

Truckee Tahoe Airport



Pavement Maintenance/Management Plan 2014 Update

Presentation to Truckee Tahoe Airport District
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Truckee Tahoe Airport – 2014 PMMP Update

Goal: Update 2011 Pavement Maintenance and Management Plan with New Pavement Condition Index and Update the Rehabilitation Schedules.

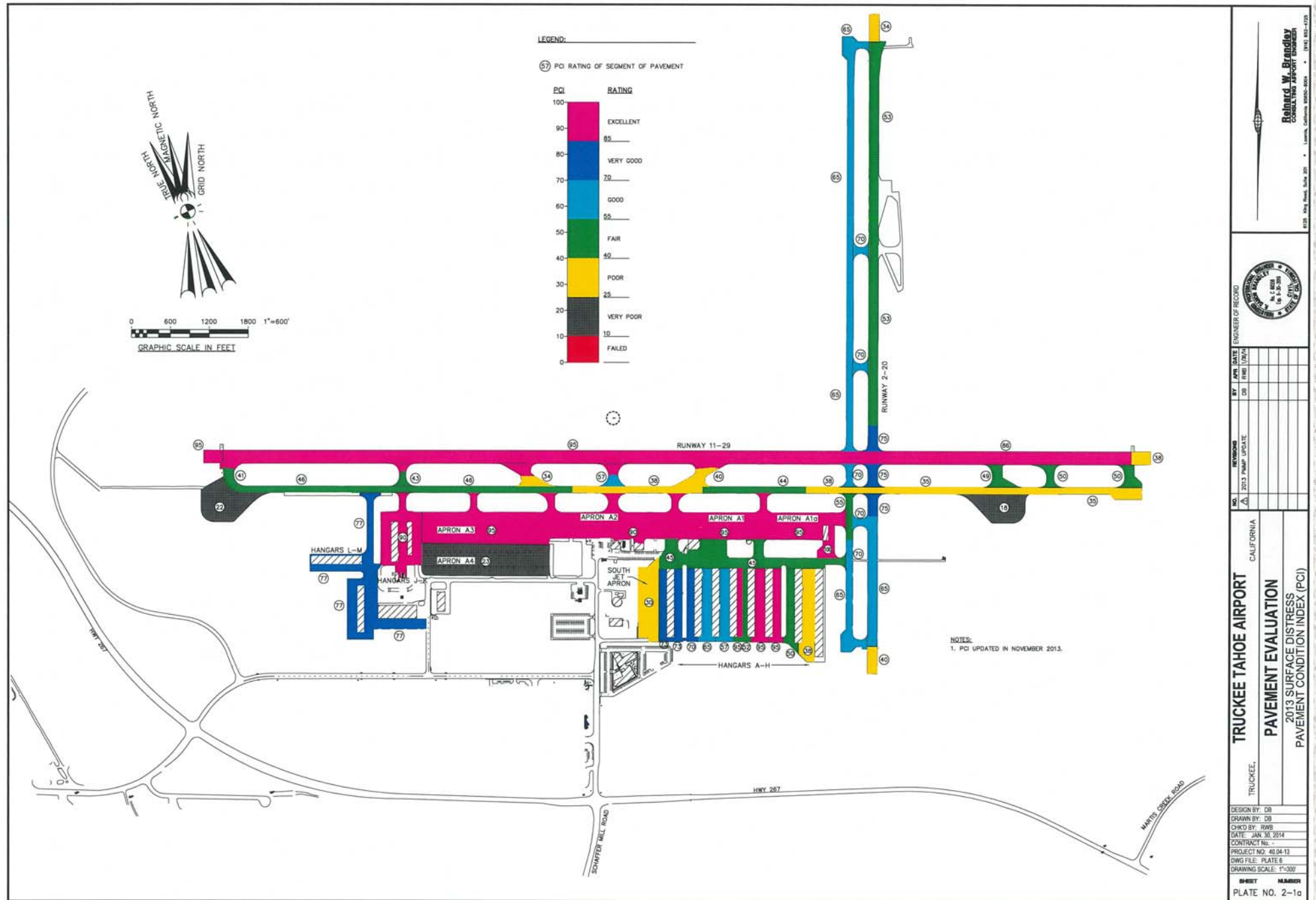
Required Elements of Study:

