

Traveler Safety

A TRANSPORTATION SAFETY INVESTMENT

Traveler Safety is one of the thirteen investment categories of MnSHIP, a fiscally constrained plan MnDOT uses to balance the needs and risks of Minnesota's state highway network. Folios for each investment category describe potential levels of investment and associated outcomes. Through MnSHIP, MnDOT will create an investment direction that guides state highway capital investments for the next 20 years.

INVESTMENT CATEGORY DETAILS

Why is Traveler Safety important?

Vehicle crashes are the leading cause of death for people under the age of 35, and the second leading cause of death overall in the nation. Crash-related deaths and serious injuries create significant costs for individuals, families, and society. Nearly one person died every day in 2014 on Minnesota roads (361/year) and more than three were seriously injured.

MnDOT and its partners have made reducing fatalities and serious injuries a top priority through the Toward Zero Deaths initiative (TZD) (www.minnesotatzd.org). Through its "Four Es" approach – education, engineering, enforcement, and emergency medical and trauma services - the TZD program has helped reduce the number of fatalities and serious injuries in Minnesota for over a decade.

The Traveler Safety investment in MnSHIP primarily affects MnDOT's ability to implement engineering safety strategies in the TZD approach.

How does Traveler Safety support the Minnesota GO Vision and the Statewide Multimodal Transportation Plan?

Investing in Traveler Safety supports the guiding principles laid out in the 50-year vision for the state's transportation system, Minnesota GO. Among those are:

- Integrating Safety: Systematically and holistically improving safety for all forms of transportation through proactive, innovative, and strategic approaches; and
- Ensuring Accessibility: The transportation system must be accessible and safe for all users, and must provide access to key resources and amenities throughout communities.

Building upon these principles, investment in Traveler Safety strengthens multiple strategies identified in the Statewide Multimodal Transportation Plan (SMTP), notably:

- Increase participation of all road authorities in the Toward Zero Deaths initiatives;
- Ensure that transportation facilities are planned, engineered, operated, and maintained with consideration for the safety of all users;



Cable Median Barriers are one example of a traveler safety feature.

- Implement strategic and sustainable engineering solutions to improve traveler safety; and
- Work together to improve accessibility and safety for everyone traveling on, along, and across roads.

How does MnDOT measure Traveler Safety?

Each year, MnDOT measures the total traffic fatalities and serious injuries involving vehicle crashes on the 143,000 miles of state and local roads. The decade-long decline in the number of fatalities and serious injuries is indicative of the progress that Minnesota agencies and partners have made in their targeted implementation of safety strategies. Minnesota's traffic fatality rate is the third lowest in the nation and 38% below the U.S. average (USDOT, 2013). However, bicycle and pedestrian-related fatalities have not followed the same decline.

MnDOT uses targets set by the TZD program to measure its progress in Traveler Safety. MnDOT aims to help the state reach 300 or fewer fatalities and 850 or fewer serious injuries by 2020.

MnDOT also looks at the change in number of traffic fatalities according to the types of crashes causing fatalities (e.g., unbelted, head-on). These measures help MnDOT evaluate the

effectiveness of its safety programs and varied safety treatments.

How did MnDOT create the investment levels?

The performance levels outlined in the table represent plausible investment levels for Traveler Safety. A risk-and performance-based analysis was undertaken in the summer of 2015 to illustrate

Tips for using this table

- Performance Levels**
- **Performance Level 0 (or PL 0)** represents a strategy in which Traveler Safety would receive less than current funding. PL 0 corresponds to the most extreme risk level MnDOT would potentially consider.
 - MnDOT’s current spending in Traveler Safety corresponds to **PL 1**.
 - PLs for Traveler Safety are independent of other investment categories.

Investment Approach

- See **MnSHIP Investment Approaches** folio

Investment Levels

- The **pie charts** represent MnSHIP’s total planning investment for years 2022-2037 (\$17.1 billion) and the portion of it which will be dedicated to Traveler Safety investment at each PL.
- **Base investment for other categories** is the amount required to invest at PL 0 in every other category.
- **Remaining revenue available** is the additional investment beyond the base investment for all categories in MnSHIP.

Outcomes

- Highlights key outcomes associated with each PL. For Traveler Safety, outcomes correspond with key performance measures.

