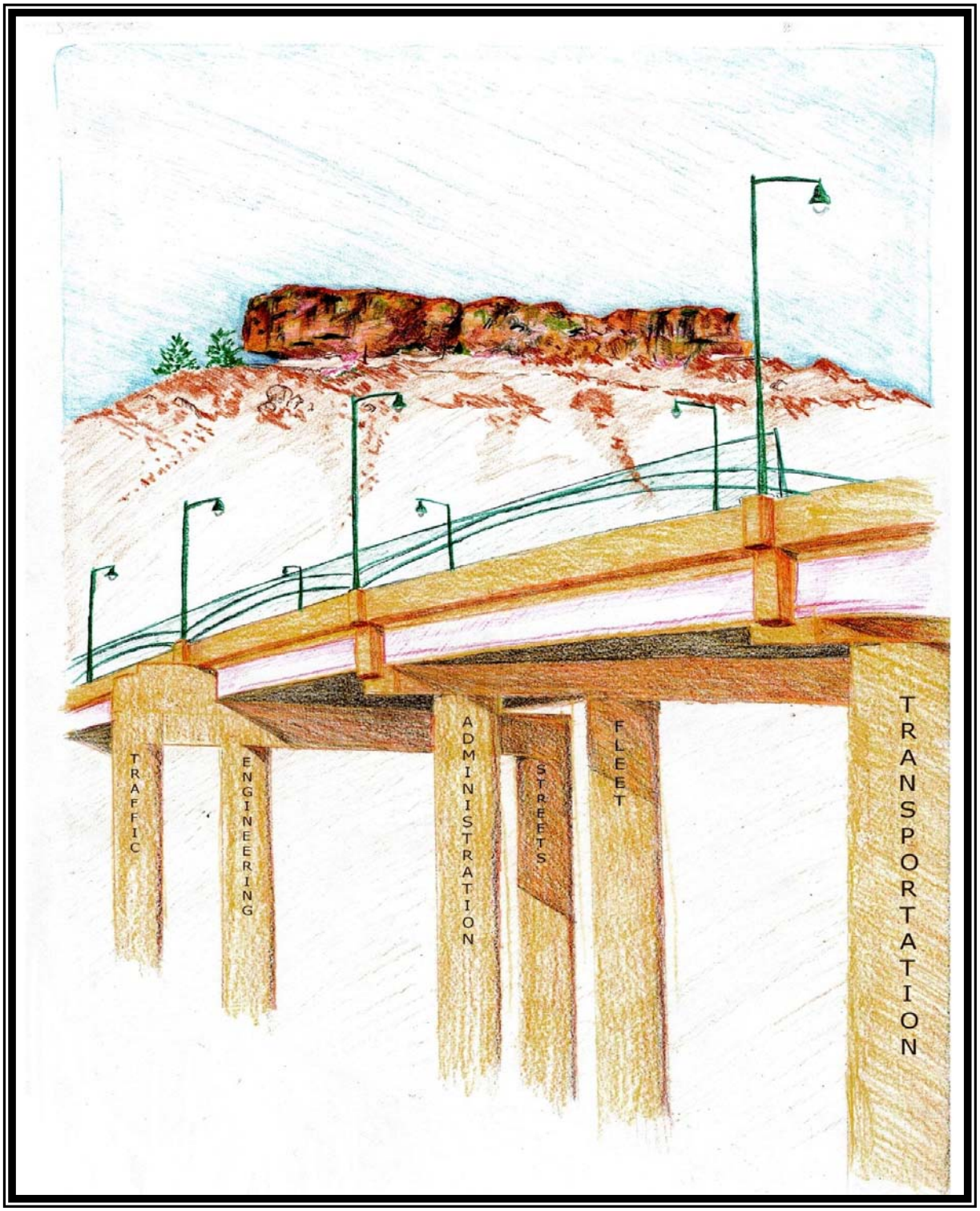
EXHIBIT A

2016 TOWN OF CASTLE ROCK
MOTOR VEHICLE CRASH FACTS



PREPARED BY THE PUBLIC WORKS DEPARTMENT

ACKNOWLEDGEMENTS

This report was assembled from data provided by the Castle Rock Police Department crash report data from the year 2016. Each crash record, whether completed by a local police officer or a member of the Colorado State Patrol, was sent to Castle Rock and entered into a centralized database maintained by the Public Works Department.

The report itself was created by personnel in the Public Works Department.

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TOWN OF CASTLE ROCK COLORADO

Public Works Department

"Our mission is to provide outstanding service, safety and support for transportation infrastructure and maintenance."

October 25, 2017

It is our pleasure to provide you with the 13th Annual Castle Rock Motor Vehicle Crash Facts Report. The statistics provided will enable emergency services and design engineers alike gain a greater insight into the factors contributing to traffic crashes. This will then help both the Town and the Colorado Department of Transportation identify improvements that may help reduce crashes in a high-hazard areas or intersections.

We will continue to dedicate our time and efforts toward the improvement of safety on our street system.

Sincerely,

Robert Goebel, PE
Public Works Director

Ryan Germeroth, PE
Transportation Planning and Traffic Engineering Manager

EXECUTIVE SUMMARY

The mission of the Public Works Department is “To provide outstanding service, safety and support for transportation infrastructure and maintenance”. We believe that by analyzing our crash data on a regular basis we can help identify locations where the roadway environment may be a contributing factor to crashes. This information helps us to develop options for improvements and to schedule projects for correction. Since 2004, when Public Works first reported crash statistics, the numbers of fatalities, and persons injured have generally been declining. The Town’s focus on encouraging intersection treatments such as the use of roundabouts, which have demonstrated an ability to reduce personal injury type such as high speed “T-bone” crashes, are just one example of improvements that have assisted in this area. The number of crashes slightly decrease when compared to 2015. This is a good trend as traffic continues to grow in the Town, the crash totals would typically increase.

Crashes are the result of many factors. These factors can generally be classified into three main categories: 1) human factors, 2) vehicle factors, and 3) roadway environment. By far, the largest percentage of crashes can be attributed to human factors. These are the factors that drivers can control and are usually the simplest to correct. Basic driver awareness and respect for all users of the Town’s roadways will go the farthest towards reducing the number of crashes. Education, Enforcement and Engineering, the three “E’s”, all play an important role in improving safety. However it will take conscious decisions by drivers to change their behavior in order to make our roadway system safer.

Addressing vehicle factors is the responsibility of everyone who owns and operates a motor vehicle. Regular vehicle inspections along with preventative maintenance procedures will help reduce the chances of a crash occurring as a result of a vehicle malfunction.

The roadway environment is something that is out of the driver’s control, but it is within the control of the Town, and the Colorado Department of Transportation (CDOT) in the case of the State system. We work to identify locations where roadways themselves could be a contributing factor in a crash and implement treatments to correct these. Public Works uses statistical modeling to identify the locations where corrections to the roadway environment may improve safety. This helps direct limited resources to the locations where the most benefit can be obtained and avoids directing these resources toward locations where problems may not exist.

The information and crash trends that become evident during the preparation of the annual crash report help staff identify needed intersection improvements. For example, in order to help reduce the number of crashes involving left turning vehicles, the left turn signal operations have been changed in the past at locations with a higher than expected total of crashes. Similar changes have been made recently with the installations of flashing yellow arrows at Founders at Front and Blackfeather at Front.

