

ITD ASSET MANAGEMENT - AN OVERVIEW

1.

ITD ASSET MANAGEMENT - AN OVERVIEW

ORGANIZATIONAL ASPECTS

2.

ITD ASSET MANAGEMENT - AN OVERVIEW

ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES

3.

ITD ASSET MANAGEMENT - AN OVERVIEW

ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES RESEARCH PROJECTS

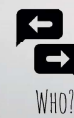
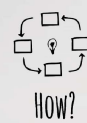
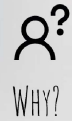
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ITD ASSET MANAGEMENT - AN OVERVIEW

ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES RESEARCH PROJECTS



5.



6.

WHAT IS ASSET MANAGEMENT?

Government Definition:

transportation Asset Management (MAP-21) - "...a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets a minimum practicable cost."

Doing the right treatment at the right time for the right reason.

7.

ITD ASSET MANAGEMENT TIMELINE



The Times have changed - Mission is Still the Same

Mission

- Monitor assets throughout their life - cycle
- Effectively collecting quality data,
- Developing accurate predictive models and investment scenarios,
- Communicating & prioritizing needs across the state, with a focus on stakeholder engagement,
- Provide continuity & effective service which ensure focused stewardship of tax dollars.

8.

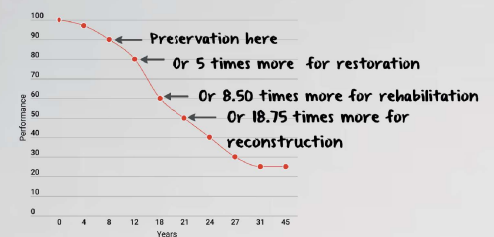
WHY?

IT'S THE RIGHT THING TO DO!
(AND WE HAVE TO)



9.

COST ACROSS THE PAVEMENT LIFE-CYCLE



10.

HIGHWAY PERFORMANCE MONITORING SYSTEM (HPMS)

Federally Mandated



Measure National Performance

Monitor System Condition



Apportionment

11.

TRANSPORTATION ASSET MANAGEMENT PLAN (TAMP)

Focuses on ITD Processes for Asset Performance, Targets and Financial Planning

8 Required Sections

- | | |
|-----------------------|-----------------------|
| Management Objectives | Life-Cycle Planning |
| Summary of Conditions | Risk Management |
| Measures and Targets | Financial Planning |
| Performance Gaps | Investment Strategies |

12.

HOW?

13.



14.

Keys to Success

1. Be "Quality - Centric "
2. Honor the People
3. Define the Process
4. Respect the Tech
5. Life-Cycle -> Go with the flow
6. Align with and Drive Asset Management objectives

15.



16.



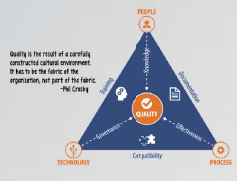
17.

Quality is the result of a carefully constructed cultural environment. It has to be the fabric of the organization, not part of the fabric.
-Phil Crosby

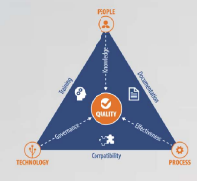


18.

HOW?



HOW?



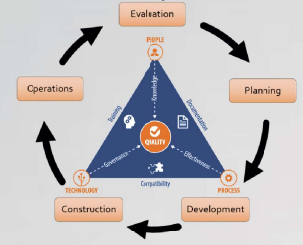
HOW?

Life-Cycle

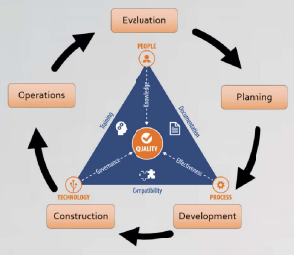


HOW?

