

COLUMBIA GORGE REGIONAL / THE DALLES MUNICIPAL AIRPORT

This report describes how your Pavement Maintenance Management Program (PMMP) was developed. Your Program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by the Oregon Department of Aviation and the Federal Aviation Administration (FAA). The information and data contained in this report ensures you comply with the requirements of FAA Grant Assurance Number 11 which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

DATA COLLECTION

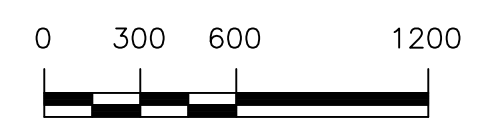
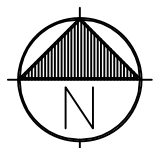
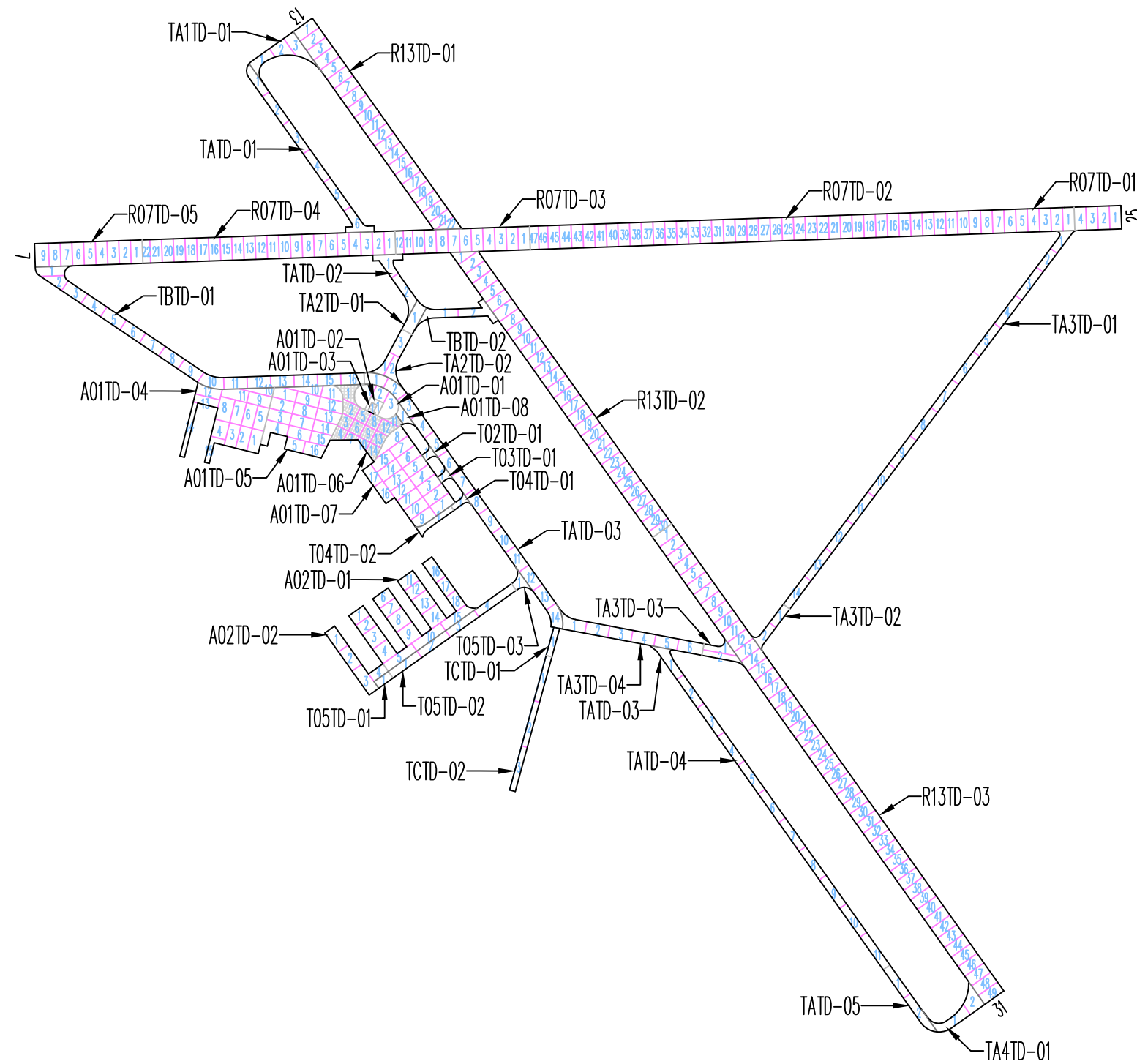
To determine how your pavements were constructed and their age, a records review was conducted. Figure TD-1 shows the records review results. This figure identifies pavement boundaries, dimensions, pavement layer types, thicknesses and dates of construction. The most recent construction date for each pavement can also be found in the Section Condition Report in Appendix 2. Figure TD-1 and the information contained in Appendices 1, 2 and 4 ensure that your airport complies with the “pavement inventory” requirement of FAA’s PMMP guidelines.

