

How Oslo Achieved Zero

Pedestrian and Bicycle Fatalities in 2019, and How Other Cities Can Apply What Worked

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CITY OF OSLO, NORWAY



Rendering of multimodal safety improvements to City Ring Road in Oslo, Norway.

In 2015 the City of Oslo, Norway made a commitment to reduce car traffic, to prioritize the safety of people on foot and bicycles, and the environment, which came after years of increasing transportation injuries. Unlike in the United States, where transportation fatalities are often viewed as unavoidable, the government of Norway made a strong commitment to Vision Zero nationally, and has worked towards this vision for nearly two decades. Over the last 10 years (2010-2019), Oslo had an average of five to seven traffic fatalities a year. Some U.S. cities of similar size to Oslo, where the population in 2018 was 693,491, have more than double the traffic fatalities in a given year.¹

In 2015, political climate and public will in the City of Oslo changed the tone on accepting continued surface transportation fatalities. The mayor, city council, and transport division staff all supported a shift in roadway decision-making from car-centric to people-centric. Reductions in serious injury and fatal crashes in Oslo's downward trend shift around 2015 coincided with several important changes made that year:

- The city government set a goal to reduce car traffic by one-third by 2030, in effect doing away with the regime of "predict and provide," meaning that road safety measures could largely be implemented without traffic studies even if they were believed to cause congestion or slow down traffic.
- The authority to designate bus lanes, bike lanes, one way traffic and close streets to traffic was transferred from the police to the city government, allowing swift transformation of parking lanes to bike lanes and closure of cut through streets.
- The city implemented a bicycle strategy, with an aim to increase the bicycle mode to 25 percent by 2025.
- The city launched a smart phone app for children in school, where they can report traffic hazards and request road safety measures directly to the road authority. It is used by children at 98 schools (more than half of all schools in the city), and has gathered more than 60,000 reports from children so far.
- Oslo received attention in 2015 when it announced that it would make the city center car-free by 2019. In the end, the project has led to a removal of all regular street parking in the city center, and the center has been closed to through traffic.

Oslo also relies on national road safety efforts, especially when it comes to vehicle standards, driver education, and enforcement of road rules. Vision Zero was adopted in Norway in 2002, and is currently one of the safest countries for road users in the world.

