Infrastructure Asset Management Enterprise Software

Pavement Analysis: DOT Preservation Techniques through Optimization Analysis

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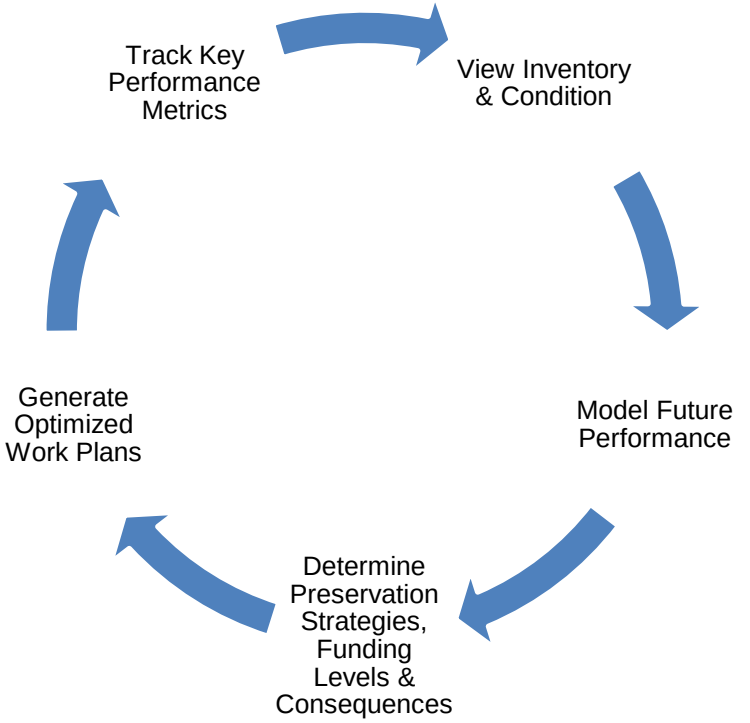
Product Manager

Overview of Pavement Analyst™



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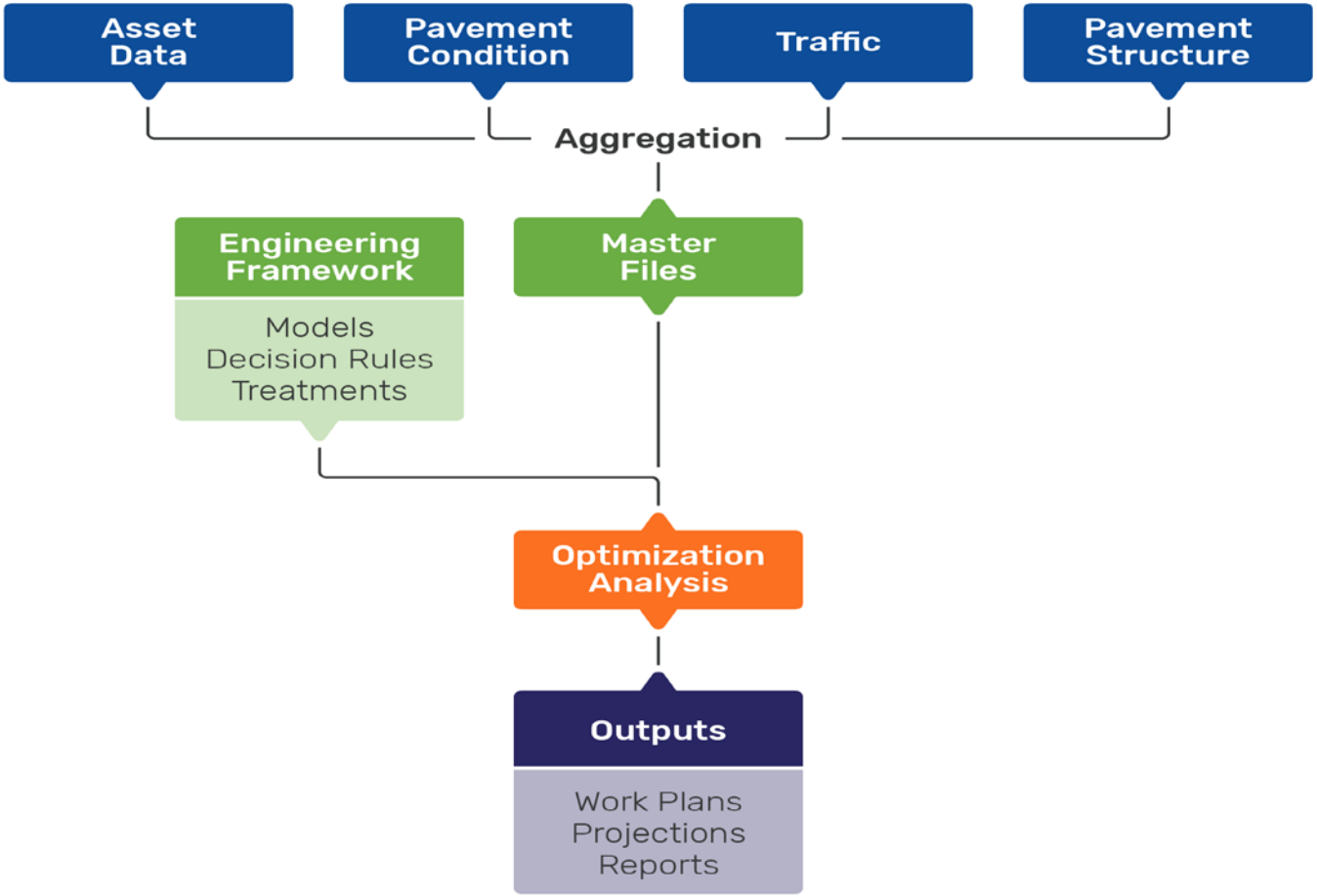
Overview of Pavement Analyst™



