

Maintenance Accountability Process (MAP)

Background Information on Targets Missed

CY 2013

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Keller Ferry Operations

Here's What Maintenance Does:

- Operating the Keller Ferry service across Lake Roosevelt, connecting parts of SR 21

Here's How Maintenance Measures:

- Level of Service Descriptions: Annual hours of operational downtime
 - LOS A = 40 or less
 - LOS B = 41 to 80
 - LOS C = 81 to 165
 - LOS D = 166 to 360
 - LOS F = more than 360 ← CY 2013

The Work Accomplished: N/A

- Work units are not applicable to this maintenance activity



Urban Tunnel System Operation

Here's What Maintenance Does:

- Completes preventive maintenance on tunnel components, repairs and operates systems

Here's How Maintenance Measures:

- Total number of annual closures to flammable loads
 - LOS A = 0 - 5
 - LOS B = 6 - 10 ← CY 2013 Results
 - LOS C = 11 - 25
 - LOS D = 26 - 50
 - LOS F = 50 or more
- Total Number of Closures = 9
 - Preventive Maintenance Closures = 4 (Planned)
 - Corrective/Repair Closures = 5 (Unplanned)

The Work Accomplished:

- Preventive maintenance tasks completed
 - CY 13 Planned PM Tasks = 2,108
 - CY 13 Delivered PM Tasks = 2,009 (95%)
 - Test Fire Suppression & HVAC Systems
 - Testing Emergency Phone Systems



I-90 Mt. Baker Tunnel

Structural Bridge Repair

Here's What Maintenance Does:

- Repairing structural bridge deficiencies including damaged expansion joints, truss members, piers, and other structural components

Here's How Maintenance Measures:

- The percentage of priority one repairs completed
 - LOS A = 90% - 100%
 - LOS B = 80% - 89%
 - LOS C = 65% - 79%
 - LOS D = 50% - 64%** ← **CY 2013 Results**
 - LOS F = 50% or less

The Work Accomplished:

- CY 13 Planned Priority 1 Tasks = 586
- CY 13 Delivered Priority 1 Tasks = 317 (**54%**)
 - High cost/long duration repairs impact delivery

Example:

SR 169 Green River Gorge Expansion Joint
Step 1 + Step 2 + Step 3 = 1 Task Complete

Step 1: →
Containment
Preparation



← **Step 2:**
Containment
Complete

Step 3: →
Install
Expansion Joint



Slope Repair

Here's What Maintenance Does:

- Removal of slope erosion materials from ditches and road shoulders as well as repair of undermined road shoulders

Here's How Maintenance Measures:

- Percentage of centerline miles with slides or erosion encroaching on, or undermining the shoulder or traveled way.

LOS A = 0 - 2% ← CY 2013

LOS B = 2.1% - 4%

LOS C = 4.1% - 7%

LOS D = 7.1% - 10%

LOS F = more than 10%

The Work Accomplished: N/A

- Work units are not applicable to this maintenance activity



Pavement Striping Maintenance

Here's What Maintenance Does:

- Re-painting stripes, or lane lines (i.e. skip lines, edge lines) when existing lane lines are worn

Here's How Maintenance Measures:

- Level of Service Descriptions: Percentage of reflectivity readings that are greater than the acceptable standard (90 RL)
 - LOS A = 90% or more
 - LOS B = 70 to 89.9%
 - LOS C = 40 to 69.9% ← CY 2013
 - LOS D = 20 to 39.9%
 - LOS F = less than 20%

The Work Accomplished:

- Work Units: Number of line miles re-painted
 - 2013 Planned Units = 25,596
 - 2013 Delivered Units = 24,501 (96%)



Ditch Maintenance

Here's What Maintenance Does:

- Clean and reshape ditches to help ensure adequate flow of highway runoff from roadway

Here's How Maintenance Measures:

- Percentage of ditches greater than 50% filled with sediment and/or debris

LOS A = 0 – 1%

LOS B = 1.1% - 5% ← **CY2012**

LOS C = 5.1% - 10%

LOS D = 10.1% - 15%

LOS F = more than 15%

The Work Accomplished: N/A

- Work units are not applicable to this maintenance activity





Notable results

- WSDOT achieved 80% of highway maintenance asset condition targets in 2013
- WSDOT estimates a current maintenance backlog of \$72 million

Highway maintenance holds steady in 2013

WSDOT met 80 percent of highway maintenance targets in 2013, the same as achieved in 2012. The Maintenance Accountability Process (MAP) measures performance of 30 maintenance activities using two metrics, asset condition level of service (LOS) and task completion.

