

2016 Annual Report

Work Zone Traffic Control



Bureau of Maintenance and Operations
Highway Safety and Traffic Operations Division

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Introduction

This work zone report is compiled with results, graphs, and tables to illustrate work zone activities in the Commonwealth of Pennsylvania during calendar year 2016 and includes performance trends from previous years.

The first priority is to use this document as a basis for improving work zone safety and mobility.

Secondly, it will meet Federal Highway Administration (FHWA) obligations for the Work Zone Final Rule, and define performance and action items addressed in the previous year. This document is also a cornerstone for developing and improving planning efforts for the next year. It will help to identify what practices are effective in mitigating crash congestion and improving safety.

This information is being reported by the Bureau of Maintenance and Operations (BOMO), District Traffic Units' work zone personnel, and FHWA. The report contains the results of quality assurance reviews, Independent Oversight Program (IOP) process reviews, crash data, costs, accomplishments, and goals for the future.

Executive Summary

BOMO's Work Zone Traffic Control Unit goals are always striving to improve safety and mobility in work zones throughout Pennsylvania. Five primary functions are used in reaching these goals:

1. Evaluation of new traffic control devices and approval process
2. Training in work zone traffic control
3. Work with FHWA in developing new work zone traffic control standards and guidance for Districts
4. Publication and policy updates
5. Conduct QA reviews to evaluate how well traffic control standards are being followed

The following tables and graphs capture the 2016 Work Zone highlights:

- Work Zone QA Review scores
- Work Zone crash data from the Crash Information System
- PSP Assistance costs associated with construction/maintenance projects

Work Zone QA Performance

District	BOMO QA Staff (July 2015 – June 2016)		
	Number of QA's	Average Score (Max = 5.00)	Automatic Unsatisfactory*
1	25	4.66	1
2	31	4.73	2
3	34	4.80	2
4	24	4.54	1
5	26	4.74	0
6	27	4.50	2
8	36	4.69	3
9	25	4.76	1
10	23	4.79	0
11	18	4.75	2
12	25	4.72	1
Total	294	4.70	15
4.75-5.00=Very Good 4.25-4.74=Good 3.25-4.24=Fair 0.00-3.24=Failure			

* Automatic Unsatisfactory (Failure) does not count towards average score.

District	Central Office IOP QA Reviews*		
	Number of QA's	Average Score (Max = 100)	Failures
4	9	79.89	0
11	5	91.60	0
12	7	81.43	0
Total	21	83.19	0
85-100=Good 75-84=Fair 65-74=Poor 0-64=Failure			

**** 2016 IOP Conducted In Department Districts 4, 11 and 12.***

Most Common Deficiencies Noted From All QA Reviews:

- Improper Flagger actions
- Incorrect set-ups
- Incorrect placement of shadow vehicles
- Inadequate buffer zone lengths
- Inadequate signing for closures and detours
- Poor condition of devices
- Inadequate management/accountability actions
- Lack of delineation of work area

Remedial Actions to Correct Deficiencies:

- BOMO's QA findings are discussed with the project manager, contractor, and work zone manager.
- A closeout conference is held with the construction unit and the traffic unit, and a formal written report is given to the Work Zone Manager for the correction of deficiencies.
- Maintain WZTC QA scores as a District metric and evaluate trends for improvement opportunities.
- Review details of fatal work zone crashes and determine/implement improvement opportunities.
- Continue training for maintenance crews and inspectors:
 - Publication 213 on proper traffic control setups.
 - Use examples of acceptable and unacceptable devices as shown in the 2009 PA Quality Guidelines for Temporary Traffic Control Devices.
 - Use deficiencies from recent Quality Assurance Reviews for learning opportunities.
 - Use recent crash experience for learning opportunities.

2015 Work Zone Independent Oversight Program

Action Plan

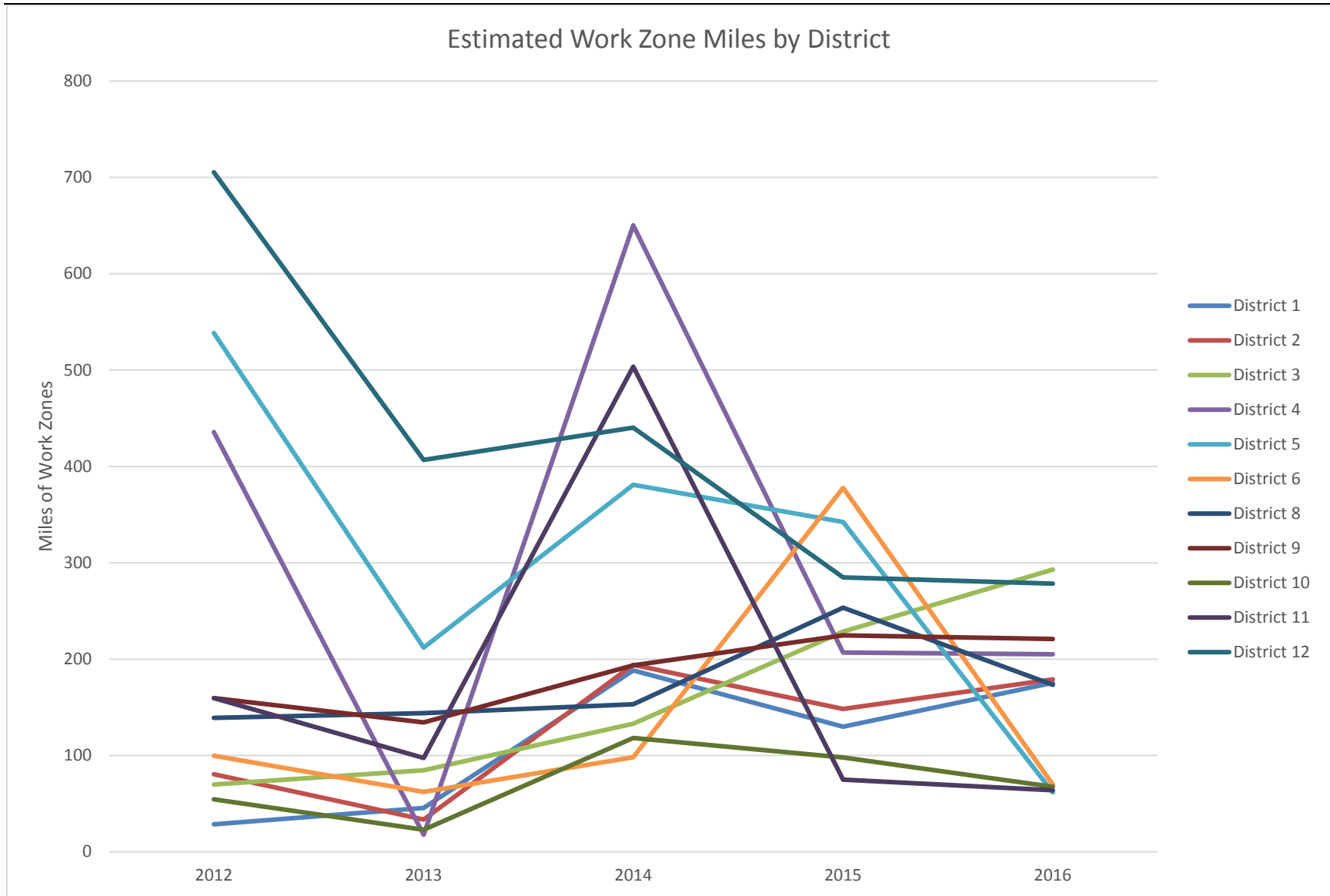
No.	2015 WZ IOP Findings / Recommendations	Owner / Support	Current Status / Actions to be Taken	Target Date	Closed Y/N
1	<p><u>FINDING:</u> Traffic Control Plans (TCPs) and related specifications lack sufficient guidance on the maintenance and protection of pedestrians and other non-motorized users.</p> <p><u>RECOMMENDATION:</u> In order to increase the awareness of the maintenance and protection of pedestrians and other non-motorized uses, PennDOT Should ensure that proper pedestrian accommodations are provided in design, whether it be applicable Pennsylvania Typical Application (PATAs) drawings or project-specific pedestrian TCPs. PennDOT should consider including a separate lump sum pay item for pedestrian MPT when there are significant pedestrian impacts on a project.</p> <p><u>FOLLOW-UP:</u> The Department plans to perform a thorough review of how pedestrian and other non-motorized TCPs are implemented. Several items such as additional Pub. 213 guidance, additional designer and construction training, appropriate adjustments to specification, a separate pedestrian Maintenance Protection of Traffic (MPT) item are being considered. The Department will plan to set up a meeting with Mr. Bobitz and Mr. Castellano by Friday, May 13, 2016 to discuss suggested updates and timelines for implementation.</p>		<u>ACTION:</u>		

No.	2015 WZ IOP Findings / Recommendations	Owner / Support	Current Status / Actions to be Taken	Target Date	Closed Y/N
2	<p><u>FINDING:</u> Portable Changeable Message Signs (PCMS) displays were not following the MUTCD and Pub. 213 guidance for message content.</p> <p><u>RECOMMENDATION:</u> If messages are specified in the TCPs or construction specifications, or messages are to be developed by construction field staff, they shall be in accordance with the MUTCD. Field staff should consult with the District Traffic Engineer to develop PCMS messages. Additionally, Central Office should consider incorporating the DMS Operating Guidelines into Pub. 46 to improve message consistency.</p> <p><u>FOLLOW-UP:</u> The Department plans to establish a publication for Dynamic Message Sign (DMS) Operating Standards. Currently, the Department has DMS operating standards for permanent ITS devices and will expand these standards to PCMS for work zone applications. The Department plans to establish the new publication by the end of this calendar year.</p>		<u>ACTION:</u>	12/31/16	N

No.	2015 WZ IOP Findings / Recommendations	Owner / Support	Current Status / Actions to be Taken	Target Date	Closed Y/N
3	<p><u>FINDING:</u> Signs that were in conflict with the TCP or current phase were not covered or removed properly, and nearly all the project reviews have substandard sign covers or signs that were not sufficiently covered in accordance with Pub. 408 and the MUTCD.</p> <p><u>RECOMMENDATION:</u> Construction Field staff should ensure that conflicting signs be covered in accordance with Pub. 408. Central Office should consider the PTC's new specification for sign covers in making revisions to Pub. 408 Section 901.3(a).</p> <p><u>FOLLOW-UP:</u> The Department will update Pub. 408, Section 901.3 (a) language to be more consistent with the Pennsylvania Turnpike Commission's (PTC) current specification. The Department will also work with District construction personnel and other work zone trainings to ensure that appropriate attention is given to covering and removing signs. The Department will look to have a draft specification out for Clearance Transmittal review by June 3, 2016.</p>	Gaffney	<u>ACTION:</u> Currently awaiting signatures and will then go out on Step 1 Clearance Transmittal	10/31/16	N

