



Using MAP-21/FAST TAMP to Strengthen New Mexico DOT's TAM Program

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July 12, 2016**

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Hyun-A Park, Spy Pond Partners, LLC**





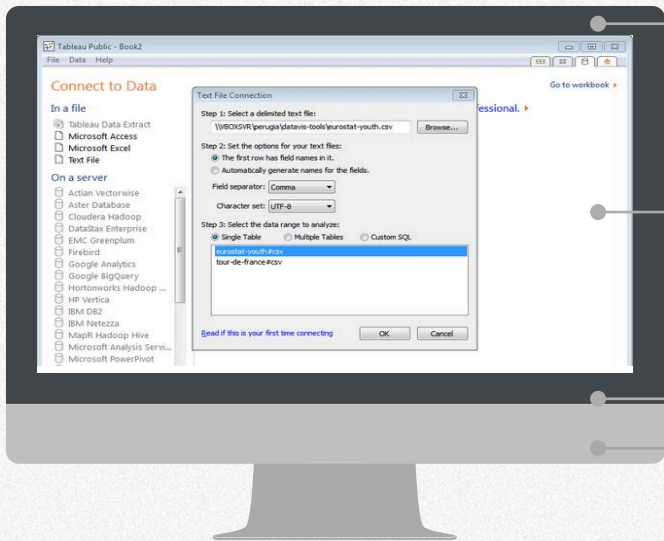
TAM Mission

NMDOT uses data-driven asset management to maximize use of limited public resources and maintain the state's transportation infrastructure in the best possible condition.

Do what you can, with what you have, where you are.
Theodore Roosevelt 26th president of US (1858 - 1919)

Self-Serve Data

Making data available for:



1

Download when needed

2

Generating your own reports

3

Mapping

4

Graphing



Self-Service Data

Route Details

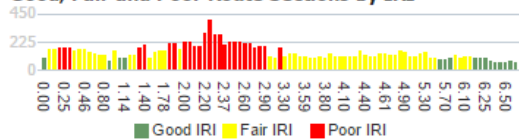
Year: 2013
NHS: NHS Interstate:NHS I
District: (All Column Values)
ADT Range: (All Column Values)
Urban/Rural: (All Column Values)
MPO Boundary: (All Column Values)
Functional Class: (All Column Values)

Owner: (All Column Values)
Route Id: BL-13-P
Segment Begin MP: --Select Value--
Segment End MP: --Select Value--

