Making Data Serve Many Masters; Experiences of Data Sharing with WYDOT

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AASHTO Data Principles

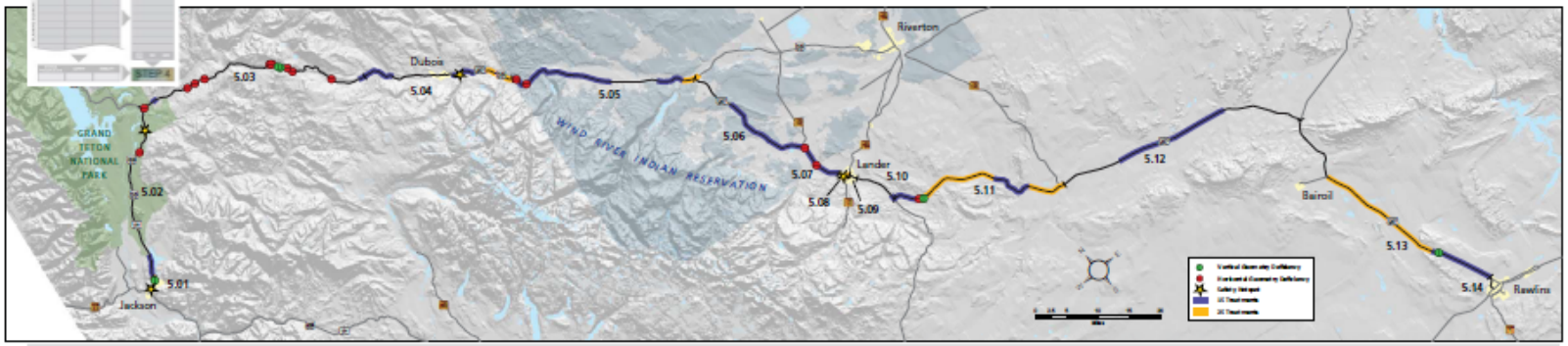
- Valuable
- Available
- Reliable
- Authorized
- Clear
- Efficient
- Accountable

NCHRP 08-92

Business Needs

Corridor Plan

STEP 4: SUMMARY OF CORRIDOR NEEDS



System Preservation Needs

- The system preservation need for the corridor is to maintain the current condition of the corridor, which is in above system average condition and is classified as good, and should be focused on pavement maintenance.

Safety Need

- The primary safety needs within the corridor based on qualifiers are in regard to wildlife related accidents, alcohol related accidents, seat belts usage, and intersection "hot spots".
- Additionally, there are a few horizontal and vertical insufficiencies. Specifically, within segment 5.03, between Moran Junction and Dubois over Togwotee Pass. Some of these locations may be improved and brought to standard with the current construction project; however, these locations should be further studied to determine the need and potential action required.
- Alcohol-related accidents for this corridor are average to that of the system; however, segments 5.03, 5.06, 5.07, 5.09, and 5.14 that have a higher percentage of impaired driving accidents with the highest percentage of accident occurring in 5.06 and 5.14.

Safety Related to Wildlife on the Road

- The number of wildlife related accidents occurring in SSC 5 are above the system average. Some characteristics of these accidents have been noted, which are summarized below.

Within Grand Teton National Park (5.02)

- The largest number of wildlife accidents are occurring in Teton National Park between the edge of Jackson and Moran Junction (5.02). Specifically a hot spot was located at mile marker 181 along ML 10 within Grand Teton National Park. This hot spot flagged a location where 8 out of 11 of the accidents included within this hot spot involve an animal.
- The wildlife related accidents occur mostly at dusk, dawn and throughout the night.
- These accidently mostly involve elk and moose with a number of migration routes between mile marker 164-171.

Segment 5.04

- A hot spot was flagged at mile marker 58, along U.S. Highway 287/Wyoming Highway 26, east of Dubois. Seven of the 9 accidents within this hot spot involve a deer or antelope on the roadway.

Segment 5.08 to 5.12

- Wildlife accidents are often at dawn or dusk. Locations are sporadic and there is not a direct correlation with the migration routes and accidents locations.