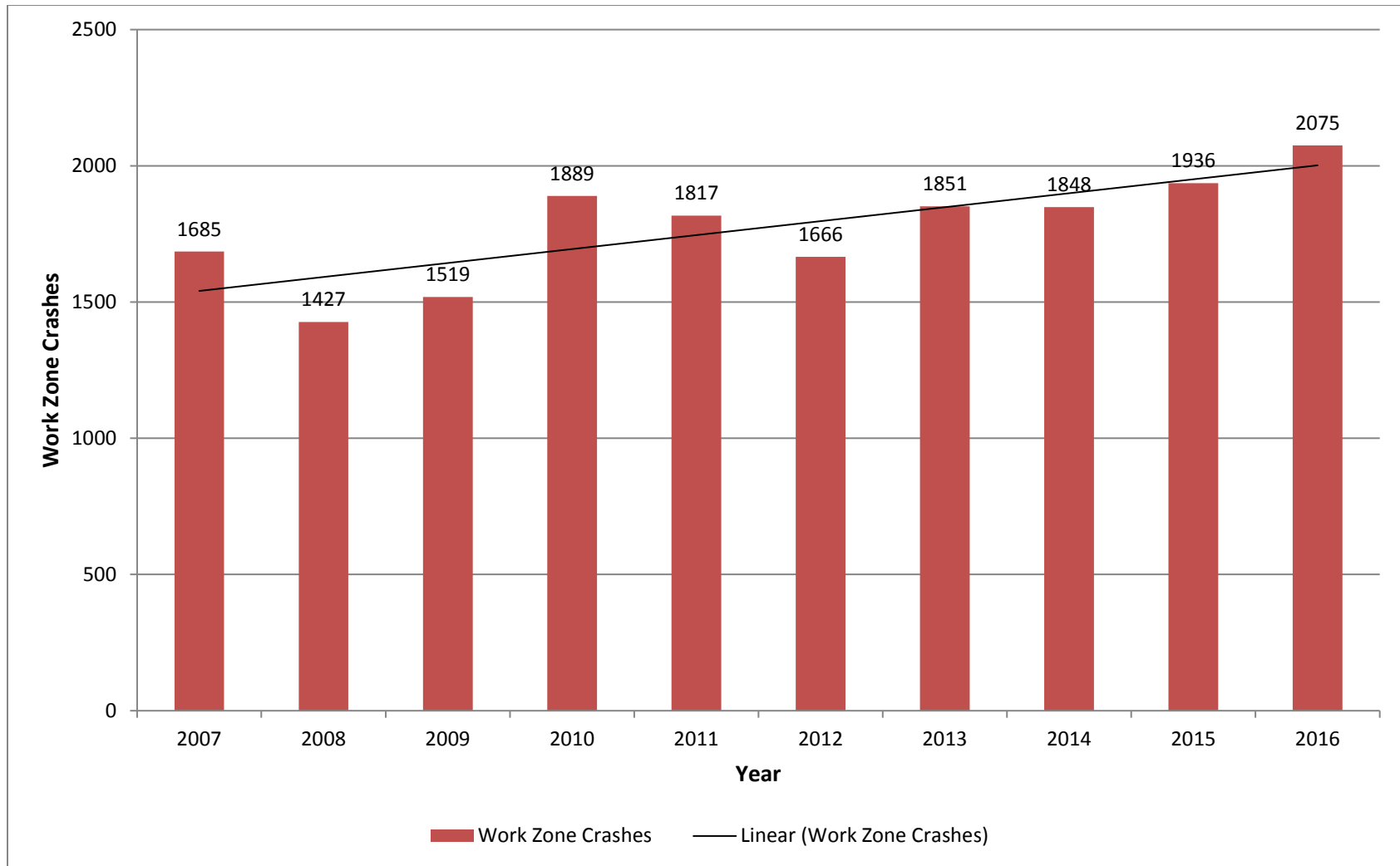
No.	2015 WZ IOP Findings / Recommendations	Owner / Support	Current Status / Actions to be Taken	Target Date	Closed Y/N
4	<p><u>FINDING:</u> There is no statewide consistency or guidance to apply when to establish work zone speed limits in Pennsylvania.</p> <p><u>RECOMMENDATION:</u> The review team believes that the recommendations of the Work Zone Safety Implementation Plan should be followed. That report, issued on October 1, 2014, was prepared by a consultant under a work zone safety grant from FHWA. In particular, the following recommendations should be implemented:</p> <ul style="list-style-type: none"> • PennDOT Central Office, district offices, and the PTC should collaborate to define criteria related to establishing consistent work zone speed limits to improve driver expectancy and compliance. • PennDOT should develop and implement a statewide policy for establishing work zone speed limits. • PennDOT and PA Turnpike should continue to coordinate such that motorists see consistent work zone traffic control and speed limit application on high speed roadways. <p><u>FOLLOW-UP:</u> The Department concurs and will move forward with establishing an identified team of individuals from Central Office, District Offices, PTC, and industry to develop appropriate criteria to establish a consistent statewide policy for work zone speed limits as identified within the 2014 Work Zone Safety Implementation Plan. The department plans to establish the team and have a draft policy out for Clearance Transmittal by July 29, 2016.</p>		<p><u>ACTION:</u></p>		

Estimated Work Zone Miles

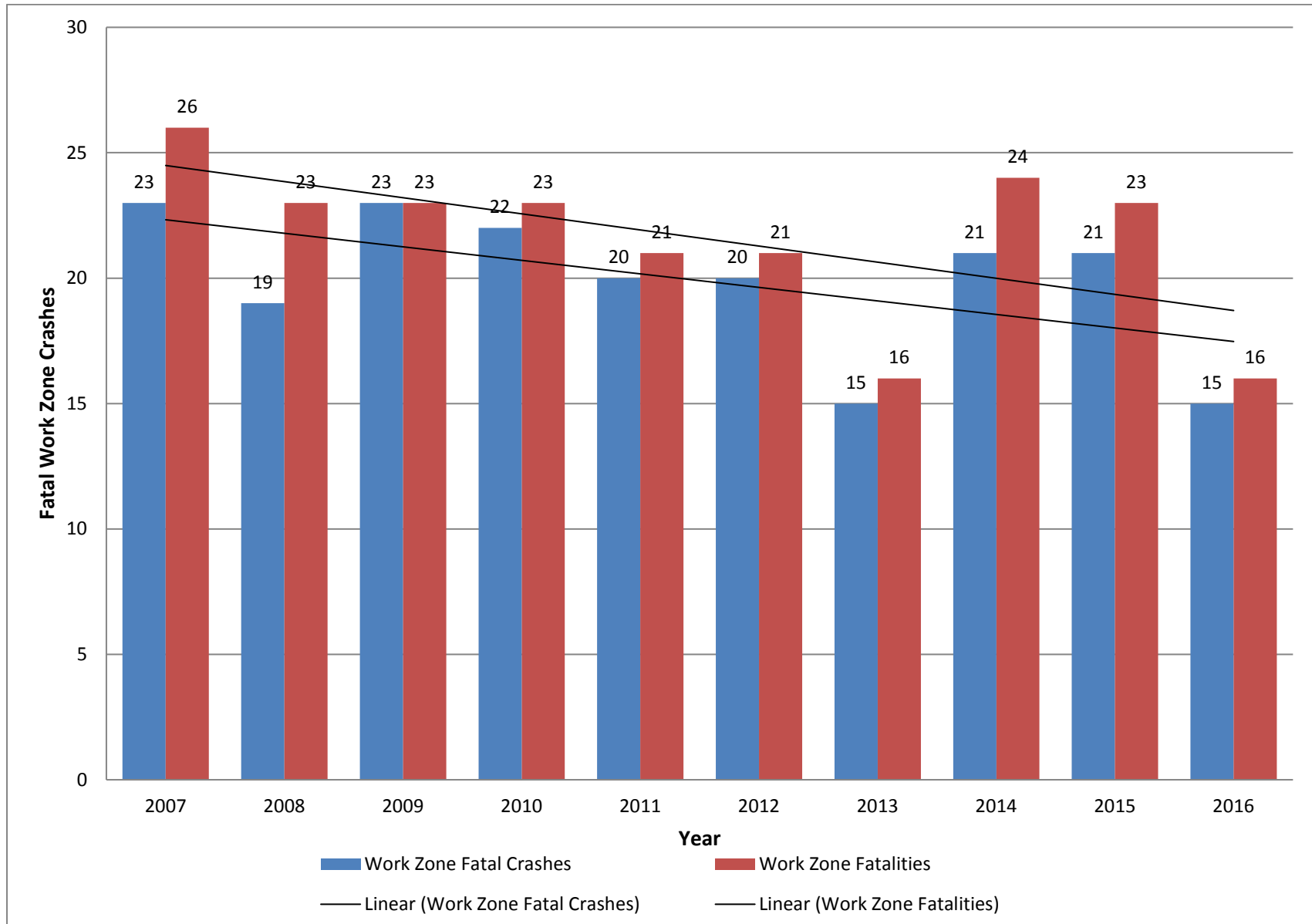


Work Zone Crash Statistics

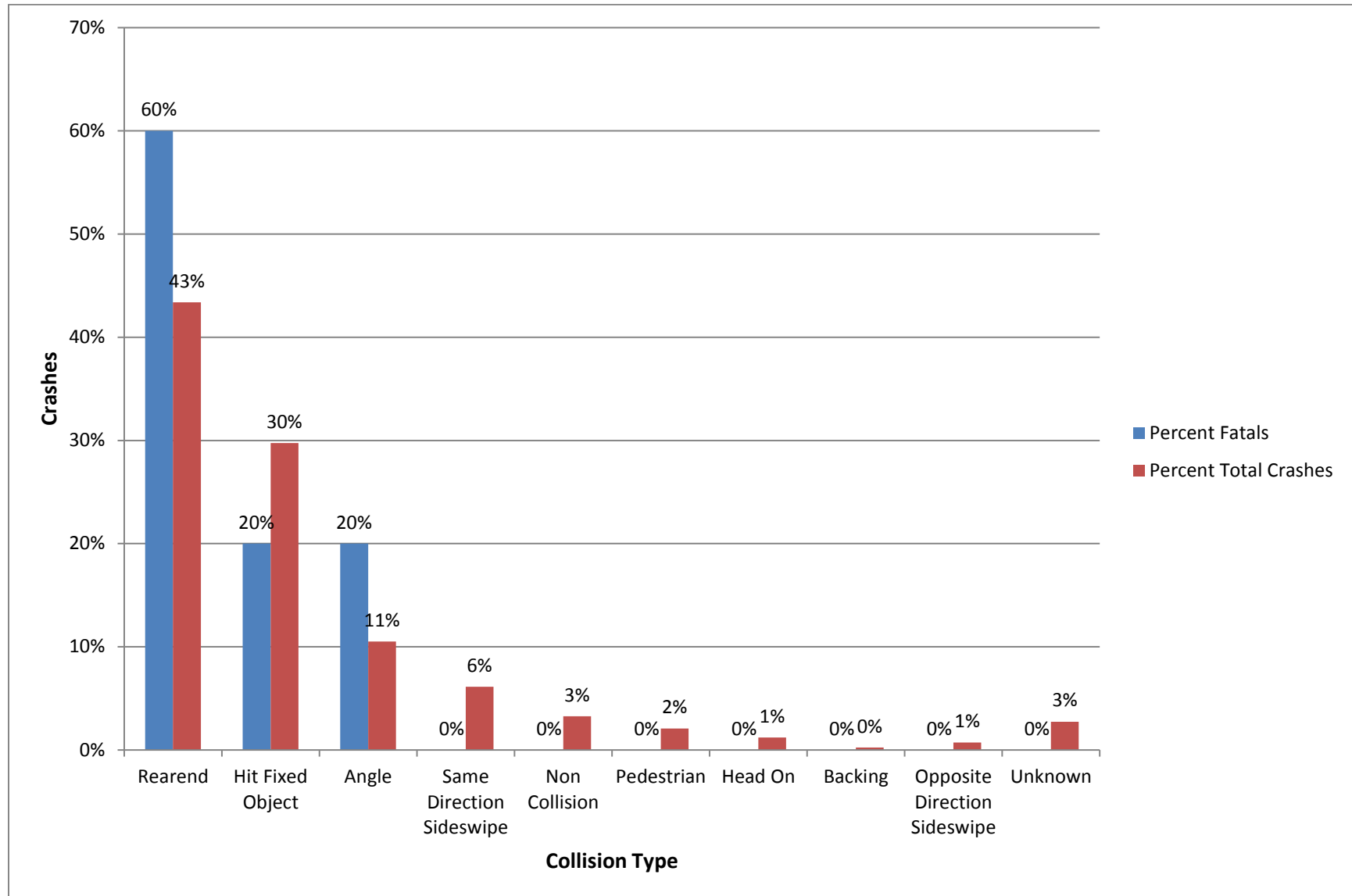
Number of Work Zone Crashes (2007-2016)