Mon Apr 18 2016

Pavement Condition

Good, Fair and Poor Route Sections by IRI

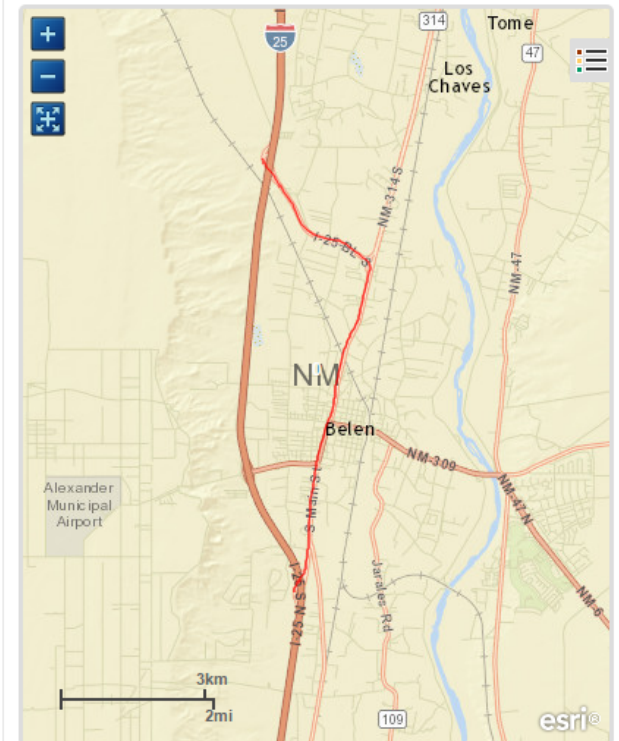


Asset Inventory

Barrier Length in Miles
No data found

Refresh

Route

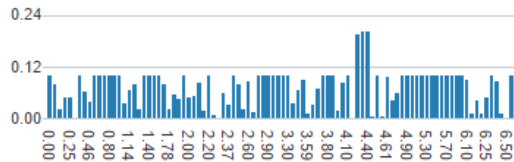


Road Accident Summary

Fatality Rate per 100 Million Vehicle Miles
No data found

Refresh

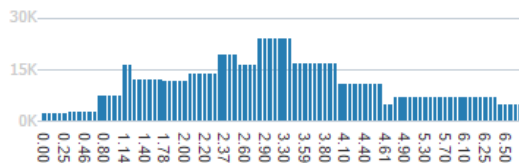
Cost Per Centreline Miles



Average Treatment Cost per Centreline Miles

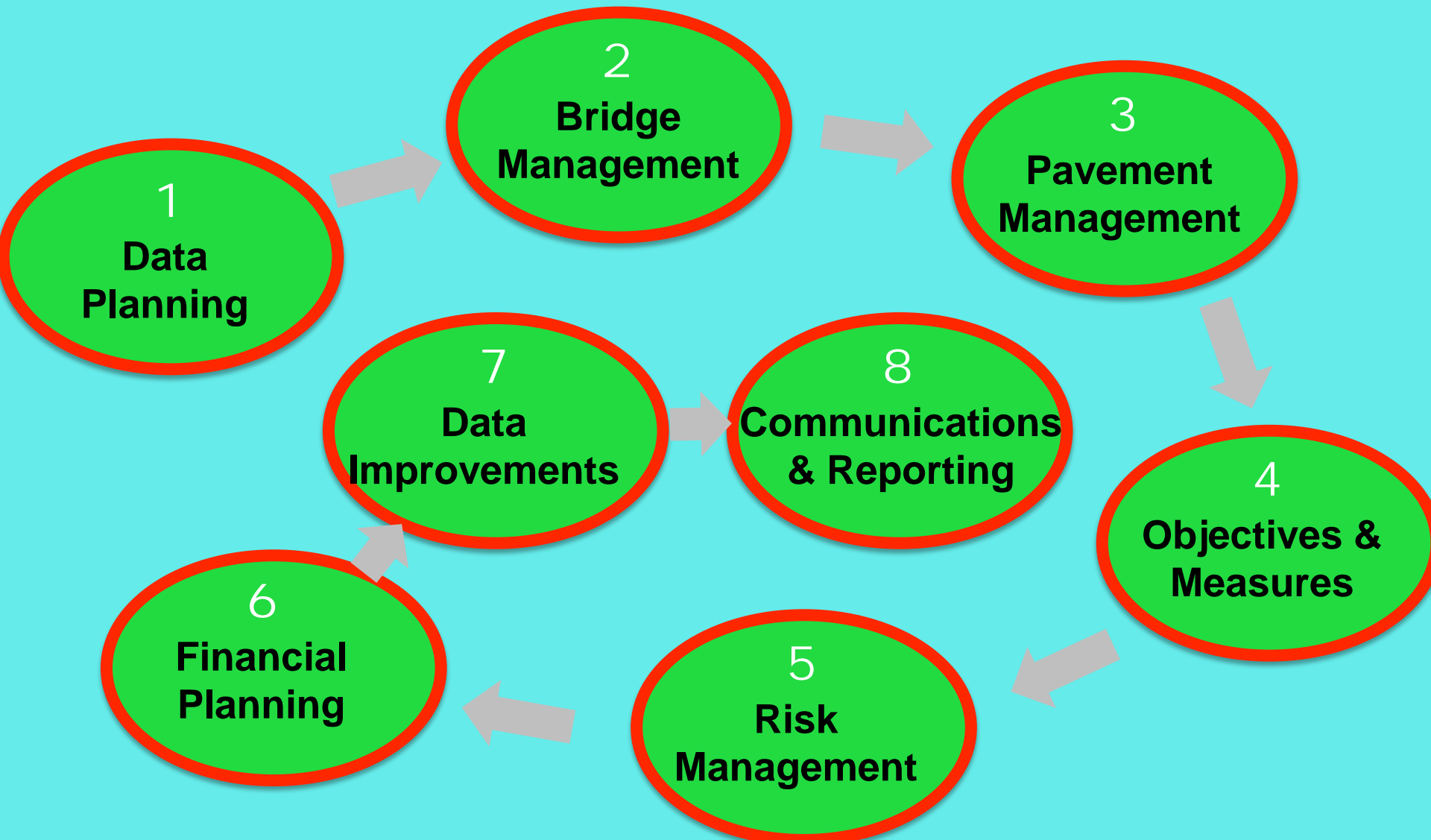


Average AADT



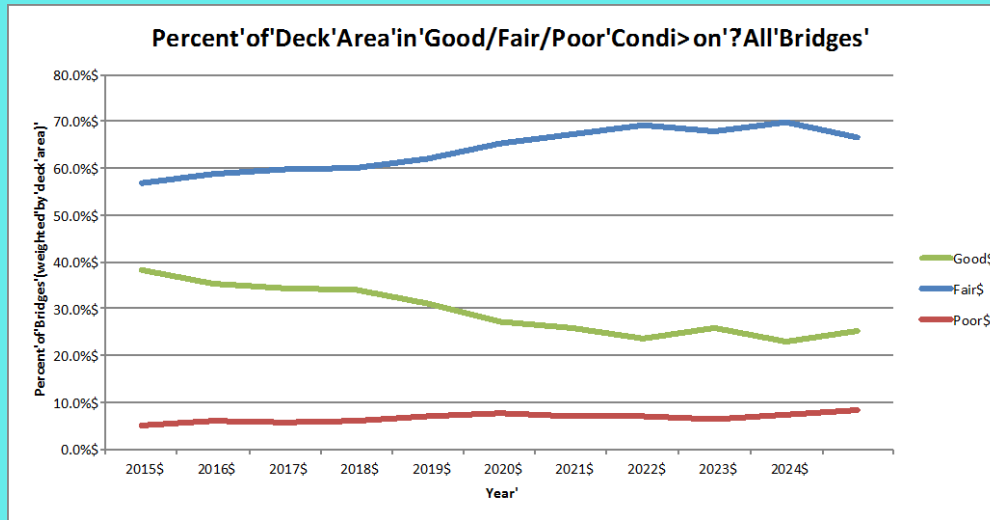


Workshops





Bridge Management Workshop



Budget and Results by Year All Bridges

Year	Budget	Adj Budget	Need	Spent	Avg Condition			% of Deck Area		
					Deck	Super	Sub	Good	Fair	Poor
2015	63,000,000	63,000,000	336,875,704	61,944,172	6.4	6.5	6.3	38.2%	56.8%	5.1%
2016	63,000,000	64,055,828	359,279,252	63,185,556	6.5	6.5	6.4	35.4%	58.6%	6.0%
2017	63,000,000	63,870,272	343,178,476	61,343,054	6.5	6.6	6.4	34.4%	59.8%	5.8%
