

WARRENTON-ASTORIA REGIONAL 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 AT-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 AT-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 AT-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 Astoria Regional Airport in May 2018. 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 AT-1. Airport Layout, Dimensions and Pavement Cross-Sections.
Warrenton-Astoria Regional Airport

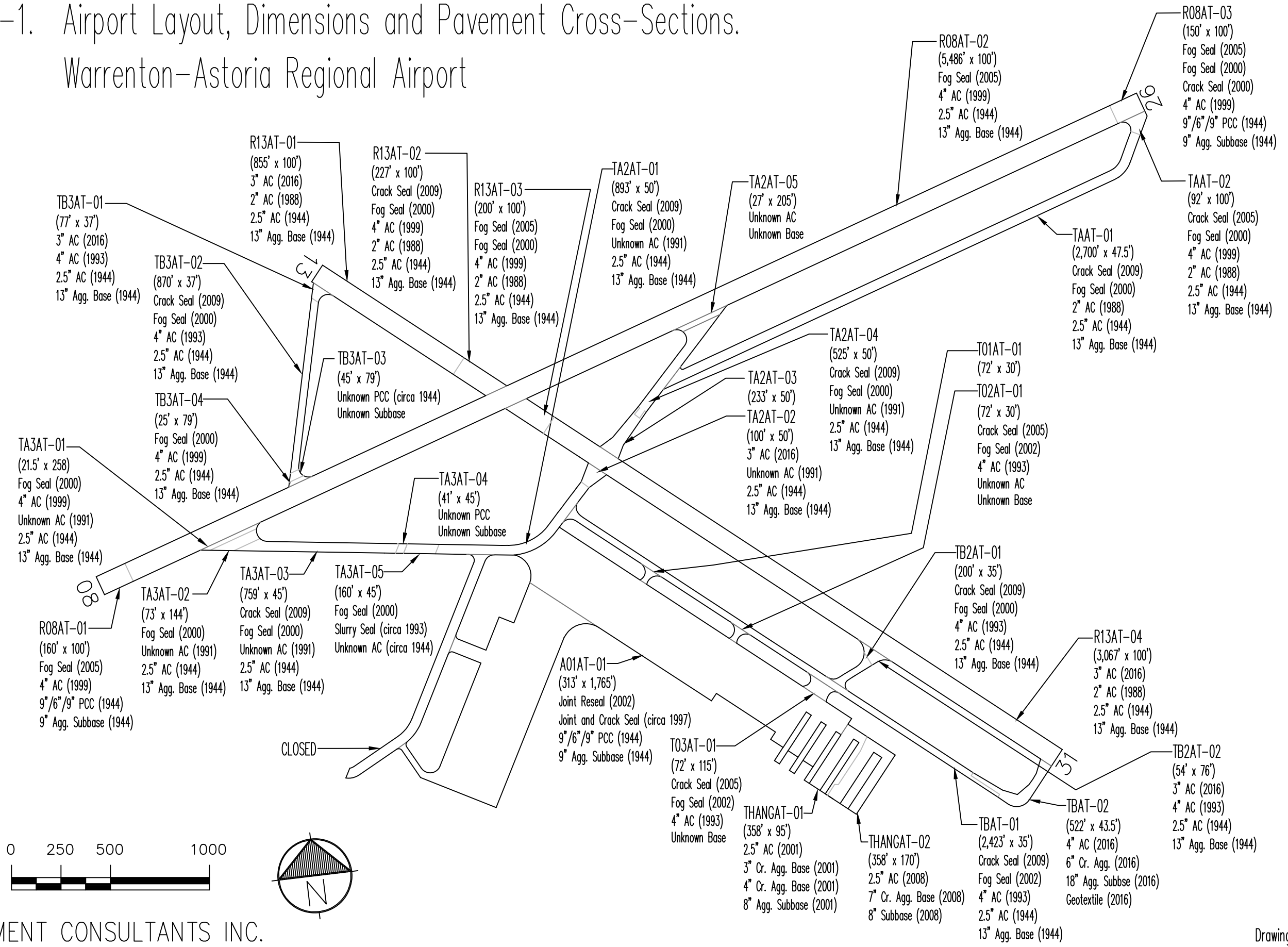
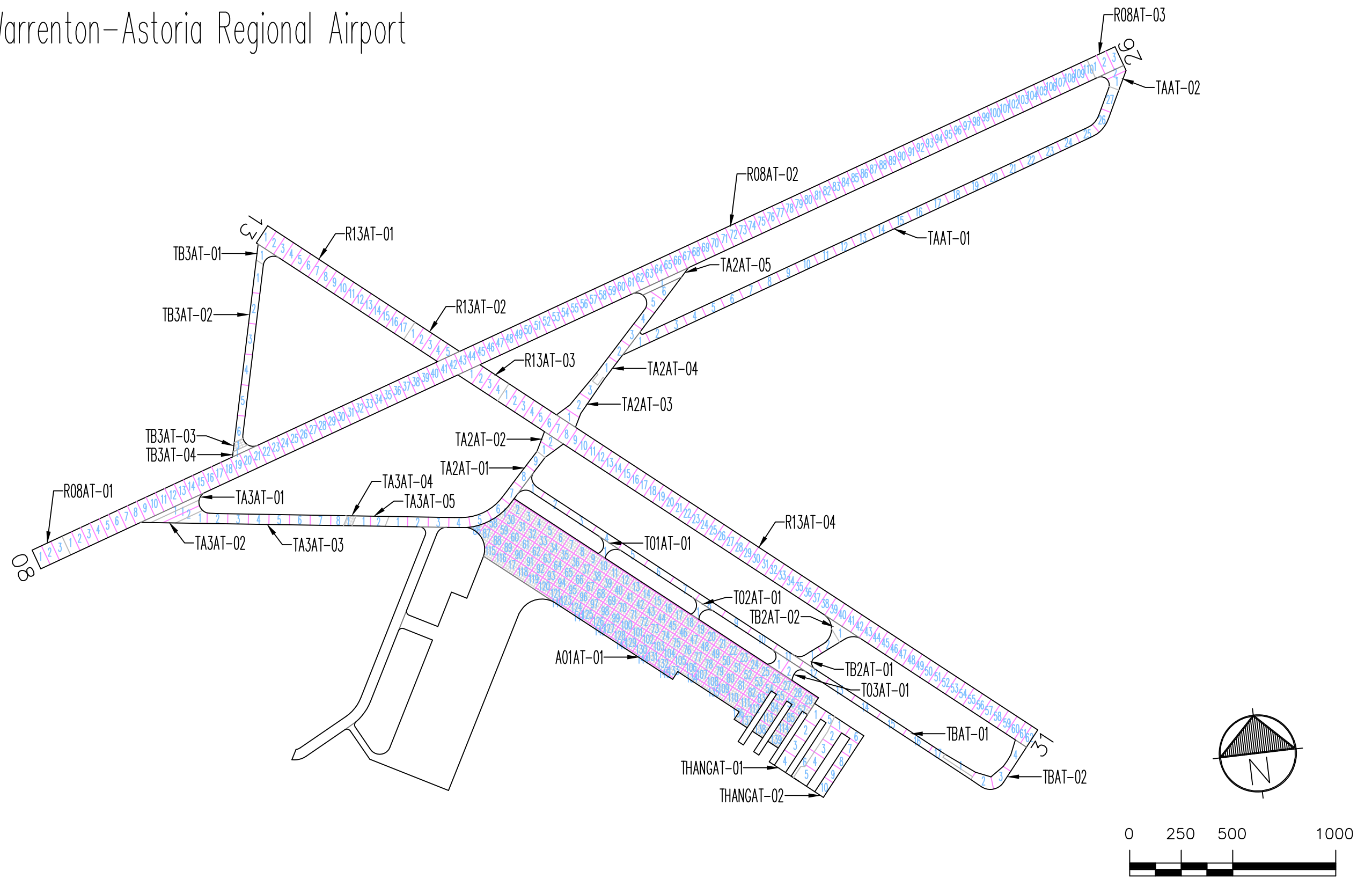


Figure AT-2. Pavement Branch, Section and Sample Unit Layout.
Warrenton-Astoria Regional Airport



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 2023 and 2028. 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 AT-3.

