

APPENDIX C

WASHINGTON STATE TRANSPORTATION FRAMEWORK FOR GIS (WA-TRANS)

**Prepared by Tamilee Griffin, WA-Trans Project Manager, Washington State
Department of Transportation**

EXECUTIVE SUMMARY

Washington State Department of Transportation (DOT) is planning to develop a multi-modal statewide transportation network, including information on roads, railroads, light rail, non-motorized transportation routes, aviation, and ferries and ports, for use by the entire department as well as all public utilities and government agencies in the state. This project will improve public safety, intergovernmental coordination, and economic development. The DOT has identified and quantified specific benefits. The financial analysis shows an annualized return on investment of 10.91% over a 20-year project life. The likelihood of sound financial performance coupled with significant strategic benefits has prompted staff to recommend that the DOT fund a pilot data compilation effort.

Washington DOT's mission is to keep people and business moving by operating and improving the state's transportation systems vital to taxpayers and communities. WA-Trans will support this mission by providing a seamless, statewide transportation location-based dataset that includes the best information available about roads, railroads, airports, ferry terminals and routes, port facilities, and non-motorized transportation routes such as bike paths and horse trails. The data will be used to improve transportation planning, analysis and design capabilities not only for WSDOT but also for local and regional organizations across the state. Better transportation planning will ultimately lead to better transportation infrastructure and more effective utilization of existing resources.

Benefitted organizations include: Puget Sound Regional Council, multiple county governments, Sound Transit, County Road Administration Board (CRAB), a U.S. Bureau of Census Regional Office, Washington Department of Natural Resources, and Washington Department of Fish and Wildlife. Nineteen different organizations contributed to the case study. Excluded from this analysis due to resource limitations, but of equal or greater value are the benefits to emergency management related applications.

In order to integrate data from local, state, federal, and tribal government sources, the scope of the WA-Trans project includes:

- Complete development of the statewide spatial database and related data standards.
- Implement supporting applications that provide access to the spatial database and support integration of disparate datasets.

- Develop interagency agreements in support of data sharing to formalize collaborative data collection and maintenance.

The strategic analysis addresses the relationship of the project to the organization's mission and goals. It presents costs and benefits that cannot be quantified and are therefore ignored by the financial analysis. Sometimes a project has such significant strategic value that it is worthwhile even if the financial analysis is not persuasive. Examples for this case study could fall in the areas of emergency management and response, cross-governmental communication, and public communication. Additionally, WA-Trans is identified as a part of the state enterprise architecture and as a strategic data resource.

The following case study demonstrates the robustness and effectiveness of the developed ROI toolset. It includes separate financial analyses from a wide variety of agencies that will share data and services. These separate analyses are then consolidated to provide an overall project financial analysis (from the perspective of a state taxpayer rather than the perspective of a single agency).

From the sole perspective of Department of Transportation, the financial return on this investment appears small (NPV of \$255,000 and ROI below 1%). But when the financial impact on all participating agencies is considered, the project shows a very healthy return (NPV of over \$17 million and ROI of nearly 11%). The WA-Trans project furthers the mission of WSDOT and is projected to be a financially sound investment for taxpayers.

This case study includes six separate financial analyses based on the Financial Details-Future20.xls template. These agency and group-specific analyses are consolidated using the Multi-participant Summary—Future20.xls template.

PROJECT COST AND SCHEDULE

The present value of the remaining project investment is estimated to be roughly \$8 million. The investment analysis considers a 20-year project life. At present, the original data compilation efforts are estimated to take five years.

The ultimate schedule of activities will depend on the availability of funding for the data compilation effort.

FINANCIAL ANALYSIS

The following productivity benefits (labor savings) have been identified, quantified, and provided for the financial analysis:

Job Category	Benefit Description	Quantified Value
Transportation Planning Specialist 4 DOT	Reduce amount of time spent providing data to local partners.	16 hours per month for 6 regions = 1152 hours saved per year
Transportation Planning Specialist 4 DOT	Reduce amount of time spent gathering data to scope a project.	70 projects per year @ 3 hours per project times 6 regions = 1260 hours per year
Transportation Planning Specialist 4 DOT	Reduce the time needed to update statewide road maps by providing data directly from WA-Trans.	209 hours per year for a variety of maps produced
Transportation Planning Specialist 3 WSDOT	Eliminate research/data acquisition time for Highway Usage Branch of Transportation Data Office to acquire usage data on non-state routes.	80 hours per year
Transportation Planning Specialist 3 WSDOT	Increase efficiency (by reducing number of county data sources) for updating county data in the Highway Performance Management System.	70 hours per year
Transportation Planning Specialist 2 WSDOT	Increase efficiency (by reducing number of data sources) for updating functional classes for the Freight and Goods System.	75 hours per year