Asset condition LOS applies two types of assessments, condition assessment and operational assessment. Condition assessment is measured through data collection from site surveys in many different forms including statewide surveys. Operational assessment looks at the operation of the asset, such as how many traffic signal repairs were needed in a given period of time.

Task completion quantifies the number of planned tasks for a specific activity each year, and how many of those tasks were completed. See [Gray Notebook 36, p. 17](#) for a more comprehensive overview of the task completion metric. To see a table that shows both LOS and task completion percentages for select assets, go to http://wsdot.wa.gov/publications/fulltext/graynotebook/GNB52_Extra//Maintenance_TaskCompletion.pdf.

Maintenance is critical to assets

Maintenance plays a critical role in WSDOT's asset management by meeting the daily needs of almost 19,000 highway and state route lane miles plus 2,000 miles of ramps and special use lanes on the state highway system, focusing on preventive maintenance, repairs and the safe operation of the highway infrastructure. LOS is affected not only by maintenance actions, but also by rehabilitation/rebuilding and new construction projects.

LOS targets for some of these assets were changed by the Legislature in 2013 (see the Legislative Evaluation and Accountability Program Transportation Document 2013-2014 <http://leap.leg.wa.gov/leap/budget/lbns/2013transportation1315.pdf#page=60>).

The table below lists maintenance activities in order of priority and their LOS scores achieved compared to the Legislative targets. These targets use a grading scale from A+ to F-, with A+ being the best and F- being the worst. [Gray Notebook 32, p. 19](#) has a detailed overview of the MAP LOS standards.

WSDOT meets 80 percent of asset condition targets

Level of service (LOS) target and score achieved by priority

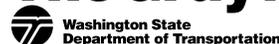
	Legislative target	2012 results	2013 results
Movable & floating bridge operations	*A+	A+	A+
Traffic signal system operations	*C+	C+	B-
Snow & ice control operations	*A	A	A+
Keller Ferry operations	B	B	F-
Urban tunnel systems operations	B	C	B-
Structural bridge repair	C	D	D
Regulatory/Warning sign maintenance	C+	C+	C+
Slope repairs	*A	A	A-
Intelligent transportation systems	*A-	A-	A-
Maintain catch basins & inlets	*B	C	B+
Bridge deck repair	*C+	C+	C+
Guardrail maintenance	*A-	A-	A
Pavement striping maintenance	*B-	C	C+
Raised/Recessed pavement markers	*C+	C+	B-
Control of vegetation obstructions	*C	C	C
Rest area operations	B	B	B
Sweeping and cleaning	*A	A	A
Maintain ditches	*B+	B+	B
Highway lighting systems	*A-	A-	A
Guidepost maintenance	D	D	D
Maintain culverts	*D	C-	D
Pavement marking maintenance	*D	D	D
Noxious weed control	*C+	B	B
Shoulder maintenance	*C-	C+	C
Guide sign maintenance	*C+	B	B
Stormwater best management practices	C	C	C
Bridge cleaning & painting	*B	B	B
Nuisance vegetation control	*D-	D+	D+
Landscape maintenance	*D	C-	D+
Litter pickup	D	D	D
Percent of targets achieved or exceeded		80%	80%
Percent of targets missed		20%	20%

Data source: WSDOT Maintenance Office.

Notes: The 30 maintenance activities are in prioritized order. The Legislative targets with an asterisk (*) denote a new target for 2013.

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Asset Management: Highway Maintenance Annual Report

WSDOT meets 24 of 30 maintenance targets in 2013

Twenty-four maintenance LOS targets were met in 2013. Six missed their goals: Keller Ferry operations, urban tunnel system operations, structural bridge repair, slope repairs, pavement striping maintenance and maintain ditches.

