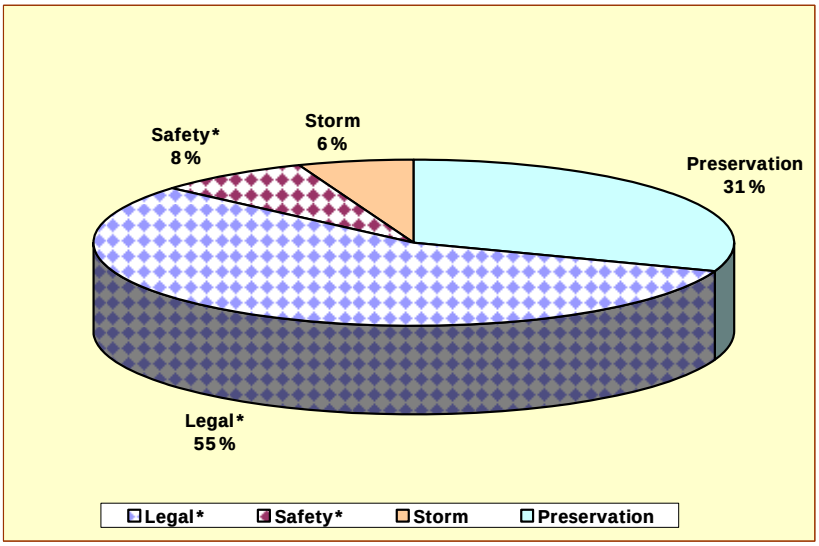
Major Storm Response/Recovery

A significant amount of each year's resources are reallocated from regular ongoing maintenance activities in order to accomplish response, recovery and repairs arising from major storm events; generating a substantial backlog of deferred maintenance work. From January 2006 to December 2008 (If it were to include the flood of January 2009 it would be even higher), it is estimated that

$2.4 million of maintenance was deferred annually due to storms. This cost is illustrated thusly: storms occurring in the time period of 2006-2008 caused an over expenditure of the Maintenance Section Low Org 1676 of $14.2 million. The total storm costs during this period however was $21 .3 million. That means that $7.1 million in storm costs were absorbed by the regular maintenance budget, deferring importance maintenance items such as drainage repair, shoulder work etc. On an annual basis this means storms borrow approximately $2.4 million per year from the regular maintenance budget ($7.1 million divided by three years equals approximately $2.4 million). Put another way, the amount storm response has borrowed from the regular maintenance budget has averaged $2.4 million annually over the past three years.

Preservation

The remaining portion of the Road Maintenance budget is for preservation. Examples include the work currently done on the travelled roadway surface such as grinding of existing pavement, square cut patching, and grading.



***Some overlap between Legal and Safety allcoations.**

Budget Composition	**$ (Millions)**	**%**
Legal Mandates*	25.6	56
Safety Activities (Exclusive of Legal Mandates)*	3.5	8
Storm Response/Recovery*	2.7	6
Preservation*	14.0	30
TOTAL	45.8	100

*Assumes operations support

The funding gap that exists post-annexation is laid out in the table below. The table shows 2012 through 2017 for illustrative purposes. It is built from the 2009-2028 Financial Plan, starting from the 2009 Adopted (non-reimbursable) budget and then taking Section reductions per year outlined in the "Section Budget and FTE Reductions to Balance 20 Year Financial Plan" tab, with adjustments made for A&Is. Requirements for Legal Mandates, Safety, Storm, and Preservation are then specified to identify the Funding Requirement. The Shortfall then, is the difference between the Funding Requirement and Revised Maintenance Budget without PAAs.

Funding Gap 2012-2017* Including Distributed Costs	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Revised Maint. Budget w/o PAAs	$28,572,000	$30,831,000	$32,407,000	$33,636,000	$34,688,000	$35,329,000
Legal Mandates	$27,309,000	$28,183,000	$29,085,000	$30,016,000	$30,976,000	$31,967,000
Safety	$ 3,700,000	$ 3,818,000	$ 3,941,000	$ 4,067,000	$ 4,197,000	$ 4,331,000
Storm	$ 2,868,000	$ 2,960,000	$ 3,055,000	$ 3,153,000	$ 3,254,000	$ 3,358,000
Preservation	$14,933,000	$15,411,000	$15,904,000	$16,413,000	$16,939,000	$17,481,000
Funding Requirement	$48,810,000	$50,372,000	$51,985,000	$53,649,000	$55,366,000	$57,137,000
(Shortfall)	($20,238,000)	($19,541,000)	($19,578,000)	($20,013,000)	($20,678,000)	($21,808,000)

**Rounded to nearest $1,000*

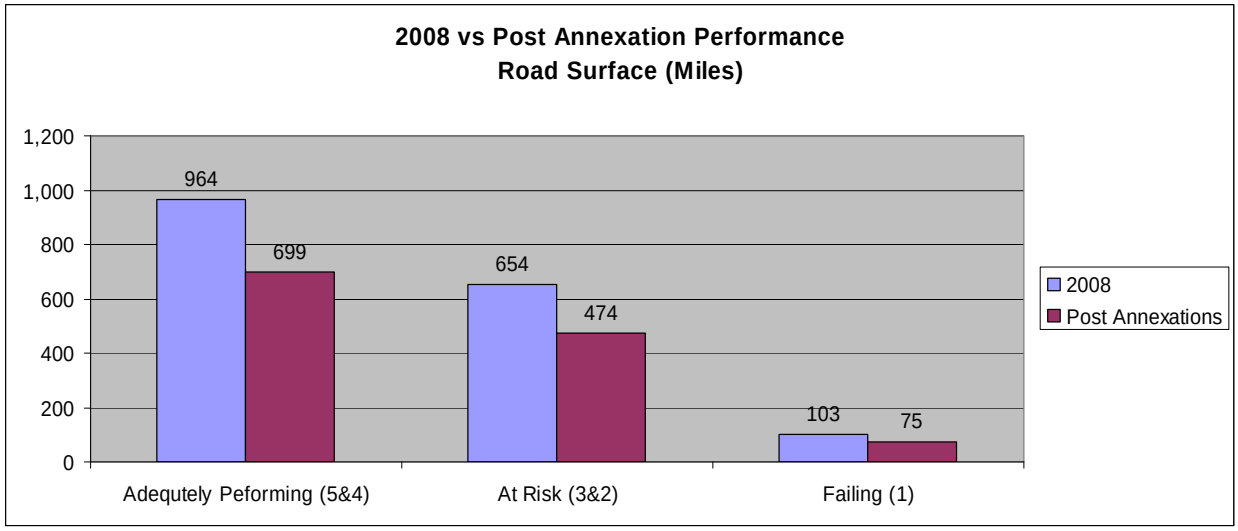
The average shortfall annually between 2012 and 2017 is -$20.3 million. The gap after 2020 will accelerate dramatically as Section budget reductions grow rapidly.

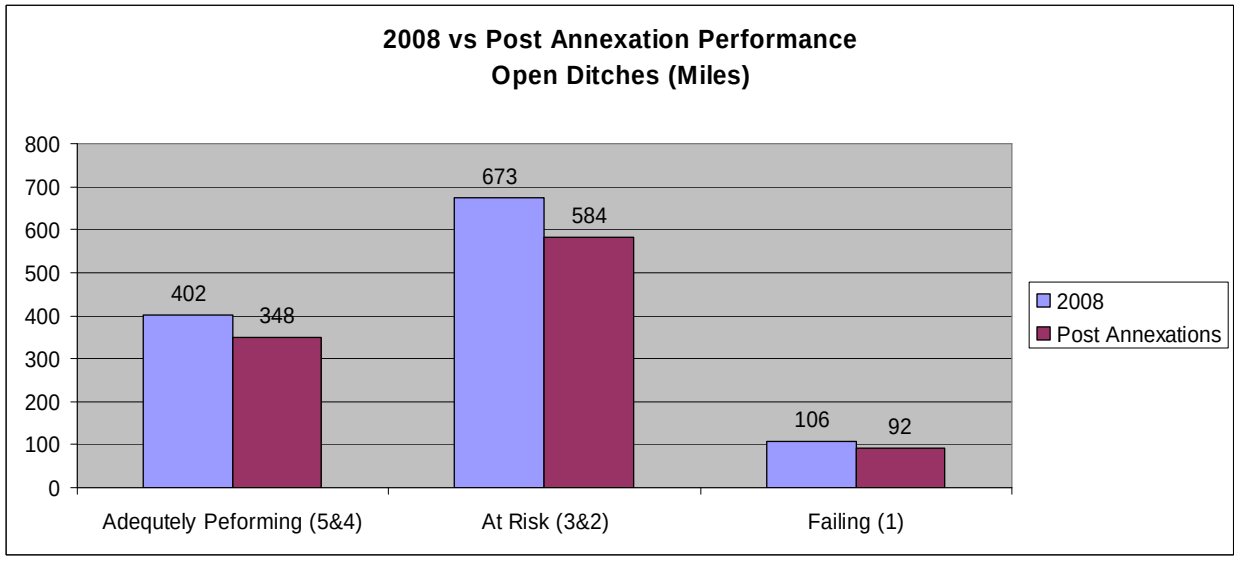
Outcomes

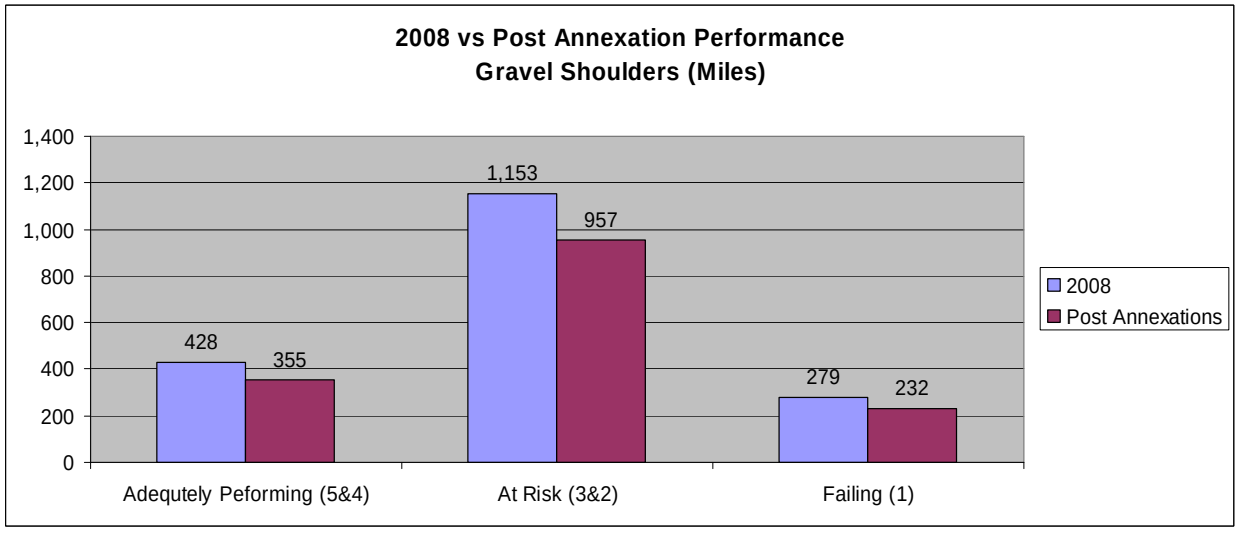
The outcomes for implementing option A are detailed below:

- A significant portion of road drainage system assets will not meet regulatory requirements such as required by the King County Surface Water Design Manual.

- The number of roadway assets remaining in the post A&I inventory which will be at-risk and failing is shown in the series of bar charts that follow, and are contrasted with those identified in the 2008 Condition Ratings. The remaining number of "at risk" and "failing" assets post-A/I continues to be significant.


2008 vs Post Annexation Performance
Road Surface (Miles)
1,200
1,000
800
600
400
200
0
964
699
654
474
103
75
Adequtely Peforming (5&4)
At Risk (3&2)
Failing (1)
2008
Post Annexations


2008 vs Post Annexation Performance
Open Ditches (Miles)
800
700
600
500
400
300
200
100
0
402
348
673
584
106
92
Adequtely Peforming (5&4)
At Risk (3&2)
Failing (1)
2008
Post Annexations


2008 vs Post Annexation Performance
Gravel Shoulders (Miles)
1,400
1,200
1,000
800
600
400
200
0
428
355
1,153
957
279
232
Adequtely Peforming (5&4)
At Risk (3&2)
Failing (1)
2008
Post Annexations

- It should be noted that overall condition levels will continue to deteriorate from 2008 through 2012 as a result of reduction in funding which is greater than that associated with loss of A/I areas and impact on deferred maintenance resulting from storms. The bar charts above assume the same percentage "failing" and "at risk" as in 2008, which is a very conservative assumption.

- For emergency events which are and will continue to be located primarily in rural areas, there will be less staff available to mobilize. A greater proportion of the Maintenance budget will be spent on response and recovery, thereby adding to deferred maintenance and asset deterioration.

- For road arterials which are failing, there will begin to be road closures and restrictions affecting commerce.

- The downward spiral will escalate: deferred maintenance grows; asset deterioration continues; the maintenance that you are able to do costs more so you are able to do less maintenance; then deferred maintenance grows again; and so on.

- The probability of flooding roads and private property as a result of poor drainage adjacent to roads is increasing and will also escalate.

- There will be a high probability of asset failure and collapse impacting public safety of the travelling public as the percentage of failing assets grows.

- There will be increasing County liability over time evidenced by claims and lawsuits.

- Road assets are 37% of the County's balance sheet. As asset conditions continue to deteriorate under this option, there is risk that the County's bond rating could be jeopardized.

- Maintenance will either become more reactive as Road Maintenance responds to imminent safety hazard and other complaints rather than doing planned maintenance, or they would record citizen action requests for service but be unable to meet them in a timely manner, if at all.

- Citizen outcry will be loud. Between 2005 and 2008, the number of Citizen Action Requests increased 53%, despite loss of service area.

Option B and B1: Maximize asset life cycle in rural areas

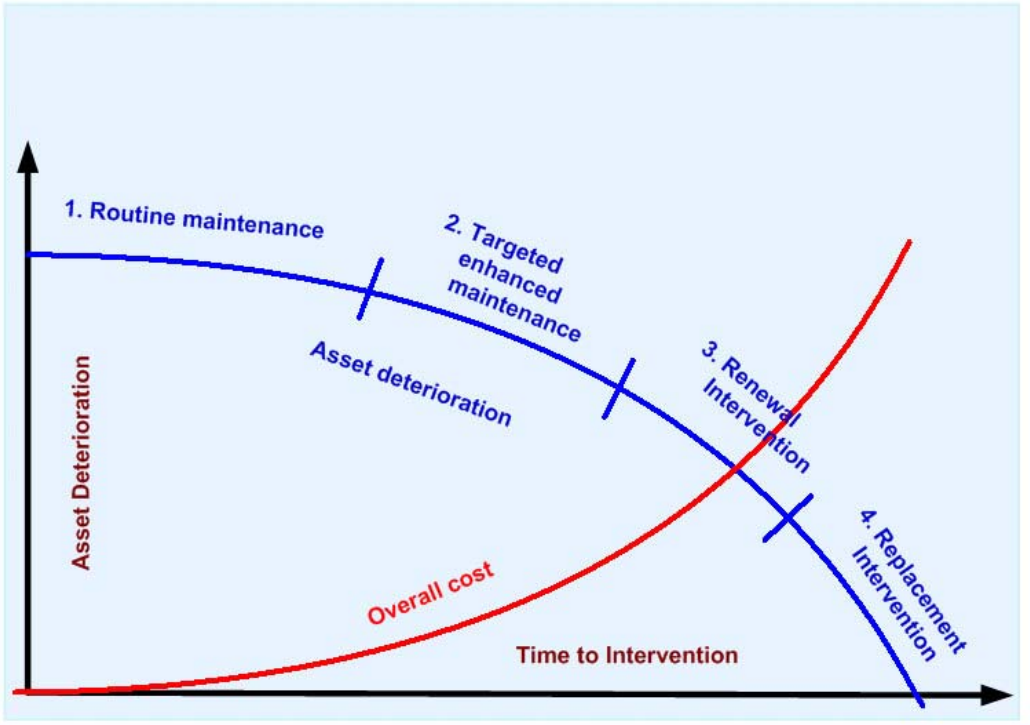
This scenario is assumed to mean the same as "minimize the life cycle cost" of assets in rural areas. To fully implement this option, standard condition ratings and a history of expenditures needs to be available for each asset. This data is not currently available and would require the investment in GIS Asset Management software and accounting systems similar to what is envisioned for the Roads Comprehensive Asset Management Maintenance System (RCAMM).

The RCAMM project would put in place a modern system and improved business processes for management of the Division's assets. Specifically, it would address areas of service request tracking, work order management, performance measurement and work programming and budgeting. These systems, commonly referred to as Computerized maintenance management systems (CMMS) or enterprise asset management (EAM) systems, are software solutions that are mature and their benefits have been realized by many Transportation and Public Works Departments within the region and across the country.

This project would address our currently fragmented, error prone and redundant systems and processes in the areas of asset and work management. The impacts of these deficiencies are significant and include customer service lags, repeat investigative work, loss of productivity at all levels of the organization, greater liability exposure and excessive records research for information requests.

Asset Management is key to minimizing life cycle costs for both operating and capital expenses. At its most simple, asset management optimizes the trade-off between maintenance and replacement. According to this scenario, rural area infrastructure preservation would be the top priority for both operating and capital investment decisions.

In the graph below, it is most cost effective to do maintenance activities up until the point that the red line intersects with the blue line. When assets are being maintained on the right side of that intersection, the costs of maintaining the asset are increasing sharply. While moving along the blue line into renewal intervention it is still maintenance, but is more major and costly maintenance which doesn't last. When you move along the blue line into replacement intervention, reconstruction is needed. For example, travelled roadway surface condition ratings of "1" would require a complete reconstruction of the road, particularly for arterials. A condition rating of "2" would typically require something less than reconstruction but some type of major maintenance intervention.



Option B – Asset Life Cycle, Post-A/I Revenues

According to the rural asset management strategy, a balanced approach should be followed that is neither capital intensive nor maintenance intensive. There is a balance between having adequate funding to ensure that those assets with relatively high condition ratings stay high, while infusing "one-time" monies to rehabilitate and reconstruct roads with failing and/or low condition ratings. In order to fully implement this option under current road asset conditions where there are a significant number of "failing" or "at risk" of failing assets, a major one-time investment would be required to rehabilitate and reconstruct roads and other assets that are no longer efficient to maintain. Without it, maintenance costs continue to escalate while the effectiveness and longevity of that maintenance fix decreases to a point where maintenance no longer works.

For example, Roads Maintenance performs the work required to prepare roads for the annual pavement overlay contract (overlay prep). These activities are performed in advance of the contract to correct imperfections in the roadway surface. Imperfections are areas in the asphalt that have minor to severe cracks, potholes, dips or ware marks in the driving lanes due to heavy traffic, etc. Flaws in the existing surface must be repaired to ensure they do not mirror up into the new overlay surface and result in a shortened life for the new overlay. In extreme cases, the base of the road needs to be replaced since it is not sufficiently compact or stable enough to support the new roadway surface. In the year 2000, Roads Maintenance spent $600,000 on preparation to overlay 34 center lanes miles. Last year, in 2008, overlay prep costs totaled $2.4 million for 41 center lane miles of roadway. The corresponding cost of the year 2000 expenditures in 2008 dollars would be less than $890,000. In other words, the majority of the cost increase is due to the condition of the roads being overlayed and the amount of work

associated with correcting imperfections in advance of the contract. This maintenance intensive trend will likely continue unless there are changes in the program.

The post-A/I financial plan does not allow for either part of this strategy, because of the funding gap identified under option A. As such, if implemented, this option would entail the following:

- The focus would be on arterials since they are the most heavily traveled roads and the most expensive to reconstruct. In contrast to the "worst first" approach, roads with condition ratings of 5 and 4 would be maintained in order to minimize the life cycle cost. Roads with condition ratings of 3 and below would deteriorate the most since they are at the end of their life cycle.

- Roads with low condition ratings would be allowed to deteriorate. The cost of maintaining roads with low condition ratings is expensive with a lower rate of return for the investment.

- Local access roads would be a lower priority than arterials since they have less traffic volume and are less expensive to rehabilitate. Similar to arterials, the focus would be on streets with higher condition ratings. The number of local access road miles "at risk" and allowed to fail would increase.

- Some roads may need to be closed or restricted.