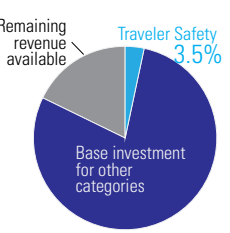
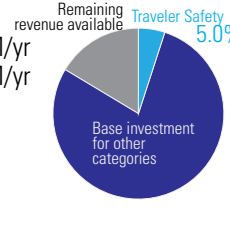
Risks

- Identified as **high**, **medium**, or **low** in each PL; each risk decreases in level from left to right.

System Investment Strategies

- Details the steps MnDOT would make to mitigate risk at each PL.

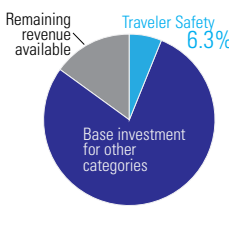
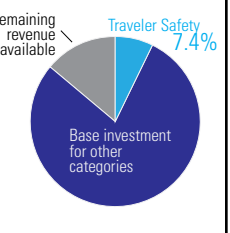
potential future scenarios. Performance levels reflect investments between 2022 and 2037 (2018-2021 funding levels influenced by 2013 MnSHIP). PL 0 through 3 represent a range of options to help stakeholders and decision-makers understand outcomes, risks, and system investment strategies for Traveler Safety.

Traveler Safety		
Overarching Goal: Safeguard travelers, applying proven strategies to reduce fatalities and serious injuries for all travel modes.		
	Performance Level 0 <i>Lowest cost, greatest risk</i>	Performance Level 1 <i>Lower cost, higher risk</i>
Investment Approach <i>(See Approaches folio)</i>	Approach A, B and C	Approximately correpsonds with current investment
Investment Level <i>Total Years 5-10 (2022-2027) Years 11-20 (2028-2037)</i>	\$588 M \$30.8 M/yr \$40.3 M/yr 	\$832 M \$41.5 M/yr \$55.3 M/yr 
Investment Description	Implement identified low cost, proactive projects at two-thirds the current rate and \$1.0 M for flexible TZD programming.	Implement identified low cost, proactive projects at the current rate and \$2.0 M for flexible TZD programming which funds 5 TZD Coordinators.
Outcomes <i>To what extent would MnDOT meet system and performance targets for Traveler Safety?</i>	Total fatalities and serious injuries less likely to continue decade-long decline, and may perhaps see an increase.	Total fatalities and serious injuries likely to continue decade-long decline, but at a slower rate.
Risks	High • High sustained crash rate locations left unaddressed	High • High sustained crash rate locations left unaddressed
	Medium • Deterioration of existing safety features • Increase in risky driving behavior • Fewer new treatments	Medium • Deterioration of existing safety features • Increase in risky driving behavior
		Low
		• Fewer new treatments
System Investment Strategies <i>What strategies would MnDOT use to manage risk?</i>	• Implement high priority, lower cost proactive treatments • Reactive installation of lighting at sustained crash locations	• Pedestrian crossing safety enhancements • Intersection improvements • Install lighting at highest-risk sustained crash locations in state

How does MnDOT typically invest in Traveler Safety?

MnDOT draws upon both state and federal funds to invest in Traveler Safety projects on state highways. The Highway Safety Improvement Program (HSIP) is a federal program that was established in 2005 to fund programs that reduce fatalities and

serious injuries on all roads. These funds are distributed among MnDOT Districts and local agencies. MnDOT has developed District Safety Plans (DSPs) for each MnDOT District over the past four years. DSPs evaluate crash data and identify areas needing safety enhancements.

Performance Objectives: Implement strategic and sustainable engineering solutions to improve safety; pursue system-wide, cost-effective, proven strategies; explore new opportunities to holistically improve safety for all modes, including bikes & pedestrians; and continue participation in the comprehensive, collaborative safety initiative Toward Zero Deaths that targets the “Four Es” (engineering, education, enforcement, & emergency medical & trauma services)	
Performance Level 2 <i>Greater cost, lower risk</i>	Performance Level 3 <i>Greater cost, lower risk</i>
PL does not correspond with an Investment Approach	PL does not correspond with an Investment Approach
\$1,041 M \$51.0 M/yr \$68.9 M/yr 	\$1,239 M \$60.0 M/yr \$81.6 M/yr 
Implement identified low cost, proactive projects at twice the current rate. Begin non-infrastructure type projects, and \$3.0 M for flexible TZD programming.	Implement identified low cost, proactive projects more quickly than current rate. Invest at most sustained crash locations and \$7.0 M for flexible TZD programming.
Total fatalities and serious injuries likely to continue decade-long decline. Ability to improve safety at select sustained crash locations.	Total fatalities and serious injuries likely to continue decline; possible reduction in non-motorized crashes. Ability to improve safety through a broader set of treatments at more sustained crash locations.
Medium • Increase in risky driving behavior	Medium • Increase in risky driving behavior
Low • Deterioration of existing safety features • High sustained crash rate locations left unaddressed • Fewer new treatments	Low • Deterioration of existing safety features • High sustained crash rate locations left unaddressed • Fewer new treatments
• Implement combination of lower and moderate cost proactive treatments • Multiple treatments at select sustained crash locations	• Implement multiple proactive projects • Multiple treatments at most sustained crash locations and other rural high-risk locations