Keller Ferry operations missed its level of service (LOS) target of B and received a rating of F- for 2013. The LOS is determined by the hours of operational downtime. At the Keller Ferry dock, the Motor/Vessel (M/V) *Martha S*

Twenty-four maintenance level of service targets were met in 2013

that served the route since 1948, made its last run on July 7, 2013. The M/V *Sanpoil*, the newly constructed vessel that replaced the M/V *Martha S*, was put into service on August 14, 2013.

During this time, the route was not operational and lowered the Keller Ferry Operations score. WSDOT capitalized on the down time and conducted needed improvements on the ferry terminal ramps.

While the urban tunnel system operations score increased from a C in 2012 to a B- in 2013, it still missed the target of B. This asset measures its LOS by the number of times the urban tunnels are closed to vehicles carrying flammable cargo. The total closures for 2013 equalled nine, missing the target due to one unplanned closure. Unplanned closures are triggered when the control center is not able to operate the systems from the remote location because of network or computer problems.

Structural bridge repair missed its target of C, and achieved a LOS score of D in 2013, the same as in 2012. The measurement for this activity is the number

of “priority one” repairs completed each year. These repairs vary significantly in cost and scope. In 2013, WSDOT was unable to complete some of the “priority one” work, and therefore missed the target.

Despite having generally good LOS ratings, both slope repair and ditch maintenance activities missed their targets, which were increased for the current biennium. The target for slope repair was an A, an A- was achieved. The target for ditch maintenance was a B+, a B was achieved. New, increased targets for these activities were assigned in April 2013, which was during the last quarter of the 2011-2013 biennium. This left little time to complete the work required to increase the LOS scores on those targets. WSDOT reassessed the work plans early in the current biennium to assist in meeting the new targets and will continue work toward the achievement of these new targets.

While the pavement striping maintenance score increased from C to C+, it still missed the target of B-. Some funds intended for striping had to be shifted to address critical bridge washing needs.

WSDOT maintenance backlog expected to increase

WSDOT estimates a current maintenance backlog of \$72 million. This estimate is expected to increase with a projected 52 percent or higher decrease in preservation funding in the next four years and the addition of transportation systems. Fewer preservation projects means that maintenance will be taking care of assets longer, while the assets age and require more care.

The estimated maintenance budget is \$200 million per year which does not incorporate the impact of new projects, inflation or reduced preservation funding. Given all of these factors, WSDOT may experience:

- Slower removal of snow and ice on secondary roads;
- More potholes and rougher roads;
- An increase in WSDOT vehicle and equipment failures, impacting the ability to complete work;
- More mountain pass closures;
- Closure of SeaTac and Silver Lake Rest Areas;
- Increased backlog for raised pavement markers, resulting in poor visibility of traveled lanes; and
- Lower Maintenance Accountability Process (MAP) scores and task completion.

Contributors include Rico Baroga, Anna Zaharris and Todd Lamphere



A WSDOT maintenance technician operates a jack hammer along a state route to stabilize slopes.

