Annual Report

Transportation Concurrency Management Program

2009 Annual Update

Introduction

Since 1995, the King County Department of Transportation's Transportation Concurrency Management (TCM) Program has been reviewing development proposals for compliance with the 1990 Growth Management Act (GMA), and to satisfy the concurrency policy of the King County Comprehensive Plan and the corresponding requirements of (RCW) 36.70A.070(6)(e). The purpose of this Annual Report on TCM is to satisfy King County Code 14.70.270.B, which requires an annual report explaining the technical assumptions and parameters used to update the concurrency map that serves as the county's basis for determining concurrency.

Major Changes and Findings

There are three main changes to the TCM program in 2009:

1) The Road Services Division (RSD) has implemented a new, more efficient and accurate travel time data collection process using state-of-the-art Global Positioning System (GPS) and Geographic Information System (GIS) technology. A full description of this methodology is in the attached Technical Appendix.

2) In 2009, only four travel sheds are now failing the concurrency test versus six in 2008.

3) A list of potential road improvement projects that will bring failing travel sheds back into compliance with concurrency standards has been developed.

Summary of Results

Concurrency Testing Results

The 2009 transportation concurrency test results are shown on the attached table titled *2009 Transportation Concurrency Test By Travel Shed.* The failing travel sheds are marked by crosshatching on the attached map titled *Transportation Concurrency, Attachment A*, which is proposed to be adopted by ordinance by the King County Council. Data was collected on principal and minor arterials and on designated state highways that function like county arterials. Travel sheds with more than 15 percent of total mileage failing concurrency level of service (LOS) standards are then identified as failing in this analysis.

2009 Failing Travel Sheds

Travel Shed	Location	Percentage of Travel Shed Miles Failing	Failing Travel Shed Routes	Total Travel Shed Routes
Green River Valley (5)	Southwest King County	22.62%	2 (**)	8
Sammamish Valley (9)	Northeast King County	42.86%	3 (*, **)	7
Novelty Hill (11)	Northeast King County	18.82%	2	16
Newcastle/East Renton (12)	Central King County	16.58%	2 (*)	12

* State Highways involvement

** City involvement

Four of the route failures are on state highways and four of the key intersections are located within city limits or involve cities on one or more legs of the intersection, so much of the congestion is out of the control of King County. Also important is that all four travel sheds are predominantly designated rural

areas. The routes that fail in the rural travel sheds are failing the rural LOS standard (B). Several of the rural roads with failing routes connect two urban areas. For example, State Route 900 in the Newcastle/East Renton Travel Shed connects the City of Renton and the City of Issaquah. This road carries urban commuter traffic through the designated rural area. No urban portions of the roads in any of the four travel sheds are failing the concurrency standard.

The four travel sheds in the table titled *2009 Failing Travel Sheds* are failing because of high traffic volume and congestion at key intersections shown on the attached map titled *Corridors Causing Travel Shed Concurrency Failures.*

- In the Green River Valley Travel Shed, congestion along South 277th Street at 83rd Avenue South and at West Valley Highway approaching State Route 167 is causing two routes (shown on the map as 1 and 2) to fail concurrency rural LOS standards.
- In the Sammamish Valley Travel Shed, congestion along State Route 202 at NE 124th Street (southbound) and at NE 145th Street (northbound) is causing three routes (3, 4 and 5 on the map) to fail the rural LOS standard B.
- In the Novelty Hill Travel Shed, congestion eastbound approaching 208th Avenue NE on Novelty Hill Road and westbound approaching the intersections at Bear Creek Road and Avondale Road on NE 133rd/132nd Street is causing those roadways (6 and 7 on the map) to fail the rural LOS standard B.
- In the Newcastle/East Renton Travel Shed congestion at the intersection on State Route 900 at 164th Avenue SE is causing the routes (8 and 9 on the map) to fail the rural LOS standard B.