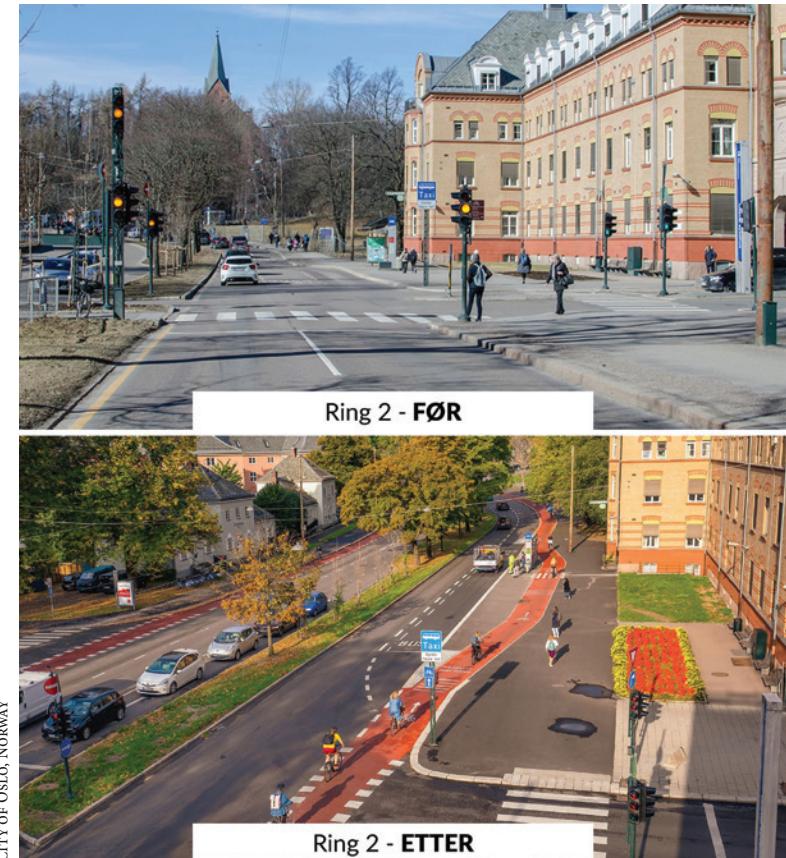


Figure 1. The City Ring Road used to have four lanes for cars. It was upgraded after five fatal crashes and 13 serious injuries in the 10 years from 2008 to 2017. There has only been one serious injury since the upgrade. It now has a raised, curb-separated bike lane; bus lanes; and just one lane for cars in each direction. Images show before and after of pedestrian and bicycle improvements to City Ring Road.