2018	63,000,000	65,527,218	306,921,082	62,401,632	6.5	6.6	6.5	33.9%	60.2%	6.0%
2019	63,000,000	66,125,586	311,215,516	34,695,618	6.5	6.6	6.5	31.0%	61.9%	7.1%
2020	63,000,000	94,429,968	321,368,492	80,035,230	6.5	6.6	6.4	27.3%	65.2%	7.6%
2021	63,000,000	77,394,738	298,064,326	42,291,922	6.5	6.6	6.5	25.8%	67.2%	7.0%
2022	63,000,000	98,102,816	311,987,732	98,057,474	6.4	6.6	6.4	23.6%	69.3%	7.1%
2023	63,000,000	63,045,342	251,079,930	21,000,594	6.5	6.6	6.5	25.9%	67.8%	6.4%
2024	63,000,000	105,044,748	307,030,318	103,581,834	6.4	6.6	6.4	22.8%	69.8%	7.4%
Total	630,000,000		203,448,484	628,537,086	6.5	6.6	6.5	25.2%	66.6%	8.2%



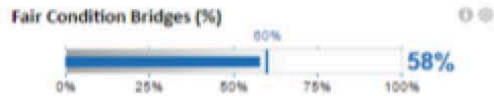
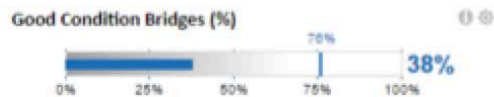
Bridge Dashboard

Bridges

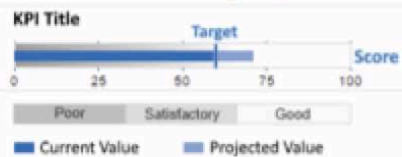
Scenarios: Year: NHS: District: ADT Range: Urban/Rural: MPO Boundary: Municipality: Functional Class:

Route:

Bridge Performance Measures



Legend



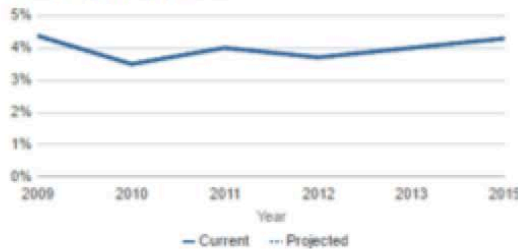
Scenario	Description
Current	Current or Historical data