- Surface Distress Survey - PCI (no FWD testing)
- Update Rehabilitation Schedules
- Maintenance Requirements
- Schedule and Cost of Pavement Maintenance and Rehabilitation

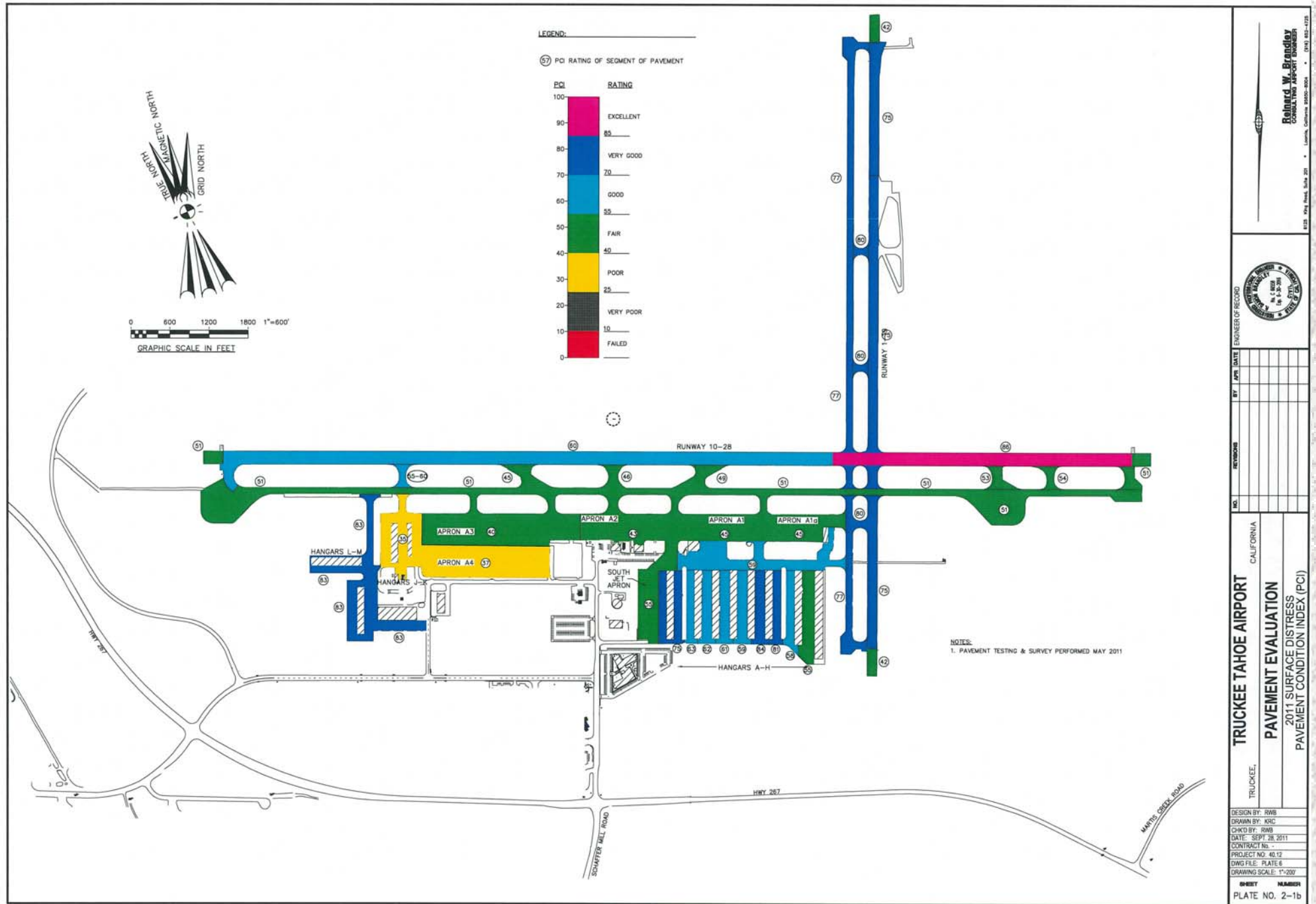
Data Collection:

