Transportation Safety

Communities in Motion 2040 2.0 (CIM 2040 2.0) assesses regional transportation safety in terms of roadway crashes, including crashes that involve bicyclists, pedestrians, and motorcyclists as well as motor vehicles (autos). The term "crash" is used in this plan because "accident" implies something that can't be foreseen or prevented. Most, if not all, crashes can be prevented by changing driver behavior, roadway design, or both.

In Ada and Canyon Counties, 45,826 motor vehicle crashes occurred between 2012 and 2016. Over 4,410 of those resulted in injuries, with 202 fatalities. In 2016, the Idaho Transportation Department (ITD) estimated the costs of motor vehicle crashes in Idaho.[1] While costs varied depending on crash severity, ITD estimated that the cost of crashes in Ada and Canyon Counties from 2012 to 2016 was $4.3 billion (Table 1).[2] Statewide costs for the same time period were $18.5 billion, meaning Ada and Canyon Counties accounted for 23.2% of the total statewide cost.

Table 1. Estimated economic costs (rounded) of motor vehicle crashes in Ada and Canyon Counties, 2012–2016

Injury Severity Level	Total Occurrences	Cost per Occurrence	Cost per Severity Level
Fatality	191	$9,623,800	$1,838,145,800
Disabling injury	2,138	$460,300	$984,121,400
Evident injury	5,963	$125,400	$747,760,200
Possible injury	10,086	$64,000	$645,504,000
Property damage only	27,448	$3,200	$87,833,600
Total estimated economic costs (rounded)			$4,303,365,000

Federal regulations state that regional transportation plans such as CIM 2040 2.0 shall "increase the safety of the transportation system for motorized and non-motorized users" and "…should be consistent with the Strategic Highway Safety Plan…and other transit safety and security planning and review processes, plans, and programs, as appropriate." [23 USC 450.306 (a), (h)][3]

In addition, the Fixing America's Surface Transportation (FAST) Act of 2015[4] emphasized performance management as a key facet in transportation planning. Metropolitan planning organizations are required to report five-year safety performance measures for all public roads and adopt either their own safety targets or targets established by the state across five categories:[5]

- Number of serious injuries
- Rate of serious injuries (per 100 million vehicles miles of travel [VMT])
- Number of fatalities
- Rate of fatalities (per 100 million VMT)
- Number of non-motorized serious injuries and non-motorized fatalities

In December 2017, the COMPASS Board of Directors adopted ITD's statewide safety targets and will work with ITD to support its statewide safety efforts and targets. All targets are for Idaho as a whole and are based on five-year averages and rates (Table 2). Starting with FY2018–2022, the Regional Transportation Improvement Program (TIP) includes an analysis of how each safety-related project is expected to decrease fatalities and serious injuries based on the reported improvements of similar projects.[6]

Table 2. Idaho statewide safety targets (five-year averages)

	Historical			Targets (less than)				
	2011-2015	2012-2016	2013-2017	2014-2018	2015-2019	2016-2020	2017-2021	2018-2022
Fatalities	192	191	190	188	187	185	185	184
Serious injuries	1,278	1,263	1,250	1,239	1,230	1,221	1,213	1,206
Fatalities per 100 million VMT*	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1
Serious injury per 100 million VMT*	8.0	7.7	7.6	7.5	7.4	7.3	7.2	7.0
Non-motorist fatalities and serious injuries	120	120	120	120	120	120	120	120

*VMT=vehicle miles traveled; grey highlight=current target

STRATEGIC HIGHWAY SAFETY PLAN

A Strategic Highway Safety Plan (SHSP) is a federally mandated statewide safety plan to reduce fatalities and serious injuries on roadways. In Idaho, ITD develops and manages the SHSP, establishing statewide goals, objectives, and key emphasis areas in consultation with federal, state, local, and private sector safety stakeholders. SHSP elements are integrated into statewide and regional transportation plans and transportation improvement programs to place safety on par with other planning factors, particularly when choosing or evaluating new and continuing projects and initiatives.

SHSP Goals and Strategies

The SHSP establishes three emphasis areas: high-risk behaviors, vulnerable users, and severe crash types (Figure 1). Each emphasis area is then subdivided into focus areas, for a total of 11, each of which is supported by strategies to increase safety and reduce crashes, injuries, and deaths. COMPASS is tracking safety performance relevant to the 11 identified focus areas, but has not set any specific measures or targets by focus area for Ada and Canyon Counties.

