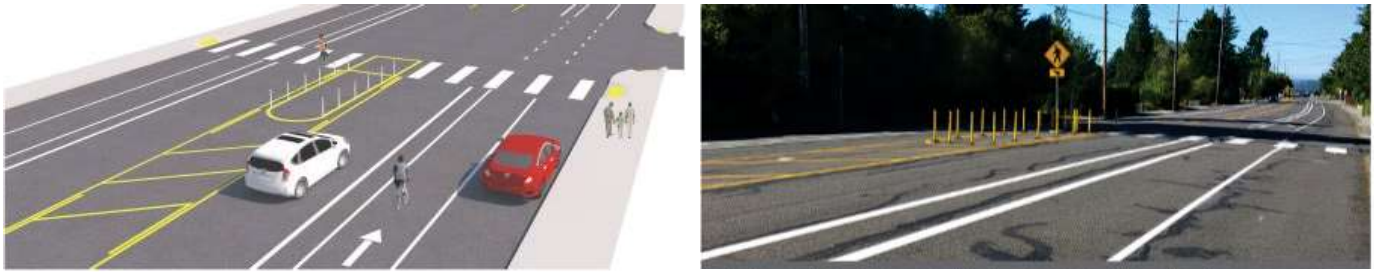
Case Study A.6. Multi-Disciplinary Approach for Speed Reduction Citywide—Portland, Oregon, USA

Key Successes

The multi-disciplinary approach for speed reduction citywide in Portland included strategies such as residential speed limit reduction, an alternative methodology to setting speed limits, street redesign, intersection left turn calming, automated speed enforcement, and community outreach and education. The key successes from the city's efforts to reduce vehicular speeds are shown below:

- A 34 percent reduction in the odds of observing speeds greater than 30 mph on residential streets
- A 50 percent reduction in the odds of observing speeds greater than 35 mph on residential streets
- Development of an alternative methodology for setting speed limits in Portland that considers vehicles, pedestrians, and bicyclists
- Street redesign (**Figure 12**) resulted in a reduction in vehicle speeds with no significant changes to travel times along the main corridor and no significant changes to volumes or speeds on nearby neighborhood streets



Source: PBOT.

Figure 12. Example of road configuration in Portland after street redesign from five lanes to three lanes.

- A 13 percent reduction in vehicular turning speeds due to left turn calming
- A 71 percent reduction in speeding over the speed limit due to automated enforcement
- A 94 percent reduction in top end speeding due to automated enforcement

The Safe System Approach Highlights

- **Death/serious injury is unacceptable:** The City adopted Vision Zero in 2015.
- **Humans make mistakes/humans are vulnerable:** Vision Zero efforts prioritize vehicular speed reduction in Portland.
- **Redundancy is crucial:** The city's multidisciplinary approach to reducing speeds includes engineering, enforcement, and education efforts.

Background

The City of Portland is the county seat of Multnomah County and is the largest city in the State of Oregon, with a population of approximately 653,000. Portland committed to Vision Zero in 2015 and released an action plan in 2016.[1] The Portland Bureau of Transportation (PBOT) has applied Safe System principles to update speed limits on nearly all streets citywide since 2017, as allowed by State law, and reduced the residential street speed limit from 25 mph to 20 mph in 2018. More than 90 percent of non-freeway streets in Portland have speed limits no higher than 30 mph, in accordance with the World Health Organization's best practices for urban areas. PBOT continues to update and evaluate the impact of speed limit reduction and pursues complementary speed management practices, including signal retiming, road restriping that accommodates buffered bike lanes, and traffic calming to reinforce posted speeds.

Implementation

As part of its Vision Zero efforts, the City of Portland adopted a multi-disciplinary approach for speed reduction citywide. The main strategies to lower speeds and reduce the chance of death or serious injury are summarized below:

- **Residential speed limit reduction:**[2] The City reduced speed limits from 25 mph to 20 mph on most residential streets in 2018. Approximately 76 percent of non-freeways in Portland have a 20 mph posted speed limit.
- **Setting target speeds:**[3] In 2016, PBOT submitted a request to ODOT to use an alternative methodology[4] for speed zones on non-arterial roads with posted speed limits greater than 25 mph. The City's proposed methodology for setting speed limits incorporates the needs of all road users by focusing on the safety of VRUs. PBOT worked with ODOT to create a process in which PBOT submits a formal request to ODOT to lower the speed limit for each roadway section in question. The investigation method includes information on the street context, including land use, facilities for pedestrians and bicyclists, crash history, and recommended speed limits based on the Simplified Decision Matrix (**Figure 13**). In 2020, ODOT adopted revised statewide speed limit setting rules for urban areas to incorporate the alternative method's more balanced consideration of safety for all users and reduced reliance on vehicular speed distribution data.

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1 City of Portland (2016). *Vision Zero Action Plan: Saving Lives with Safe Streets*. Retrieved from https://www.portland.gov/sites/default/files/2020-04/vision-zero-action-plan.pdf.

2 City of Portland (2022). "Speed Limits." Retrieved from https://www.portland.gov/transportation/vision-zero/speed-limits.

3 National Transportation Safety Board (2017). *Reducing Speeding-Related Crashes Involving Passenger Vehicles*. NTSB/SS-17/01. Retrieved from https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf.

4 PBOT (2016). *Request to Use an Alternative Methodology for Speed Zones*. Retrieved from https://bikeportland. org/wp-content/uploads/2016/08/PDX_AlternativeSpeedZone_packet-2.pdf.