- Pavement Condition Survey – PCI
- Update of Existing Pavement Sections
- Recent Construction Projects Completed

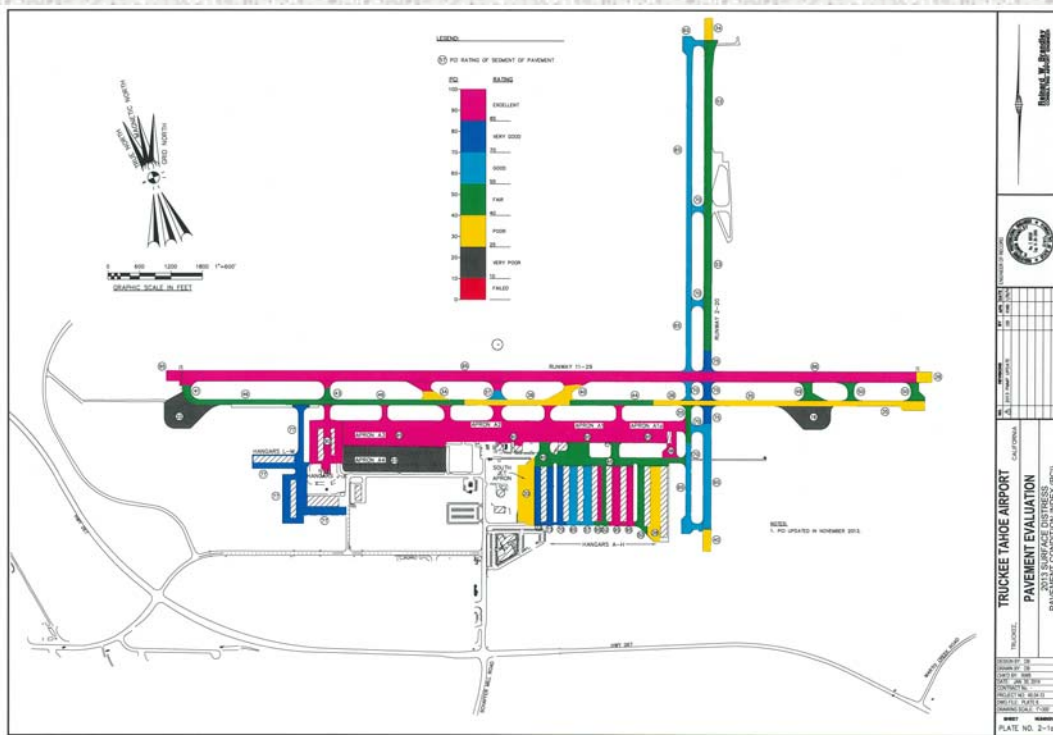
Surface Distress – 2013 Pavement Condition Index (PCI)



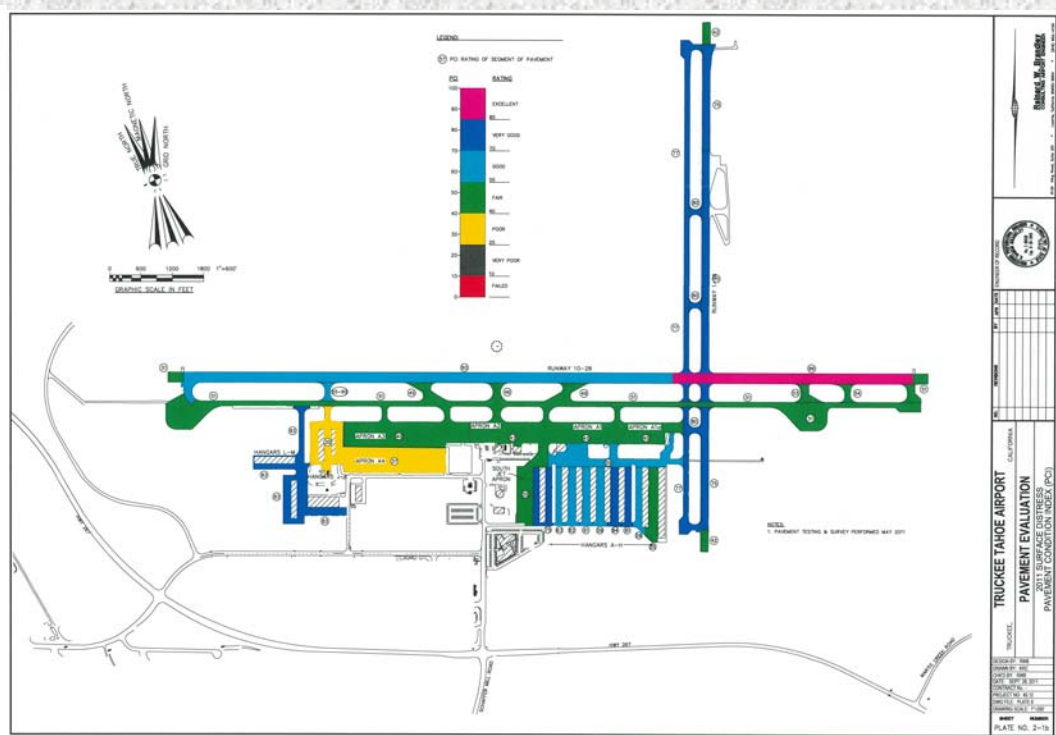
Surface Distress – 2011 Pavement Condition Index (PCI)