Of the remaining twenty-one travel sheds passing the concurrency test, twenty passed by more than 90 percent. Only one is within 5 percent of failing the test – rural Vashon Island (1) at 88.51 percent passing. All rural mobility areas: Rural Towns (Fall City, Vashon, Snoqualmie Pass) LOS E standard, and selected Rural Neighborhood Commercial Centers (Cumberland, Cottage Lake, Maple Valley, Preston) LOS D standard, passed the concurrency test.

Comparisons of 2009 to 2008

In 2008, six travel sheds failed the transportation concurrency test, while only four travel sheds fail in 2009. The two travel sheds now passing in 2009 are Woodinville (10) and Duvall (16). The Woodinville Travel Shed was failing with 15.17 percent of the road mileage not meeting standards in 2008, but is now passing with only 8.77 percent road failure. This is due to faster travel time and speed LOS changes on Avondale Road and Novelty Hill/NE 124th Street. The Duvall Travel Shed was failing 25.74 percent in 2008, but now has 100 percent of the mileage passing in 2009. This change is due to portions of State Route 203 and NE 124th Street meeting the King County concurrency LOS standard in 2009.

An analysis of the concurrency and LOS changes for 2009 indicate they are related to transportation trends in the Seattle Metropolitan region. A combination of factors, from the economic downturn to high gas prices, seems to be altering commuting habits and reducing traffic volumes and travel times on the roadways. The Washington State Department of Transportation (WSDOT) during 2008 and early 2009 studied travel time ("Economic Downturn Reduces Travel Demand in the Central Puget Sound," by the Washington State Transportation Center, April 2009, http://tinyurl.com/ntw29k) on area freeways and found travel times during commute hours are down on a majority of routes. This mirrors a national trend identified by the 2009 Urban Mobility Report published by the Texas Transportation Institute http://mobility.tamu.edu/ums/media_information/press_release.stm.

King County's 2009 traffic count data also support the apparent trend towards reduced driving and faster travel times. In March and April, the same months the concurrency program collected travel time data,

the RSD Traffic Engineering Section collected traffic counts on thirteen arterials throughout King County for which travel time data was collected. Traffic counts show a 3.0 percent to 20.8 percent decrease in average daily traffic volume. Only Novelty Hill Road showed an increase in traffic volume.

Identification of Needed Transportation Improvements

A component of the TCM program is the identification of potential transportation improvements needed to bring the failing travel sheds back into compliance, with emphasis on the road corridor segments that cause the travel sheds to fail. The failing travel sheds and their failing routes are illustrated in the attached map titled *Corridors Causing Travel Shed Concurrency Failures*. Also attached is a *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds*, which identifies the problem locations including possible road improvements to solve the problems, preliminary estimated costs, and priorities. More information on how needed improvements were determined is contained in the Technical Appendix. Several of the potential road improvements to address transportation concurrency failures within the unincorporated area are on state highways or are within cities and will be communicated by RSD to these jurisdictions.

Progression to the 2010 Annual Report

There are a number of large annexation proposals scheduled for a vote in 2009, and if passed, would take effect in 2010 and 2011. These are Juanita/Finn Hill/Kingsgate (Kirkland), Panther Lake (Kent), and North Highline south portion (Burien). The Fairwood incorporation vote is also on the ballot. The 2009 concurrency pass/fail status of all the travel sheds would not change if the annexations and incorporation were to take affect in 2010.

In 2010, the TCM program will be reviewed to identify ways to improve the process while also maintaining consistency to better compare data gathered from year to year. The RSD will be investigating ways to improve travel shed characteristics, which may involve review of travel shed boundaries, route lengths, prioritization of corridors for sampling, etc., with the target year of 2012 (King County Comprehensive Plan update) for significant changes. Strengthening the program may also involve ways to increase the multi-modal aspect of concurrency, implementation of the Climate Change Initiative, and integrating an updated Mitigation Payment System program more directly with concurrency.