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Why Focus on Preservation

Business Drivers

Sustainable

80% non-renewable resources < R^2

Maximize ROI

$1 == ($6 to $10)

Economic Vitality

25% jobs > R^2

Higher LOS and Safety

Less traffic disruptions/delays and improved roadway condition

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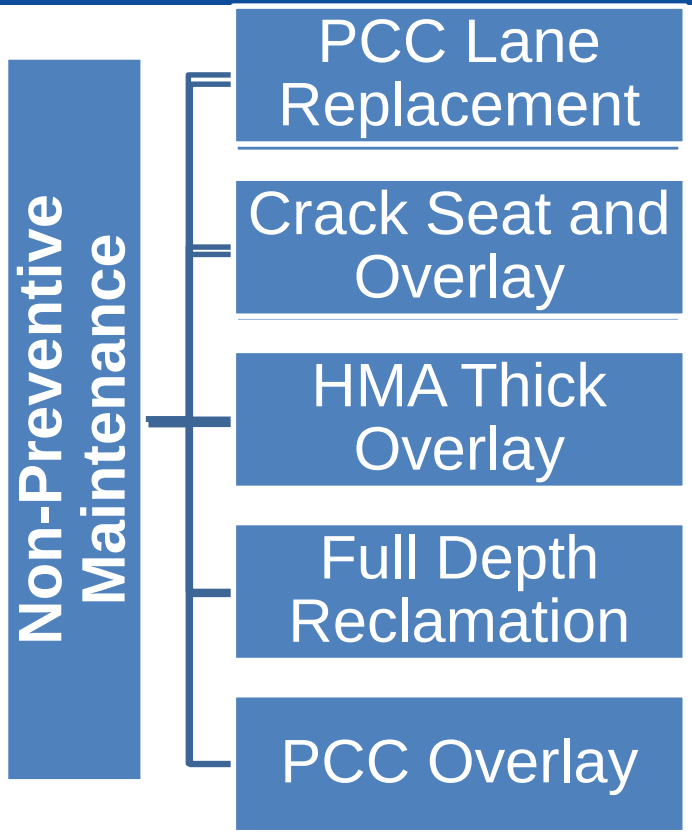
Preservation Technique: Define Treatments

Categorize treatments



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Preservation Technique: Define Treatments