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

Branch	Section	Inspections			Forecast	
		2012	2015	2018	2023	2028
A01AT	01	53	67	65	62	60
R08AT	01	99	95	74	69	63
R08AT	02	99	97	83	78	72
R08AT	03	100	95	80	75	69
R13AT	01	---	---	100	95	89
R13AT	02	98	99	90	85	79
R13AT	03	100	100	90	85	79
R13AT	04	---	---	100	95	89
T01AT	01	93	85	66	51	37
T02AT	01	96	92	66	51	37
T03AT	01	85	70	60	45	31
TA2AT	01	64	68	55	50	45
TA2AT	02	---	---	100	95	90
TA2AT	03	---	---	100	95	90
TA2AT	04	93	91	81	76	71
TA2AT	05	87	90	83	78	63
TA3AT	01	96	98	91	86	81
TA3AT	02	64	97	93	88	83
TA3AT	03	64	76	56	51	46
TA3AT	04	26	36	36	32	28
TA3AT	05	45	49	56	41	27
TAAT	01	64	64	52	47	42
TAAT	02	86	95	87	82	77
TB2AT	01	86	87	59	54	49

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

Branch	Section	Inspections			Forecast	
		2012	2015	2018	2023	2028
TB2AT	02	---	---	100	95	90
TB3AT	01	---	---	100	95	90
TB3AT	02	90	87	65	60	55
TB3AT	03	46	65	65	61	57
TB3AT	04	96	96	96	91	86
TBAT	01	91	86	62	57	52
TBAT	02	---	---	100	96	90
THANGAT	01	100	93	90	85	83
THANGAT	02	100	100	100	96	90

Section PCIs at Astoria Regional Airport range from a low of 36 (a PCR of “Very Poor”) to a high of 100 (a PCR of “Good”). The area-weighted average PCI for all airport pavements is 78, corresponding to an overall PCR of “Satisfactory”. Figure AT-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 2012 and 2015.

The primary distresses observed during the inspection in the asphalt pavements were: weathering, longitudinal and transverse cracking, block cracking, and patching, with an isolated occurrence of depressions. The primary distresses observed in the concrete pavements were: linear cracking, joint seal damage, and shattered slabs, with isolated occurrences of corner spalls, joint spalls, small patches, and corner breaks.

