STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Division of Transportation Development
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9525

MEMORANDUM

TO: Transportation Commission

FROM: Debra Perkins-Smith, Director, Division of Transportation Development

DATE: January 7, 2014

RE: FASTER Safety Program Development

Purpose: This memo presents the initial information to develop a new FASTER Safety Program.

Action Requested: Transportation Commission input.

Background: FASTER Safety is currently allocated to the Regions for a total of $87M. FASTER Safety funds are for construction, reconstruction or maintenance needed to enhance safety of a state highway. The FASTER Safety Program was recently examined by the CDOT Audit Division. The audit report found that CDOT is in compliance with requirements established by the legislature for the program, but that there were areas for improvement including: timely reports to management on funds and expenditures; better link of expenditures to safety improvement metrics; and a consistent project selection process. One recommendation from the FASTER Audit states, "The Director of the Division of Transportation Development and the Chief Engineer should present to the Transportation Commission alternatives to the current allocation method of FASTER safety funds in order to ensure the most critical safety projects are addressed."

The FASTER Safety Program was reassessed by a core staff team to better define program goals, consistent project selection criteria, measurable metrics for evaluating projects, and initial discussion on options for program structure.

Potential Program Structure: It is recommended that the FASTER Safety Program be split into two complimentary programs: FASTER Safety Asset Management and FASTER Safety Mitigation programs.

I. FASTER Safety Asset Management Program

At the September 2013 Statewide Plan Committee meeting, Commissioners discussed the possible use of FASTER Safety funds for asset management programs that have clear safety benefits. To increase accountability and transparency, staff proposal is to direct $40M of FASTER safety funds to asset management including bridge, tunnels, culverts, rockfall, and specific maintenance where projects can be prioritized using the Risk Based Asset Management Plan and for which safety benefits can be demonstrated and reported.

Program Recommendation

The staff recommendation is that the FASTER Safety Asset Management Program for FY 15 could include:

1. Structures – Program focus: signs, signals, high-mast lighting, walls, and bridge/traffic rail.
2. Tunnels – Program focus: tunnel lighting, fire suppression, traffic control, and snowmelt.
3. Culverts – Program focus: critical culverts, culvert rail, and culverts <36".
4. Rockfall – Program focus: rockfall mitigation/prevention, landslides, sink-holes, and embankment stability.

Project selection will be done according to the Risk-based Asset Management Plan and Asset Investment Management System.

II. FASTER Safety Mitigation Program

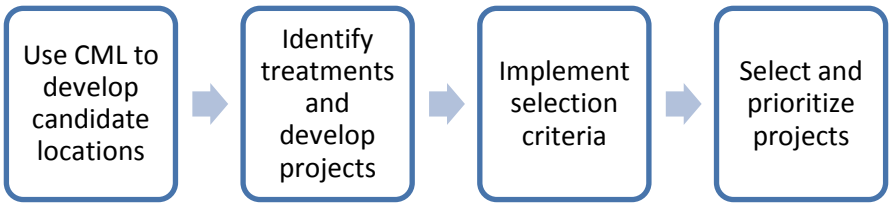
The remaining $47M for FASTER Safety would remain in the FASTER Safety budget line item. FASTER Safety funds can be used to address both remedial measures at specific high accident locations and known safety needs, as well as proactive safety measures that help avoid or reduce the potential for future accident occurrence. Staff will present crash statistics and examples to provide context of safety in Colorado, and therefore how the following proposed project selection criteria were developed.

Project Selection Process

Alternative approaches for managing the project selection process are being developed. While the specific details of what business units direct certain steps, all options follow a generalized process detailed below:

- Use metrics to develop crash mitigation list (CML), metrics include:
  - AADT
  - Number of Crashes
    - Property Damage Only
    - Injury
    - Injury + Fatality
  - Crash Rates
    - Property Damage Only
    - Injury
    - Injury + Fatality
- Identify treatments for proposed safety projects
- Implement project selection criteria
- Select projects

Generalized Process



Project Selection Criteria

Regardless of how program allocation is done, the core staff team developed criteria to enforce consistent project selection methodology to identify the most critical needs and most effective safety improvement investments. The criteria were developed by reviewing past selection criteria for FASTER Safety and adopting best practices, as well as consultation of the technical team. All candidate projects will meet a minimum of TWO of the following criteria:

A. Reduce existing crashes

B. Reduce existing crash severity

C. Address existing system for safety weakness

D. Encourage cooperative safety effort with local agency

E. Enhance other highway safety features and/or functions

F. Provide proven safety measures for a systematic/preventative location

G. Improve pedestrian/bicycle safety

H. Existing project (leveraging funding opportunities with proposed safety project)

I. Behavior Based (all users – drivers, passengers, pedestrian, bikes, motorcycle, etc.)

These criteria would then be used for evaluation and reporting metrics.

III. Next Steps

In February 2014, members of the Oversight and Core Teams will present options for project selection and methodology for allocation of funds to the Transportation Commission. It is anticipated that several options will be presented for project selection and allocation that include an analysis of Region, Statewide, and hybrid (Region/Statewide) approaches.

Commission Input Requested:
Commission input on selection criteria and general process.

FASTER Safety and Colorado Safety Programs

1/15/14
TRANSPORTATION PERFORMANCE BRANCH
TRAFFIC ENGINEERING BRANCH

Agenda

2

- Background
- Statewide Safety Programs
  - HSIP – Highway Safety Improvement Program
  - SHSP – Strategic Highway Safety Plan
  - Office of Transportation Safety (HSO – Highway Safety Office)
  - FASTER Safety
- Future FASTER Safety Program
  - Proposed Program
  - Recommendations

Safety – Save Lives, Reduce Crashes

3

- National Legislation and Programs
  - UN – United Nations: Decade of Action
  - AASHTO – Toward Zero Death
  - MAP-21 – Funded and Legislated Safety
  - FHWA – Federal Highway Administration
  - NHTSA – National Highway Transportation Safety Administration

Safety – Save Lives, Reduce Crashes

4

- State
  - Office of Transportation Safety (Highway Safety Office)
  - Traffic and Safety Engineering
  - Plans
    - Strategic Highway Safety Plan
    - Integrated Safety Plan
    - Statewide Plan - PD 14
  - Programs
    - Highway Safety Improvement Program
    - FASTER – Safety

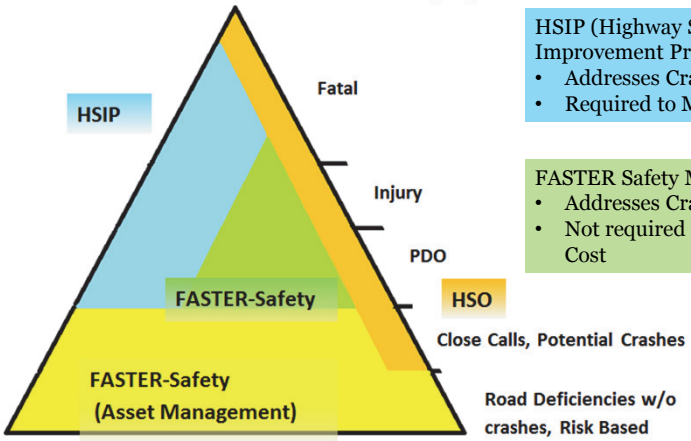
FASTER Safety Accomplishments – Audit Report

5

- Recent Audit report found that:
  - CDOT is in compliance with legislative requirements
- Audit Recommendations:
  - Need metrics to measure/report safety improvements
  - Need consistency in project selection process
  - Need timely reports on funds and expenditures

CDOT Safety Program Snapshot

6



HSIP (Highway Safety Improvement Program)
- Addresses Crash Patterns
- Required to Meet Benefit Cost

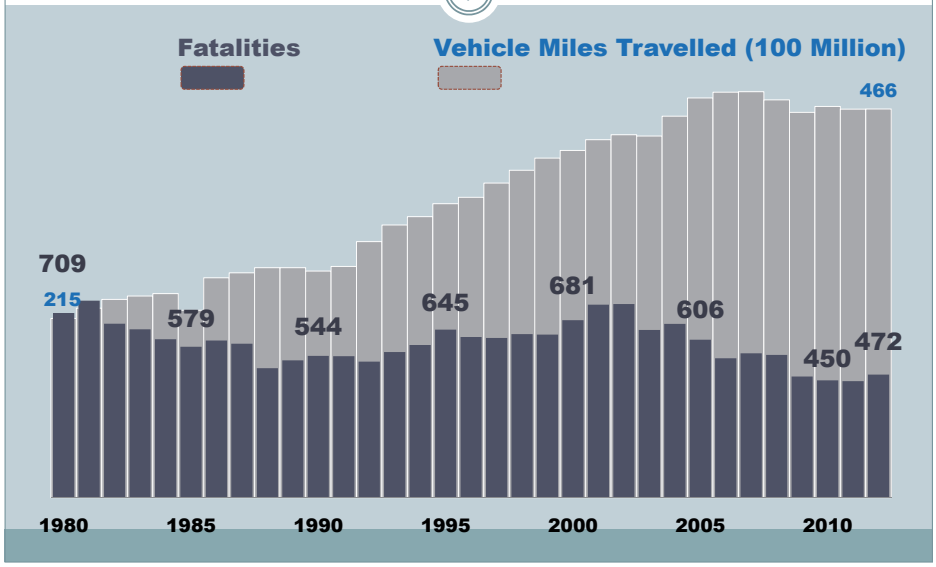
FASTER Safety Mitigation
- Addresses Crash Patterns
- Not required to Meet Benefit Cost