Life-Cycle

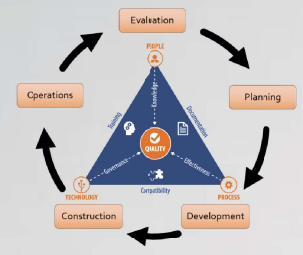


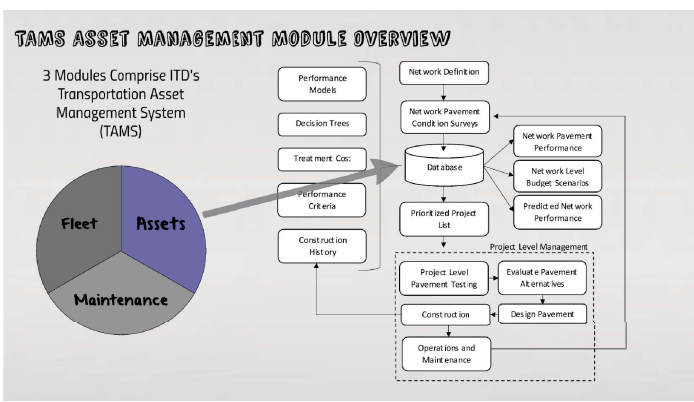
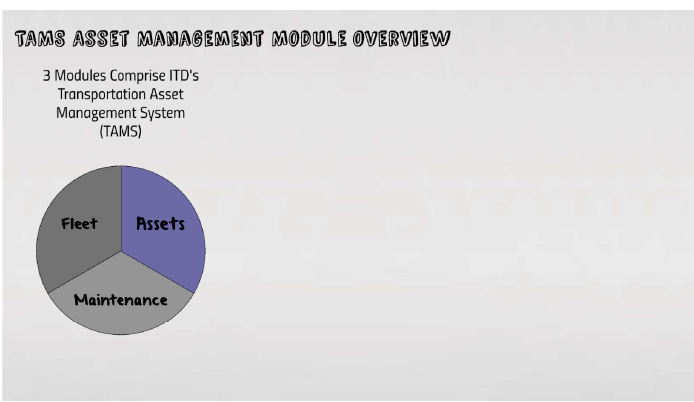
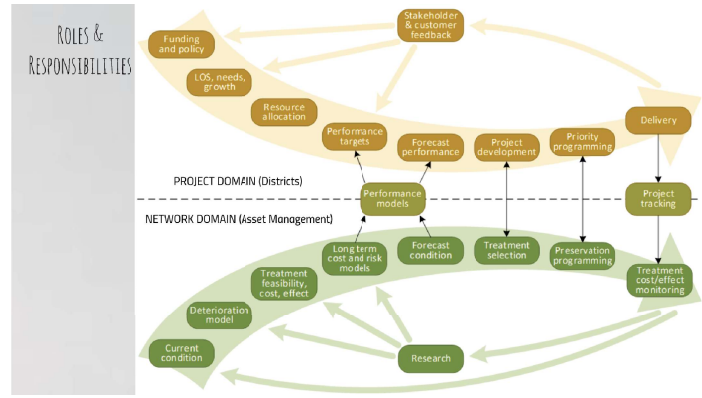
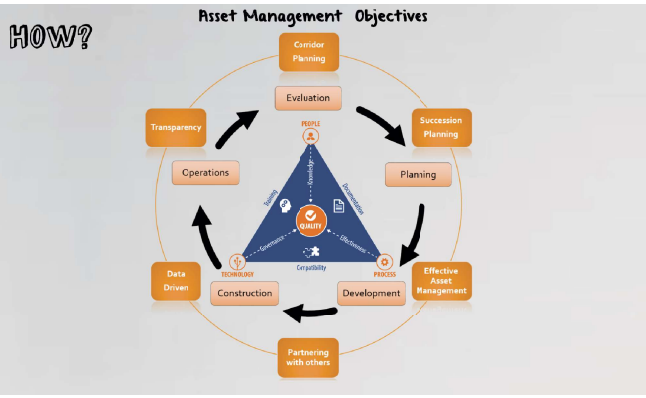
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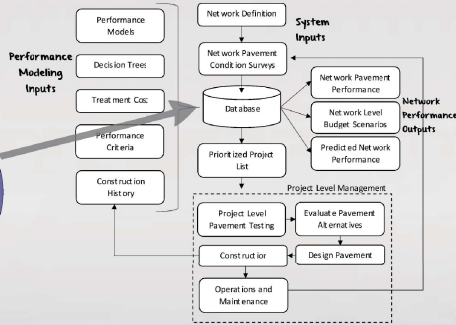
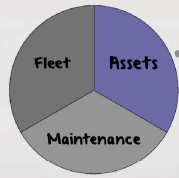
Asset Management Objectives