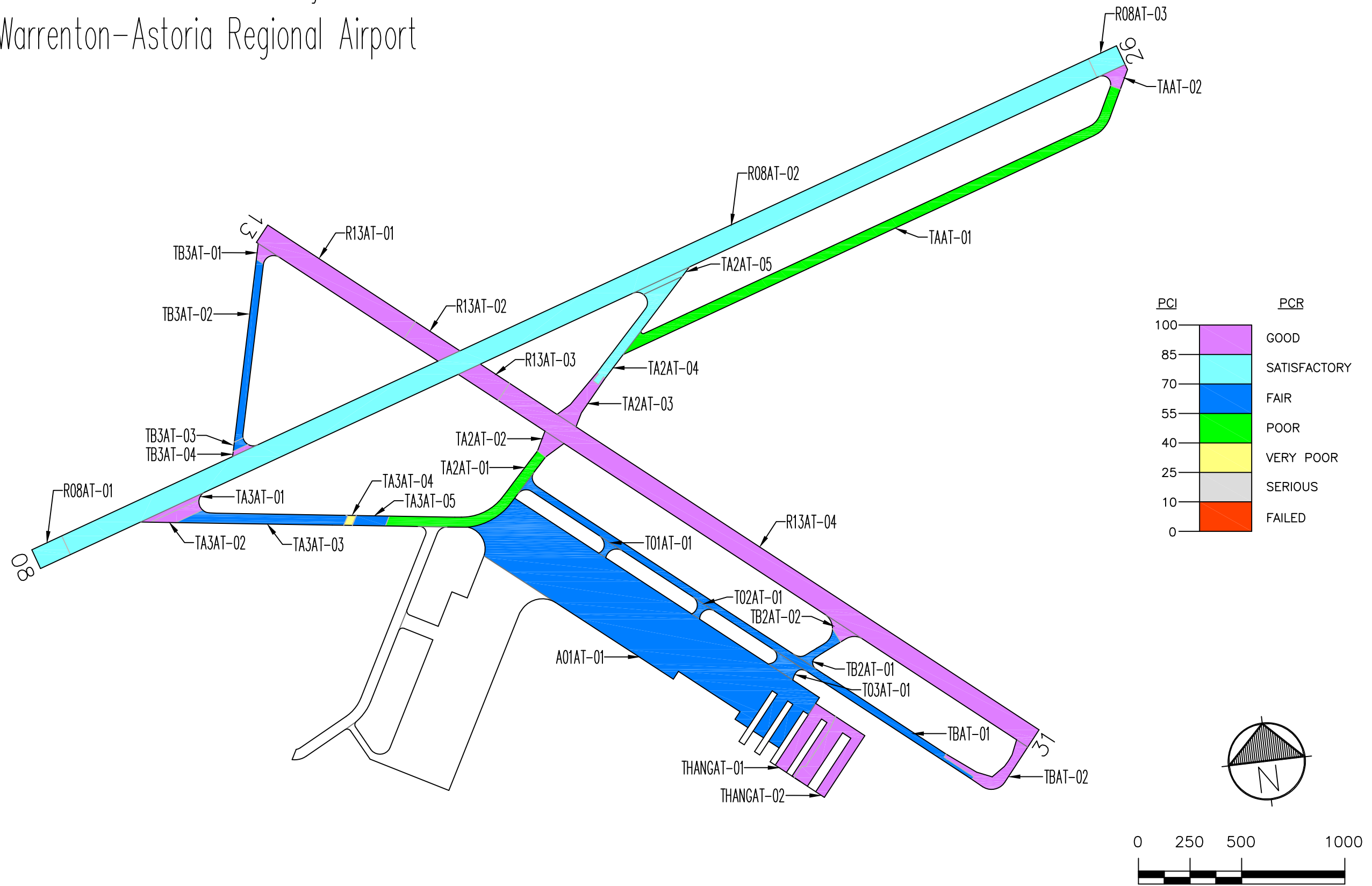
A graphical representation of the projected PCIs listed in Table 1 is shown in Figure AT-5.