The pavements at your airport were divided into branches, sections and sample units in accordance with the methodology outlined in the current edition of ASTM D5430, *Standard Test Method for Airport Condition Index Surveys*. The branches, sections and sample units established at your airport are shown in Figure TD-2. A Branch Condition Report showing all branches, their associated areas, and their area-weighted average condition is provided in Appendix 1. Additionally, the Appendix 2 Section Condition Report provides information used to define each branch and section in the PAVER database.

Using the branch, section and sample unit divisions established, a visual condition survey was conducted at Columbia Gorge Regional / The Dalles Municipal Airport in June 2017. During the inspection, pavement defects were identified and measured in accordance with the methodology outlined in ASTM D5430. This inspection ensures your airport complies with the “detailed inspection” requirement of FAA’s PMMP guidelines. After collection, the data were entered into the PAVER software for analysis. These data are reproduced in the Re-Inspection Report attached as Appendix 4.

The PAVER database updated during this project ensures your airport complies with the “record keeping and information retrieval” requirements of FAA’s PMMP guidelines.

Figure TD-2. Pavement Branch, Section and Sample Unit Layout.
 Columbia Gorge Regional / The Dalles Municipal Airport



RESULTS

Using the data collected during the visual inspection, the PAVER software was used to calculate an area-weighted average Pavement Condition Index (PCI) for each pavement section inspected using the sample units evaluated. Using each section's PCI, a Pavement Condition Rating (PCR) was assigned. The PCIs measured during this inspection are shown in Table 1. The table also contains PCIs from past inspections as well as projected PCIs for 2022 and 2027. The projections were based on pavement deterioration models developed by PAVER using the inspection data from other pavements in the same airport category as your airport, located in the same climatic region, and with the same surface type and use.

The Branch Condition Report in Appendix 1 summarizes current pavement condition by branch while the Section Condition Report in Appendix 2 lists pavement condition by section. The current Pavement Condition Rating (PCR) is shown graphically in Figure TD-3.

Table 1. Past, Present and Future Pavement Condition Indices.

Branch	Section	Inspections			Forecast	
		2011	2014	2017	2022	2027
A01TD	01	37	47	75	69	65
A01TD	02	57	67	87	76	70
A01TD	03	93	79	87	83	80
A01TD	04	60	62	77	70	66
A01TD	05	22	45	62	56	55
A01TD	06	84	69	80	78	76
A01TD	07	57	62	72	67	64
A01TD	08	---	---	100	84	75
A02TD	01	95	80	82	73	68
A02TD	02	---	---	100	84	75
R07TD	01	75	62	94	85	76
R07TD	02	65	61	86	77	69
R07TD	03	---	100	100	87	82
R07TD	04	---	49	84	75	68
R07TD	05	74	68	88	79	71
R13TD	01	---	100	100	87	82
R13TD	02	---	100	100	87	82
R13TD	03	---	100	100	94	85
T02TD	01	---	---	100	92	82
T03TD	01	---	---	100	92	82
T04TD	01	---	---	100	92	82
T04TD	02	96	75	80	73	69
T05TD	01	---	---	90	81	74
T05TD	02	93	80	79	72	69