Bridge Deficiency Status

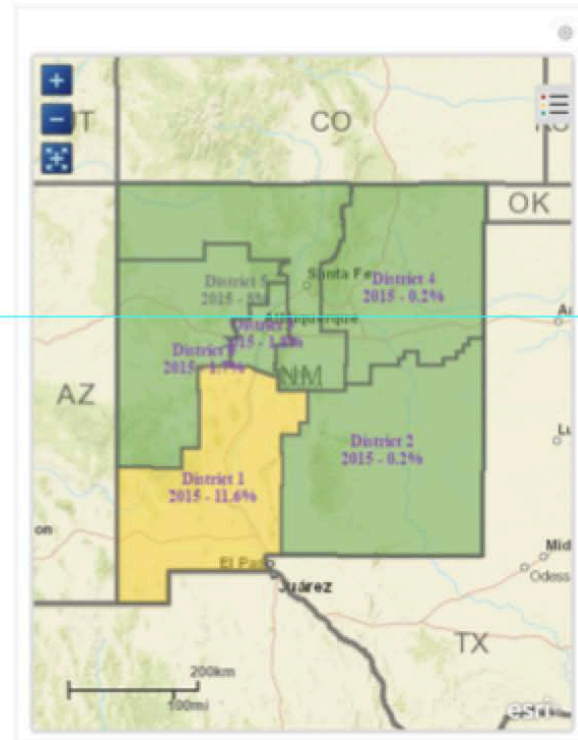
Breakdown by Bridge Map21 Condition



% Deck Area in Poor Condition

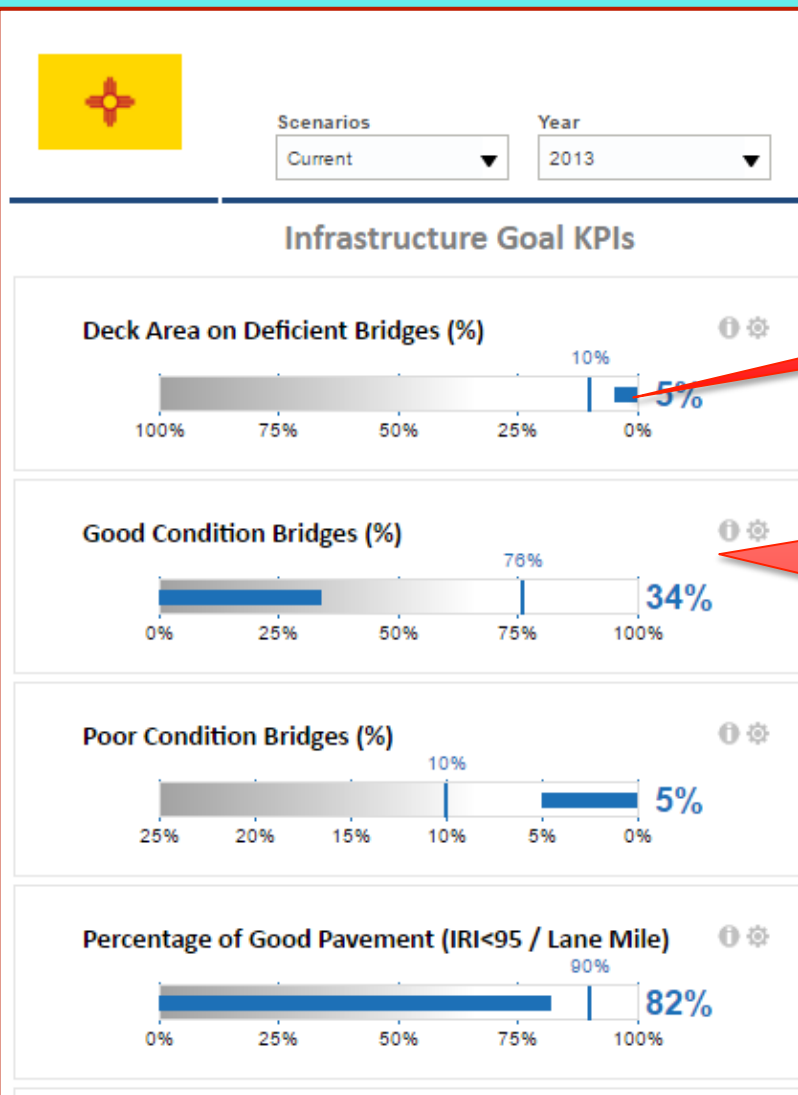


Percent of Deck Area Deficient





Bridge Condition



State Target

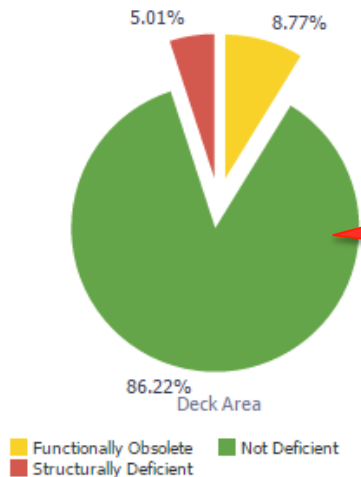
Current Condition Metric based on Applied Filters