- While the asset management strategy is a logical approach to making financial decisions, it will be difficult to implement in a climate of reduced road maintenance and possible road failures. Nevertheless, it may be important to follow this option in order to avoid increasing the backlog of assets "at risk" in the long term.

Outcomes for implementing option B:

- Since assets with low condition ratings would not be maintained (or minimally maintained), drainage compliance requirements for these assets would not be met.
- Safety may require maintenance of a given road, despite its condition rating, which is incompatible with this approach and would take away monies to maintain high condition roads.
- Life cycle cost reductions could be realized.
- Overall, average condition rating scores would be higher in the longer run.
- In the short term, there would be an increase in failed and at risk road miles. Over the long term, the number of roads in the failed and at risk categories would be reduced.
- Citizen complaints will increase dramatically. Neighborhoods would see road asset deterioration.
- Road closures, restrictions, and/or "downgrading" may be required.
- Increase in liability, claims, and/or lawsuits will likely result.
- There will need to be tradeoffs between maintaining the roadway surface and other infrastructure assets (shoulders, ditches, drainage).

- This option is operationally difficult to implement without an infusion of funds, since a given road may have segments with various condition ratings. The efficiencies of a "circuit" for maintenance may be lost.

Option B1 – Life Cycle with New Revenues

This option would allow an infusion of new funding which would allow optimal maintenance of roadway assets with good condition ratings and a "one-time" catch-up to rehabilitate and/or reconstruct assets with low condition ratings.

Based on the current inventory, there are over 103 center lane miles of roadway surface in the urban and rural areas that have a pavement condition rating of "1" and can no longer be overlayed (26 arterial miles and 77 miles of local access roads). Post A&I, roads with a condition rating of "1" total 19 arterial miles and 56 miles of local access roads. Replacement intervention would be needed on these roads to minimize the life cycle cost. The estimated cost of reconstructing 19 post-A&I arterial road miles (surface, shoulders, drainage) with a condition rating of "1" (failing) is projected to be around $75 million.

While the impacts of deferred maintenance are not obvious immediately, within a few years backlog totals can significantly exceed annual operating budget constraints. The City of Tacoma, for example, recently announced plans to request a six year levy to repair streets and sidewalks. Phase one is $180 million with three other phases to follow totaling about $750 million. Their first attention is on streets that are rated in the "fair" to "failed" categories (91 lane miles of arterials and 19 lane miles of residential streets).

While asset management is frequently used for the pavement surface, the strategy also applies to other transportation-related assets. These assets would be included in the asset management category by evaluating one-time expenditures for replacement, repair, and rehabilitation and the ongoing costs of maintenance to minimize the overall life cycle cost. It is likely that by providing more effective infrastructure asset maintenance, the need to rehabilitate certain inventory features would be reduced. For example, better maintenance of drainage facilities such as open ditches, catch basins, cross culverts, and access tiles with condition ratings below 3.0 would ensure that they have sufficient capacity and structural integrity to accommodate major storm events. The number of major drainage system failures and road washouts would be reduced thereby minimizing the overall cost. It is much less expensive to clean catch basins and culverts than it is to repair storm damage and replace a failed drainage system. If shoulders are routinely maintained, additional material can be added for a relatively small cost. If this work is not performed as needed, then complete shoulder restoration is required to remove the existing material and rebuild the shoulder.

Under option B1, arterial roads with condition ratings of 1 and 2 would be the first candidates to reconstruct if and when Roads CIP funding becomes available. Maintenance is no longer a cost effective way of achieving the desired level of service for a roadway surface that has failed (Condition Rating 1). Reconstruction or replacement of the asset is needed based on the condition. Unfortunately, in order to reconstruct the road and meet current standards, the cost could range up to $4 million per arterial mile.

An important component of this option is to ensure that there is sufficient money to fund the ongoing maintenance of the assets which currently are in good condition as well as those that have been repaired or replaced in order to minimize their life cycle cost. The key to the asset management option is obtaining a source of revenue to fund the cost of rehabilitating and/or reconstructing the infrastructure without reducing the resources available to provide for ongoing maintenance activities needed to keep the condition of assets up to standard and minimize the life cycle cost.

Outcomes for implementing option B1 are:

- Legal mandates and safety-related maintenance would be funded for all roadway assets.
- A balanced capital and maintenance strategy would be employed, reducing the life cycle costs of assets. This facilitates effective and efficient use of maintenance dollars.
- The strategy stymies the rapid deterioration of assets.
- A "catch-up" strategy to address "failing" and "at risk" roadway assets would be implemented over time decreasing the number in that category and raising long-term condition ratings.
- Liability, claims, and/or lawsuits should be reduced.
- Citizen satisfaction would be enhanced.
- Road failures should be reduced and storm-related impacts to roadway assets ameliorated unless extreme conditions prevail.
- Prevents road closures, restrictions, and "downgrading".
- The downward spiral of increasing maintenance costs is stopped.
- Ensures resources for continued excellent emergency response and recovery without huge deferred maintenance impacts.
- The probability of flooding roads and private property as a result of poor drainage adjacent to roads would be reduced.
- The County's bond rating is protected.

Option C: Grant Eligible

Grants are not generally available for ongoing maintenance activities. Grant monies acquired by Roads Maintenance have been primarily from FEMA, as partial reimbursement for storm response and recovery. Implementation of this scenario could possibly result in a CIP which is almost exclusively grant funded. CIP projects would not be prioritized according to need, but defined in order to maximize the use of grant funds.

Depending on availability, this could result in additional Road fund dollars being increased on the operating side. Depending on the assumptions used, these funds could help to mitigate a portion of the funding gap identified under option A. Conversely, not funding needed reconstruction projects could also increase maintenance costs dramatically over time. This would be especially evident for overlay preparation, where already escalating costs are visible.

Outcomes can be summarized as follows:

- Roadway asset condition ratings will continue to deteriorate at a growing rate.
- The County's bond rating will continue to be in jeopardy as assets deteriorate.

- Maintenance costs will increase and be less effective as needed rehabilitation and reconstruction is ignored (downward spiral). Additional operating monies could help deflect this somewhat, but over time maintenance ceases to be the right "fix": merely a band-aid approach which quickly falls apart.
- Increasing liability resulting in claims and lawsuits as CIP projects are not queued up and completed in an orderly, "rational" manner.
- Road and bridge failures are expected to increase since needed reconstruction and replacement is not done.
- Road and bridge closures and restrictions are likely, especially in the long-term.
- The ability to meet legal mandates and safety demands may be improved over option A, depending on monies available to the operating fund, and to Road Maintenance in particular.
- Fish passage improvements would likely be underfunded.

Impacts of Operational Models to Traffic Maintenance Program Area

Our Starting Point

Maintenance and Operations of the traffic elements of the Road System face many of the same issues identified in the Road Maintenance future conditions discussion.

A growing crisis is occurring. Assets require maintenance, rehabilitation and reconstruction at the end of their useful life. Many rural roads are functionally obsolete and require significant resources just to remain operational, rural roads can also be dangerous. ROMP Working Paper 3 states that while about 30% of the vehicle miles travelled occur on rural roads almost 60% of the fatalities occur on those roads.

Current Situation under Adopted 2009 Budget

- The Manual on Uniformed Traffic Control Devices (MUTCD) is adopted by state law and King County Code meaning that much of RSD's currently performed traffic maintenance sign and signal work is legally mandated. This work is also directly related to traffic and pedestrian safety. The RSD is currently in full compliance with this regulatory requirement.
- 2,200 collisions each year occur in Unincorporated King County. These collisions account for 16 fatalities and over $75 million in societal cost each year. A disproportionate number of the more severe collisions occur in the rural area.
- On average, sign and marking assets are currently maintained at an adequate level. Expenditures for sign and marking maintenance in unincorporated King County are approximately $1.89 million annually, or about $33 per item of inventory. This level of expenditure allows us to maintain 70% (80% in school zones) of our total assets at a condition level of good or excellent. There is a maintenance backlog of 25 - 30% of assets that are considered poor or failing each year.
- Signals, Flashers and Streetlights are also currently maintained at an adequate level. Annual expenditures for Signal Maintenance are approximately $1.97 million or about $16,000 per signal. Approximately 10% of signal assets are not able to be maintained at an adequate level each year.

Post Annexation

The County's post-annexation traffic inventory will be one with fewer signals, flashers and streetlights to maintain and operate. However, there will still be a significant inventory of signs, striping and thermoplastic markings, guardrail, and Raised Pavement Markings (RPMs) to maintain, repair and replace as necessary.

The post-annexation unincorporated road system will be rural, with the exception of the Redmond Ridge-Trilogy urban planned developments. However, the easterly cities in the county will continue to rely on County roadways linking them to jobs, shopping, schools and supply centers, located in the western urban cities. Additionally, these cities, under Growth Management, will continue to accept increased population densities and jobs, all of which will remain dependent upon the old, existing County network of arterial roadways.

- Rural roads are potentially more dangerous than urban roads. Working Paper 3 states that while about 30% of the vehicle miles travelled occur on rural roads almost 60% of the fatalities occur on those roads.
- Rural roads are basically pedestrian and bicycle unfriendly, with few road shoulders up to standard and a minimum number of paved shoulders and pathways. These roads are also largely unsuitable for people with mobility related disabilities.
- Rural roads are characterized by limited visibility and sightlines. Visibility is limited by topography, lack of street lighting, and poor maintenance condition of striping, RPMs, and thermoplastic that is more quickly degraded or eroded as the result of significant increased traffic combined with winter snow plowing and sanding activities. An increased frequency of maintenance tasks that address limited visibility will be necessary.
- Emphasis on maintenance and restoration of road shoulders and guardrail will be needed to contain the severity of accidents as the increased population takes to the roadways.

Option A – Across the Board Reduction (Post A&I)

- There will be a smaller signal and streetlight inventory in the rural area. While this inventory reduction is significant, because of the visibility challenges in the rural area more maintenance will be needed to maintain operations at an adequate level.
- There is a much smaller reduction in sign and marking inventory in the rural area, an average reduction of approximately 25%. It will be important to maximize the visibility of striping and signs to reduce the number and severity of collisions in the rural area. The reduction in the funding available to perform sign maintenance far outstrips the positive impact of the reduced inventory. For example, under current conditions RDS expends over $16 per sign, while in post A&I scenario that level is reduced to less than $7 per sign.
- Direct service level reductions to Traffic Engineering from 2010 to 2012 will total approximately $2.5 million, a reduction of over 26%.
- The implementation of that reduction will increase the number of signs unable to be maintained (backlog) in good or excellent condition to over 50%. This will reduce the overall condition rating below the adequate level.
- Traffic Engineering provides engineering support to the CIP and contract cities, in addition to performing safety related engineering in unincorporated King County. Traffic Engineers are the primary direct contact with citizens concerned by safety issues on county roads, responding to over 1000 inquiries per year.

- Reductions of this type will produce a roadway system that has less visibility and is less safe, possibly resulting in conditions similar to the photographs in the appendix to this paper.
- A reduction in marking visibility equates to an increase in collisions and increased County liability.

- Reducing safety engineering will not only reduce direct support to traffic maintenance activities but will reduce safety analysis and reporting. There will also be a reduction to the high level of citizen customer service that currently exists.
- Reducing staff and other resources would also reduce the ability of RSD to support contract city business, resulting in a loss of revenue. City contract work currently comprises 28% of the Traffic Engineering Section Budget.

Policy Questions

- What level of decreased safety is acceptable?
- At what level of staffing will Traffic Engineering be unable to support continued contract city work?

Option B –Maximize Asset Lifecycle in the rural area under current revenue scenario

- Even with the reduced inventory, applying expected revenues to these assets exacerbates the backlog of assets with poor and failing condition ratings in these more safety-critical areas.
- Maintenance costs will increase because the inventory is more dispersed, increasing labor and equipment rental costs.
- Expenditures for signal maintenance will need to be moved to fund the gap in sign and marking maintenance discussed above. This stop-gap measure would defer needed improvements to visibility on rural roads.
- Maintenance for roads in the Redmond Ridge/Trilogy UPDs and on urban connector roads between rural cities and the urban area would be at a lower service level. It will be difficult to maintain an urban service level on these roads.
- The increased backlog and general reduction in condition for assets in the rural area will increase liability for claims or lawsuits.
- Legal mandates and safety-related maintenance would be below acceptable levels.
- Citizen complaints would increase.

Policy Questions

- What service level would be maintained to serve the urban pockets and urban connectors in the rural area?
- What is an acceptable level of risk and citizen concerns given the reduced service level?

Option B1 – Maximize Life Cycle in the Rural Area with increased revenues.

- This option would allow an infusion of new funding which would allow optimal maintenance of roadway assets and reduce the backlog of assets maintained in poor or failing condition.

- RSD would emphasize safety in the rural area by performing preservation and maintenance to try to reduce the number of collisions and make them less serious.

- Improvements in visibility associated with additional lighting installation at appropriate locations and improved markings would be the goals. Signs and markings would need to be checked and maintained more often.

- The use of Intelligent Transportation Systems (ITS) capabilities designed for the rural area would be used. This includes intelligent signage designed to warn for weather related hazards and mark serious safety hazards.

- The mitigation of roadside hazards by increasing the amount of guardrail coverage and improving recovery areas on shoulders would be a priority.

- Priority arrays would be revised to emphasize the importance of the fact that collisions tend to be more serious in the rural area.

- Citizen complaints would be reduced.

Policy Questions

- What resource level would be needed to implement the maximize asset level policy? This will probably be investigated in the next phase of ROMP.

Option C – Grant Emphasis

- There are very few grants available for traffic operations and maintenance. Recent grant history shows less than $500,000 available annually to fund high priority safety projects.
- Grants are not generally available for ongoing maintenance activities. Grant revenue in general is trending downward which exacerbates the problem of the non-availability of grants for traffic operations.
- Implementation of this scenario could possibly result in a CIP which is almost exclusively grant-funded. CIP projects would not be prioritized according to need, but defined in order to maximize the use of grant funds.
- Emphasizing grants would reduce the funding available for general traffic operations and maintenance, resulting in a drop in service levels.

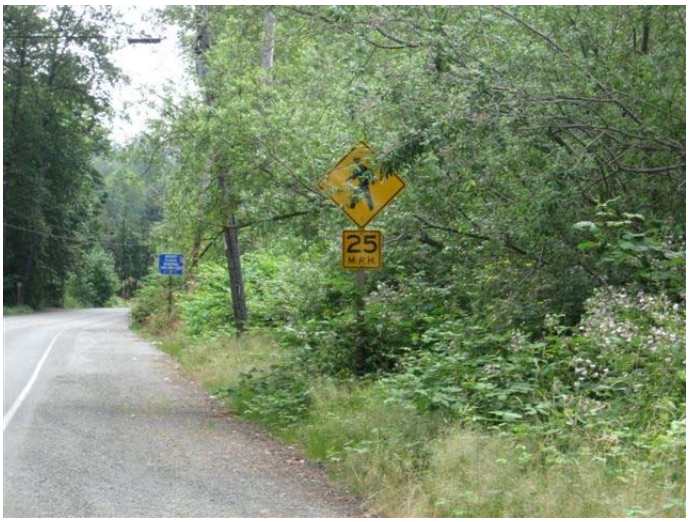
Appendix – Examples of markings in poor and failing conditions.

The striping and thermoplastic crosswalks shown in this example are examples of the poor condition for these assets

Retro-reflectivity examples for signs in good compared to poor and failing condition in daylight.

These are the same signs in nighttime conditions.

Visibility – The maintenance of signs is more critical in the rural area as lighting is less available and there are more impediments to visibility.



Appendix M: Road Services Division Facilities Maintenance Study

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King County

Roads Maintenance Facilities Study

Final Report

June 23, 2008

King County

Roads Maintenance Facilities Study

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Executive Summary

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A. Introduction

The King County Road Services Division (RSD) is the direct service provider of maintenance, repair, operations, management, capital planning, design, and construction for the county's road system that spans the 1,755 square miles of unincorporated King County. This large area includes 1,676 square miles, or over 95% of rural land and 79 square miles of urban land. Within the unincorporated rural and urban areas, the RSD is responsible for 1,768 centerline miles of roadway and 185 bridges.

Of the 2,126 square miles that comprise the whole of King County, the 39 incorporated cities occupy a combined total of about 388 square miles or about 18%. The RSD is an effective partner with nearly all of the 39 cities through the provision, on a contract basis, of an array of public works services. Of these, eight cities covering 270 square miles (about 13%) or 700 centerline miles of roadway, purchase ongoing road maintenance services from RSD while eleven cities, covering 303 square miles (over 14%) or 1,011 centerline miles, contract for traffic maintenance or engineering services on an on-going basis. Those cities which purchase significant on-going roads maintenance services from RSD also receive full emergency and storm response services from RSD. Other contract services include bridge inspection and repair, wetland restoration, soils and materials laboratory analysis, pavement overlay, and small construction projects.

Road Services Division, through its contractual services, is also a vital partner with other county agencies in maintaining, repairing, and building critical infrastructure and in providing response and recovery efforts on the ground during and following weather and other emergency events. For example, county bridges located in parks and the county's regional trail system are regularly inspected and at times repaired by RSD. RSD provides maintenance and repair for King County Water & Land Resources Division (WLRD) managed levees and retention ponds and performs small construction projects. The recently created Flood Control Zone District relies heavily upon RSD for construction and maintenance of the smaller levee projects contained within its initial 10-year work program.

Over the coming decades, the RSD will continue to respond to and plan for the evolving needs of the rural area and remaining pockets of urban areas for which it is the roadway infrastructure and services direct service provider. While the rural area will see far less growth than the urban areas, new development is expected to add over 10,000 new units in the rural area over the next 20 years. [1] This may result in up to 164,000 residents depending upon the ability of the county's system of roadways to link them to work, school,

[1] 2008 King County Benchmarks Land Use Report – page 2

recreation, goods and services. [2] The demands of aging infrastructure, along with significant increases in truck and auto traffic on roads built for the reduced traffic needs of 50 years ago, have become more challenging to address in the face of substantial constraints and declines in revenues available to the county to fund its roads infrastructure.

As a result of these and other factors, the RSD's Roads Maintenance Section will experience changes in the amount, location, and type of work that it will be called upon to perform over the next 20 years. Annexations and incorporations of the remaining approximately 79 square miles of urban unincorporated land within the Urban Growth Area (UGA) will continue to shift the focus of the Roads Maintenance Section's direct service provision to the remaining rural unincorporated 1,676 square miles, concentrated mostly in the eastern part of the county. Vashon-Maury Island, a 37 square mile island located in Puget Sound, will also continue to rely upon the county for its local roads' needs. Increased environmental regulation, shifting demographics, changing business practices in support of Roads Capital Improvement Program (CIP) and WLRD, and changes in the nature of contract work purchased by cities and other agencies will affect the Roads Maintenance Section's future work.

The current configuration of the Roads Maintenance Section's operating facilities was established in the 1930s through 1960s and met the county's needs prior to the surge in incorporations and annexations that began in 1990 and the consequent decrease in the county's road inventory. The long ago established type, size, and location of roads maintenance facilities does not reflect the service and business needs of the future. Additionally, many roads maintenance facilities are beyond their useful life and do not conform to current-day structural, functional, and operational standards and best practices. Many are in disrepair – buildings built in the 1930s through the early 1960s are at the point where decisions must be made to undertake major rehabilitation and remodeling, replacement, and consolidation of some smaller facilities at more regionally efficient locations.

B. Future Roads Maintenance Work

Geographic Distribution of Work

- Annexations and incorporations of land within the UGA are shifting the focus of direct service provision within the remaining unincorporated area to the eastern, rural part of the county with the exception of Vashon-Maury Island which is planned to remain rural.
- Certain contract work with suburban cities is in decline as recently incorporated cities mature and assume generalized road maintenance responsibilities. Simultaneously, there is a trend for cities and other agencies to seek to contract with the Roads Maintenance Section for larger scale maintenance projects and small capital construction projects work for which they do not have the resources or expertise.