Figure TD-3. Pavement Condition in June 2017.
Columbia Gorge Regional / The Dalles Municipal Airport

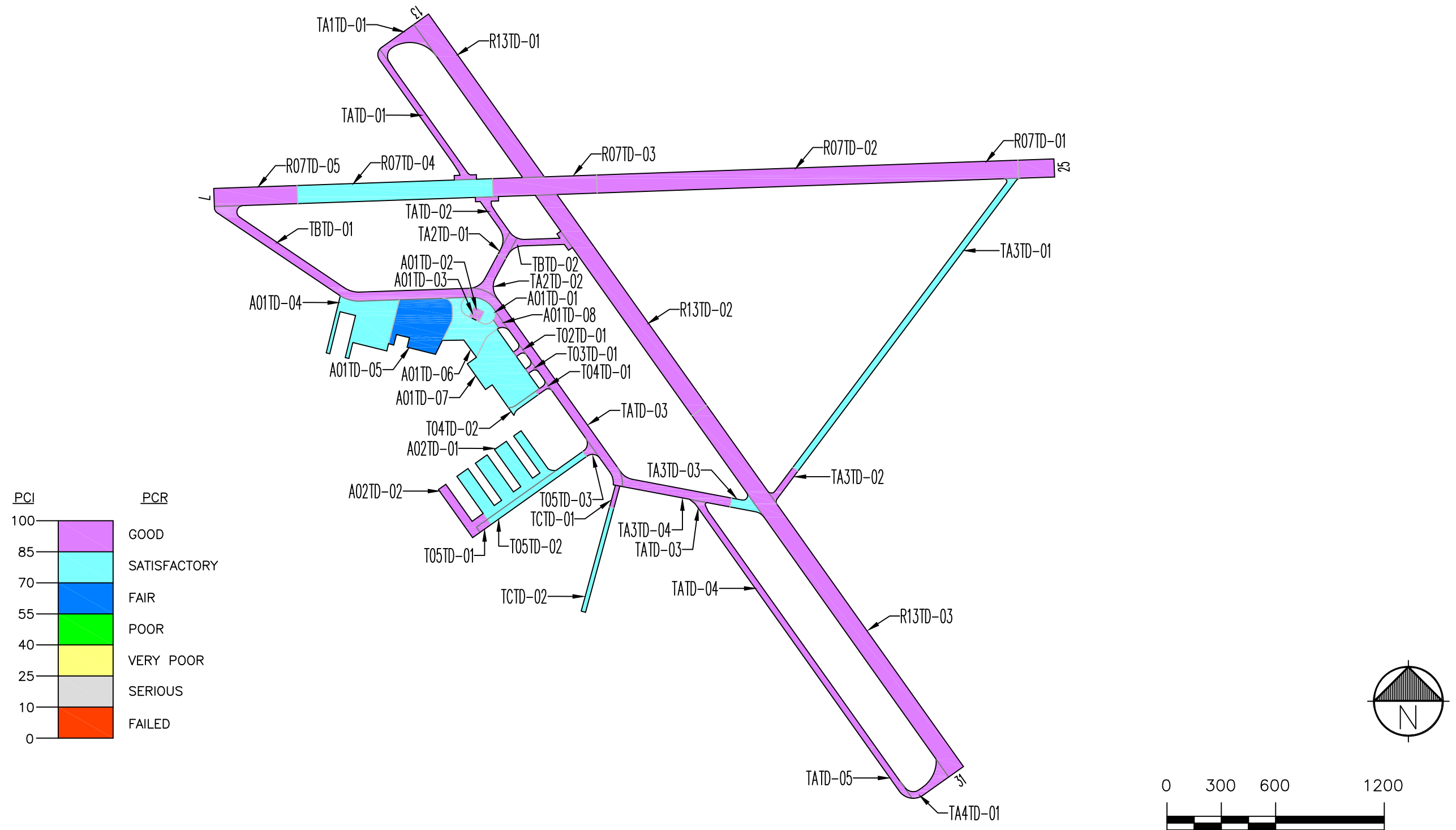


Table 1. Past, Present and Future Pavement Condition Indices.