Job Category	Benefit Description	Quantified Value
Transportation Planning Specialist 2 WSDOT	DOT: Eliminate manual (spreadsheet) data manipulation activities associated with using CRAB mobility data to update functional classification system.	560 hours per year
Transportation Planning Specialist 2 WSDOT	DOT: Eliminate manual data collection and manipulation activities associated with maintenance of functional class data in the Highway Performance Management System	67 hours per year
Transportation Planning Technician 3 WSDOT	Eliminate research and data acquisition time for Highway Usage Branch of Transportation Data Office to acquire usage data on non-state routes.	80 hours per year
Transportation Planning Technician 3 Washington Utilities and Transportation Commission	Reduce time needed to resolve the current low match rate on geocoding in the field as well as time spent responding to complaints about incorrect addresses	50 hours per year
Transportation Planning Technician 2 WSDOT	Eliminate need for Collision Data and Analysis Branch of TDO to review each accident report to determine jurisdiction.	5,240 hours per year (roughly 3 full time equivalent positions)

Job Category	Benefit Description	Quantified Value
Transportation Engineer 4 WSDOT	Increase efficiency (by reducing number of county data sources) for updating county data in the Highway Performance Management System.	40 hours per year
Transportation Engineer 4 WSDOT	Eliminate manual data collection and manipulation activities associated with maintenance of functional class data in the Highway Performance Management System	38 hours per year
Transportation Engineer 4 Washington Utilities and Transportations Commission:	Eliminate time spent resolving incorrect address data and geocoding problems when doing pipeline inspections in the field.	240 hours per year
Puget Sound Regional Council Senior GIS Analyst	Eliminate the need to create and maintain a multi-county dataset to serve as the base for all modeling work.	2774 hours per year
Sound Transit Customer Service Rep	Via the customer service application supported by WA-Trans data, eliminate four hours per week responding to customer calls (4 x 52 = 208 hours)	208 hours per year
Sound Transit GIS Coordinator	Eliminate the need to order, download and archive county data for three counties	27 hours per year

Job Category	Benefit Description	Quantified Value
Sound Transit GIS Coordinator	Via the customer service application supported by WA-Trans data, eliminate 2 hours per week responding to customer calls (2 x 52 = 104 hours)	104 hours per year
WMS Band 1	Increase efficiency of Freight and Goods Transportation System Report Update Process.	10 hours per year
Transportation Planning Specialist 5	Gather City Data for use in the Freight and Goods Transportation System Report.	16 hours per year
GIS Analyst – Development Department of Natural Resources	Provide an increased level of service by responding to research requests with WA-Trans data.	¼ FTE per year
GIS Analyst – Development Washington Utilities and Transportation Commission	Eliminate the processing time to manipulate purchased data.	1/100 FTE per year
GIS Analyst – Cartographer Department of Natural Resources	Reduce time needed to compile trail and forest road data for public lands quadrangle map series – 2.5 weeks/map x 10 maps/yr = 25 weeks	½ FTE per year

Job Category	Benefit Description	Quantified Value
U.S. Census Bureau Geographer	Reduce data collection workload for the decennial TIGER and MAF (master address file) updates.	8528 hours per 10 year cycle
U.S. Census Bureau Geographer	Reduce street name and address data collection workload (by reducing number of data sources).	12688 hours per 10 year cycle

Productivity benefits were also modeled for typical medium/large counties and typical small counties as shown in the following table.

Job Category	Benefit Description	Quantified Value
Typical Med/Large County GIS Specialist	Eliminate county transfers of data to city governments: 29 medium/large counties x 1 hour per transmittal x 12 transmittals per year	348 hours per year
Typical Med/Large County GIS Specialist	Reduce map development and maintenance requirements for the new Washington/Oregon Regional Transportation COG (2 medium counties x 140 hours to develop) + (2 medium counties x 24 hours per year to maintain)	280 hours per year to develop 48 hours per year to maintain

Job Category	Benefit Description	Quantified Value
Typical Med/Large County GIS Specialist	For dense, fast-growing counties (King, Pierce, Snohomish, Clark, and Spokane): Eliminate the need to gather data from neighboring local governments to support regional business needs. (40 hours per year per county x 5)	200 hours per year
Typical Med/Large County GIS Specialist	For dense, fast-growing counties (King, Pierce, Snohomish, Clark, and Spokane): Eliminate the need to maintain border city data: (200 hours per county x 5)	1000 hours per year
Typical Med/Large County GIS Specialist	For dense, fast-growing counties (King, Pierce, Snohomish, Clark and Spokane): Eliminate the need to edge-match to bordering counties: (340 hours per county x 5)	1700 hours per year
Typical Small County GIS Specialist	Eliminate county transfers of data to state and federal agencies: (10 small counties x 1 hour per transmittal x 20 transmittals per year)	200 hours per year
Typical Small County GIS Specialist	Eliminate need to develop border state (Oregon, Idaho) centerline data for various maps: (7 small counties x 3 hours map x 10 maps per year)	210 hours per year