The 2016 data does show a few locations with higher numbers of crashes than would be expected to occur at intersections having similar characteristics. Several projects have been identified that will be completed that are expected to help to reduce the number of collisions at the highest crash locations. All of the information gathered by staff will be forwarded along to CDOT for their use at intersections along the State Highway system in Castle Rock.

SECTION 1: 2016 Raw Data Summaries

This section summarizes the raw crash data for 2016 by various categories. The totals include all forms of transportation and include pedestrian, bicycle and motorcycle crashes. The purpose of this is for general public interest as well as for use by other staff departments that may use this information to assist with improving their operations.

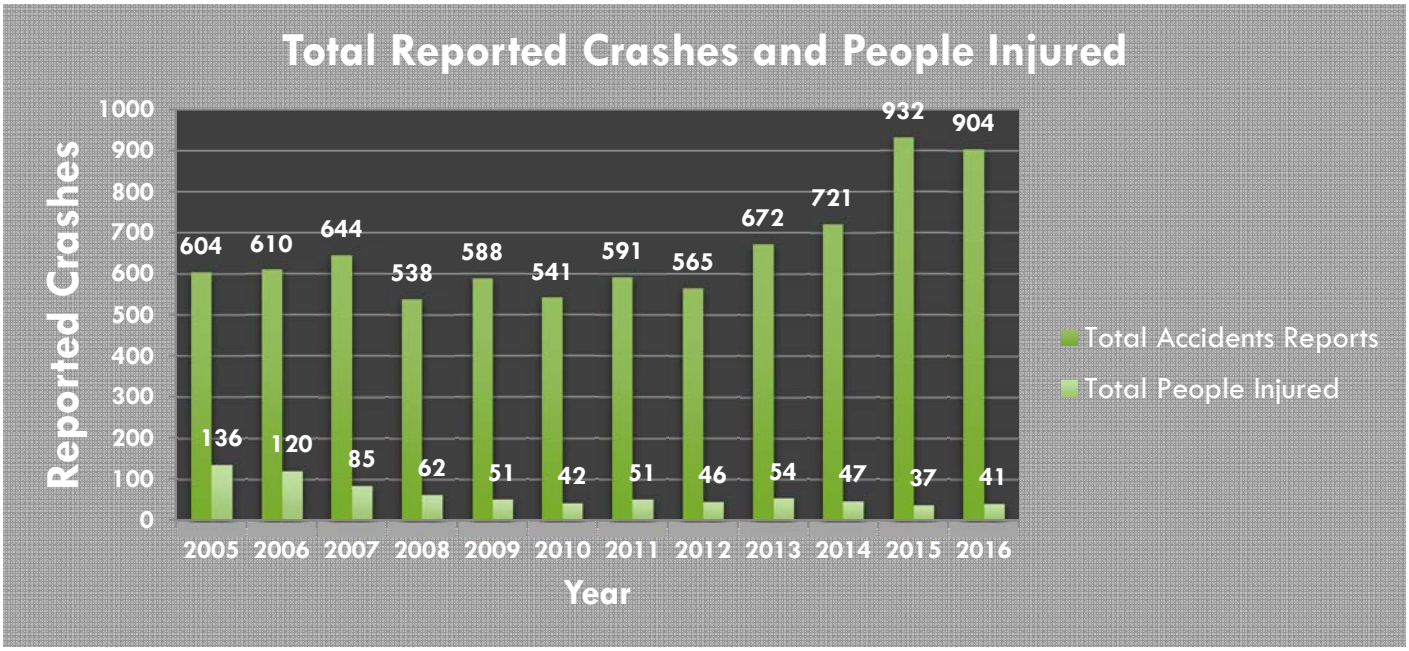
Quick Facts

	2016	2015	2014	2013	2012
Total Reported Crashes	904	932	721	672	565
Fatalities	1	0	1	1	0
Total Persons Injured	41	37	47	54	46
Total Injury Incident Crashes	32	30	38	47	45

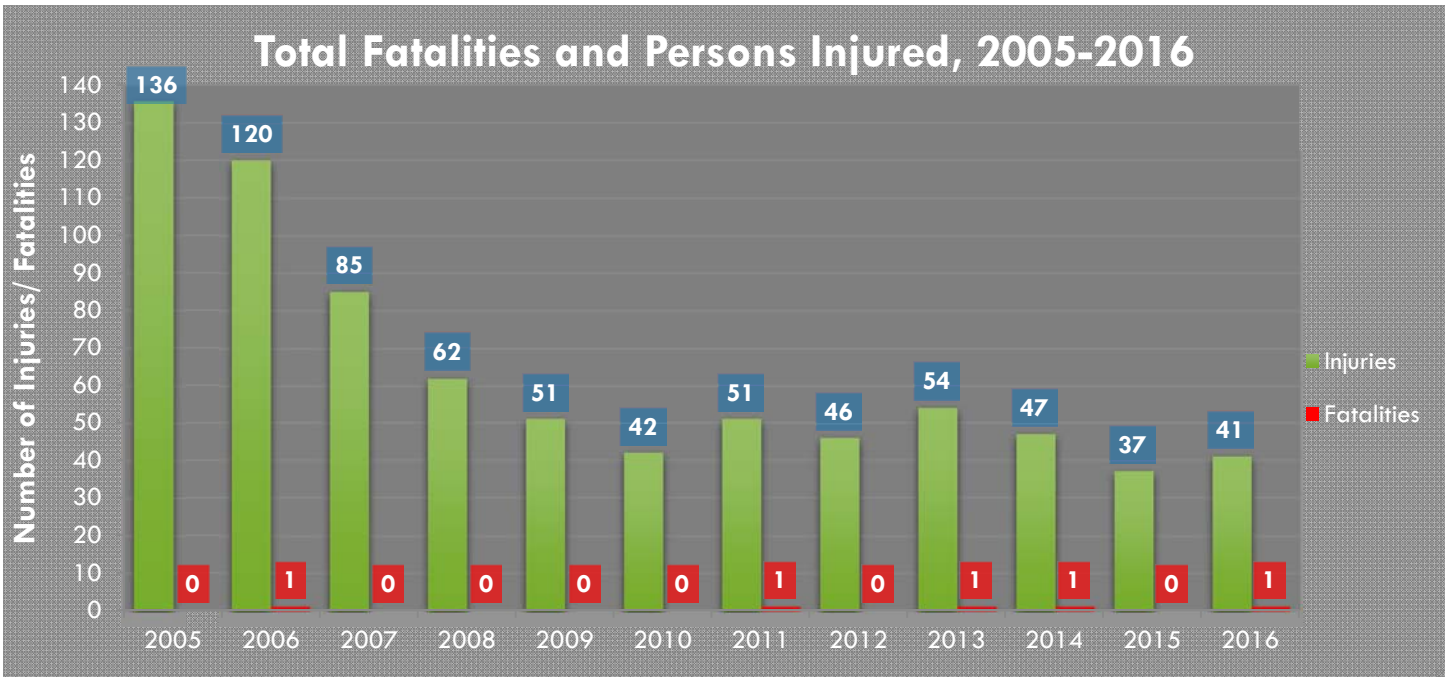
- On average, 1.0 traffic crash crashes were reported every 12 hours.
- Of all the crashes, the most frequent crash types were rear end collisions at 38% of the total, 18% were turning movement collisions and 14% were collisions with objects.