Pavement Condition Index(PCI) – 2013 vs. 2011



2013 PCI



2011 PCI

Rehabilitation Plan – Runway 11-29 Complex

TABLE NO. 4-1 (2014 PMMP Update)
TRUCKEE TAHOE AIRPORT
REHABILITATION PLAN

Required for Deep Seated Distress							
Estimated - Surface Distress							
Year	Element	Station	2011 PCI	2013 PCI	Recommended Rehabilitation		Estimated Construction Cost
					Code	Description	
RUNWAY 11-29 COMPLEX							
2026	Runway 11-29	0+00 to 47+00	50	95	F, H	Saw & Seal New Joints, Fog Seal	\$ 595,000
2031					G	Crack Repair, Seal Cracks & Joints	\$ 275,000
2017	Runway 11-29	47+00 to 70+00	80-85	86	F	Saw & Seal New Joints - Supplemental	\$ 155,000
2022					G	Crack Repair, Seal Cracks and Joints	\$ 156,000
2026					A or E	Reconstruct	\$ 1,275,000
2018	Runway 11-29	East Blast Pad	55	38	D	Remove AC and Reconstruct	\$ 82,000
2019	T/Ws A, B, C, D (Holding Apron)	0+00 to 28+00 (T/W A)	51	41-46	G	Crack Repair, Seal Cracks	\$ 48,000
2024					B	Rehabilitate - Reconstruct	\$ 1,256,000
2036					F, H	Saw & Seal New Joints, Fog Seal	\$ -
2016	T/Ws A, F, H, U, J (Holding Apron)	28+00 to 72+00 (T/W A)	51	38-57	B	Rehabilitate - Reconstruct	\$ 2,000,000
2031					F, H	Saw & Seal New Joints, Fog Seal	\$ 145,000

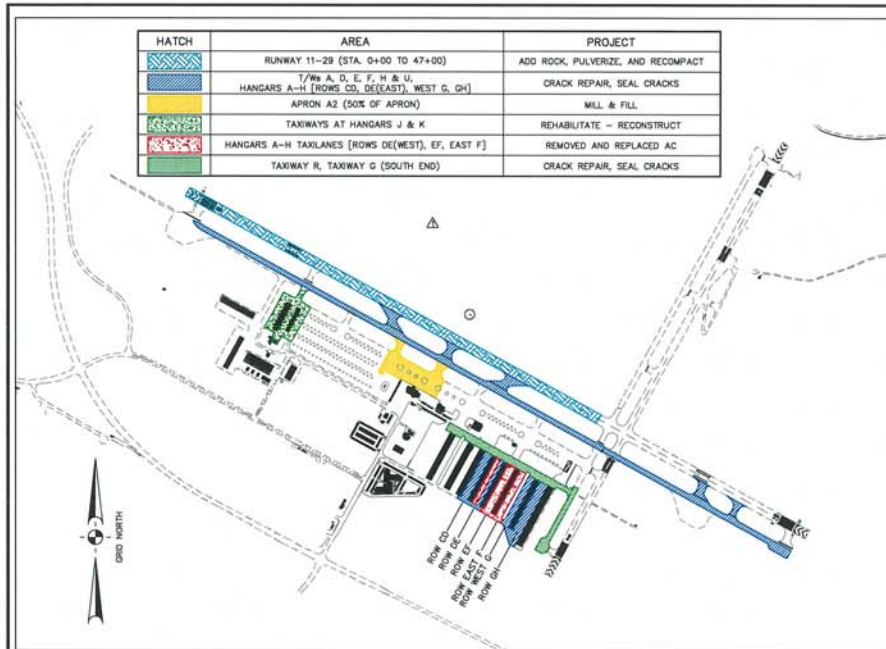
Note: Pavement Maintenance Remarking Projects are not shown in this table. See Table 4-2