Job Category	Benefit Description	Quantified Value
Typical Small County GIS Specialist	Eliminate county transfers of data to city governments: 10 small counties x 1 hour per transmittal x 12 transmittals per year	120 hours per year
Typical Small County GIS Specialist	Reduce map development and maintenance requirements for the new Washington/Oregon Regional Transportation COG: (2 small counties x 140 hours to develop) + (2 small counties x 24 hours per year to maintain)	280 hours per year to develop 48 hours per year to maintain

Other financial anticipated benefits include:

- The WSDOT Planning Office will no longer need contracts to acquire data for transportation planning and scoping projects. This will save \$15,000 to \$20,000 per project. There are usually two projects per year.
- WSDOT can avoid the \$30,000 annual subscription for commercial centerline data for 30,000 miles of city roads not covered by CRAB.
- The WSDOT Construction Office will enjoy more efficient data acquisition by contractors. This will save roughly \$130 per project. WSDOT anticipates 80 projects per year through 2015 and 50 projects per year thereafter.
- The WSDOT Construction Office's contractors will no longer need to merge datasets for large area projects. This will save \$600 per project. WSDOT anticipates 25 such projects per year through 2015 and 15 projects per year thereafter.
- Local governments will benefit from reduced time to compile regional incident maps. Assuming 20 local government incidents per year and a compilation cost of \$1,400 per local government incident, this comes to \$28,000 in annual savings.

- Local governments will enjoy lower street data collection costs charged by contractors for various projects. It is projected that 45 local governments will save an average of \$5,000 per year in contract costs.
- City and county contractors will be able to automate point placement (geocoding), providing a savings of roughly \$1,200 per project (for an average of two projects per year).
- City and county contractors will no longer need to assign road attributes and cost values for routing projects, and they will enjoy improved route analysis efficiency. This is projected to provide a savings of \$3,300 per year.
- Sound Transit can eliminate \$400 per year in data purchases.
- Sound Transit can eliminate contract costs for cleaning data after downloads, geocoding, basemap maintenance, and clipping to combine datasets. Savings are projected to be \$65 per hour x 157 hours per year.
- Various state agencies can avoid the annual cost of purchasing commercial centerline data for city and county roads. This will provide annual savings of \$7,000 to the State Employment Security Division, \$7,000 to the Washington Utilities and Transportation Commission, and \$20,000 to the Washington State Patrol.

The preliminary financial analysis for the WA-Trans project shows an overall net present value of \$13.4 million and an annualized return on investment of 8.25%. Breakeven is anticipated in 2014.

Because WSDOT is funding the bulk of this investment, its internal net present value is much smaller than that of other participants, who will reap the benefits of the shared data for a relatively small contribution of staff time.

The table below summarizes the project value for each participant or participant group.

Participant	NPV	ROI	Breakeven
WSDOT	\$90,929	0.06%	2026
Various State Agencies	\$1,756,559	2067.76%	2009
Cities and Counties	\$8,372,271	74.16%	2010
PSRC	\$3,445,756	978.62%	2007
Sound Transit	\$258,167	1397.57%	2008

Participant	NPV	ROI	Breakeven
U.S. Census Bureau	\$905,370	2480.35%	2010

The DOT has prepared a preliminary financial analysis to compare these initial benefit estimates with the current cost and schedule projections. This draft analysis shows a \$17.4 million gain (net present value), reflecting an average annual gain of roughly 10.64% (return on investment). The following table summarizes this preliminary analysis.

	2007	2008	2009	2010	2011
Cash Flows for All Participants					
Costs (Future Value)	(\$593,507)	(\$1,548,678)	(\$1,736,640)	(\$1,096,782)	(\$272,159)
Benefits (Future Value)	\$57,192	\$1,561,574	\$1,746,123	\$1,311,710	\$1,345,686
<i>Present Value Multiplier:</i>	100.0%	97.6%	95.3%	93.0%	90.8%
Current Values					
<i>Annual Project Costs</i>	(\$593,507)	(\$1,511,805)	(\$1,654,927)	(\$1,020,291)	(\$247,150)
<i>Cumulative Costs</i>	(\$593,507)	(\$2,105,311)	(\$3,760,239)	(\$4,780,529)	(\$5,027,680)
<i>Annual Project Benefits</i>	\$57,192	\$1,524,394	\$1,663,964	\$1,220,230	\$1,222,031
<i>Cumulative Benefits</i>	\$57,192	\$1,581,586	\$3,245,550	\$4,465,779	\$5,687,810
Cumulative Net Benefits	(\$536,315)	(\$523,726)	(\$514,689)	(\$314,750)	\$660,130