Asset Management: Highway Maintenance Annual Report

WSDOT's task completion and asset conditions

2012 through 2013; Level of service score for selected maintenance activities

Activity or asset (Task completion goals)	Performance measures	Calendar year 2012	Calendar year 2013	Goal met
Movable or floating bridges (Completed planned maintenance)	% of total planned work completed	98%	91%	
	Asset condition rating (2013 Legislative target: A+)	A+	A+	Yes
Traffic signal systems operations (Completed planned maintenance)	% of total planned work completed	88%	84%	
	Asset condition rating (2013 Legislative target: C+)	C+	B-	Yes
Urban tunnel systems operations (Completed planned maintenance)	% of total planned work completed	91%	95%	
	Asset condition rating (2013 Legislative target: B)	C	B-	No ¹
Structural bridge repair (Completed priority one repairs)	% of priority one repairs completed	60%	54% ²	
	Asset condition rating (2013 Legislative target: C)	D	D	No ¹
Regulatory sign maintenance (Completed planned maintenance)	% of total planned work completed	87%	75%	
	Asset condition rating (2013 Legislative target: C+)	C+	C+	Yes
Intelligent Transportation Systems (Completed planned maintenance)	% of total planned work completed	51%	47% ³	
	Asset condition rating (2013 Legislative target: A-)	A-	A-	Yes
Maintain catch basins and inlets (Completed annual inspection and maintenance in NPDES ⁴ permit area)	% of inspection and maintenance completed	61% ¹	100%	
	Asset condition rating (2013 Legislative target: B)	C	B+	Yes
Bridge deck repair (Completed planned maintenance)	% of total planned work completed	111%	77% ⁵	
	Asset condition rating (2013 Legislative target: C+)	C+	C+	Yes
Pavement (Completed planned maintenance)	% of total planned work completed	86%	129% ⁶	
	Percent in fair or better condition (Target: 92%)	91.8%	N/A ⁷	Yes
Cable barrier ⁸ (Completed planned maintenance and repairs)	% of planned maintenance and repairs completed	103%	96%	
	Asset condition rating (2013 Legislative target: A)	A-	A+	Yes
Pavement striping maintenance (Completed planned maintenance)	% of total planned work completed	88%	96%	
	Asset condition rating (2013 Legislative target: B-)	C	C+	No ¹
Raised/recessed pavement markers (Completed planned maintenance)	% of total planned work completed	85%	73%	
	Asset condition rating (2013 Legislative target: C+)	C+	B-	Yes
Highway lighting systems (Completed planned maintenance)	% of total planned work completed	78%	46% ⁹	
	Asset condition rating (2013 Legislative target: A-)	A-	A	Yes
Guidepost maintenance (Completed planned maintenance)	% of total planned work completed	87%	134% ¹⁰	
	Asset condition rating (2013 Legislative target: D)	D	D	Yes
Maintain culverts (Completed planned maintenance)	% of total planned work completed	77%	113% ¹¹	
	Asset condition rating (2013 Legislative target: D)	C-	D	Yes
Pavement marking maintenance (Completed planned maintenance)	% of total planned work completed	112%	98%	
	Asset condition rating (2013 Legislative target: D)	D	D	Yes
Shoulder maintenance (Completed planned maintenance)	% of total planned work completed	48%	88%	
	Asset condition rating (2013 Legislative target: C-)	C+	C	Yes
Stormwater BMPs ¹² (Completed annual inspection and maintenance in NPDES ⁴ permit area)	% of inspection and maintenance completed	N/A ⁷	100%	
	Asset condition rating (2013 Legislative target: C)	C	C	Yes

Data source: WSDOT Maintenance Office.

Notes: 1 See *Gray Notebook 52*, p. 13, for reasons for missed MAP scores. 2 While task completion of "priority one" repairs declined from 2012, the overall asset condition stayed the same. The scope and costs of these repairs can vary by type of repair and location. WSDOT is evaluating its coordination of the priority one repairs to improve the asset condition. 3 Original preventive maintenance (PM) frequencies were based on older technology. The data collected is not reflecting a higher number of PM's results in fewer repairs. WSDOT is revisiting the PM schedules with the newer technology and will reduce the number of PM tasks as appropriate. 4 NPDES stands for the National Pollutant Discharge Elimination System. 5 WSDOT reduced its maintenance on bridge decks toward the end of fiscal year 2013 to avoid overspending the budget at the end of the 2011-2013 biennium. 6 Beginning in the 2013-2015 biennium, WSDOT will use only one type of unit measurement that represents the largest component of the pavement activity, rather than four different types of units used in the 2011-2013 biennium. 7 The table lists "N/A" where data is unavailable. 8 This activity is a subset of the activity Guardrail Maintenance listed in the table on p. 12 of *Gray Notebook 52*. 9 This year electrical service PMs were added into the total plan and were not previously measured. Also, two regions focused less on lighting and more on other activities, completing less than 18% of the regions' identified PMs, while the remaining regions completed between 65% and 98% of their PMs. This significantly lowered the statewide completion percentage. 10 WSDOT increased activities with minimal material expenditures to avoid overspending at the end of the biennium. This activity is mostly labor (e.g., cleaning, straightening or reinstalling). 11 There is an increased need for maintenance activities on culvert inspections, cleaning and minor repairs. Without preservation funding to replace or rehabilitate deficient culverts, the overall asset condition will continue to deteriorate. 12 Stormwater BMPs stands for Stormwater Treatment Facilities Best Management Practices.

See Highway Maintenance Annual Report, *Gray Notebook 52*, pp. 12-13