Maintenance and Rehabilitation Schedule – 2014-2020

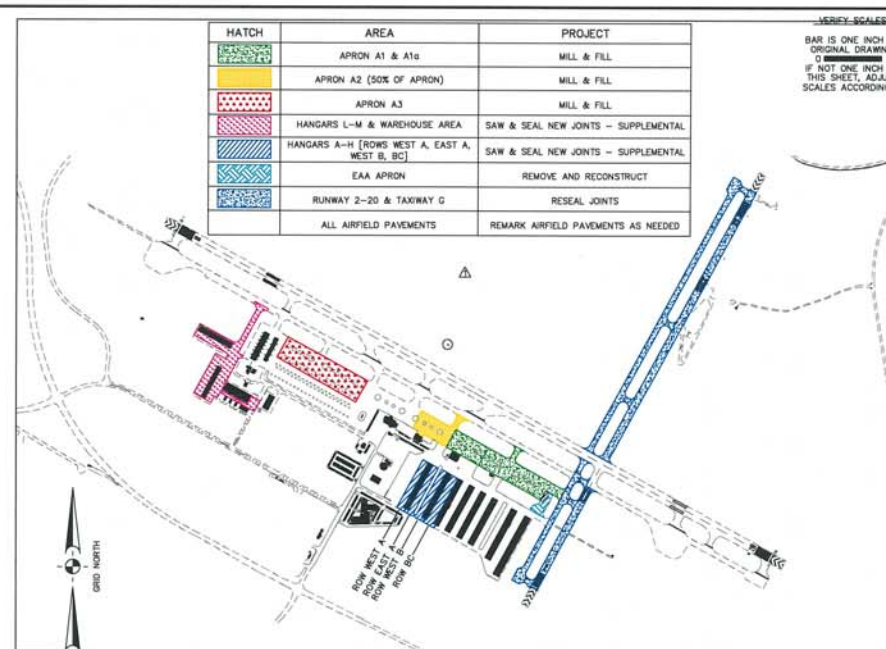
TABLE NO. 4-2 (2014 PMMP Update)
TRUCKEE TAHOE AIRPORT
MAINTENANCE AND REHABILITATION SCHEDULE

