## STAFF REPORT

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| **Agenda Item:** | 4 | **Name:** | Leah Krekel-Zoppi |
| **Proposed No**.: | 2016-0292 | **Date:** | December 6, 2016 |

**SUBJECT**

A motion approving the Strategic Technology Roadmap for Transit (STRT), as required by a proviso in the 2015/2016 Budget.

**SUMMARY**

The Executive’s Proposed 2015/2016 Budget included eleven Transit technology projects totaling $23.6 million in appropriation requests, many of which were initial phases of larger projects expected to be proposed in future budget requests. In reviewing these projects, the Council determined that it would be beneficial for the Transit Division to develop a Strategic Technology Roadmap for Transit (STRT) in order to provide a planned, integrated, and forward-looking understanding of Transit’s technology needs. The Council included a proviso requiring a STRT in the 2015/2016 Budget.

As required by the proviso, the Executive transmitted the STRT on May 31, 2016. The STRT was developed by a consultant team and steering committee of Metro and KCIT staff that interviewed internal stakeholders, scanned Metro’s technology environment, and checked in periodically with Council staff. The STRT describes Metro’s technology environment; provides Metro’s technology vision, goals, objectives, and strategies; describes Transit’s project assessment and prioritization process; and lists planned technology projects during the 2016-2021 timeframe.

The final STRT was responsive to the issues identified by Council during review of the STRT Preliminary Report, and was used successfully by the Council to review transit technology requests in the 2017-2018 budget review process. Because the STRT is intended to be a living document and the transit technology capital program will continue to be complex and robust, it will be important to keep the STRT up-to-date for future budget review cycles.

**BACKGROUND**

King County Metro maintains approximately 300 technology applications and interfaces,[[1]](#footnote-1) which are used to plan routes and schedules, collect fares, communicate between the base and buses, provide customers information, and much more. The development of technology applications over time to address different functions has resulted in a multitude of interdependent technology applications, some of which need replacement. For example, the 4.9 Network communications system and the ORCA fare payment system are two major technologies that Metro has identified as needing replacement. Customer demand and market trends also drive technology investments, such as the expectation of customers to be able to use smartphones to pay fares and to track bus arrival information in real time.

The 2015/2016 Executive proposed budget included eleven Transit technology projects totaling $23.6 million in appropriation requests. These projects represent less than one-quarter of the $119 million of transit technology investments planned over the next six years[[2]](#footnote-2) and the 100 potential technology projects that the Transit Division evaluated in developing their 2015/2016 budget request.

In considering these projects during review of the 2015/2016 Budget, the Council recognized the need to assess technology needs and developments within the context of Metro’s goals and resources and in relation to how projects integrate with one another and with other regional systems. The Council determined that it would be beneficial for Metro to develop a Strategic Technology Roadmap for Transit to aid Metro and policy makers in planning for and prioritizing technology investments. The Council added Capital Improvement Project 1124887 Strategic Technology Roadmap for Transit with an appropriation of $550,000 and included Proviso P4, Section 129 in the 2015/2016 Budget Ordinance (Ordinance 17941).

*P4 PROVIDED FURTHER THAT:*

 *Of the appropriation for capital project 1124887, strategic technology roadmap for transit, $25,000 may not be encumbered until the executive transmits the Strategic Technology Roadmap for Transit and a motion that approves the Strategic Technology Roadmap for Transit and the motion is passed by the council. The motion shall reference the subject matter, the proviso's ordinance, ordinance section and proviso number in both the title and body of the motion.*

 *The Strategic Technology Roadmap for Transit shall address how technology will be used in the future to support Transit in delivering transit services. The Strategic Technology Roadmap for Transit is intended to provide a planned, integrated, and forward-looking understanding of the evolving technology needs and solutions over the next five years for transit riders, operations and administration. The Strategic Technology Roadmap for Transit shall recommend and prioritize technology solutions and identify the integration points of those solutions other transit and county and regional technologies.*

 *Before transmitting the Strategic Technology Roadmap for Transit, the executive must file a preliminary report identifying the specific components to be included in the Strategic Technology Roadmap for Transit and a draft outline of the Strategic Technology Roadmap for Transit and motion approving this preliminary report by April 1, 2015, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff, the policy director and the lead staff for the transportation, economy and environment committee, or its successor.*

*The executive must file the Strategic Technology Roadmap for Transit and motion approving it in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff, the policy director and the lead staff for the transportation, economy and environment committee, or its successor.*

The “Preliminary Report Identifying the Specific Components to be Included in the STRT” was transmitted on March 30, 2015. The final STRT was transmitted in May 31, 2016.