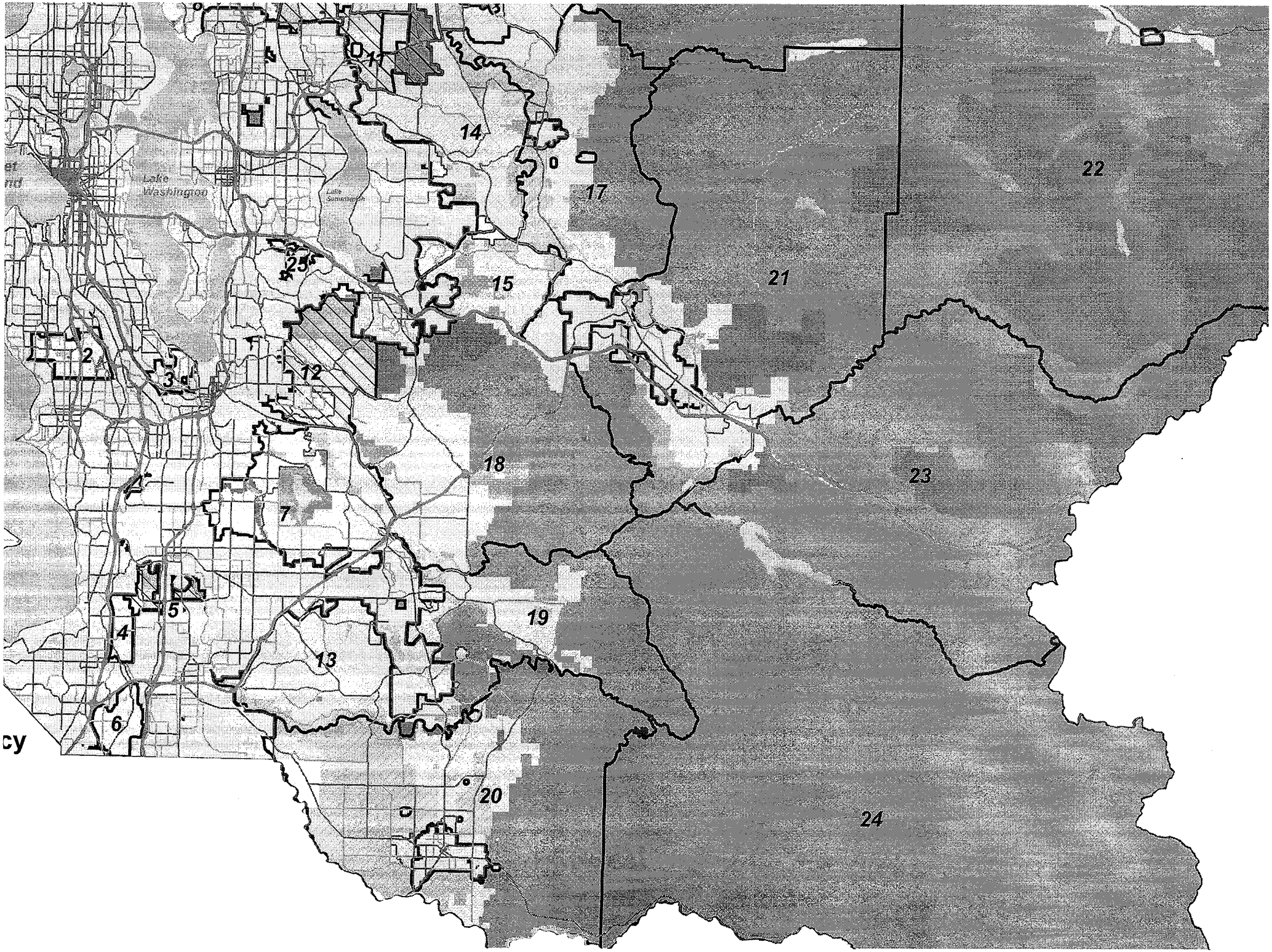
2009 Transportation Concurrency Test by Travel Shed