	2012	2013	2014	2015	2016
Cash Flows for All Participants					
Costs (Future Value)	(\$278,150)	(\$284,292)	(\$246,782)	(\$252,139)	(\$257,630)
Benefits (Future Value)	\$1,475,719	\$1,538,083	\$1,630,838	\$1,727,276	\$1,647,337
<i>Present Value Multiplier:</i>	88.6%	86.5%	84.5%	82.5%	80.5%
Current Values					
<i>Annual Project Costs</i>	(\$246,577)	(\$246,021)	(\$208,476)	(\$207,930)	(\$207,400)
<i>Cumulative Costs</i>	(\$5,274,256)	(\$5,520,277)	(\$5,728,753)	(\$5,936,683)	(\$6,144,082)
<i>Annual Project Benefits</i>	\$1,308,207	\$1,331,028	\$1,377,694	\$1,424,421	\$1,326,153
<i>Cumulative Benefits</i>	\$6,996,017	\$8,327,045	\$9,704,739	\$11,129,160	\$12,455,313
Cumulative Net Benefits	\$1,721,761	\$2,806,768	\$3,975,987	\$5,192,478	\$6,311,231

	2017	2018	2019	2020	2021
Cash Flows for All Participants					
Costs (Future Value)	(\$263,258)	(\$269,027)	(\$274,941)	(\$281,002)	(\$287,214)
Benefits (Future Value)	\$1,688,255	\$1,730,196	\$1,773,186	\$1,817,251	\$1,862,417

<i>Present Value Multiplier:</i>	78.6%	76.7%	74.9%	73.1%	71.4%
----------------------------------	-------	-------	-------	-------	-------

Current Values

<i>Annual Project Costs</i>	(\$206,884)	(\$206,384)	(\$205,899)	(\$205,427)	(\$204,970)
<i>Cumulative Costs</i>	(\$6,350,967)	(\$6,557,351)	(\$6,763,250)	(\$6,968,677)	(\$7,173,647)

<i>Annual Project Benefits</i>	\$1,326,734	\$1,327,320	\$1,327,912	\$1,328,508	\$1,329,110
<i>Cumulative Benefits</i>	\$13,782,047	\$15,109,367	\$16,437,278	\$17,765,786	\$19,094,896

Cumulative Net Benefits	\$7,431,080	\$8,552,016	\$9,674,028	\$10,797,109	\$11,921,249
--------------------------------	--------------------	--------------------	--------------------	---------------------	---------------------

	2022	2023	2024	2025	2026
Cash Flows for All Participants					
Costs (Future Value)	(\$293,582)	(\$300,109)	(\$306,799)	(\$313,657)	(\$320,686)
Benefits (Future Value)	\$2,000,300	\$2,050,042	\$2,137,112	\$2,227,261	\$2,087,587

<i>Present Value Multiplier:</i>	69.7%	68.0%	66.4%	64.8%	63.3%
----------------------------------	-------	-------	-------	-------	-------

Current Values

<i>Annual Project Costs</i>	(\$204,526)	(\$204,095)	(\$203,677)	(\$203,272)	(\$202,879)
<i>Cumulative Costs</i>	(\$7,378,172)	(\$7,582,267)	(\$7,785,944)	(\$7,989,216)	(\$8,192,094)

<i>Annual Project Benefits</i>	\$1,393,521	\$1,394,170	\$1,418,779	\$1,443,422	\$1,320,692
<i>Cumulative Benefits</i>	\$20,488,417	\$21,882,587	\$23,301,366	\$24,744,788	\$26,065,480

Cumulative Net Benefits	\$13,110,245	\$14,300,320	\$15,515,422	\$16,755,572	\$17,873,385
--------------------------------	---------------------	---------------------	---------------------	---------------------	---------------------

SENSITIVITY ANALYSIS

If agencies external to WSDOT choose not to take advantage of WA-Trans data, WSDOT's investment will still provide a positive net present value, albeit a small one.

If data development contract costs are double what WSDOT has anticipated (\$5 million instead of the projected \$2.5 million), WSDOT will not break even, but the project as a whole will still offer a better than 5% return on investment to taxpayers.

If the data development effort takes longer than expected, such that all project benefits are delayed until 2011, the project will still have an annualized return on investment of 7.25% and a net present value of close to \$12 million.