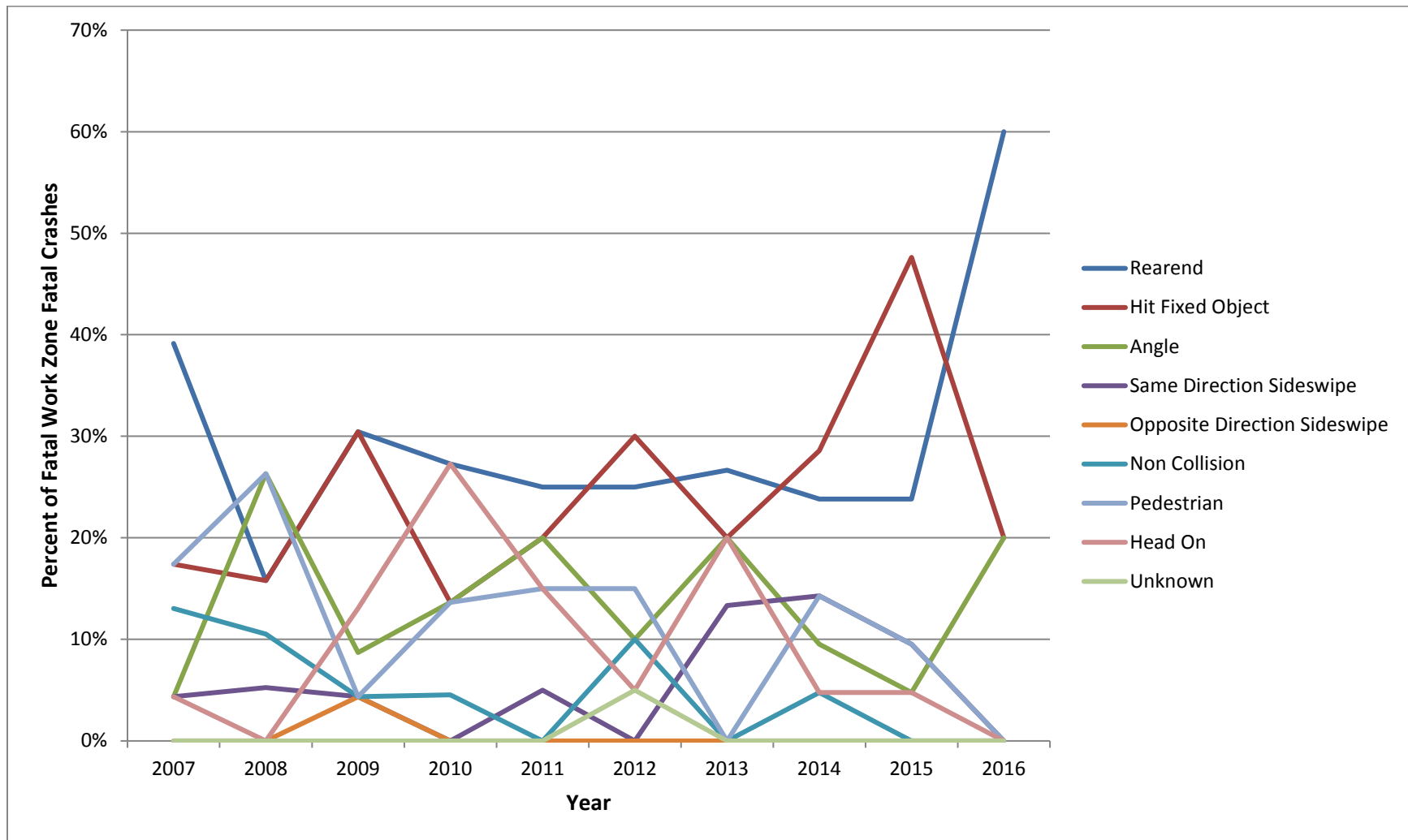
Fatal Work Zone Crashes (2007-2016)



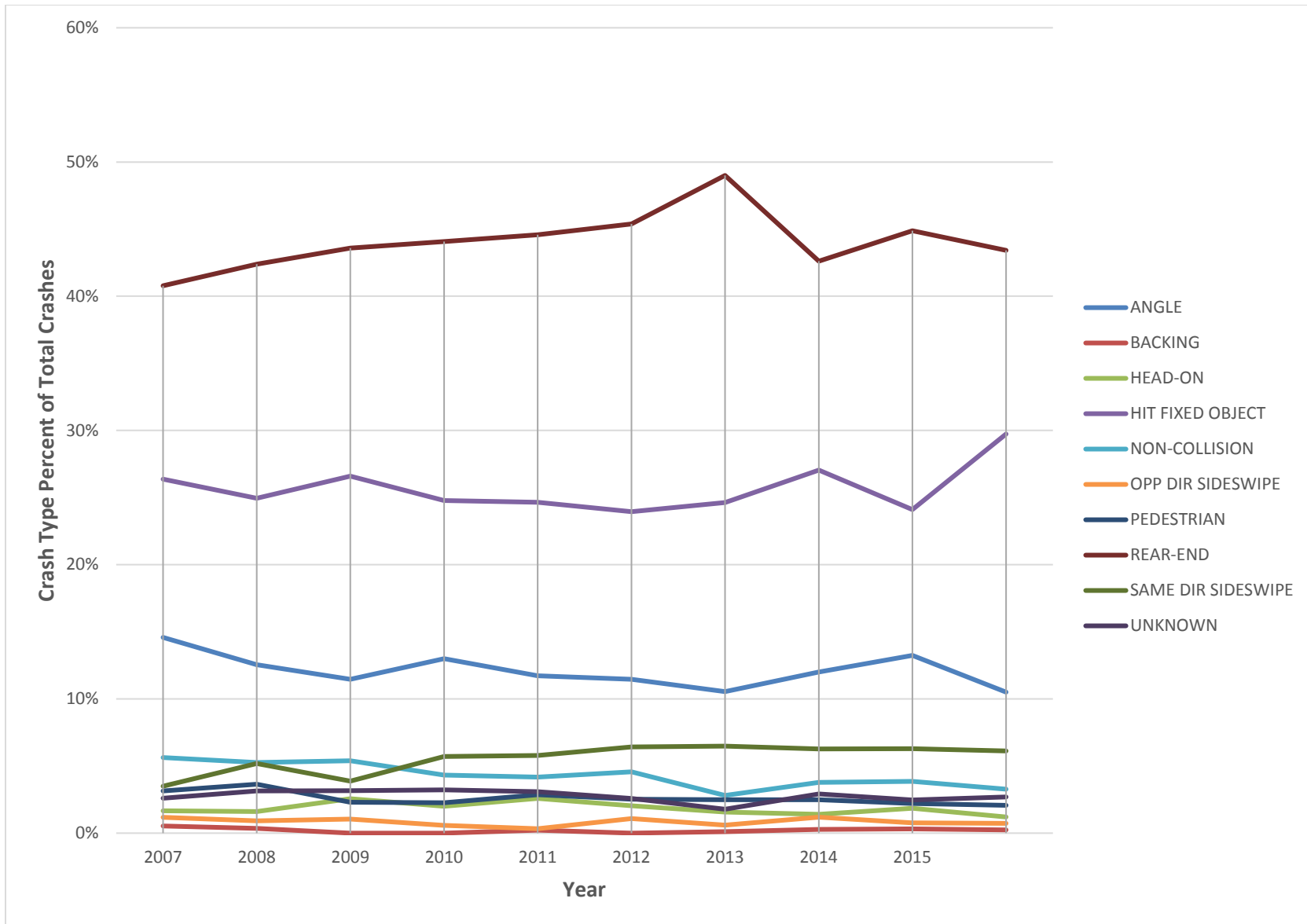
Type of Work Zone Crashes Fatalities and All Crashes



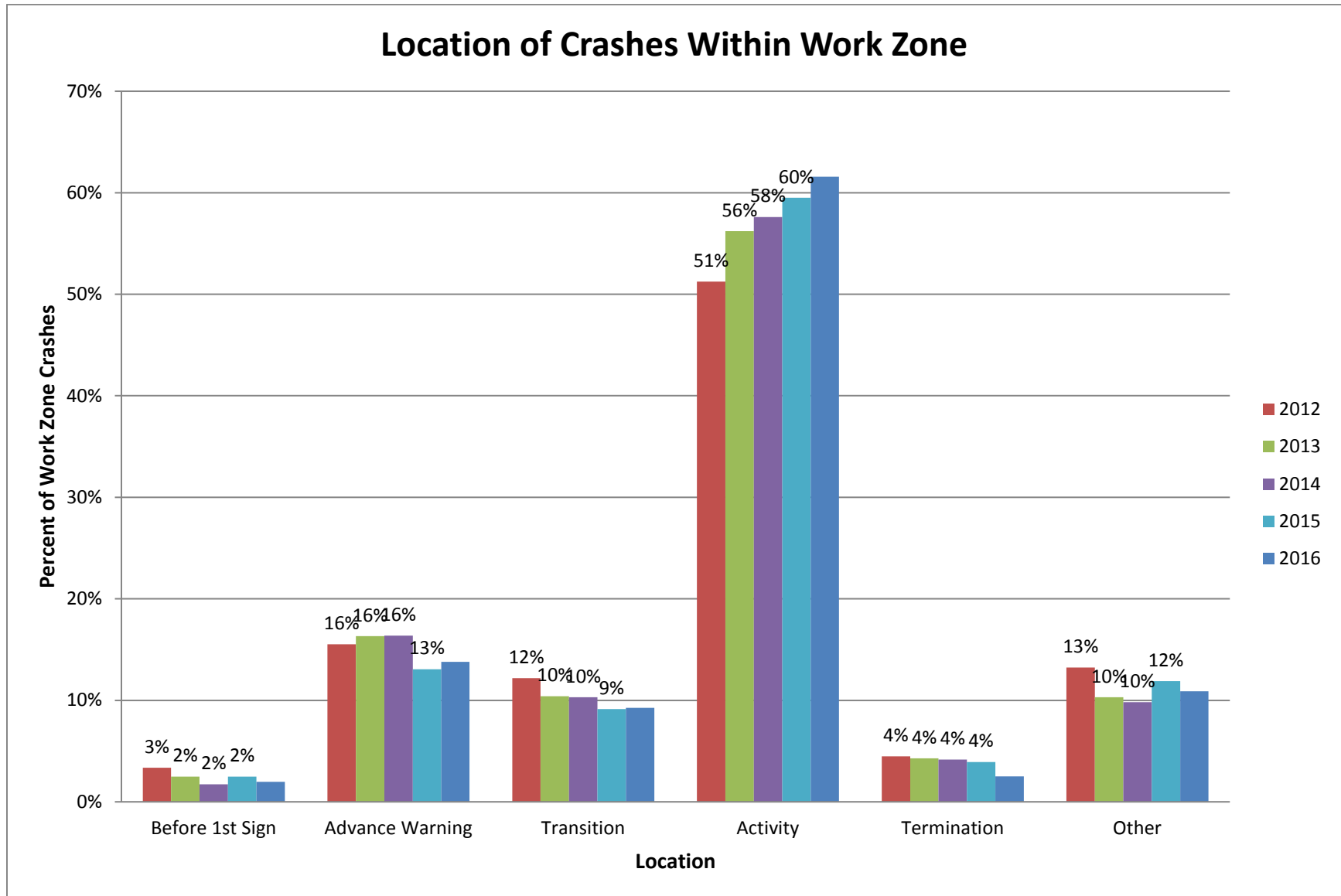
Type of Fatal Work Zone Crashes Trend (2007-2016)