[2] 2007 Annual Growth Report – page 117

Volume of Work

By 2012, the county anticipates the remaining urban unincorporated area will incorporate or be annexed by neighboring cities. The resulting loss of road miles from the unincorporated roads system is the single largest factor responsible for the projected decline in direct local roads maintenance services provided by the county, except to the extent that the annexing or newly formed cities continue to contract with the county for such services. The county may see a loss of 38% of the current system of unincorporated area road miles by 2028. *Yet reducing the unincorporated King County direct service area geographically does not equivalently reduce the workload of the Roads Maintenance Section due to the following factors*:

- Cities choose which areas to annex and when to annex them. Generally those areas where the roads and other infrastructure are in good condition and the property values are higher are annexed sooner. As a result, over the next decade, the urban roads remaining in the county's unincorporated inventory on average will be the ones in older communities, with aged and outdated infrastructure, that require a higher frequency and extent of maintenance and repairs.
- Vehicle Miles Traveled (VMT) by autos and trucks on remaining county unincorporated roads is projected to increase by about 30% by 2028.[3] This substantial increase will result in markedly greater wear and tear on the county's road system and will require more frequent and extensive maintenance and repairs.
- New road standards, largely established to comply with new state and federal requirements, have increased maintenance workload per mile. An example is in the requirements for more intensive installation of enclosed stormwater conveyance systems with water quality treatment features (e.g. catch basins, vaults, treatment ponds). These water quality structures must be monitored and maintained regularly to ensure they function within ranges acceptable to regulatory agencies.
- Work potentially available from WLRD is anticipated to decrease by about 25% over the next 20 years because of the shrinkage of the county's Surface Water Management Utility fee revenues due to the annexations and incorporation of the unincorporated urban areas.
- Conversely, the new King County Flood Control Zone District, recently approved by the King County Council, has already resulted in construction work now being performed by Roads Maintenance crews on some flood control features such as levees and revetments. It is expected this work will increase and then stabilize as the Flood Control Zone District ramps up its aggressive ten-year program.
- Environmental regulations will increase workload especially with respect to improving and maintaining water quality and fish barrier removal within the county's road rights-of-way.

[3] Puget Sound Regional Council. "Puget Sound Trends: Vehicle Miles Traveled." August 2007

- The Snoqualmie Valley and other eastern rural areas are prone to seasonal flooding and there is disproportionately more snow and ice removal work and post storm repairs necessary in these parts of the county.

In addition to the above known conditions, it is predicted that winter storms will increase in intensity and frequency over the next twenty years due to the impacts of climate change.

Analysis indicates that the net impact of changes facing the Roads Maintenance Section in the coming decades will potentially result in a reduction in workload equivalent to 25 to 35 FTEs by 2028. This analysis accounts for the forecasted, increased work effort that will be necessary to provide the same level of service per mile in 2028 as is currently provided in 2008. For example, paving and patching asphalt is a routine maintenance activity that is performed to preserve the life of a road and to provide a safe, smooth surface for road users. The level of service, the outcome from the work performed, is measured by pavement condition, namely a smooth road. Due to the factors listed above: increased VMT, severe storms, age of the road structures, and environmental regulation, the amount of work required to provide the same level of service is greater on the county's rural road inventory, after all incorporations and annexations of the urban roads has occurred. More importantly, the remaining rural road inventory, due to its location, topography, and age is more affected by the factors increasing the workload.

The Roads Maintenance Section is working to update the maintenance management system that will provide current data based on the measured effort required to perform maintenance work and the application of newer best management practices to the maintenance work. This can be used to refine estimates of the labor, equipment, and materials required to meet King County's maintenance level of service standards on the reduced road miles.

C. Roads Maintenance Operating Facilities

Most of the county's ten existing roads maintenance operating facilities were built during the 1930s through the 1960s and were located to serve a roads system that existed prior to the boom in incorporations and annexations that occurred in the 1990s. These facilities form the operating base which supports the Roads Maintenance Section's day-to-day ongoing maintenance work and routine services to contract cities, and from which it launches its critically important response to seasonal storms and other emergency events. The facilities are widely spread across the 1,755 square miles of unincorporated King County, including the isolated Skykomish area and Vashon-Maury Island. With most facilities between 40 and 70 years of age, the building structures remain largely unchanged from their original construction and are woefully inadequate in terms of today's industry standards and practices. Today, the Roads Maintenance Section's workforce includes an increasing number of women performing the entire spectrum of job duties alongside their male counterparts. The existing outdated facilities never contemplated this eventuality and consequently, restroom and locker spaces are not able to accommodate female workers adequately.

As might be expected, the age of these facilities and the cost of substantially rehabilitating or replacing them has resulted in a large backlog of deferred facility improvement needs; many sites are in need of major renovation to improve employee safety and to enhance structural integrity. Most of the facilities are not able to properly garage maintenance equipment which affects equipment costs and out-of-service time. It will take a major financial investment to maintain and modernize the operating facilities infrastructure that is necessary to support the county's roads maintenance responsibilities into the future. Roads maintenance operating facilities realignment should be evaluated and considered concurrent with consideration of facilities renovations or consolidations because some costly repairs may be avoided as buildings or locations are deemed obsolete or ill sited for short and long-term business needs, as part of a Facilities Master Plan.

The primary business driver for the consolidation of roads maintenance operating facilities is efficient access to the road system for which the Roads Maintenance Section is responsible both during normal working conditions and during emergency events. Secondary drivers include: the economies of scale in the maintenance and use of equipment, more flexibility in the management and deployment of crews, and other operational efficiencies that arise from consolidation.

Based on locating facilities to provide accessibility to work sites within a 30-minute drive time to most of the roads served by a given facility, this study recommends that the Roads Maintenance Section consolidate its current ten widespread sites to three regional roads maintenance facilities, with one smaller site to the east (in the vicinity of Preston) and one to the west (Star Lake) and two satellite facilities (Skykomish and Vashon-Maury Island). The regional roads maintenance operating facility locations would include the current Roads Maintenance Section headquarters at Renton, and north and south crew facilities. The Star Lake crew facility should be retained depending on workload associated with Burien and the North Highline PAA.

Most Roads Maintenance facilities are old and in need of major repairs. This situation provides an opportunity to evaluate and plan for future needs and update or relocate crew sites to match changing service area requirements and meet current standards. The following report provides a description of current Roads Maintenance operations, estimates workload over the next 20 years, and makes recommendations for facilities realignment and consolidation.

I. Introduction and Study Purpose

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At the request of the King County Department of Transportation Road Services Division, Dye Management Group, Inc. has prepared an accelerated analysis of the future volume and location of the Roads Maintenance workload and the implications for the potential realignment of maintenance crew facilities. This document presents the results of this analysis and provides preliminary recommendations that will eventually inform the broader Roads Operational Master Plan (ROMP) and Facilities Master Plan (FMP) of the King County Road Services Division.

A. Background

Declines in workload and changes in the geographical distribution of operations necessitate a realignment of the Road Service Division's maintenance crew facilities. The term "crew facility" is used by Roads Maintenance to mean any facility that is permanently staffed.

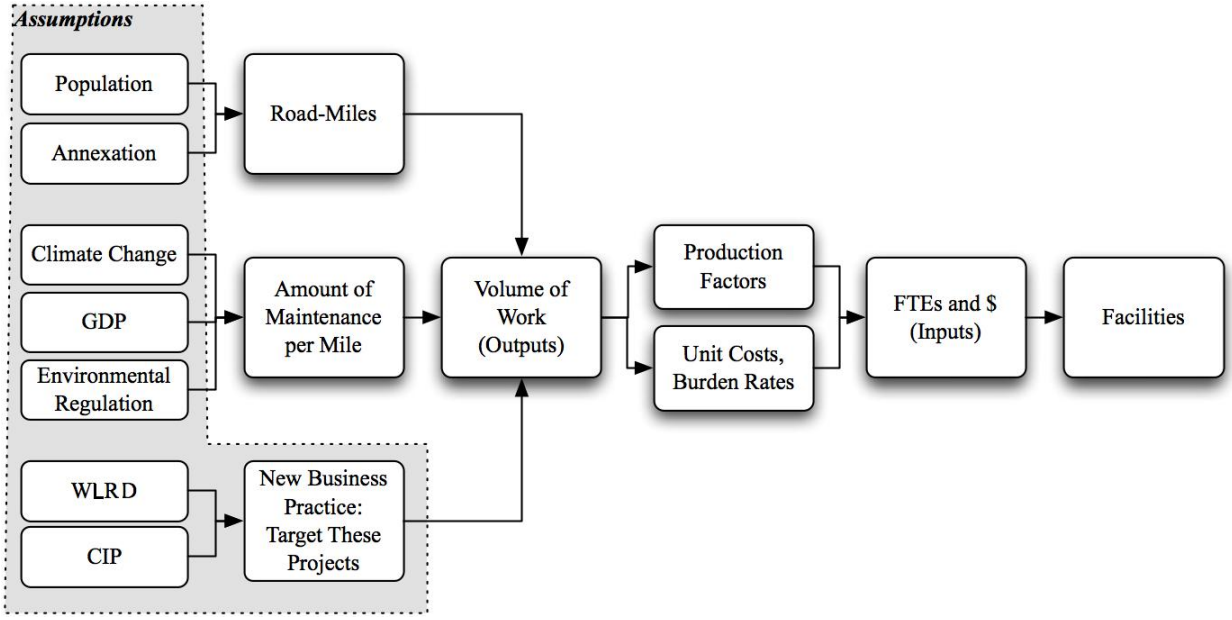
Crew facilities are currently distributed into four geographic planning units (maintenance divisions) with Renton acting as headquarters for Special Operations and Administration. Roads Maintenance currently has ten crew sites including: Brugger's Bog, Cadman, Diamond, Fall City, Issaquah, Renton, Skykomish, Star Lake, Summit, and Vashon. Vashon and Skykomish serve as remote satellite facilities because of the relative geographic isolation of the areas they serve. This alignment was ideal when Roads Maintenance operations covered more road miles and included service to the western more urban part of the county but will not serve Roads Maintenance after planned annexations are complete. A smaller number of crew facilities will be required to provide service efficiently to the remaining county service area. (For a map of unincorporated King County roads pre-1989, please refer to Appendix B, Exhibit B-4.) In addition to suboptimal locations, many of these facilities are in obsolete physical condition and in need of major renovation.

B. Approach

This report builds on data from the Roads Maintenance 2008 budget and discussions with staff. Roads Maintenance is in the process of updating their performance standards – these are measures that relate budget expenditures, labor, materials, and equipment to the maintenance work performed. Given the expedited time frame for this report, Dye Management Group, Inc. used the performance standards from the 2008 budget as the basis for forecasting future Roads Maintenance productivity. These standards date back to 2003 and likely underestimate the labor required to perform many activities. Further, they likely understate the amount of work on specific activities that is required to provide the current level of service. For example, due to increases in traffic volume, the need for flagging has increased. In addition, service levels for sweeping and culvert work, among other activities, have also increased. Roads Maintenance is updating such production standards as part of work to implement a new maintenance management system. When these data are available they can be used to refine the analysis presented here.

The general approach of this study was to make estimates and assumptions about the future volume of workload in unincorporated King County including an analysis of population trends, annexation schedules, employment and traffic growth, increased environmental regulation, and changing Roads Maintenance support to WLRD and Roads CIP. To the degree possible, the potential impacts of climate change and the King County Executive's energy initiative are also taken into consideration. Dye Management Group, Inc. projected future trends onto the current volume of Roads Maintenance work culminating in an analysis of staffing impacts. This business analysis informs facility needs because it identifies changes in the type of work, the volume of labor, and its distribution between major categories of work. These staffing needs were then considered in the larger context of geographical distribution of future workload to recommend potential crew facility realignment. Exhibit I-1 provides a summary of the analysis approach.

Exhibit I-1: Summary of Approach



C. Organization of the Report

This report is divided into four main sections and two appendices:

Section I. Introduction and Study Purpose. This section provides a background introduction to the project and introduces the project approach.

Section II. Current Roads Maintenance Operations. This section provides an overview of the county roadway assets that Roads Maintenance maintains as well as services provided to contract cities, Roads CIP, WLRD, and other outside entities. Section II discusses the main functions, services, responsibilities and resources of the Roads Maintenance Section.

Section III. Quantification of Future Roads Maintenance Workload. This section uses the results from Section I as well as Appendix A to provide a quantitative assessment of the future workload by type of work.

Section IV. Facility Realignment Recommendations. This section presents findings and recommendations regarding crew facility realignment.

Appendix A. Trends Affecting Future Roads Maintenance Workload. This section provides projected trends in the county that will affect the volume and geographical distribution of Roads Maintenance work including annexations, changes in business practices, changes in the physical environment, as well as changes in environmental regulation.

Appendix B. Data Sources. This appendix, available under separate cover, provides detail on the data sources used in this analysis.

II. Current Roads Maintenance Operations

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A. Summary

Maintenance of the roadway infrastructure is performed by two units in the Road Maintenance Section: Division Maintenance and Special Operations. The Division Maintenance Work Unit is responsible for maintaining, repairing, and cleaning roadway features. The Unit is divided into four geographic areas with nine crew facility sites. Division staff responds to inclement weather and other emergencies 24 hours a day, seven days a week. Some of the Unit's responsibilities include:

- Road Surfaces (pothole patching and surface repair)
- Shoulders (mowing and grading)
- Drainage systems (cleaning and repair)
- Ditches (cleaning)
- Slopes within the public right-of-way (mowing and stabilization)
- Emergency response
- Support to contract cities

Whereas the Division Maintenance Work Unit generally performs routine annual ongoing maintenance tasks, the Special Operations Work Unit performs more unique project-related tasks such as paving, bridges, river control, facilities management, and storm water retention/detention. The Special Operations Unit's construction, maintenance, and stabilization activities are performed throughout the county on the following:

- Roadways and shoulders
- Culverts and drainage systems
- Landscape maintenance
- Asphalt surface of roadways
- Bridges
- Guardrails
- Facilities
- Riverbank stabilization and seawall construction
- Support to Roads CIP and WLRD
- Major system failure repairs (roadways, drainage, slides, etc)

- Support to Division staff during emergency response events

Special Operations crew facilities are consolidated at the Renton headquarters site and are divided into five countywide Planning Units as follows:

1. **Rivers Management** specializes in the construction and repair of many different types of wall construction such as: rock, geo-fabric, shot-crete, gabion, and J-walls depending on the project's specific needs.
2. **Drainage** construction projects are performed in compliance with state and federal environmental regulations and permitting requirements. Many larger projects must be completed within the fish window, often to improve fish habitat. Smaller projects that are not deemed environmentally sensitive may be performed throughout the year.
3. **Paving** is responsible for large paving projects, the installation of speed bumps, and islands as requested by the Traffic Engineering Section. The Paving Unit is also responsible for the Coordinated Reduction of Waste (CROW) program.
4. **Bridges, Guardrail, Concrete & Facilities** is responsible for the maintenance of 185 bridges as well as for various types of concrete work (curbs, sidewalks, ADA ramps), guardrail installation, and maintenance of crew facilities.
5. **Vegetation Management** includes mowing, vegetation control, and minor maintenance of Roads retention detention facilities. Vegetation control is performed using multiple methods including mowing, spraying, and hand pulling. The Unit is also responsible for the danger tree program to remove trees within the right-of-way that may pose a danger to the public.

In summary, the Roads Maintenance Section is responsible for:

- Routine and major maintenance, as well as emergency response and repair of all components of roads and streets within the county-owned rights-of-way
- Support to the Flood Control Zone District and WLRD for the routine and emergency maintenance and repair of surface water management assets
- Support to Roads CIP, contract cities, and other agencies as requested
- Environmental rehabilitation in the roadway, such as the removal of fish passage barriers (major culvert replacement)
- Clearance, damage control, and repair of maintenance assets in extreme weather conditions
- Design, engineering, and construction of some of these assets

To fulfill these responsibilities, the field crews, engineers, and management staff undertake over 400 different maintenance tasks that we group, with some simplification, into these categories:

- *Roadway Surfaces and Shoulders:* paving and patching asphalt; gravelling and grading roads and their shoulders; street sweeping, snow and ice control; and litter control

- *Drainage*: cleaning, replacing, and repairing the ditches, culverts, catch basins, and pipes that make up the road drainage system; and maintaining stream banks and flood control devices in the county's rivers and creeks
- *Bridges and Facilities*: inspection and repair of the structural and electrical components of bridges, guardrails, ADA ramps, pumphouses, storage buildings, and other specialized facilities
- *Roadside Vegetation:* slope and shoulder mowing, hand brushing, herbicide application, noxious weed control, and dangerous tree removal
- *Recycling and Waste Processing/Handling:* the Coordinated Reduction of Waste (CROW) program includes stockpiling and separating waste materials into recyclable components for temporary storage until quantities are large enough to haul efficiently to vendors and treatment sites. Materials include brush, tires, asphalt, concrete, lumber, litter, catch basin solids, street sweeping material, scrap metal, and other mixed waste. In addition, the Street Waste Alternatives Program (SWAP) includes hauling, screening, sorting, and processing street sweeping material and catch basin solids in order to allow bioremediation to remove contaminants. Clean material, after passing sampling thresholds, is either recycled or used as fill and topsoil in site reclamation

B. Responsibilities

Roads Maintenance has the following broad areas of responsibility:

- Maintenance and repair or replacement of county road assets
- Emergency response and related operations
- Contract maintenance work with cities
- Work on Road Services Division CIP projects
- Services to Water and Land Resources Division (WLRD)
- Maintenance of facilities used in support of the above
- Other county work

Each of these is described below.

1. Ongoing Maintenance on County Road Assets

Roads Maintenance is responsible for the maintenance of all assets within the right-of-way. The assets Roads Maintenance is responsible for as of 2008 are summarized in Exhibit II-2 below. A complete list of the Roads Maintenance inventory of assets is in Appendix B.

Exhibit II-2: Summary of Roads Maintenance Assets[4]

County Assets Under Management of Roads Maintenance		
Description	**Measure**	**Quantity**
All Roadway Surface	SQ YD	22,890,417
All Paved Roadway	Lane Miles	3439.6
Gravel Roadway	Lane Miles	104.7
Curb and Gutter	Lineal Feet	3,314,634
Catch Basin and Manhole	Each	30,505
Paved Ditch and Gutter	Linear Feet	77,729
Open Ditch	Linear Feet	6,233,462
Enclosed Drainage System	Linear Feet	3,963,524
Planter Strips	SQ YD	90,633.5
All Shoulder Miles	Road Miles	2,456.1
Mowable Slope	SQ YD	5,127,161.4
Retaining Walls	SQ YD	59,868
Bridges	Each	181

An annual cycle of maintenance and rehabilitation provides safe and efficient conditions, as well as optimal performance of county roads. It is in Roads Maintenance's best interest, and the interest of the public, to not fall behind in the Division's general maintenance responsibilities. Avoiding deterioration reduces the need for major reconstructions, extends the working-life of these assets, minimizes costs, and reduces risk and liability. Typical maintenance duties include: bridge maintenance, dangerous tree removal, litter control, ditch cleaning and restoration, drainage construction and maintenance, guardrail construction and maintenance, illegal dumping cleanup, mowing, grading, pothole repairs, road closures, seawall repair and construction, snow and ice removal, storm drain maintenance and vactor disposal, sweeping, and weed and vegetation control.

2. Emergency Response and Related Operations

Roads Maintenance provides 24-hour emergency response in unincorporated King County as well as emergency response to contract cities. This can include removing down trees, unblocking culverts, flood response, snow and ice removal, and addressing roadway failures among other activities. Roads Maintenance is typically the first on-the-scene and is responsible for assessing the emergency situation and making judgments about road closure.

[4] Source: King County Department of Transportation Maintenance Management System (MMS) 2008 Budget Unincorporated King County Base. The above table has been adjusted to reflect the recent annexations of Lea Hill, West Hill, and Benson Hill.

Because it is not possible to predict with accuracy when major storm events will occur, Roads Maintenance budgets only minimally for unscheduled and emergency events such as snow and ice control, flood response, and slide removal. Funding levels for these activities are based upon historical expenditures in non-event years. The past 10 years have had abnormally active storm seasons. Since these events were not budgeted for, Roads Maintenance had a significant budget shortfall and had to request supplemental funding appropriated by the King County Council. During emergency events, road maintenance crews must be diverted from their typical duties to storm response. This creates a backlog of deferred maintenance work which over time adversely impacts the condition of the county's roadway assets and increases the work required to maintain them. The 2008 budget includes $ 210, 246 in deferred maintenance costs which is only a small proportion of the overall deferred maintenance need.

3. Contract Maintenance Work with Cities

The extent of Roads Maintenance responsibility within the contract cities varies and is on a contract-to-contract basis. Historically, Roads Maintenance support has been a function of length of time since a city has incorporated, although some cities continue to contract with Roads Maintenance long after incorporation. King County currently contracts with ten cities. This adds an additional 763 road miles to the maintenance inventory; however, information on contract city miles can be misleading since cities may have partial to full service contracts for road maintenance services. The largest contract is with the City of Burien.