STRATEGIC ANALYSIS

Common benefits from WA-TRANS can be summarized as follows:

- It will provide a common foundation for the development of state-wide disaster management plans related to evacuation, transportation of fuel and other emergency supplies, and critical infrastructure protection. Better plans will improve the state's disaster preparedness and response.
- It will improve the quality of the State's accident information, which will in turn improve the quality of the DOT's decisions about where to invest limited capital improvement dollars. By targeting road network improvements to the areas that are truly the most critical, the sState anticipates it can reduce the frequency and severity of accidents per capita.
- A common (shared) transportation map will improve coordination between local emergency responders. This will facilitate dispatch and reduce extra-jurisdictional response times to incidents that require the cooperative efforts of multiple local governments.
- A common law enforcement landbase will enable law enforcement agencies at all levels of government to share data and collaborate more effectively. This will improve the quality of crime pattern analysis and should ultimately reduce crime.

WA-TRANS will also improve inter-governmental coordination and planning by providing a common framework for the analysis of current and future land uses, traffic patterns, and development trends.

In addition to supporting state-wide coordination, the WA-TRANS dataset will benefit each participating agency. By providing cities, counties, and other government agencies with a robust, accurate street network, the DOT will enable these outside organizations to develop beneficial GIT applications with minimal investment in data. Since the data investment is typically the most expensive part of a GIT project, the agencies that use the WA-TRANS data will enjoy significantly higher returns on their GIT investments than would otherwise be possible. From the perspective of state taxpayers who fund not only WSDOT but also these additional government agencies, this presents the opportunity for a significant return on the combined investments of WA-TRANS and the GIT projects it will support statewide.

Finally, WA-TRANS will support economic development by making the state more attractive to the business community. The integrated state-wide road network will facilitate demographic and traffic analysis, site selection, advertising planning, and other activities essential to retailers and many other types of businesses. Also, the improved level of interagency communication will supported by WA-TRANS will allow local governments to be more responsive to all customers, including the development community and businesses that are considering relocation to the state or expansion of their operations within the state.

A detailed strategic analysis for each participating agency follows.

King County Transportation — *Michael Berman, Supervisor for GIS and Project Management, and Tamara Davis, GIS Program Manager*

King County's Department of Transportation is committed to helping people travel around the region. Serving 1.6 million people in an area covering more than 2,000 square miles, it:

- Provides King County residents with bus service, paratransit, carpool assistance, vanpools, and other alternatives to driving alone;
- Creates programs and facilities for pedestrians, bicyclists, and horseback riders in King County;
- Works with other King County jurisdictions and organizations to plan transportation investments;
- Designs, builds, operates, and maintains roads and bridges in unincorporated areas of King County; and
- Provides vehicles, equipment, maintenance, and supplies to all departments in King County government.

The department is made up of five divisions and has about 5,000 employees who provide a wide range of transportation services to people who live, work, shop, play, or travel in King County. In addition, the department works in partnership with 35 cities within King County and also with many subregional, regional, and state groups

Strategic Benefits

King County is an unusual example for Washington State of a large county with a well-established GIS program. King County would not expect significant changes in its own data maintenance program as a result of WA-TRANS efforts, but rather would reap benefits from improved capability for data sharing with other counties.

Having data on other counties through CRAB is a benefit for planning. Currently, disparate data is not conflated for use in analysis and decision-making processes.

Transit related projects would benefit from WA-TRANS. Planners currently contact each other informally, use disparate map sources, and perform manual review of data. Having a seamless road network would result in improved processes through planners knowing where to get data rather than searching and other county data being better integrated with King County data. The biggest return is knowing where to get desired data rather than having to search data sources and agencies.

There is a strategic benefit in keeping E911 data up-to-date. WA-TRANS data makes the difference between data and no data for E911. The E911 benefit is always for a region rather than any single

county. Currently there are a lot of redundant data collection efforts. Counties may use digital orthophotos for most of their data but 911 can't wait for flights to update data.

Avoidance of edge matching at counties on a project-by-project basis has been debated as a strategic vs. quantifiable benefit and is probably some of each.

Puget Sound Regional Council — *Andy Norton, PSRC*

The Puget Sound Regional Council coordinates regional transportation, economic, and growth planning for the central Puget Sound region of Washington state. PSRC serves as a forum for cities, counties, ports, transit agencies, tribes, and state government to work together on important regional issues, and partners with business, civic, environmental organizations, and citizens to identify and advocate regional priorities.

Destination 2030 is the region's long-range transportation plan, which details the investments needed to keep pace with growth, including more roads, more transit service, better traffic management, and improved linkages between land use and transportation. PSRC distributes about \$160 million in Federal Highway Administration and Federal Transit Administration funds each year to transportation projects that support Destination 2030.

Strategic Benefits

PSRC allocates funds for transportation improvement projects, which all must have functional class designation. If WA-TRANS sponsors an accurate functional class network and accurate status of functional class change process, this would be a significant strategic benefit. Benefits would accrue to PSRC constituency organizations that maintain roads without functional class designations. Currently, there is no way to track functional class changes, which is a big issue.