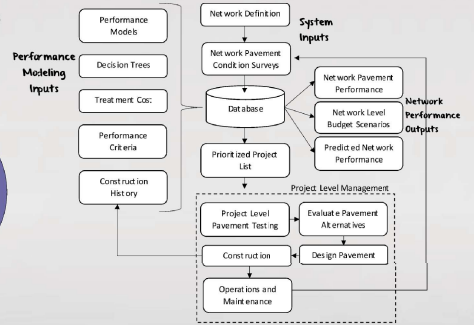
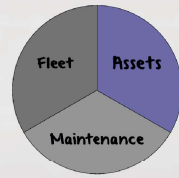
TAMS ASSET MANAGEMENT MODULE OVERVIEW

3 Modules Comprise ITD's Transportation Asset Management System (TAMS)



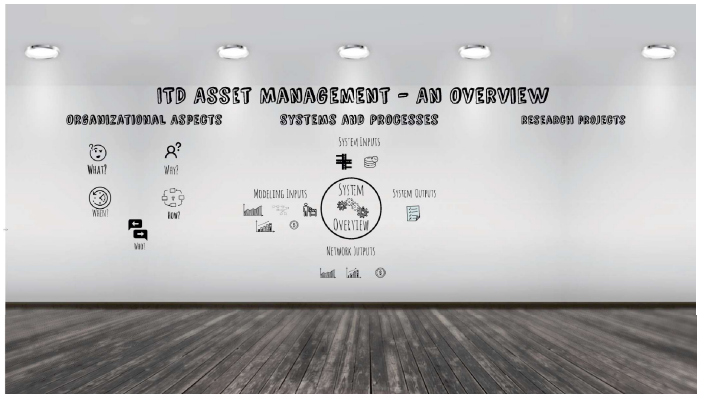
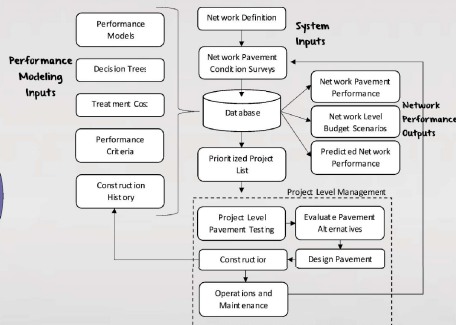
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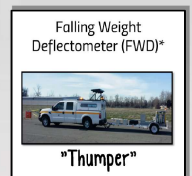
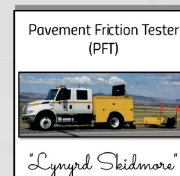


SYSTEM INPUTS



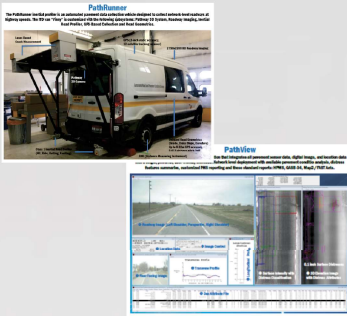
NETWORK PAVEMENT CONDITION SURVEYS

NETWORK PAVEMENT CONDITION SURVEYS - ALL STAR LINEUP



* Used on the project level

PATHWAY INERTIAL PROFILER



- Collects rutting, roughness, cracking, geometrics, GPS position, and roadway images
- Collect entire network every year
- Primary input into TAMS
- Produces the "Video Log"
- 5.2 million points per second
- 15 photos per second
- 15 TB data per year

37.

PAVEMENT FRICTION TESTING



WHY?