August 27, 2009

Travel Shed	Geographic Identifier	Total Travel Shed Mileage	Travel Shed Total Failed Mileage	Percent Travel Shed Failing Standards	Travel Shed Concurrency Test (85% Compliance)
1	Vashon	26.11	3.00	11.49	PASS
2	White Center	11.07	0.25	2.26	PASS
3	West Hill	5.06	0.00	0.00	PASS
4	North Federal Way	5.54	0.00	0.00	PASS
5	Green River Valley	4.42	1.00	22.62	FAIL
6	SE Federal Way	5.94	0.00	0.00	PASS
7	Soos Creek	39.92	0.66	1.65	PASS
8	Juanita/Kingsgate	12.31	1.00	8.12	PASS
9	Sammamish Valley	5.53	2.37	42.86	FAIL
10	Woodinville	20.30	1.78	8.77	PASS
11	Novelty Hill	15.41	2.90	18.82	FAIL
12	Newcastle/East Renton	14.11	2.34	16.58	FAIL
13	East Auburn	24.70	1.54	6.23	PASS
14	Union Hill/202	33.44	2.27	6.79	PASS
15	Sammamish	10.43	0.00	0.00	PASS
16	Duvall	8.61	0.00	0.00	PASS
17	Snoqualmie Valley	20.14	0.46	2.28	PASS
18	Tiger Mtn/Hobart	31.10	1.53	4.92	PASS
19	Black Diamond	14.04	0.00	0.00	PASS
20	Enumclaw*	45.63	0.00	0.00	PASS
21	North Bend	3.14	0.00	0.00	PASS
22	Skykomish	0	0.00	0.00	PASS
23	Snoqualmie Pass	0	0.00	0.00	PASS
24	White River	0	0.00	0.00	PASS
25	Klahanie/Eastgate	5.04	0.00	0.00	PASS

* Includes SR-169 south of the Green River Bridge; 2008 data were used because the bridge was closed for repairs and data could not be collected in 2009; SE 440th Street, an urban minor arterial from 284th Avenue SE to the Enumclaw City Limits, mileage and data were not included because the road was closed for repair during the data collection period; no 2008 data were available; also, SR-164 has been designated a Highway of Statewide Significance effective 7/26/2009, but is included in the county concurrency testing because it functions as a county arterial.

Designated Rural Towns and Rural Neighborhood Commercial Centers all pass concurrency testing.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Summary Table
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
September 2009

Route Number	Corridor	Corridor Route	2009 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimates $ (million)	Ease of Implementation (1) Easiest to (3) Most Difficult
Travel Shed 5 - Green River Valley							22.62				
1	83rd Ave S (Central)	Green River Bridge to S 277th St	D	B	SB	11.30		Intersection delay Southbound movements @ 277th St; delay caused by heavy Eastbound traffic from SR-167 to west	A - Add 300 foot westbound through/right lane with 135 foot taper (11-foot wide lane) B - Convert added Lane (A) to thru only; add 150-foot westbound right only lane C - Add 1000-foot full width eastbound lane on east leg with 495 foot merge taper Intersection phasing (less green time for east/west movement) D - Auburn ITS project on S 277th corridor will help this intersection N leg 5 to 10% E - Ultimate Auburn project: 5-lanes from Central Ave to existing 6-lanes east	A: 2.9 B: 2.2 C: 6.8 D: City E: City	A: 1 B: 2 C: 1 D: 1 E: 3
2	S 272nd/277th Street	Lake Fenwick Rd to SR-167 East off ramp	C	B	EB	11.32		Intersection delay Eastbound @ West Valley Highway and @ SR-167 ramp intersections; delay caused by heavy through traffic	ITS; signal modification to coordinate signals in corridor; KC CIP Project number 300108 scheduled for 2009/2010; coordination with WSDOT and Auburn	0.7	1
Travel Shed 9 - Sammamish Valley							42.86				
3	SR-202	NE 124th St to NE 136th St	D	B	NB	14.65		Intersection delay Southbound @ 124th St caused by heavy volume	City project east leg intersection (WB thru/WB right) will help delay on north leg; also City project to widen south leg SR-202 in planning stage	8.2 City of Redmond plus UPD contribution	1
4	SR-202	NE 136th St to NE 145th St	C	B	SB	9.95		Intersection delay Northbound @ 145th St caused by heavy volume	Roundabout; State/City project; series of 3 roundabouts around intersection	5.9 City of Woodinville construction 2009	1
5	NE 124th St	Willows Road to SR-202	C	B	EB	18.26		Intersection delay Eastbound @ SR-202 caused by heavy volume and competing movements	City project east leg intersection (WB thru/WB right) will help delay on north leg; also City project to widen south leg SR-202 in planning stage	8.2 City of Redmond plus UPD contribution	1
Travel Shed 11 - Novelty Hill							18.82				
6	Novelty Hill Rd	Redmond City Limits to 218th Ave NE	C	B	EB	12.98		Volume and intersection delay @ 208th Ave NE	A: Roundabout at 208th Ave NE B: Add separated WB free through lane; NB left turn acceleration/merge lane; U-turn route for north driveway C: ITS signal interconnect and coordination CIP project (100992) roundabout at new 196th Ave NE connection	A: 9.8 B: 3.3 C: 0	A: 2 B: 1 C: 1
7	NE 133rd St	Avondale Rd to 202nd Ave NE	C	B	WB	5.84		Volume and intersection delay Westbound @ Bear Creek Rd and @ Avondale Road	Widen and rechannelize intersection at Avondale Rd; realign intersection at Bear Creek Rd to make major movement east west and Bear Creek Rd at 90 degrees to NE 133rd; old KC CIP Project number 101088 (NE 128th/NE 132nd St)	11.4	3