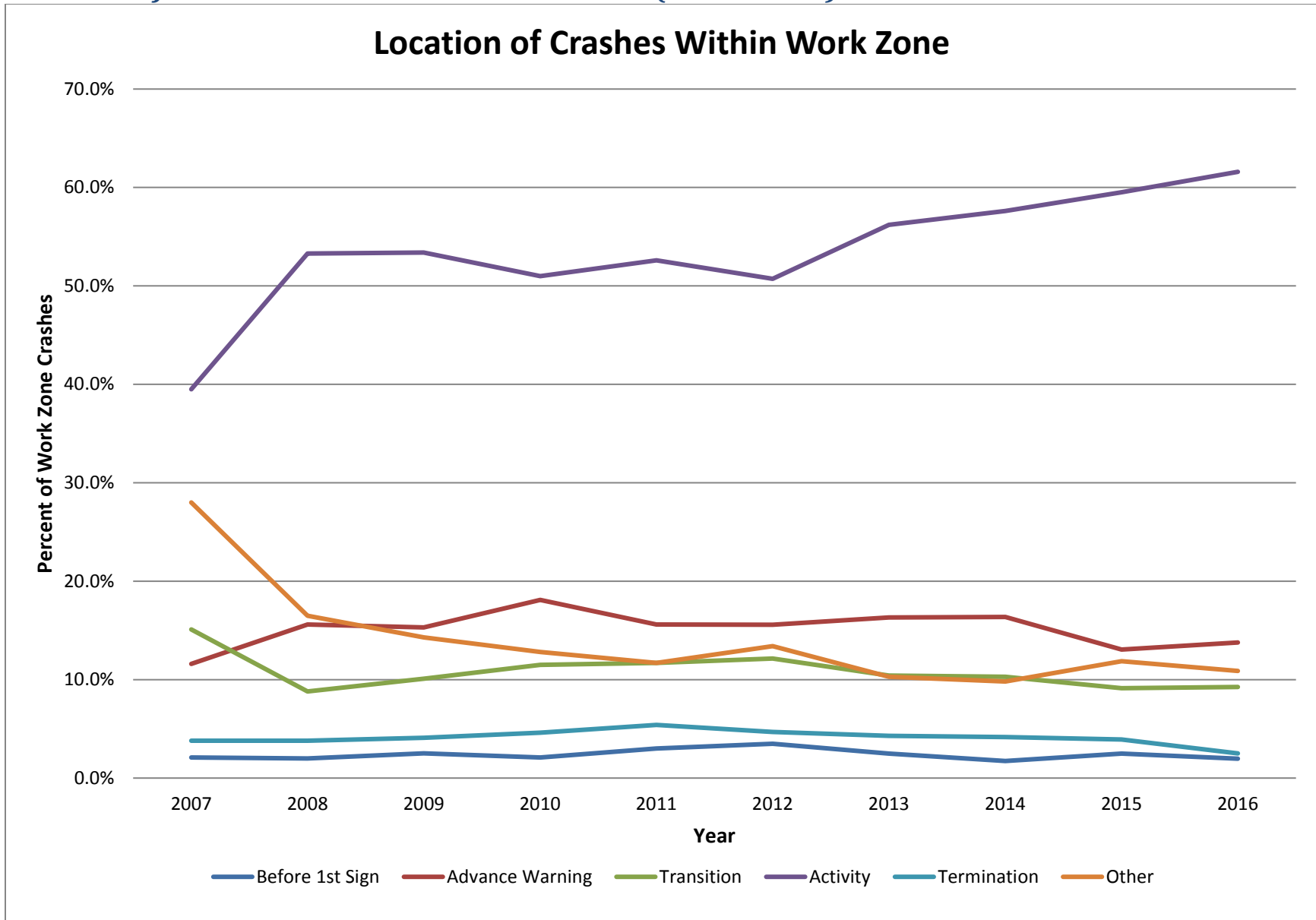
Type of Work Zone Crashes (All Crashes 2007 to 2016)



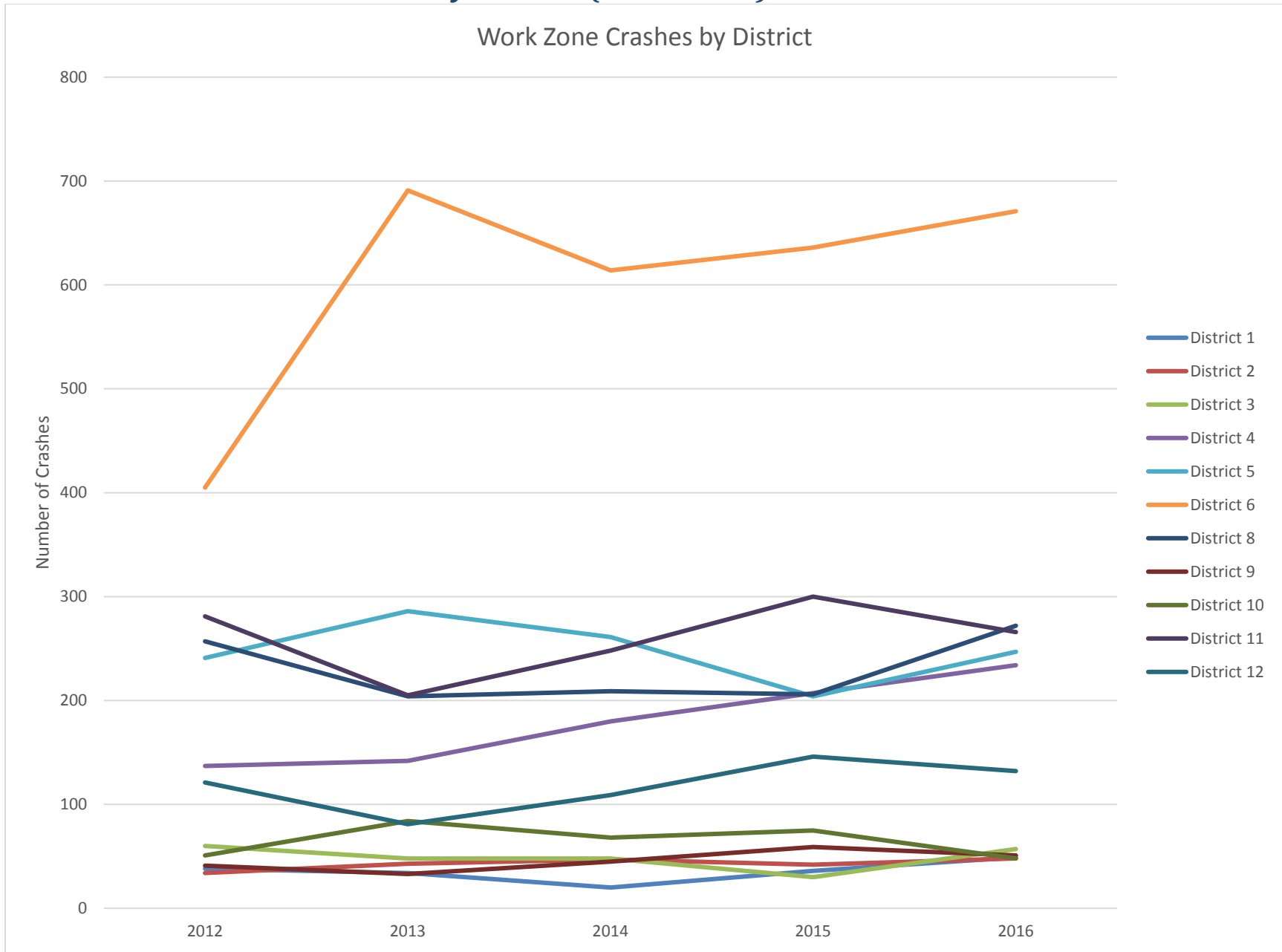
Location of Crashes within Work Zone (2012-2016)



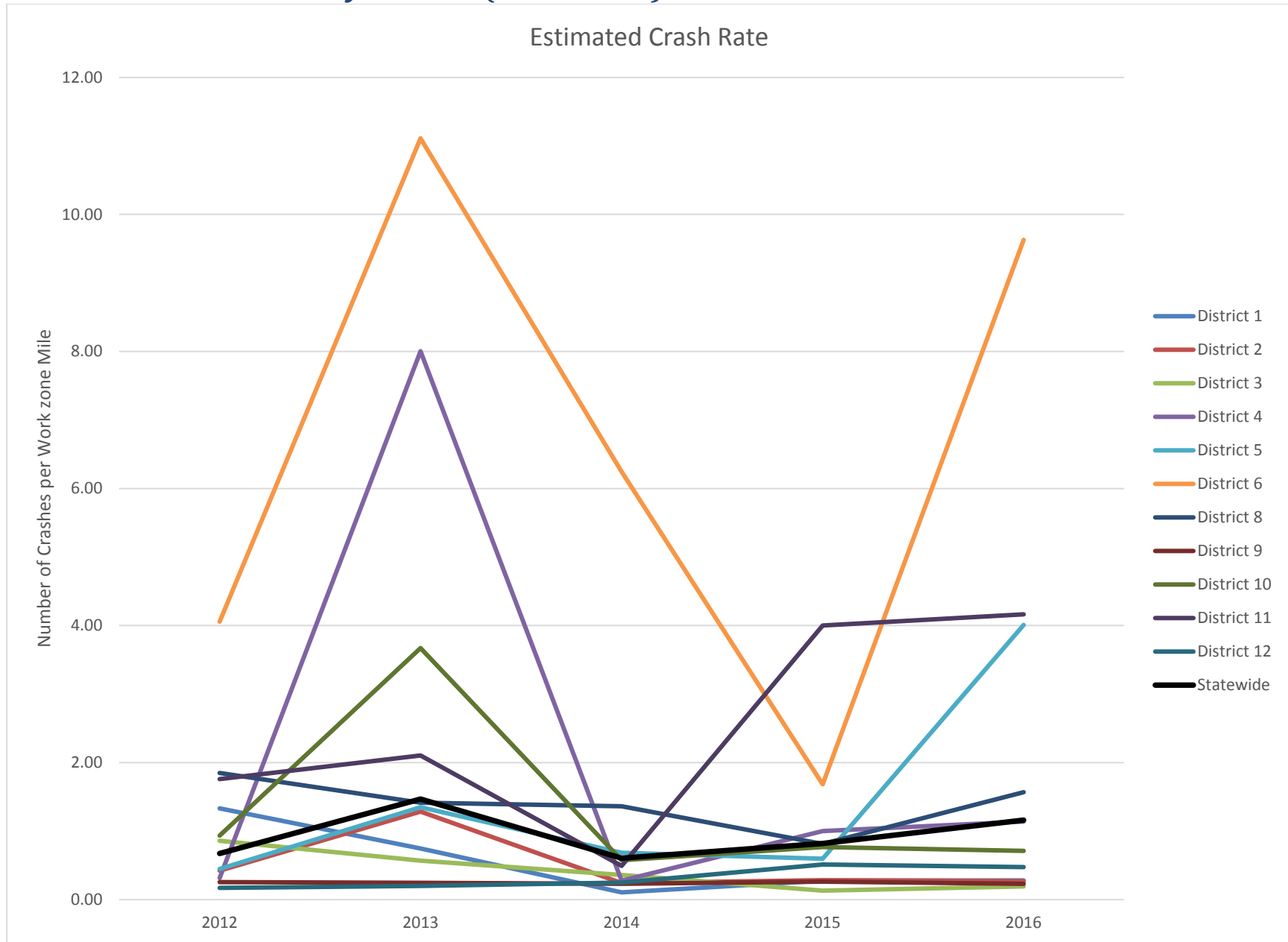
Location of Crashes within Work Zone Trend (2007-2016)