Beginning in 1990, many cities within King County began to incorporate and progressively annex contiguous land within the Urban Growth Area (UGA). When cities first incorporate they do not have the expertise, equipment, or facilities to provide their own road maintenance services and initially depend on King County Roads Maintenance for continued routine maintenance and support. The Interlocal Cooperation Act of 1967 (RCW 39.34) enables cities to contract with the county with the understanding that avoiding costly bidding processes and providing services in-house benefits all parties and the public.

Typical contract work performed by Roads Maintenance for cities includes mowing, sweeping, vactoring, and emergency support. Historically, as newly incorporated cities mature, they take over routine maintenance operations and are more likely to contract with Roads Maintenance for technically specialized work such as hydroseeding or bridge repair, equipment intensive maintenance, and supplemental emergency response.

The chart below shows the difference in the contract city cost per mile with the range from $17,767 for Burien to $22 for Newcastle. Expenditures per mile vary depending on the type of work performed on each road mile with some cities contracting with Roads Maintenance for the entire extent of services, such as Burien, and others contracting for a limited range of services, such as Newcastle. For this reason, decreased roadmiles with contract cities does not necessarily represent a proportional decrease in workload.

Exhibit II-3: Maintenance Expenditures by Mile in Contract Cities[5]

	Road Miles	2007 Expenditures	Expenditure per mile
BURIEN	99	$ 1,758,979.35	$17,767.47
SAMMAMISH	145	$ 327,176.87	$ 2,256.39
COVINGTON	50	$ 76,190.20	$ 1,523.80
WOODINVILLE	40	$ 51,926.34	$ 1,298.16
KENMORE	57	$ 69,615.77	$ 1,221.33
SEATAC	82	$ 90,970.14	$ 1,109.39
LAKE FOREST PARK	45	$ 43,208.41	$ 960.19
SHORELINE	167	$ 63,314.44	$ 379.13
MAPLE VALLEY	47	$ 11,517.38	$ 245.05
NEWCASTLE	31	$ 687.04	$ 22.16
TOTAL	763	$ 2,493,585.94	$ 3,268.13
	Average Exp/Mile Excluding Burien		$ 1,001.73

In the past four years, there has been an increasing trend of project work for non contract cities and other entities including Seattle Public Utilities (SPU) and King County Solid Waste, among others. This is often technically specialized work which is seasonal and equipment intensive.

4. Work on Roads Division CIP Projects

Road Maintenance crews provide support services to Road Services Division CIP projects. This work is usually on smaller scale construction projects in support of Roads CIP such as drainage projects, culvert replacements, ADA ramps, and the Non-Motorized Pathways Program.

5. Services to Water and Land Resources Division (WLRD)

Roads Maintenance has considerable expertise in the repair and maintenance of surface water management assets which it provides to WLRD by agreement. WLRD primarily utilizes Roads Maintenance Special Operations staff for projects in several areas: 1)Capital Projects and Open Space Acquisition (CPOSA), 2) Stormwater Services, and 3) Flood Control Zone District (FCZD). Support to these functions includes cleaning catchbasins and ponds, removing sediment, repairing and replacing pipes, levee/revetment repair, bank stabilization, mowing, retrofitting ditches and swales, hand and mechanical brushing, noxious weed control, bioswale, hydroseeding,

[5] 2007 Actual Expenditures

slide removal, stream restoration, levee repair and reconstruction, and other emergency services.

Maintenance, repair, or improvements within watersheds where salmon spawn, must be conducted during the "fish window" in compliance with the Endangered Species Act (ESA) to minimize disruption to salmon habitat. The "fish window" is the brief period of time when salmon are not present in freshwater river systems and can be as short as 45 days. WLRD projects on salmon-inhabited rivers must be completed during this abbreviated time-frame. This uneven distribution of labor makes it challenging for Roads Maintenance to staff specifically for WLRD support.

6. Other County-Wide Activities

In addition to providing facilities for operations, employees, materials, and equipment storage, other critical Roads Maintenance activities take place at crew sites. These are listed below.

a. Coordinated Reduction of Waste (CROW)

The Coordinated Reduction of Waste program facilitates energy efficiency and recycling of waste while helping to deal with large amounts of road maintenance debris and waste material generated during slide repair, asphalt grinding, storm debris cleanup, ditch digging, and culvert replacement. The CROW program sorts and consolidates waste which is eventually recycled as fill or hauled to vendors for reuse. Twenty-three Roads Maintenance sites house CROW program stations.

b. Street Waste Alternative Program (SWAP)

The Street Waste Alternative Program is a bioremediation program which manages street waste generated from sweeping and storm water drainage system cleaning. The SWAP annually treats roughly 11,000 tons of solids at Summit from unincorporated King County, contract cities, Washington State Department of Transportation (WSDOT), and private entities.[6] Street sweepings and catch basin solids from county pit sites are hauled to Summit where they are processed, bioremediated, sampled and tested, and eventually reused for site reclamation.

c. Mining and Filling

Roads Maintenance has gravel mining and filling operations at several sites throughout the county. Mining activities provide sand and gravel and also create space for clean fill as part of the site reclamation process.

[6] King County Transportation Today "County 'SWAPS' Litter and Debris for Clean Soil." June 12, 2007.

Over 100,000 cubic yards of fill are generated annually through vactor decant and street sweeping bioremediation, slide removal, and other maintenance activities. Roads uses the holes left by extraction of mined resources as places to permanently store fill. In comparison to vendor tipping fees which average over $14 per cubic yard, Roads Maintenance is able to save about $1.4 million per year in the disposal of fill material at county operated sites.

d. Fueling

Several roads maintenance sites include fueling stations. These stations enable county-owned vehicles from a variety of departments (Public Safety, Parks and Recreation, Department of Development and Environmental Services, Public Health Seattle and King County, and Road Services) to fuel from reserves at a wide variety of locations providing a time and cost savings to the public. These sites are essential during emergencies when private fueling stations are crowded or closed due to lack of electricity and when prices are potentially elevated. Fleet Administration estimates that county fueling stations can provide savings of up to 8% compared with retail. In 2007, 583,408 gallons of unleaded gas and 314,393 gallons of diesel were distributed at Road Maintenance facilities. Based on an average price of $3.00 per gallon, savings total $215,472.

e. Other

Other activities that take place at Roads Maintenance sites include: equipment repair performed by Fleet Administration, temporary hazardous waste storage, and the housing of scales which enable Roads Maintenance to bill for debris brought in and processed at facilities.

C. Activities and Resources

Slightly over half of the 601 FTEs in the Road Services Division 2008 budget are allotted to the road maintenance activities described above. The 316.5 FTEs in the Roads Maintenance workforce can be grouped as follows:

1. Section FTEs by Budget and Work Unit

King County maintains a uniform organization hierarchy, in which *divisions* are composed of *sections* which are, in turn, composed of organizational *work units*. The Maintenance Section, which is part of the Road Services Division, is made up of six work units: Management, Administration, Human Resources & Technical Support, Engineering/Environmental, Division Maintenance, Special Operations, and Utility Inspection. Exhibit II-4 provides a summary of FTEs by budget and work unit.

Exhibit II-4: Summary of Road Maintenance FTEs*

Administration	16.3
Engineering & Environmental	36.5
Utility Inspection	11.0
Roads CIP Support	24.5
Contract Cities	19.0
WLRD Support	40.1
Other Support	11.1
Division and Special Operations	158.0
Total	**316.5**

*Work Crew Positions are Shaded

The field work crews that make up 252.7 of these FTEs are organized into geographical areas. Division crews perform most of the annual ongoing maintenance on the roadway inventory and provide maintenance support to contract cities. Division crews, assigned to specific areas, report to facilities located throughout the county. Special Operations crews, based in Renton, perform more specialized functions with regard to countywide paving, drainage, vegetation management, surface water management assets, bridges, and facilities. These Special Operations crews also handle most of the construction and rehabilitation of assets that the Section undertakes for Roads CIP, WLRD, and other county agencies on a reimbursable basis.

2. Movement of Staff among the Field FTE Allocations

In the Road Maintenance budget, FTEs are distributed by organization unit, type of work, and budget source. These are FTEs of effort, in which one FTE of effort is not necessarily performed by one person in one year. The seasonal nature of Roads Maintenance work, support to other organizations, and the variations forced upon the section by emergency responses to weather events, result in the cross-utilization of field crews between Divisions and Special Operations units depending on the demand for resources. For example, as many as 64 FTEs from Special Operations that support Roads CIP and WLRD in the summer and fall months are available for emergency response during the stormy months of the winter and spring. Alternatively, during the construction season, Division crews provide additional support to Special Operations to complete projects constrained by the "fish window".

a. WLRD Work

The 2008 budget for maintenance and capital work is the equivalent of about 40 FTEs for WLRD. The effort varies throughout the year, requiring as many as 80

or more people in the summer and fall to as few as 15 people in the winter and spring. As this workload is countercyclical to emergency storm response, people who perform WLRD construction and maintenance work in the summer and fall are also deployed for emergency response road maintenance in the winter and spring. If the work required by WLRD declines then the number of Roads Maintenance FTEs declines and the section loses some of its emergency response capability.

b. Roads CIP and Contracted City Maintenance

Similar to the WLRD programs, Roads Maintenance field crews that work on Roads CIP in the summer and fall are available to clear snow and repair flood damage in the winter and spring. The 2008 budget contains about 24.5 FTEs of effort on road-related capital construction.

King County provides minimal maintenance services equivalent to 3 FTEs of effort, to cities that do not have recurring annual contracts with King County Roads Maintenance. Support to cities with annual contracts requires 16 FTEs for a total of 19 FTEs within city boundaries.

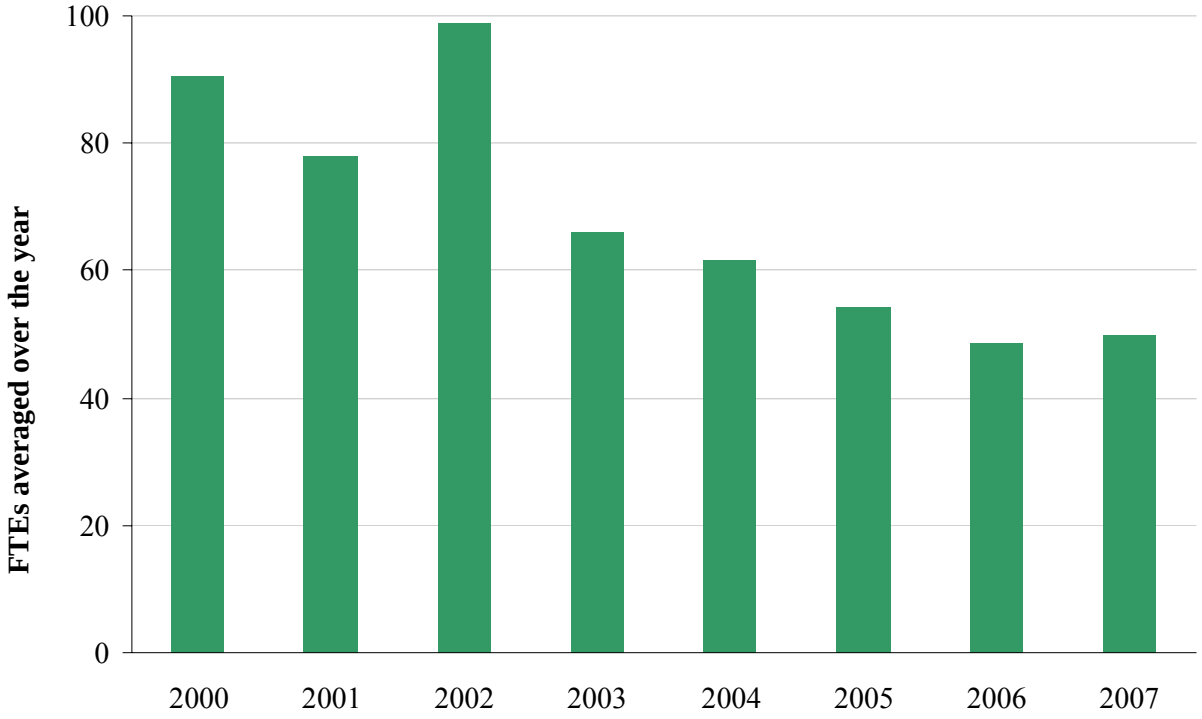
The City of Burien has relied on King County Roads Maintenance for a full range of services since incorporation in 1993. Currently the Burien account comprises more than one-third of Roads Maintenance contracts with cities. In dollar terms, this contract has ranged from a low of $673,275 in 2000 to $1,758,979 in 2007.

The City of Burien shares its northern border with the North Highline Potential Annexation Area (PAA); the PAA also shares borders with the cities of Seattle, Tukwila, and SeaTac. On October 3, 2007, the Growth Management Planning Council (GMPC) adopted a motion to show North Highline as an overlap or contested interim potential annexation area in the countywide Planning Policies. Because of this overlap, it is unclear which areas of North Highline will be annexed by which cities and annexation is likely to be delayed beyond the current January 2009 annexation date until territory disputes are resolved.

If Burien, as opposed to Seattle, annexes North Highline, Burien's contract with King County Roads Maintenance could be expanded further to include the annexation area. Alternatively, if Seattle annexes North Highline, the City of Seattle would eventually assume Roads Maintenance's responsibilities but in the short term, could contract with the county.

In summary, Exhibit II-5 below illustrates the declining FTEs dedicated to city maintenance, WLRD, and Roads CIP since 2000.

Exhibit II-5: Road CIP, WLRD, and City Maintenance FTEs



The decline in loan out support work is due principally to decreasing city maintenance work, although reductions in Roads CIP work have also contributed to the overall decline.

3. Weather Events

Significant storm events disrupt the regular maintenance work of the Roads Maintenance section. Because Roads Maintenance budgets minimally for emergencies, all staff members must be mobilized to respond to emergency situations as they arise. Storm repair projects can also monopolize staff time. Routine maintenance operations can be considerably postponed depending on a storm's duration and intensity as crews are pulled to respond to emergencies and work on storm repair projects. For example, the winter 2006-2007 storm season included four Federal Disaster declarations and generated 120 new projects at an estimated cost of $20.7 million including construction contracts and county force expenditures.[7]

Decreases in staffing due to loss of city contracts, Roads CIP, WLRD support, and annexation-driven reductions in routine workload could affect how Roads Maintenance responds in emergency situations. The department has a responsibility to dedicate

[7] King County Department of Transportation Roads Services Division "A Season of Storms: November 2006-February 2007 Damage Report" September 2007.

employees to emergency events affecting contract cities. However, unincorporated areas have priority for Roads Maintenance employees during emergencies since contract cities do not support the full spectrum of the Roads Maintenance budget. As a general rule, during a countywide event, Roads Maintenance provides support to contract cities equal to the number of FTEs funded by the city contract. For example, if the city budget supports 3 FTEs, then the equivalent of 3 FTEs would be available for the city during a major storm or emergency event.

In 2008, 75.6 FTEs can be made available from WLRD, Roads CIP, and other loan out support programs to bolster the 158 regular maintenance FTEs who are already available to respond to major storms. In all, there are 252.7 field FTEs available to:

- In *heavy rains and windstorms*: close flooded roads, clear debris, clear drainage systems, remove slides, and repair bridges, washouts, roads, dikes, levees and other structures
- In *snow and ice storms*: plow, sand and de-ice roads, clear fallen trees, and free up frozen drainage systems, frost heaves, and potholes
- In *other natural disasters or emergencies:* provide emergency response for events such as earthquakes

Roads Maintenance designates certain roads as "priority routes" during inclement weather. These routes, because of location, traffic volume, and safety issues, are the first to be sanded or plowed during snow and ice events. Only after these routes are cleared are non-priority routes cleared. Priority routes are often cleared multiple times before non-priority routes are cleared, depending on the severity of a winter storm event and Roads Maintenance staffing resources.[8]

[8] King County Department of Transportation Road Services Division Roads Maintenance Section "2007-2008 Snow and Ice Response Plan."

III. Quantification of Future Roads Maintenance Workload

■

This section provides some quantification of future Roads Maintenance workload and draws out the implications for facility realignment recommendations. Appendix A describes in detail the projected trends in the county that will affect the volume, type, and geographical distribution of work performed by Roads Maintenance through 2028. The trends addressed in Appendix A include: annexations, changes in business practices, changes in the physical environment, as well as changes in environmental regulation. The impact of these trends is summarized in the exhibit below.

Exhibit III-1: Summary of Changes in Staffing from 2008 to 2028

Year	Unincorp Road Miles	Routine Maintenance	Partner City Contracted Work FTEs	Roads CIP FTEs	WLRD FTEs	Other Loan Out Support FTEs	Emergency Response Increase FTEs	Other Trends	Total FTEs
2008	**1768.3**	**158.0**	**19.0**	**24.5**	**40.1**	**11.1**			**252.7**
2028	1090	105.7	26.7	24.5	30.0	11.1	15.0	5 to15	218 to 228
Staff Change		(52.3)	7.7	0.0	(10.1)	0.0	15.0	5 to 15	(25 to 35)

Note: For a more complete breakdown of 2008 Baseline FTEs by division, please see the FTE Spreadsheet in Appendix B. Subsections A-F below detail the staffing impacts and effects on workload summarized in Exhibit III-1, above. Subsection G details location implications of reductions in FTEs.

A. Routine Maintenance Work

Unincorporated area road miles subject to maintenance by Roads Maintenance may decrease by about 38% due to annexations and incorporations, from 1768 road miles in 2008 to 1090 road miles in 2028. There will be a loss of roughly 52 FTEs directly associated with loss of road miles in the unincorporated area, or a 33% reduction in staffing. The reduction in FTEs was calculated using the road maintenance management system, MMS, based on the roadway feature inventory within the geographic boundaries of the Potential Annexation Areas using current performance standards and service levels.

B. Contracted Work for Cities

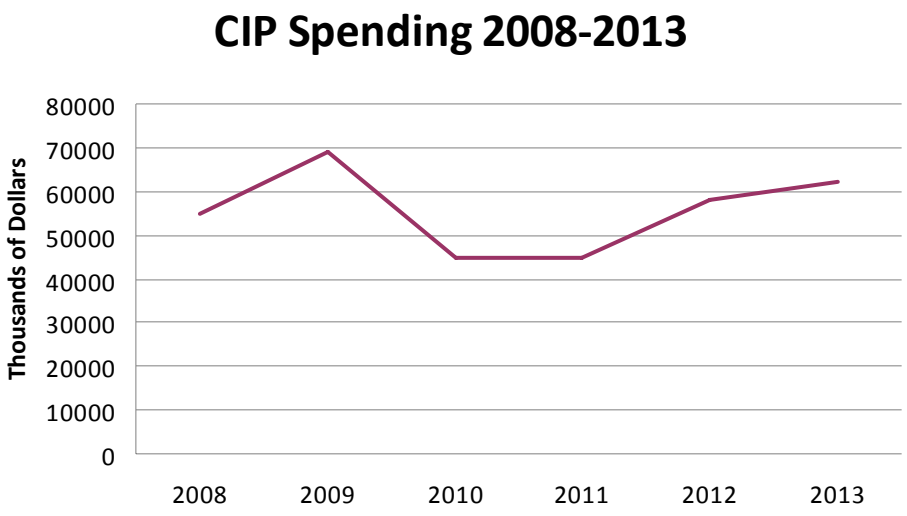
There is a lag between the time a city incorporates and the amount of road maintenance work they are able to assume and contract with Roads Maintenance while they develop their own capabilities. Further, small cities cannot achieve the economy of scale possible in larger organizations. As a result, they may contract for specialized work with Roads Maintenance. Therefore, although King County Roads Maintenance unincorporated road miles will decrease, there is a potential for these roads to remain under county maintenance through contracts with incorporated cities.

Cities continue to contract with Roads Maintenance for technical and specialized services even after they have established their own road maintenance division. As a result, King County Roads Maintenance should plan on increasing contract work with cities and for this work to become more specialized and technical. Roads Maintenance projects that support to contracted cities will increase staffing to 26.7 FTEs through 2028 from the 2008 level of 19 FTEs based on the assumption that the county will continue supporting Sammamish and Burien including the North Highline PAA. Fairwood is assumed to incorporate and contract with the county for road maintenance services.

C. Roads CIP

Taking annexations into consideration, Roads Division CIP and Planning Section has projected needs until the horizon year 2022 based on modeling done by the Puget Sound Regional Council (PSRC). Roads CIP is updated every year as part of King County's annual budget process. The CIP project spending plan in the near term is illustrated in Exhibit III-2.