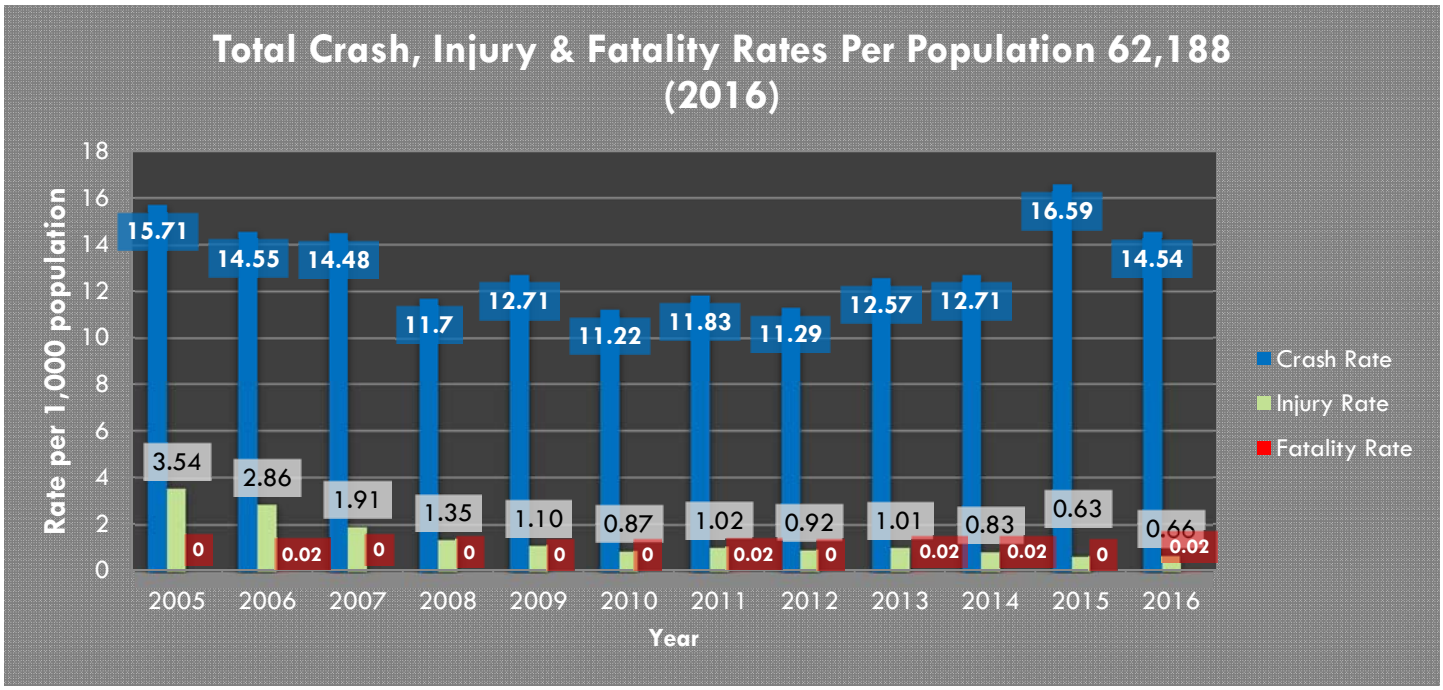
ANNUAL TRENDS

Over the past eleven years the Town has averaged 719 reported crashes per year. In 2016 the number of crashes was 3% lower than in 2015. Although the Town had a few major construction zones in 2016 they did not contribute to any increase with accidents as what was seen in 2015. However, the total number of accidents in 2016 is 25% greater than the total of 2014, this can be attributed to the population growth seen from 2014 to 2016 with a growth of 5,543 within the last two years contributing to more motorists using the Town's roadway system. The following charts provide a summary of the annual trends in recent years.

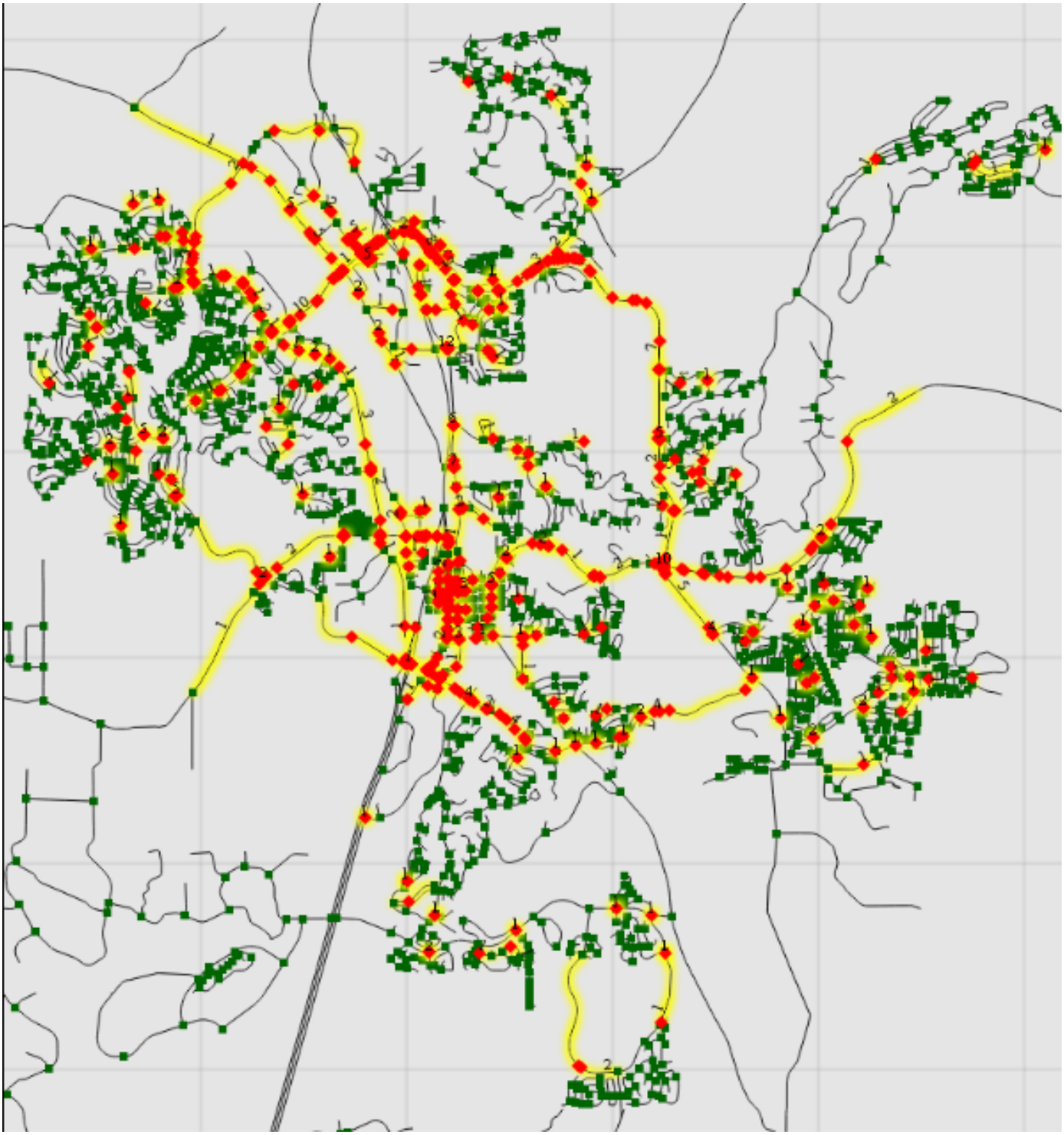


The number of people injured in 2016 crashes increased by 11% from 2015's total of people injured. (*the method of reporting injured persons changed statewide in July 2007). In 2016 there were 24 crashes where one person was injured, 7 crashes where 2 people were injured and 1 crash where three people were injured. For the year 2016 there was 1 fatality recorded. The fatality that was recorded was a result of a young driver crossing the double yellow line on a two lane collector and running into a delivery truck head on. Speed and aggressive driving was cited as the contributing factors to this accident.