Treatments Actions ▼

Treatment No.	* Treatment Name	* Unit Cost	Comment	* Selection Priority	Exclusion Priority	Exclusion Years	Cost	Budget Group	* Work Code
194	Seal Coat - Corrective	$94,000		20	8	8	Unit Cost Per Lane Mile	Corrective Maintenance	Seal Coat
196	HMA Medium Overlay	$350,000	Thickness greater than 0.	30	5	3	Unit Cost Per Lane Mile	CAPM	Medium Overlay
197	HMA Thick Overlay	$600,000	Thickness Greater than 0	40	3	4	Unit Cost Per Lane Mile	Rehab	Thick Overlay
199	Full Depth Reclamation	$1,000,000	Changed from $1.651 mil	70	4	4	Unit Cost Per Lane Mile	Rehab	Full Depth Reclamation
200	Cold In-Place Recycling	$345,000		60	7	3	Unit Cost Per Lane Mile	CAPM	Cold In-Place
201	Seal Cracks	$5,000		5	10	1	Unit Cost Per Lane Mile	Preventive Maintenance	Unknown
223	Hot In-Place Recycling	$345,000		65	7	3	Unit Cost Per Lane Mile	CAPM	Cold In-Place
218	Digouts - Corrective	$920,000		6	9	6	Digouts Cost Expression	Corrective Maintenance	Unknown
234	Slab Replacement with Asphalt	$0		15	6	1	Replace Slabs Expressio	Corrective Maintenance	Slab Replacement
212	Microsurfacing	$65,000		23	8	6	Unit Cost Per Lane Mile	Preventive Maintenance	Seal Coat

<< < 13 of 46 total rows > >>

Improvements Actions ▼

* Condition Attributes	Future Detr Type	Condition Improvement Script	Effective for ... years
IRI AVG (in/mi)	New PC model	Improve to - 60	
CRACKING - HMA Wł	New PC model	Improve to - 0	
Mean Profile Depth	New PC model	Improve to - 1.000	
Flexible Total Cracking	New PC model	Improve to - 0	
Alligator A+B (%)	New PC model	Improve to - 0	
CRACKING - PCCP 3I	New PC model	Improve to - 0	

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Other Improvements Actions ▼

* Changing Attributes	Condition Improvement Script Other	Date Update	User Update	Comment
Alligator A pct	Reset to 0	04/27/2016	CONFIG	
% Unsealed Flex Cracks	Reset to 0	02/01/2013	PAVEM-PROXY	
Pvmnt Age	Reset to 0	09/19/2013	PAVEM-PROXY	
Work Code	Thick Overlay	03/13/2012	ERIC	
Pavement Type	Set to Flexible	01/25/2012	VYSHNAVI	