RECOMMENDATIONS

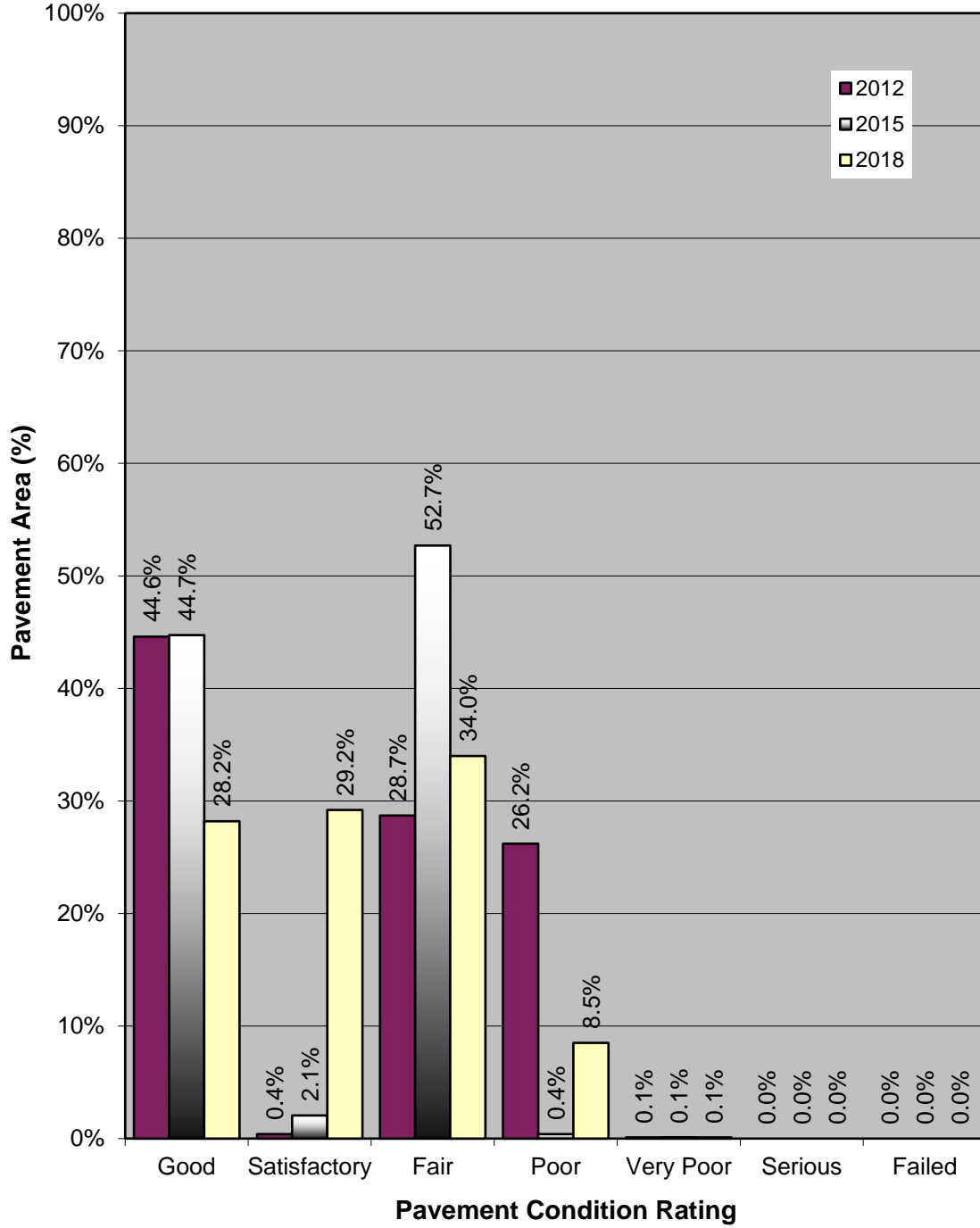
Data collected during the visual condition survey were used by the PAVER software to generate the Network Maintenance Report contained in Appendix 3. This report identifies, for each pavement section, the recommended localized maintenance activities (i.e.-crack sealing, patching) that should be completed 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 quantity of localized maintenance is needed:

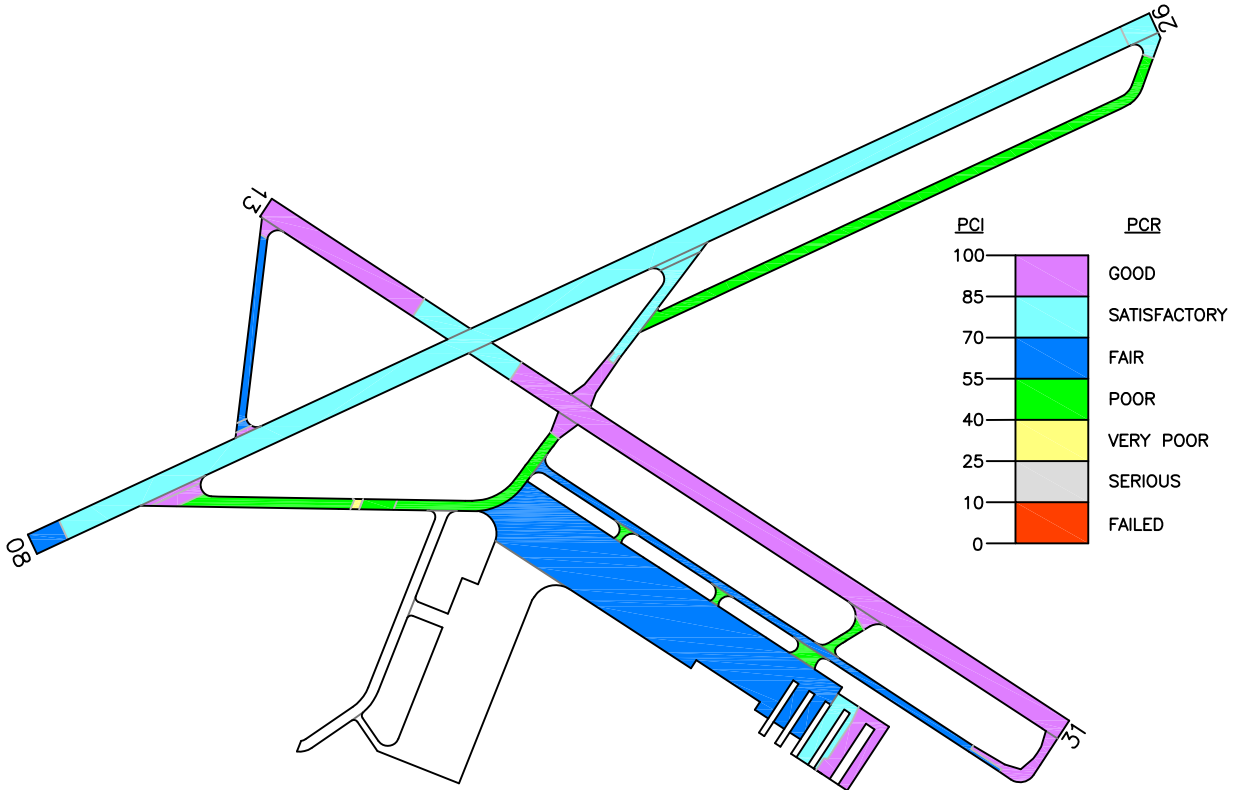
Figure AT-3. Pavement Condition in May 2018.
Warrenton-Astoria Regional Airport



**Figure AT-4. Pavement Condition Distribution
Warrenton-Astoria Regional Airport**



Predicted Condition in 2023.



Predicted Condition in 2028.