Summary Table
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
September 2009

Route Number	Corridor	Corridor Route	2009 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimates $ (million)	Ease of Implementation (1) Easiest to (3) Most Difficult
Travel Shed 12 - Newcastle/East Renton							16.58				
8	SR-900	May Valley Rd to 164th Ave SE	C	B	WB	8.65		Intersection delay Westbound @ 164th Ave SE	**A:** Construct roundabout in NE quadrant of 164th Ave SE **B:** Add WB left turn and EB left turn **C:** Close north leg of intersection and add WB left Add quarter mile segment of 3 lane road east and west; review phasing (green time); State route **D:** ITS signal interconnection and coordination	**A:** 4.5 **B:** 3.6 **C:** 2.2 **D:** NA	**A:** 3 **B:** 1 **C:** 3 **D:** 2
9	SR-900	164th Ave SE to 148 Ave NE	C	B	EB	7.93		Intersection delay Eastbound @ 164th Ave SE	SEE ABOVE; same improvements will improve delay for this corridor route	See above	See above

Technical Appendix

Annual Report
Transportation Concurrency Management Program
2009 Annual Update

I. Travel Time Data Collection Methodology

The Transportation Concurrency Management (TCM) program collects travel time data each year to update the Transportation Concurrency map. Several procedural changes were made to the data collection and analysis in 2009 that build from the effort in 2008. While the 2008 process was a significant change from concurrency use of complex land use pipeline information, six year planned/funded improvement project timeline, and travel forecast modeling of the preceding years, the process from 2008 forward is based on data collected for the current year. Concurrency analysis is now based solely on actual travel times and not future-funded improvements and pipeline traffic growth. Still, the data collection and analysis in 2008 required considerable staff time and manual data analysis. The 2009 effort became less labor intensive and more automated, which is explained further below. This change has saved, and will continue to save, the county staff time and the associated cost to annually update the TCM program.

In 2009, the concurrency process became more automated when the Road Services Division acquired eight GeoLoggers, a Global Positioning System (GPS) device that is designed for collecting detailed vehicle travel data. The GeoLogger units allow for an accurate and intensive data collection effort using half the manpower as previous survey efforts. The data logger automatically records second-by-second time, geographic position, speed data, etc. The automated nature of the device allows the driver of the data collection vehicle to be more attentive to road conditions, thus increasing safety. Companion software imports the collected data from the GeoLogger and processes it. The data are then displayed graphically through Geographical Information System (GIS) software covering the King County road network.