***STRT Development Process***

The STRT was developed with the help of a consultant team, with members of the Transit Technology Review Committee serving as the steering committee for STRT development. The consultant team and steering committee developed the STRT by interviewing technical and project management staff, assessing existing related strategic plans, performing an environmental scan, and reviewing Metro’s enterprise architecture model and databases of existing and anticipated needs. A team of Council staff periodically checked in on the STRT development process and reviewed drafts to provide feedback about the direction on the STRT.

***Summary of the STRT***

Purpose

The purpose of the STRT is to articulate Metro’s technology planning environment, technology program vision, process for prioritizing technology initiatives, and five-year program of priority initiatives.

Technology Environment

In section 3, the STRT describes Transit’s technology environment, including internal and external technology drivers and market trends. Some examples of the myriad of issues that drive Metro’s technology needs are:

* Constant changes in technology that drive infrastructure investments and customer expectations,
* Aging infrastructure such as the ORCA regional fare payment system, the 4.9 radio communications network, and the cash fare collection equipment on buses that lead to policy and technology decisions about replacement, and
* The need to integrate technology platforms not only with other internal platforms but also with other external systems such as King County’s enterprise systems, other regional providers such as Sound Transit and ORCA partners, and road network equipment such as traffic signals.

Diagram 1 depicts the complexity of Metro’s technology environment.

**Diagram 1: Metro’s technology environment**[[3]](#footnote-3)



Vision, Goals, Objectives, and Strategies

Section 4 of the STRT provides a strategic vision, goals, objectives and strategies for Metro’s technology investments. The STRT vision statement is:

Metro’s technology program supports transit’s goals and meets business needs by providing secure, reliable, flexible and cost-effective technology solutions that measurably demonstrate continuous improvement; are intuitive for end-users; deliver accurate and accessible data for a wide range of users and uses; and are integrated with regional transit initiatives.

The goals that drive Metro’s technology investments are to:

1. Enhance the customer experience,
2. Ensure business continuity and effective technology investments,
3. Manage data effectively,
4. Promote accessible information services,
5. Deliver initiatives that promote a quality, effective workforce.

The STRT contains various objectives and strategies for achieving these goals through Metro’s technology investments.

Technology Roadmap

Section 5 of the STRT describes Metro’s process for assessing and prioritizing technology initiatives as well as a five-year look at anticipated proposed technology projects.

The technology project assessment and prioritization process described in the STRT involves first identifying potential needs through a variety of sources such as employee suggestions, process improvement efforts, and enterprise architecture assessments. Next the potential needs are categorized as maintenance, enhancements of existing investments, and new projects. Next the projects are assigned to a program area so staff with specialized knowledge of that program area can analyze and prioritize the project based on the following evaluation criteria:

* How does it further STRT goals and objectives?
* Does it have equity and social justice implications?
* What is the level of need (for example: is it mandated by law? Is it necessary for avoiding critical business failures?)?
* What are the benefits to the organization?
* What is the feasibility/risk assessment?
* What is the cost/benefit ratio?

Projects identified to move forward advance to conceptual review which involves the Office of Performance, Strategy, and Budget and the Chief Information Officer evaluating which projects to include in the Executive’s proposed budget. Diagram 2 depicts Metro’s project assessment and prioritization process.

**Diagram 2: Transit’s Prioritization Process**[[4]](#footnote-4)

Due to staffing and budget constraints, there were many more worthy investments identified through the evaluation process than can be accomplished within the STRT timeframe. Some of the key areas of focus identified were:

* Improving data access, management, and reporting;
* Replacing outdated, at-risk systems;
* Improving fare collection;
* Enhancing safety and security;
* Improving the customer experience of real-time information; and
* Coordinating with regional partners.

Transit technology projects proposed in the 2017/2018 timeframe include[[5]](#footnote-5):

* Next generation wireless implementation – replacement of the 4.9 radio network that currently serves the communication needs on Metro’s buses.
* ORCA replacement (ORCA 2) – a regional project to replace the regional coordinated fare system infrastructure.
* Transit Signal Priority Replacement – to replace the existing aging transit signal priority system.
* Transit Business Intelligence Reporting Database – to create an integrated, multi-purpose reporting database combining data from various collection points.
* Transit video cameras and video management – providing a comprehensive system for acquiring, managing, viewing, and archiving video from various transit sources.
* Comprehensive safety and security technology assessment and enhancement – replacing various safety and security applications reaching their end-of-life with a comprehensive safety and incident management system.
* Vehicle telematics – evaluate technologies to manage vehicles remotely to reduce fleet management and repair costs.

These projects, along with continuation of several technology projects already underway[[6]](#footnote-6), were put forward in the 2017/2018 Executive Proposed Budget and adopted by the Council[[7]](#footnote-7).