Mobility Needs

- The mobility need for the corridor is below the system average and the corridor is currently experiencing average traffic growth at ~2%.
- The mobility need is higher than the system average in segments 5.01 and 5.02, specifically on ML10 in Jackson Urban area from MP 152 - 154 and the outer limits of Jackson to Airport Road MP 155 - 156, due to a fair or poor level of service for both the urban and rural facility type.
- Additionally, the regional route Wyoming Highway 135 and local route Wyoming Highway 73 are below the system average for pavement condition and should be made a priority on the 1R, 2R, & 3R treatment list.

Overlapping Safety and System Preservation Needs

- Considerations should be made to coordinate potential Safety needs qualified by insufficient geometry with System Preservations needs. Consider deferring the preventative maintenance and program the appropriate 3S improvement to address safety as well as system preservation.
  - Segment 5.01 – 2S need which overlaps with two vertical insufficiency's. ML 10, mile marker 154.5 and 154.88.
  - Segment 5.06 – 2S need overlaps with a series of intersection Hot Spots. As these hot spots a further evaluated there may be multiple opportunities to improve safety while preserving the system.
  - Segment 5.11 – 2S need which overlaps with 1 vertical and 3 horizontal insufficiencies, ML 20, mile marker 67.07, 66.13, 67.07, , 67.32 and 67.88, respectively.

Overlapping Safety Needs

- Many safety needs are overlapping within planning segments along the corridor. As solutions are developed to address these safety needs, WYDOT should consider either addressing multiple needs with a specific solution such as installation of variable message signs or look for opportunities to bundling a specific need throughout the system and allocate appropriate funds for the specific segments outline in this corridor. Locations which have several overlapping safety qualifying needs are listed below:
  - Segment 5.03 – Weather, alcohol and horizontal geometry
  - Segment 5.05 – Wildlife and horizontal geometry
  - Segment 5.06 – Alcohol and horizontal geometry
  - Segment 5.08 – Wildlife, seal belt and intersection related hot spots
  - Segment 5.09 – Vertical geometry, seat belt and intersections related to hot spots
  - Segment 5.10 – Wildlife and alcohol
  - Segment 5.14 – Alcohol and vertical geometry.
- Both the urban areas of Jackson and Lander have "hot spots" or a high number of accidents occurring at intersections specifically at SH22 and SH26 in Jackson and US287 and SH789 in Lander.