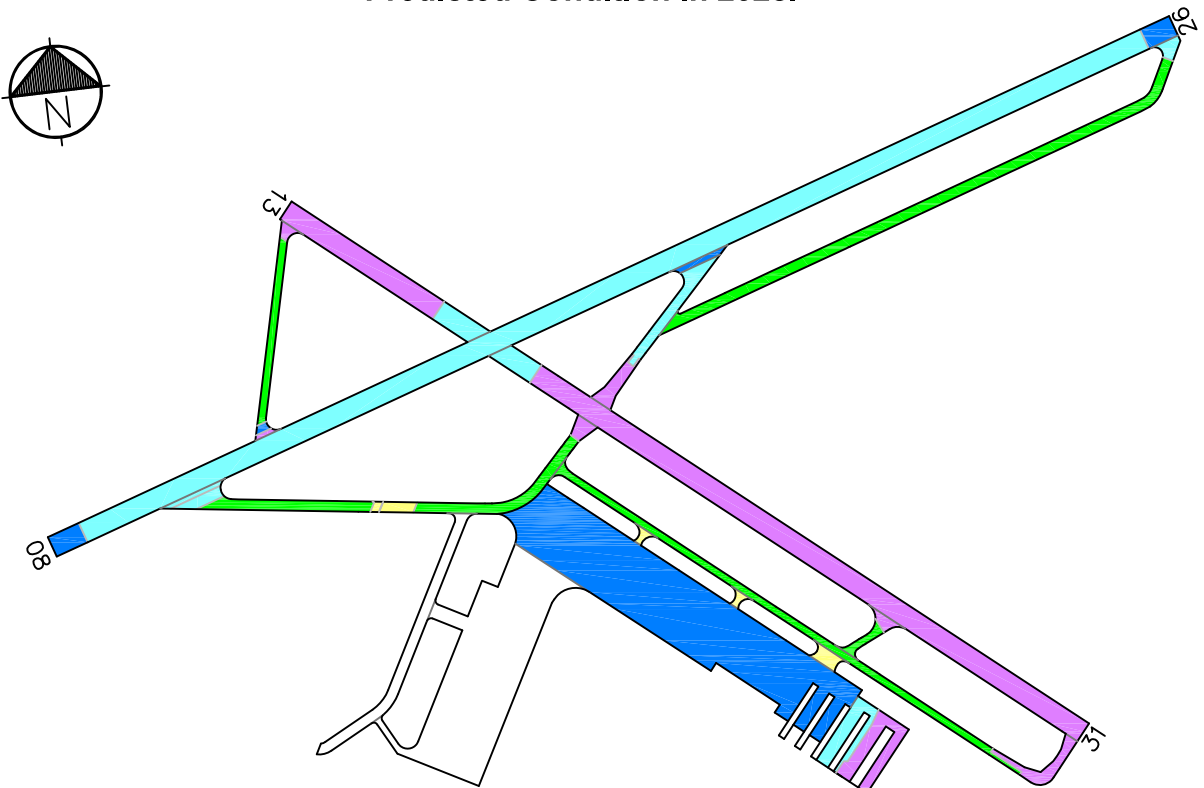


Figure AT-5. Future Pavement Condition.

- 22,236 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 2019 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 AT-6.

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

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2019	R08AT	01	Slurry Seal	16,000	\$0.31	\$4,960
2019	R08AT	02	Slurry Seal	548,600	\$0.31	\$170,066
2019	R08AT	03	Slurry Seal	15,000	\$0.31	\$4,650
2019	R13AT	02	Slurry Seal	22,732	\$0.31	\$7,047
2019	R13AT	03	Slurry Seal	19,993	\$0.31	\$6,198
2019	T01AT	01	Slurry Seal	3,396	\$0.31	\$1,053
2019	T02AT	01	Slurry Seal	3,355	\$0.31	\$1,040
2019	T03AT	01	2" AC Overlay	9,227	\$2.50	\$23,068
2019	TA2AT	01	2" AC Overlay	43,925	\$2.50	\$109,813
2019	TA2AT	04	Slurry Seal	31,854	\$0.31	\$9,875
2019	TA2AT	05	Slurry Seal	6,627	\$0.31	\$2,054
2019	TA3AT	01	Slurry Seal	6,298	\$0.31	\$1,952
2019	TA3AT	02	Slurry Seal	10,343	\$0.31	\$3,206
2019	TA3AT	03	2" AC Overlay	37,971	\$2.50	\$94,928
2019	TA3AT	04	2.5" AC over 7" Crushed Aggregate Base over 8" Aggregate Subbase	1,981	\$8.58	\$16,997
2019	TA3AT	05	2" AC Overlay	7,704	\$2.50	\$19,260
2019	TAAT	01	2" AC Overlay	136,063	\$2.50	\$340,158
2019	TAAT	02	Slurry Seal	7,358	\$0.31	\$2,281
2019	TB2AT	01	2" AC Overlay	8,740	\$2.50	\$21,850
2019	TB3AT	02	Slurry Seal	32,262	\$0.31	\$10,001
2019	TBAT	01	Slurry Seal	86,863	\$0.31	\$26,928

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

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2019	THANGAT	01	Slurry Seal	33,806	\$0.31	\$10,480
2019 Total						\$887,863
5-Year Total						\$887,863