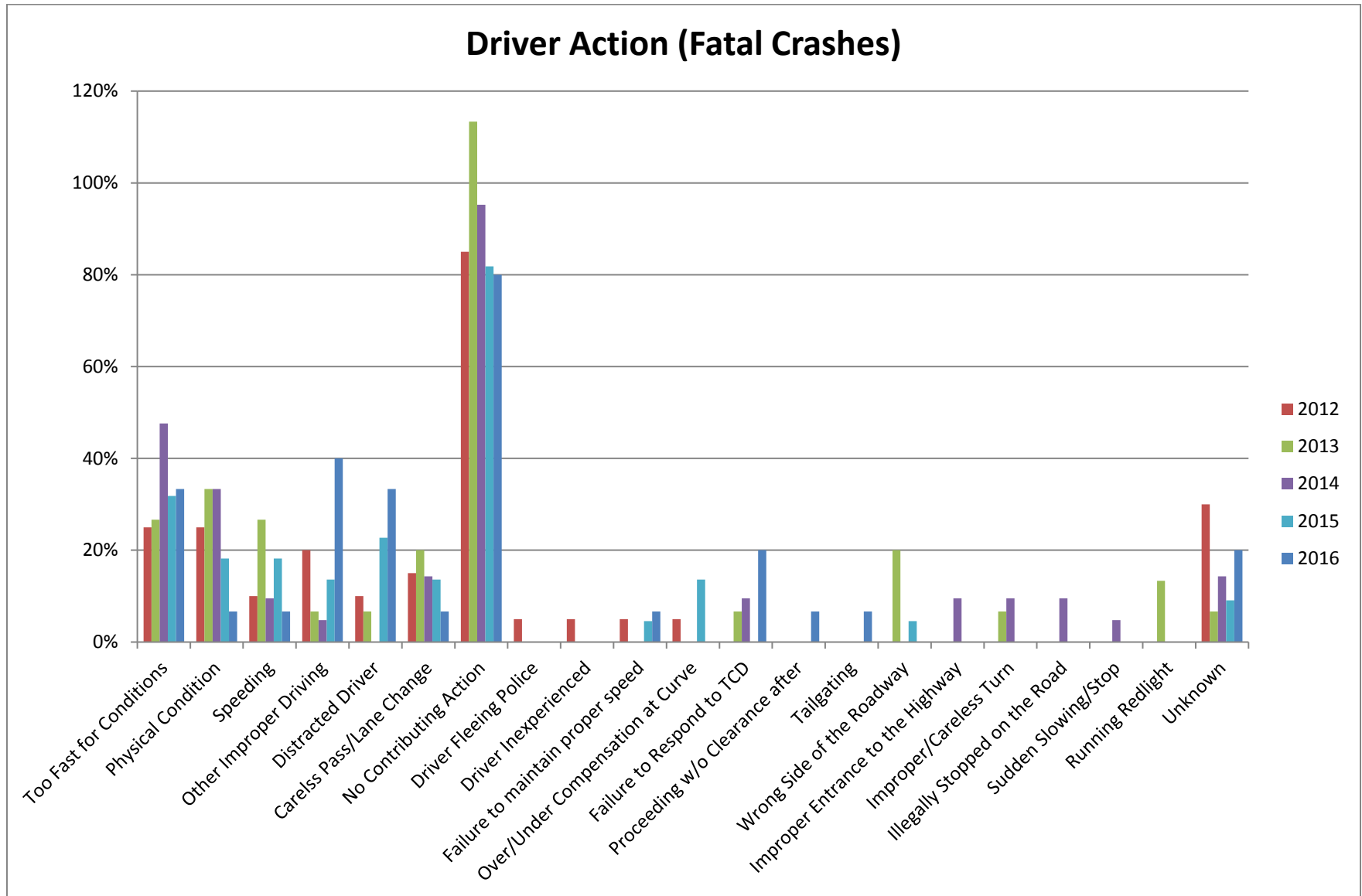
Estimated Work Zone Crashes by District (2012-2016)



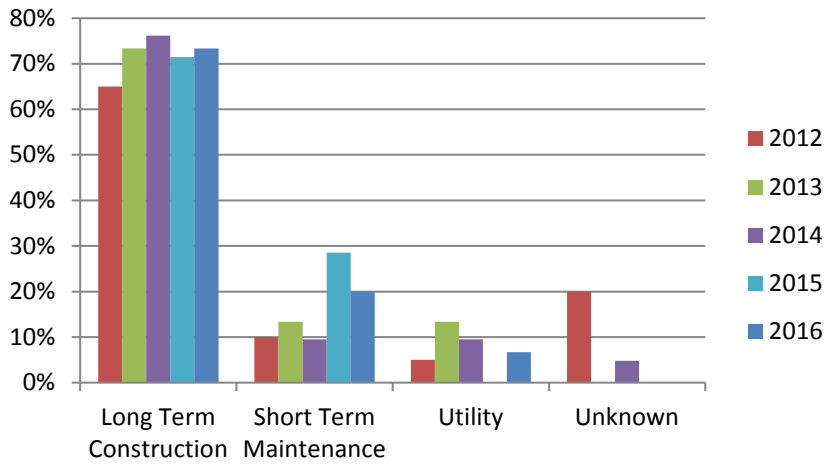
Work Zone Crash Rate by District (2012-2016)



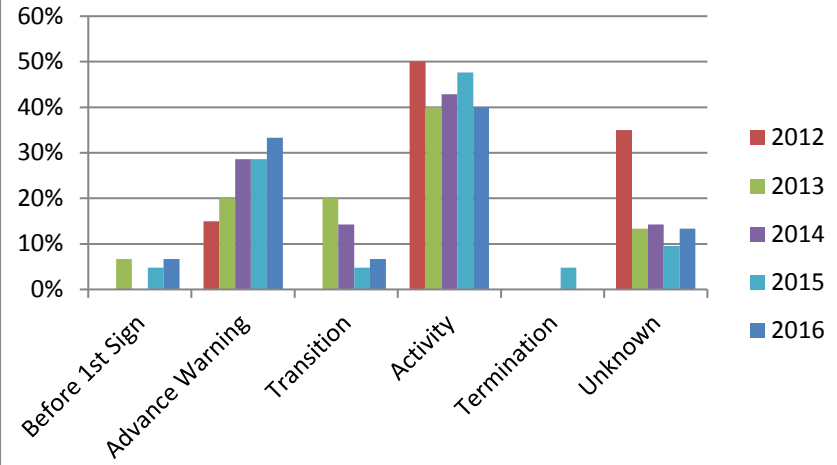
Summary of Work Zone Fatal Crashes (2012-2016)



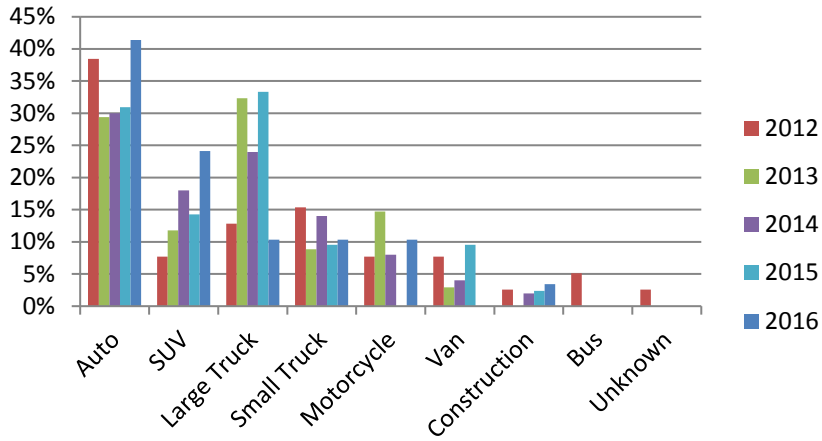
Crash Type (Fatal Crashes)



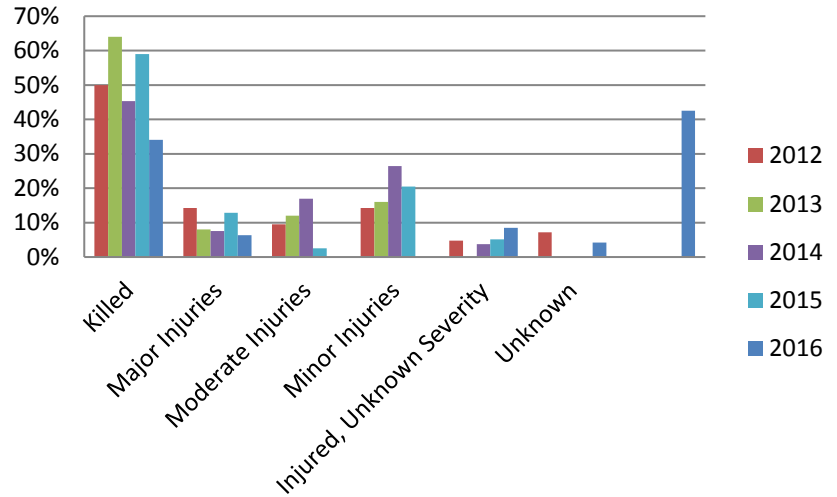
Crash Location (Fatal Crashes)



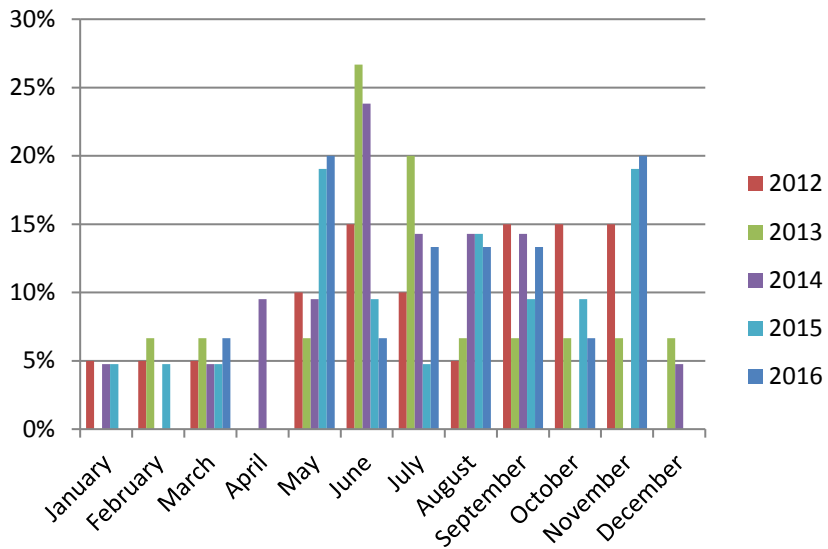
Vehicle Type (All Vehicles Involved)