Street and limits:	Street									
Advisory		Statutory								
Speed	10 mph	≤15	≤20	≤25	≤30	≤35	≤40	≤45	≤50	
PED	Shared roadway			5′ sidewalk 100% one side	Sidewalk both sides; curb or swale; 8′ separation	>8′ separation both sides NCHRP 562 crossings: 20/Hr.	>12′ separation both sides	Impermeable separation barrier		
BIKE	Shared roadway			≤ 5′ bike lane	6′ – 7′ bike lane	Minimum 2′ separation from autos	Permeable barrier	Impermeable separation barrier		
AUTO	Gravel roadway	≤ 9′ travel lanes	10′ travel lanes, greenway	10′ travel lanes		≤ 11′ travel lanes; Angle crash mitigations	Permeable center barrier; Roadside object setback or shielding		Impermeable center barrier	

Source: PBOT.

Figure 13. Simplified speed limit matrix for fatal crash reduction by mode.

- **Street redesign:** One example of street redesign to lower speeds is the NE 102nd Avenue safety project.[5] NE 102nd Avenue was a high speed, High Crash Network corridor where pedestrian safety was a concern.[6] One of the primary goals of the safety project was to reduce vehicular speeds along the corridor. The project design included a road diet that reduced the roadway from five to three vehicular travel lanes, lowered the speed limit to 30 mph, and installed improvements for pedestrians and bicyclists.
- **Intersection left turn calming**: Approximately 20 percent of pedestrian crashes in Portland result from left turning drivers failing to yield to pedestrians in the crosswalk at signalized intersections.[7] Portland piloted a left turn calming project[8] in 2019 using a combination of rubber bumps, delineator posts, and thermoplastic striping at 42 signalized intersections.
- **Automated speed enforcement**: Oregon allows Portland to use speed safety cameras on its High Crash Network streets. The city's eight fixed speed safety cameras were installed between 2016 and 2018.
- **Community outreach and education**: Portland has a citywide Struck Speed Campaign[9] to inform citizens of the risk of death and serious injuries due to high speeds.

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5 Portland Bureau of Transportation. (2020). *NE 102nd Ave Safety Project Pilot Evaluation Report*. Retrieved from https://www.portland.gov/sites/default/files/2020-06/102nd-evaluation-report-jan-2020_0.pdf.

6 City of Portland. (2022). "High Crash Network Streets and Intersections." Retrieved from https://www.portland. gov/transportation/vision-zero/high-crash-network.

7 City of Portland. (2022). "Left-Turn Calming." Retrieved from https://www.portland.gov/transportation/vision-zero/ left-turn-calming.

8 Portland Bureau of Transportation. (2020). *Evaluation Report: Left Turn Calming Pilot Project*. Retrieved from https://www.portland.gov/sites/default/files/2020-07/left-turn-calming-evaluation-report.pdf.

9 City of Portland. (2022). Struck Traffic Safety Campaign. Retrieved from https://www.portland.gov/ transportation/vision-zero/struck.

Outcomes

PBOT does not have available crash data after the implementation of speed reduction measures and, therefore, the outcomes are measured in terms of impacts on vehicular speeds.

- **Residential speed limit reduction**: A study conducted to determine the impact on vehicular speeds following the residential speed limit reduction from 25 mph to 20 mph found a 34 percent reduction in the odds of observing speeds greater than 30 mph and a 50 percent reduction in the odds of observing speeds greater than 35 mph.[10]
- **Setting target speeds**: In 2021, a segment of West Burnside Street was the first street in Portland to get a new speed limit under the alternative methodology for setting speed limits. A before-after analysis of impacts on vehicular speeds and crashes is not available.
- **Street redesign**: The before-after evaluation of the NE 102nd Avenue corridor showed a reduction in vehicle speeds and no significant changes to travel times. Further, there were no significant changes to volumes or speeds on nearby neighborhood streets.
- **Intersection left turn calming**: An evaluation of the pilot left turn calming project showed reduction of overall vehicular turning speeds by approximately 13 percent.
- **Automated speed enforcement**: Since the speed safety cameras were installed, speeding over the speed limit has dropped 71 percent and top-end speeding (more than 10 mph over the speed limit) has dropped 94 percent.[11]

Additional Information

Moving forward, all new High Crash Network capital projects in Portland will include project components that help achieve safe speeds. Further, the City is expanding left-turn calming to locations where permissive turns present risks to pedestrians. An important item to note is that Portland considers equity in speed safety camera placement so that cameras are not concentrated in any one community, and it also has options to tier camera fines based on family income and ability to pay. For further information, contact Matthew Kelly, Vision Zero Specialist at the Portland Bureau of Transportation, at matthew.kelly@portlandoregon.gov.

[10] Portland State University. (2020). *Effect of Residential Street Speed Limit Reduction from 25 to 20 mph on Driving Speeds in Portland, Oregon*. Retrieved from https://www.portland.gov/sites/default/files/2020/pbot-20-mph-speed-study-finalv5.pdf.

[11] Portland Bureau of Transportation. (2020). *Legislative Report – Outcome Evaluation: Fixed Photo Radar System City of Portland 2019-2020*. Retrieved from https://www.oregonlegislature.gov/citizen_engagement/Reports/Fixed%20Photo%20Radar%20System_Portland%202019-20_FINAL.pdf.