In 2009, from three to ten data runs per day were collected on each corridor over a one- to three-day period, depending on corridor length and congestion. A single run consists of a roundtrip drive through the corridor in one direction, and returning in the opposite direction to the starting point. Each corridor was prioritized to determine how many days and runs should be taken. Prioritization was established based on several factors including the perceived congestion level of the corridor based on data collection in 2008. If corridors were contiguous and short, data were collected from multiple corridors by the same driver in a given evening. Data collection was halted or the data dismissed if there was an accident or emergency that obstructed traffic flow in the corridor. Corridors were scheduled based on avoiding abnormal traffic conditions due to construction, road closures, or other identified events. Data were collected on principal and minor arterials and certain state highways.

Travel time data were collected by driving each corridor and timing how long it takes to move from one end of the corridor to the other, noting intermediate points in between. According to the Federal Highway Administration (Travel Time Data Collection Handbook), the spring season

is the time of year providing the most representative driving conditions, so the data collection program was run over a seven-week period during the months of March and April. Data were only collected on Tuesdays, Wednesdays, and Thursdays, when the most representative weekly traffic conditions occur during the peak evening commuting period (4 p.m. to 6 p.m.). No data were gathered during school spring breaks, holiday periods, and construction and traffic events to avoid obtaining data during atypical commuting days.

II. Data Processing and Analysis

Once the data is collected, it is downloaded and processed by new TravTime software recently acquired by the RSD. The software reads the GPS data and calculates information including number of runs, distance, average travel speed, travel time, etc., for each corridor route, including the level of service (LOS) using the Highway Capacity Manual methodology, which is the industry standard. Previously, processing of the data was accomplished manually using spreadsheets. The use of the software has greatly increased the efficiency of this exercise, with much faster results that are much less susceptible to human error. All route lengths are measured from the GPS points and matched to the road network in the King County Geographical Information System. TravTime compares the calculated speed with the travel speed LOS for roads by functional classification identified in the *Road Levels of Service* table in the next section. Using the LOS for each roadway, RSD staff can then proceed to concurrency testing in the travel sheds.

An important element of the travel time data collection is documentation and quality control for travel time procedures. All phases of the data collection process included review by the concurrency staff team to ensure accurate data gathering procedures. Documentation includes GeoLogger data files, field notes from data collection, and summary tables of this data for each corridor. The following are some of the quality control checks performed for the 2009 TCM program:

- Check of the field note forms submitted by each driver.
- Review of corridors and routes, distances, functional classifications.
- Review of speeds and LOS standards.
- Review of shared corridors (the arterial forms the boundary between two travel sheds), rural vs. urban arterials, incorporated portions of corridors.
- Travel shed mileage.
- Check of recently annexed areas, as well as elections in pending potential annexation areas.

III. Level of Service Standards

The LOS standards adopted in the King County Comprehensive Plan are used to appropriately encourage growth in the urban area and to determine if future growth can be accommodated on the transportation facilities. Levels of service on roadways range from LOS A for free flow to LOS F for heavily congested traffic. The LOS for different arterial classifications and state highways is identified by travel speed in the following table from the King County Code. There is a different LOS standard for urban areas (LOS E) than for rural areas (LOS B). In addition, mobility areas established in the rural areas have their own LOS standard. Rural Towns (Fall

City, Vashon, Snoqualmie Pass) have a LOS E standard and selected Rural Neighborhood Commercial Centers (Cumberland, Cottage Lake, Maple Valley, Preston) have a LOS D standard. These LOS standards remain the same as in 2008 and can only be changed during a major comprehensive plan update that occurs every four years. The next plan update will be in 2012.