Bridge Deficiency

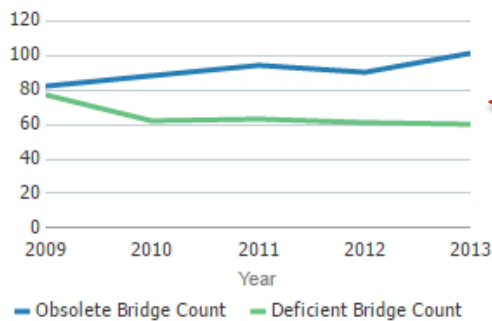
Bridge Deficiency Status

Breakdown by Bridge Deck Area%



Breakdown by Structurally Deficient (SD) and Functionally Obsolete

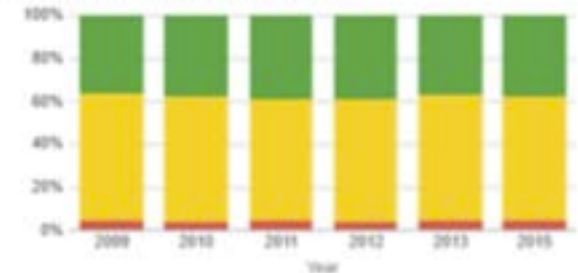
Annual Trend for Deficient Bridges



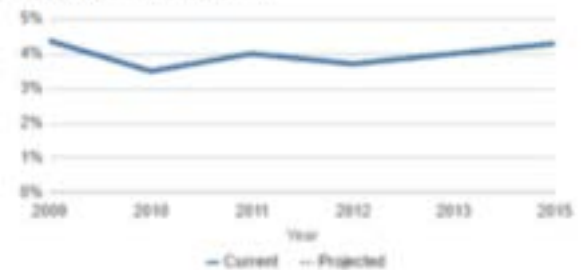
Annual Trends and Projected Values

Bridge Deficiency Status

Breakdown by Bridge Map21 Condition

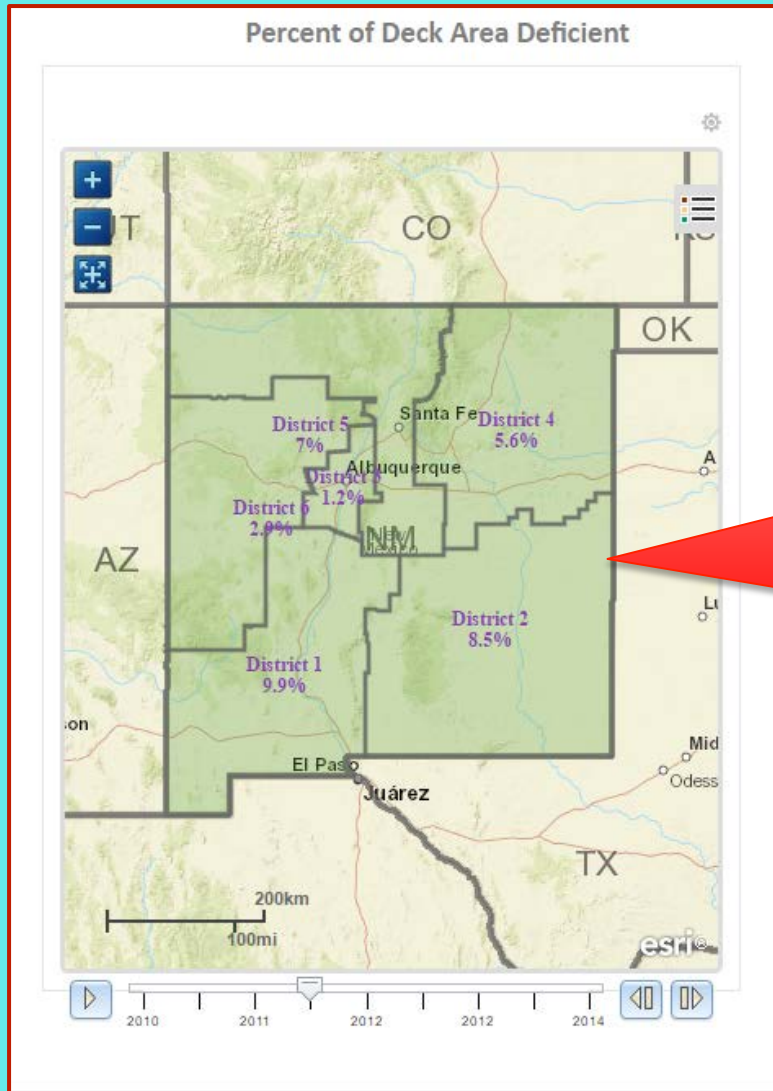


% Deck Area in Poor Condition





Bridge Deficiency by District



Data can be visualized spatially at District, County, MPO or Route Level

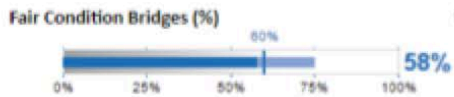
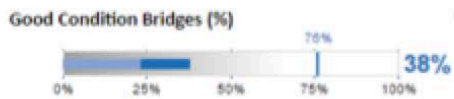


Investment Scenario - \$63M

Bridges

Scenarios: Bridge-Scenario1:Cur
Year: 2015
NHS: NHS Interstate:NHS I
District: (All Column Values)
ADIT Range: (All Column Values)
Urban/Rural: (All Column Values)
MPO Boundary: (All Column Values)
Municipality: (All Column Values)
Functional Class: (All Column Values)

Bridge Performance Measures

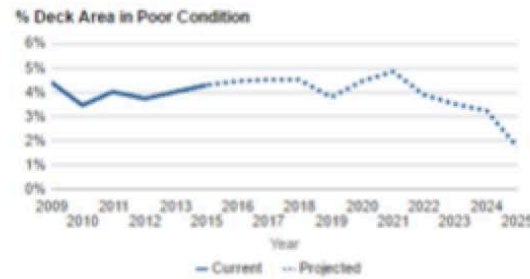
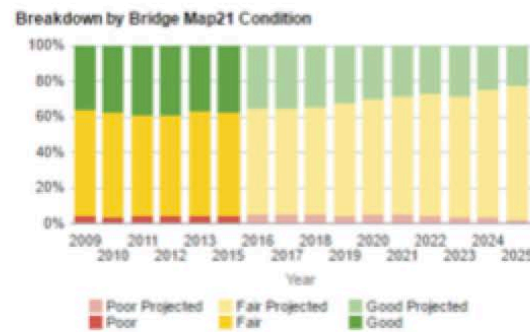


Legend

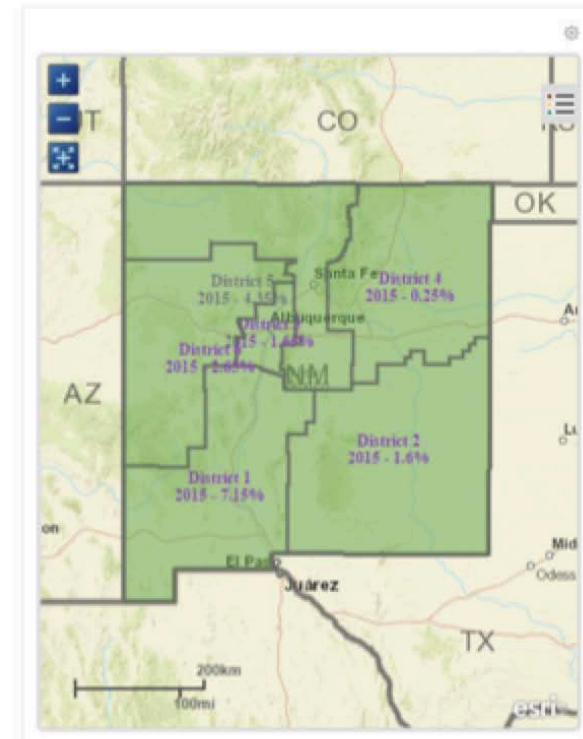


Scenario	Description
Current	Current or Historical data

Bridge Deficiency Status



Percent of Deck Area Deficient



Scenario 1: \$63M Investment annually



Investment Scenario - \$32M

Bridges

Scenarios: Year: NHS: District: ADT Range: Urban/Rural: MPO Boundary: Municipality: Functional Class:

Route:

Bridge Performance Measures

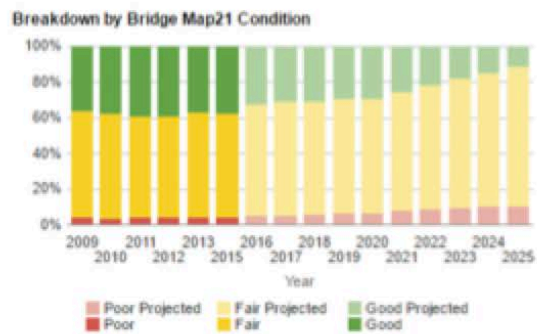


Legend

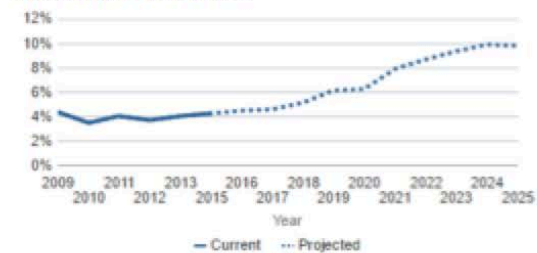


Scenario	Description
Current	Current or Historical data

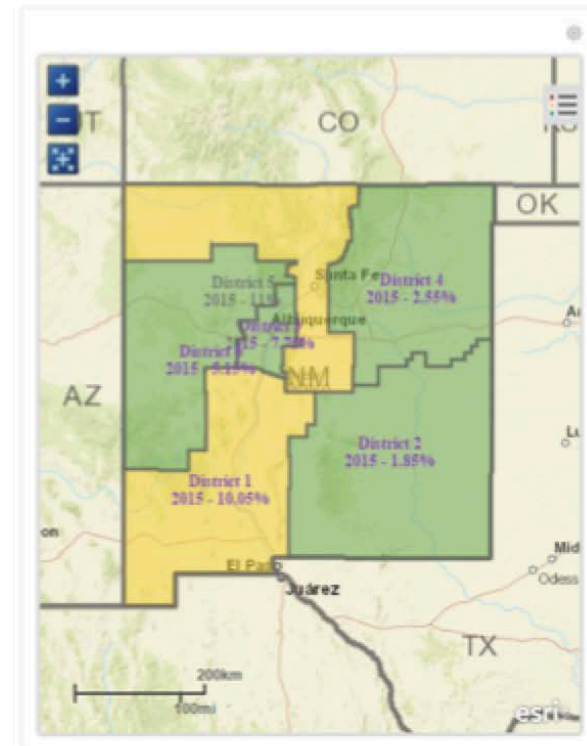
Bridge Deficiency Status



% Deck Area in Poor Condition



Percent of Deck Area Deficient



Scenario 3: \$32M Investment annually

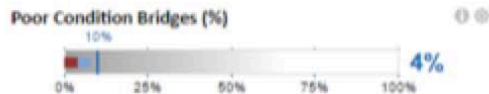
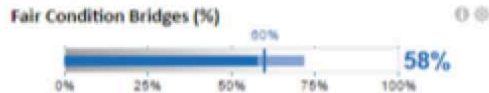


Investment Scenario - \$47M

Bridges

Scenarios: ge-Scenario4:Current | Year: 2015 | NHS: NHS Interstate/NHS I | District: (All Column Values) | ADT Range: (All Column Values) | Urban/Rural: (All Column Values) | MPO Boundary: (All Column Values) | Municipality: (All Column Values) | Functional Class: (All Column Values) | Route: (All Column Values)

Bridge Performance Measures

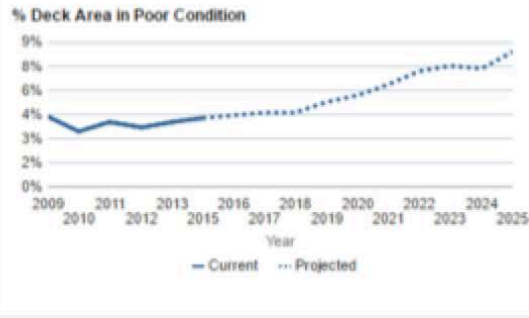
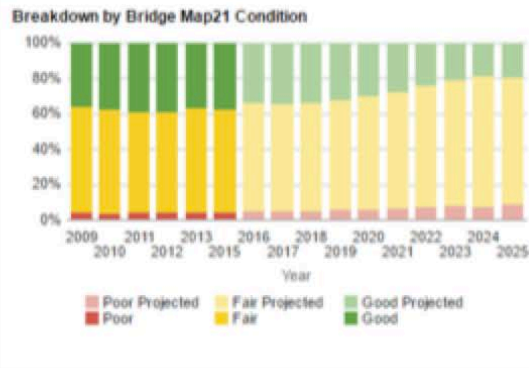