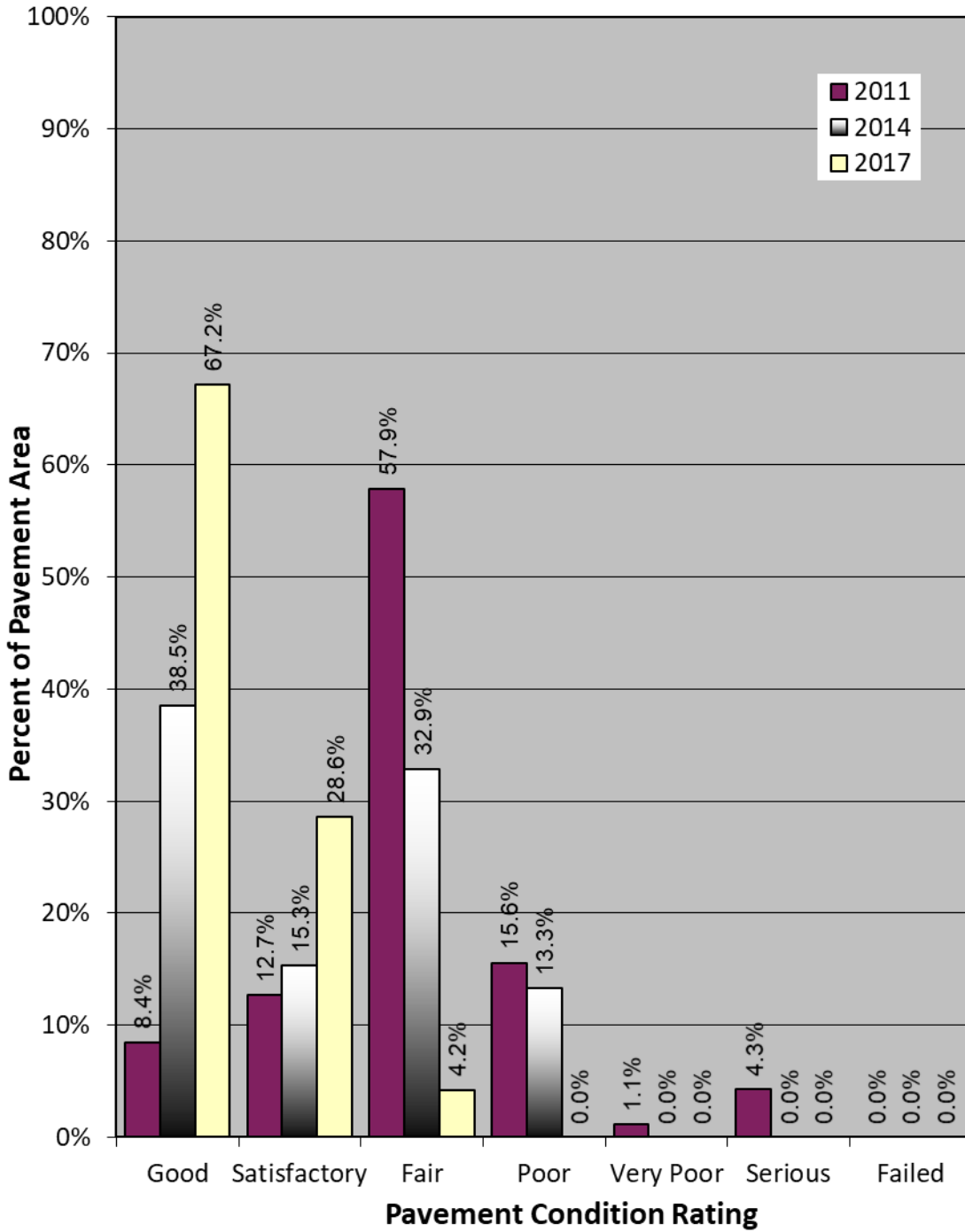
Branch	Section	Inspections			Forecast	
		2011	2014	2017	2022	2027
T05TD	03	---	---	100	92	82
TA1TD	01	---	100	99	90	81
TA2TD	01	---	100	100	92	82
TA2TD	02	---	---	100	92	82
TA3TD	01	63	75	75	70	67
TA3TD	02	---	100	100	91	81
TA3TD	03	61	72	76	71	67
TA3TD	04	---	---	100	92	82
TA4TD	01	---	100	99	90	81
TATD	01	---	100	100	92	82
TATD	02	---	100	100	92	82
TATD	03	---	---	100	92	82
TATD	04	---	100	100	92	82
TATD	05	---	100	99	90	81
TBTD	01	85	67	87	78	72
TBTD	02	---	100	98	89	80
TCTD	01	---	---	100	92	82
TCTD	02	---	---	84	76	71