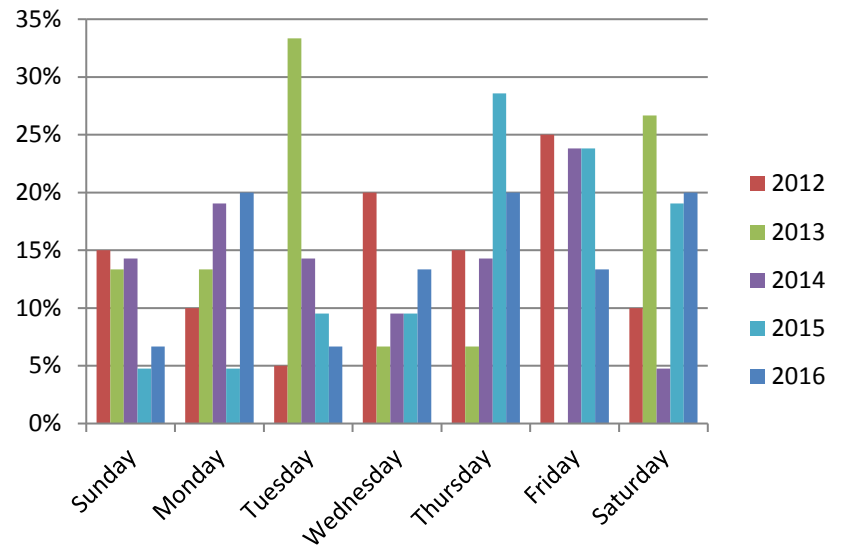
Severity Count (Fatal Crashes)



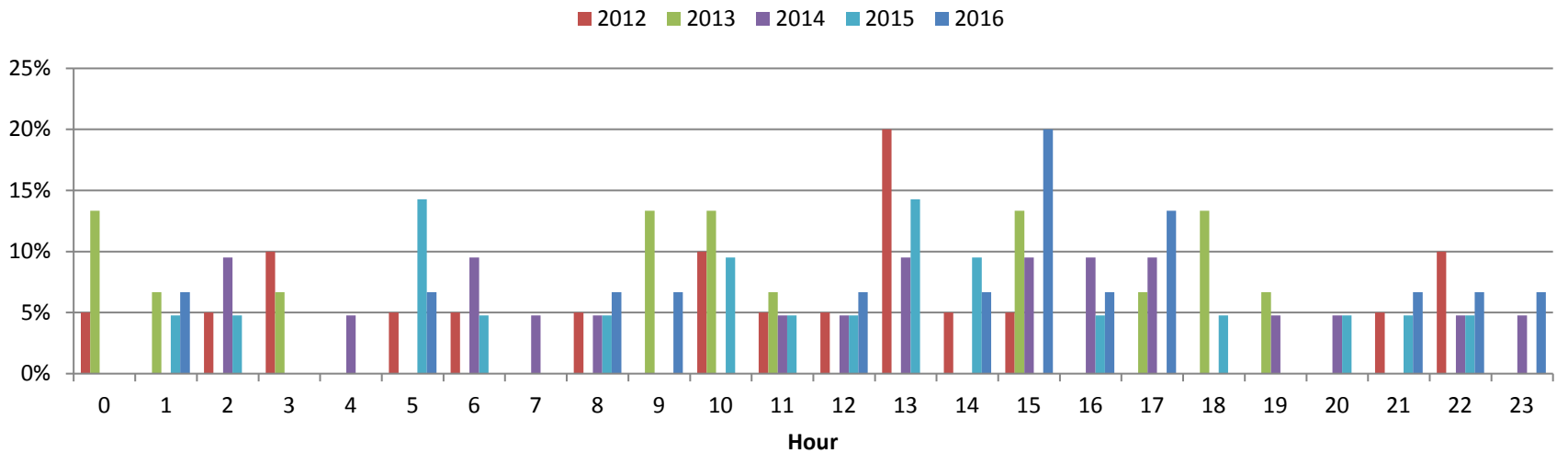
Month (Fatal Crashes)



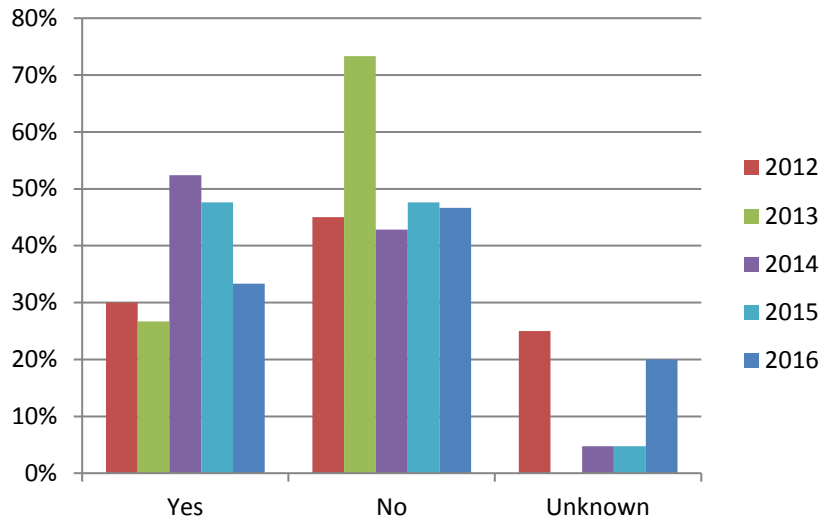
Day of Week (Fatal Crashes)



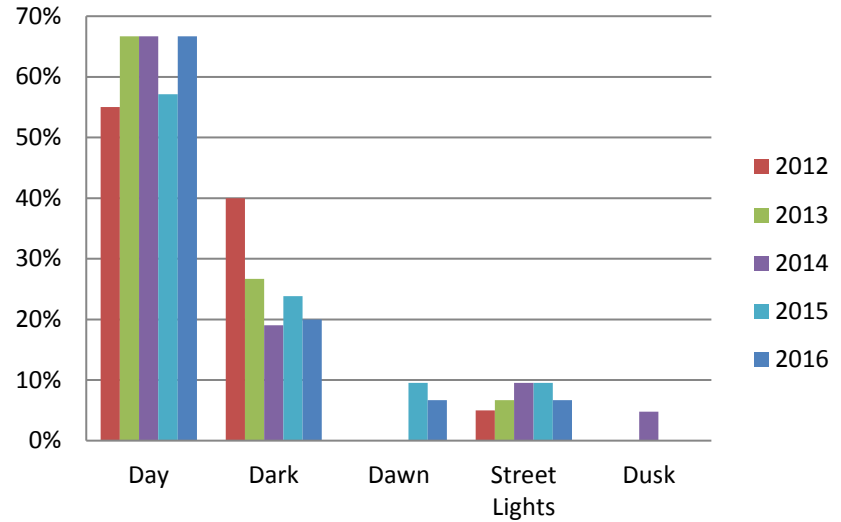
Hour (Fatal Crashes)



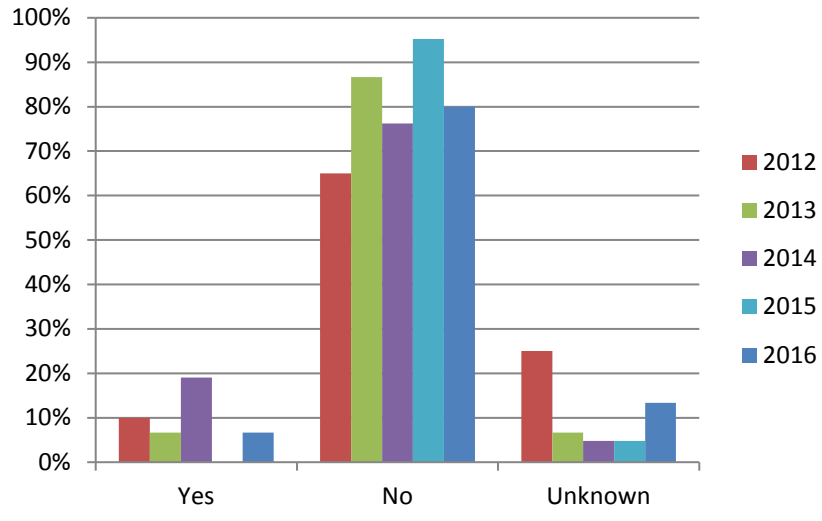
Workers Present (Fatal Crashes)



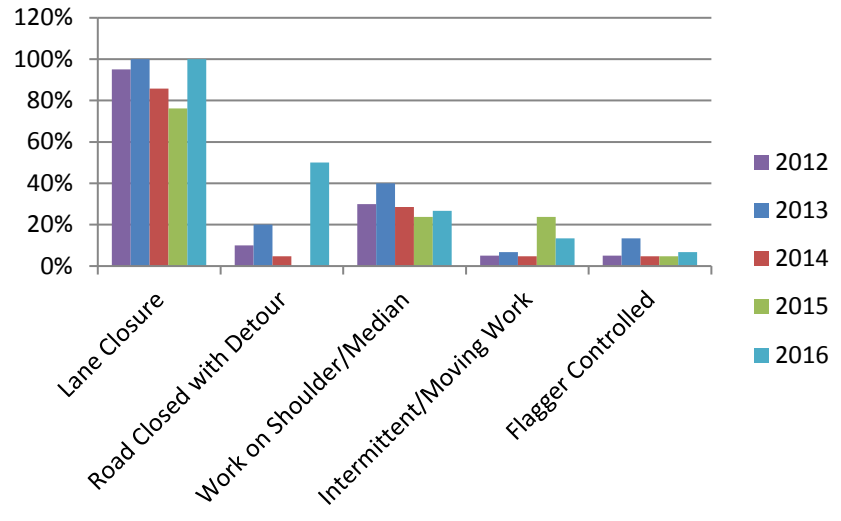
Illumination (Fatal Crashes)



Law Enforcement Present (Fatal Crashes)



Special Characteristics (Fatal Crashes)