2016 Accident Location Map

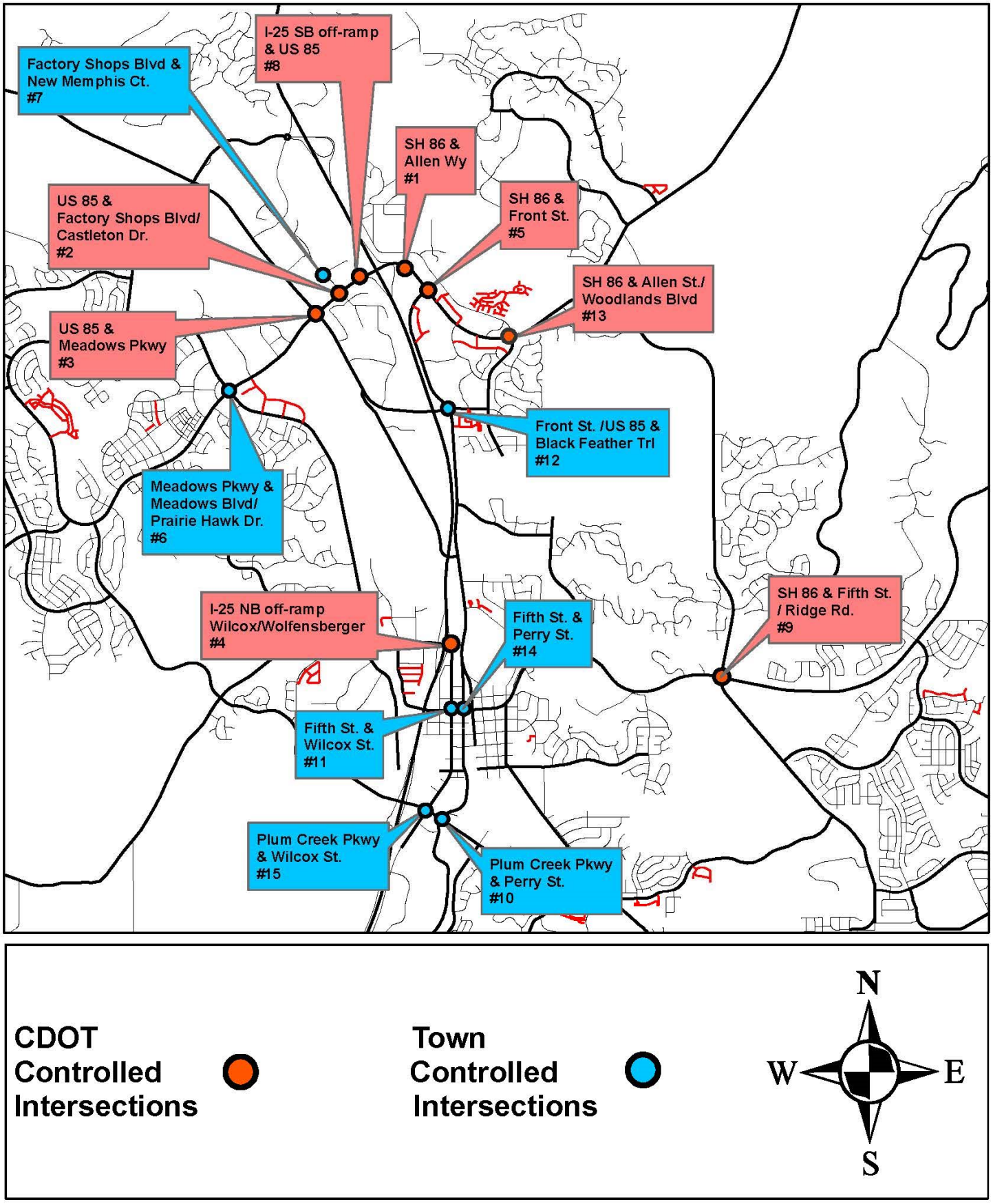


This map shows the crash locations in 2016 throughout the town, crashes are identified by the red dots intersections are identified by green dots. Many of these locations had several crashes reported. The arterial and collector streets have the highest incident of crashes, which is expected considering that they also have the highest traffic volumes.

HIGHEST CRASH RATES BY LOCATION (SIGNALIZED INTERSECTIONS)

Intersections	Number of Crashes (2012-2016)	Average Volume through Intersection	Crash Rate (MEV)	Rank (2016)/(2015)
SH 86 @ Allen Way	191	49,269	2.12	1/1
US 85 @ Factory Shops / Castleton Dr.	188	62,563	1.65	2/2
US 85 @ Meadows Pkwy	110	44,969	1.34	3/5
NB I-25 @ Wilcox St.	52	22,501	1.27	4/6
SH 86 @ Front St.	101	47,389	1.17	5/3
Meadows Pkwy @ Meadows Blvd/ Prairie Hawk Dr.	69	37,074	1.02	6/10
Factory Shops Blvd @ New Memphis	45	24,981	0.99	7/4
SB I-25 @ US 85	112	65,005	0.94	8/8
SH 86 @ Fifth / Ridge	52	31,919	0.89	9/9
Plum Creek Pkwy @ Perry St.	57	34,999	0.89	10/-
Fifth @ Wilcox St.	35	23,138	0.83	11/7
Front St. @ Blackfeather	40	26,824	0.82	12/14
SH 86 @ Allen St./ Woodlands Blvd.	41	27,785	0.81	13/12
Fifth @ Perry St.	35	25,748	0.74	14/19
Plum Creek Pkwy @ Wilcox St.	51	38,389	0.73	15/13

15 Highest Accident Rate Locations



SECTION 2: Public Works Statistical Analysis

This section of the report summarizes the statistical review of the 2016 raw data. The purpose of this is to provide an initial "screen" to identify the signalized intersections that are producing crash numbers that exceed the number that may be expected to occur when compared to similar intersections sharing similar characteristics in Colorado. The reason signalized intersections are the primary focus is related to the ability to produce an accurate statistical model. As more data becomes available, the Town will work toward establishing models for all intersection types: roundabouts, four-way stops, two-way stops, and non-intersection segments. Since crashes are "expected" to occur, it's important to determine which locations are experiencing crashes at a higher rate than should be expected.

ROAD & INTERSECTION SAFETY

One important goal from this crash data is to identify locations where the road environment may be a contributing factor to crashes. This is possible through statistical analysis. The goal in this regard is to identify locations where roadways or traffic control devices could be a contributing factor and implement treatments to correct these.

The definition of the safety of a road section or intersection used by the Transportation Planning and Traffic Engineering Division is the number of crashes expected to occur at these locations during a specified period as compared to what actually has occurred. Because there are factors that are not related to the physical roadway environment that contribute to crashes, road sections and intersections are expected to have crashes occur. Since what is 'expected' cannot be known, safety can only be estimated, and estimation is in degrees of precision. The precision of an estimate is usually expressed by its standard deviation.