The subtitle of ITD's 2016–2020 SHSP,[7] *Toward Zero Deaths*, supports its vision of fatality- and injury-free travel on Idaho roadways. *Idaho Traffic Crashes*[8] provides an annual description of motor vehicle crash characteristics for crashes that have occurred on public roads in Idaho. This document is used by state and local transportation, law enforcement, health, and other agencies to identify traffic safety problems and target areas for the development of crash-reduction and injury-prevention programs.

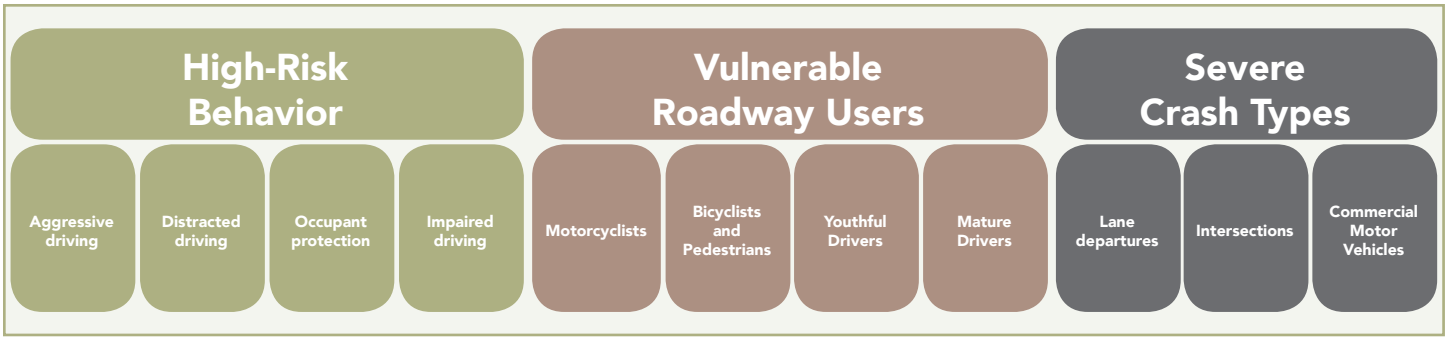

Figure 1. Safety categories and data sets defined by ITD's 2016–2020 Strategic Highway Safety Plan share core values with the National Highway Traffic Safety Administration (NHTSA) and other federal aid safety programs administered by the Federal Highway Administration (FHWA).

CIM 2040 2.0 AND TRANSPORTATION SAFETY

CIM 2040 2.0 specifically addresses safety issues in goal 1.2: *Improve safety and security for all transportation modes and users.* Several other CIM 2040 2.0 goals, as well as related objectives and tasks, also address safety either directly or indirectly. These are discussed below, organized by SHSP emphasis area. Crash data are obtained from ITD annually. Records were aggregated into a five-year time period from 2012–2016 to align with the 2016 SHSP. Analyses were conducted for Ada and Canyon Counties by COMPASS staff.

CIM 2040 2.0 AND SHSP EMPHASIS AREAS

High-Risk Behavior

High-risk behaviors include aggressive driving, distracted driving, lack of use of occupant protection such as seat belts, and impaired driving. High-risk behaviors can be addressed through enforcement programs, but require a sizable number of law enforcement agencies and personnel statewide.

1. Aggressive Driving

Aggressive driving includes failure to yield right-of-way, driving too fast for conditions, exceeding the posted speed, and following too closely. From 2012 to 2016, aggressive driving was a contributing factor in 13,833 crashes (30% of all crashes) in Ada and Canyon Counties, resulting in 21 fatalities. The most frequent type of crashes were rear-end crashes resulting from following too closely. Ever-increasing vehicle miles of travel, traffic congestion, travel delays, and the resulting frustration and impatience all contribute to aggressive driving.

CIM 2040 2.0 addresses aggressive driving through improvements to minimize congestion and manage increases in vehicle miles of travel.

2. Distracted Driving

There were 8,800 total crashes attributed to distracted driving in Ada and Canyon Counties from 2012 to 2016, which accounted for 19% of all crashes. Distracted driving collisions occur when at least one of the drivers is not paying attention. Distracted driving also led to 27 fatalities, accounting for 13% of the total fatalities in the two-county area. Side swipes and rear-end collisions were the most frequent crash types.

CIM 2040 2.0 helps alleviate distracted driving by supporting education on sharing the road, coordinating with law enforcement, and reducing distractions via improvements in the current transportation system.