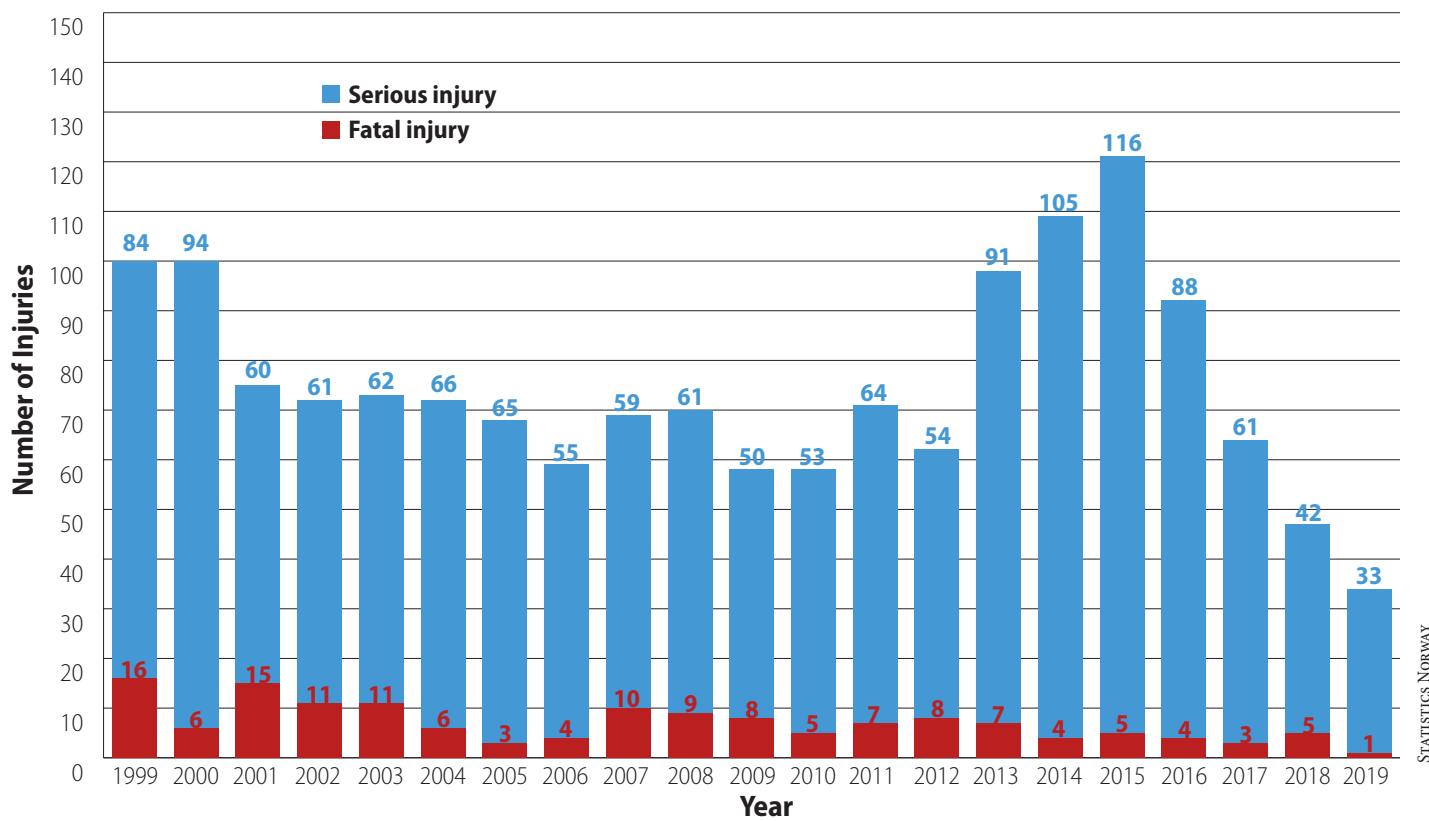


Figure 2. Transportation fatalities and serious injury data in the City of Oslo by year. Note: 2019 numbers are preliminary.

The Norwegian Public Roads Administration was also shifting goals and metrics nationally at the same time as Oslo, with plans like the National Cycling Strategy, which was a factor in driving decision making in the Norwegian capital of Oslo. The *National Cycling Strategy* in Norway had one goal, to make it safer and more attractive to cycle.²

Then, in June 2016, the City of Oslo released *Oslostandarden for sykkeltilrettelegging*, or *The Oslo Standard for Bicycle Facilities*, which prioritized safety and mode share for bicycles through rigorous design standards and exceptions to accommodate bicyclists in a safe manner on all road types. *The Oslo Standard for Bicycle Facilities* was the city's effort to figure out the best possible bicycle infrastructure that could be implemented within the boundaries set by the national laws and regulations. Contraflow cycling has been one of the measures most widely implemented, to allow cyclists to choose the safest possible route. Before 2015, when the city gained authority to allow contraflow cycling, it was only allowed on two streets. Today, contraflow cycling is allowed on most one-way streets in Oslo.

The City of Oslo also prioritized safety in road design and road user decisions from 2015 to present for vulnerable road users. The Norwegian Public Roads Administration transferred the authority of traffic-controlling signage and markings from the police to the cities. Additionally, there was a citywide shift of installing dedicated

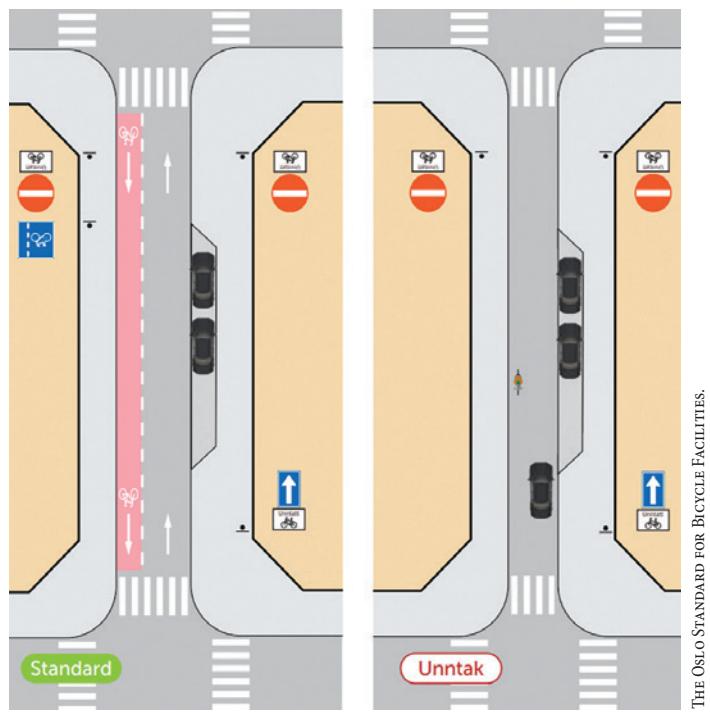


Figure 3. Left: The standard contraflow bike lane layout. Right: Contraflow cycling can be allowed on single lane streets if the roadway width is at least 13 feet.