For practical reasons Traffic Engineering is interested in the safety of a road section or intersection that seems to have too many crashes. If the estimation of safety is based only on crash counts or crash rates, the estimate would be biased. The existence of this 'regression-to-mean' bias has been long recognized given that crash rates at a given location tend to fluctuate from one year to the next due to multiple variables. If not accounted for, regression-to-mean bias is known to produce inflated estimates of countermeasure effectiveness so it is important to review several years' worth of data to account for statistical anomalies.

In light of this, the magnitude of safety problems at intersections can be assessed through the use of Safety Performance Functions (SPF). The SPF reflects the complex relationship between exposure (measured in daily traffic) and the crash count for an intersection measured in crashes per year. The SPF models provide an estimate of the normal or expected crash frequency and severity for a range of ADT among similar facilities. The Colorado Department of Transportation (CDOT) has calibrated several different Safety Performance Functions based on actual crash data collected at intersections throughout the State.

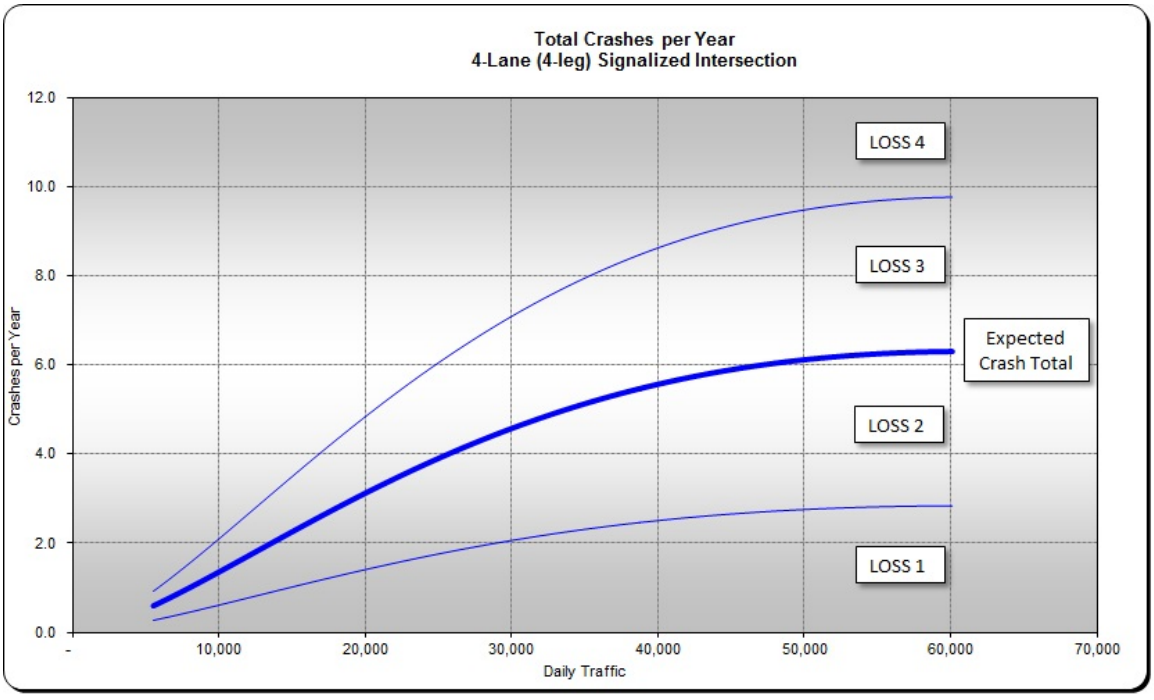
All of the dataset preparation was performed using the Town's crash databases. Crash history for each intersection was prepared using the most recent three years of available crash data. Average Daily Traffic (ADT) for each intersection approach (major street and minor street) over the three years was entered into the same dataset.

Development of the SPF lends itself well to the conceptual formulation of the Levels of Service of Safety (LOSS). The concept of level of service uses quantitative measures that characterize safety of an intersection in reference to its expected performance. If the level of safety predicted

by the SPF will represent a normal or expected number of crashes at a specific level of ADT, then the degree of deviation from the norm can be stratified to represent specific levels of safety.

LOSS-I – Indicates low potential for crash reduction
LOSS-II – Indicates better than expected safety performance
LOSS-III – Indicates less than expected safety performance
LOSS-IV – Indicates high potential for crash reduction

Gradual change in the degree of deviation of the LOSS boundary line from the fitted model mean reflects the observed increase of variability in crashes as ADT increases. LOSS reflects how the intersection is performing in regard to its expected crash frequency at a specific level of ADT (major street and minor street). It only provides a crash frequency comparison with the expected norm. It does not, however, provide any information related to the nature of the safety problem itself. If a safety problem is present, LOSS will only describe its magnitude from the frequency standpoint. The nature of the problem is determined through diagnostic analysis using direct diagnostics and pattern recognition techniques and will be discussed later in this report. The following provides an example of a SPF for a 4-lane signalized intersection as well as the corresponding LOSS categories.



SIGNALZED INTERSECTIONS WITH THE HIGHEST CRASH RATES

The following tables summarize the 2016 highest crash rate locations. This table provides the actual crash total, the statistically expected crash total as well as the Level of Service of Safety and corresponding safety performance.

Intersections	Expected Crash History (Crashes / Year)	Observed Crash History (Crashes / Year)	Level of Service of Safety	Safety Performance
SH 86 @ Allen Way	17.9	38.2	4	High potential for reduction
US 85 @ Factory Shops / Castleton Dr.	27.1	37.6	4	High potential for reduction
NB I-25 @ Wilcox St.	5.0	10.4	4	High potential for reduction
US 85 @ Meadows Pkwy	17.4	22.0	3	Worse than expected
SH 86 @ Front St.	15.8	20.2	3	Worse than expected
SH 86 @ Allen St./ Woodlands Blvd.	7.5	8.2	3	Worse than expected
Factory Shops Blvd @ New Memphis	7.2	9.0	3	Worse than expected
Fifth @ Wilcox St.	5.4	7.0	3	Worse than expected
Meadows Pkwy @ Meadows Blvd/ Prairie Hawk Dr.	13.2	13.8	2	Average performance
Front St. @ Blackfeather	8.2	8.0	2	Average performance
Fifth @ Perry St.	7.2	7.0	2	Average performance
SH 86 @ Fifth / Ridge	10.3	10.4	2	Average performance
SB I-25 @ US 85	26.4	22.4	2	Better than expected
Plum Creek Pkwy @ Perry St.	12.4	11.4	2	Better than expected
Plum Creek Pkwy @ Wilcox St.	14.1	10.2	2	Better than expected

As can be seen in this table there are a total of eight intersections that have an observed crash total that is higher than what would be expected at other similar intersections in Colorado. The next section provides a summary of the crash types to focus on potential areas for improvement to the roadway environment.

PLANNED MITIGATION MEASURES (SIGNALIZED INTERSECTIONS)

The crash history from January 2012 to December 2016 was reviewed for each of the nine intersections with a LOSS rating of 3 or higher. The following tables summarize the crash type(s) at each intersection that was higher than would be expected for a similar four or six lane signalized intersection in Colorado.