ROAD LEVELS OF SERVICE				
Road Classification:	I (State Routes)	II (Principal Arterials)	III (Minor Arterials)	IV (Collector Arterials)
LEVEL OF SERVICE	AVERAGE TRAVEL SPEED (MILES PER HOUR)			
A	>42	>35	>30	>25
B	>34 – 42	>28 – 35	>24 – 30	>19 – 25
C	>27 – 34	>22 – 28	>18 – 24	>13 – 19
D	>21 – 27	>17 – 22	>14 – 18	>9 – 13
E	>16 – 21	>13 – 17	>10 – 14	>7 – 9
F	<=16	<=13	<=10	<=7

From King County Code 14.70.220.B.2

IV. Concurrency Testing Methodology

The 2009 transportation concurrency testing process compared the monitored road miles passing the King County LOS standards with the total monitored road miles in a travel shed. The LOS for travel speed on various arterial classifications and state highways is identified by the King County Code and shown in the *Road Levels of Service* table above. A travel shed is deemed to be concurrent if at least 85 percent of the roadway miles meet the urban and rural LOS standards. If less than 85 percent of the roadway miles pass the LOS standards, the travel shed fails the concurrency test.

Within a travel shed that contains both rural and urban designated land, the passing segment lengths of urban roads (LOS E standard) are added to the passing segments lengths of rural roads (LOS B standard) for a passing mileage total in the entire travel shed. This mileage is then compared to the individual travel shed total mileage, and the percentage pass/fail is determined. The designated rural mobility areas, consisting of Rural Towns and Rural Neighborhood Commercial Centers, are tested separately using road miles within the entire travel shed in which they are located. This test is based on a LOS E standard for Rural Towns and LOS D for selected Rural Neighborhood Commercial Centers. In 2009, all these areas passed the concurrency test.

V. Identification of Needed Transportation Improvements

The four travel sheds out of compliance had a total of nine road routes or segments that failed the concurrency LOS standards. A RSD staff team reviewed the travel time data and field notes for reasons the corridors appeared to be failing. The main congestion areas identified were primarily choke points at major intersections causing delay and slowing vehicle speeds. These causes are due in part to lack of turn channelization, heavy volume, and signal timing. Specific solutions

were identified by the team to address needs in each corridor. Each solution was then reviewed, and costs were estimated. These projects were then prioritized based on their feasibility and effectiveness in bringing the corridor travel shed back into compliance. The project information is presented in the attached *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds.*

Bringing a travel shed back into compliance depends on the total travel shed compliance percentage and the number and length of the routes out of compliance in each travel shed. If a failing route is long enough, just making that one route compliant can bring the travel shed back into compliance. However, a travel shed with a large failing percentage can require more than one of the routes to be compliant. For example, the Sammamish Valley Travel Shed (9) is out of compliance by a significant percentage for three failing routes. Two of the three failing routes need to be brought back into compliance for the shed to pass concurrency; improvements at two locations on State Route 202 can achieve this goal. Green River Valley Travel Shed (5) is out of compliance for two failing corridor routes. Only one of the failing corridor routes needs to be brought back into compliance for the travel shed to pass concurrency. This is also the case with the Novelty Hill (11) and Newcastle/East Renton (12) travel sheds.

The road projects identified include a variety of intersection treatments, and Intelligent Transportation System (ITS) signal interconnection. Some projects are already identified in the adopted Transportation Needs Report (TNR) 2008 and 2009 Capital Improvement Program (CIP), while others are entirely new projects. These new projects will need to be added to the TNR and as appropriate, to the CIP for implementation. Several of the new projects will require involvement by the state or by cities. Four of the failing segments are on state routes, and three out of four project locations on these segments involve cities. Some of the city and state road projects are already being planned or are near construction, but others are entirely new projects not on the jurisdiction's plans.

Cost estimates in 2008 and 2009 dollars were made, and known costs from other jurisdictions were used, for each of the new projects identified in the *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds.* The projects were then prioritized based on cost and feasibility. Projects were given a priority of one for the perceived easiest to implement, up to three for the most difficult to implement. Identified projects will undergo further review to determine how to move them through the implementation process based in part on the determined priority. Not every road segment will have to be brought back into compliance for a travel shed to pass concurrency. Strategies will be developed to identify a timeline for implementing the projects, including combinations of multiple projects and coordination with other jurisdictions.