3. Occupant Protection/Seat Belts

Seat belt use decreased by about 1% in both Ada and Canyon Counties from 2012 to 2016, but remains close to 93% in Ada County and 89% in Canyon County over the five-year time period. Five-year (2012–2016) statewide data show that children ages 0-3 were buckled safely in age-appropriate restraints 91.6% of the time. However, children ages 4-6 were appropriately restrained only 62% of the time.[9]

While CIM 2040 2.0 does not directly address occupant protection, it does help support this target area through sharing data on seat belt usage.

4. Impaired Driving (Drugs/Alcohol)

An impaired driving collision is one in which alcohol or drugs may have contributed to the collision. Impaired driving is of particular concern due to the significant number of fatal crashes caused by those driving under the influence. The economic cost of impaired driving crashes for the state as a whole is depicted in Table 3.[10] In Ada and Canyon Counties, 23% of all fatal crashes (46 total) were attributed to impaired driving for 2012–2016.

While CIM 2040 2.0 does not directly address impaired driving, it does help support this target area through sharing data and coordinating with law enforcement.

Table 3. Estimated economic costs of impaired driving crashes in Idaho in 2016. Source: *Idaho Traffic Crashes 2016.*

Incident Description	Total Occurrences	Cost per Occurrence	Cost per Incident Type
Fatalities	88	$9,623,771	$846,891,848
Serious injuries	223	$460,257	$102,637,311
Visible injuries	397	$125,360	$49,767,920
Possible injuries	482	$64,013	$30,854,266
Property damage only	1,703	$3,243	$5,522,829
Total of estimated economic costs			$1,035,674,174

Vulnerable Roadway Users

Vulnerable roadway users include motorcyclists, bicyclists and pedestrians, youthful drivers between 15-19 years, and mature drivers 65+. Those on bike, foot, and motorized two-wheeled vehicles have greater exposure to injury than those in vehicles, whereas youthful and mature drivers are vulnerable due to inexperience, declining reflexes, or health conditions.

5. Motorcyclists

Of all the motorcyclists involved in crashes statewide in 2014, 83% received some degree of injury.[11] Motorcycle crashes between 2012 and 2016 represented just 2% of the total number of crashes in the Treasure Valley, yet accounted for 17% of the total number of fatalities (35) during that same time. Side swipes and rear-end collisions were the two most frequent crash types, resulting in overturns and often caused by excessive speed.

CIM 2040 2.0 helps address issues related to motorcycle safety by supporting education on sharing the road with all users and coordinating with law enforcement.

6. Bicyclists and Pedestrians

Between 2012 and 2016, there were 955 crashes involving cyclists in Ada and Canyon Counties, resulting in 7 fatalities. During that same time frame, there were 494 crashes involving pedestrians, resulting in 24 fatalities. Overall cyclists were involved in 2% of all crashes and 3% of all fatalities. Pedestrians were involved in 1% of all crashes, but 12% of total fatalities. Conflicts involving cyclists and pedestrians were relatively evenly split between intersection (708) and non-intersection (741) crashes.

CIM 2040 2.0 addresses bicycle and pedestrian safety by supporting more walkable and bikeable communities, prioritizing projects that help complete bicycle and pedestrian networks, and supporting education on sharing the road with all users. As COMPASS works with the Active Transportation Workgroup[12] on bicycle and pedestrian issues, further analyses can detail crash frequency, identify the presence or lack of appropriate and adequate facilities, and begin to identify project needs and priorities.

7. Youthful Drivers

Drivers between the ages of 15 and 19 are considered "young" drivers. Between 2012 and 2016, young drivers were involved in 11,103 crashes in Ada and Canyon Counties, which accounted for 24% of the total crashes. Fatalities (31) accounted for 15% of the total in the same time period. The highest-occurring crash types were side swipes and rear-end collisions. These were attributed to unknown factors and following too closely, as reported by local law enforcement.

CIM 2040 2.0 goals and tasks address issues relating to young drivers by placing a high priority on creating walkable and bikeable communities and improved access to public transportation, thus providing young drivers with accessible, safe options to driving a car or riding with a friend.

8. Mature Drivers

Between 2012 and 2016, senior drivers, aged 65 or older, were involved in 1.6% of the total number of crashes in Ada and Canyon Counties; however, they accounted for 18% of total fatalities during the same time period. The most frequent crash events were rear-end crashes followed by angled crashes, which were caused by unknown factors, failure to yield, and following too closely.

While senior drivers are not specifically addressed in CIM 2040 2.0, the plan goals include creating walkable and bikeable communities, improving access to public transportation, and reducing distractions by addressing congestion and providing for overall improvements to the current transportation system.