Having a partnership where there is absolute knowledge of functional class designation and status of changes would be very helpful. Making the changes is supposed to be a three-month process and there is a requirement to know the point where any designation is in this process. Twenty-five or 30 processes have happened since 2001. PSRC can't give the jurisdictions Federal money in cases where the process has not been completed. Is there a lost opportunity with Federal funding? Pierce County was recently disturbed about not being able to apply for Federal funding due to this situation. Both Pierce and King County have areas where they disagree with existing classifications.

There is strategic advantage for PSRC in having the most current functional class and correct information for sub-networks. Number of miles reported does affect funding levels. There is different money for urban vs. rural functional class designation, yet no one has taken the time to determine which local roads are urban vs. rural.

There is a push to formalize corridor analysis. Study areas are not well formalized, yet the actual projects are big money. Locations around Lake Tapps provide a good example of lost projects. In King County the area around Muckleshoot Amphitheatre is an example of lost opportunity.

There are strategic benefits for homeland security and disaster recovery. Valuation of transportation features done through a framework will yield faster and better disaster recovery efforts than if there is no framework. If a T1 or T2 route goes down, government officials will go nuts because the result is that the economy stops.

There would be strategic benefits for FAST Corridor and international freight development. WA-TRANS as an integrated system allows decision-makers to determine the efficacy of huge freight projects—\$1 million per grade separation projects, in a regional context. The freight roundtable is statewide. Decision-makers spend a lot of money on freight access (getting stuff from/to port). Decision-makers are in the driver's seat regarding access problems, so they need consolidated intermodal data access. Large port development money is not being spent for Washington. Los Angeles recently spent \$10 Billion on port access. PSRC currently is the only organization addressing these port issues as it has the four-county transportation network stitched together. Regional planners are not currently doing a good job on national rail or truck characteristics. WA-TRANS is the logical home for multi-jurisdictional networks.

A final strategic benefit— PSRC has all these projects and does not really know when they are complete. Using WA-TRANS for tracking and communicating the progress of the projects would be very helpful.

Sound Transit — *Kristina Evanoff, Project Development Coordinator*

In November 1996, voters in the urban areas of King, Pierce, and Snohomish counties approved the local taxes to create Sound Transit. The agency's mission is to plan, build, and operate regional transit systems and services to improve mobility for Central Puget Sound. The system includes: high-occupancy vehicle (HOV) lane access improvements; ST Express bus routes; Sounder commuter rail; Link light rail and new park-and-ride lots and transit centers. Sound Transit carries about 11 million people a year in buses and commuter and light rail trains, improving mobility and providing alternatives to sitting in traffic.

Strategic Benefits

WA-TRANS will address issues with attribute and geocoding consistency. Currently, there is redundancy in street attributes. Having one master street dataset will be more efficient.

Spokane County GIS — *Ian VonEssen*

Tax dollars go out according to maintained miles. Thus, counties would like to learn of segments that are undercounted. That's where the big cost and strategic benefit are in determining errors regarding mileage. Each year, a set amount of gas tax revenue goes out to the counties. Having WA-TRANS in place would provide more accurate accounting and provide accountability for CRAB.

There are FEMA Region 9 issues regarding data for rural counties. No address range information is being maintained. Route milepost information is a big deal for counties and DOT. It would be very positive to have that information but building it is another thing.

There are large Homeland Security implications to having a seamless road network for the state.

US Bureau of Census — *Wendy Hawley and Michaellyn Garcia*

The Census Bureau utilizes staff in 12 regional offices and a National Processing Center to manage operations related to the preparation of the decennial census as well as ongoing demographic and economic surveys. The United States Congress, Bureau of Labor Statistics, the National Center for Health Statistics, Department of Housing and Urban Development and the American public are just a few of the Census Bureau's customers.

Each Census Bureau regional office is responsible for collecting road network data from state, county and local government partners throughout the decade. This data is used primarily for manual address geocoding and digitizing file maintenance. During the current decade, Regional Offices have also been researching and collecting road network data for the MAF/TIGER Accuracy Improvement Project (MTAIP) which will achieve a minimum of 7.6m accuracy for the street centerlines in the Census Bureau Topographically Integrated Geographic Encoding and Referencing (TIGER) database.

Strategic Benefits:

It is difficult to project the future costs of maintenance to the TIGER[®] database because the Census Bureau conducts maintenance planning on a 12-year cycle and it is difficult to anticipate the direction in which changes in technology may drive the program in the next decade. The Seattle Regional Office estimates that considerable cost and time would have been saved had a comprehensive database existed at the state level at the forefront of the MTAIP program. The Regional Office procedure for the MTAIP program was to start with state and tribal sources, then county, then city. A state level database would have either provided one-stop-shop access to county/city level data or at least identified key contacts to reach at the county level, thus reducing research time.