- Key component of roadway safety;
- ~20% of crashes occur on wet pavement
-
- Approximately 14% of all fatal crashes occur on wet pavement;
- Ensuring acceptable friction levels leads to 50-60% decrease in wet weather accidents;

38.

ITD ASSET MANAGEMENT - AN OVERVIEW

ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES RESEARCH PROJECTS



39.

MODELING INPUTS



40.

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ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES RESEARCH PROJECTS

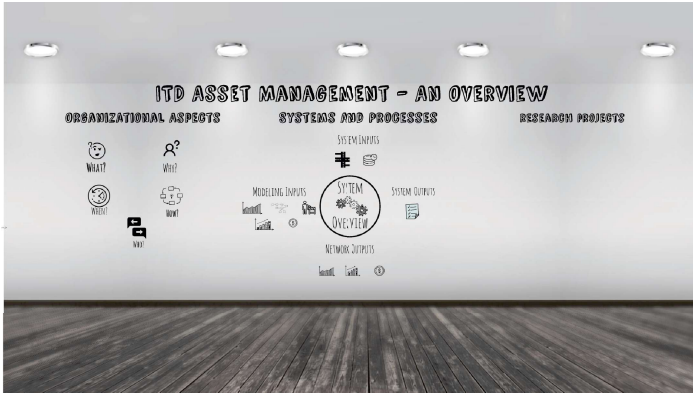


41.

NETWORK OUTPUTS



42.



43.

PRIORITIZED PROJECT LIST

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Clearance Dist.	Plan No.	Budget Group	Treatment	Estimate C.Y.	Route	Dist.	Manag. Dist.	Logment Dist.	Manag. C.	Logment C.	Length	1	2	3	4	5	6	7	8
2	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	8,000	501B	8,000	501B	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
3	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	9,000	501B	9,000	501B	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
4	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	10,000	501B	10,000	501B	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
5	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	11,000	501B	11,000	501B	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
6	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	12,000	501B	12,000	501B	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
7	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	13,000	501B	13,000	501B	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
8	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	14,000	501B	14,000	501B	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000
9	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	15,000	501B	15,000	501B	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
10	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	16,000	501B	16,000	501B	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
11	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	17,000	501B	17,000	501B	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000
12	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	18,000	501B	18,000	501B	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
13	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	19,000	501B	19,000	501B	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000
14	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	20,000	501B	20,000	501B	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
15	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	21,000	501B	21,000	501B	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
16	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	22,000	501B	22,000	501B	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
17	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	23,000	501B	23,000	501B	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000
18	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	24,000	501B	24,000	501B	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
19	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	25,000	501B	25,000	501B	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
20	501A	DISTRICT 5	Restoration	Restoration - Flexible	ASG	ALL	26,000	501B	26,000	501B	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000

44.

PRIORITIZED PROJECT LIST

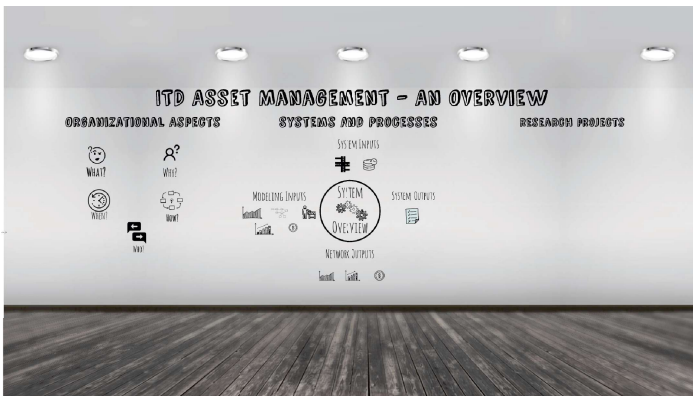
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Clearance Dist.	Plan No.	Budget Group	Treatment	Estimate C.Y.	Route	Dist.	Manag. Dist.	Logment Dist.	Manag. C.	Logment C.	Length	1	2	3	4	5	6	7	8
13	601A	DISTRICT 6	Restoration	Restoration - Flexible	ASG	ALL	5582.490	1015	5582.490	1015	5582.490	5582.490	5582.490	5582.490	5582.490	5582.490	5582.490	5582.490	5582.490
14	601A	DISTRICT 6	Restoration	Restoration - Flexible	ASG	ALL	879.648	1015	879.648	1015	879.648	879.648	879.648	879.648	879.648	879.648	879.648	879.648	879.648
15	601A	DISTRICT 6	Restoration	Restoration - Flexible	ASG	ALL	52,616.768	1015	52,616.768	1015	52,616.768	52,616.768	52,616.768	52,616.768	52,616.768	52,616.768	52,616.768	52,616.768	52,616.768
16	601A	DISTRICT 6	Restoration	Restoration - Flexible	ASG	ALL	5784.735	1015	5784.735	1015	5784.735	5784.735	5784.735	5784.735	5784.735	5784.735	5784.735	5784.735	5784.735