FASTER Safety Asset Management
- Systematic
- Programmatic
- Proactive

Office of Transportation Safety (Highway Safety Office)
- Behavioral Programs

Fatal Crashes vs. Vehicle Miles Travelled

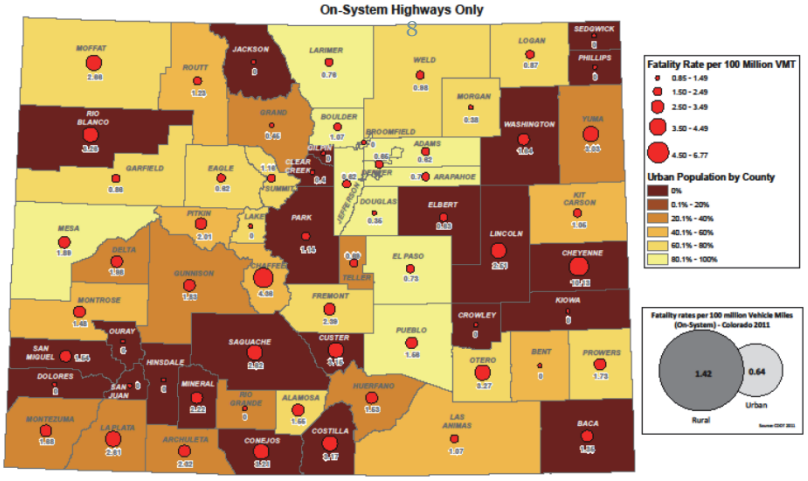
7



8

Colorado Traffic Fatality Rates - 2011
by Vehicle Miles Traveled (VMT)

On-System Highways Only

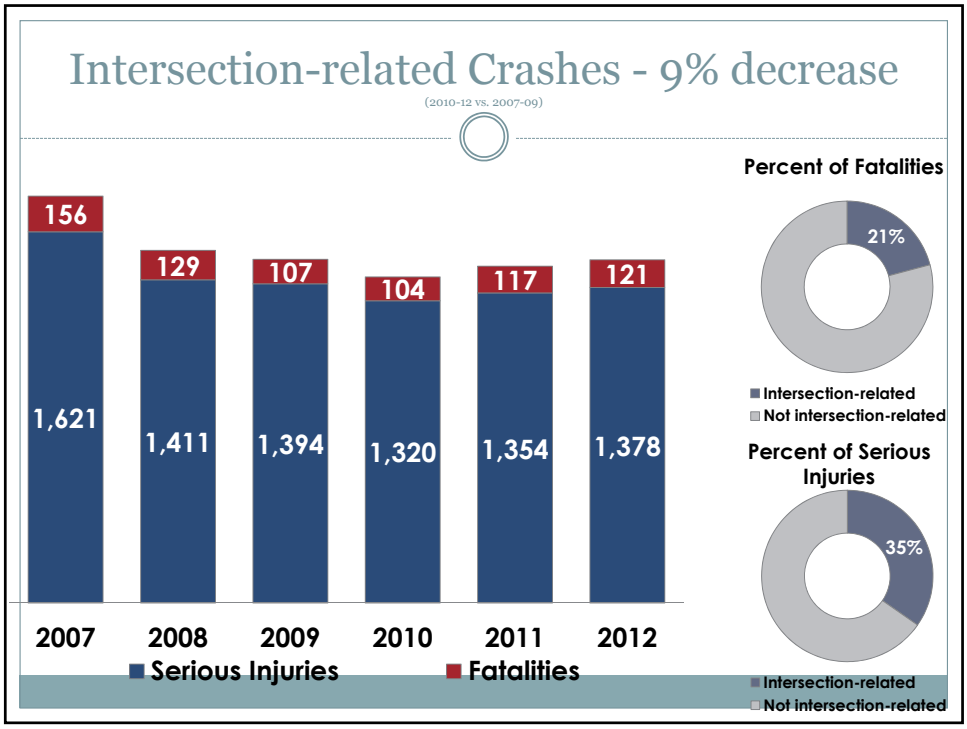


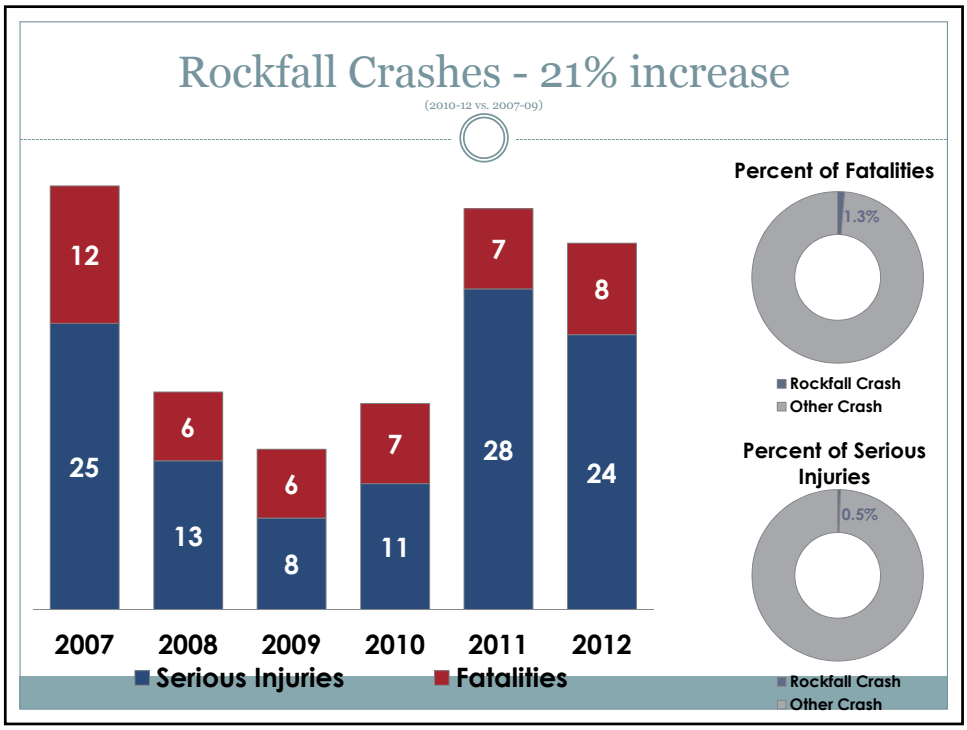
	Year	Total Fatalities	Annual VMT	Fatality Rate (per 100 mil. VMT)
Urban	2011	109	16,963,630,099	0.64
Rural	2011	157	11,063,570,111	1.42

Source: CDOT 2011; U.S. Census Bureau; DOLA; State Demography Office
Published: Oct 2013

0 25 50 100 Miles

N


Intersection-related Crashes - 9% decrease
(2010-12 vs. 2007-09)
156
129
107
104
117
121
1,621
1,411
1,394
1,320
1,354
1,378
2007
2008
2009
2010
2011
2012
Serious Injuries
Fatalities
Percent of Fatalities
21%
Intersection-related
Not intersection-related
Percent of Serious Injuries
35%
Intersection-related
Not intersection-related


Rockfall Crashes - 21% increase
(2010-12 vs. 2007-09)
12
6
6
7
7
8
25
13
8
11
28
24
2007
2008
2009
2010
2011
2012
Serious Injuries
Fatalities
Percent of Fatalities
1.3%
Rockfall Crash
Other Crash
Percent of Serious Injuries
0.5%
Rockfall Crash
Other Crash

Measuring Safety Example

11

- A comparison of 4 lane, divided Interstates, ranked by various safety measures and tools
  - I-25 through Pueblo in Yellow
  - I-25 through Colorado Springs in Green
  - US 36 Baseline to Sheridan in Blue
  - Remaining statewide segments of similar Interstate geometry and traffic volumes in grey.