Required for Deep Seated Distress							
Estimated - Surface Distress							
Year	Element	Station	2011 PCI	2013 PCI	Recommended Rehabilitation		Estimated Construction Cost
					Code	Description	
2014	Apron A4 & Hangar 1 Apron	All	37-40	23	D	Remove AC and Reconstruct	\$ 1,498,000
	2014 Total Cost						\$ 1,498,000
2015	South Jet Apron	All	55	30	A	Remove and Reconstruct	\$ 845,000
	Hangars A-H - Rows West G, GH	All	55-61	38-50	D	Remove AC and Reconstruct	\$ 867,000
	Runway 2-20	0+00 to 46+00	75	53-75	F, H	Saw and Seal New Joints - Supplemental & Reclaimite	\$ 270,000
	Taxiway G, V, P, Q	All	77	55-70	F, H	Saw and Seal New Joints - Supplemental & Reclaimite	\$ 240,000
	Hangars L-M & Warehouse Area	All	83	77	H	Reclaimite Seal	\$ 26,000
	All Airfield Pavements	All				Remark Airfield Pavements as Needed	\$ 253,000
	2015 Total Cost						\$ 2,501,000
2016	T/Ws A, F, H, U, J	28+00 to 72+00	51	38-57	B	Rehabilitate - Reconstruct	\$ 2,000,000
	2016 Total Cost						\$ 2,000,000
2017	Runway 11-29	47+00 to 70+00	80-85	86	F	Saw & Seal New Joints - Supplemental	\$ 155,000
	Hangars A-H - Rows CD & DE(East)	All	55-61	52-57	D	Remove AC and Reconstruct	\$ 390,000
	All Airfield Pavements	All				Remark Airfield Pavements as Needed	\$ 250,000
	2017 Total Cost						\$ 795,000
2018	R/W 2-20 Blast Pads	All	42	34-40	D	Remove AC and Reconstruct	\$ 142,000
	R/W 11-29 East Blast Pad	All	55	38	D	Remove AC and Reconstruct	\$ 82,000
	Hangars A-H - Rows West A, East A, West B, and BC	All	63-75	65-73	G	Crack Repair, Seal Cracks & Joints	\$ 75,000
	Hangars L-M & Warehouse Area	All	83	77	G, H	Crack Repair, Seal Cracks & Joints, Fog Seal	\$ 116,000
2019	2018 Total Cost						\$ 415,000
	Hangars A-H - Taxilane R	All	59	45	A	Reconstruct	\$ 760,000
	T/Ws A, B, C, D	0+00 to 28+00	51	41-46	G	Crack Repair, Seal Cracks	\$ 48,000
	All Airfield Pavements	All				Remark Airfield Pavements as Needed	\$ 340,000
2020	2019 Total Cost						\$ 1,148,000
	Hangars J-K	All	35	90	F	Saw and Seal New Joints - Supplemental	\$ 60,000
2020 Total Cost							\$ 60,000