Intersections	Crash Type(s) in Need of Correction	Mitigation Measures
SH 86 @ Allen Way	Rear end, Angle (left turns & broadside)	Evaluate for flashing yellow arrow turn phase as part of current intersection design project.
US 85 @ Factory Shops / Castleton Dr.	Rear end	Review the red / yellow clearance intervals at the intersection.
NB I-25 @ Wilcox St.	Approach Turn (EB lefts & WB thrus)	Evaluate for flashing yellow arrow left turn phase
US 85 @ Meadows Pkwy	Rear end	Review the red / yellow clearance intervals at the intersection
SH 86 @ Front St.	Rear end	Review the red / yellow clearance intervals at the intersection
SH 86 @ Allen St./ Woodlands Blvd.	Rear end	Review the red / yellow clearance intervals at the intersection
Factory Shops Blvd @ New Memphis	Curb / Sign	Review location of median nose on south leg of the intersection as well as alignment of southbound thru lanes
Fifth @ Wilcox St.	Rear end	No recommendation

As can be seen in this table, primarily rear end collisions and approach turn collisions (a crash where a left turning vehicle turns out in front of an opposing through vehicle) are the crash types that are occurring at a rate that is more frequent than expected. By nature, traffic signals tend to cause an increase in rear end collisions so they cannot be eliminated entirely. However, certain measures such as improved signal timing can help to reduce the number of rear end collisions by reducing congestion. Town staff will work to implement the other measures not yet complete in the table above over the remainder of 2017 and early 2018.

REVIEW OF CRASH HISTORY AT UNSIGNALIZED INTERSECTIONS

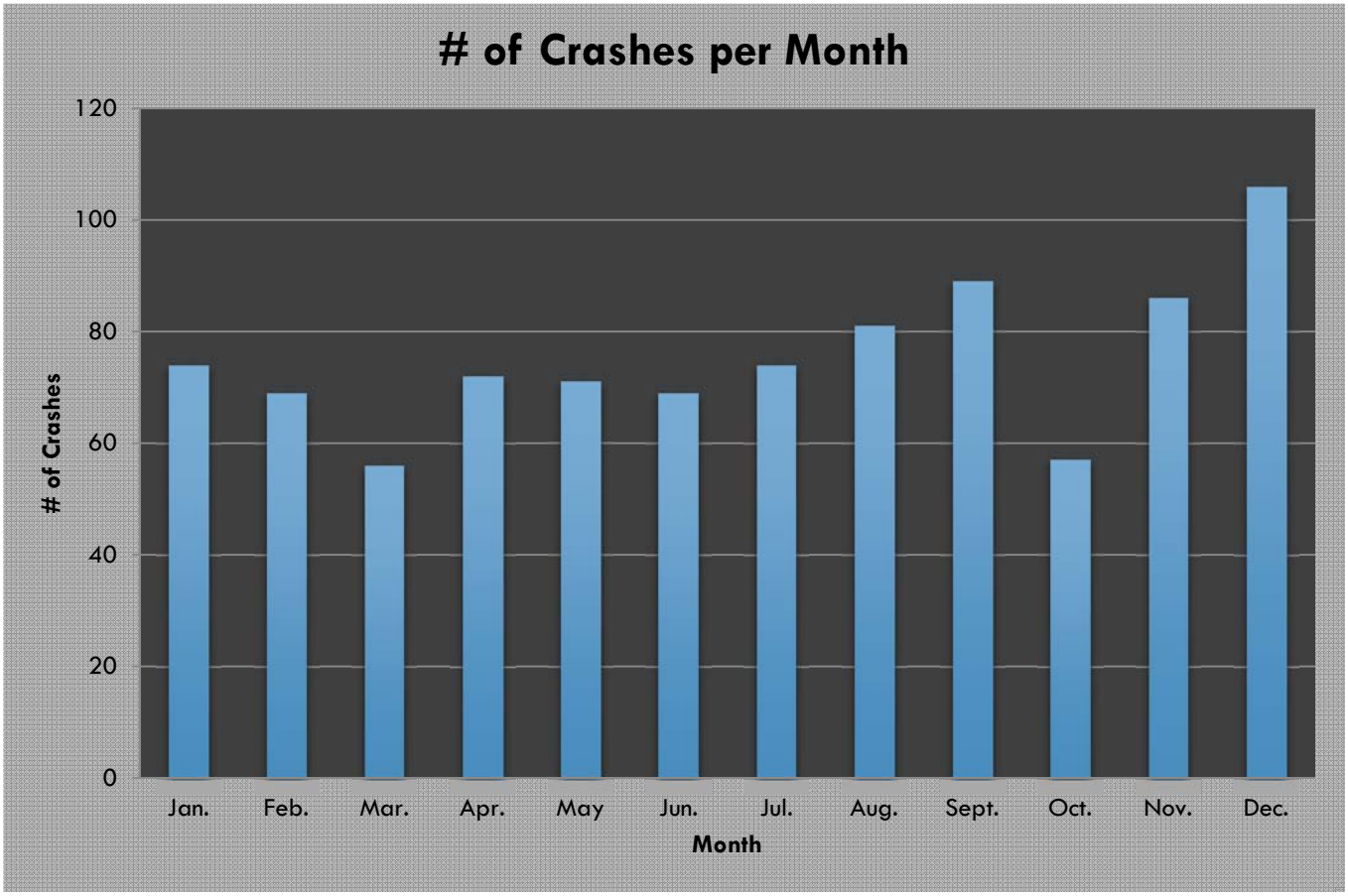
While fewer crashes occur at the stop controlled and other unsignalized intersections in Town (i.e. roundabouts) it is still important to review the crash patterns at these locations. The crash history from January 2012 to December 2016 was reviewed for each of the top eleven unsignalized intersections in Town. The following table summarize the crash type(s) at each intersection that was higher than would be expected for a similar stop controlled intersection in Colorado. If a correctable crash pattern was identified, a potential mitigation measure has also been included.

Intersections	Number of Crashes (2012-2016)	Crash Type(s) in Need of Correction	Mitigation Measures
Ridge Rd @ Enderud Blvd	23	Curb / sign	Review signage on southbound approach of roundabout
Castleton Dr @ Genoa Wy	17	Broadside	Review intersection for traffic control change
Front St @ Milestone Ln	15	Broadside	Review sight distance at intersection
Coachline Rd @ Foothills Dr	14	Broadside	All-way stop installed in Dec. 2016
Wolfensberger Rd @ Red Hawk Dr	13	None	Traffic signal installed in Oct. 2017 due to traffic volume
Perry St @ Rio Grande Dr	13	Broadside	All-way stop installed in Oct. 2016
SH 86 @ Black Pine Dr	12	None	Traffic signal installed in Oct. 2016 due to traffic volume
Meadows Blvd @ Morningview Dr	10	None	None needed
SH 86 @ Rising Sun Dr	7	None	Traffic signal installed in Oct. 2017 due to traffic volume
Wilcox St @ Second St	7	None	None needed
Fifth @ Valley Dr	5	None	Traffic signal to be installed in 2018 due to traffic volume