Highway Listings by MP

12

4 Lane Divided Freeways Sections
Rank
Created June 4, 2013

I-25 through Pueblo
I-25 CO Springs Area
US 36 Baseline to Sheridan

								Number of Crashes					Crash Rates (MVMT)							Rank				
Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	LOSS INJ	LOSS Total	INJ+FAT crashes	INJ+FAT Rate	Total Crash Rate	Total LOSS	INJ+FAT LOSS
25	A	94.77	95.89	1/1/2008	12/31/2012	35803	1.12	52	7	1	8	60	0.71	0.1	1.37	0.11	0.82	2	3	56	16	29	6	12
25	A	95.9	96.66	1/1/2008	12/31/2012	40996	0.74	38	4	0	4	42	0.51	0.05	0	0.05	0.56	2	2	81	64	60	27	13
25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	0.17	1.49	4	4	38	4	1	1	1
25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	0.14	1.43	4	4	35	11	3	2	2
25	A	98.55	99.32	1/1/2008	12/31/2012	72084	0.73	91	9	0	9	100	0.69	0.07	0	0.07	0.76	3	3	53	45	37	7	3
25	A	99.33	99.94	1/1/2008	12/31/2012	72810	0.61	84	9	2	11	105	0.71	0.07	1.5	0.08	0.79	3	3	47	33	31	6	4
25	A	99.95	100.7	1/1/2008	12/31/2012	70098	0.8	64	7	0	7	71	0.5	0.05	0	0.05	0.55	2	2	62	65	61	28	14
25	A	100.7	101.4	1/1/2008	12/31/2012	43042	0.65	43	6	1	7	50	0.55	0.08	1.27	0.09	0.64	3	3	63	27	48	9	5
25	A	101.4	102.2	1/1/2008	12/31/2012	36000	0.76	17	0	0	0	17	0.26	0	0	0	0.26	1	1	99	99	91	71	58
25	A	102.2	103.9	1/1/2008	12/31/2012	33765	1.71	48	4	2	6	54	0.46	0.04	1.9	0.05	0.51	2	2	70	72	62	29	15
25	A	127.9	131.6	1/1/2008	12/31/2012	38000	3.63	138	31	2	33	171	0.52	0.12	0.75	0.12	0.64	2	2	3	14	49	30	16
25	A	131.7	135.3	1/1/2008	12/31/2012	44992	3.59	176	22	5	27	203	0.6	0.07	1.7	0.09	0.69	2	2	15	28	47	31	17
25	A	135.3	137.7	1/1/2008	12/31/2012	73952	2.44	115	12	3	15	130	0.35	0.04	0.91	0.04	0.39	2	1	36	61	76	31	18
25	A	150.3	151.7	1/1/2008	12/31/2012	91607	1.34	144	13	0	13	157	0.65	0.06	0	0.06	0.71	2	2	41	59	44	32	19
25	A	151.7	153.2	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	239	0.97	0.08	0	0.07	1.04	2	3	22	46	15	32	20
25	A	153.2	155.9	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	402	0.97	0.08	0	0.08	1.05	2	3	9	34	13	11	21
25	A	155.9	158.2	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	287	0.96	0.06	0	0.06	1.02	2	3	25	53	18	12	22
25	A	158.2	160.8	1/1/2008	12/31/2012	71000	2.53	232	29	0	29	261	0.71	0.09	0	0.08	0.79	2	2	12	35	32	33	23
25	A	160.8	163.3	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	0.14	1.49	3	4	4	12	2	3	6
36	B	37.6	39.19	1/1/2008	12/31/2012	47996	1.7	140	13	1	14	154	0.94	0.09	0.67	0.09	1.03	2	3	39	24	16	18	31
36	B	39.2	43.19	1/1/2008	12/31/2012	70891	4.02	414	34	1	35	449	0.8	0.07	0.19	0.06	0.86	2	2	1	61	27	40	32
36	B	43.2	45.82	1/1/2008	12/31/2012	82018	2.59	254	34	1	35	289	0.66	0.09	0.26	0.09	0.75	2	2	2	30	39	41	33
36	B	45.63	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	402	1.21	0.09	0	0.09	1.3	2	3	16	25	6	19	34
36	B	48.04	50.37	1/1/2008	12/31/2012	80000	2.33	276	30	0	30	306	0.81	0.09	0	0.09	0.9	2	2	10	31	24	42	35
36	B	50.38	52.56	1/1/2008	12/31/2012	81705	2.06	253	28	1	29	282	0.82	0.09	0.32	0.09	0.91	2	2	13	26	22	43	36

Slide Enlarged on Following Page

Highway Listings by MP

4 Lane Divided Freeways Sections
Rank
Created June 4, 2013

I-25 through Pueblo
I-25 CO Springs Area
US 36 Baseline to Sheridan

								Number of Crashes					Crash Rates (MVMT)							Rank				
Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	LOSS INJ	LOSS Total	INJ+FAT crashes	INJ+FAT Rate	Total Crash Rate	Total LOSS	INJ+FAT LOSS
25	A	94.77	95.89	1/1/2008	12/31/2012	35803	1.12	52	7	1	8	60	0.71	0.1	1.37	0.11	0.82	2	3	56	16	29	6	12
25	A	95.9	96.66	1/1/2008	12/31/2012	40996	0.74	38	4	0	4	42	0.51	0.05	0	0.05	0.56	2	2	81	64	60	27	13
25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	0.17	1.49	4	4	38	4	1	1	1
25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	0.14	1.43	4	4	35	11	3	2	2
25	A	98.55	99.32	1/1/2008	12/31/2012	72084	0.73	91	9	0	9	100	0.69	0.07	0	0.07	0.76	3	3	53	45	37	7	3
25	A	99.33	99.94	1/1/2008	12/31/2012	72810	0.61	94	9	2	11	105	0.71	0.07	1.5	0.08	0.79	3	3	47	33	31	8	4
25	A	99.95	100.7	1/1/2008	12/31/2012	70098	0.8	64	7	0	7	71	0.5	0.05	0	0.05	0.55	2	2	62	65	61	28	14
25	A	100.7	101.4	1/1/2008	12/31/2012	43042	0.65	43	6	1	7	50	0.55	0.08	1.27	0.09	0.64	3	3	63	27	48	9	5
25	A	101.4	102.2	1/1/2008	12/31/2012	36000	0.76	17	0	0	0	17	0.26	0	0	0	0.26	1	1	99	99	91	71	58
25	A	102.2	103.9	1/1/2008	12/31/2012	33765	1.71	48	4	2	6	54	0.46	0.04	1.9	0.05	0.51	2	2	70	72	62	29	15
25	A	127.9	131.6	1/1/2008	12/31/2012	38000	3.83	138	31	2	33	171	0.52	0.12	0.75	0.12	0.64	2	2	3	14	49	30	16
25	A	131.7	135.3	1/1/2008	12/31/2012	44992	3.59	176	22	5	27	203	0.6	0.07	1.7	0.09	0.69	2	2	15	28	47	31	17
25	A	135.3	137.7	1/1/2008	12/31/2012	73952	2.44	115	12	3	15	130	0.35	0.04	0.91	0.04	0.39	2	1	36	81	76	31	18
25	A	150.3	151.7	1/1/2008	12/31/2012	91007	1.34	144	13	0	13	157	0.65	0.06	0	0.06	0.71	2	2	41	59	44	32	19
25	A	151.7	153.2	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	239	0.97	0.08	0	0.07	1.04	2	3	22	46	15	32	20
25	A	153.2	155.9	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	402	0.97	0.08	0	0.08	1.05	2	3	8	34	13	11	21
25	A	155.9	158.2	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	287	0.96	0.06	0	0.06	1.02	2	3	25	53	18	12	22
25	A	158.2	160.8	1/1/2008	12/31/2012	71000	2.53	232	29	0	29	261	0.71	0.09	0	0.08	0.79	2	2	12	35	32	33	23
25	A	160.8	163.3	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	0.14	1.49	3	4	4	12	2	3	6
36	B	37.6	39.19	1/1/2008	12/31/2012	47998	1.7	140	13	1	14	154	0.94	0.09	0.67	0.09	1.03	2	3	39	24	16	18	31
36	B	39.2	43.19	1/1/2008	12/31/2012	70891	4.02	414	34	1	35	449	0.8	0.07	0.19	0.06	0.86	2	2	1	61	27	40	32
36	B	43.2	45.82	1/1/2008	12/31/2012	82018	2.59	254	34	1	35	289	0.66	0.09	0.26	0.09	0.75	2	2	2	30	39	41	33
36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	402	1.21	0.09	0	0.09	1.3	2	3	16	25	6	19	34
36	B	48.04	50.37	1/1/2008	12/31/2012	80000	2.33	276	30	0	30	306	0.81	0.09	0	0.09	0.9	2	2	10	31	24	42	35
36	B	50.38	52.56	1/1/2008	12/31/2012	81705	2.08	253	28	1	29	282	0.82	0.09	0.32	0.09	0.91	2	2	13	26	22	43	36