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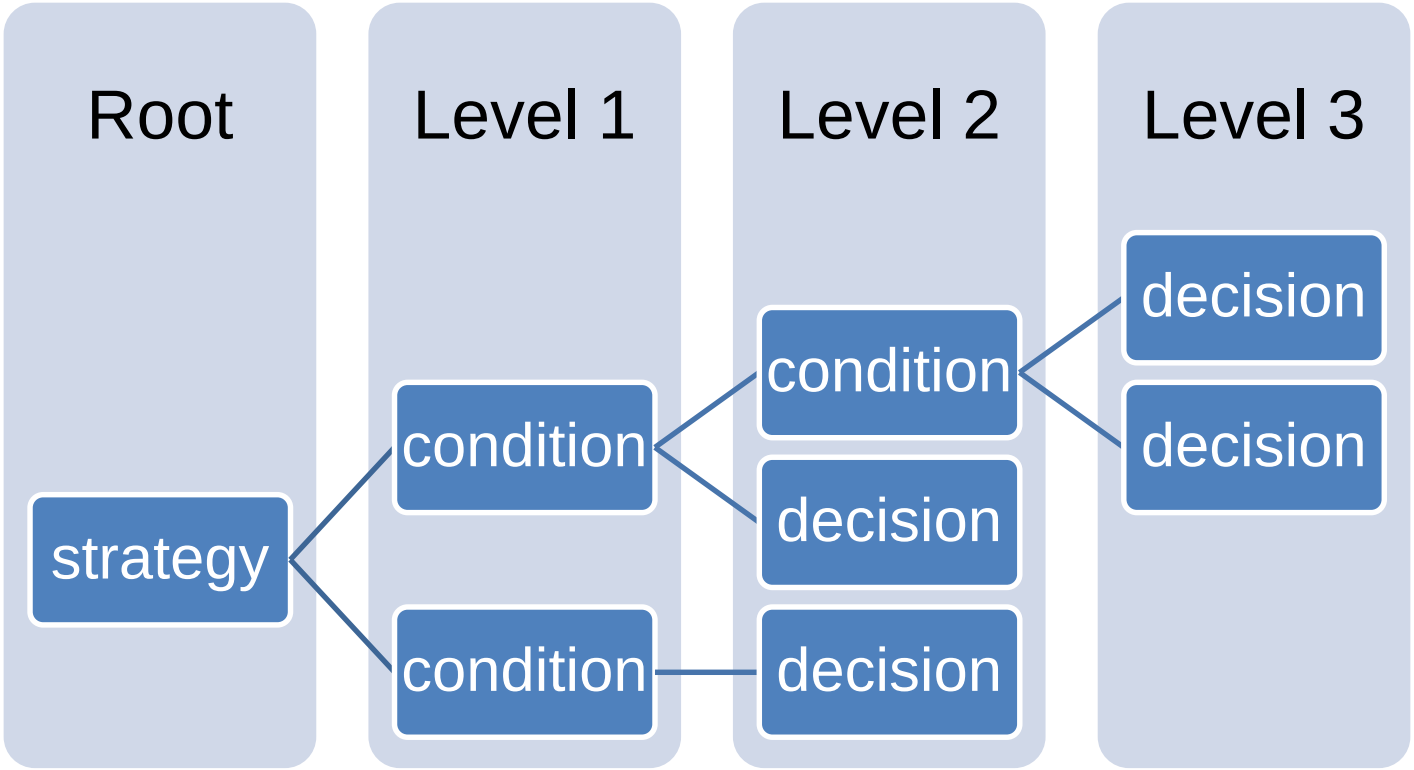
Preservation Technique: Decision Trees