Section PCIs at Columbia Gorge Regional / The Dalles Municipal Airport range from a low of 62 (a PCR of “Fair”) to a high of 100 (a PCR of “Good”). The area-weighted average PCI for all airport pavements is 90, corresponding to an overall PCR of “Good”. Figure TD-4 shows how much pavement area is associated with each Pavement Condition Rating category and also shows pavement condition distribution from the inspections conducted in 2011 and 2014.

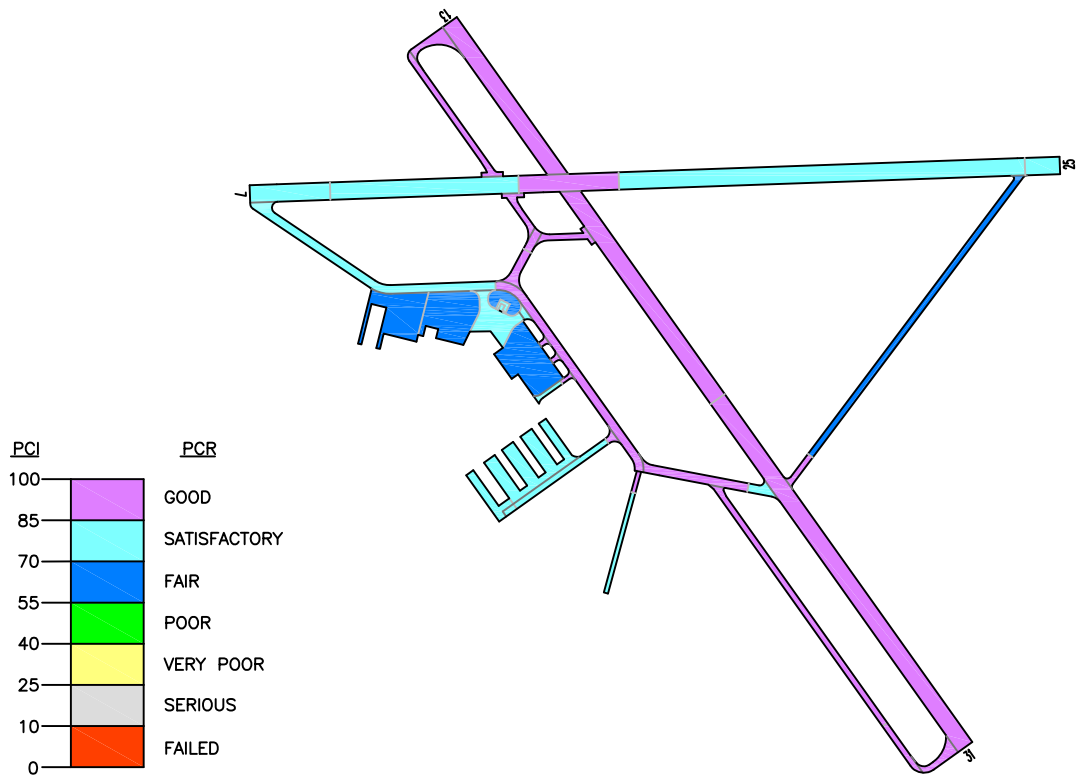
The primary distresses observed during the inspection of asphalt concrete pavements were: longitudinal and transverse cracking, weathering, patching, and raveling, with isolated occurrences of block cracking and alligator cracking. The primary distresses observed during the inspection of portland cement concrete pavements were: small patches, linear cracks, large patches, joint seal damage, corner spalls, shrinkage cracks and faulting.