Total Crashes

4 Lane Divided Freeways Sections

5 YEAR sorted by Total Crashes

Created June 4, 2013

- I-25 through Pueblo
- I-25 CO Springs Area
- US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	**TOTAL**	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	LOSS INJ+FAT	LOSS TOTAL
1	36	B	39.2	43.19	1/1/2008	12/31/2012	70891	4.02	414	34	1	35	**449**	0.8	0.07	0.19	0.06	0.86	2	2
2	25	A	153.2	155.92	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	**402**	0.97	0.08	0	0.08	1.05	2	3
3	36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	**402**	1.21	0.09	0	0.09	1.3	2	3
4	25	A	160.76	163.31	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	**338**	1.35	0.14	0.44	0.14	1.49	3	4
5	470	A	21.07	24.13	1/1/2008	12/31/2012	99000	3.08	287	29	2	31	**318**	0.52	0.05	0.36	0.05	0.57	1	2
6	36	B	48.04	50.37	1/1/2008	12/31/2012	80000	2.33	276	30	0	30	**306**	0.81	0.09	0	0.09	0.9	2	2
7	25	A	255.27	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	32	**304**	1.17	0.13	0.86	0.13	1.3	3	3
8	25	A	265.31	268.47	1/1/2008	12/31/2012	52018	3.03	259	27	3	30	**289**	0.9	0.09	1.04	0.1	1	2	3
9	36	B	43.2	45.82	1/1/2008	12/31/2012	82018	2.59	254	34	1	35	**289**	0.66	0.09	0.26	0.09	0.75	2	2
10	25	A	155.93	158.19	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	**287**	0.96	0.06	0	0.06	1.02	2	3
11	270	A	2.36	4.56	1/1/2008	12/31/2012	85000	2.18	266	19	1	20	**286**	0.78	0.06	0.29	0.06	0.84	2	2
12	25	A	257.31	259.3	1/1/2008	12/31/2012	60420	1.98	267	17	0	17	**284**	1.22	0.08	0	0.08	1.3	2	3
13	36	B	50.38	52.56	1/1/2008	12/31/2012	81705	2.08	253	28	1	29	**282**	0.82	0.09	0.32	0.09	0.91	2	2
14	25	A	250.24	252.25	1/1/2008	12/31/2012	60999	2.01	250	15	0	15	**265**	1.11	0.07	0	0.07	1.18	2	3
15	25	A	158.2	160.75	1/1/2008	12/31/2012	71000	2.53	232	29	0	29	**261**	0.71	0.09	0	0.08	0.79	2	2
16	270	A	0.39	2.35	1/1/2008	12/31/2012	93000	1.93	240	21	0	21	**261**	0.73	0.06	0	0.06	0.79	1	2
17	225	A	5.37	6.88	1/1/2008	12/31/2012	105008	1.5	219	29	2	31	**250**	0.76	0.1	0.7	0.11	0.87	2	2
18	25	A	262.3	265.3	1/1/2008	12/31/2012	60000	3	213	28	0	28	**241**	0.65	0.09	0	0.08	0.73	2	2
19	25	A	151.66	153.19	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	**239**	0.97	0.08	0	0.07	1.04	2	3
20	225	A	6.89	7.91	1/1/2008	12/31/2012	118000	1.01	201	30	0	30	**231**	0.92	0.14	0	0.14	1.06	2	2
21	225	A	7.92	8.94	1/1/2008	12/31/2012	117001	0.99	207	17	0	17	**224**	0.97	0.08	0	0.08	1.05	2	2
22	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	18	**222**	1.15	0.1	0.56	0.1	1.25	3	4
23	25	A	259.31	262.29	1/1/2008	12/31/2012	65000	2.99	190	20	0	20	**210**	0.54	0.06	0	0.05	0.59	2	2
24	25	A	131.65	135.25	1/1/2008	12/31/2012	44992	3.59	176	22	5	27	**203**	0.6	0.07	1.7	0.09	0.69	2	2
25	470	A	17.05	18.45	1/1/2008	12/31/2012	77000	1.4	181	16	1	17	**198**	0.92	0.08	0.51	0.09	1.01	2	3

Total Crash Rate

4 Lane Divided Freeways Sections

5 YEAR sorted by Total Crash Rate

Created June 4, 2013

I-25 through Pueblo
I-25 CO Springs Area
US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	**TOTAL**	LOSS INJ+FAT	LOSS TOTAL
1	25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	0.17	**1.49**	4	4
2	25	A	160.76	163.3	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	0.14	**1.49**	3	4
3	25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	0.14	**1.43**	4	4
4	25	A	255.27	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	32	304	1.17	0.13	0.86	0.13	**1.3**	3	3
5	25	A	257.31	259.3	1/1/2008	12/31/2012	60420	1.98	267	17	0	17	284	1.22	0.08	0	0.08	**1.3**	2	3
6	36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	402	1.21	0.09	0	0.09	**1.3**	2	3
7	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	18	222	1.15	0.1	0.56	0.1	**1.25**	3	4
8	25	A	250.24	252.3	1/1/2008	12/31/2012	60999	2.01	250	15	0	15	265	1.11	0.07	0	0.07	**1.18**	2	3
9	76	A	20.91	22.4	1/1/2008	12/31/2012	29870	1.52	85	12	1	13	98	1.02	0.14	1.2	0.16	**1.18**	2	4
10	76	A	19.72	20.9	1/1/2008	12/31/2012	25009	1.15	54	3	0	3	57	1.03	0.06	0	0.05	**1.08**	1	3
11	25	A	268.48	269.4	1/1/2008	12/31/2012	39000	0.99	66	10	0	10	76	0.93	0.14	0	0.14	**1.07**	3	3
12	225	A	6.89	7.91	1/1/2008	12/31/2012	118000	1.01	201	30	0	30	231	0.92	0.14	0	0.14	**1.06**	2	2
13	25	A	153.2	155.9	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	402	0.97	0.08	0	0.08	**1.05**	2	3
14	225	A	7.92	8.94	1/1/2008	12/31/2012	117001	0.99	207	17	0	17	224	0.97	0.08	0	0.08	**1.05**	2	2
15	25	A	151.66	153.2	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	239	0.97	0.08	0	0.07	**1.04**	2	3
16	36	B	37.6	39.19	1/1/2008	12/31/2012	47998	1.7	140	13	1	14	154	0.94	0.09	0.67	0.09	**1.03**	2	3
17	470	B	7	8.89	1/1/2008	12/31/2012	30000	1.74	81	16	1	17	98	0.85	0.17	1.05	0.18	**1.03**	3	3
18	25	A	155.93	158.2	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	287	0.96	0.06	0	0.06	**1.02**	2	3
19	470	A	17.05	18.45	1/1/2008	12/31/2012	77000	1.4	181	16	1	17	198	0.92	0.08	0.51	0.09	**1.01**	2	3
20	25	A	265.31	268.5	1/1/2008	12/31/2012	52018	3.03	259	27	3	30	289	0.9	0.09	1.04	0.1	**1**	2	3
21	76	A	8.05	9.47	1/1/2008	12/31/2012	56038	1.41	122	11	1	12	134	0.85	0.08	0.69	0.08	**0.93**	3	3
22	36	B	50.38	52.56	1/1/2008	12/31/2012	81705	2.08	253	28	1	29	282	0.82	0.09	0.32	0.09	**0.91**	2	2
23	25	A	252.26	254.2	1/1/2008	12/31/2012	55003	1.98	161	16	2	18	179	0.81	0.08	1.01	0.09	**0.9**	2	2
24	36	B	48.04	50.37	1/1/2008	12/31/2012	80000	2.33	276	30	0	30	306	0.81	0.09	0	0.09	**0.9**	2	2
25	225	A	5.37	6.88	1/1/2008	12/31/2012	105008	1.5	219	29	2	31	250	0.76	0.1	0.7	0.11	**0.87**	2	2