bus lanes, restricting traffic on light rail corridors, and installing bicycle lanes in lieu of on-street parking on high mode split streets, and where increased transit and bicycle riding was needed and encouraged. Formerly, the city had to apply to the police or the national road authority to install bike lanes, bus lanes or close streets to traffic, often through formal planning proposals involving consultations and hearings, often delaying projects for years. With the authority to place traffic control signs and markings, the city can now implement such measures in a matter of weeks. This change has helped the city increase the rate of bike lane implementation ten-fold, from an average of 1.5 km (1 mile) per year, to more than 15 km (9 miles) in 2019.

Another driver in reducing roadway fatalities in the City of Oslo is a goal set by the city government in 2015 to reduce car traffic by one third by 2030. To reach this goal, the city has implemented a congestion charge, increased the number of road toll gates, and increased the tolls. While data indicate traffic has started falling, the main takeaway of this goal so far is not reduced traffic. Instead, it is that many measures can now be implemented even if they cause congestion or delays to car traffic. This has enabled more bus lanes, bike lanes, and speed humps to be installed quickly.

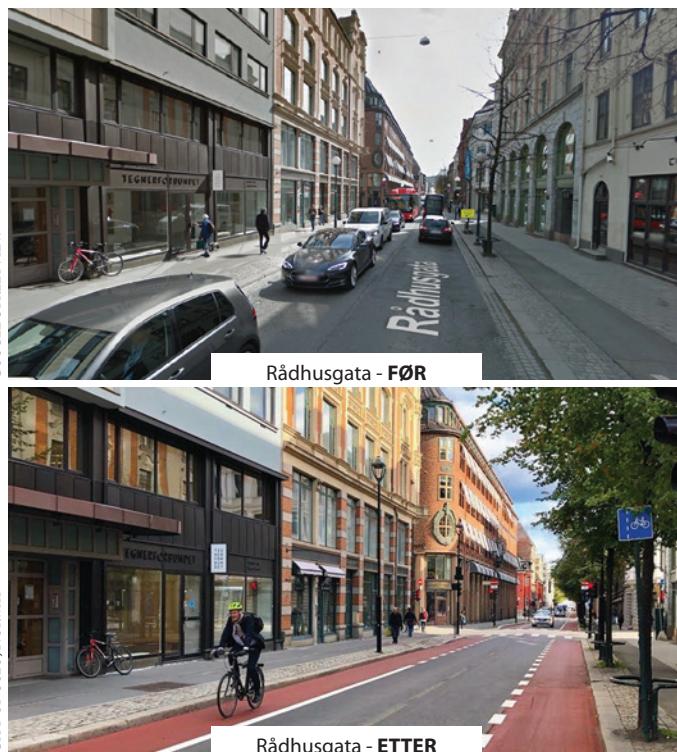


Figure 4. Rådhusgata in Oslo, Norway, shown in May 2017 Google Imagery, which carried 9000 cars per day through the city centre. City centre was closed to through traffic in 2018, Rådhusgata was made a one way street, and Oslo's signature red bike lanes were installed. Now, it is used by up to 2,000 cyclists and 4,000 pedestrians per day.

Another big shift for the City of Oslo was closing some streets to car traffic, either at peak pedestrian and bicyclist times, or permanently. The city also looked at streets with high pedestrian and bicycle crashes in the selection of converting car streets to people streets. Oslo quickly found that separating vulnerable road users from car traffic would be an effective road design priority toward achieving zero. While some of Oslo's achieving zero pedestrian and bicycling fatalities in 2019 is circumstance, a major factor was prioritizing safety across the city.