Scope

Pavement Condition

Safety

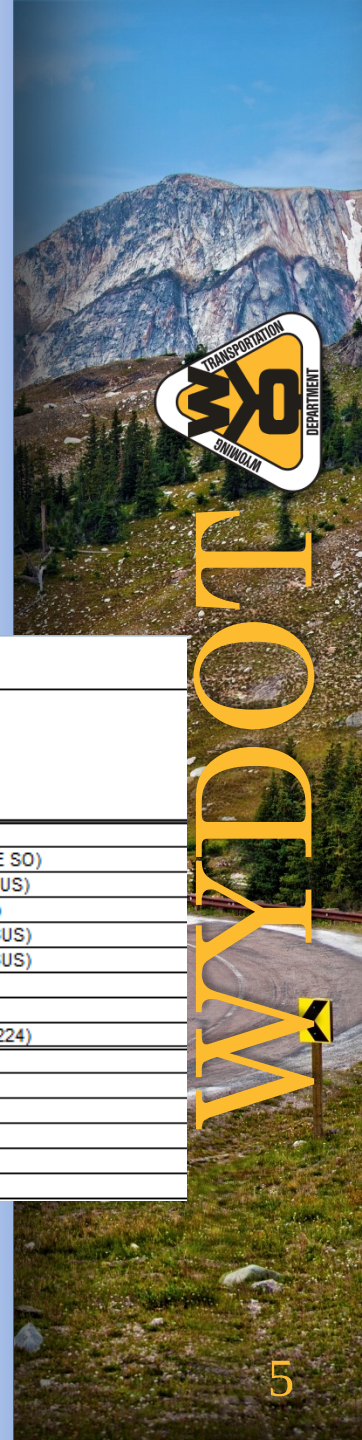
ADT

Bridge

History

Pavement Need

STIP



District Tour Worksheet

Route Number	Route Signed	Beg RM	End RM	Maint Crew	Maint Section	PSR	Bridge Index	AADT	AADTT	Safety Rating (Rank)	PMS Candidate Priority (S)	Last Rehab	Rockslope Rating	Pvmt STIP Year (R)	Description
I-180/US-85															
ML180B	I-180/US-85	0.00	7.30	1035	LA05A	2.71		14594	680	4 (94)	31 (2S)	1988			PALAMINO(COLO ST-CHEYENNE SO)
ML180B	I-180/US-85	7.30	8.31	1035	LA05A	2.83	3.49	20291	700	4 (48)		1996			CHEY(SO GREELEY HWY)(I25 BUS)
ML180B	I-180/US-85	8.31	8.47	1035	LA05A	2.62		24083	770	4 (31)	23 (2S)	1996			CHEYENNE (SO GREELEY HWY)
ML180D	I-180/US-85	8.47	9.74		LA05Z	1.96	3.44	10278	280			1983			CHEY(SO GREELEY)(I80/US87 BUS)
ML180I	I-180/US-85	8.47	9.74		LA05Z	1.96	3.28	10918	326			1983			CHEY(SO GREELEY)(I80/US87 BUS)
ML180D	I-180/US-85	9.74	11.30	1035	LA05Z	0.85		12872	212		3 (2S)	2001		2013 (1R)	CHEYENNE (CENTRAL AVE)
ML180I	I-180/US-85	9.74	11.30	1035	LA05Z	0.74		13260	218		2 (2S)	2001		2013 (1R)	CHEYENNE (WARREN AVE)
ML180B	I-180/US-85	11.30	12.61	1035	LA05Z	3.23	3.44	16546	272	4 (262)		2002		2013 (1R)	CHEY(CENTRAL)(WY219 & WY224)
I-25															
ML25D	I-25	0.00	7.36	2040	LA03A	3.28	2.74	9227	1508	3 (621)	1 (1S)	2005			COLORADO LINE NORTH
ML25I	I-25	0.00	7.36	2040	LA03A	3.59	2.78	9478	1830	4 (457)		2008			COLORADO LINE NORTH
ML25D	I-25	7.36	10.37	2040	LA03A	3.53	2.53	10629	2000	4 (400)		2001			COLLEGE DR. - MISSILE DR.
ML25I	I-25	7.36	10.37	2040	LA03A	3.58	2.53	11240	1930	4 (339)		2001			COLLEGE DR. - MISSILE DR.
ML25D	I-25	10.37	13.07	2040	LA03A	2.99	2.46	11459	1380	2 (722)	9 (3S)	1987			CENTRAL AVENUE SECT.

Current Construction Spending

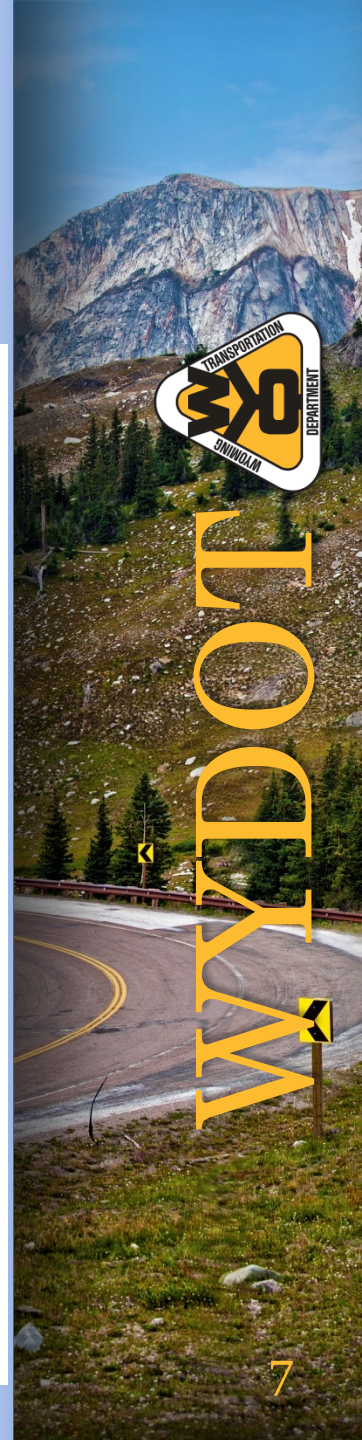
Program	
Bridge	10%
Community Development	3%
Environment	1%
Maintenance	6%
Mobility	8%
Other	1%
Pavement	54%
Safety	15%
Urban	2%

What is the Data-Driven Safety Analysis Initiative?