Severe Crash Types

Lane departures and crashes at intersections are most commonly associated with severe injuries and fatalities amongst motorists. According to ITD, 20% of fatal crashes and 39% of fatal injuries from 2012 to 2016 occurred at intersections.[13] During the same time frame, 51% of fatal crashes and 30% of serious injuries occurred with lane departure crashes.[14] In addition, certain vehicle types, such as commercial trucks, create more harm in collisions due to their sheer size and weight.

9. Lane Departures

A lane departure crash is defined as a non-intersection-related crash that occurs after a vehicle crosses an edge line or a center line, or otherwise leaves the anticipated travel lane. Lane departure crash incidents primarily include single-vehicle run-off-road, head-on, and side-swipe crashes.[15]

From 2012 to 2016, there were 5,660 lane departure crashes in Ada and Canyon Counties. They accounted for 12% of all crashes and 6% of all fatal crashes. Urban areas had higher occurrences of lane departures (5,266) when compared to rural areas (394). However, statewide, 51% of all fatal crashes were attributed to lane departures, with 87% of those fatalities occurring on rural roads.[16]

10. Intersections

Intersections are conflict points for motorists, cyclists, and pedestrians, and come in an array of design configurations and treatments. Between 2012 and 2016, there were 18,424 crashes resulting in 52 fatalities at intersections in Ada and Canyon Counties. They accounted for 40% of all crashes and 25% of fatalities. ITD's five-year target is to reduce fatalities at intersections by 12% by 2020. The Treasure Valley population has grown by 18% over the last 8 years, which means realizing a 12% reduction in intersection crashes would be a significant achievement for our region.

ITD has committed to evaluate intersections and implement innovative engineering designs to reduce the severity of crashes. Collisions at intersections are addressed in CIM 2040 2.0 by funding intersection improvements that address safety, encouraging entities to adopt measures in the Access Management Toolkit,[17] and reducing conflict points between modes (Figure 2).

11. Commercial Motor Vehicles

Commercial motor vehicles include buses and trucks with different weights and axle combinations. Truck crashes were examined as part of a 2017 freight study[18] conducted by COMPASS. According to the study, between 2011 and 2015 in Ada and Canyon Counties, trucks were involved in 1,950 crashes—accounting for approximately 5% of all crashes. The truck crash data, together with truck delay data, are used to prioritize freight needs and identify appropriate solutions to address them.

The strategies associated with each focus area are summarized in Table 4; more detail can be found in the SHSP.[19]

Table 4. Strategies and emphasis areas in ITD's 2016–2020 Strategic Highway Safety Plan. Other capital-related strategies that address safety on state-managed facilities include traffic calming, rail crossing improvements, rest area parking, pullouts for emergency vehicles, visual obstruction clearance, work zone safety projects, and public transportation facilities.

Strategies	Aggressive Driving	Distracted Driving	Occupant Protection	Impaired Driving	Motorcyclists	Bicyclists and Pedestrians	Youthful Drivers	Mature Drivers	Lane Departures	Intersection Crashes	Commercial Motor Vehicles
Non-capital strategies											
Improved enforcement	x	x		x		x					
Research new or improved laws	x	x	x	x	x	x	x	x			x
Training for professionals, officials				x	x					x	
Training for public, including media campaigns and events	x	x	x	x	x	x	x	x		x	x
Data monitoring and analysis	x	x		x	x	x		x	x	x	
Safe Routes to School						x					
Partnerships between private sector and transportation	x	x	x	x	x	x	x	x	x	x	x
Other public or private policies				x		x	x	x	x		
Capital-related strategies											
New or improved facilities		x				x					
Intersection and roadway design										x	
Shoulder, edge line, and centerline rumble strips/ stripes, drop-off removal, paint markings								x	x		
Roundabouts										x	
Guardrail design and installation									x		
Message boards and signs								x	x	x	
Traffic control devices								x		x	
Lighting and beacons								x		x	