The DSPs focus on appropriate proactive strategies that could be implemented to address high-risk locations, such as high tension cable barriers, pavement markings, and intersection lighting. The DSPs also implement lower cost, high benefit safety treatments at high risk and sustained crash locations.

What is a lower cost, high benefit safety treatment?

Lower cost, high benefit safety treatments are safety solutions that use proven engineering-based approaches to reduce the likelihood of traffic-related crashes on a system-wide basis. These treatments may be applied on a proactive basis or concurrently with roadway infrastructure projects.

- **Roadway infrastructure projects** with lower cost, high benefit safety improvements include edge treatments (such as rumble stripes and rumble strips), guardrail, and pavement markings. A rumble strip is a row of indents in the pavement that is designed to alert inattentive drivers. Rumble stripes are rumble strips that have a pavement marking installed on top of them to improve visibility in wet conditions.
- **Proactive** lower cost, high benefit safety features include standalone projects, such as retrofitted rumble stripes and rumble strips, and new cable median barriers. Proactive safety features also include intersection improvements to enhance lighting, signage, improved sight lines, enhanced delineation of curves, curb extensions, median refuges, and countdown timers for pedestrians.

What is a sustained crash location?

There are some locations in the state that experience a consistently high crash rate over a five-year period compared to other locations across the state. MnDOT refers to these spots as sustained crash locations. Crashes in these spots may occur as a result of an underlying issue that has not been effectively managed and requires more substantial, higher cost investments. Sustained crash reduction treatments include higher-cost intersection improvements for all modes, such as turn lanes, roundabouts, reduced-conflict intersections/J-turns, shared-use paths, and curb extensions. An example is the reduced conflict intersections/J-turns that were constructed in Cologne, MN at US 212 and MN 284 and in Cotton, MN at US 53 and County State Aid Highway (CSAH) 52.

MnDOT would be able to treat certain sustained crash locations if Performance Levels 2 or 3 were implemented.

What risks are addressed through increased investment in Traveler Safety?

Generally, the more MnDOT invests in Traveler Safety, the more MnDOT is able to reduce these key risks:

- Reduced investment in safety infrastructure (shoulders, guardrails, lighting, pavement markings, etc.) reduces the effectiveness of safety features and results in a less safe transportation system for all vehicle classifications, including heavy commercial freight.
- Inability to implement new proactive lower cost, high benefit treatments increases risk of fatal and serious injury crashes;
- Bicycle and pedestrian crashes increase due to reduced funding availability for infrastructure specific to these modes of travel.
- Fewer educational and enforcement programs leads to an increase in risky driving behavior.
- Increased instances of inattentive driving, driving under the influence and other behavioral factors lead to a higher risk of fatal and serious injury crashes.

How is MnDOT enhancing financial effectiveness through Traveler Safety?

MnDOT uses a combination of reactive and proactive systemic safety treatments that are proven to reduce fatalities and serious injuries on Minnesota's highways. The types of treatments that are implemented vary depending on the location and type of road, as urban and rural areas typically have different safety needs. MnDOT implements low-cost, high benefit treatments when deciding on safety enhancement investments.



MnDOT Freeway Incident Response Safety Team (FIRST) helps reduce secondary crashes and assists with first aid.

Find more information with these additional folios!

Asset Management

- Pavement Condition
- Bridge Condition
- Roadside Infrastructure Condition
- Jurisdictional Transfer
- Facilities

Critical Connections

- Twin Cities Mobility
- Greater Minnesota Mobility
- Bicycle Infrastructure
- Accessible Pedestrian Infrastructure

Transportation In Context

- Regional + Community Improvement Priorities

Other Investments

- Project Delivery
- Small Programs

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