Exhibit III-2: Roads CIP Spending 2008-2013



The Roads CIP Section anticipates a change in the type of projects in the plan: declines in major widening projects, and increases in smaller projects such as culvert replacement and pedestrian pathway projects. In other words, the mix of work that CIP does will change to favor smaller-scale projects for which Roads Maintenance has, in the past, been the preferred supplier. Therefore although the number of road miles in unincorporated King County will decrease, our analysis predicts that through 2028, Maintenance Section support work on CIP projects will remain equivalent to 24.5 FTEs.

D. WLRD

WLRD foresees a decrease in Stormwater Services and Capital Projects and Open Space Acquisition (CPOSA) Sections work due to annexations and incorporations, and an increase in work due to climate change and FCZD work. Overall, Road Maintenance anticipates a net decrease of 10 FTEs from the 2008 budget level associated with support to WLRD projects over the next 20 years.

E. Other Loan-Out Support

Other loan-out support includes any work unrelated to contracted work for partner cities, WLRD, or Roads CIP. Typically, support is provided to Solid Waste, Parks, Fleet, Animal Control and Public Safety among others. Roads Maintenance has provided consistent support to Parks and Solid Waste, and this assistance is projected to remain constant through 2028 at 11.1 FTEs of support.

F. Emergency Response Workload

The post-annexation road mileage requires disproportionately more emergency response effort than the current mileage. Our analysis finds that there are many factors, discussed below and in Appendix A, that are increasing the volume of emergency response work. Therefore, for facility planning purposes we recommend planning based on a 50% increase in emergency response related work.

The emergency response workload does not decrease proportionately with loss of road jurisdiction for the following reasons:

- As a result of annexation, a larger percentage of roads will be in high-snow and flood areas which are particularly vulnerable to severe weather[9]
- Increased density of traffic on unincorporated county roads, arising from a 30% increase of VMT and a 10% increase in road miles associated with new development and road construction will highlight concerns related to the need for a higher standard of plowing and sanding frequency than the Section's current standard of once per shift[10]
- Changing precipitation patterns will impact workload associated with culverts, drainage and road closures due to increased flooding and slides

[9] Changon, S.A. *Frequency Distributions of Heavy Snowfall from Snowstorms in the United States*. Journal of Hydrologic Engineering, Vol 11. No. 5. 2006

[10] Zwaheln, H.T. *The Use of Average Traffic Speeds to Indicate Level of Roadway Snow and Ice Control Operations.* Transportation Research Board, 85th Annual Meeting. 2006

- As the average residential density of unincorporated areas of the county increases, the ability of the natural drainage system to absorb intense rainfall will diminish, putting an added strain on open ditch, enclosed ditch, and riverine drainage systems[11]
- Increased storm intensity and frequency due to climate change

Due to the above factors, operational and facility plans should be based on a projected increase of 15 FTEs in work directly related to emergency response events by 2028. The 15 FTEs results from the following: analysis of the budget finds the equivalent of 52 FTEs in emergency response work, the reduction in work load based on current budgeting is accounted for under the routine maintenance reductions, and we could assume it is at about 30 to 34 FTEs, therefore assuming at least a 50% increase in work, for the reasons listed above, we estimate 15 FTEs of extra work related to emergency response.

When considering emergency response workload and its impacts on Roads Maintenance it is important to note that:

- Significant storm events disrupt the regular maintenance work of the Roads Maintenance Section. Because Roads Maintenance as a policy does not staff for emergencies, all staff members must be mobilized to respond to emergency situations as they arise. Routine maintenance operations can be considerably postponed depending on a storm's duration and intensity.
- Decreases in staffing due to loss of contracts and annexation could impact how roads maintenance responds in emergency situations. The Road Services Division has a responsibility to dedicate employees to emergency events with contract cities should they arise. Unincorporated areas have priority for Roads Maintenance employees during emergencies since contract cities do not support the full spectrum of the Roads Maintenance budget.

With VMT traffic density increasing by at least 30% on those roads, sand and plowing once per shift may become an unacceptable standard. Roads Maintenance would do well to recruit to a higher level and be more proactive in its pursuit of small projects in the Roads CIP and other non-seasonal work to ensure a minimum staffing requirement during emergencies.[12]

G. Other Trends Effect on Future Workload

While the number of unincorporated area road miles may decrease by 38%, the cumulative impact of the trends described in detail in Appendix A will increase the volume of work required to meet the county's level of service standards for scheduled maintenance. *The reduction in road miles does not equivalently reduce Road Maintenance staffing.* These assumptions are driven by concluding that the work required to provide the same level of

[11] Alfelor, R.M. *Weathering the Storm*. Public Roads, Vol 69, No. 3. 2005.
[12] Dlesk, R.J. & Bell, L.C. Outsourcing Versus In-House Highway Maintenance: Cost Comparison and Decision Factors. 2006. Clemson University, South Carolina Department of Transportation and Federal Highway Administration.

service will increase in rural areas and that some of the work standards have changed and/or will change requiring more labor.

A range of potential staffing impacts between 5 and 15 FTEs accounts for the inherent uncertainty in projecting the impacts of the following trends:

- *Vehicle Miles Traveled (VMT) on county roads will increase by about 30%*; Increased VMT affects the labor required for flagging. It also triggers the requirement for small projects and the addition of items to the maintenance inventory. In addition, increases in heavy vehicle use impacts pavement management requirements.
- *New development and road construction will continue to increase road miles within the unincorporated area.* Roads Maintenance projects an increase in roughly 114 new road miles between 2008 and 2028. Since roughly 1 FTE is required to maintain every 10.3 miles of roadway, Roads Maintenance projects an additional 11 FTEs in staff to maintain the unincorporated King County base by 2028.
- *More work is required per unit to meet level of service standards in the unincorporated areas.* County maintenance managers' experience indicates that it is easier to maintain inventory that has been annexed because cities have generally taken areas with the fewest maintenance problems.
- *Environmental regulation may double some requirements with respect to stormwater.* Roads Maintenance will continue to comply with the Endangered Species Act, the Clean Water Act, and environmental Best Management Practices (BMPs). Implications are acutely pertinent to rural and unincorporated King County which has a high concentration of critical areas requiring more BMPs, monitoring, and habitat restoration to complete major projects. Road Maintenance will still be required to update fish blocking culverts, largely located in rural areas.
- *Winter storms have the potential to double in intensity and frequency.* In addition to needs for emergency response, intense precipitation can cause significant degradation of shoulder and the roadway base. Periods of intense rain can cause micro size washouts of shoulders that are graded to current standards. Ditches may be scoured and culvert systems undersized resulting in urban flooding.
- *Demands on the SWAP program will not decrease proportionately to the loss of road miles.* This program supports the entire county including unincorporated areas, contract cities, and private sector vendors. Furthermore, new road standards must comply with the Clean Water Act, requiring increased street sweeping, catch basin cleaning and vactoring.

Although not required for facility consolidation recommendations, a more data driven assessment of the resources required to meet level of service standards on the road system after annexation will enable King County to better plan for future maintenance staffing and budget levels.

H. Location Implications

The quantitative analyses in the section above estimate that Roads Maintenance field crew FTEs will fall from about 252.7 FTEs in 2008 to between 218 and 228 FTEs in 2028, depending on the range of impacts from environmental regulation, climate change, increased road miles, and VMT. (See summary FTE Exhibit III-1) Within that overall conclusion are some more specific conclusions that have implications for the locations at which these FTEs may be based over the next twenty years.

- As the Roads Maintenance Section workload changes in future years, the proportion of work may shift from general unincorporated area road maintenance to the more specialized work required to support loan out projects which is performed by Special Operations crews primarily based in Renton
- The emergency response workload will increase and the FTEs expended on emergency response will increase
- The emergency response effort will be most concentrated in the flood prone areas and higher elevations in the county
- During snow and ice events, emergency response efforts to deploy labor and equipment are more effectively mounted from a small number of large locations while raw materials such as sand and salt are more easily distributed in the field from multiple locations
- Crews can be more easily deployed from a larger pool of staff reporting into one base

IV. Facilities Realignment and Consolidation Recommendations

■

A. Summary

The ten existing Roads Maintenance crew facilities are located to serve a pre-annexation workload and road network. Nearly all sites are in need of substantial renovation to ensure employee safety and to guarantee structural integrity. Current Roads Maintenance crew facilities are in decline and disrepair.

Roads Maintenance should consolidate to three primary crew facilities (north, south, and central) with two smaller sites (east and west in the vicinity of Preston and Star Lake respectively) and maintain satellite facilities at Skykomish and Vashon. The future sites should be newly constructed or retrofitted to meet Roads Maintenance needs as well as LEED™ standards.

Over the coming decades, Roads Maintenance will face changes to the geographical distribution of work, the volume of work, and the type of work for which they will be responsible. The following are the primary changes in the volume, type, and location of work that necessitate consolidation and realignment of crew facilities:

- 38% reduction in unincorporated area road network
- Geographical redistribution to the east and rural part of unincorporated King County
- Projected reduction of 25 to 35 FTEs by 2028 for unincorporated area road maintenance considering both a decrease in road miles and routine maintenance and an increase in compliance with environmental regulation and potential increase in emergency weather events

The primary business drivers for the consolidation of crew facilities are:

- Efficient access to county road miles during normal working conditions and during emergency events. This is because the time it takes for crews and equipment to reach the job site is part of the cost. This study uses an assumption of a 30 minute drive time as the criterion for this driver
- Crew supervision and management. A smaller number of facilities with a consolidation of crews allows for more efficient assignment and allocation of labor to projects
- Efficient deployment of and access to equipment. The productive utilization of specialized equipment can be enhanced through consolidation

- Reduced carbon emissions. LEED™ certified buildings are energy efficient and have reduced carbon footprints compared with older, inefficient crew facilities
- Lower Operating Costs. Reducing redundant and surplus facilities directly reduces maintenance and engineering costs associated with facilities operations
- Lower equipment life-cycle costs. Most facilities are not able to properly garage maintenance equipment which affects equipment costs and out-of-service time

B. Consolidation Criteria

1. Efficient Access to County Road Miles

Exhibit IV-1 is a map that overlays the current Roads Maintenance crew facilities onto county maintained roads (*after all annexations*). Some city roads may continue to be maintained by the county under contractual agreements. Exhibit IV-2 then shows the current distribution of employees between maintenance facilities. Fewer lane miles and decreased work performed by fewer staff are the main drivers behind redundant and surplus facilities.

Exhibit IV-1: Roads After All Annexations

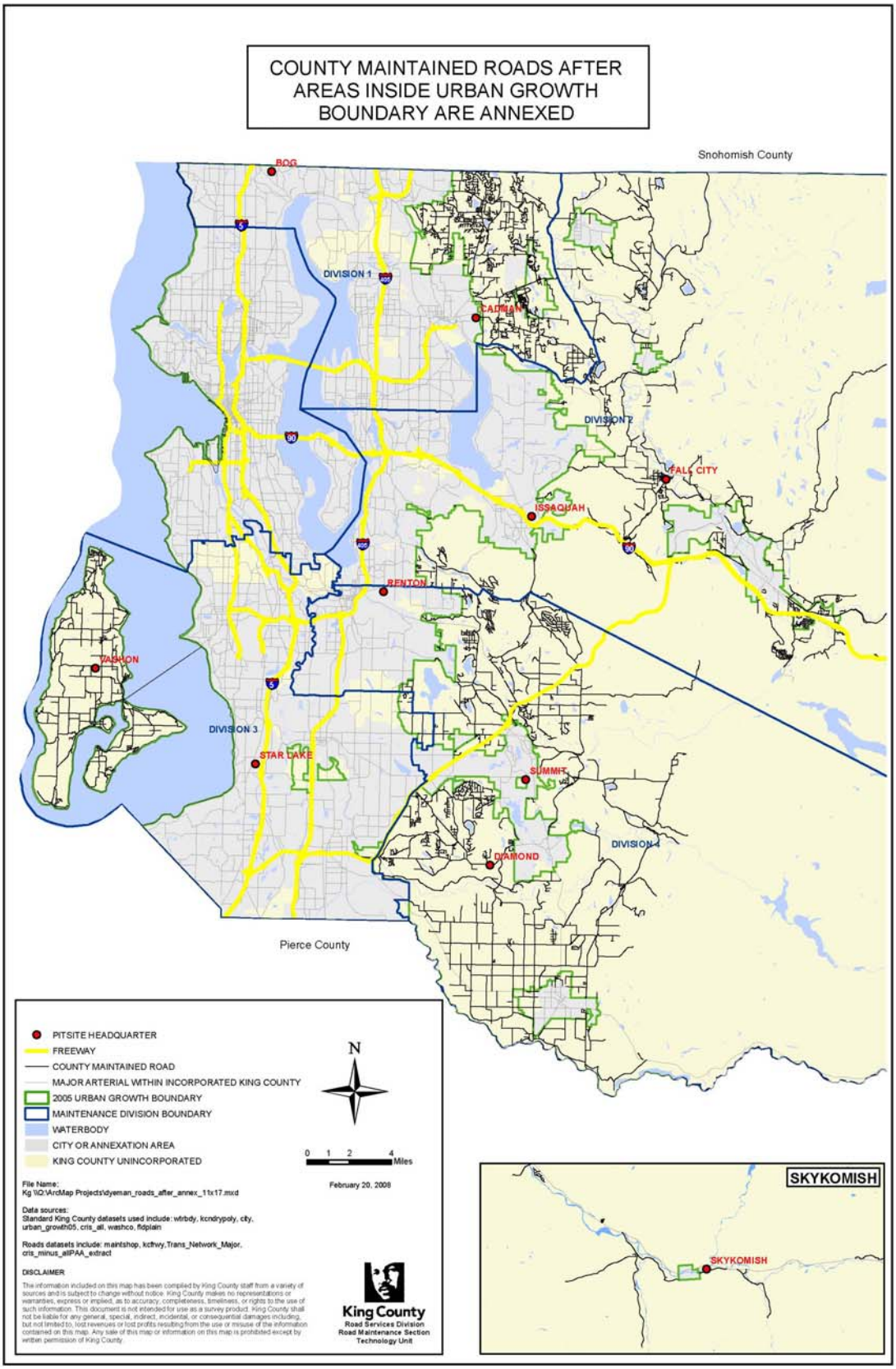


Exhibit IV-2: Current Location of Crew Facilities[13]

Current Site	Current Staffing Assignment
Bog (Shoreline)	8.0
Cadman	12.5
Issaquah	9.5
Fall City	14.5
Renton	204.5
Summit	15.5
Diamond	16.0
Star Lake (West Kent)	25.0
Vashon	7.0
Skykomish (Stevens Pass)	4.0
Total	316.5

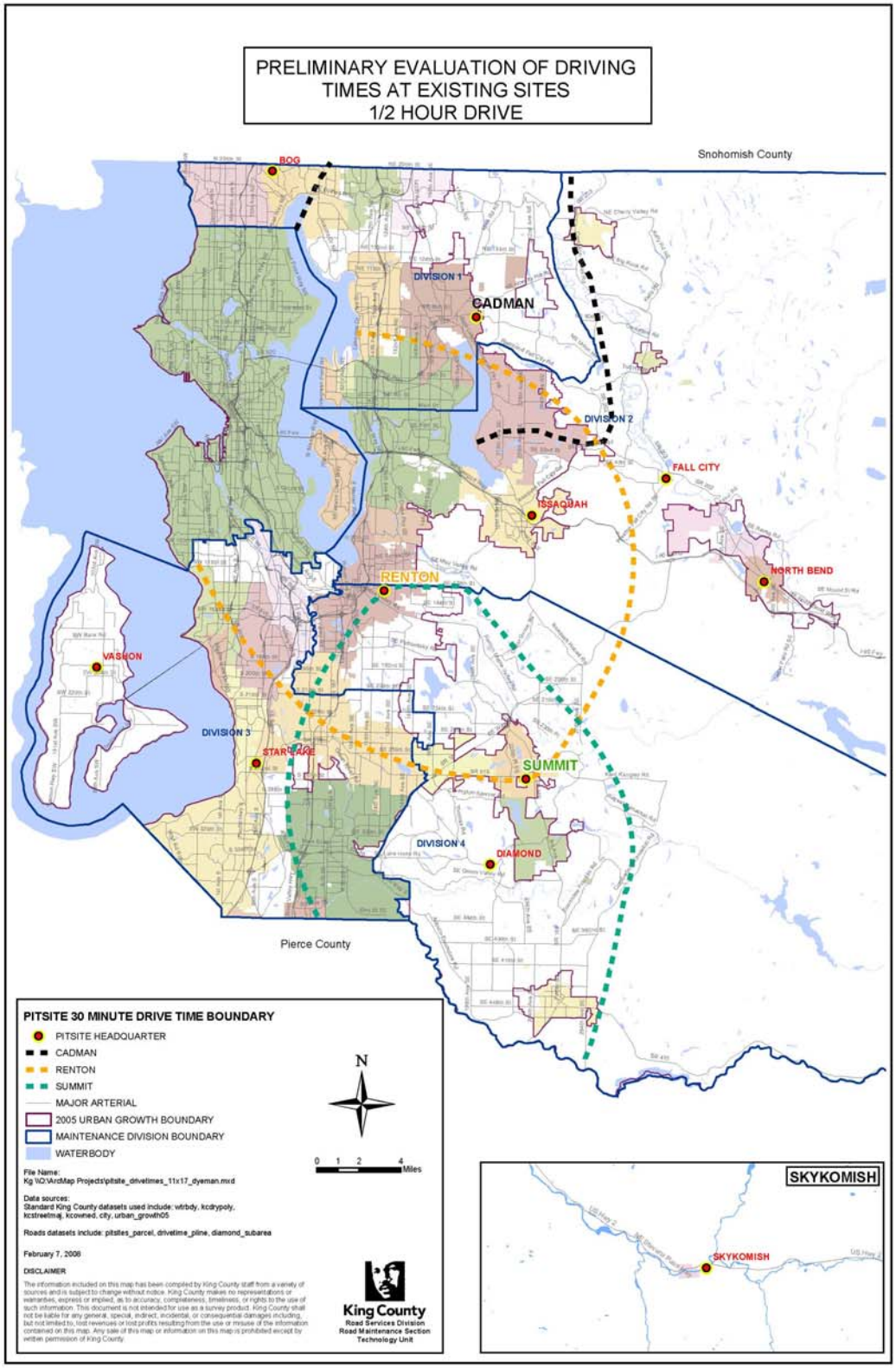
2. Drive Times

Balancing the economies of scale from consolidation with timely access to county roads is a driver for determining how to consolidate the current facilities. Given that there will be a need for fewer crew facilities, service areas were identified such that all county roads could be serviced within a 30-minute drive time. Exhibit IV-3 shows county roads, after annexation, which could be serviced within a 30 minute driving radius from the potential crew sites of Renton, Cadman, and Summit. This shows that many locations in the eastern part of the county could not be readily accessed. To meet this criterion, a smaller facility which can accommodate between 8 and 15 employees, would be needed in the eastern part of the county.

The data presented in Exhibit IV-3 likely understate travel times and accessibility during peak periods and weather events. These events tend to disproportionately increase east-west drive times while north-south drives are relatively less impacted.