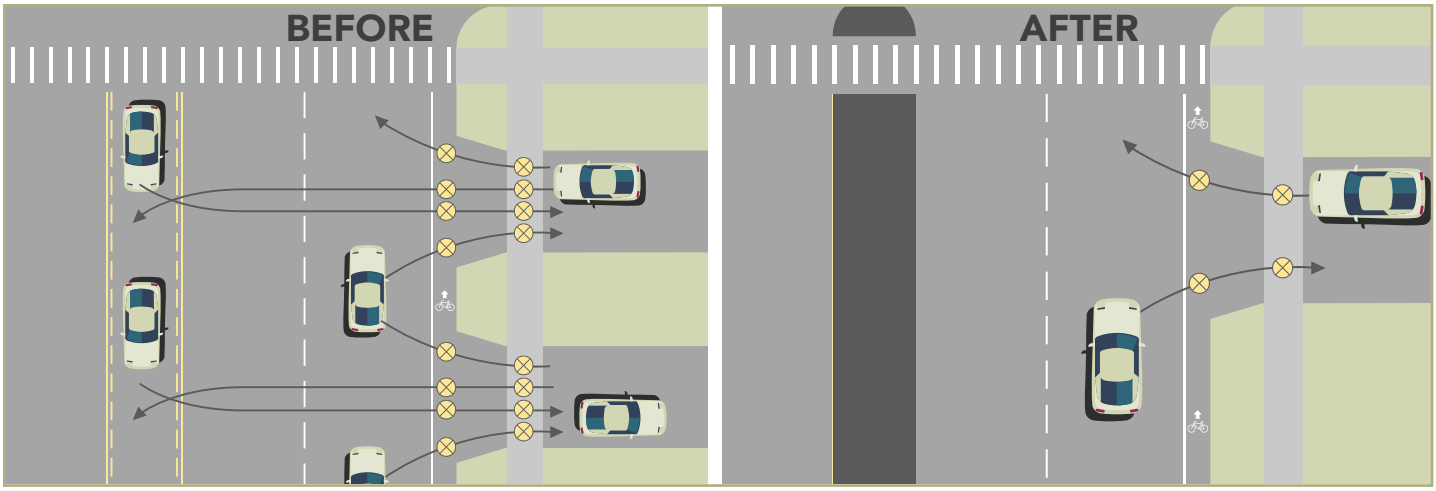

Figure 2. Managing access can reduce potential conflict points, thus providing improved safety for motorists, pedestrians, and cyclists alike. *Source*: COMPASS.

CONCLUSION

Crashes in Ada and Canyon Counties, home to 39% of the state's population in 2016, accounted for 23% of total statewide crash-related costs from 2012 to 2016. With the increased focus on improving transportation safety on federal, state, and local levels, COMPASS continues to work toward safer transportation for all, especially the most vulnerable users, by planning for, and funding, projects with safety benefits. The TIP[20] identifies projects that help meet safety targets and includes an analysis of the anticipated safety benefits.

NOTES

1 *Idaho Traffic Crashes 2016*, Idaho Transportation Department, Office of Highway Safety, http://apps.itd.idaho.gov/apps/ohs/Crash/16/Analysis.pdf

2 Ibid.; inflation-adjusted 2016 costs were applied to the 5-year time period.

3 "Planning Assistance and Standards." *Code of Federal Regulations*. Title 23, 450.306 (a), (h). https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=d3de9a1f8d4f7903c983f87040d40dd4%20&mc=true&n=pt23.1.450&r=PART&ty=HTML#se23.1.450_1306

4 FAST Act, https://www.fhwa.dot.gov/fastact

5 "Metropolitan Planning Organization Safety Performance Measures Fact Sheet," US Department of Transportation Federal Highway Administration, https://safety.fhwa.dot.gov/hsip/spm/mpo_factsheet.cfm

6 "Transportation Improvement Program," COMPASS, http://www.compassidaho.org/prodserv/transimprovement.htm

7 Ibid.

8 See note 1.

9 Ibid.

10 Ibid.

11 *FFY2017 Idaho Highway Safety Plan*, Idaho Office of Highway Safety, Idaho Transportation Department, http://apps.itd.idaho.gov/apps/ohs/Plan/FFY2017HSP.pdf

12 Active Transportation Workgroup, http://www.compassidaho.org/people/workgroups.htm#atwg

13 Idaho Department of Transportation, 2012–2016 Intersection Crash Summary

14 Idaho Department of Transportation, 2012–2016 Single Vehicle Run Off Road Crash Summary

15 *FFY2018 Idaho Highway Safety Plan*, Idaho Office of Highway Safety, Idaho Transportation Department, http://apps.itd.idaho.gov/apps/ohs/Plan/FFY2018HSP.pdf

16 See note 15.

17 *Access Management Toolkit*, COMPASS, http://www.compassidaho.org/documents/planning/studies/AcMgtTlkt_08Cover_Electronic.pdf

18 *Freight Working Paper 3-A: Safety*, COMPASS, http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightWorkingPaper3ASafety.pdf

19 *Idaho's Strategic Highway Safety Plan*, Idaho Transportation Department, http://apps.itd.idaho.gov/apps/ohs/Plan/FFY16-FFY20_SHSP.pdf

20 See note 6.