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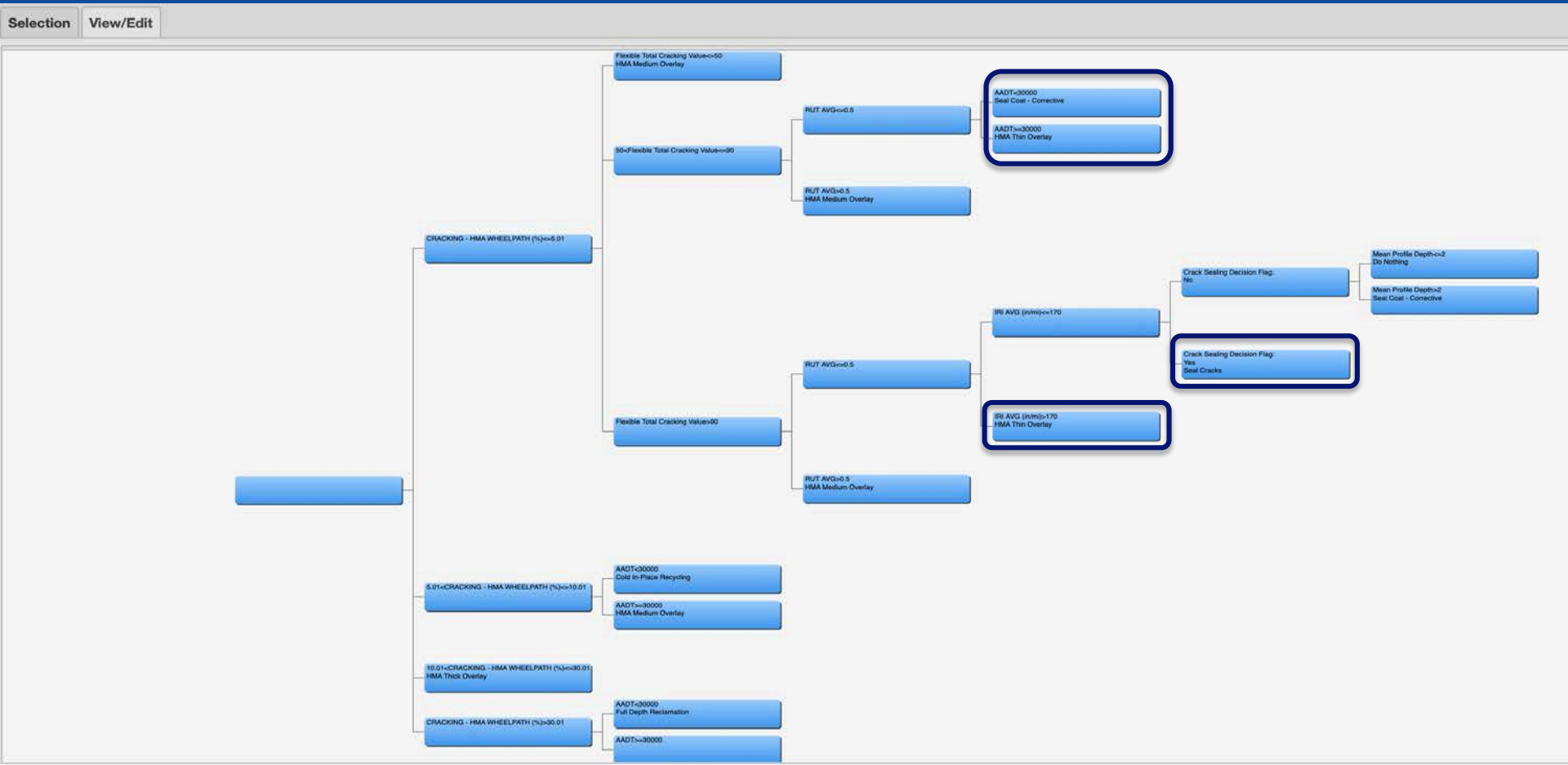
Example