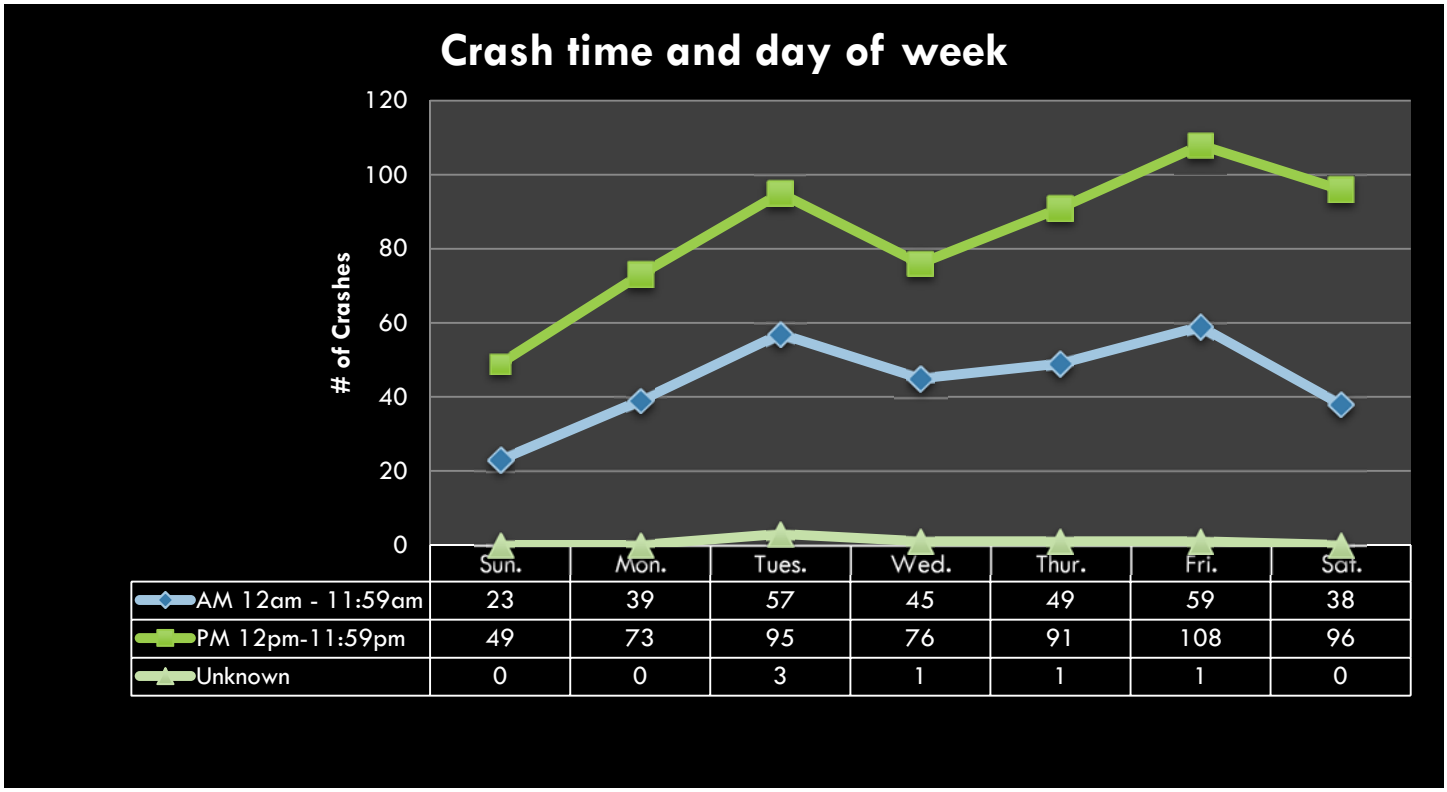
As can be seen in this table, broadside collisions is the crash type in need of correction at most of these intersections. These crashes typically occurred when the driver on the side street misjudged the available gap in traffic and was struck by a vehicle on the main street. To address this pattern, all-way stops were installed late in 2016 at two of the intersections on the list, with initial information from 2017 showing that the broadside crash pattern has been addressed. Town staff will work to implement the other measures not yet complete in the table above over the remainder of 2017 and early 2018.

2016 CRASH DATA TRENDS & METRICS

Months	Crashes	%	Fatalities	%
January	74	8%	0	0%
February	69	8%	0	0%
March	56	6%	0	0%
April	72	8%	0	0%
May	71	8%	0	0%
June	69	8%	0	0%
July	74	8%	0	0%
August	81	9%	0	0%
September	89	10%	1	0%
October	57	6%	0	0%
November	86	10%	0	0%
December	106	11%	0	0%
Total	**904**	**100.00%**	**1**	**0%**



CRASH BREAKDOWN BY WEEKDAY & TIME IN 2016

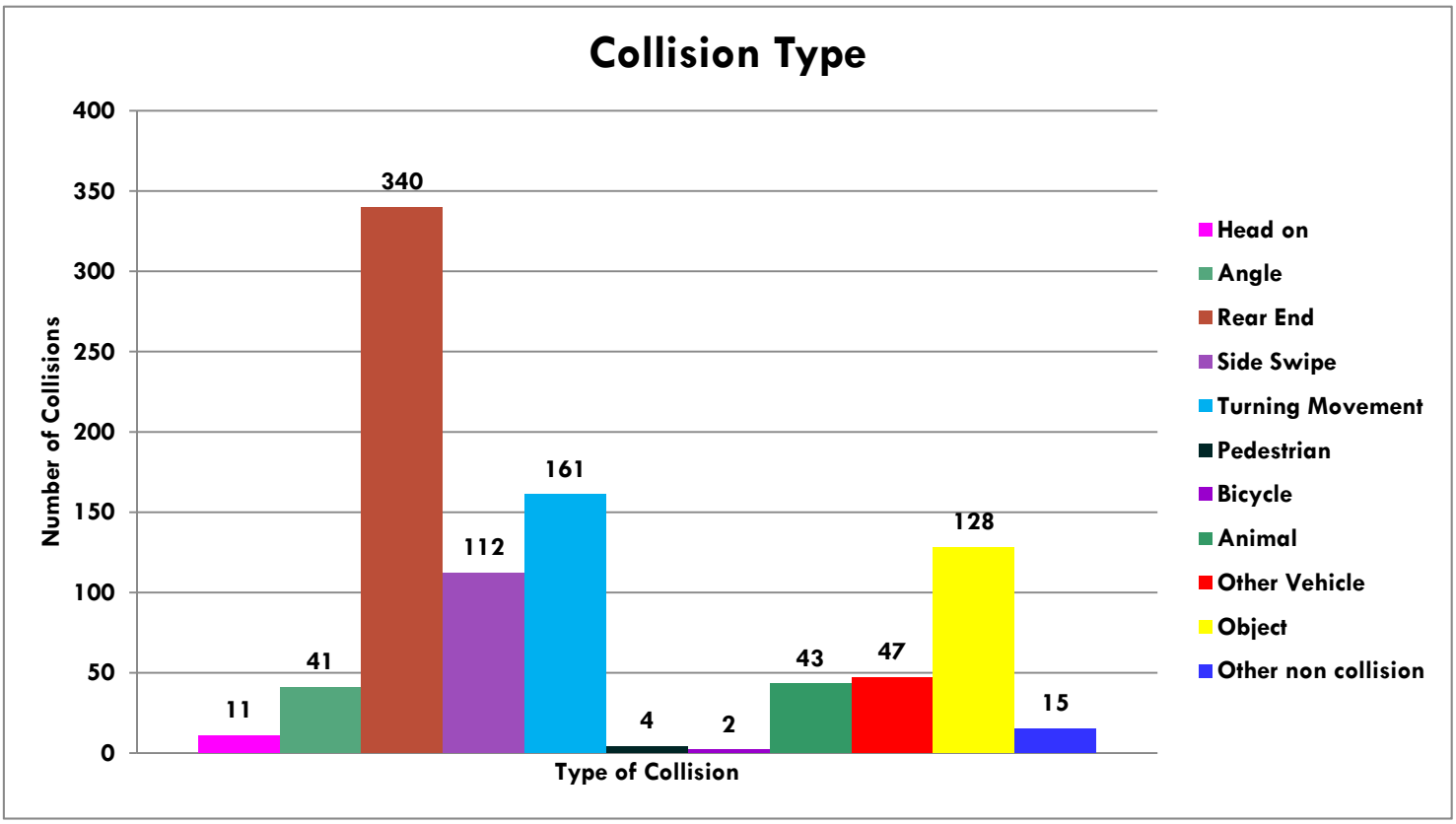


Days of the Week	# of Crashes	%	Injuries	%	Fatalities	%
Sun.	72	7%	7	1%	0	0%
Mon.	112	13%	10	1%	0	0%
Tues.	155	15%	1	0%	1	0.001%
Wed.	122	16%	4	0%	0	0%
Thur.	141	19%	8	1%	0	0%
Fri.	168	17%	6	1%	0	0%
Sat.	134	13%	5	1%	0	0%
Total	**904**	**100.00%**	**41**	**5.00%**	**1**	**0.00%**