Injury + Fatal Crashes

4 Lane Divided Freeways Sections

5 YEAR sorted by Inj+ Fat Crashes

Created June 4, 2013

- I-25 through Pueblo
- I-25 CO Springs Area
- US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	LOSS INJ+FAT	LOSS Total
1	36	B	39.2	43.19	1/1/2008	12/31/2012	70891	4.02	414	34	1	**35**	449	0.8	0.07	0.19	0.06	0.86	2	2
2	36	B	43.2	45.82	1/1/2008	12/31/2012	82018	2.59	254	34	1	**35**	289	0.66	0.09	0.26	0.09	0.75	2	2
3	25	A	127.86	131.64	1/1/2008	12/31/2012	38000	3.83	138	31	2	**33**	171	0.52	0.12	0.75	0.12	0.64	2	2
4	25	A	160.76	163.31	1/1/2008	12/31/2012	48027	2.59	306	31	1	**32**	338	1.35	0.14	0.44	0.14	1.49	3	4
5	25	A	255.27	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	**32**	304	1.17	0.13	0.86	0.13	1.3	3	3
6	225	A	5.37	6.88	1/1/2008	12/31/2012	105008	1.5	219	29	2	**31**	250	0.76	0.1	0.7	0.11	0.87	2	2
7	470	A	21.07	24.13	1/1/2008	12/31/2012	99000	3.08	287	29	2	**31**	318	0.52	0.05	0.36	0.05	0.57	1	2
8	25	A	153.2	155.92	1/1/2008	12/31/2012	79000	2.64	372	30	0	**30**	402	0.97	0.08	0	0.08	1.05	2	3
9	25	A	265.31	268.47	1/1/2008	12/31/2012	52018	3.03	259	27	3	**30**	289	0.9	0.09	1.04	0.1	1	2	3
10	36	B	48.04	50.37	1/1/2008	12/31/2012	80000	2.33	276	30	0	**30**	306	0.81	0.09	0	0.09	0.9	2	2
11	225	A	6.89	7.91	1/1/2008	12/31/2012	118000	1.01	201	30	0	**30**	231	0.92	0.14	0	0.14	1.06	2	2
12	25	A	158.2	160.75	1/1/2008	12/31/2012	71000	2.53	232	29	0	**29**	261	0.71	0.09	0	0.08	0.79	2	2
13	36	B	50.38	52.56	1/1/2008	12/31/2012	81705	2.08	253	28	1	**29**	282	0.82	0.09	0.32	0.09	0.91	2	2
14	25	A	262.3	265.3	1/1/2008	12/31/2012	60000	3	213	28	0	**28**	241	0.65	0.09	0	0.08	0.73	2	2
15	25	A	131.65	135.25	1/1/2008	12/31/2012	44992	3.59	176	22	5	**27**	203	0.6	0.07	1.7	0.09	0.69	2	2
16	36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	**27**	402	1.21	0.09	0	0.09	1.3	2	3
17	70	A	27.57	31.34	1/1/2008	12/31/2012	18000	3.79	71	19	3	**22**	93	0.57	0.15	2.4	0.18	0.75	2	2
18	270	A	0.39	2.35	1/1/2008	12/31/2012	93000	1.93	240	21	0	**21**	261	0.73	0.06	0	0.06	0.79	1	2
19	25	A	259.31	262.29	1/1/2008	12/31/2012	65000	2.99	190	20	0	**20**	210	0.54	0.06	0	0.05	0.59	2	2
20	270	A	2.36	4.56	1/1/2008	12/31/2012	85000	2.18	266	19	1	**20**	286	0.78	0.06	0.29	0.06	0.84	2	2
21	76	A	18.08	19.71	1/1/2008	12/31/2012	30000	1.62	50	18	1	**19**	69	0.56	0.2	1.13	0.22	0.78	2	3
22	25	A	151.66	153.19	1/1/2008	12/31/2012	82000	1.53	221	18	0	**18**	239	0.97	0.08	0	0.07	1.04	2	3
23	25	A	252.26	254.22	1/1/2008	12/31/2012	55003	1.98	161	16	2	**18**	179	0.81	0.08	1.01	0.09	0.9	2	2
24	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	**18**	222	1.15	0.1	0.56	0.1	1.25	3	4
25	25	A	155.93	158.19	1/1/2008	12/31/2012	67000	2.3	270	17	0	**17**	287	0.96	0.06	0	0.06	1.02	2	3

Injury + Fatal Rate

4 Lane Divided Freeways Sections

5 YEAR sorted by Inj+ Fat Rate

Created June 4, 2013

- I-25 through Pueblo
- I-25 CO Springs Area
- US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	**INJ+FAT**	TOTAL	LOSS INJ+FAT	LOSS Total
1	76	A	18.08	19.71	1/1/2008	12/31/2012	30000	1.62	50	18	1	19	69	0.56	0.2	1.13	**0.22**	0.78	2	3
2	70	A	27.57	31.34	1/1/2008	12/31/2012	18000	3.79	71	19	3	22	93	0.57	0.15	2.4	**0.18**	0.75	2	2
3	470	B	7	8.89	1/1/2008	12/31/2012	30000	1.74	81	16	1	17	98	0.85	0.17	1.05	**0.18**	1.03	3	3
4	25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	**0.17**	1.49	4	4
5	58	A	3.82	5.39	1/1/2008	12/31/2012	26000	1.68	47	12	1	13	60	0.59	0.15	1.26	**0.16**	0.75	2	2
6	76	A	20.91	22.4	1/1/2008	12/31/2012	29870	1.52	85	12	1	13	98	1.02	0.14	1.2	**0.16**	1.18	2	4
7	25	A	268.48	269.36	1/1/2008	12/31/2012	39000	0.99	66	10	0	10	76	0.93	0.14	0	**0.14**	1.07	3	3
8	70	A	31.35	33.99	1/1/2008	12/31/2012	23998	2.65	28	16	0	16	44	0.24	0.14	0	**0.14**	0.38	2	2
9	225	A	6.89	7.91	1/1/2008	12/31/2012	118000	1.01	201	30	0	30	231	0.92	0.14	0	**0.14**	1.06	2	2
10	70	A	288.22	289.15	1/1/2008	12/31/2012	38601	0.9	24	10	0	10	34	0.34	0.14	0	**0.14**	0.48	2	2
11	25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	**0.14**	1.43	4	4
12	25	A	160.76	163.31	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	**0.14**	1.49	3	4
13	25	A	255.27	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	32	304	1.17	0.13	0.86	**0.13**	1.3	3	3
14	25	A	127.86	131.64	1/1/2008	12/31/2012	38000	3.83	138	31	2	33	171	0.52	0.12	0.75	**0.12**	0.64	2	2
15	70	A	285.73	288.21	1/1/2008	12/31/2012	29000	2.45	49	15	1	16	65	0.38	0.12	0.77	**0.12**	0.5	1	1
16	25	A	94.77	95.89	1/1/2008	12/31/2012	35803	1.12	52	7	1	8	60	0.71	0.1	1.37	**0.11**	0.82	2	3
17	70	A	25.56	27.56	1/1/2008	12/31/2012	16000	1.95	11	5	1	6	17	0.19	0.09	1.75	**0.11**	0.3	1	1
18	225	A	5.37	6.88	1/1/2008	12/31/2012	105008	1.5	219	29	2	31	250	0.76	0.1	0.7	**0.11**	0.87	2	2
19	285	D	248.44	250.07	1/1/2008	12/31/2012	28002	1.69	51	9	0	9	60	0.59	0.1	0	**0.11**	0.7	2	2
20	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	18	222	1.15	0.1	0.56	**0.1**	1.25	3	4
21	25	A	265.31	268.47	1/1/2008	12/31/2012	52018	3.03	259	27	3	30	289	0.9	0.09	1.04	**0.1**	1	2	3
22	76	A	22.41	25.14	1/1/2008	12/31/2012	18943	2.74	26	8	1	9	35	0.27	0.08	1.06	**0.1**	0.37	1	1
23	470	B	25.52	27.84	1/1/2008	12/31/2012	16000	2.36	14	7	0	7	21	0.2	0.1	0	**0.1**	0.3	2	1
24	36	B	37.6	39.19	1/1/2008	12/31/2012	47998	1.7	140	13	1	14	154	0.94	0.09	0.67	**0.09**	1.03	2	3
25	36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	402	1.21	0.09	0	**0.09**	1.3	2	3