Legend

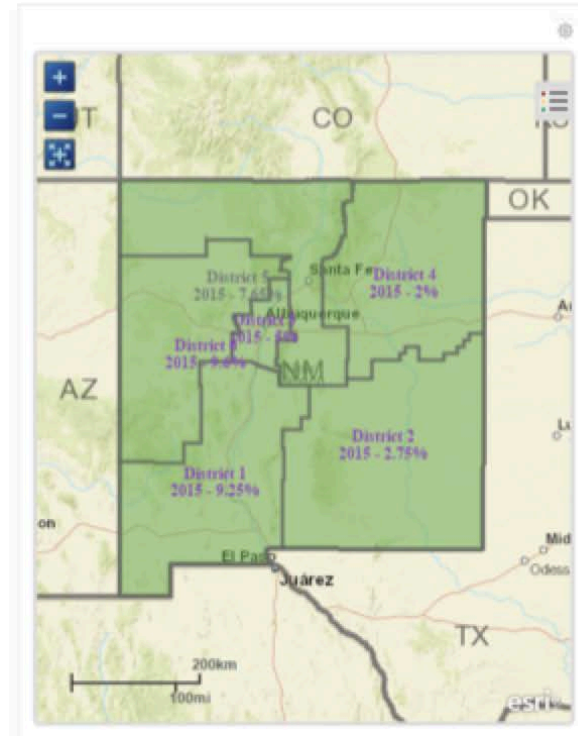


Scenario	Description
Current	Current or Historical data

Bridge Deficiency Status



Percent of Deck Area Deficient



Scenario 4: \$47M Investment annually



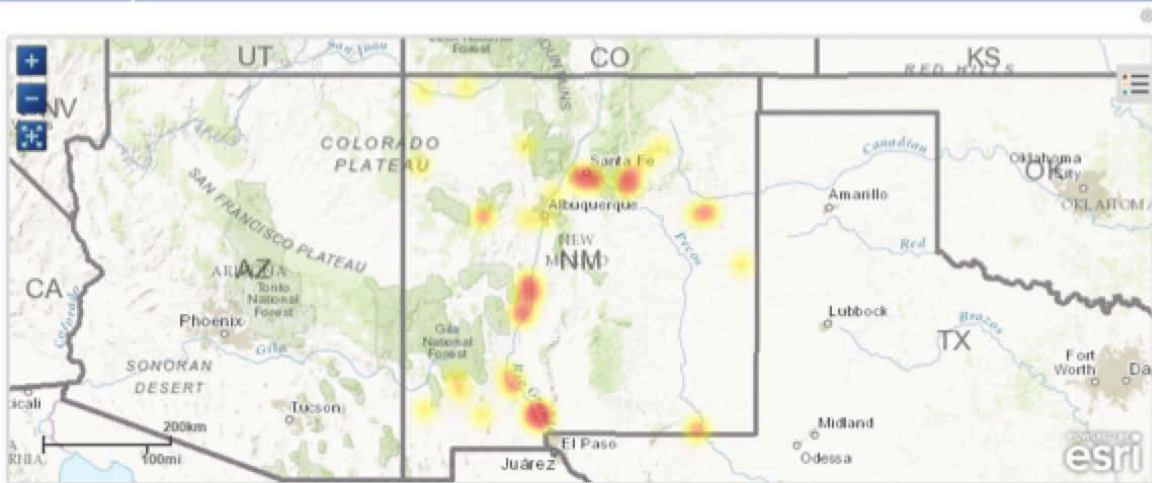
Bridge Inventory

Bridge Inventory

Scenarios: Current | Year: 2015 | NHS: NHS Interstate/NHS | District: (All Column Values) | ADT Range: (All Column Values) | Urban/Rural: (All Column Values) | MPO Boundary: (All Column Values) | Municipality: (All Column Values) | Functional Class: (All Column Values)

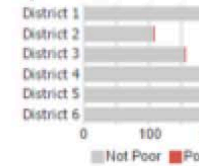
Route: (All Column Values)

Thu Jul 07 2016

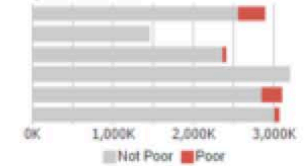


District distribution

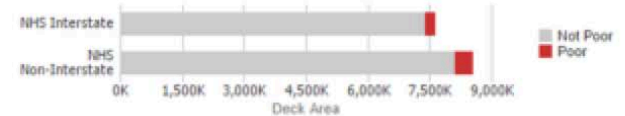
By Number



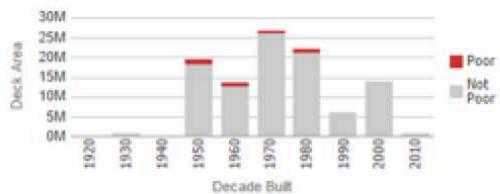
By Deck Area



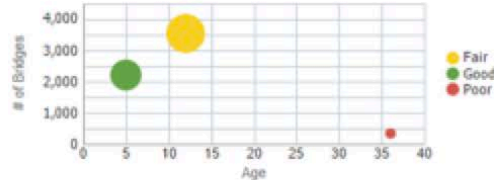
By NHS Category



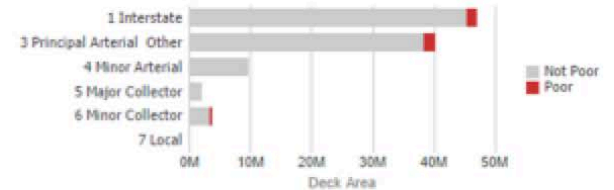
By Construction Decade



Condition by Age and Deck Area



By Functional Class





Pavement Dashboard

Pavement Condition

Scenarios: Current | Year: 2013 | NHS: NHS Interstate:NHS I | District: (All Column Values) | ADT Range: (All Column Values) | Urban/Rural: (All Column Values) | MPO Boundary: (All Column Values) | Municipality: (All Column Values) | Functional Class: (All Column Values)

Route: (All Column Values)