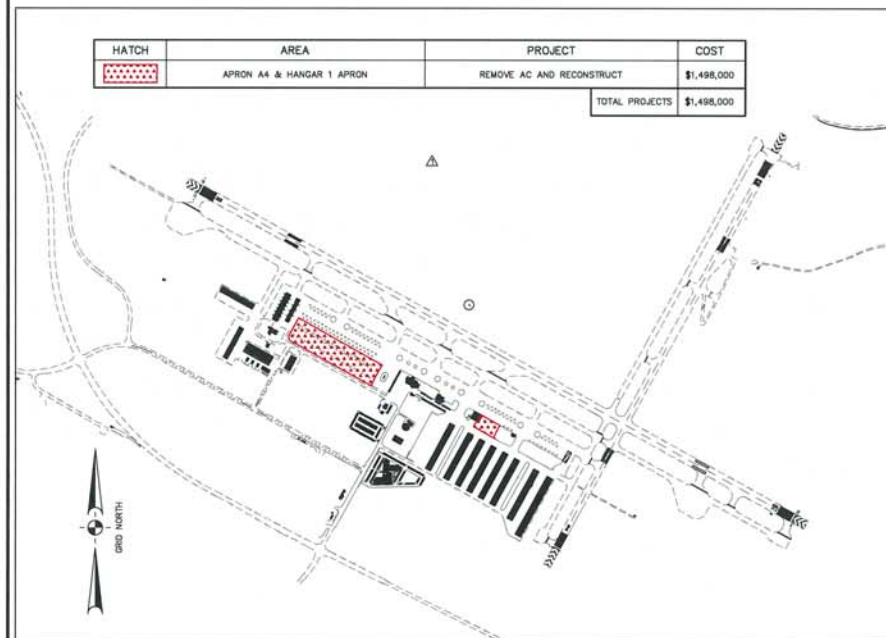
Rehabilitation Schedule – 2012-2015



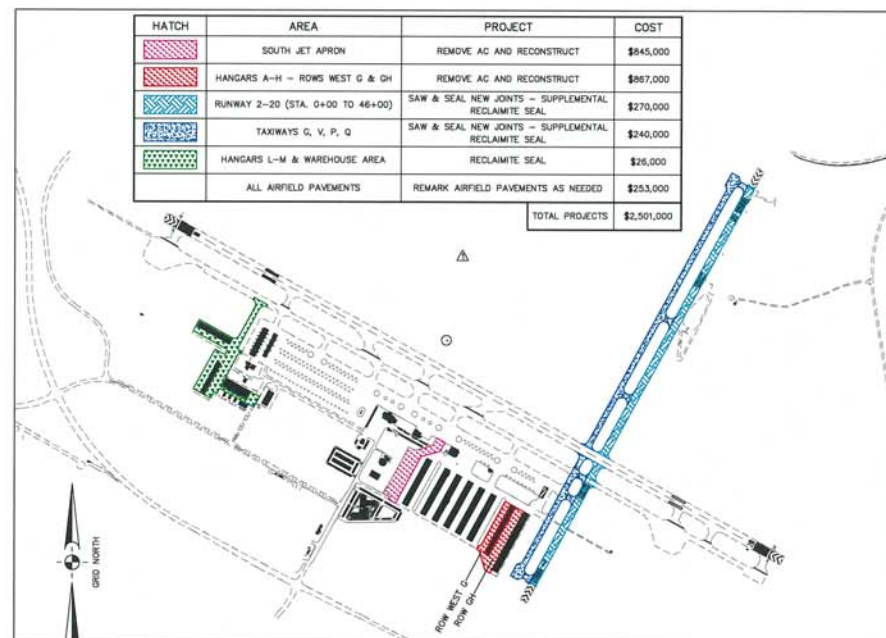
2012 MAINTENANCE AND REHABILITATION COMPLETED PROJECTS



2013 MAINTENANCE AND REHABILITATION COMPLETED PROJECTS



2014 MAINTENANCE AND REHABILITATION COMPLETED PROJECTS



2015 MAINTENANCE AND REHABILITATION SCHEDULE

VERIFY SCALES:
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Reinard W. Brandy
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BY: [Signature] DATE: [Date]
DB: [Signature] RMB TO: [Date]

REVISIONS:
NO. 1 2013 PUMP UPDATE

TRUCKEE, CALIFORNIA
PAVEMENT EVALUATION
REHABILITATION SCHEDULE 2012-2015

DESIGN BY: RMB
DRAWN BY: CMB
CHECKED BY: RMB
DATE: SEPT 7, 2011
CONTRACT NO.: -
PROJECT NO.: 40
DWG FILE: SPANWORKS SCHEDULES
DRAWING SCALE: 1"=400'
SHEET NUMBER
PLATE NO. 4-1

Pavement Condition Survey & Rehabilitation Schedule

Runway 11-29 * Station 26+00 to Station 37+00

TABLE NO. C4 - PAVEMENT CONDITION SURVEY AND REHABILITATION SCHEDULE							
Airport:	Truckee-Tahoe Airport				Date of Survey:	May 5 & 6, 2011 October 2013 Update	
Element:	Runway 11-29						
Station:	26+00 to 37+00						
Dimensions:	100' x 1100'						
FAA Pavement Strength Survey - Element Identification (Form 5335-1):		R1 Single Gear - 60 kips Dual Gear - 100 kips					
		Thickness - inches		E ksi		μ	Remarks
		2011	2013	2011	2013		
Existing Pavement Section:	PFC						
	PCC						
	AC	4	3	250	350	0.35	
	AB	8	14	30	40	0.35	
	ASB		-				
	Subgrade	48	48	10	10	0.35	
	Sub-soil	S.I.	S.I.	20	20	0.35	
Date Constructed:	1963						
Rehabilitation Record:	Date	Type					
	1986, 2012	2012 - Reconstruction (Add 2" Rock, Pulverize, + 3"AC)					
Pavement Condition:		Grooved (center 80'), no joints, no cracks.					
Weathering - Light							
No Rutting, Shoving, or Ravelling							
				2011 PCI = 60			
Pavement Rating = Excellent				2013 PCI = 95			
2011 Pavement Remaining Life Analysis		Brandley - Fatigue Analysis		FAA - FAARFIELD			
Traffic Index		B	B1	B	B1		
FWD Center Plate Deflection - 25 K Load		63-93 (80)	63-93 (80)	63-93 (80)	63-93 (80)		
Pavement Structure Remaining Life - Years		23	16	1.0	0.5		
Pavement Structure Estimate Year of Failure		2034	2027	2012	2012		
2013 Updated Remaining Life - Years		81	59	-	-		
2013 Update Estimated Year of Failure		2094	2072	-	-		
Recommended Rehabilitation:							
Date	Rehab. Code	Description					
2026	F, H	Saw & Seal New Joints, Fog Seal					
2031	G	Crack Repair, Seal Cracks & Joints					
Remarks:							
Station based on Sta. 0 located at Runway 11 threshold and proceeding east.							
FWD used was mean value for section - See FWD Graphs, Appendix B							
For Traffic Index see Appendix D. For Rehabilitation Code see Tables 3-1 & 3-3.							