Level of Service of Safety - Total Crashes

4 Lane Divided Freeways Sections

5 YEAR sorted by TOTAL Level of Service Safety (LOSS)

Created June 4, 2013

I-25 through Pueblo
I-25 CO Springs Area
US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	LOSS INJ+FAT	**LOSS TOTAL**
1	25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	0.17	1.49	4	**4**
2	25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	0.14	1.43	4	**4**
3	25	A	160.8	163.3	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	0.14	1.49	3	**4**
4	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	18	222	1.15	0.1	0.56	0.1	1.25	3	**4**
5	76	A	20.91	22.4	1/1/2008	12/31/2012	29870	1.52	85	12	1	13	98	1.02	0.14	1.2	0.16	1.18	2	**4**
6	25	A	94.77	95.89	1/1/2008	12/31/2012	35803	1.12	52	7	1	8	60	0.71	0.1	1.37	0.11	0.82	2	**3**
7	25	A	98.55	99.32	1/1/2008	12/31/2012	72084	0.73	91	9	0	9	100	0.69	0.07	0	0.07	0.76	3	**3**
8	25	A	99.33	99.94	1/1/2008	12/31/2012	72810	0.61	94	9	2	11	105	0.71	0.07	1.5	0.08	0.79	3	**3**
9	25	A	100.7	101.4	1/1/2008	12/31/2012	43042	0.65	43	6	1	7	50	0.55	0.08	1.27	0.09	0.64	3	**3**
10	25	A	151.7	153.2	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	239	0.97	0.08	0	0.07	1.04	2	**3**
11	25	A	153.2	155.9	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	402	0.97	0.08	0	0.08	1.05	2	**3**
12	25	A	155.9	158.2	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	287	0.96	0.06	0	0.06	1.02	2	**3**
13	25	A	250.2	252.3	1/1/2008	12/31/2012	60999	2.01	250	15	0	15	265	1.11	0.07	0	0.07	1.18	2	**3**
14	25	A	255.3	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	32	304	1.17	0.13	0.86	0.13	1.3	3	**3**
15	25	A	257.3	259.3	1/1/2008	12/31/2012	60420	1.98	267	17	0	17	284	1.22	0.08	0	0.08	1.3	2	**3**
16	25	A	265.3	268.5	1/1/2008	12/31/2012	52018	3.03	259	27	3	30	289	0.9	0.09	1.04	0.1	1	2	**3**
17	25	A	268.5	269.4	1/1/2008	12/31/2012	39000	0.99	66	10	0	10	76	0.93	0.14	0	0.14	1.07	3	**3**
18	36	B	37.6	39.19	1/1/2008	12/31/2012	47998	1.7	140	13	1	14	154	0.94	0.09	0.67	0.09	1.03	2	**3**
19	36	B	45.83	48.03	1/1/2008	12/31/2012	77077	2.19	375	27	0	27	402	1.21	0.09	0	0.09	1.3	2	**3**
20	58	A	0.72	3.81	1/1/2008	12/31/2012	19329	2.92	78	3	0	3	81	0.76	0.03	0	0.02	0.78	2	**3**
21	76	A	8.05	9.47	1/1/2008	12/31/2012	56038	1.41	122	11	1	12	134	0.85	0.08	0.69	0.08	0.93	3	**3**
22	76	A	16.48	18.07	1/1/2008	12/31/2012	25000	1.57	52	6	0	6	58	0.73	0.08	0	0.08	0.81	2	**3**
23	76	A	18.08	19.71	1/1/2008	12/31/2012	30000	1.62	50	18	1	19	69	0.56	0.2	1.13	0.22	0.78	2	**3**
24	76	A	19.72	20.9	1/1/2008	12/31/2012	25009	1.15	54	3	0	3	57	1.03	0.06	0	0.05	1.08	1	**3**
25	470	A	17.05	18.45	1/1/2008	12/31/2012	77000	1.4	181	16	1	17	198	0.92	0.08	0.51	0.09	1.01	2	**3**

Level of Service of Safety - Injury+ Fatal Crashes

4 Lane Divided Freeways Sections

5 YEAR sorted by INJ+FAT Level of Service Safety (LOSS)

Created June 4, 2013

- I-25 through Pueblo
- I-25 CO Springs Area
- US 36 Baseline to Sheridan

									Number of Crashes					Crash Rates (MVMT)						
	Highway	section	from mp	to mp	from date	to date	AADT	Length	PDO	INJ	FAT	INJ+FAT	TOTAL	PDO	INJ	FAT (x100)	INJ+FAT	TOTAL	**LOSS INJ+FAT**	LOSS TOTAL
1	25	A	96.67	97.44	1/1/2008	12/31/2012	45974	0.77	111	14	0	14	125	1.32	0.17	0	0.17	1.49	**4**	4
2	25	A	97.69	98.54	1/1/2008	12/31/2012	59467	0.81	140	14	1	15	155	1.29	0.13	0.92	0.14	1.43	**4**	4
3	25	A	98.55	99.32	1/1/2008	12/31/2012	72084	0.73	91	9	0	9	100	0.69	0.07	0	0.07	0.76	**3**	3
4	25	A	99.33	99.94	1/1/2008	12/31/2012	72810	0.61	94	9	2	11	105	0.71	0.07	1.5	0.08	0.79	**3**	3
5	25	A	100.68	101.38	1/1/2008	12/31/2012	43042	0.65	43	6	1	7	50	0.55	0.08	1.27	0.09	0.64	**3**	3
6	25	A	160.76	163.31	1/1/2008	12/31/2012	48027	2.59	306	31	1	32	338	1.35	0.14	0.44	0.14	1.49	**3**	4
7	25	A	255.27	257.3	1/1/2008	12/31/2012	63998	2	272	30	2	32	304	1.17	0.13	0.86	0.13	1.3	**3**	3
8	25	A	268.48	269.36	1/1/2008	12/31/2012	39000	0.99	66	10	0	10	76	0.93	0.14	0	0.14	1.07	**3**	3
9	76	A	6.8	8.04	1/1/2008	12/31/2012	74011	1.32	204	17	1	18	222	1.15	0.1	0.56	0.1	1.25	**3**	4
10	76	A	8.05	9.47	1/1/2008	12/31/2012	56038	1.41	122	11	1	12	134	0.85	0.08	0.69	0.08	0.93	**3**	3
11	470	B	7	8.89	1/1/2008	12/31/2012	30000	1.74	81	16	1	17	98	0.85	0.17	1.05	0.18	1.03	**3**	3
12	25	A	94.77	95.89	1/1/2008	12/31/2012	35803	1.12	52	7	1	8	60	0.71	0.1	1.37	0.11	0.82	**2**	3
13	25	A	95.9	96.66	1/1/2008	12/31/2012	40996	0.74	38	4	0	4	42	0.51	0.05	0	0.05	0.56	**2**	2
14	25	A	99.95	100.67	1/1/2008	12/31/2012	70098	0.8	64	7	0	7	71	0.5	0.05	0	0.05	0.55	**2**	2
15	25	A	102.16	103.89	1/1/2008	12/31/2012	33765	1.71	48	4	2	6	54	0.46	0.04	1.9	0.05	0.51	**2**	2
16	25	A	127.86	131.64	1/1/2008	12/31/2012	38000	3.83	138	31	2	33	171	0.52	0.12	0.75	0.12	0.64	**2**	2
17	25	A	131.65	135.25	1/1/2008	12/31/2012	44992	3.59	176	22	5	27	203	0.6	0.07	1.7	0.09	0.69	**2**	2
18	25	A	135.26	137.74	1/1/2008	12/31/2012	73952	2.44	115	12	3	15	130	0.35	0.04	0.91	0.04	0.39	**2**	1
19	25	A	150.3	151.65	1/1/2008	12/31/2012	91007	1.34	144	13	0	13	157	0.65	0.06	0	0.06	0.71	**2**	2
20	25	A	151.66	153.19	1/1/2008	12/31/2012	82000	1.53	221	18	0	18	239	0.97	0.08	0	0.07	1.04	**2**	3
21	25	A	153.2	155.92	1/1/2008	12/31/2012	79000	2.64	372	30	0	30	402	0.97	0.08	0	0.08	1.05	**2**	3
22	25	A	155.93	158.19	1/1/2008	12/31/2012	67000	2.3	270	17	0	17	287	0.96	0.06	0	0.06	1.02	**2**	3
23	25	A	158.2	160.75	1/1/2008	12/31/2012	71000	2.53	232	29	0	29	261	0.71	0.09	0	0.08	0.79	**2**	2
24	25	A	250.24	252.25	1/1/2008	12/31/2012	60999	2.01	250	15	0	15	265	1.11	0.07	0	0.07	1.18	**2**	3
25	25	A	252.26	254.22	1/1/2008	12/31/2012	55003	1.98	161	16	2	18	179	0.81	0.08	1.01	0.09	0.9	**2**	2

Strategic Highway Safety Plan (SHSP)

19

- Required by Map-21
- 2014 update
- Data driven
- Establishes safety focus
- Establishes goals
- Aligned with CDOT and other agency safety plans

SHSP Example Performance Measures

2007-present

20

Example Performance Measure	Target	Actual	Goal Met?
Total crashes per 100 MVMT	290	212	Yes
Fatal crashes per 100 MVMT	1.0	0.9	Yes
Injury crashes per 100 MVMT	65	51	Yes
Percent of fatal crashes - alcohol-related	29%	35%	No
Seat belt use	85%	83%	No
Percent of crashes - age 21 to 34	32%	31%	Yes
Percent of crashes - age 65+	12%	12%	Yes
Motorcycle crashes per 1,000 registrations	15	12	Yes
Percent of fatal crashes – bicycles	1%	2%	No
Percent of fatal crashes –pedestrians	6%	10%	No
Construction and work zone crashes	1,150	914	Yes

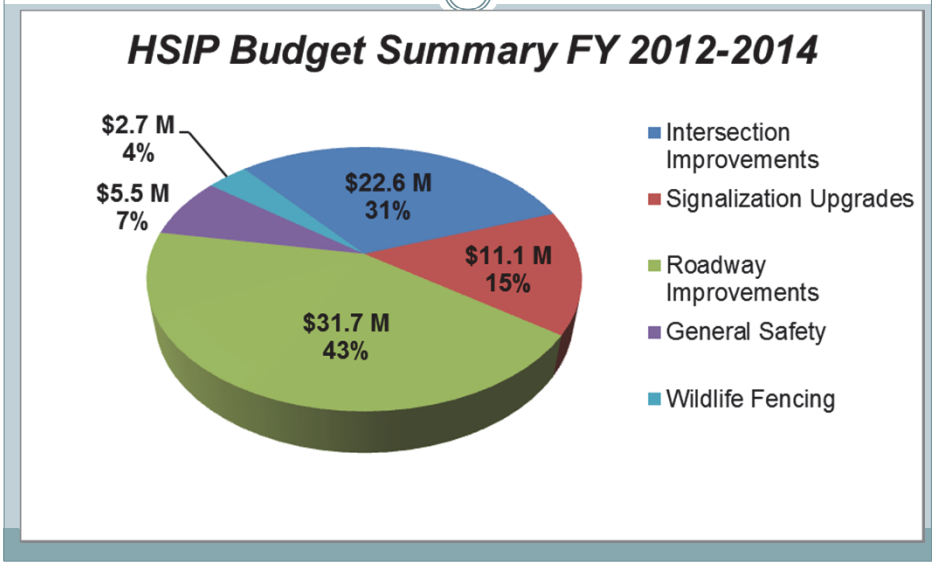
Highway Safety Improvement Program (HSIP)