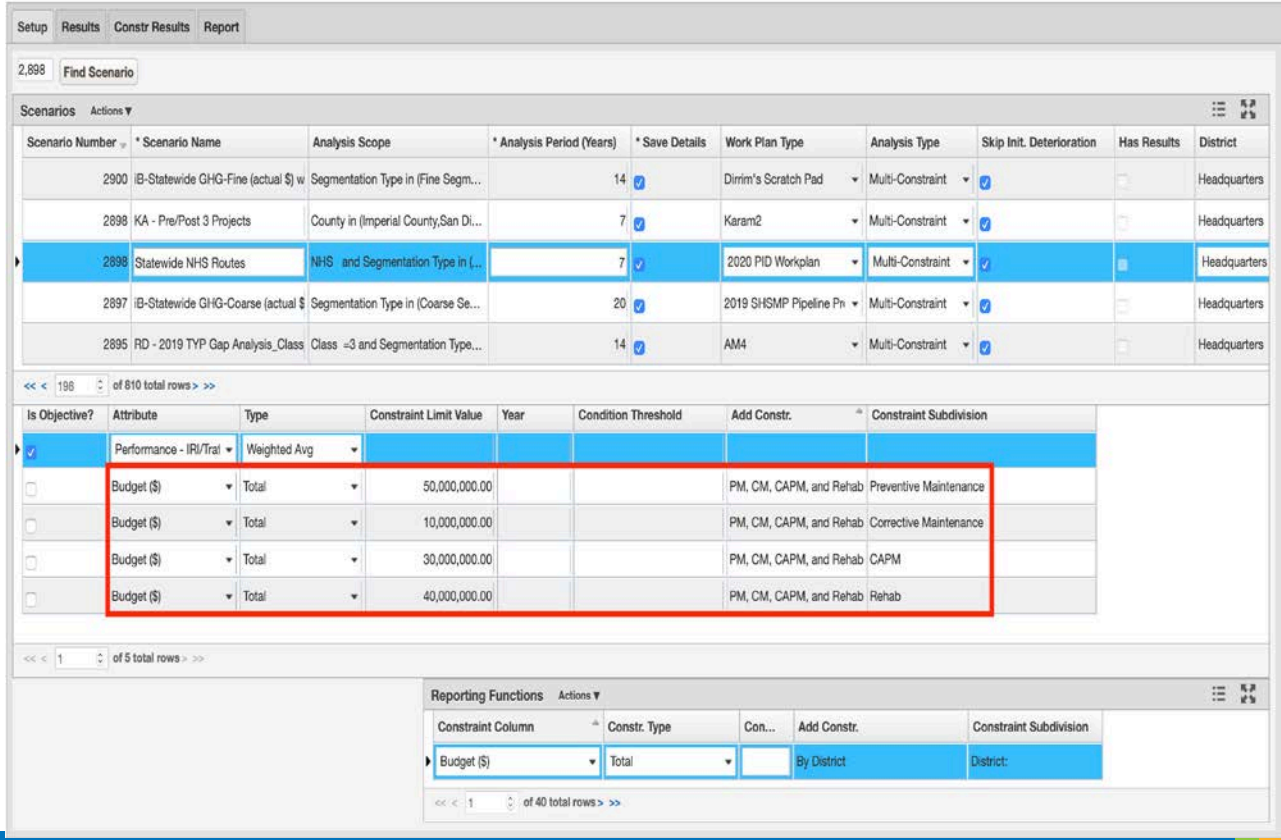

Selection
View/Edit
Flexible Total Cracking Value<=50
HMA Medium Overlay
50<Flexible Total Cracking Value<=90
RUT AVG<=0.5
AADT<30000
Seal Coat - Corrective
AADT>=30000
HMA Thin Overlay
RUT AVG>0.5
HMA Medium Overlay
CRACKING - HMA WHEELPATH (%)<=5.01
Mean Profile Depth<=2
Do Nothing
Crack Sealing Decision Flag:
No
Mean Profile Depth>=2
Seal Coat - Corrective
IRI AVG (in/mi)<=170
Crack Sealing Decision Flag:
Yes
Seal Cracks
Flexible Total Cracking Value>90
RUT AVG<=0.5
IRI AVG (in/mi)>170
HMA Thin Overlay
RUT AVG>0.5
HMA Medium Overlay
5.01<CRACKING - HMA WHEELPATH (%)<=10.01
AADT<30000
Cold In-Place Recycling
AADT>=30000
HMA Medium Overlay
10.01<CRACKING - HMA WHEELPATH (%)<=30.01
HMA Thick Overlay
CRACKING - HMA WHEELPATH (%)>30.01
AADT<30000
Full Depth Reclamation
AADT>=30000

Example

AADT CURRENT<100.0001
ACP ALLIG CRK LI<=3.0001
NEEDS NOTHING
3.0001<ACP ALLIG CRK LI<=25.0001
ACP-PM
25.0001<ACP ALLIG CRK LI<=50.0001
ACP-LR
50.0001<ACP ALLIG CRK LI<=80.0001
ACP-MR
ACP ALLIG CRK LI>80.0001
ACP-HR
100.0001<=AADT CURRENT<1000.0001
ACP ALLIG CRK LI<=3.0001
NEEDS NOTHING
3.0001<ACP ALLIG CRK LI<=20.0001
ACP-PM
20.0001<ACP ALLIG CRK LI<=45.0001
ACP-LR
45.0001<ACP ALLIG CRK LI<=60.0001
ACP-MR
ACP ALLIG CRK LI>60.0001
1000.0001<=AADT CURRENT<5000.0001
ACP ALLIG CRK LI<=3.0001
NEEDS NOTHING
3.0001<ACP ALLIG CRK LI<=15.0001
ACP-PM
15.0001<ACP ALLIG CRK LI<=40.0001
ACP-LR
40.0001<ACP ALLIG CRK LI<=55.0001
ACP-MR
ACP ALLIG CRK LI>55.0001
ACP-HR
AADT CURRENT>=5000.0001
ACP ALLIG CRK LI<=3.0001
NEEDS NOTHING
3.0001<ACP ALLIG CRK LI<=10.0001
ACP-PM
10.0001<ACP ALLIG CRK LI<=35.0001
ACP-LR
35.0001<ACP ALLIG CRK LI<=50.0001
ACP-MR