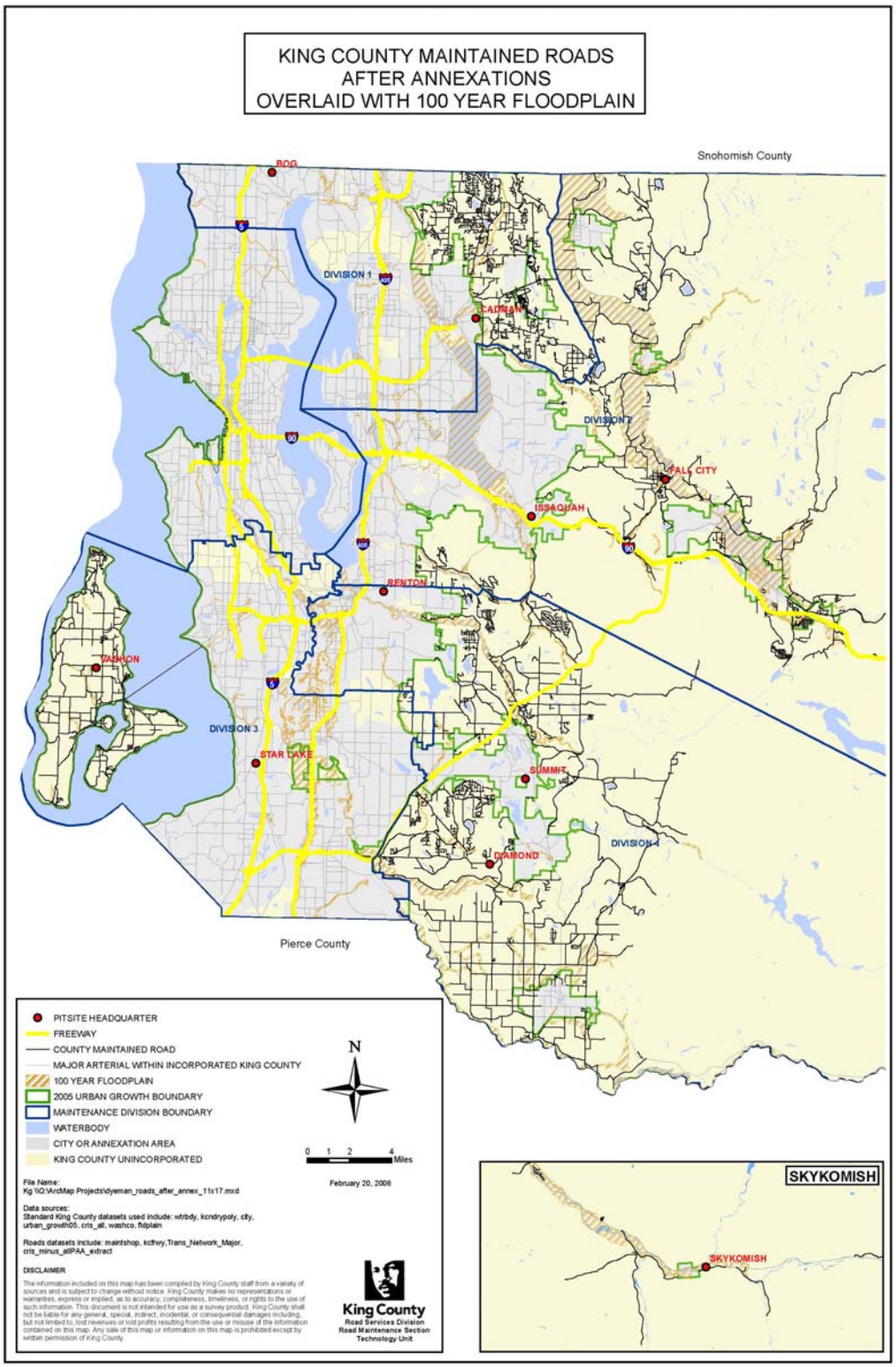
[13] Excludes seasonal hire extra help positions.The positions at Renton include Roads Maintenance Administrative, Engineering, Environmental, and Utility Inspection positions.The Renton numbers exclude positions from other sections in the Roads Division (Traffic, Soils Lab, Survey) and other agencies (Fleet, Parks).

Exhibit IV-3: Estimated Driving Times



The eastern crew site would need to address accessibility to the Snoqualmie Valley during flooding and emergency events. Exhibit IV-4 on the following page shows the roads maintained after annexations overlaid with the 100 year flood plain. Many of Roads main arterials are directly located in the floodplain and during a flood, would be inaccessible. This underscores the importance of an eastern crew facility that would enable access to the eastern part of the county if an east/west route were closed due to flooding. In addition, location decisions will also need to consider issues related to snow and ice control services in the higher elevations of the county in areas like Wilderness Rim.

Exhibit IV-4: King County Maintained Roads after Annexations Overlaid with 100-Year Floodplain



Renton is centrally located within King County. Maintaining Renton as the headquarters for Special Operations, which must service the entire county, is most efficient for drive times.

3. Crew Supervision and Equipment Productivity

The consolidation of crew facilities will enable more efficient crew supervision and work force management. This provides greater flexibility when employees are unexpectedly absent. In addition, consolidation will allow for more efficient use of equipment. Equipment can be shared and deployed more effectively.

a. Workload

A 38% decrease in the unincorporated area road network leaves Roads Maintenance with a high concentration of roads in the eastern part of the county. This part of the county is more susceptible to winter storm events and flooding concentrating workload in support of emergency and storm response. Increased support to WLRD and Roads CIP will concentrate workload in Special Operations. Roads CIP and WLRD work is best served through a central location. The benefits of retaining Renton as a headquarter are twofold; Renton is ideally located in a central location and is already established as the current headquarters of Special Operations.

b. Risk Management

It is Roads Maintenance's responsibility to select crew facility locations that minimize response time to assets during emergency events. If a crew facility is inaccessible during an emergency such as flooding, property is at a risk of being damaged, and lives are at a risk of being lost. As crew facilities consolidate, it may be necessary to maintain additional satellite facilities for materials storage to ensure that gravel, salt, and other emergency related equipment are accessible and in closer proximity to where they are most needed during extreme weather events.

c. Collocation Benefits

In addition to better serving the new geographical distribution of unincorporated King County, consolidating crew facilities could also have important collocation benefits. More compact operations centralize management and create efficiencies through the operation of multiple functions at a single site. For example, collocation benefits could include reduced equipment costs by providing space for mechanics to perform repairs and service at the crew facilities.

Renton has unique collocation benefits. Besides Special Operations and Administrative headquarters for Roads Maintenance, the Renton site also headquarters Fleet, Traffic Maintenance, Survey, Materials Lab, the Solid Waste Renton Transfer Station, and King County Parks Operations.

C. Existing Property

A fine grained facility analysis that would allow comparison between specific facilities locations in the north, south, and east, was beyond the scope of this report. Nonetheless, there are unique aspects of maintenance operations which make selecting future crew facilities from existing properties logical. The following provides summary background on existing property.

Property Inventory

Roads Maintenance owns 46 properties totaling 1,154.93 acres. Properties owned by the Road Services Division can be divided into six categories: sites which are staffed and serve as regional crew facilities, sites which are used exclusively for storage, sites which are designated surplus and are in the process of being sold, sites which are used for mining, sites which are inactive and potentially surplus, and sites which are being held for environmental remediation purposes. This study addresses crew facilities.

Roads Maintenance Current Crew Facilities

Roads Maintenance currently has ten crew facilities including: Brugger's Bog, Cadman, Diamond, Fall City, Issaquah, Renton, Skykomish, Star Lake, Summit, and Vashon. Vashon and Skykomish serve as remote satellite facilities because of the relative isolation of the maintenance areas which they serve. The term "crew facility" is used to mean any site that is staffed and can range from 4 FTEs (Skykomish) to over 204 FTEs for Roads Maintenance (Renton).

Crew facilities are currently distributed into four geographic divisions with Renton acting as headquarters for Special Operations and Administration. This alignment was ideal when Roads Maintenance operations included service to the western and more urban part of the county but will not serve Roads Maintenance after annexations are complete in 2012 (For a map of unincorporated King County roads pre-1989, please see Appendix B, Exhibits B-5 and B-6.) In addition to suboptimal locations, many of these facilities are in obsolete physical condition and in need of major renovation.

The following is the current distribution of assignments to facilities:

- Planning Unit 1) Crew Facilities at Brugger's Bog in Shoreline and Cadman
- Planning Unit 2) Crew Facilities are at Fall City and Issaquah; satellite station in Skykomish
- Planning Unit 3) Crew Facility at Star Lake and satellite station at Vashon Island
- Planning Unit 4) Crew Facilities at Summit and Diamond
- Planning Units 7-11) Renton serves as headquarters for Special Operations as well as Administration, Maintenance Engineering, Environmental, and Technology Roads Maintenance Staff

The analysis in this report addresses the volume, type, and location of work that Roads Maintenance faces in the coming decades but did not include a financial analysis that would compare the net present value of different crew facility scenarios and consolidated

configurations accounting for the quantifiable business benefits and costs of consolidation into new facilities. Such a fine grained analysis would allow comparison between specific facilities locations in the north, south, and east. The Facilities Master Plan should address the fiscal impacts of such specific real-estate decisions.

Pierce County has recently gone through a successful consolidation of their maintenance crew facilities and identified $6 million in savings over 20 years for taxpayers as well as an overall 13% improvement in productivity and efficiency of staff as a direct result of consolidation. There is strong evidence from Pierce County's experience to support the business case for consolidating Roads Maintenance crew facilities.

D. Recommendations: Facilities Realignment

Considering the changing business drivers and the crew facility consolidation criteria identified above, Dye Management Group Inc. concludes that Roads Maintenance will be best served by three main crew facilities divided into northern, central, and southern regions, two smaller crew sites in the eastern region and Star Lake, and the two satellite operations at Vashon and Skykomish. The central headquarter site, Renton, would continue to serve as headquarters for administration, engineering, and technology as well as Special Operations and other county offices. Satellite operations at Vashon and Skykomish are well situated and should continue to operate out of their present locations.

Annexation schedules and contract renewals are beyond the control of Roads Maintenance. To accommodate tentative annexation time tables and uncertainty regarding future contracts, Roads Maintenance may find it necessary to proceed with consolidation in stages. This will enable them to remain flexible and respond appropriately even as service areas are in a state of flux.

North Regional Road Maintenance Crew Facility

In the North, Cadman appears to be the site best suited for a regional road maintenance crew facility. The Cadman site is relatively large, centrally positioned to service northern unincorporated King County, and is permitted and equipped with offices, garages, equipment and material storage, scales, as well as a decant facility. Significant improvements would be necessary as buildings are old and in disrepair. There is not sufficient covered storage for equipment and the decant station is not open to the public.

East Regional Sub-Crew Facility

In the East, the existing facilities of Fall City and Issaquah do not appear to be adequate to serve Roads Maintenance future needs. Fall City is located on a small lot near the Raging River and much of the area served by Issaquah is in the Eastgate and Klahanie PAA. The business analysis of this report suggests a much more detailed location study that evaluates the specific needs of winter maintenance, flooding trends of the Snoqualmie Valley, and other requirements for locating an eastern sub-crew facility or satellite site.

South Regional Road Maintenance Crew Facility

In the South, Diamond and Summit should be consolidated and an appropriate alternate site selected as a regional road maintenance crew facility.

Central Headquarter

Renton would continue to serve as headquarters for Administration, Engineering, and Environmental as well as Special Operations Work Units.

Star Lake- Crew Facility

Since the future relationship of Burien, North Highline, and Roads Maintenance is unknown, it is important that Roads Maintenance remains flexible and adaptable to various annexation scenarios. Currently, the Star Lake facility services the majority of Burien's needs. This facility should likely remain operational as long as the city contract remains at the 2008 service level.

E. Recommendations: Business Practices

The following recommendations address business practices that drive facility needs:

1. Budget for Maintenance Emergency Activities

The current practice is to use the maintenance budget and seek supplemental funding. Maintenance has sometimes received additional deferred maintenance funding; however, the supplement has not covered the entire amount of work deferred. The net effect of emergency response work without deferred maintenance appears to be a reduction in maintenance level of service and a growing backlog. This actually increases the costs of maintenance and can reduce the life of the county's road assets. Increasing backlogs of deferred maintenance work indicate that Roads Maintenance is diverting employees to storm and emergency response. Storms have become frequent events and stormless winters atypical; Roads Maintenance should budget to reflect shifting climate patterns by creating an emergency event storm response contingency reserve in fund balance and specifically accounting for all the costs associated with major storm events.

2. Roads Maintenance Should Aggressively Pursue More Contracts through Active Marketing

King County Roads Maintenance is both Roads CIP and WLRD's preferred contractor, particularly for small projects. It is important that Roads Maintenance seek to maintain flexible schedules for contract projects to distribute the workload evenly. Budgeting for these projects will enable Road Maintenance to maintain a high caliber of road maintenance operations in the unincorporated area. In the face of declining responsibilities due to annexation activity, increasing loan out labor associated with

support to Roads CIP and WLRD enables Roads Maintenance to shift these additional employees to provide emergency response when necessary, enables a large pool of staff expertise and equipment, and enables recovery of a portion of the Section's overhead costs. Contracts with other organizations including King County Solid Waste, Parks and Recreation Division, and Seattle City Light should also be considered.

3. Update Maintenance Management System Production Standards to Better Link Maintenance Budgeting and Maintenance Level of Service

With new best management practices, specifications and other factors that effect production factors for maintenance activities updated standards are required. These will enable better budgeting and analysis of the link between the FTEs, equipment, and materials required to meet maintenance level of service standards. Such information can also be used to perform an analysis of the labor required to meet King County's maintenance level of service standards. This can provide highly accurate data to plan for and budget future Roads Maintenance FTE levels.

Appendix A

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A. Trends Affecting Future Roads Maintenance Workload

This section describes the projected trends in the county that will affect the volume, type, and geographical distribution of work performed by Roads Maintenance. The trends addressed include: annexations, changes in business practices, changes in the physical environment, as well as changes in environmental regulation.

B. Summary

Changes within King County beyond the control of Roads Maintenance will affect the responsibilities of the Road Services Division in the coming decades. Population growth dynamics, changing economic patterns, as well as major annexations and incorporations within the Urban Growth Area (UGA) will concentrate workloads to the east and rural side of the county. Changing environmental regulations and climate patterns will influence the specific functional needs of Roads Maintenance operations. The impacts of these trends are explained in more detail in this section.

C. Annexation

By 2012, the county assumes that cities will annex all land within the Urban Growth Area. Roads Maintenance will be responsible for 1,090 road miles, a reduction of 38% from 1,768 unincorporated area road miles in 2008.[14]

Uncertainty: Exact time-line of annexations

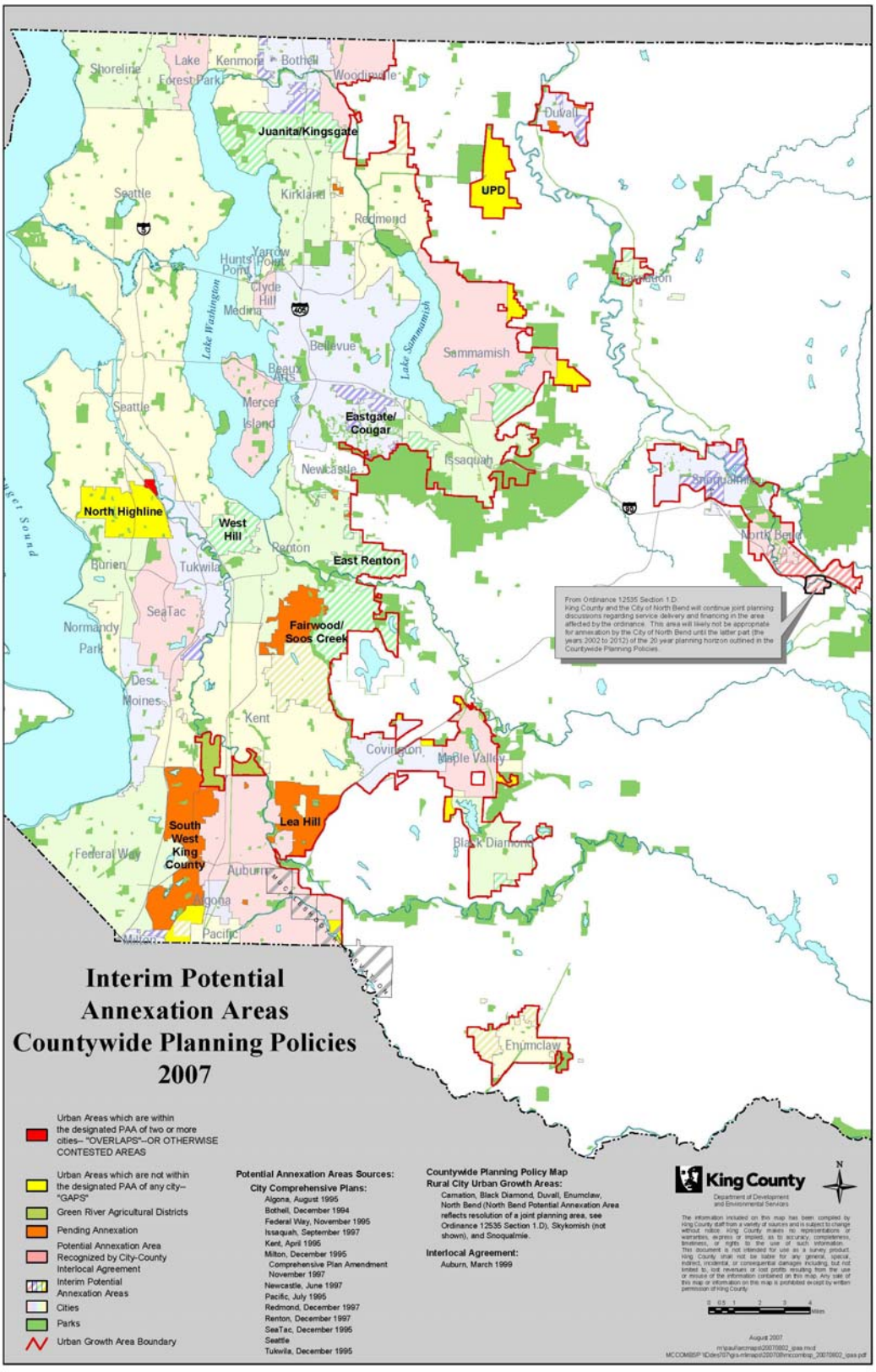
Annexations and incorporations are beyond the control of the county yet are critical to understanding and evaluating future responsibilities of Roads Maintenance. Voter approval is necessary for an unincorporated area to become annexed by a city and political support and exact timelines can be difficult to assess with any certainty. Nonetheless, the Countywide Planning Policies (CPP) developed jointly by the cities and King County in the early 1990s as required by the state Growth Management Act (GMA) state the goal that all unincorporated areas of King County within the urban-designated areas be annexed by neighboring cities by 2012. Consequently, the number of road miles in unincorporated King County for which Roads Maintenance is directly responsible will decrease by 38%, from 1768.3 miles in 2008 to 1090.4 road miles in 2028.

[14] This number does not include new road miles within unincorporated King County, only miles directly lost to annexation. Roads Maintenance expects 114 miles of new construction in unincorporated King County over the next twenty years for a total of 1204 miles.

Roads Maintenance currently provides support to partner cities on a contract to contract basis. (See Exhibit II-3, page 8) Cities choose areas within the UGA to annex. If assets within a particular region are in disrepair, or if a particular region has low property values, the city may delay annexation. This concentrates assets in poor condition, which require significant work and investment, within the county's jurisdiction. Roads Maintenance believes that the unincorporated areas left, and in particular the older, urban areas, are costing more to maintain and therefore are not achieving designated levels of service. Examples include West Hill and North Highline, which are some of the last to be annexed.

Geographically, annexations will progressively shift the unincorporated base to the eastern and rural part of the county. Areas in eastern King County include numerous stream crossings which require more environmental considerations as well as flooding and snow and ice emergencies. Although there are fewer roads in the unincorporated King County base, Roads Maintenance experiences a disproportionate volume of work in these areas. The unincorporated King County base will still include the Snoqualmie Valley and the Wilderness Rim, a one thousand home subdivision in the rural area, and other high elevation locations. The Snoqualmie Valley is particularly prone to seasonal flooding events and the Wilderness Rim is located at a high elevation necessitating steady snow and ice removal. Exhibit A-1 on the following page shows the potential annexation areas within King County. For an illustration of King County maintained roads after annexation, please refer to Exhibit IV-1.

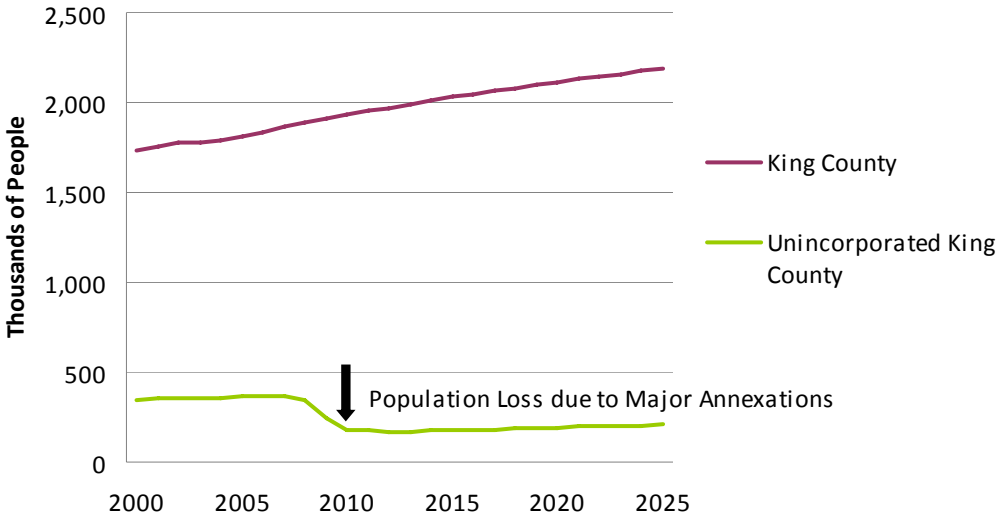
Exhibit A-1: Interim Potential Annexation Areas



D. Population Growth and New Road-Miles

Population growth within unincorporated King County is projected to be roughly 3000 persons per year after the completion of the annexation initiative as shown in Exhibit A-2. This population growth increases the workload volume by 6% through 2028. This will contribute to continued growth in the unincorporated county road system, with 114 new lane-miles added to the system over the next 20 years.