- The application of two science-based analysis approaches into two common transportation processes

Approaches	
Systemic	Predictive

Transportation Process	
Safety Management	Project Development



USING HSM PREDICTIVE*

- Screen with confidence
  - Hot spots that really will be hot spots in the future
- Prioritize treatments with confidence
  - Reduction in future crash
  - Benefit / Cost ratios

Higher confidence in the expected future crash numbers to better drive safety investment decision

(*) SPF Models, site-specific CMFs, and Empirical-Bayes corrected crash counts

STATEWIDE SCREENING

2-lane bidirectional Highways

EB correction

SPF & CMF

Roadway Features

Facility types

Linear Reference System, Crash Data

State Highways

Public Roadways

Highways 72 % of fatal/incapacitating injury crashes

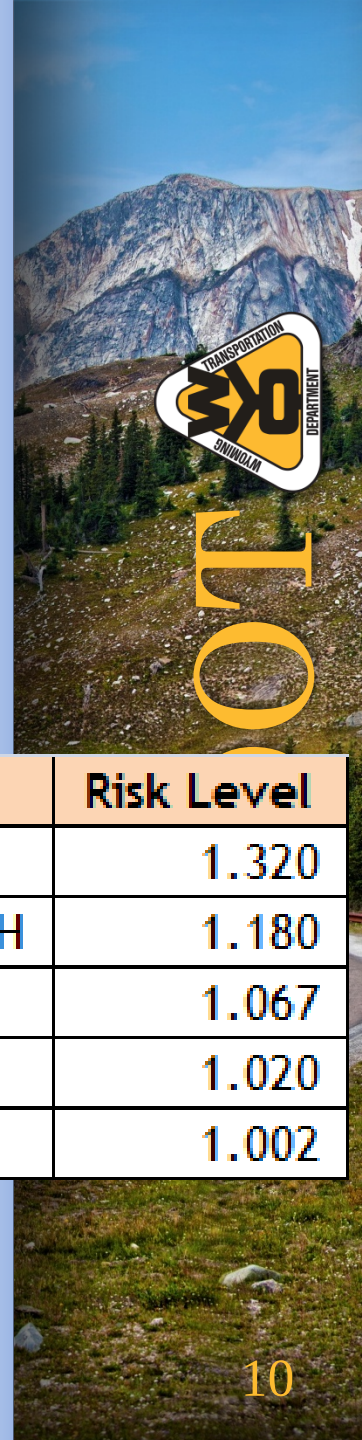
Initial focus – rural 2-lane largest mileage

