2013-2015 Regional Mobility Grant Application Step One

Welcome to the first of two steps in the grant application process. Below you will find important dates and examples to help you calculate your projects reductions in Vehicle Trips (VT) and Vehicle Miles Traveled (VMT).

WSDOT staff will assist the applicant upon request, to calculate their projects reductions in VT and VMT, but it is the applicant's responsibility to obtain WSDOT's approval of its estimated Year 1 and Year 4 VT and VMT reductions by the due dates provided below. Applicants must respond to WSDOT as soon as possible to ensure timely approval. WSDOT staff will make every reasonable effort to review and approve all VT and VMT estimates submitted, and will not unreasonably delay or withhold approval.

Step one of the grant application process is complete once an applicant receives WSDOT approval of its estimated Year 1 and Year 4 VT and VMT reductions. To complete step two, the applicant must submit its grant application at any time after receiving WSDOT's approval of step one, and prior to the due date provided below.

Please send your calculations in a pdf (showing all work) to Janice Helmann at helmanj@wsdot.wa.gov for review and approval. If you need assistance please contact Janice at 206-464-1284.

Important Dates:

September 14, 2012	**The estimated Year 1 and Year 4 VT and VMT reductions due date no later than 4 p.m. PDT.**
September 28, 2012	**First revision (if needed) of the estimated Year 1 and Year 4 VT and VMT reductions due date.**
October 5, 2012	**Second revision (if needed) of the estimated Year 1 and Year 4 VT and VMT reductions due date.**
October 9, 2012	**All estimated Year 1 and Year 4 VT and VMT reductions must be approved by WSDOT no later than 4 p.m. PDT.**
October 10, 2012	**Grant application due date. WSDOT must receive applications no later than 4 p.m. PDT.**

Construction, Operations, and Equipment Projects

Provide effectiveness measures:

- annualized reduction in vehicle miles traveled (VMT)
- annualized reduction of vehicle trips (VT)

As part of the application process, agencies must provide information about underlying assumptions and show calculations that indicate how their projects aim to reduce VMT and VT. Underlying assumptions must be consistent with industry best practices and relevant corridor planning, alternatives analysis, major investment studies, corridor analysis and/or environmental documentation. Agencies should be prepared to show documentation upon request.

Projects which improve transit service efficiency
Travel time improvements may be the most direct metric to measure project benefits rather than VT and VMT reductions. However, in order to render projects comparable, you must convert these results into VT and VMT reductions. We recommend doing so using the guidance provided in Transit Cooperative Research Program Project A-23A, "Cost and Effectiveness of Selected Bus Rapid Transit Components," which found that ridership increases by approximately 0.3% to 0.5% for every 1% decrease in transit travel time. Based on this study it is reasonable to assume a 0.4% increase in ridership for every 1% decrease in transit travel time.* If there is reason to use another conversion rate you must provide sufficient justification for using it.

*More information is available here:
TCRP Report 118, the BRT Practitioner's Guide http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_118.pdf
NCHRP Report 616: Multimodal Level of Service Analysis for Urban Streets.
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf See page 75.

WSDOT will conduct a review for accuracy and may contact applicants for clarification. You must provide a range for each effectiveness measure that indicates projected performance in the first year of operation and the fourth year of operation.

Examples

Park and Ride

$$Vehicle\ \ Trips\ \ Reduced\ \ Annually$$
$$= (utilization) * (capacity) * \left(2\,\frac{trips}{day}\right) * \left(260\,\frac{days}{year}\right)$$

Transit Service

$$Vehicle\ \ Trips\ \ Reduced\ \ Annually$$
$$= \left((daily\ ridership) * \left(260\,\frac{days}{year}\right)\right) - \left((daily\ bus\ trips) * \left(260\,\frac{days}{year}\right)\right)$$

Park and Ride or Transit Service

$$Vehicle\ Miles\ Traveled\ Reduced\ Annually$$
$$= (Vehicle\ \ Trips\ \ Reduced\ \ Annually) *$$
$$(Average\ \ One\ \ Way\ \ Trip\ \ Length\ \ in\ \ Miles)$$

Example #1 - Park and Ride Expansion Project

The existing park and ride is used primarily by commuters and has reached capacity. The expansion of the lot will provide an additional 100 spaces. On average trips leaving the park and ride travel a distance of 13 miles one way. In the opening year utilization is anticipated at 50% with the lot being fully utilized by year 4.