21

- Federal Program, Annual Budget $20-30M
- Addresses Crash Locations
  - Highway and off-system
- Meets Benefit/Cost Ratio of 1 or greater
- Data Driven process:
  - Statewide crash database
  - Pattern Recognition
  - Crash Mitigation Factors
  - Level of Service Of Safety
  - Crash Rates
  - Crash Severity

HSIP Project Types

22



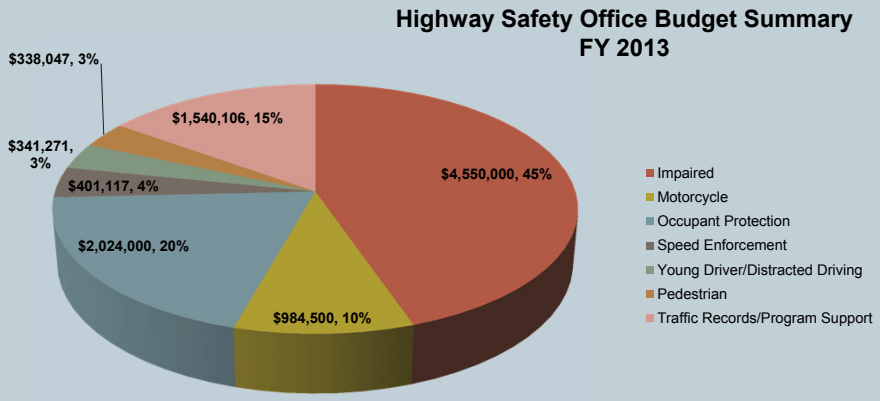
Office of Transportation Safety (Highway Safety Office)

23

- Federal and State Programs
- Annual Budget $9.9M
- Behavior Based Grants
- Driver Behavior Focus
  - Impaired Driving
  - Motorcycle Safety
  - Occupant Protection
  - Young Drivers
  - Speed Enforcement
  - Distracted Driving
  - Pedestrian Safety

Office of Transportation Safety (Highway Safety Office)

24



FASTER Safety Legislation

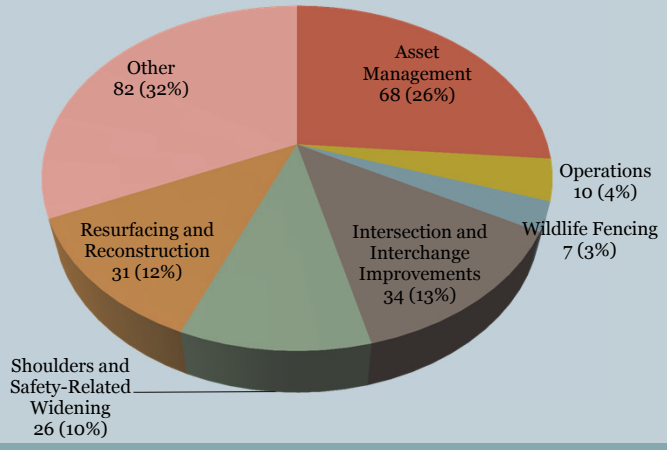
25

- Started in FY 2010 after passage of FASTER legislation.
- *"…Construction, reconstruction or maintenance project that the Commission determines is needed to enhance safety of a state highway"*. SB 09-108

Historical FASTER Safety Projects

26

FASTER Safety Projects



Program Development

27

- Development Teams
  - Oversight Team: Myron Hora – Acting R4 RTD, Kerrie Neet R5 RTD, Deb Perkins-Smith – Dir. DTD, Ryan Rice – Dir. TSM&O, Scott Richrath - CFO, and Herman Stockinger – Dir. Policy and Government Relations.
  - Core Staff Team: Alisa Babler – HQ Traffic Safety Engineering Section Manager, Carol Gould – OTS Highway Safety Manager, Steven Hersey – R1 Traffic and Safety Engineer, William Johnson – DTD Transportation Performance Branch Manager, Sandi Kohrs – DTD Multi-modal Planning Branch Manager, Charles Meyer HQ Traffic and Safety Engineering Branch Manager, Mike McVaugh – R5 Traffic and Safety Engineer, Jeff Sudmeier – MPO and Regional Planning Section Manager, Ermias Weldemicael – DTD Economist, and Rebecca White – Policy and Government Relations Local Government Liaison.
  - Technical Team: James Biren/Sasan Delshad – R2 Traffic and Safety Engineer, Long Nguyen – R4 Traffic and Safety Engineer, David Swenka – HQ Traffic and Safety engineer, Sean Yeates –R3, and Zane Znamenacek – R3 Traffic and Safety Engineer.

New FASTER Safety Program

28

- New program assumptions:
  - The new program addresses Audit Recommendations.
  - Alignment with other Safety Programs.
    - Strategic Highway Safety Plan
    - PD 14
    - Integrated Safety Plan
    - Core Performance Measures

New Program Goals and Objectives

29

- FASTER Safety Program Goals and Objectives
  - Reduce total highway crashes.
  - Reduce severity of highway crashes (fatality and injury).
  - Address systematic safety concerns using a risk-based safety approach (FASTER Safety Asset Management).

Proposed FASTER Safety Program

30

* The new Program will focus on two categories: Statewide Asset Management and Mitigation Program.

- Asset Management $40 M

  (Proactive Safety Improvements)
- Mitigation Program $47M

  (Crash Data, Safety Improvements)
- TOTAL FY15 Allocation $87M

New FASTER Safety Asset Management Program

31

- The proposed $40m will be allocated on four Asset Categories and administered in accordance with the Risk-based Asset Management Plan.
- Fund distribution and program focus:
  - Structures
    - Program focus: signs, signals, high-mast lighting, walls , and bridge/traffic rail.
  - Tunnels
    - Program focus: tunnel lighting, fire suppression, traffic control, and snowmelt
  - Culverts
    - Program focus: critical culverts, culvert rail, and culverts <36”
  - Rockfall
    - Program focus: rockfall mitigation/prevention, landslides, sink holes, and embankment stability.

New FASTER Safety Mitigation Program

32

- Project selection process
  - Use metrics to develop crash mitigation list (CML), metrics include:
    - AADT
    - Number of Crashes
      - Property Damage Only
      - Injury
      - Injury + Fatality
    - Crash Rates
      - Property Damage Only
      - Injury
      - Injury + Fatality
  - Identify treatments for proposed safety projects
  - Implement project selection criteria
  - Select projects

New FASTER Safety Mitigation Program

33

Generalized Project Selection Process

Use CML to develop candidate locations → Identify treatments and develop projects → Implement selection criteria → Select and prioritize projects

Proposed Project Selection Criteria

34

All Region projects considered for FASTER-Safety funding shall include a minimum of <u>TWO</u> of the following criteria:
A. Reduce existing crashes
B. Reduce existing crash severity
C. Address existing system for safety weakness
D. Encourage cooperative safety effort with local agency
E. Enhance other highway safety features and/or functions
F. Provide proven safety measures for a systematic/preventative location
G. Improve pedestrian/bicycle safety
H. Existing project (leveraging funding opportunities with proposed safety project)
I. Behavior Based (all users – drivers, passengers, pedestrian, bikes, motorcycle, etc.)