Preservation Technique: Analysis Scenario Constraint

Design scenarios with sub-divided budget constraints



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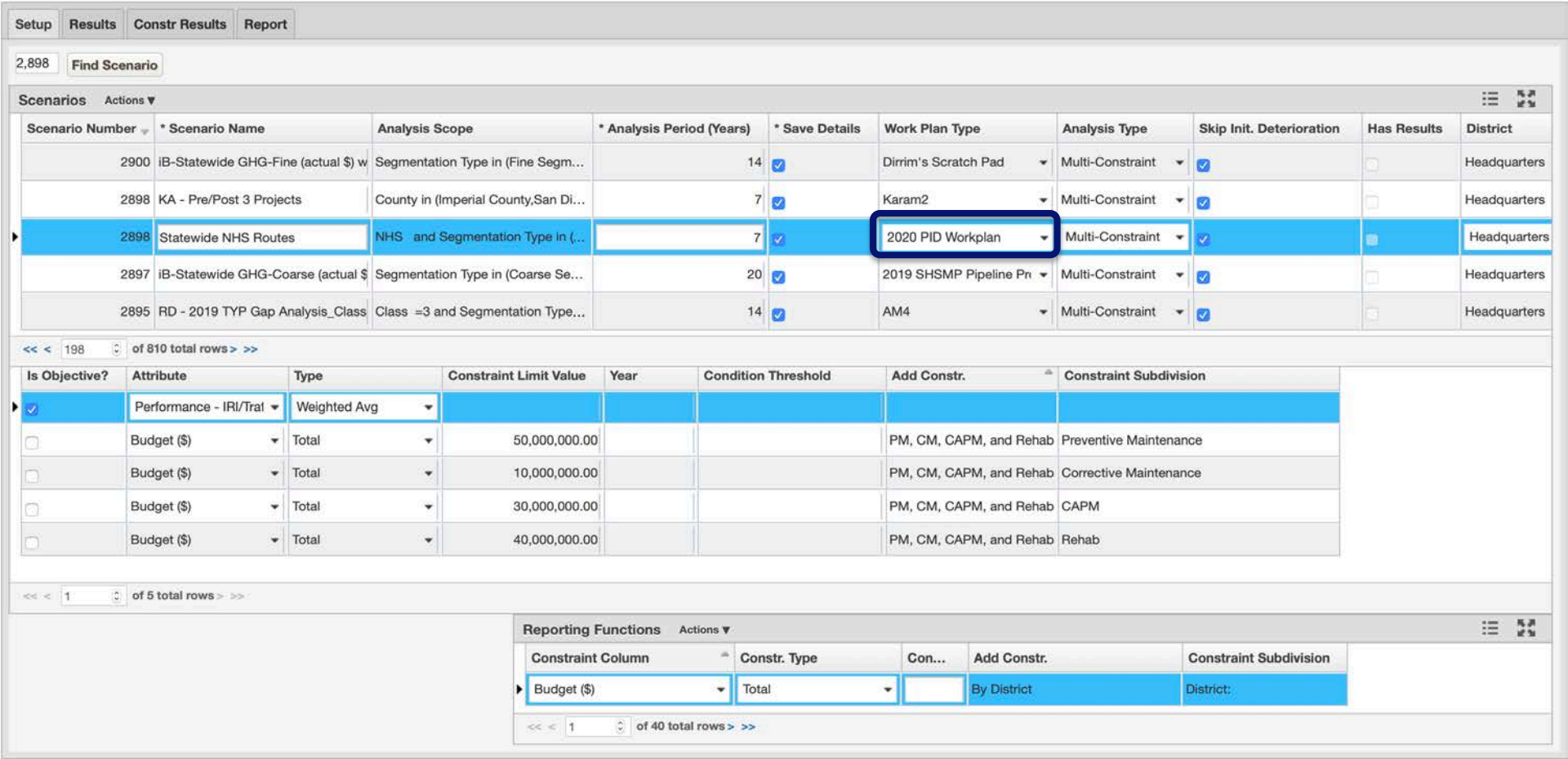
Preservation Technique: Import Existing Workplans