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Construction Cost Changes and Lessons Learned:

- ➔ *Existing Subgrades in Hangar Areas were found to be variable, soft, unstable, and required overexcavation and stabilization.*
- ➔ *Hangar Taxiways A-H need to be reconstructed instead of just removing and replacing the existing AC due to unstable subgrades.*
- ➔ *Existing subgrade soils in Apron and Runway areas are much more difficult to excavate than originally anticipated due to the amount of cobbles present. Unit prices were increased for excavation in construction estimates to account for difficulty of excavation.*
- ➔ *Added Reclaimite Seal Coat for some pavements to help surface condition of the pavement.*
- ➔ *Updated all estimates to 2014 prices.*

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Summary of Major Project Changes:

Element	2014 Recommended Rehabilitation	2011 PMMP		2014 PMMP Update		Change in Cost		Notable Change	Reasons for Changes
		Year	Cost	Year	Cost	(\$)	(%)		
Runway 11-29 (east)	Supplemental Joints	2017	\$105,000	2017	\$155,000	\$50,000	48%	Cost	Added Resealing of Existing Joints Added Remarketing of Pavements
Runway 11-29 (east)	Crack Repair and Seal Joints	2020	\$290,000	2022	\$156,000	(\$134,000)	-46%	Cost	Deleted Fog Seal (Based on History/Experience)
Taxiway A (east of E), Taxiways F, H, U, & J	Reconstruction	2018	\$1,900,000	2016	\$2,000,000	\$100,000	5%	Date	Additional Cracking and Rutting Taxiway E removed from Project Added 50% of T/W H Runup to Project
Runway 2-20 and Taxiway G Complex	Supplemental Joints and Reclaimite Seal	2016	\$215,000	2015	\$510,000	\$295,000	137%	Cost	Added Resealing of Existing Joints Added Reclaimite Seal Added Remarketing of Pavements
Runway 2-20 and Taxiway G Complex	Add Rock, Pulverize, add 3" New AC	2031	\$3,370,000	2022	\$3,450,000	\$80,000	2%	Date	Additional Surface Distresses Potential Increased Traffic Levels
Apron A1	Reconstruction	2020	\$1,550,000	2023	\$1,590,000	\$40,000	3%	Date	Mill and Fill Anticipated to Extend Life
Apron A2	Reconstruction	2025	\$1,150,000	2025	\$1,465,000	\$315,000	27%	Cost	Increased Excavation Prices Added Reconstruction of Taxiway Connector to T/W A
Apron A3	Reconstruction	2017	\$900,000	2021	\$1,207,000	\$307,000	34%	Cost and Date	Mill and Fill Anticipated to Extend Life Increased Excavation Prices Changed from Remove and Replace AC to reconstruction. This is based upon the need to upgrade the strength of the apron to meet the latest approved aircraft fleet mix.
South Jet Apron	Remove and Reconstruct	2020	\$550,000	2015	\$845,000	\$295,000	54%	Cost and Date	Cracks Too Large and Too Many to Patch Increased Excavation Prices Added Jetway Connector to Ramp to the Project
Hangars A-H - Taxilane R	Reconstruction	2020	\$640,000	2019	\$760,000	\$120,000	19%	Cost	Increased Excavation Prices
Hangars A-H - Rows West G and GH	Remove and Reconstruct	2015	\$338,000	2015	\$867,000	\$529,000	157%	Cost	Changed From Replace AC to Reconstruction Increased Excavation Prices Added Budget for Potential Soft, Unstable Subgrade Added Replacement of Slot Drain with Concrete Apron