Example
Project Selection Process - I-70 MP 29.50-31.50

35

DiExSys™, LLC
DiExSys™ Safety Systems
Pattern List by Location

05/06/2013

Job #: 20130506181948

Location File: UFUR4F_5YR_AADT_000000_029999_BATCH_FILE_SUMMARY Cutoff: 5 Acc's @ 99%

Location— SH0070A MP: 29.67 to 30.67 :: From: 01/01/2007 to 12/31/2011 PDO: 18 INJ: 6 FAT: 1
Patterns
Location: OFF ROAD [19], OFF ROAD RIGHT [12]
Crash Type: OVERTURNING [10]

Location— SH0070A MP: 29.77 to 30.77 :: From: 01/01/2007 to 12/31/2011 PDO: 20 INJ: 6 FAT: 1
Patterns
Location: OFF ROAD [20]
Crash Type: OVERTURNING [10]

Location— SH0070A MP: 29.87 to 30.87 :: From: 01/01/2007 to 12/31/2011 PDO: 18 INJ: 7 FAT: 1
Patterns
Location: OFF ROAD RIGHT [12]
Crash Type: OVERTURNING [10]

Location— SH0070A MP: 29.97 to 30.97 :: From: 01/01/2007 to 12/31/2011 PDO: 15 INJ: 7 FAT: 1
Patterns
Location: OFF ROAD [18], OFF ROAD RIGHT [11]
Crash Type: OVERTURNING [10]

Location— SH0070A MP: 30.07 to 31.07 :: From: 01/01/2007 to 12/31/2011 PDO: 20 INJ: 7 FAT: 1
Patterns
Location: OFF ROAD [21]
Crash Type: OVERTURNING [12]
Road Condition: DRY ROAD [24]

Location— SH0070A MP: 30.17 to 31.17 :: From: 01/01/2007 to 12/31/2011 PDO: 18 INJ: 6 FAT: 1
Patterns
Crash Type: OVERTURNING [11]
Weather: NO ADVERSE WEATHER [22]
Road Condition: DRY ROAD [22]

Example
Project Selection Process - I-70 MP 29.50-31.50

36

- Overturning pattern (Location-Off Road Crashes)

	Roadside								
	Relocated/ Breakaway Utility Poles	Median Rumble Strips	Shoulder Rumble Strips	Upgrade Guardrail	Upgrade Median Barrier	New Median Barrier	Impact Attenuators	Flatten Side Slopes	Remove Obstacles
Fixed/Other Objects	X	X	X	X	X	X	X	X	X
Rear End									
Broadside									
Overturning		X	X	X	X	X		X	
Head-On		X			X	X			
Sideswipe Same Direction									
Sideswipe Opposite Direction		X			X	X			
Approach Turn									
Overtaking Turn									
Parked Motor Vehicle			X						
Pedestrian (School-Age)			X						
Pedestrian (Other)			X						
Railway Vehicle									
Bicycle			X						
Motorized Bicycle			X						

Example
Project Selection Process - I-70 MP 29.50-31.50

37

- Project is on "Mitigation List"
- Traffic data – 49 PDO, 9 INJ, 1 FAT
- Guardrail scope addresses pattern
- Region advances Project

DOT

DR2447 Format

Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report

Microsoft Visual FoxPro 9 SP2
12/19/2013

Job #: 20131219072449

Highway: 70A **Begin:** 29.50 **End:** 31.50 **From:** 01/01/2006 **To:** 12/31/2010

Severity

PDO:	71	
INJ:	14	17 :Injured
FAT:	1	2 :Killed
Total:	86	

Multi-Vehicle

One Vehicle:	45
Two Vehicles:	37
Three or More:	4
Unknown:	0
Total:	86

Location

On Road:	48	Off in Median:	0
Off Road Left:	11	Private Property:	0
Off Road Right:	27	Unknown:	0
Off Road at Tee:	0	Total:	86

Accident Type

Overturning:	16	Road Maintenance Equipment:	0	Fence:	4
Other Non Collision:	2	Domestic Animal:	0	Tree:	1
School Age Peds:	0	Wild Animal:	5	Large Rocks or Boulder:	0
Ped on Toy Motorized Vehicle:	0	Light/Utility Pole:	1	Railroad Crossing Equipment:	0
Other Pedestrians:	1	Traffic Signal Pole:	0	Barricade:	0
Head On:	0	Sign:	3	Wall/Building:	1
Rear End:	15	Guard Rail:	7	Crash Cushion/Traffic Barrel:	0
Broadside:	3	Cable Rail:	0	Mailbox:	0
Approach Turn:	6	Concrete Highway Barrier:	1	Other Fixed Object:	0
Overtaking Turn:	2	Bridge Structure:	1	Involving Other Object:	3
Sideswipe (Same):	9	Vehicle Debris/Cargo:	0	Unknown:	0
Sideswipe (Opposite):	1	Culvert/Headwall:	0	Total:	86
Parked Motor Vehicle:	1	Embankment:	3		
Railway Vehicle:	0	Curb:	0	Total Fixed Objects:	22
Bicycle:	0	Delineator Post:	0	Total Other Objects:	3

Lighting Conditions

Daylight:	57
Dawn or Dusk:	6
Dark - Lighted:	10
Dark - Unlighted:	13
Unknown:	0
Total:	86

Weather Conditions

None:	70	Dust:	0
Rain:	3	Wind:	0
Snow/Sleet/Hail:	12	Unknown:	1
Fog:	0	Total:	86

Road Description

At Intersection:	12
At Driveway Access:	0
Intersection Related:	8
Non Intersection:	57
Alley Related:	0
Roundabout:	0
Ramp:	9
Parking Lot:	0
Unknown:	0
Total:	86

Road Conditions

Dry:	69
Wet:	6
Muddy:	0
Snowy:	7
Icy:	1
Slushy:	1
Foreign Material:	0
Dry w/Icy Road Treatment:	0
Wet w/Icy Road Treatment:	0
Snowy w/Icy Road Treatment:	0
Icy w/Icy Road Treatment:	1
Slushy w/Icy Road Treatment:	1
Unknown:	0
Total:	86

Mainline/Ramps/Frontage Rds

Mainline:	56
Crossroad (Ramp A):	1
Frontage Rd:	0

Ramps

B:	6	H:	0
C:	2	I:	0
D:	1	J:	0
E:	0	K:	0
F:	0	T:	0
G:	0		

Intsx Frontage/Ramps

M:	0	N:	9
O:	11	P:	0

HOV Lanes:	0
Uknwn:	0
Total:	86

Accident Rates

PDO:	1.06	MVMT	Total:	1.29 MVMT
Injury:	0.21	MVMT		
Fatal:	1.50	100 MVMT		

Example
Project Selection Process - I-70 MP 29.50-31.50

39

- Cable Rail project

type	life	arf lanes	fat factor	inj factor	pdo factor	notes
BRIDGE - REPLACEMENT, REALIGN APPROACH	20		45	45	45	BRIDGE AND APPROACH BRIDGE ACCIDENTS
BRIDGE - WIDENING	20		40	40	40	BRIDGE AND APPROACH BRIDGE ACCIDENTS
GUARDRAIL - INSTALLATION (MBGR)	20		60	40	0	RUN OFF THE ROAD ACCIDENTS ONLY AND RELATED ACCIDENTS
GUARDRAIL - INSTALLATION (CABLE RAIL)	20		60	40	20	RUN OFF THE ROAD ACCIDENTS ONLY AND RELATED ACCIDENTS
GUARDRAIL - UPGRADE (MBGR)	20		60	60	0	GUARDRAIL ACCIDENTS ONLY
GUARDRAIL - UPGRADE (MBGR TO CABLERAIL)	20		60	60	20	GUARDRAIL ACCIDENTS ONLY
INTERSECTION - ADD RIGHT TURN LANES	20	MULTI	30	30	30	
INTERSECTION - RELOCATION/REALIGNMENT	20		35	35	35	
INTERSECTION - REPLACE WITH ROUNDABOUT	20	MULTI	50	50	50	
LANES - ADD ACCEL/DECEL LANES	20		30	30	30	

- Criteria A, Total Crashes

Project Description	PDO	INJ	FAT	Mitigation List?	Matrix	PDO CMF	INJ CMF	FAT CMF	PDO Red	INJ Red	FAT Red	Total Crash Reduction	Meets Criteria
Cable Median Rail	49	9	1	Y	Y	20%	40%	60%	9.8	3.6	0.6	14	Y

Example
Project Selection Process - I-70 MP 29.50-31.50

40

- <u>Criteria A: Reduce existing crashes – (Must meet all 3)</u>
  - Location is on the Mitigation List <u>AND</u>
  - Scope of project addresses crash patterns per the established matrix <u>AND</u>
  - The number of crashes reduced , calculated by CMF will be calculated and documented.
- **<u>Does</u> meet Criteria A.**

Example
Project Selection Process - I-70 MP 29.50-31.50

41

- Criteria B, Crash severity:

Project Description	INJ	FAT	Mitigation List?	Matrix	INJ CMF	FAT CMF	INJ Red	FAT Red	Severe Crash Reduction	Meets Criteria
Cable Median Rail	9	1	Y	Y	40%	60%	3.6	0.6	4.2	Y

Example
Project Selection Process - I-70 MP 29.50-31.50

42

- Criteria B: Reduce existing crash severity –:
  - Location is on the Mitigation List AND
  - Scope of project addresses INJ/Fatal crash pattern per the established matrix AND
  - The number of severe crashes is reduced, calculated by CMF will be calculated and documented.
- **Project meets Criteria B.**
- **Project meets both Criteria A and Criteria B, Project is Advanced.**

Next Steps

43

- TC Workshop in February
  - Identify methodology for allocation of funds
    - Region vs. Statewide vs. Hybrid
    - Allocation Formula if applicable
  - Refine program structure based on Transportation Commission Comments.
- Future Staff Task
    - Develop program reporting metrics

Questions

44

?