Humans always make the decisions. Computers assist us by processing data, consistently following processes, performing unbiased analysis, and providing information.

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45.

46.

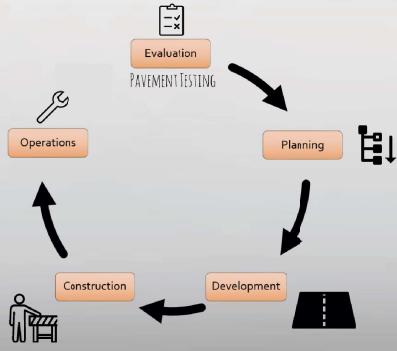


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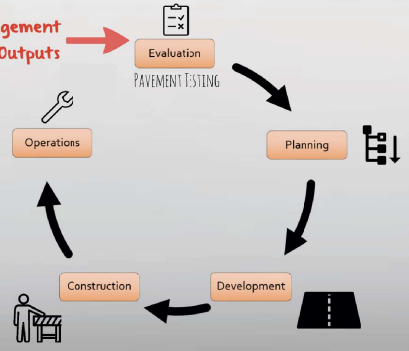
48.

PROJECT LEVEL PAVEMENT MANAGEMENT & LIFECYCLE



PROJECT LEVEL PAVEMENT MANAGEMENT & LIFECYCLE

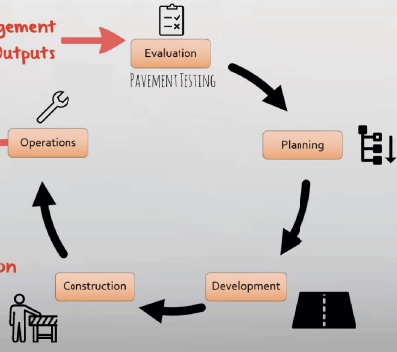
From Asset Management Project Outputs



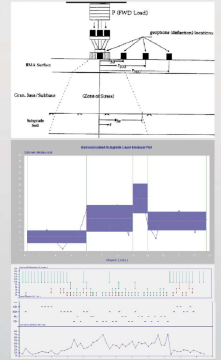
PROJECT LEVEL PAVEMENT MANAGEMENT & LIFECYCLE

From Asset Management Project Outputs

To Asset Management Network Evaluation



FALLING WEIGHT DEFLECTOMETER (FWD)

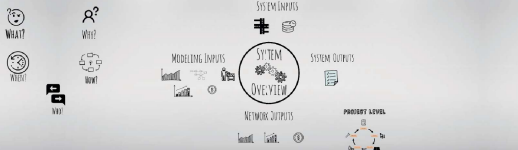


WHY?

- Non-Destructive Test;
- Can determine what is failing (i.e. base or pavement);
- Estimate remaining pavement life;
- Simulates the expected deflection from a moving load ;
- Can be used in conjunction with distress survey;
- Identify locations for destructive testing;
- Tailor treatments within project limits;
- Recommended for overlay design.

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ORGANIZATIONAL ASPECTS SYSTEMS AND PROCESSES RESEARCH PROJECTS



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55.