Summary

- Decision Tree Criteria
- Treatments, Benefit/Cost and Condition Reset
- Optimization constrained by budget group
- Use existing preservation-based work plans

- Quality Data

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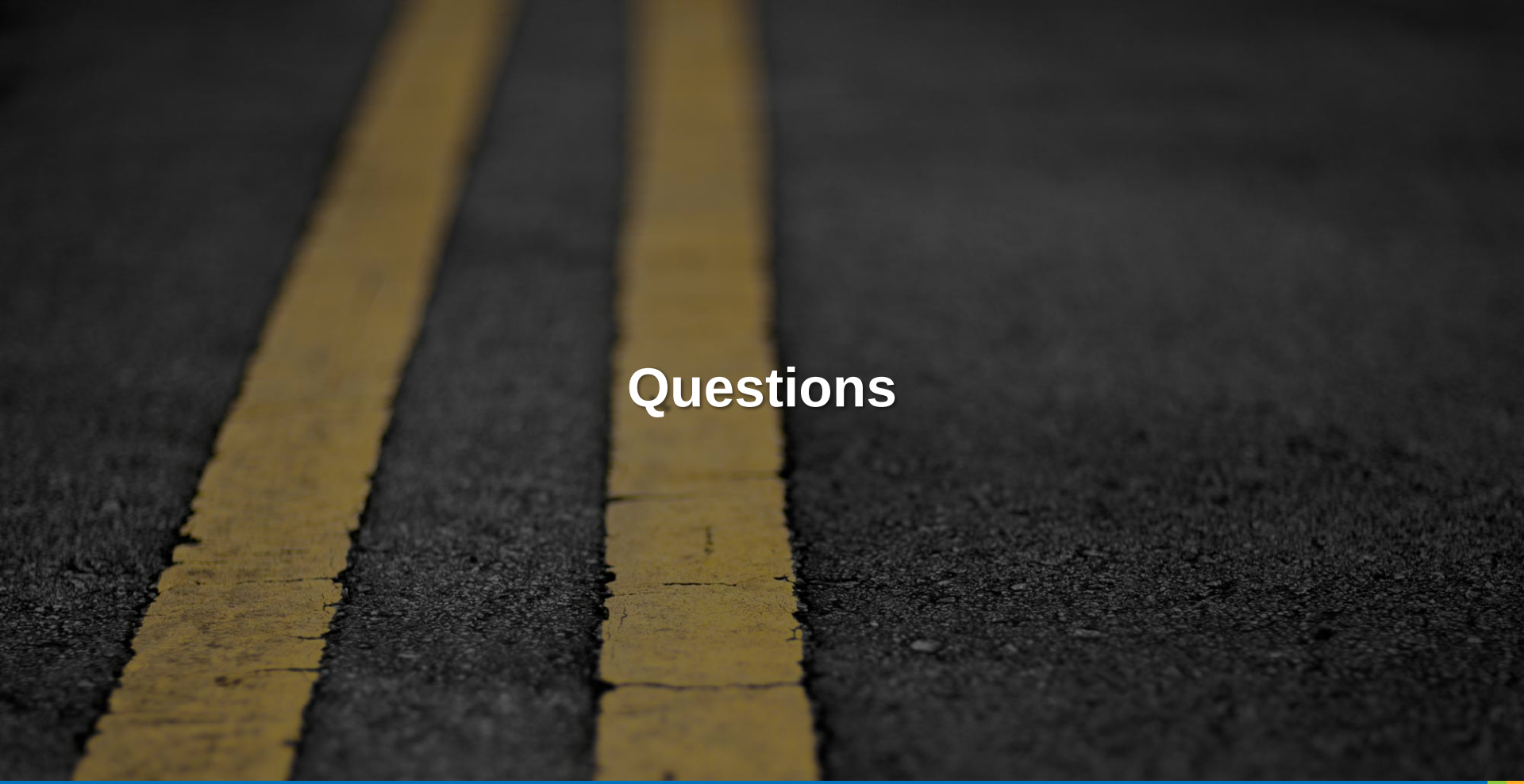

Questions

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