Exhibit A-2: Forecast Population in Incorporated (Red) and Unincorporated King County (Green)[15]



Note: Exhibit III-3 is based on projected annexation/incorporations guides and should be used only as a very rough indication of potential population trends. King County Population Assumptions:[16] Forecast of King County total population based on WA State OFM "intermediate" projection released December 2007. Assumes annexation initiative proceeds as scheduled, with all but two PAAs annexed by 2011. Assumes last two PAAs, Eastgate and Klahanie, annex by 2012. After 2012, assumes annual growth of 3,000 persons per year in unincorporated King County, primarily rural.

E. Economic Growth and Vehicle Miles Traveled (VMT)

VMT, which is projected to increase at roughly 1.3-1.5% per year through 2028, is directly linked to population growth, economic growth, and employment.[17] This translates to significant VMT growth of about 30% by 2028.

Uncertainty: Impacts of urban/rural interface on traffic and safety patterns

[15] Felt, Chandler Demographer; This figure was compiled with the assistance of Chandler Felt, King County Demographer, Office of Management and Budget

[16] Felt, Chandler, Demographer; WA State Office of Financial Management, cities of King County, King County Budget Office, 2004; updated January 2008 (very rough)

[17] Puget Sound Regional Council. "Puget Sound Trends: Vehicle Miles Traveled" August, 2007

While the King County Comprehensive Plan expects population and employment growth to be contained within the UGA, there will also be some growth in the smaller incorporated areas in eastern King County and some in unincorporated King County. The classification of some of unincorporated King County as "rural" is largely a misnomer, as growth distribution more closely resembles "exurbia." Exurbia is typically characterized as not fully suburban and not fully rural; low density communities located on the suburban fringe with high population growth from a low base and a high percentage of commuters who make journey-to-work trips to the suburbs or other urban districts.

This is supported by data from the Puget Sound Regional Council which found that between 1999 and 2006, the average commute in King County increased by 5%.[18] Increased commutes disproportionately affect residents of unincorporated King County, particularly residents of eastern King County. These residents have some of the longest driving distances to work within the Puget Sound region, a mean distance of 24.9 miles in 2006 for a 13% increase from 1999-2006.[19] Employment and population trends directly affect VMT within King County. Historically in the Puget Sound region, population has been growing at about 1.4% per year, employment at about 1.5%, and VMT at 1.3%.

Although VMT is expected to increase 30% in the next 20 years, Roads Maintenance estimates a growth in the road system of only 114 miles, or about 10%, based on historical changes over the past ten years.[20] This low ratio of increasing VMT to increasing new roads implies an increase in congestion on existing roads. Increased VMT could further stress a road system ill-equipped for changing traffic patterns and volume. There will be resulting improvements to address safety and related needs that will add to maintenance inventory.

Increases in the urban-rural interface will have significant impacts on Roads Maintenance operations. Although it is difficult to quantify to what extent shifting demographics within unincorporated King County will impact roads maintenance in terms of increased volume of maintenance work, certain safety issues, such as increased flagging for work zone safety, should be anticipated.

F. Environmental Regulation

The principal environmental regulations and policies affecting Roads Maintenance workload are:

- Clean Water Act (CWA): Increased National Pollutant Discharge Elimination System (NPDES) permitting requirements for the Stormwater Management Program (SWMP)
- King County Critical Areas Ordinance

[18] Puget Sound Regional Council. "Puget Sound Trends: Vehicle Miles Traveled" August, 2007
[19] Ibid.
[20] From 1998-2007, there were 57 new miles of road in the unincorporated King County base (not including areas within the Urban Growth Boundary). Assuming a continued rate of road growth, there will be 114 new miles of road in 2027.

- Endangered Species Act (ESA): Direct regulatory requirements on maintenance activities as well as retrofit initiatives to bring existing infrastructure into compliance, such as culvert replacement
- Regulations relating to the handling of road/construction waste materials
- Compliance with the Clean Air Act
- King County Climate Change Action Plan (GHG Regulation)

Uncertainty: Quantification of the increased work required to follow best management practices in maintenance activities in compliance with these policies and regulations, as well as the political climate surrounding climate change.

1. Clean Water Act: National Pollutant Discharge Elimination System Permits (NPDES)

Under the Clean Water Act (CWA), the Environmental Protection Agency (EPA) requires all point sources (localized sources) discharging pollutants into US waterways to obtain permits. Authority for enforcement of the CWA in Washington State has been delegated to the Washington State Department of Ecology (hereafter referred to as "Ecology"). Ecology has implemented NPDES permitting in a phased approach. Section 5 (S5) of the Phase I Municipal Stormwater NPDES Permit requires government agencies to create a Stormwater Management Program (SWMP).[21] This program documents compliance with Section 5 and details implications for the general operation and maintenance of programs within the King County Roads Maintenance Section. Roads Maintenance anticipates changes in the following areas:

- Increased cleaning, repair, maintenance, and installation of stormwater facilities
- Increased street sweeping
- Increase in maintenance of road rights-of-way and associated structures
- New inspection programs
- Increased catch basin cleaning
- Implementation of Illicit Discharge Detection and Elimination (IDDE) Training
- Increased permit requirements for controlling runoff from new developments, redevelopment, and construction sites
- Implementation of environmental best management practices , particularly in the area of erosion and sediment control
- Increased sampling (parameters, frequency, locations), reporting, and monitoring

[21] King County Roads Maintenance. "The Stormwater Management Program (SWMP)—Section 5(S5) of the Phase I Municipal Stormwater NPDES Permit" SWMP Presentation. January 31st, 2008.

Changes to this program are of particular importance to the amount of vactoring (decanting) done by King County and the cities. More precipitation falling as rain rather than snow directly leads to an increase in stormwater runoff. Stormwater, especially stormwater that runs over pavement, has a relatively high concentration of pollutants that collect in catch basins and require increased vactoring to comply with NPDES permits.[22] In light of these new environmental regulations, it is likely that the quantity and frequency of vactored catchbasins and street sweeping will place new demands on Division maintenance operations as well as on the Street Waste Alternative Program (SWAP). The Roads Maintenance budget forecasts additional revenue from a growth in vactoring and estimates large increases in the decant program.[23]

King County Road Maintenance Service anticipates that NPDES requirements will increase the amount of monitoring and reporting needed on a project, facility, and regional basis. The Department of Ecology is currently establishing pollutant thresholds, or Total Maximum Daily Loads (TMDL), to limit the amount of pollutants discharged into water quality impaired receiving waters. Ecology has increased its inspection staff for NPDES-permitted sites, with an increase in the frequency of impromptu compliance inspections. At present, no TMDLs have been established in unincorporated King County. However, the establishment of TMDLs is inevitable since King County's storm water system within the road right-of-way is so large. Furthermore, King County Road Maintenance may be required to retrofit drainage systems within unincorporated King County to comply with the TMDLs.

Current permit requirements have been appealed by environmental groups claiming that the requirements are too lenient. It is not clear what the outcome of these appeals will be and if environmental groups are dissatisfied with the results of these appeals, they may seek relief through the judicial system. Nonetheless, it is likely that the current permit, in effect for the next five years, will be re-issued with more stringent requirements upon expiration.

Stormwater and water quality best management practices will be required more in rural areas because fish and wildlife habitat in those areas are the most extensive. State, federal, and local permit agencies have historically focused on protecting these areas. More stringent requirements are anticipated for mitigation, stormwater controls, best management practice usage, and potential retrofits in rural areas. Rural habitat protection is the main focus in many of the Water Resource Inventory Area (WRIA) plans, Puget Sound Partnership, and salmon recovery plans, and will continue to increase regulation and cost of maintaining roadways in those areas.

The new NPDES Construction Permit has reduced the threshold for permit requirements from 1 acre to 5,000 square feet of land clearing. This will require more review, cost, monitoring, and mitigation for many construction projects. Based on concerns regarding increased pollution and runoff from construction sites, it is likely

[22] Washington State Department of Ecology.
[23] Department of Transportation Roads Maintenance Division 2008 Budget (unadopted).

that the 5,000 square feet threshold will be reduced further. As a consequence, King County Roads Maintenance will be applying for and securing more permits for its projects. Increased compliance monitoring will be required in order to meet environmental conditions associated with those permits.

2. Other Environmental Permitting

Projects that at one time were routine now require more environmental review work, documenting the need for the project, evaluating impacts, designing mitigation, meeting with federal representatives, preparing permit application documents and biological evaluations, and performing post-construction monitoring. As additional species, both plant and animal are recognized as threatened or endangered, and as other activities are seen as contributing to their decline, the regulatory framework in which maintenance must be undertaken will continue to become more complex, time consuming, and expensive.

Road Maintenance construction projects must obtain various permits from county, state, and federal agencies. These permits include Washington State Department of Fish and Wildlife Hydraulic Project Approval (HPA), Army Corps of Engineers (ACOE) nationwide permits, King County Department of Development and Environmental Services (KCDDES) clearing and grading, and Shoreline Management Area (SMA) approvals.

The Army Corps of Engineers (ACOE) is concerned about the increased amount of pollutants entering water bodies in storm water and it is anticipated that increased regulation will be utilized as a means to address this concern. The ACOE is expanding its jurisdiction to include smaller streams, wetlands and ditches in county owned rights-of-way which will increase: permitting time, monitoring requirements before, during and after construction, mitigation requirements; and ultimately costs for both Division and Special Operations projects are expected to increase.

Regulations governing construction activities conducted within sensitive or threatened species habitat areas are subject to frequent changes. These changes can be driven by legislative actions at the federal, state, or local level, or adjudicated in response to citizen lawsuits. These regulatory changes generally increase the number of projects that are subject to regulation while, at the same time, making the design, study, construction, and monitoring requirements more complex, rigorous, and costly. For example, the recent Supreme Court decision regarding Rapanos has ruled that small streams and ditches that were once unregulated at the federal level are now jurisdictional waters of the ACOE, which has a major impact on KCDOT's permitting, design, maintenance, and construction workload.[24] As a result of the Rapanos decision, these areas that were formerly free of federal oversight are now regulated.

[24] Rapanos et.ux., et al. v. U.S.

3. Green House Gas (GHG) Regulation

King County, along with California and Massachusetts, is taking a proactive stance and implementing relatively aggressive adaptation strategies to tackle climate change. Currently these are the only state and local governments to legislate climate-change analysis in the state environmental review process for land development. King County requires climate change mitigation and adaptation factors to be included in cost-benefit evaluations for projects within the county.[25] King County Executive Ron Sims has targeted the transportation sector as the biggest challenge to climate change mitigation within King County.[26] Although most GHG reduction responsibilities belong to Fleet and Transit divisions within the King County Department of Transportation, this policy initiative will bring Roads Maintenance operations under greater scrutiny.[27] For King County to achieve its climate change goals, the entire DOT, including Roads Maintenance, will have to make significant changes in facilities, equipment, and operations.

In 2006, King County became the first county to join the Chicago Climate Exchange (CCX), a voluntary, legally binding, carbon emissions trading and offset market. The effectiveness of a carbon trading program depends on the thorough, up-to-date, and transparent disclosure of all emissions contributing to climate change. Accurate representation of emissions establishes baselines from which progress can be benchmarked and measured. Recording and tracking emissions will require additional administrative and support work on the part of Roads Maintenance. Furthermore, financial penalties result if the goals of CCX are not met.

By 2050, King County is to reduce greenhouse gas (GHG) emissions by 80% below 2007 levels. The most effective way to reduce GHG emissions is to not produce them in the first place. The greatest potential for reducing GHG emissions within the Roads Maintenance sector is to minimize employee drive time by strategically locating crew facilities. Proximity to worksites will be a major consideration when determining where new Roads Maintenance crew facilities should be located.

Another opportunity for Roads Maintenance to minimize GHG impacts is to replace energy intensive facilities. King County's Green Building Ordinance requires all new construction and renovations of government facilities with budgets of over $250,000 to attain the highest achievable level of LEED™ certification (Leadership in Energy and Environmental Design). Since many Roads Maintenance buildings are in disrepair and are currently on-track for major renovations, Roads Maintenance will have the dual opportunity to improve facilities while simultaneously decreasing their carbon footprint by eliminating energy inefficient buildings.

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[25] Executive Orders on Global Warming Preparedness (PUT 7-5, 7-7, and 7-8)

[26] Ron Sims "Town Meeting with Politicians on Solutions to Climate Change" University of Washington January 31, 2008.

[27] As of 2008, the use of state vehicles (Fleet) and employee vehicles (Non Fleet) comprise the second largest source of GHG emissions within the County, or 38% of total emissions (13.8 million $MTCO_2^e$ annually)

4. Continued Compliance with the Endangered Species Act

Roads Maintenance may have increased responsibilities in relation to ESA compliance. Recently adopted best management practices and any new best management practices required for ESA compliance increase the amount of work required to perform maintenance activities per mile of roadway or per maintenance feature. This is a major contributing factor to increased Road Maintenance workload.

Uncertainties: New best management practices regarding ditch maintenance, roadside vegetation control, chip sealing, and sea wall restoration in compliance with ESA are unknown. New-listings, or de-listings, of additional species as endangered or threatened are uncertain.

The purpose of the ESA of 1973 is to protect animal and plant species as well as the "the ecosystems upon which they depend." King County is subject to the enforcement authority of three federal agencies under the ESA.

In response to the ESA listings of Chinook salmon and bull trout in 1999 and 2001 respectively, the Regional Road Maintenance ESA Program (RRMP) was developed and approved by National Marine Fisheries Service (NMFS) to provide legal protection under Section 4(d) of the ESA for species under their jurisdiction. The National Oceanic and Atmospheric Administration (NOAA) Fisheries approved the program and issued a Biological Opinion to thirty agencies in August 2003. The Biological Opinion gives Roads Maintenance an affirmative defense by NOAA Fisheries against a potential third-party lawsuit. The Biological Opinion applies through the end of the calendar year 2008. Roads Maintenance is currently working with NOAA to get the program re-approved for an additional 5 years.

In 2008, negotiations will occur with the Army Corps of Engineers (ACOE) and the United States Fish and Wildlife Service (USFWS) to approve the program under Section 7 of the ESA, and will include all 185 of the endangered, threatened, and candidate aquatic and terrestrial species in Washington State. [28]

Anticipated future federal listing of clams, mussels, other fish, and amphibian species found in King County will impact road maintenance work. Orca and steelhead were recently listed as threatened in Puget Sound and listing of other species is anticipated. The Wild Fish Conservancy, Sierra Club, and other resource protection groups are researching the need for other listings under the ESA. Lake Washington kokanee, sea run cutthroat trout, several freshwater clam species, and Coho salmon are potential listings. The status of Pacific smelt and five species of rockfish in Puget Sound is being reviewed by NOAA for ESA listing.

The consequences of such listings will require negotiated addenda to the existing Regional Roads Maintenance ESA Management Program (RRMP), and additional restrictions or requirements. Examples of these additional restrictions and

[28] USFWS does not have a comparable 4 (d) program.

requirements are: more sampling, monitoring, mitigation and reporting to government agencies, changes in conservation areas (buffers), and/or new operational requirements such as Best Management Practices (BMPs). In addition, new listings will require King County Roads Maintenance Environmental Unit to prepare more Biological Assessments (BA) for future maintenance projects, with increased consultation with federal agencies.

Additional changes in ESA requirements may result from third-party lawsuits against the county if salmon or other listed species are thought to be impacted by Road Maintenance actions.

Washington State law (RCW 77.57.030) requires that all road and bridges be installed and maintained to provide unrestricted fish passage.

In August 2007, the Washington State Department of Transportation (WSDOT) lost a law suit brought by the Treaty Tribes of Washington regarding fish barriers in state owned rights-of-way. The US District Court sustained the Tribes' allegation that failure to provide fish passage at road crossings, and a failure to restore passage in a timely manner, breached the Tribes' Treaty rights with respect to fisheries. The Court has not yet determined restitution but it can be anticipated that the Court will require a substantially increased commitment by WSDOT to restoring fish passage. As the jurisdiction with the second largest number of culverts, King County Road Maintenance Services recognizes that the county has exposure to law suits by the Treaty Tribes. If the Tribes decide to sue King County, it is likely that the county will be required to complete an inventory of culvert fish barriers, and increase the number of barriers removed per year. Both of these tasks will increase the workload for Roads Maintenance staff.

G. Climate Change

Increased storm frequency and/or intensity will contribute to a significant increase in storm and emergency response. Climate models predict a broad range of impacts on emergency operations, anywhere from an increase of 50% to 100% in the next 20 years.[29] Furthermore, portions of unincorporated King County are susceptible to flooding and snowstorms. For this reason, despite a loss of jurisdiction due to annexation, work associated with emergency events in unincorporated King County could remain relatively stable in the coming decades and depending on the effects of climate change, emergency events in this region could increase substantially. Climate change could increase health concerns associated with West Nile Virus which would require larvacide or mechanical means of removing standing water (vactoring) in catch basins, ditches, and ponds in the event of a breakout.

[29] This figure is calculated based on an accumulation of knowledge about climate projections from the University of Washington Climate Impacts Group as well as review of recent weather patterns in the Puget Sound region

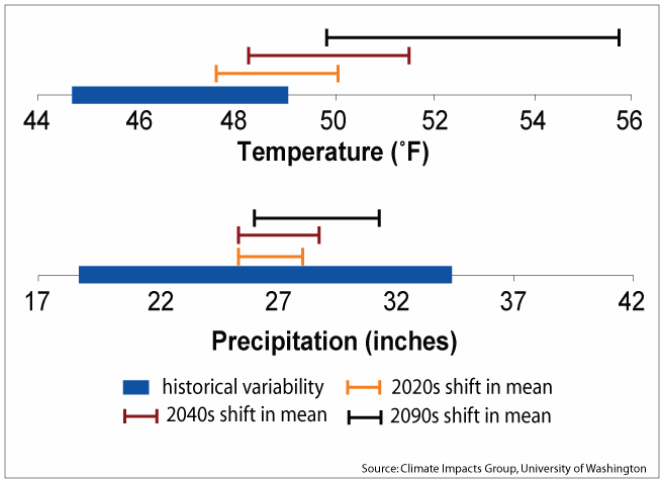
Uncertainty: Since it is nearly impossible to quantify increased frequency and intensity of storms with any certainty, the full potential for impacts on Roads Maintenance can not be defined. For example, changes in peak flow of rivers and changing salmon spawning patterns could alter the "fish window" and limit the amount of work Roads Maintenance is able to perform due to the impact on labor distribution. There would also be impacts associated with demands for higher levels of emergency response, increased liability for damages, and deterioration to the roadway infrastructure.

While the exact impacts of climate change are ambiguous at the local level, it is possible to predict regional trends. Temperatures in the Pacific Northwest have increased 1-3° F and annual precipitation has increased 10% since the beginning of the 20th century. Climate models produced by the University of Washington Climate Impacts Group project that by 2030, temperatures will increase another 3° Fahrenheit and by 2050, temperatures will have increased 5° Fahrenheit.[30] Climate is acutely sensitive to ostensibly small changes in temperature. For every degree of warming, the snow level rises 300 feet. Increased precipitation as rain coupled with a rising snow level translates to increased winter flooding events and increased risk for landslides throughout the Pacific Northwest.

Precipitation patterns are of particular importance to Roads Maintenance. Although total precipitation is not projected to intensify significantly, precipitation will become more concentrated and unevenly spread during an annual climate cycle. Precipitation projections by the University of Washington Climate Impacts Group indicate that historically extreme precipitation events will intensify; heavy rain days will become heavier, while dry days will be even drier. Winter flood conditions will be followed by reduced summertime stream flow conditions, in other words, the Pacific Northwest will experience wetter winters and drier summers and more intense storms in general.[31] The results of this research are summarized in Exhibit A-3.