Consolidated Information

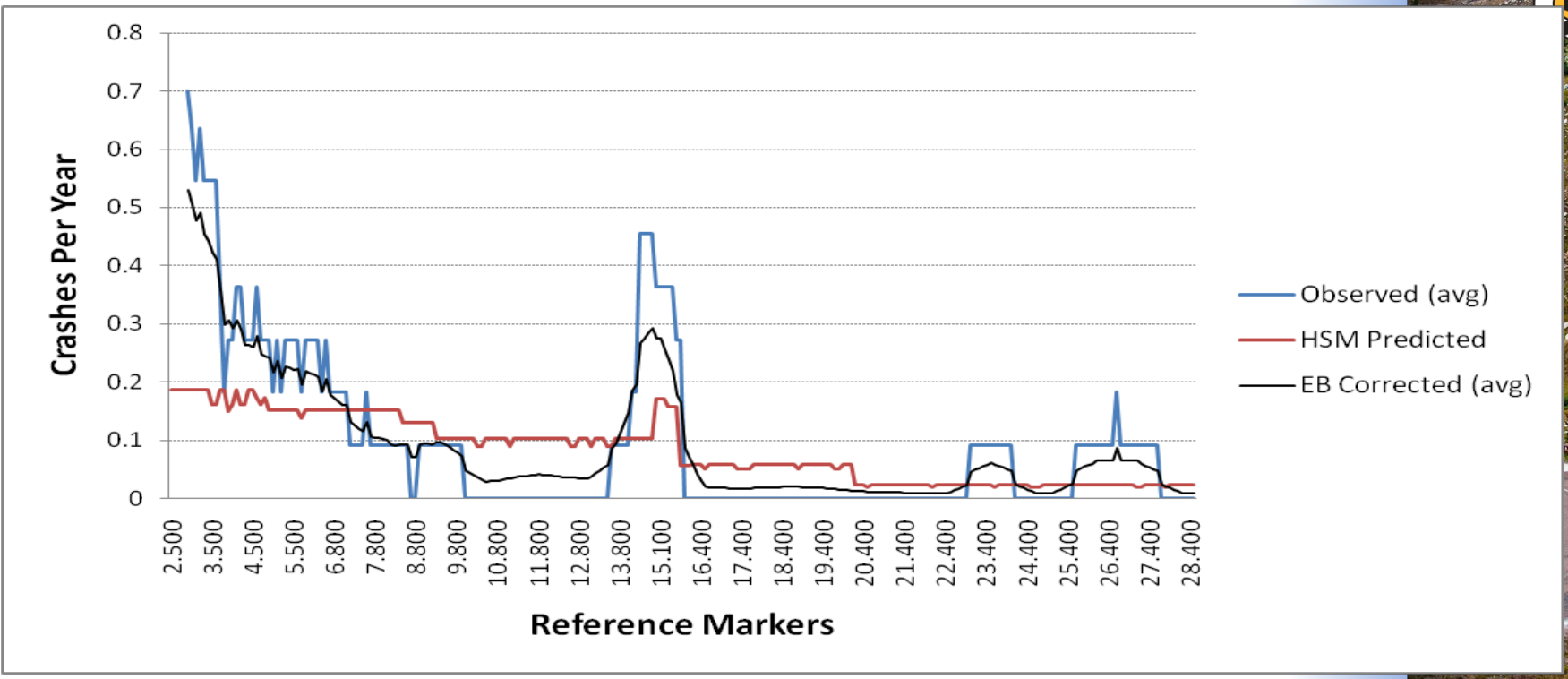
Crash Factor	Prevalence	Over-rep
RUN OFF ROAD	55%	2.78
LIGHTING DARK LIGHTED	48%	1.38
LOCATION OFF ROAD RIGHT	39%	3.10
CROSSING CENTERLINE	32%	2.56
LIGHTING DUSK	22%	0.86

Risk Factor	Risk Level
VERTICAL GRADE	1.320
RIGHT SHOULDER WIDTH	1.180
DRIVEWAY DENSITY	1.067
MEDIAN WIDTH	1.020
HORIZONTAL CURVE	1.002

Route	From RM	To RM	Relative Score	Rating
ML10B	55.100	72.000	8.1	4
ML10B	72.000	84.200	9.0	4
ML10B	87.400	99.400	12.0	4