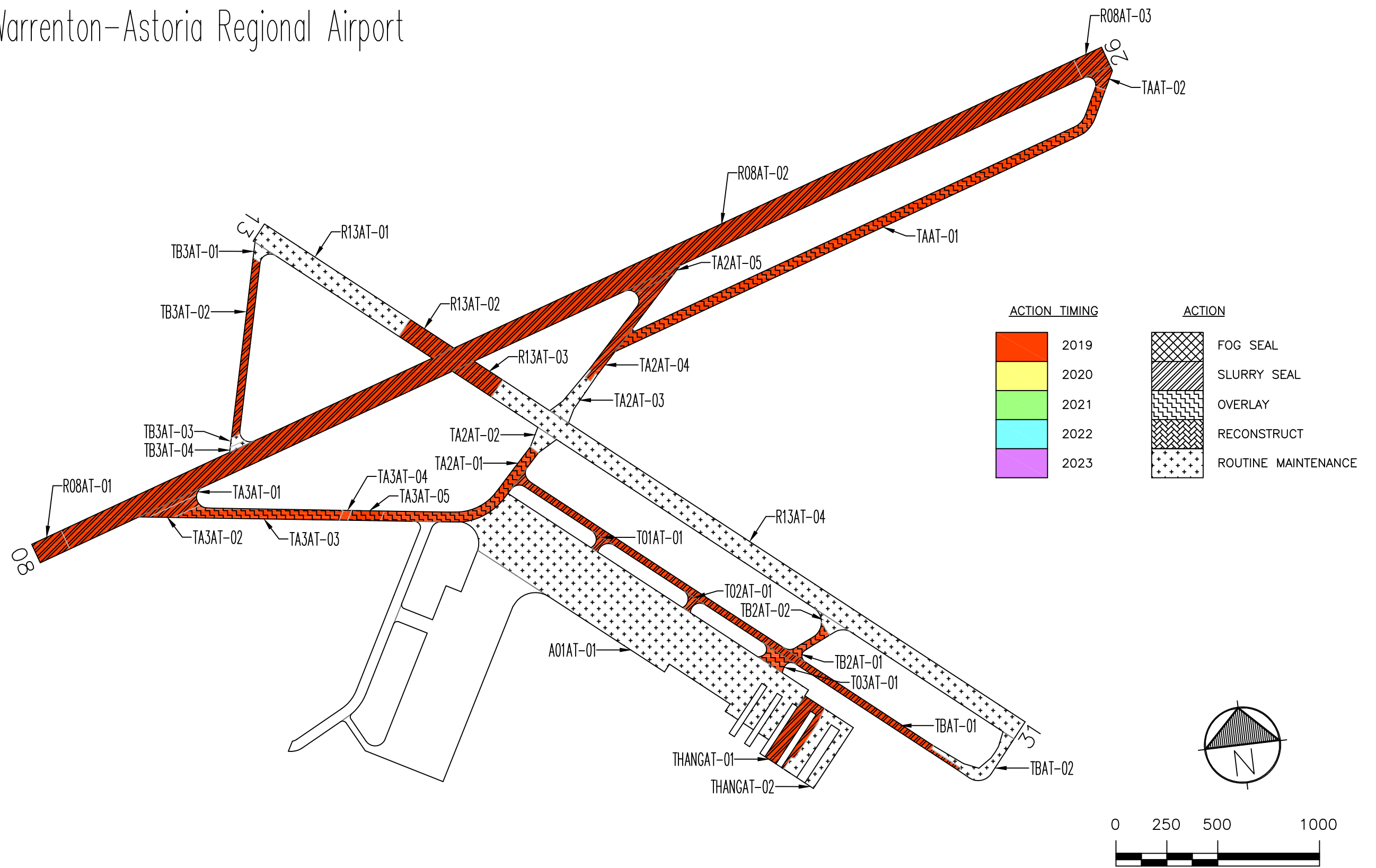
If the global maintenance and/or rehabilitation activities recommended in Table 2 are not completed, the localized maintenance activities identified in the Network Maintenance Report (Appendix 3) for that section should be done. Additionally, for those sections not listed in Table 2 as requiring global 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.

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 2021.

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.

Figure AT-6. Five-Year Pavement Management Plan.
Warrenton-Astoria Regional Airport



Drawing Date: September 2018