Key Facts:

- Weekday use
- 100 spaces
- 50% initial utilization, 100% utilization in year 4

$$\text{Year 1 - Annual Vehicle Trips Reduced}$$

$$= (0.50\ utilization) * (100\ spaces) * \left(2\ \frac{trips}{day}\right) * \left(260\ \frac{days}{year}\right)$$

$$= 26{,}000\ Vehicle\ Trips$$

$$\text{Year 4 - Annual Vehicle Trips Reduced}$$

$$= (1.00\ utilization) * (100\ spaces) * \left(2\ \frac{trips}{day}\right) * \left(260\ \frac{days}{year}\right)$$

$$= 52{,}000\ Vehicle\ Trips$$

Annual Vehicle Trip Reduction:
26,000 in year 1 and 52,000 in year 4

$$\text{Year 1 - Annual Vehicle Miles Traveled Reduced}$$

$$= (26{,}000\ Vehicle\ Trips\ Reduced) * (13\ miles)$$

$$= 338{,}000\ Vehicle\ Miles\ Traveled$$

$$\text{Year 4 - Annual Vehicle Miles Traveled Reduced}$$

$$= (52{,}000\ Vehicle\ Trips\ Reduced) * (13\ miles)$$

$$= 676{,}000\ Vehicle\ Miles\ Traveled$$

Annual Vehicle Miles Traveled Reduced:
338,000 in year l and 676,000 in year 4

Example #2 – Transit Service Project

This new commuter service will provide transit along a congested corridor connecting areas where service does not currently exist. The service will provide 10 trips per weekday. Average daily ridership is estimated at 240 riders per day in year 1 and 400 riders per day in year 4. The average distance of the service is 15 miles one way.

Key Facts:

- 10 trips per weekday
- Average of 240 riders per day in year 1 and 400 riders per day in year 4
- Average 15 mile one way rider trip length

$$\text{Year 1 - Annual Vehicle Trips Reduced}$$

$$= \left((240\ \textit{daily riders}) * \left(260\ \frac{\textit{days}}{\textit{year}} \right) \right) - \left((10\ \textit{daily bus trips}) * \left(260\ \frac{\textit{days}}{\textit{year}} \right) \right)$$

$$= 59{,}800\ \textit{Vehicle Trips}$$

$$\text{Year 4 - Annual Vehicle Trips Reduced}$$

$$= \left((400\ \textit{daily riders}) * \left(260\ \frac{\textit{days}}{\textit{year}} \right) \right) - \left((10\ \textit{daily bus trips}) * \left(260\ \frac{\textit{days}}{\textit{year}} \right) \right)$$

$$= 101{,}400\ \textit{Vehicle Trips}$$

Annual Vehicle Trip Reduction:
59,800 in year 1 and 101,400 in year 4

$$\text{Year 1 - Annual Vehicle Miles Traveled Reduced}$$
$$= (59{,}800\ \textit{Vehicle Trips Reduced}) * (15\ \textit{miles})$$
$$= 897{,}000\ \textit{Vehicle Miles Traveled}$$

Annual Vehicle Miles Traveled Reduced:

$$\text{Year 4 - Annual Vehicle Miles Traveled Reduced}$$
$$= (101{,}400\ \textit{Vehicle Trips Reduced}) * (15\ \textit{miles})$$
$$= 1{,}521{,}999\ \textit{Vehicle Miles Traveled}$$

So: 897,000 in year 1, and 1,521,000 in year 4

Example #3 – Transit Service Efficiency Improvements

This project will provide transit signal prioritization on a congested corridor served by an existing express bus route. The current route travels approximately 12 miles with an average travel time of 40 minutes. The average rider trip length is assumed to equivalent to the approximate route length because the service is express with stops at the beginning and end of the route. Traffic analysis for the corridor indicates that the implementation of transit signal prioritization will reduce the transit travel time by 4 minutes. Currently there are 10 transit trips per weekday which will continue after the project is implemented. The current average daily ridership is 250 riders per day. Ridership has increased by approximately 2% each year over the last several years. The project is expected to be complete in late 2012.