Although most of the work for MTAIP file acquisition is completed, WA-TRANS will provide future benefits for both address geocoding and digitizing work, as the Census Bureau anticipates continuing to work with local files for TIGER[®] file maintenance. The benefits will be time saved researching key contacts and available files as well as providing easy access to current data and reduce time that

local governments spend responding to Census Bureau data requests. These benefits will enable the Census Bureau to improve TIGER[®] data in a more timely and efficient manner, essentially contributing to the improvement of census data, congressional representation, and the distribution of federal funds. A secondary benefit is the potential for WA-TRANS to provide a platform for encouraging data maintenance by counties where GIS data is currently not maintained. Local maintenance of data will reduce Census Bureau cost in creating and maintaining the data in TIGER[®].

Washington Department of Natural Resources — *Deborah Naslund, IT/GIS Business Analyst; Mac McKay, Hydrography and Transportation Data Steward; Ralph Silva-Perry, Cartography Supervisor*

DNR has a role to protect and manage many valuable state assets. The people of Washington own more than 5 million acres of land—forests, farms, commercial properties and underwater lands—all of which are managed to provide benefits to citizens.

Much of this land is dedicated to supporting public institutions, like schools and universities DNR manages it, selling products like timber and wheat. DNR manages underwater lands to provide access to the waters of the state—rivers, lakes, streams and Puget Sound. DNR also works to serve the continuation of navigation and commerce. In 2005, product sales and leases from managed lands brought in about \$271 million.

DNR also protects other public resources—fish, wildlife, water, etc. Two of the largest and most important responsibilities in resource protection are fire prevention and suppression and regulating forest practices (or timber harvest).

Strategic Benefits

There will be benefits to the public, which wants access to DNR land. There will be reduction of liability due to improved accuracy (for example, notation to not take the family car on a forest four-wheel-drive road). DNR gets sued when people have problems with roads. Consistency across regulatory agencies would also provide strategic benefits; for example, in the area of public submissions of application to harvest timber.

Having a seamless dataset provides benefit to everyone. Getting out of the business of maintaining data on roads that are not DNR roads is beneficial to the agency. For example, WA-TRANS would provide data on public use/public access from county roads to DNR land. This analysis is not done currently due to lack of resources. Every couple of years DNR gets wild analysis requests from legislature and this is an example.

DNR provides a product that is a statewide coverage of public lands quadrangles. It would be a strategic advantage to users to have from WA-TRANS a consistent, current data set based on a regular update cycle.

Management of public land is a big deal in Washington, as possibly one-third of the total land in eastern Washington and one-half in western Washington is public. It will be strategically beneficial to have better seamless data sets for use in this management.

Scale-selectable detail is absolutely essential for some applications, but staff currently must do this with custom data sets. Road ownership information is needed. Easements (for example, from the Forest Service) are not available regarding forest practices and maintenance responsibilities. Any extent to which WA-TRANS can manage this data will be of strategic benefit to DNR.

County Road Administration Board (CRAB) — *Steve Hillesland, Assistant Director; Kathy O'Shea, Database Development Specialist*

The County Road Administration Board (CRAB) was created by the Legislature in 1965 to provide statutory oversight of Washington's thirty-nine county road departments. The agency is funded from the portion of the counties' fuel tax that is withheld for state supervision, and from a small portion of the two grant programs that it administers.

The agency is governed by a nine-member board, which meets quarterly and is comprised of six county commissioners/council-members and three county engineers. The Board is appointed by the Board of Directors of the Washington State Association of Counties. The Board establishes and maintains "Standards of Good Practice" to guide and ensure consistency and professional management of county road departments in the state of Washington.

The agency is a major resource for the Washington Association of County Engineers and the Washington State Association of Counties for transportation related issues. CRAB does research, provides reports, and presents testimony when appropriate. The responsibility to distribute the counties' portion of the Motor Vehicle Fuel Tax (MVFT) was given to CRAB in 1985. At that time the agency also became the custodian of the county road log, a database of over 40,000 miles of roads. The formula for the distribution of fuel tax revenues is updated biennially to reflect statewide changes in population, costs, and mileage.

Strategic Benefits

CRAB administers two grant programs: rural arterials and preservation of arterial system. Its culture is to help counties become more effective, rather than to manage by controlling purse strings. There is a staff of 15, made up of engineers and IT staff. Its board is made up of county commissioners and engineers.

Counties must keep a road log to provide fair distribution of gas tax. CRAB did early IT developments to enable this record keeping. The Mobility program is the latest incarnation but it does not have a GIS component. Less than half of the counties currently have a viable GIS, yet they need GIS data to synchronize with Mobility. The legislature wants statewide Mobility data for any number of reasons.