A graphical representation of the projected PCIs listed in Table 1 is shown in Figure TD-5.

**Figure TD-4. Distribution of Pavement Condition
Columbia Gorge Regional/The Dalles Municipal Airport**



Predicted Condition in 2022.



Predicted Condition in 2027.

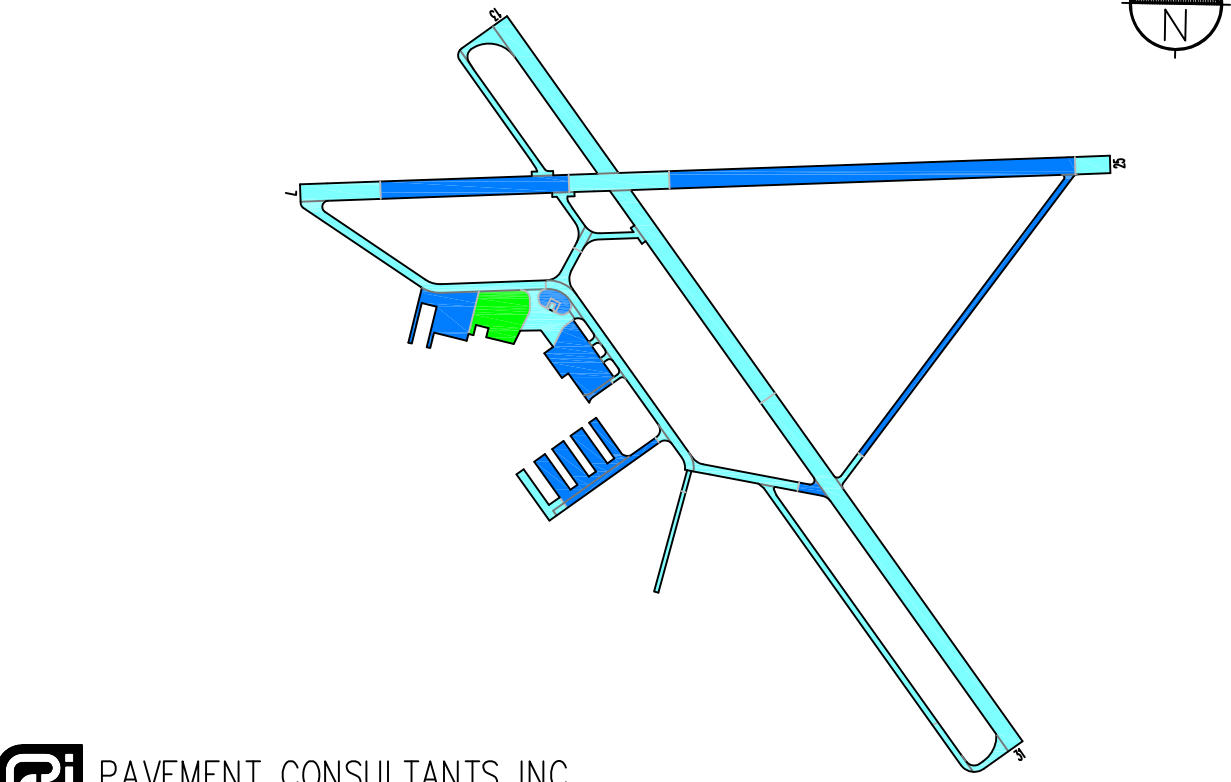


Figure TD-5. Future Pavement Condition.

RECOMMENDATIONS

Data collected during the visual condition survey were used by the PAVER software to generate the Network Maintenance Report contained in Appendix 3. This report identifies, for each pavement section, the recommended localized maintenance activities (i.e.-crack sealing, patching) that should be completed to repair the defects observed during the visual inspection. The repair quantities identified in the report were extrapolated to cover the entire pavement section, based on the distresses measured in the inspected sample units. If the repair activities identified are completed, the pavement deterioration rate will be slowed.