Key Facts:

- Average Trip length is 12 miles
- Current travel time is 40 minutes
- Project will reduce the travel time by 4 minutes
- 10 transit trips per weekday
- Current average daily ridership is 250 riders per day
- Natural ridership growth is approximately 2% per year
- Project completion by end of 2012

Transit Cooperative Research Program Project A-23A, "Cost and Effectiveness of Selected Bus Rapid Transit Components," found that ridership increases by approximately 0.3% to 0.5% for every 1% decrease in transit travel time. Based on this study it is reasonable to assume a 0.4% increase in ridership for every 1% decrease in transit travel time.

$$Anticipated\ \%\ Travel\ Time\ Reduction = \frac{Travel\ Time\ Reduction\ in\ Minutes}{Total\ Baseline\ Travel\ Time\ in\ Minutes}$$

$$= \frac{4\ Minutes}{40\ Minutes} = 10\%\ Travel\ Time\ Reduction$$

$$\%\ Ridership\ Increase = \%\ Travel\ Time\ Reduction * \frac{.4\%\ Ridership\ Increase}{1\%\ Travel\ Time\ Reduction}$$

$$= 10\%\ Travel\ Time\ Reduction * \frac{.4\%\ Ridership\ Increase}{1\%\ Travel\ Time\ Reduction} = 4\%\ Ridership\ Increase$$

$$Year\ 1\ Ridership\ Increase = (Current\ Ridership) * (\%\ Ridership\ Increase)$$

$$= (250\ Daily\ Riders) * (4\%\ Ridership\ Increase) = 10\ New\ Daily\ Riders$$

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$$Annual\ Vehicle\ Trips\ Reduced = (New\ Daily\ Riders) * \left(260\ \frac{days}{year}\right)$$

Year 1 Annual Vehicle Trips Reduced

$$= (10\ New\ Daily\ Riders) * \left(260\ \frac{days}{year}\right) = 2{,}600\ Annual\ Vehicle\ Trips\ Reduced$$

Year 4 Annual Vehicle Trips Reduced

$$Year\ 4\ Ridership\ Without\ Project\ Improvements = (Current\ Ridership) * (1 + Average\ \%\ Ridership\ Increase\ per\ Year)^{number\ of\ years\ of\ growth}$$

$$= (250\ Daily\ Riders) * (1 + 2\%\ Average\ Ridership\ Increase\ per\ Year)^{4\ years\ of\ growth} = 271\ Daily\ Riders\ in\ Year\ 4\ Without\ Project\ Improvements$$

$$Year\ 4\ Ridership\ Increase = (Year\ 4\ Ridership\ Without\ Project\ Improvements) * (\%\ Ridership\ Increase\ from\ Project\ Improvements)$$

$$= (271\ Daily\ Riders) * (4\%\ Ridership\ Increase\ from\ Project\ Improvements) = 11\ New\ Daily\ Riders$$

$$= (11\ New\ Daily\ Riders) * \left(260\ \frac{days}{year}\right) = 2{,}860\ Annual\ Vehicle\ Trips\ Reduced$$

Annual Vehicle Trips Reduced (VT)
2,600 in year 1 and 2,860 in year 4

$$Annual\ Vehicle\ Miles\ Traveled\ Reduced = (Annual\ Vehicle\ Trips\ Reduced) * (Average\ Trip\ Length)$$

Year 1 Annual Vehicle Miles Traveled Reduced

$$= (2{,}600\ Annual\ Vehicle\ Trips\ Reduced) * \left(12\ \frac{miles}{trip}\right) = 31{,}200\ Annual\ Vehicle\ Miles\ Traveled\ Reduced$$

Year 4 Annual Vehicle Miles Traveled Reduced

$$= (2{,}860\ Annual\ Vehicle\ Trips\ Reduced) * \left(12\ \frac{miles}{trip}\right) = 34{,}320\ Annual\ Vehicle\ Miles\ Traveled\ Reduced$$

Annual Vehicle Miles Traveled Reduced (VMT)
31,200 in year 1 and 34,320 in year 4