RESEARCH PROJECTS

Travel Speed
Deflectometer

Next Gen
Performance
Measures

Skid Number
Translation

56.

TRAVEL SPEED DEFLECTOMETER (TSD)



- State of the Art
- Measures structural capacity
- Builds on D6 work
- Part of a 3-year multi-state pooled fund study
- Collecting over 2,500 miles
- Allow ITD to tailor pavement treatments
- High ROI

57.

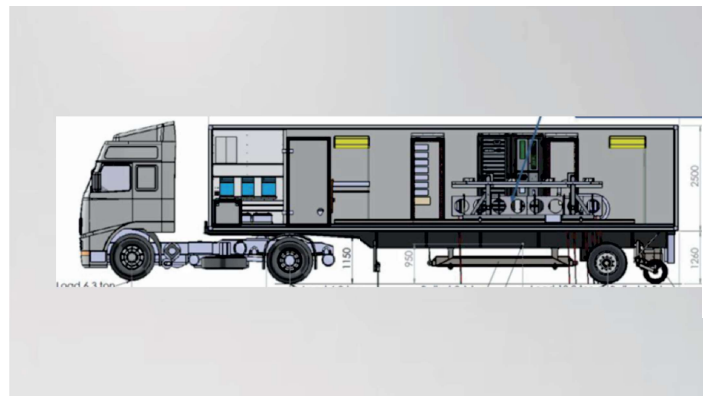
TRAVEL SPEED DEFLECTOMETER (TSD)



58.



59.



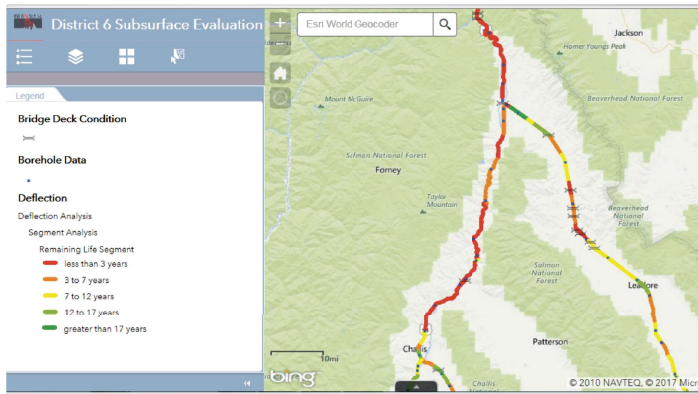
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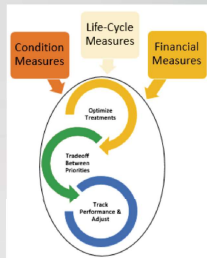
63.



64.

NEXT GEN PERFORMANCE MEASURES

Project Background and Description - Utilizing existing data, processes, and asset management systems, validate and apply 8 leading performance measures and a cross asset optimization to determine benefit of long-term investment strategizing and decision-making.



- Optimize treatments through Life cycle planning and Project selection
- Perform Trade-off Analysis using Cross-asset and Cross-program analysis to build Program
- Monitor Performance using TPM, Level of Service, and State of good repair
- Not a black box solution, this is a framework which will enable and inform ITD decision makers regarding implications of prioritization across competing programs and assets.

65.

SKID NUMBER TRANSLATION

This study had the following objectives:
 Examine the correlation between SN, pavement and speed
 Investigate the effect of pavement characteristics on the measured SN
 Develop a statistical model that can be used to predict SN at a reference speed
 Develop a software utility that can be used by operators to easily convert SN to different speeds.

• We got an equation:

$$SN_2 = 0.97145 \cdot SN_1 - 0.58093(V_2 - V_1) + 1.37935MPD$$



Improved SAFETY
 Improved EFFECTIVENESS
 Showed value of CONSTRUCTIVE CULTURE

66.



67.



68.

TAKE AWAYS

- Asset Management takes more than a computer program.
- Effective AM does the best with less.
- Quality AM requires people, process, technology.
- AM occurs across the pavement life cycle
- Network AM vs Project AM
- AM is about changing "data" into "information"

69.



70.