The recommended localized maintenance activities to be applied are selected by the PAVER software based on a Distress Maintenance Policy established for the Oregon airport system. The report results indicate that, over your entire airport, the following quantities of localized maintenance are needed:

- 1,992 linear feet of asphalt concrete crack sealing

The PAVER software can also identify and schedule recommended global (applied over an entire section) maintenance activities such as fog seals, slurry seals and other surface treatments, as well as major rehabilitation activities such as asphalt concrete overlays and complete reconstruction. PAVER schedules global maintenance on a user-defined interval. To schedule major rehabilitation PAVER uses pavement deterioration models developed during this project. These models are used to estimate future pavement condition and to schedule rehabilitation based on a trigger PCI.

During this project a 5-year program outlining recommended global maintenance and rehabilitation was developed. The program begins in the year 2018 to allow time for project development. These recommendations are presented in Table 2, which identifies the pavement section requiring rehabilitation, the year the action should be completed, the type of action, and an associated cost. This information is also presented graphically in Figure TD-6.

Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

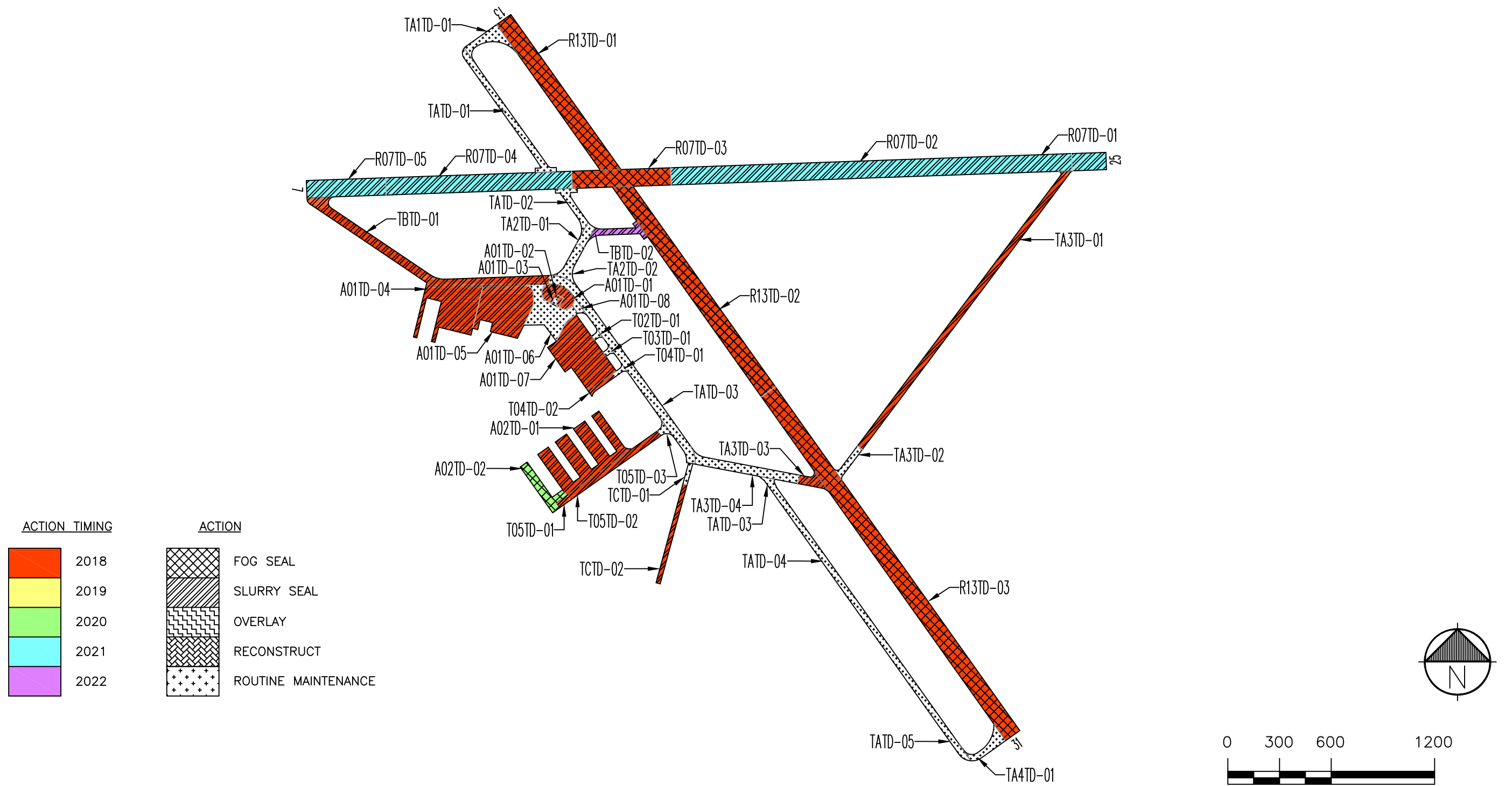
Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2018	A01TD	01	Slurry Seal	16,167	\$0.31	\$5,012
2018	A01TD	02	Slurry Seal	2,568	\$0.31	\$796
2018	A01TD	04	Slurry Seal	70,840	\$0.31	\$21,960
2018	A01TD	05	Slurry Seal	78,753	\$0.31	\$24,413
2018	A01TD	07	Slurry Seal	83,735	\$0.31	\$25,958
2018	A02TD	01	Slurry Seal	89,259	\$0.31	\$27,670

Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2018	T04TD	02	Slurry Seal	4,566	\$0.31	\$1,415
2018	T05TD	01	Slurry Seal	2,625	\$0.31	\$814
2018	T05TD	02	Slurry Seal	22,606	\$0.31	\$7,008
2018	TA3TD	01	Slurry Seal	70,507	\$0.31	\$21,857
2018	TA3TD	03	Slurry Seal	8,321	\$0.31	\$2,580
2018	TBTD	01	Slurry Seal	78,981	\$0.31	\$24,484
2018	TCTD	02	Slurry Seal	14,889	\$0.31	\$4,616
2018 Total						\$168,583
2020	A02TD	02	Fog Seal	19,288	\$0.19	\$3,665
2020 Total						\$3,665
2021	R07TD	01	Slurry Seal	20,000	\$0.31	\$6,200
2021	R07TD	02	Slurry Seal	232,750	\$0.31	\$72,152
2021	R07TD	03	Fog Seal	57,500	\$0.19	\$10,925
2021	R07TD	04	Slurry Seal	108,050	\$0.31	\$33,495
2021	R07TD	05	Slurry Seal	46,000	\$0.31	\$14,260
2021	R13TD	01	Fog Seal	107,010	\$0.19	\$20,331
2021	R13TD	02	Fog Seal	146,010	\$0.19	\$27,741
2021 Total						\$185,105
2022	TBTD	02	Slurry Seal	12,842	\$0.31	\$3,981
2022 Total						\$3,981
TOTAL						\$361,334

If the global maintenance and/or rehabilitation activities recommended in Table 2 are not completed, the localized maintenance activities identified in the Network Maintenance Report (Appendix 3) for that section should be done. Additionally, for those sections not listed in Table 2 as requiring global maintenance or rehabilitation, the localized maintenance activities outlined in the Network Maintenance Report should be completed. By completing the localized maintenance activities, pavement condition is improved, life is extended, deterioration is slowed and the length of time until major repair or rehabilitation is required is increased.

Figure TD-6. Five-Year Pavement Management Plan.
Columbia Gorge Regional / The Dalles Municipal Airport



Drawing Date: July 2017

INSPECTION SCHEDULE

To comply with the inspection schedule requirement of FAA Grant Assurance Number 11, a detailed visual inspection should be conducted every 3 years using the methodology described in ASTM D5430. The next scheduled detailed visual inspection should take place in 2020.

In addition, the FAA requires that a drive-by inspection be conducted monthly to detect unforeseen changes in pavement condition. The results of each drive-by inspection should be recorded and kept in a file. At a minimum, the date of the inspection and an indication of any maintenance performed since the last drive-by inspection should be recorded.