TIMES OF CRASHES

Time	# of Crashes	% of Crashes	# of Fatalities	% of Fatalities
12:00 am	8	1%	0	0%
1:00 am	4	0%	0	0%
2:00 am	7	1%	0	0%
3:00 am	6	0%	0	0%
4:00 am	8	1%	0	0%
5:00 am	6	0%	0	0%
6:00 am	25	3%	0	0%
7:00 am	65	7%	0	0%
8:00 am	43	5%	0	0%
9:00 am	37	4%	0	0%
10:00 am	46	5%	1	0.001%
11:00 am	55	6%	0	0%
12:00 pm	61	7%	0	0%
1:00 pm	59	7%	0	0%
2:00 pm	60	7%	0	0%
3:00 pm	71	8%	0	0%
4:00 pm	56	6%	0	0%
5:00 pm	91	10%	0	0%
6:00 pm	75	8%	0	0%
7:00 pm	29	3%	0	0%
8:00 pm	34	4%	0	0%
9:00 pm	23	3%	0	0%
10:00 pm	16	2%	0	0%
11:00 pm	13	2%	0	0%
Unknown	6	0%	0	0%
TOTAL	**904**	**100.00%**	**1**	**0.00%**

TYPES OF CRASHES



Vehicle Type	Vehicles Involved in Crashes	% of Vehicles
Auto	682	41%
SUV	603	37%
Pick-up	227	14%
Auto/SUV/ Truck w/ Trailer	16	1%
Truck (over 10,000 lbs.)	33	2%
Motorcycle/Moped	12	1%
Bicycle	2	0%
School Bus/ Bus	4	0%
Hit & Run	49	3%
Other	9	1%
Total	**1637**	**100.00%**

CRASH LOCATION

Intersections By Classification	# of Crashes	# of Fatalities	# of Injuries
Arterial/Arterial	341	0	12
Arterial/Collector	159	0	1
Arterial/Local	41	0	4
Collector/Collector	14	0	2
Collector/Local	34	1	1
Local/Local	24	0	2
Total	**613**	**1**	**22**

Segments	# of Crashes	# of Fatalities	# of Injuries
Multi-lane Arterial or Collector	136	0	4
Two-lane Arterial or Collector	133	0	5
Local	22	0	1
Total	**291**	**0**	**10**

CRASH ENVIRONMENT

Traffic Control Device	Crashes	Crashes related to Traffic Control Device	% of Traffic Control Device Accidents
Railroad Device	0	0	0%
Roundabout	6	0	1%
Yield Sign	0	0	0%
Stop Sign	192	0	21%
Traffic Signal	414	3	46%
None	292	0	32%
Total	**904**	**3**	**100.00%**

Weather	Crashes	%
Clear	790	87%
Rain	32	4%
Snow/Sleet	77	8%
Other	5	1%
Total	**904**	**100.00%**

Road Conditions	Crashes	%
Dry	743	82%
Wet	56	6%
Icy/Slushy/Snowy	103	11%
Other	2	1%
Total	**904**	**100.00%**

Lighting Conditions	Crashes	%
Day	692	77%
Night	212	23%
Total	**904**	**100.00%**

THE DRIVER

Primary Causes of Crashes *	Driver 1	Driver 2	% of Primary Causes D.1 & D.2 (1,639)
Failed to Yield Right of Way	118	9	8%
Careless/Reckless Driving	404	20	26%
Violation of Red Signal	22	2	2%
Violation of Stop Sign	4	1	0%
Unsafe Backing	27	0	2%
Speeding too fast for conditions	34	5	2%
Following too closely	52	3	3%
All Other/ Unknown/ No Cause	243	695	57%
Total	**904**	**735**	**100.00%**

Condition of Drivers *	Driver 1	Driver 2	% of Condition of Drivers D.1 & D.2 (1,639)
No Defect or Unknown	364	700	65%
Other* (includes: aggressive driving, fatigue, distractions, illness)	488	33	31%
Inexperienced Drivers	27	1	2%
Cell Phone	14	1	1%
Drugs or Alcohol Related	11	0	1%
Total	**904**	**735**	**100.00%**

ALCOHOL & DRUG INVOLVEMENT

*Number of Crashes Involving Drivers Influenced by Alcohol or Drugs, 2 drivers unknown for gender or age but determined by police to have been under the influence

Age	All Drivers	Male	Female
<14	0	0	0
15-19	1	0	1
20-24	1	1	0
25-29	1	1	0
30-34	0	0	0
35-39	0	0	0
40-44	1	0	1
45-49	3	3	0
50-54	1	1	0
55-59	1	1	0
60-64	0	0	0
65-69	0	0	0
>70	0	0	0
Total	**9**	**7**	**2**

1% of the total crashes reported in 2016 involved alcohol or drugs.

AGES OF DRIVERS/PEDESTRIANS INVOLVED IN CRASHES OVERALL

- 130/ unknown drivers/pedestrians (gender & age)

Age	% of Total Drivers/Pedestrians			
	Male	Female	Total	Percent
<14	1	0	1	0%
15-19	119	108	227	15%
20-24	80	77	157	10%
25-29	73	61	134	9%
30-34	74	72	146	10%
35-39	62	71	133	9%
40-44	86	58	144	10%
45-49	74	72	146	10%
50-54	70	47	117	8%
55-59	59	38	97	6%
60-64	36	37	73	5%
65-69	31	32	63	3%
>70	31	40	71	5%
Total	**796**	**713**	**1509**	**100.00%**

DEFINITIONS

The following special terms are used throughout this report, and are provided to clarify the meaning of the data.

1. **Crash (or traffic crash):** An unintended event involving a motor vehicle that causes death, injury, or property damage.

2. **Alcohol Involvement Crash:** Any motor vehicle crash in which a driver, pedestrian, or bicyclist had consumed alcohol.

3. **Fatal Crash:** A traffic crash which involving the death of one or more persons.

4. **Hit-Other-Vehicle:** A type of collision in which the first harmful event involves a collision between two or more vehicles.

5. **Injury Crash:** An crash involving injuries to one or more persons which may or may not require transportation to a medical facility.

6. **Motor Vehicle:** Any motorized (mechanically or electrically powered) vehicle not operated on rails.

7. **Other Non-collision:** An event during an crash sequence which does not involve a collision with another vehicle or object.

8. **Property Damage Crash:** An crash not involving either a fatality of an injury to any party but which does include damage to one or more vehicles.

9. **Rollover:** An crash in which the overturning of a vehicle was the first harmful event.

10. **Type of Crash:** The category which best describes the general type of collision which was the first event.