[30] Climate Change Impacts on the United States *The Potential Consequences of Climate Variability and Change: Pacific Northwest Region;* National Assessment Synthesis Team, US Global Change Research Program; 2000.
[31] 2007 King County Climate Plan

Exhibit A-3: Climate Change Impacts on Temperature and Precipitation in the Pacific Northwest through 2090 [32]



The effects of climate change are becoming apparent throughout Washington State. Windstorms, heat waves, droughts, dust storms and extreme rain and snow are now typical of any given season. In the 1970s, large forest fires (>500 acres) occurred at the rate of six per year, while today, the figure is closer to 21 major forest fires per year.[33] Loss of snow pack in the Cascade Mountains translates to historic 50 year droughts occurring every ten years, and historic ten year droughts occurring every two years.[34]

Roads Maintenance operations may already be experiencing the effects of climate change. Roads Maintenance reports several major abnormal flooding events in the past 5 years with five back-to-back storm events in King County between November 2006 and February 2007. The 2005-2006 storm season was also abnormally active with 58 winter storm projects, thirty of which exceeded $30,000 in repairs.[35] While it is impossible to link these events in isolation to global climate change, it is reasonable and realistic to expect an increase in storm frequency and intensity in the coming decades. What Roads Maintenance refers to as the "Season of Storms" may become a more typical Pacific Northwest winter.

The 2007 King County Climate Plan identified vulnerable infrastructure particularly prone to the impacts of increased flooding and climate change in general. Many of these vulnerable areas are located within unincorporated King County and would affect Roads Maintenance operations. Particularly flood prone regions include unincorporated parts of King County within the Snoqualmie Valley and the Lower Green River. These regions provide corridors to properties valued at over $1.5 billion dollars.[36] Furthermore, the King County

[32] Climate Change Impacts Group. University of Washington, Compilation of Various Climate Scenarios
[33] "Impacts of Climate Change on Washington State's Economy: A Preliminary Assessment of Risks and Opportunities." Department of Ecology. Department of Community, Trade and Economic Development. November 2006. http://www.ecy.wa.gov/pubs/0701010.pdf
[34] "Impacts of Climate Change on Washington State's Economy: A Preliminary Assessment of Risks and Opportunities." Department of Ecology. Department of Community, Trade and Economic Development. November 2006. http://www.ecy.wa.gov/pubs/0701010.pdf
[35] King County DOT Roads Services Division "2006 Winter Storm Report" August 2006.
[36] 2007 King County Climate Plan

Global Warming Team has identified 500 ageing levees and revetments over 115 miles of riverbank which are at high risk of failure during increased flooding. Failure of the county's infrastructure would lead to an estimated $4 billion in losses. In response, the county has established a Flood Control Zone District (FCZD) to manage levees and purchase vulnerable property in floodplains. The implementation of the FCZD work program will generate additional work for Roads Maintenance crews that contract with WLRD for river related work.

1. West Nile Virus (WNV)

Warming climate patterns will increase the frequency of WNV outbreaks within King County.

Uncertainties: The frequency and severity of outbreaks, the Seattle King County Department of Health response, and the impact on Roads Maintenance is uncertain.

The King County Department of Transportation (KCDOT) is responsible for controlling larva and treating stagnant water within KCDOT rights-of-way as a means to controlling mosquitoes that could potentially carry the WNV.[37] The Road Services Division has designated five WNV alert levels which correspond to increasing levels of risk, from Level 0, no risk, to Level IV, public health emergency declaration. Each level is associated with particular tasks for Roads Maintenance.[38] Tasks include monitoring mosquito habitat on county properties, reducing mosquito habitat on county property where feasible, conducting mosquito surveillance by larval dipping, conducting larval and/or adult mosquito control efforts on county property and at county facilities and responding to citizen complaints regarding ditches and catchbasins.[39] This is the lowest level of response. Depending on the situation, conditions might require larvacide or mechanical means of removing standing water (vactoring) in catch basins, ditches, and ponds in the event of a breakout. (For a complete list of alert levels and associated tasks, please reference the Road Services Division West Nile Virus Response Plan.) WLRD may also have increased responsibilities for off road systems including mosquito larvaciding, pesticide application, and mosquito surveillance which could potentially be contracted to Roads Maintenance. As the threat of WNV escalates, Roads Maintenance should expect to have sporadic yet extensive work from Seattle and King County Public Health relating to WNV prevention.

[37] Washington Department of Health. "Guidance for Surveillance, Prevention, and Control of Mosquito Borne Disease." 2007.
[38] "Road Services Division West Nile Virus Response Plan." October 28th, 2005.
[39] "Road Services Division West Nile Response Plan." October 28, 2005.

Appendix B

Exhibit B-1: King County Roads Maintenance Current Crew Facility Distribution

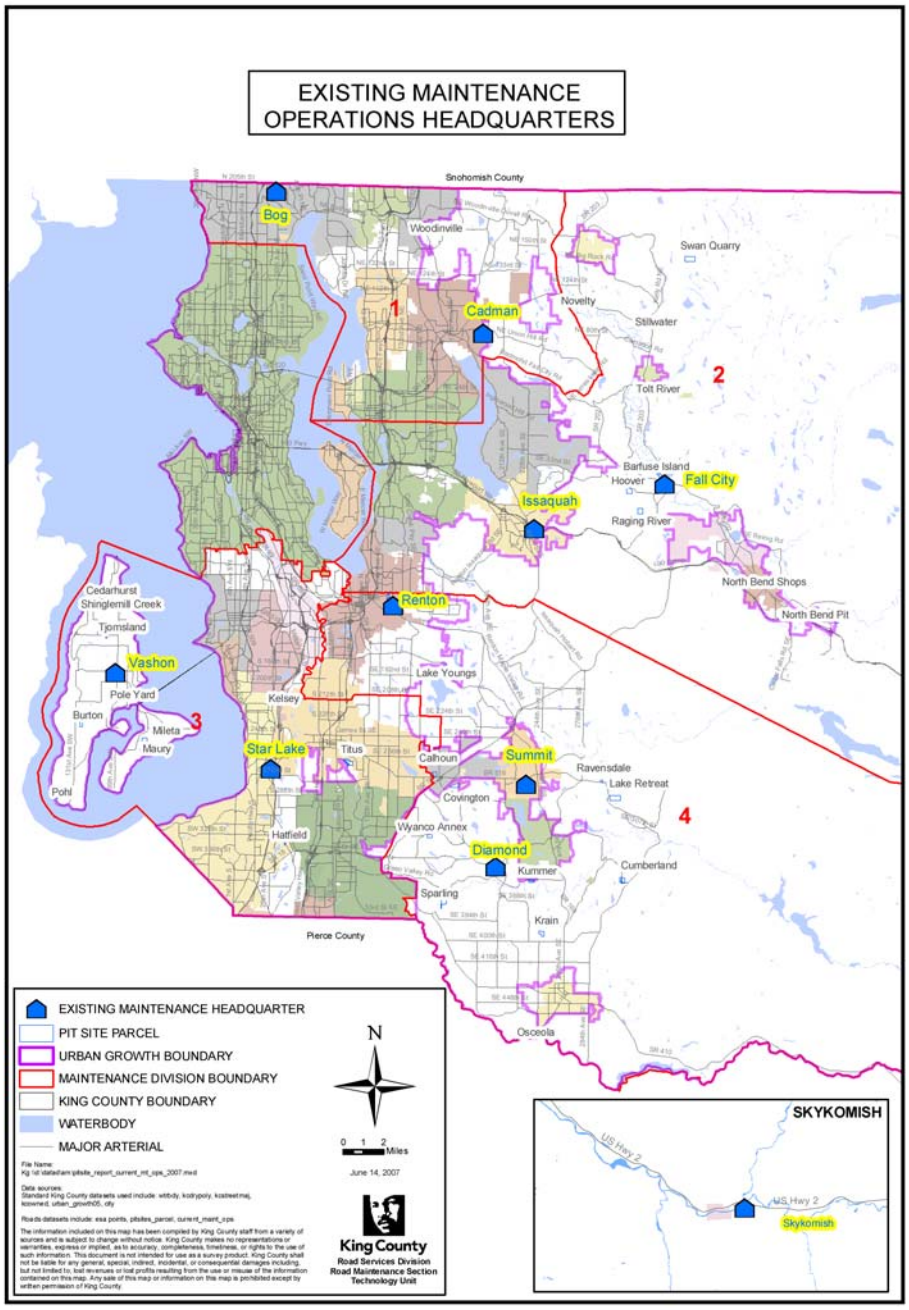


Exhibit B-2: Road Maintenance 2008 FTE Baseline

		2008							
		Miles	**FTEs**						
Div		Unincorp Road Miles	Unincorp Area FTEs	Partner City FTEs	Roads CIP FTEs	WLRD FTEs	Other Loan Out Support FTEs	Total 2008 FTEs	
1	Bog		5.5	2.5				8	
1	Cadman		10.8	1.7				12.5	
	Total	350	16.3	4.3				20.5	
2	Issaquah		5.5	4.0				9.5	
2	Fall City		14.5					14.5	
	Total	379	20.0	4.0				24	
North District									
East District									
2	Skykomish	31	4.0					4	
3	Star Lake	301.1	18.4	6.6				25	
3	Vashon	133	7.0					7	
4	Summit		14.4	1.1				15.5	
4	Diamond		16.0					16	
	Total	574.2	30.4	1.1				31.5	
South District									
CW	**Renton**		**61.9**	**3.1**	**24.5**	**40.1**	**11.1**	**140.7**	
	Total**	**1768.3**	**158.0**	**19.0**	**24.5**	**40.1**	**11.1**	**252.7**	
	Financial, Eng/Env							52.8	
	Utility Inspection							11.0	
	Total Section FTEs							316.5	
	Unincorp Area								
	Miles/FTE		11.2						

* Based on Dye Management estimate.
** An additional 764 miles exist in partner cities.

Exhibit B-3: Potential Annexation Area Allocations

City	PAA	Anticipated Effective Date	Comments
Renton	Benson Hill	3/1/2008	
Auburn	Lea Hill	1/1/2008	
Auburn	Auburn West Hill	1/1/2008	
Kirkland	FinnHill/Juanita/ Kingsgate	3/2/2010	
	Fairwood Incorporation	2010	Should vote go forward in early '09
Possibly combination of cities	North Highline	2010	Either to one city or split among several
Federal Way	East Federal Way	2011	
Renton	West Hill	2011	
Renton	Fairwood Annexation	2011	
Renton	East Renton	in small sections by 2011	
Kent	Panther Lake/Kent PAA	2010	
Bellevue	Eastgate	2010	
Sammamish	Klahanie	2010	Assumes Issaquah agreement in summer and comp plans adjusted

Appendix B-4: Unincorporated King County Pre-1989

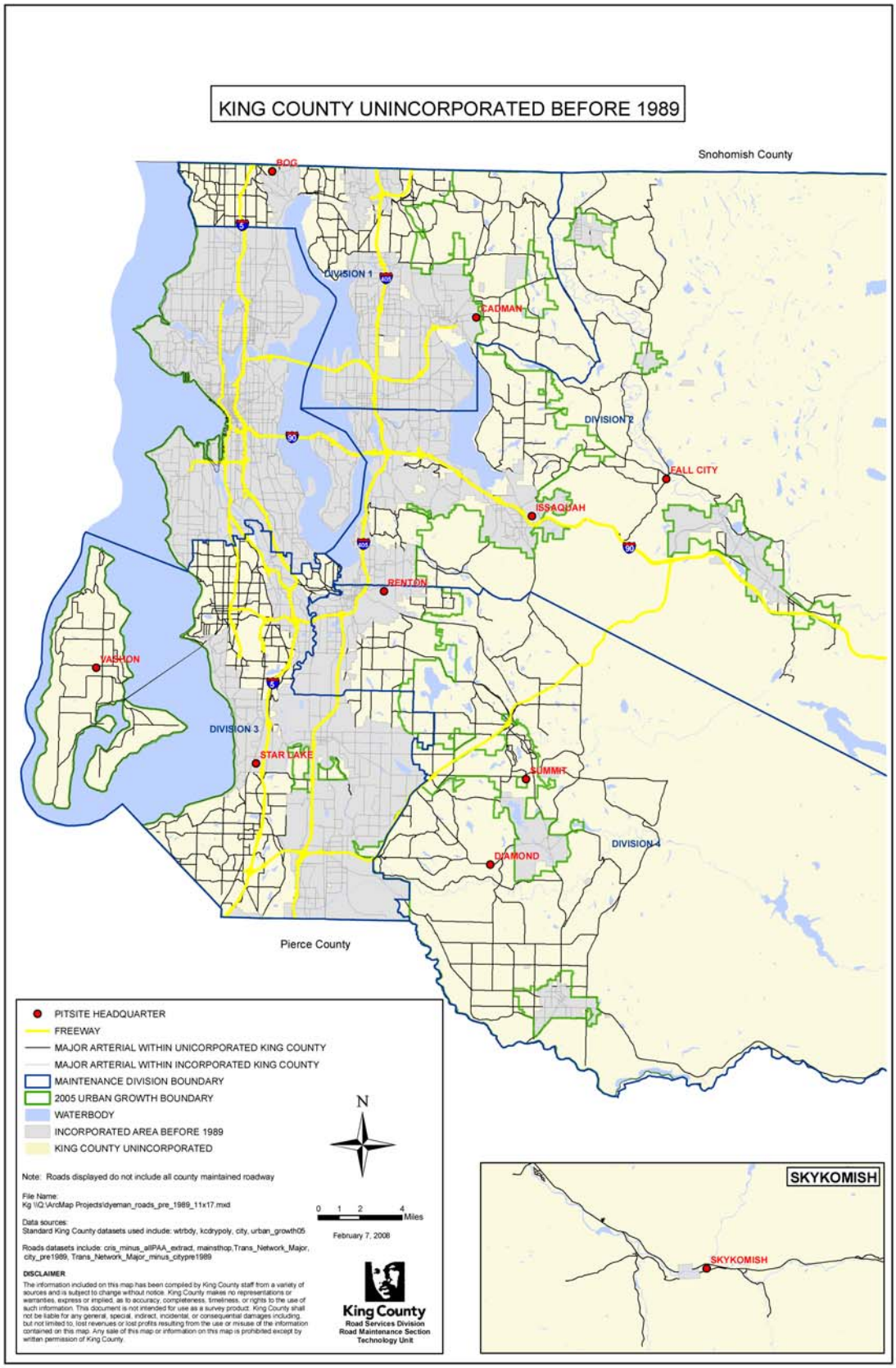


Exhibit B-5: Unincorporated King County - Road Inventory Summary

Unincorporated King County - 2007		Auburn Annexations		Renton Annex	Unincorporated King County	
		Lea Hill	West Hill	Benson Hill	(adjusted for annexation deletions)	
Total Road Surface Area	24,162,225.20	426,924.50	273,406.10	571,476.70	22,890,417.90	Square Yards
Total Road Miles - All Road Types	1,871.20	32.9	21	44.1	1,773.20	**Road Miles**
Lane Miles - All Paved Road Surface	3,635.40	65.9	41.7	88.2	3,439.60	Lane Miles
Lane Miles - Light Bituminous	764.2	12.6	1.7	12.5	737.40	Lane Miles
Lane Miles - Gravel Road	105.1	0.1	0.3	0	104.70	Lane Miles
Lane Miles - A/C and Concrete	2,870.50	53.2	40	75.4	2,701.90	Lane Miles
Lane Miles - A/C Only	2,834.20	53.2	37.7	75.3	2,668.00	Lane Miles
Road Miles - A/C Road Surface	1,416.80	26.6	18.8	37.6	1,333.80	Road Miles
Road Miles - A/C and Light Bituminous	1,799.10	32.8	19.7	43.9	1,702.70	Road Miles
Lane Miles - Light Bituminous and Gravel	869.8	12.7	2.1	12.6	842.40	Lane Miles
Square Yards - Concrete Road Surface	234,145.60	0	14,285.30	965.5	218,894.80	Square Yards
Curb and Gutter - Linear Feet	3,673,418.00	121,657.00	72,397.00	164,730.00	3,314,634.00	Linear Feet
Total Catch Basins and Manholes – Each	33,351.00	910	516	1,420.00	30,505.00	Each
Paved Ditch and Gutter - Linear Feet	79,073.00	1,159.00	0	185	77,729.00	Linear Feet
Open Ditch - Linear Feet	6,471,524.00	113,207.00	55,475.00	69,380.00	6,233,462.00	Linear Feet
Enclosed Pipe System - Linear Feet	4,304,036.00	104,506.00	59,986.00	176,020.00	3,963,524.00	Linear Feet
Total Cross Culverts and Access Tiles	42,265.00	908	479	1,058.00	39,820.00	Each
Cross Culverts Only	17,905.00	448	216	569	16,672.00	Each
Curb & Gutter and Thickened Edge - Road Miles	942.6	24.9	16	49.4	852.30	Road Miles

Unincorporated King County - 2007		Auburn Annexations		Renton Annex	Unincorporated King County	
		Lea Hill	West Hill	Benson Hill	(adjusted for annexation deletions)	
Gravel Shoulders - Road Miles	1,935.30	27.7	17.7	27.9	1,862.00	Road Miles
Gravel Shoulders - Lane Miles	10,223,505.00	146,870.00	94,165.00	148,356.00	9,834,114.00	Linear Feet
Planter Strips - Square Yards	100,502.00	2,578.30	451.3	6,838.90	90,633.50	Square Yards
Total Shoulder Miles - All Types	2,552.50	38.7	24.4	33.3	2,456.10	Road Miles
Total Shoulder Feet - Liner Feet	13,481,240.00	205,553.00	129,334.00	176,848.00	12,969,505.00	Linear Feet
Paved Shoulders - Road Miles	593.6	10.7	6.6	5.1	571.20	Road Miles
A/C Walkways - Linear Feet	91,007.00	2,836.00	157	187	87,827.00	Linear Feet
Concrete Walkways - Square Yards	1,368,808.90	52,306.50	33,712.20	76,814.80	1,205,975.40	Square Yards
A/C Walkways - Square Yards	50,558.90	1,575.50	87.2	103.8	48,792.40	Square Yards
Mowable Slopes - Square Yards	5,225,422.40	49,283.90	39,184.50	9,792.60	5,127,161.40	Square Yards
Mowable Slopes - Pass Miles	4,452.70	41.9	33.2	8.2	4,369.40	Pass Miles
Mowable Slopes - Lane Miles	1,483.80	13.9	11	2.6	1,456.30	Lane Miles
Jersey Barriers - Linear Feet	21,533.00	582	0	83	20,868.00	Linear Feet
Retaining Walls - Linear Feet	61,163.00	472	437	386	59,868.00	Linear Feet
Guardrails - Linear Feet	339,818.00	2,365.00	3,778.00	174	333,501.00	Linear Feet
Retaining Walls - Cubic Yards	108,733.70	839	776.7	686.1	106,431.90	Cubic Yards
Retaining Walls - Square Yards	40,774.90	314.6	291.2	257.2	39,911.90	Square Yards
Bridges	182	1	0	0	181.00	Each
Bridge Drains	1,092.00	6	0	0	1,086.00	Each
Bridge Surface - Linear Feet	22,039.00	223	0	0	21,816.00	Linear Feet
Fencing - Linear Feet	19,274.00	615	0	160	18,499.00	Linear Feet
Auxiliary Pipe - Linear Feet	42,725.00	1,385.00	2,002.00	25	39,313.00	Linear Feet

Unincorporated King County - 2007		Auburn Annexations		Renton Annex	Unincorporated King County	
		Lea Hill	West Hill	Benson Hill	(adjusted for annexation deletions)	
Planter Boxes	39	1	0	0	38.00	Each
Trash Racks	104	0	0	0	104.00	Each
Headwalls	289	3	0	1	285.00	Each
Brick Road Surface - Lane Miles	2.3	0	0	0	2.30	Lane Miles
Road Surface Bulb	51	0	0	2	49.00	Each
Cul-De-Sac	417	18	5	5	389.00	Each
Speed Bumps	50	0	0	23	27.00	Each
Crossing Enclosed Pipe	8,065.00	423	0	94	7,548.00	Linear Feet
Box Culverts	36	0	0	0	36.00	Each
R/D Facilities	62	0	0	1	61.00	Each

Exhibit B-6: 2007 County Maintained Roads