Anticipated transit technology initiatives for 2019/2021 include[[8]](#footnote-8):

* Mobile ticketing continuation – potentially moving forward with implementation of mobile ticketing technology after evaluating the mobile ticketing pilot project.
* New farebox needs assessment – deciding whether to replace farebox collection equipment reaching end-of-life.
* Regional trip planner – evaluating the lifecycle replacement needs of Metro’s regional trip planner and considering opportunities for better integrated regional trip planning.
* Vanpool information system replacement – replacing this system reaching end-of-life.
* On-board systems/communication center system replacement planning – evaluating replacement needs for this system reaching end-of-life.

This section of the STRT also includes a timeline of Transit’s technology projects and initiatives from 2016-2021[[9]](#footnote-9) (see Diagram 3 below), and diagrams of the project relationships of program areas with several interdependent projects including fare collection,[[10]](#footnote-10) data analytics and reporting,[[11]](#footnote-11) and networks and communications[[12]](#footnote-12) (including next generation wireless, ORCA replacement, real-time information, transit signal priority, and transit video cameras).

**Diagram 3: STRT Projects Timeline**[[13]](#footnote-13)



Moving Forward

The final section of the STRT identifies recommendations for moving forward with Metro’s near-term program, such as maintaining the investment and addressing financial considerations. This section also establishes that the STRT is a living document that will be updated over time to reflect Metro’s ever-changing technology environment.

**ANALYSIS**

***Proviso Responsiveness***

The STRT is responsive to the requirements included in the proviso as it prioritizes Metro’s technology needs for the next five years in a planned, integrated way.

***Responsiveness to Issues Identified in Review of the Preliminary Report***

When the Council approved the STRT Preliminary Report[[14]](#footnote-14) on June 22, 2015, staff identified issues to monitor in the drafting of the final report. Those issues include:

* Ensuring the STRT scope adequately addresses Transit’s Business/Enterprise System needs.
* Ensuring the STRT uses common strategic planning language
* Evaluating how the STRT addresses financial stewardship
* Evaluating how the STRT addresses equity and social justice considerations in project selection
* Ensuring the STRT discusses and considers regional partnerships and points of integration.

Following is analysis on how the final STRT addresses each issue.

STRT Scope: Business/Enterprise System Technology

In the Council’s review of the STRT Preliminary Report, it was noted that, due to Metro’s size as one of KCIT’s largest customers, the STRT should address how Metro’s technology needs will drive KCIT’s initiatives for enterprise system technologies. The STRT final report notes that the scope of the STRT “is intended to focus on initiatives that are in the realm of Transit’s control without being short-sighed to the realities of shared services and infrastructure within the County.”[[15]](#footnote-15) Additionally, Transit has previously noted that the STRT will function as a communication tool for Metro to convey its business and technology needs to stakeholders such as KCIT. KCIT countywide initiatives were reviewed for potential impacts on Transit technology as part of the needs identification process of developing the roadmap.[[16]](#footnote-16)

STRT Structure: Common Use of Strategic Planning Language

The Council’s review of early drafts of the STRT noted the importance of using common strategic planning terms as defined in K.C.C. 2.10.020. In Section Four, the STRT uses common strategic language to identify Metro’s technology vision statement, goals, objectives, and strategies. The STRT strategic plan identifies and addresses Metro’s technology priorities and relates to the overall strategic plans for Metro and King County Information Technology.

Vision and Roadmap Policy Consideration: Financial Stewardship

In reviewing Transit technology projects, the Council has stressed the importance of financial stewardship to prioritize limited resources. In Section 5.1 of the STRT, the evaluation criteria used to identify and prioritize transit technology projects includes several criteria designed to ensure projects are sound financial investments. Those criteria include evaluating projects according to feasibility, risk, and the cost/benefit ratio.[[17]](#footnote-17) Section 6.2 also includes a discussion of financial considerations that should guide transit technology planning.[[18]](#footnote-18)

Vision and Roadmap Policy Consideration: Equity and Social Justice

Consideration of equity and social justice (ESJ) issues has been another area of emphasis for the Council in considering Transit projects and initiatives. The STRT addresses the need to incorporate ESJ considerations into transit technology projects in several ways. First, within the Strategic Technology Vision, Objective D-1 is “Deliver information and services that support equity and social justice.”[[19]](#footnote-19) Second, in STRT Section 5.1, one of the evaluation criteria for prioritizing technology needs is: “Does the Need have Equity and Social Justice Implications?”[[20]](#footnote-20)

Regional Partnerships and Points of Integration

The Council’s review of the STRT Preliminary Report noted the importance of ensuring the STRT identifies regional partnerships and points of integration between projects. The STRT identifies regional partnerships as an external driver in Section 3.4[[21]](#footnote-21) and as a strategy within Goal C: manage data effectively.[[22]](#footnote-22) Section 5.2 of the STRT includes diagrams and descriptions of how projects inform and are dependent on each other within major program areas.[[23]](#footnote-23) According to Transit, the agency’s project management structure is designed to identify interdependencies between projects and assign and schedule tasks related to project coordination and integration.