WA-TRANS will provide data that doesn't currently exist to counties that can't afford GIS. CRAB would have to hire this work done if there was no WA-TRANS project. Going to DNR would be possible but less attractive relative to road accuracy. Nineteen to 20 counties do not have GIS data at this point. Only five large counties have GIS and a Mobility layer. There are also counties with GIS but without a Mobility layer.

Collision data is important and complex, storing 140 fields. CRAB wants to capture WA-TRANS shape files to display this type of data in Mobility, using a linear referencing system to show more data. Other opportunities are use of a pavement management tool or an application to display the condition of roads for prioritization.

Pavement management is a very effective tool to predict when a road is going to fail. The ideal time to rehabilitate this road is between "should" and "must" conditions. Currently CRAB performs this analysis with tabular reports. Showing the analysis visually reveals things that don't show in tabular reports. It is possible to see missing links. With visual analysis, planners begin to be able to combine multiple projects into one project, by getting a better look at system-wide analyses. All interchanges have county elements. Better tools encourage cooperation on funding as well as project management and construction. The result is that better projects bubble to the surface, are completed, and save the public money. CRAB wants the best rural projects to compete. How can you get a clear picture of needs without GIS capability? Needs assessment could have a GIS element as well.

Better data will result in making better decisions on grant projects. Avoiding wasting money is difficult to quantify. Better project management for CRAB is a huge strategic benefit. Would having better metrics help Washington as a state get more transportation funding from the legislature? How much more effective are traffic engineers in prioritizing safety programs and competing for funding with a spatial model available? There are anecdotal experiences regarding opportunity costs of unfunded projects.

Citizens in counties come to public works all the time with interests in safety, comfort, and many other topics. If they could see Mobility at the counter with a map, it would make the work of the staff so much easier.

Mason County Public Works — *Lurleen Smith, GIS Manager*

Mason County Public Works has the responsibility of engineering, construction, maintenance, and administration of the Mason County Road System. This includes all county roads but none of the state routes or the City of Shelton streets. The Public Works Department is one of the county's largest departments. The daily tasks are numerous and can vary greatly in nature. The one common point associated with all of the Public Works Department activities is the County Road System.

The Engineering Section is responsible for planning and developing the designs for the new road construction. This includes the management and inspection during construction, the related survey

work, and right-of-way acquisition. Additionally, the department has responsibility for bridge construction and inspection and the environmental review associated with any of the construction projects.

Strategic Benefits

Some people would raise issues with county-level not benefiting from statewide data. But as datasets are used by state and federal agencies, the data is improved for everyone. Using county control points, for example, for DNR flyovers would have resulted in more accurate data sets. Mason County's credibility with the public is affected by the accuracy of the data.

GIS is very new here, only in place two years. Thus the data sets are very new. As WA-TRANS creates data standards, Mason County can implement them, as the county has neither staff time nor expertise in-house. Having a geodatabase design provided by WA-TRANS is a huge benefit for Mason County. WA-TRANS provides important benefits to small rural counties that just implemented e-mail several years ago. These counties must borrow from others in order to incorporate enterprise GIS.

There are strategic benefits in the area of emergency management. Mason County is considered a liability due to lack of emergency response capability. Having comprehensive regional data would be of benefit for responding to a disaster. There is a need to have emergency responders be able to respond across county lines. As another example, fires were bad during the past year. DNR trail data in the national forest does not match up with Mason County data at all. Yet firefighters must respond in an emergency and Mason County could not find where their fires were. There would be a strategic benefit from improved response.

There is a strategic benefit in the ability to use the WA-TRANS structure to facilitate data sharing with utilities. Counties and utilities would need to provide the impetus to get this going.

Functional classifications will be available in WA-TRANS. Federal transportation funding is dependant on classification being up-to-date. There are many strategic benefits to having greater accessibility to Federal funding.

Mason County has tremendous issues with flooding and emergency evacuation routes. There are only a couple of ways in and out of the county (State highways 3 and 101). Forest service roads are evacuation routes, but are very steep, four-wheel-drive routes. Mason County has not even addressed this issue.

CH2MHill — *Jamie Crawford*

Linear referencing and routing projects are currently not being done due to lack of data. Having the data available to perform these analyses would be an important strategic benefit as it would open

consulting organizations up to doing additional work to support efforts of transportation organizations in the state.

CONCLUSION

The WA-Trans project promises to provide significant benefits to the DOT and even greater benefits to state tax payers.

Furthermore, given the significant strategic benefits of the project and the likelihood that there will be a positive financial return, staff recommends that the DOT proceed with a project pilot, which will help to clarify the costs and benefits of the full investment.