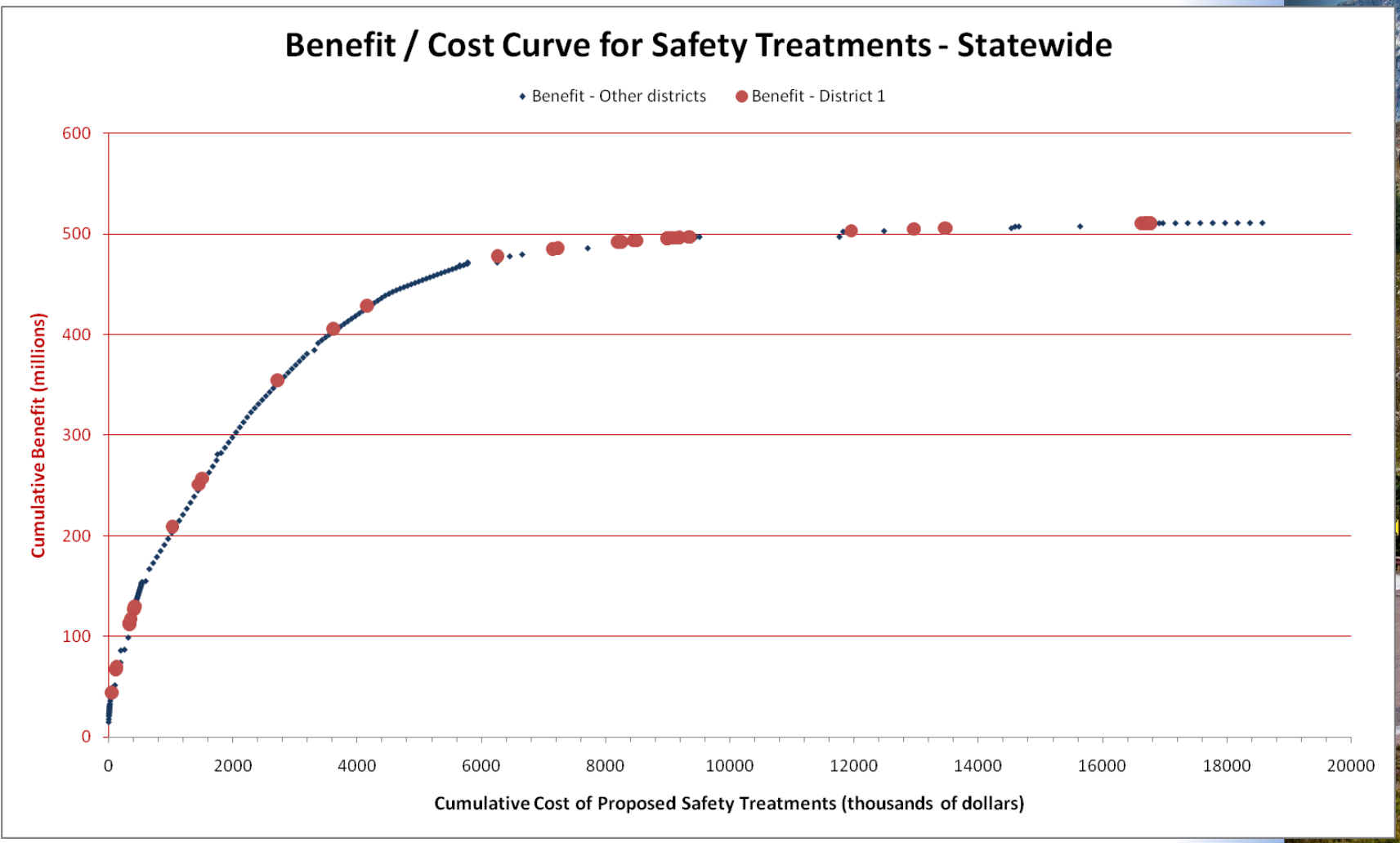


Empirical Bayes Corrected ("Expected")



Safety Management System

- Library of approved treatment types
  - Traffic
- Locations to consider for safety treatments
  - Highway Safety
- Proposed safety treatments (at specific locations)
  - Project decision-makers


Benefit / Cost Curve for Safety Treatments - Statewide
Benefit - Other districts
Benefit - District 1
Cumulative Benefit (millions)
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
Cumulative Cost of Proposed Safety Treatments (thousands of dollars)

TARGET SETTING

- HSIP funds = 18M$
- 20:1 B/C ratio achievable
- 18M$ of treatments with 20:1 should result in an annual reduction in critical crashes of 8.05

HSIP funds	$18,000,000
Benefit to cost average	20:1
Number of critical crashes per year that can be theoretically reduced	8.05

An anticipated reduction of critical crashes by 1.5 per district per year
*seems to be an **achievable target***

Performance Review

Conclusion

- The competition for funds is fierce
- We must move to performance management
- Show how funds provide a return
- Risk is becoming a critical part
- Reconcile segments
- Location errors
- Speaking the language

Thank You

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