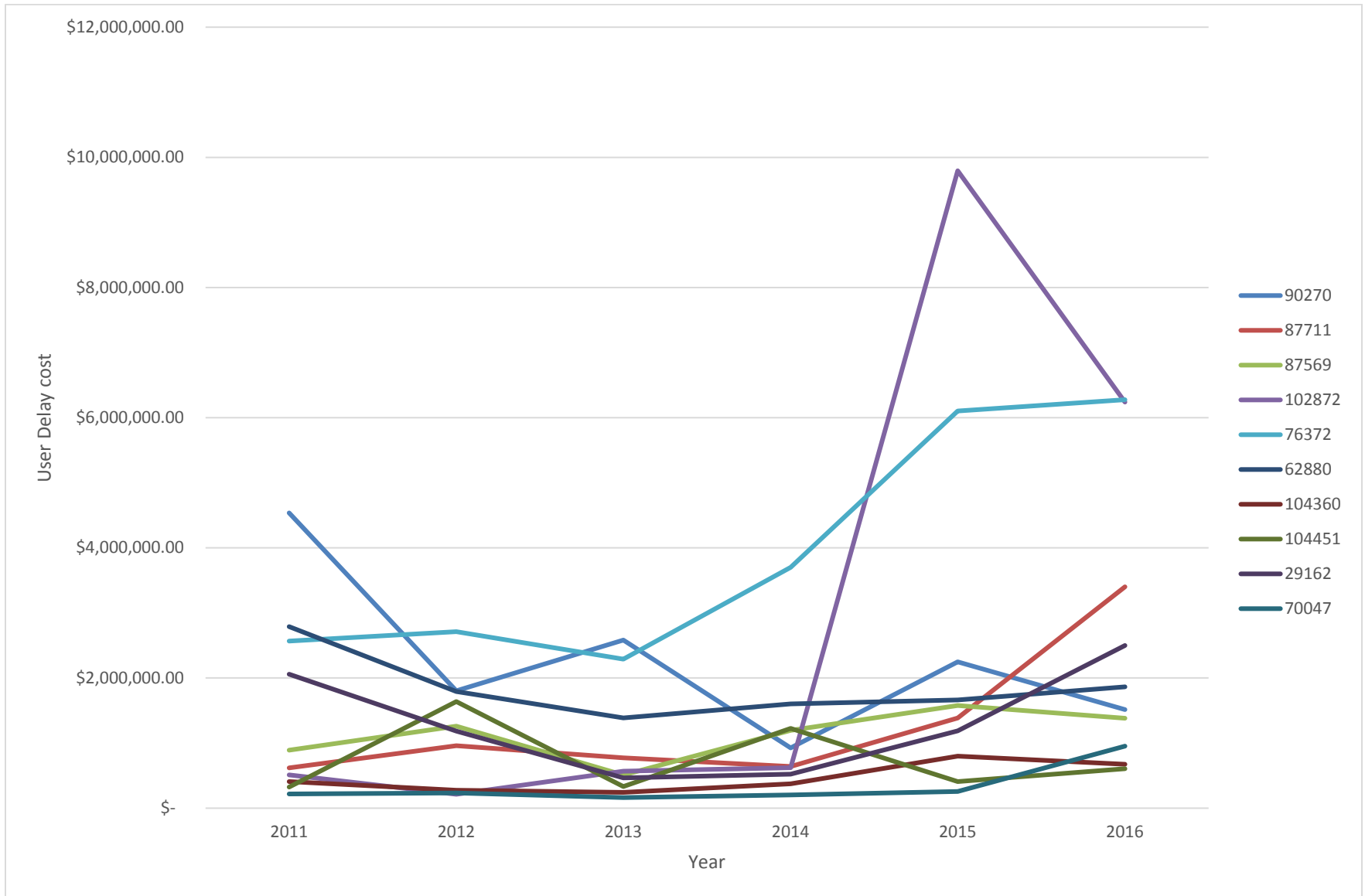


Selected Projects Performance

Projects Selected

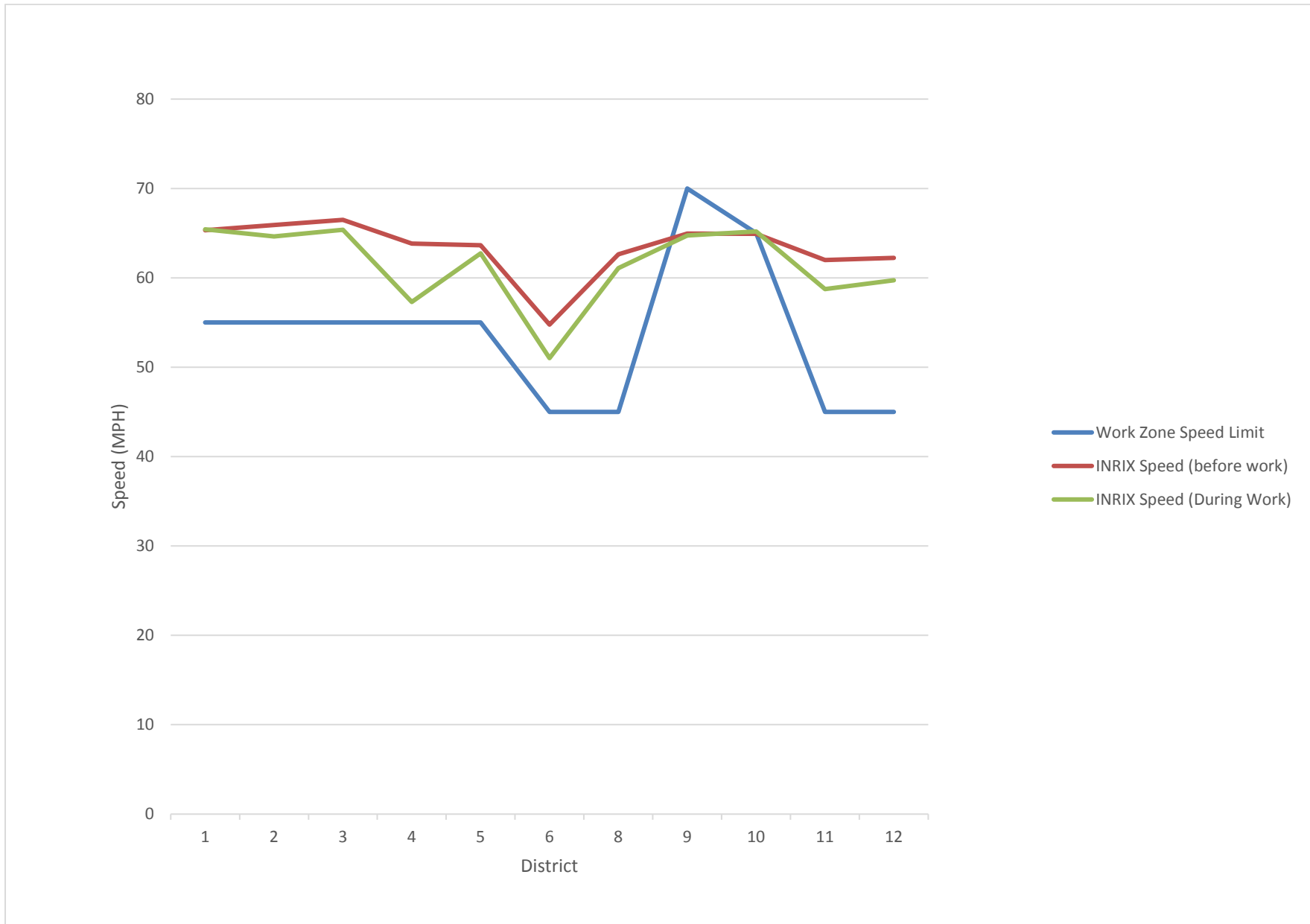
ECMS#	District	Short Description	County	SR	Sec	Notice To Proceed	Completion Date
90270	1	I-80:State Line to US 19	Mercer	80	112	9/14/2015	5/1/2017
87711	2	I-80 Roadway Restoration	Clinton	80	B40	7/20/2015	11/2/2016
87569	3	SR 54 to Columbia Co "Design" limited to Roadway, Bridge Rehabilitation (SR 80-137), and M&PT	Montour	80	M21	11/10/2015	10/24/2018
102872	4	I 80/81 Concrete Patching	Luzerne	81	21M	6/8/2015	12/23/2016
76372	5	I-81 Lebanon County Line to Exit 104	Schuylkill	81	21M	2/2/2015	5/5/2017
83640	6	I-95 Shackamaxon-Columbia. Design-build activities limited to: ADA ramps and protective barrier	Philadelphia	95	GR3	10/15/2012	5/10/2017
62880	8	I-83 Exit 18	York	83	040	4/20/2015	11/12/2018
104360	9	D9 2015 HSIP CMB	Blair	99	18S	6/16/2016	7/28/2017
104451	10	I-79 Epoxy Overlay	Butler	79	258	5/23/2016	11/1/2016
29162	11	Vanport Bridge Rehab	Beaver	376	B04	12/30/2015	1/27/2018
70047	12	Bentleyville Interchange	Washington	70	21H	8/31/2015	12/19/2018

User Delay Costs

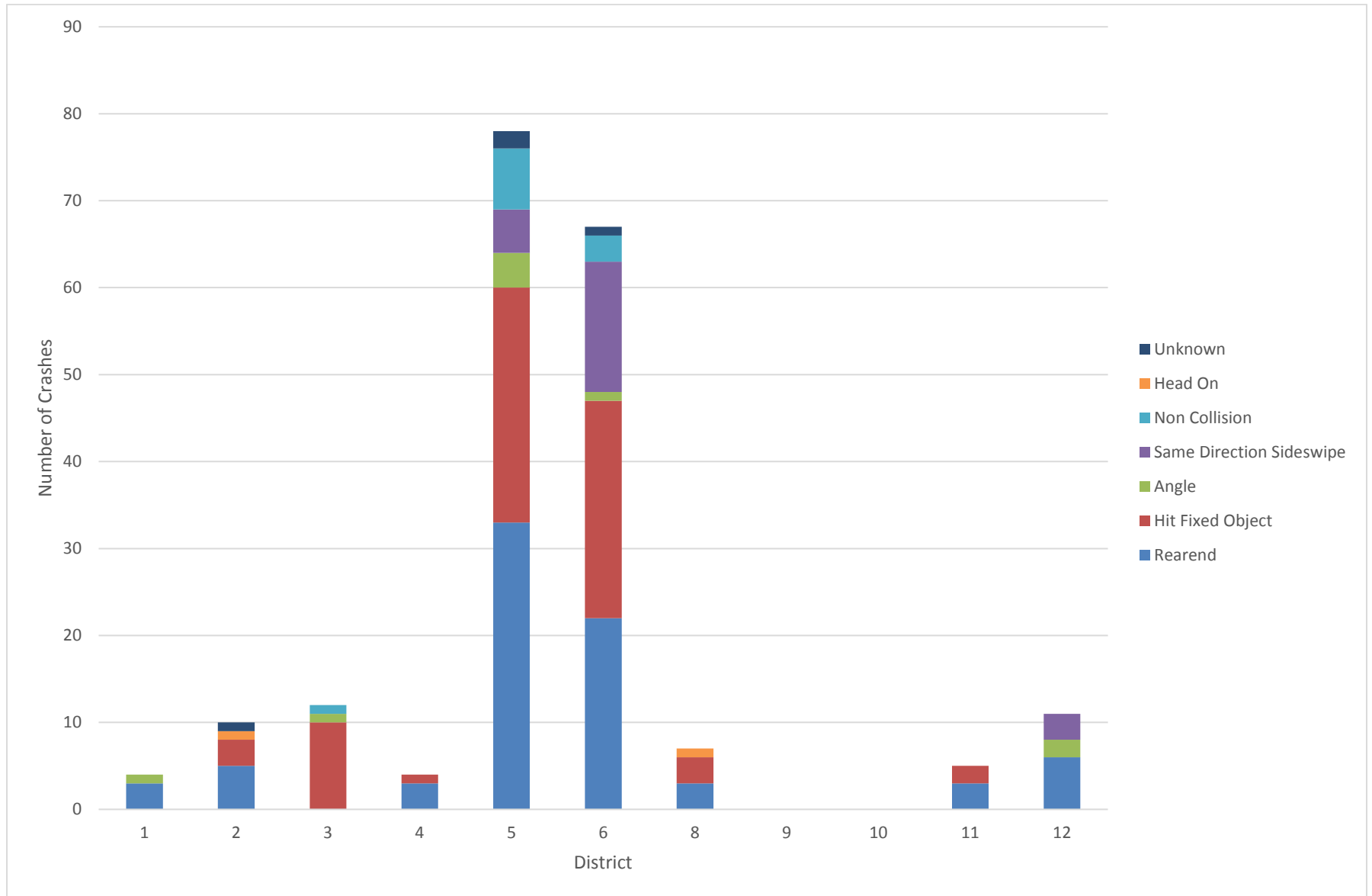


District 6 was excluded due to the significantly higher user delay costs associated with the project.