Pavement Performance Measures

Percentage of Good Pavement



Percentage of Poor Pavement



Asset Book Value vs. Replacement Cost



Annual Improvement of 1% in Urban roads



Annual Improvement of 1% in Rural roads

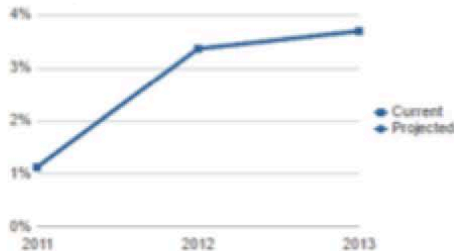


Pavement Condition Trends

Pavement Breakdown



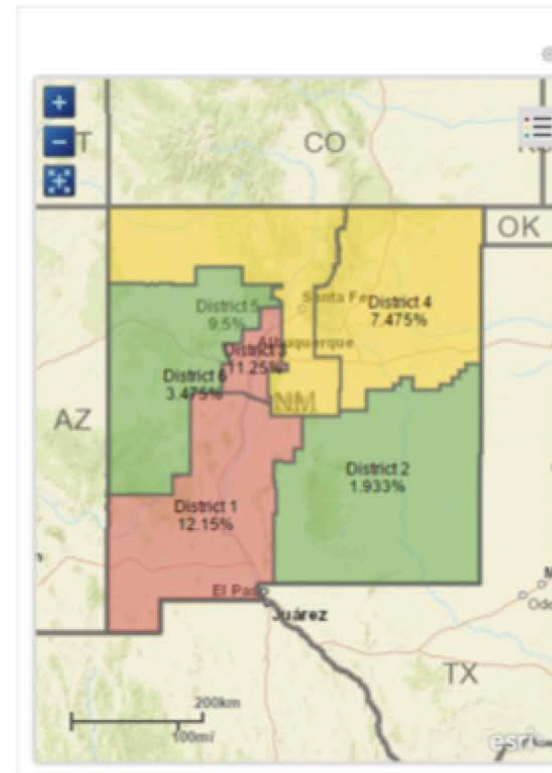
Percentage Of Poor Pavement



Legend

KPI Title | Target

Percent of Pavement in Poor Condition



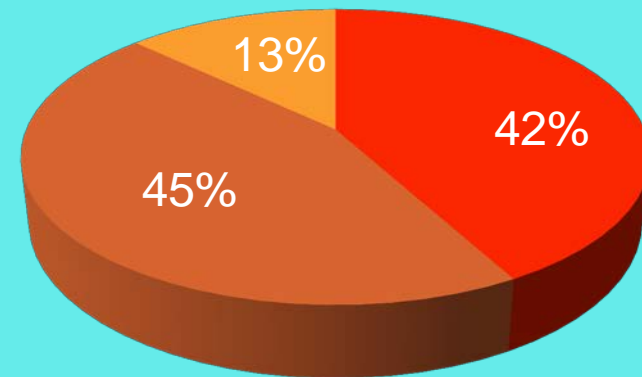


Historic NMDOT Allocations

- Averaged FY13 and FY14 STIP
- Divided reconstruction & new construction equally among Bridge, Pavement, and Other

STIP %

- Bridge
- Pavement Preservation
- Reconstruction & New Construction





Asset Condition

at various 10-Year annual funding levels

Bridge % Poor

	Current	\$0	\$25	\$50	\$75	\$100	\$125
NHS	3.4%	26.5%	17.5%	8.4%	3.1%	.7%	.4%
Non-NHS	6.5%	34.2%	28.7%	15.1%	4.7%	.9%	.3%
All	5.1%	30.6%	23.5%	12.0%	3.9%	.8%	.4%

Pavement Condition

	Current	\$110	\$165	\$220	\$275	\$330	\$385
Interstate	58.6	43.3	50.0	51.5	59.3	63.6	66.3
Non-I NHS	56.7	42.4	47.5	49.7	59.5	64.6	65.3
Non-NHS	51.1	37.6	44.2	49.8	54.3	57.8	60.9
All	53.3	39.4	45.6	51.4	56.1	60.1	63.4



Sustainability Index in NM

To Sustain Current Condition of NMDOT Bridges and Highways
(\$ millions)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Bridge need	65	66	68	69	70	72	73	75	76	78
Bridge \$	94	96	99	103	106	108	109	106	122	124
Pavement need	250	255	260	265	271	276	282	287	293	299
Pavement \$	119	122	126	130	134	137	138	136	139	141
Total need	315	321	328	334	341	348	355	362	369	377
Total \$	213	218	225	232	239	245	247	242	261	265
S.I.	0.68	0.68	0.69	0.69	0.70	0.70	0.70	0.67	0.71	0.70

Assumptions: Combine Maintenance, Preservation, Replacement/Reconstruct

- Roughly use SPP models developed in March; assume Reconstruction favored.
- Inflation = Revenue Growth (2%). BIG assumption.



Delphi Exercise



- \$241 million annual baseline scenario
- Participants allocate funding among Bridge, Pavement, Other Construction
- Highs and Lows must defend their allocations



Delphi - \$241 Million

Round 2 \$241M Scenario

	Bridge	Pavement	Other
Average	\$71	\$151	\$19
Max	\$100	\$190	\$40
Min	\$51	\$101	\$0
Standard Deviation	11.0	15.6	8.1



Delphi - \$390 Million

Round 2 \$390M Scenario

	Bridge	Pavement	Other
Average	\$87	\$268	\$35
Max	\$156	\$300	\$50
Min	\$65	\$204	\$20
Standard Deviation	20.9	21.6	8.9



Tell a Story

1. Where are we now?

- Asset inventory & condition
- Organization framework
- Challenges

2. Where are we going?

- Targets
- Organization vision
- Data vision
- Funding

3. How do we get there?

- Improvement plan



Vignettes

Telling the Story: Preserving the System

Trent Doolittle, District 1 Engineer, on the role of the District Engineer in TAM

At the District level, the impact of asset management elements such as improved data management Having been involved with developing asset management both on the Committee and within his District, Trent has a multilayered understanding of the dynamic between local and state priorities, and how improved data capabilities have aided that give and take. Prior to the formation for the Asset Management Committee, Trent emphasizes that “we were very reactive and not proactive.” Improved data collection and analysis has been a big part of that change, with, for example, Agile Assets beginning decision tree capabilities in 2011 and the pavement management system now offering long-term scenarios.

Now, he says, “I like that we have the right data in the system that can help make us more proactive, giving us enough information to know what to do for the next five to ten years and more.” He adds, “And even when we still reactive, we are reactive with the





Improvements

Pavement Action Item Status

Stage A: Crawl

PMS stores and manages pavement inventory and condition data

Stage B: Walk

District Implementation of predictive modeling

Stage C: Run

Statewide Standard Operating Procedures

Implementation Plan Recommendation:

*Incorporate lifecycle cost considerations when selecting asset management projects
(Current Maturity = 2/5)*

Pavement projects are identified and selected by NMDOT District officials, based on their knowledge of local conditions and engineering judgment. By and large there is a desire to be more proactive and less reactive when it comes to projects and strategies.



Questions?

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