***STRT and the 2017-2018 Budget Review Process***

The STRT was a useful tool for reviewing transit technology capital projects in the Executive’s Proposed 2017-2018 budget. The STRT provided context and information about how the projects aligned with Transit’s strategic technology vision, what technology trends and advances are impacting Transit, why the proposed projects were selected as top priorities, and how the proposed projects related to each other and potential future initiatives.

The Executive proposed the following projects in the 2017-2018 budget.

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| **Project** | **2017-2018 Request** | **Total Project Cost**[[24]](#footnote-24) |
| ORCA Replacement | $42,933,167 | $57,537,784 |
| Replacement for 4.9 Network | $23,950,639 | $28,099,616 |
| Transit Signal Priority | $4,328,805 | $6,619,305 |
| Vehicle Telematics for Transit Coaches | $3,428,817 | $3,428,817 |
| Transit Business Intelligence Resource Data | $1,678,764 | $6,000,976 |
| Rider Information Systems | $1,090,000 | $1,896,427 |
| Safety and Security Systems  | $2,114,368 | $2,406,468 |
| Transit Customer Information Systems | $765,394 | $5,149,251 |
| On-Board Camera Management | $640,778 | $640,778 |
| Real-Time Improvements | $565,018 | $1,309,722 |
| Vehicle Maintenance Dispatch Replacement | $195,667 | $323,831 |
| Hastus Planning Module | $99,444 | $443,302 |
| **Total**  | **$81,790,861** | **$113,856,277** |

In contrast to the 2015-2016 budget review, when several proposed transit technology projects were deleted, reduced in scope, or restricted due to lack of information about Transit’s strategic technology plans, all of the 2017/2018 proposed transit technology projects were approved by the Council.

The Executive also proposed, and the Council adopted, additional operating resources to help ensure the technology program is delivered successfully. These resources included additional staff support, lifecycle maintenance funding, and additional business analysis support from KCIT.

***Next Steps***

STRT Section 6.4 states that, “The STRT is a living document that will be updated over time to reflect the changing environment affecting Transit’s business requirements, goals and objectives, Business Plan, and the resultant STRT goals and objectives.”[[25]](#footnote-25) Transit proposes to update the STRT every two years between biennial budget processes as part of their business planning and budget development process.

The STRT’s primary value to the Council is as a tool to provide context for Transit’s technology budget requests, which will continue to be numerous, large, and complex. While future updates of the STRT are not currently required by code or ordinance, keeping the STRT relevant and up-to-date on Transit’s business needs, technology environment, and proposed projects will be critically important for the Council’s review of future transit technology requests.

**ATTACHMENTS**

1. Proposed Motion 2016-0292 (and its attachments)
2. Transmittal Letter

**INVITED**

* Jill Krecklow, Finance Manager, Transit Division
1. STRT, page 9 [↑](#footnote-ref-1)
2. According to the 2015/2016 Capital Improvement Program. [↑](#footnote-ref-2)
3. STRT, Page 11 [↑](#footnote-ref-3)
4. STRT, page 31 [↑](#footnote-ref-4)
5. STRT, pages 38-40 [↑](#footnote-ref-5)
6. STRT, pages 36-38 [↑](#footnote-ref-6)
7. Ordinance 18409 [↑](#footnote-ref-7)
8. STRT, page 41 [↑](#footnote-ref-8)
9. STRT, page 46 [↑](#footnote-ref-9)
10. STRT, page 47 [↑](#footnote-ref-10)
11. STRT, page 48 [↑](#footnote-ref-11)
12. STRT, page 49 [↑](#footnote-ref-12)
13. STRT, page 46 [↑](#footnote-ref-13)
14. Motion 14381 [↑](#footnote-ref-14)
15. STRT, page 2 [↑](#footnote-ref-15)
16. STRT, Appendix D [↑](#footnote-ref-16)
17. STRT, page 33 [↑](#footnote-ref-17)
18. STRT, page 54 [↑](#footnote-ref-18)
19. STRT, page 24 [↑](#footnote-ref-19)
20. STRT, page 32 [↑](#footnote-ref-20)
21. STRT, page 16 [↑](#footnote-ref-21)
22. STRT, page 23 [↑](#footnote-ref-22)
23. STRT, page 44 [↑](#footnote-ref-23)
24. Includes expenditures in prior years through completion. [↑](#footnote-ref-24)
25. STRT, page 58 [↑](#footnote-ref-25)