Work Zone Speeds

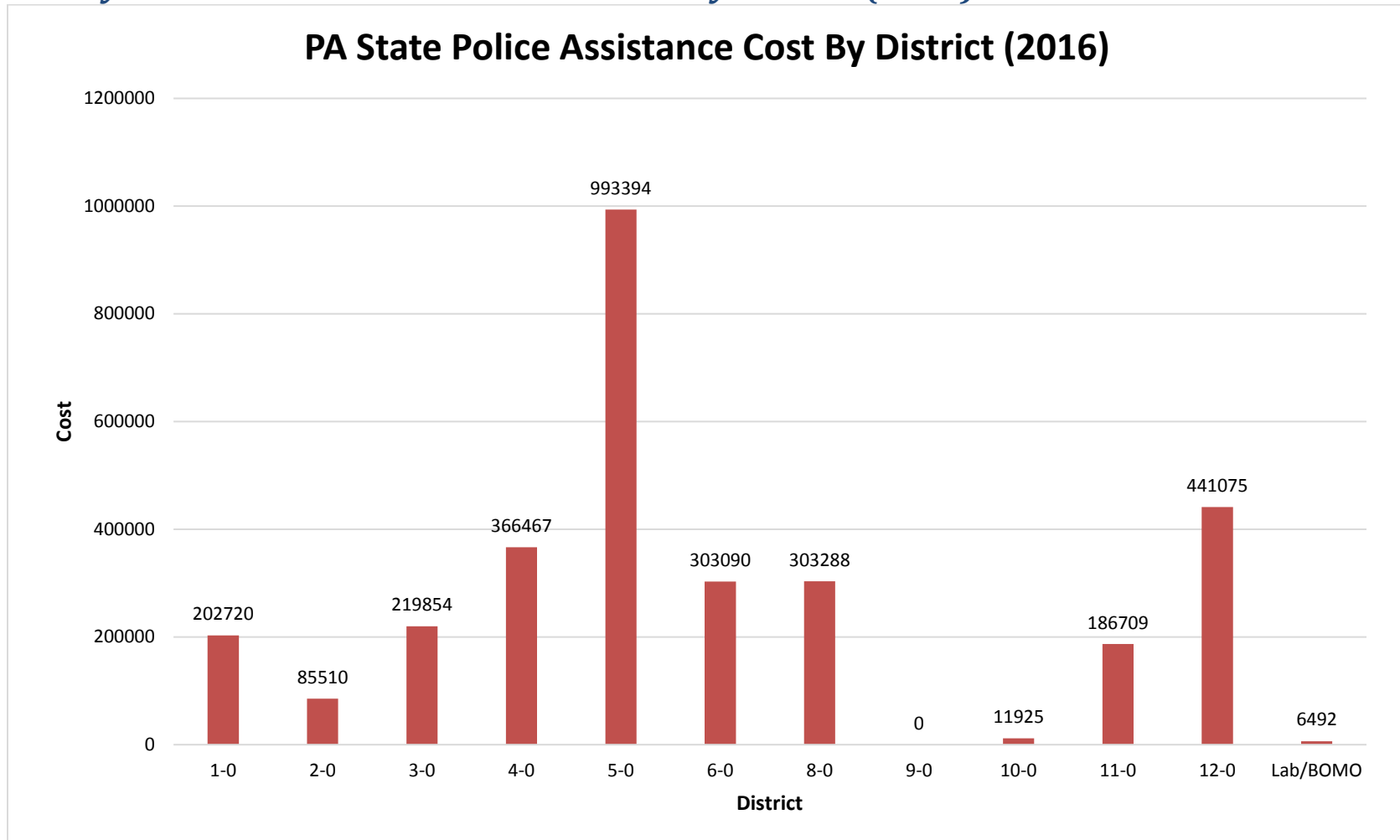


Crash Types

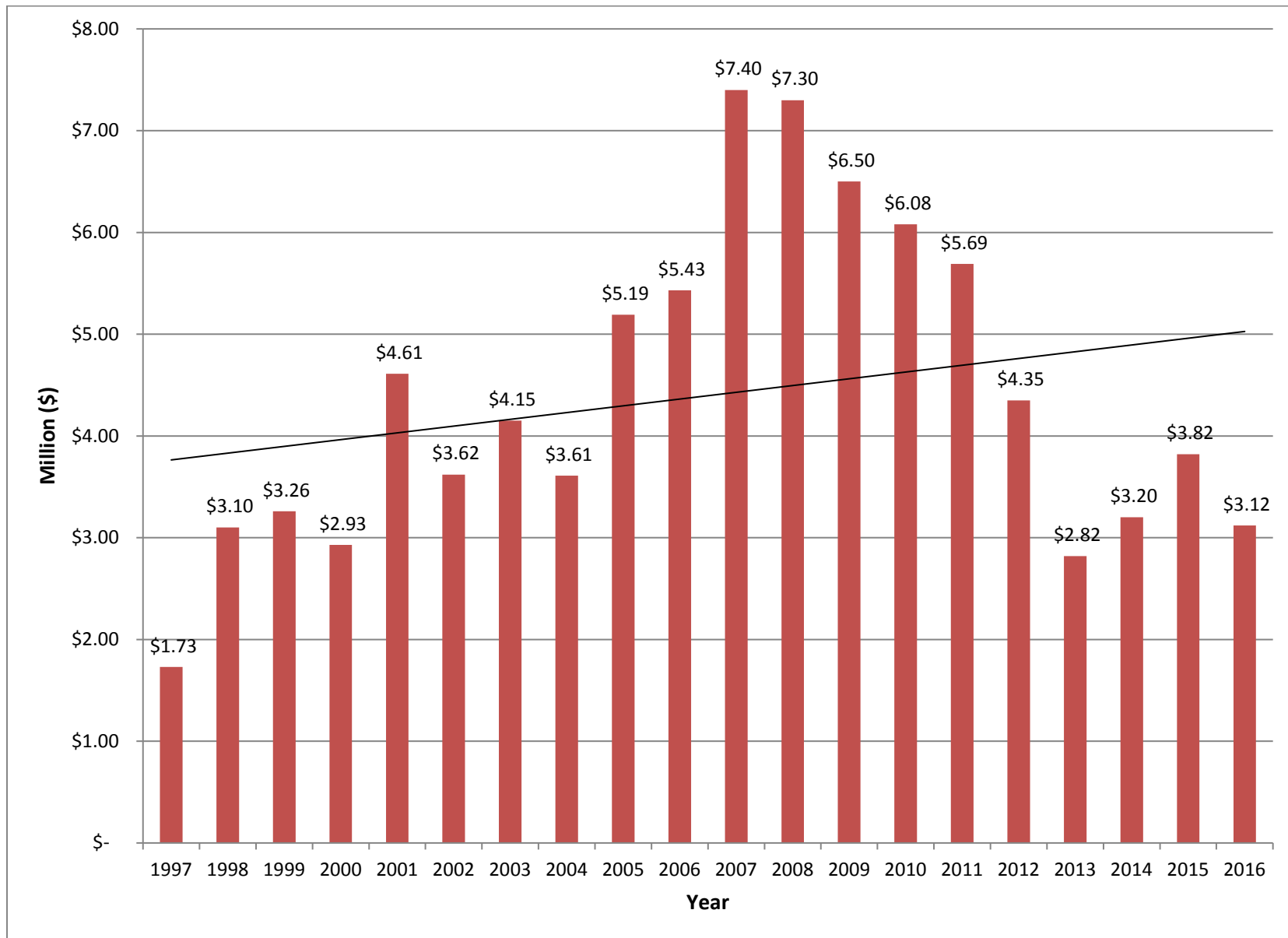


Pennsylvania State Police Assistance

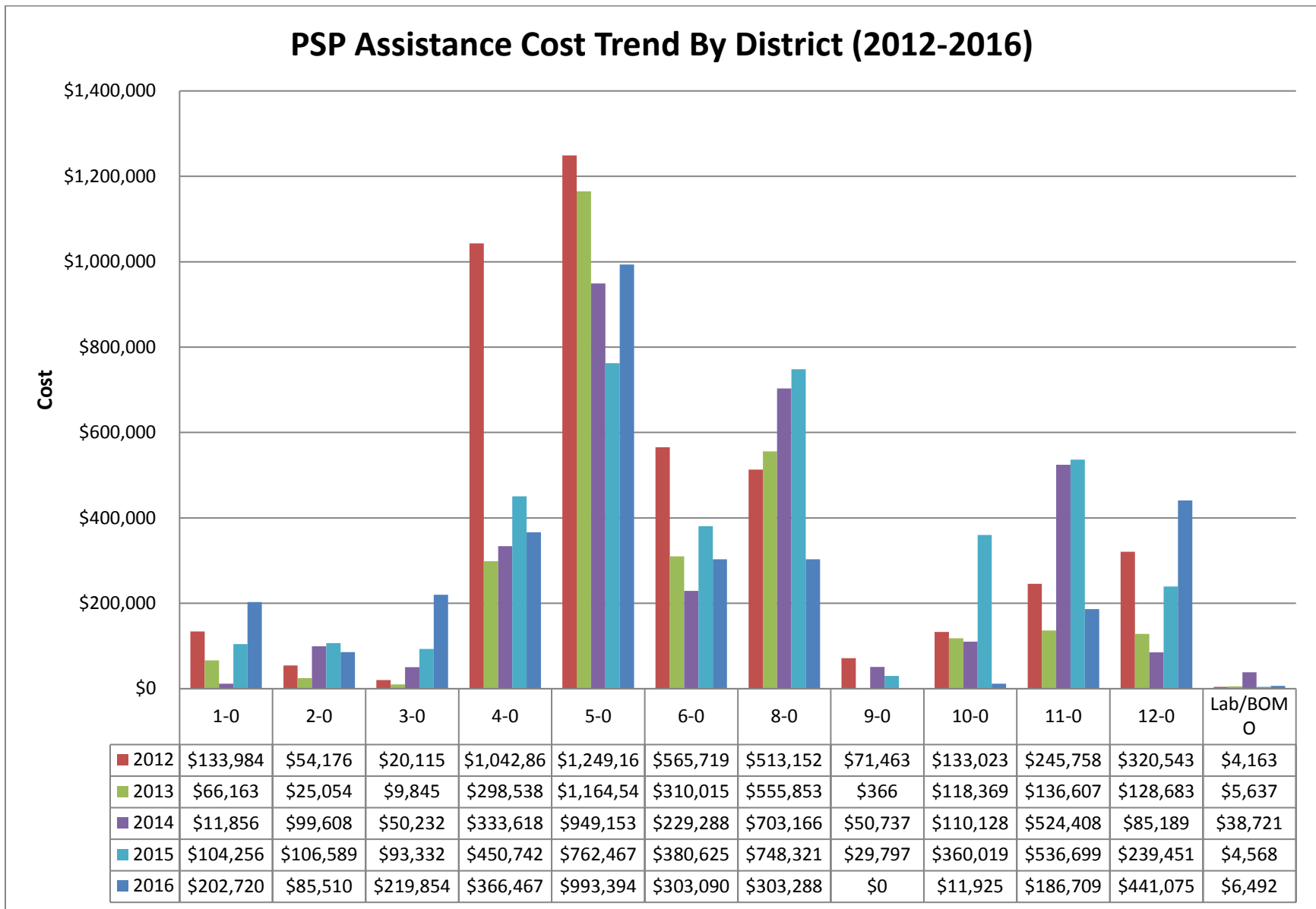
Pennsylvania State Police Assistance Costs by District (2016)



Pennsylvania State Police Assistance Cost Trend (1997-2016)



Pennsylvania State Police Assistance Cost Trend by District (2012-2016)



Summary

This report confirms the Department's activity in addressing safety and mobility in work zones. There are new measures that have been included in this report. These include a summary of the crashes in each district, an estimate of the miles of work zones in each district and a crash rate for each district. In addition, an analysis of a small cross-section of interstate work zones is included. There is one project select from each district and the delays and crashes for each of those work zones is reported. A quick summary of the positive action the Department is taking includes:

- Publication 213 Updates
- Work Zone Traffic Control Training
- BOMO's extensive QA program
- The Department and FHWA have established an Independent Oversight Program for work zone traffic control
- Automated Speed Enforcement
- Work Zone Traffic Control Certification Program
- FHWA Work Zone Safety Implementation Plan
- Advanced Queue Warning System
- Increased emphasis on delay analysis including training, data collection and the analysis aimed at preventing extensive traffic delays
- Working with Pennsylvania State Police to clarify their role in providing assistance in work zones

While the Department is aggressively addressing safety and mobility in work zones, opportunities exist for improvements. As always, the Department strives to make work zones safe for all and continues to implement the work zone safety and mobility policy.