Every time a fatal crash happens, an accident analysis investigation is conducted by the Norwegian Public Roads Administration, with input from the police investigation, where they look at factors that contributed to the crash and its severity. Such investigation reports in Norway regularly include recommendations for road improvements, both at the crash site, and general improvements to prevent similar crashes elsewhere. The accident analysis investigation reports also provide recommendations to ensure similar crashes are avoided on similar roads. For example, a single fatal cyclist crash in 2018 led to the redesign of four bus stops, four intersections, and widened bike lanes over a distance of 1 km that included signal timing and separated junctions for cyclists at similar intersections to

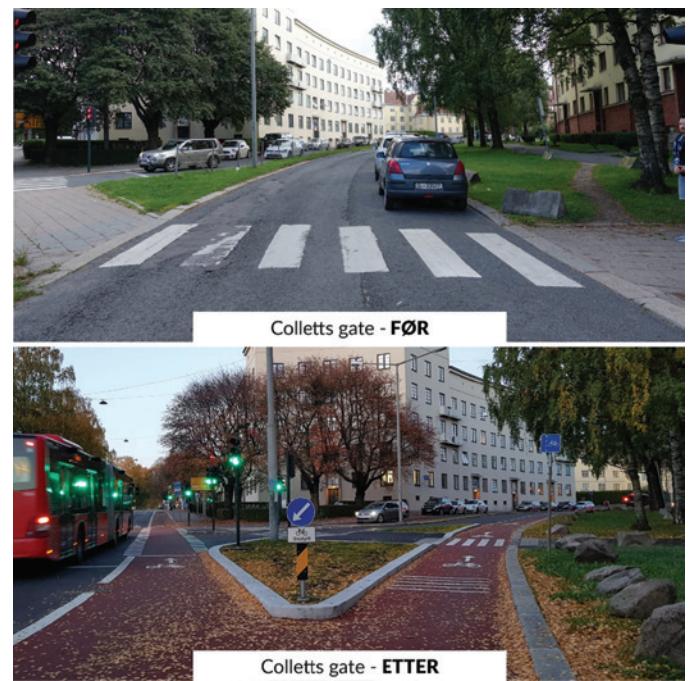


Figure 5. This treatment removed parking on one side of the side street and established a protective island. The treatment allows cyclists to go straight, while motor vehicles are restricted to a turning radius of about 40 feet. Together with an advanced stop line, this protects both cyclists going straight on the main street, and pedestrians crossing the side street. Note that drivers who are turning are required by law to yield to cyclists on the bike lane, and pedestrians in the crosswalk regardless of signals.

Anbefaling 2/S 17-2018 Kartlegging av utflytende kryss med tanke på utbedring

Det aktuelle krysset er uvanlig utflytende og UAG anbefaler Vegavdeling Agder at krysset strammes inn. Utformingen er vurdert som en medvirkende faktor i denne ulykken og det er kjent kunnskap at utflytende kryss kan gi både uheldig plassering i krysset og høy fart gjennom krysset, og igjen økt risiko for ulykker. Jf. også omtale i kap.5. UAG anbefaler at Vegdirektoratet eller Region Sør gjennomfører kartlegging av tilsvarende kryss andre steder i landet/regionen med sikte på utbedring.

Figure 6. A typical conclusion from a Norwegian accident analysis investigation report from a crash: "Recommendation: Survey of spacious intersections with the intent of reconstruction. The intersection in question is unusually spacious, and the accident analysis committee recommends that this intersection is tightened (meaning that the radii and dimensions of the intersection should be reduced through reconstruction). The design has been regarded as a contributing factor in this accident, and it is well known that spacious intersections can cause unfortunate vehicle trajectories and high speeds, which again increases the risk of crashes. The crash analysis committee also recommends that the national or regional road authority survey all similar intersections in the nation or region, with the intent of reconstruction." Source: The Norwegian Public Roads Administration, Crash analysis report S-17 2018, page 26.

where the fatal crash occurred. These reports also give transportation professionals an understanding of crash causation, a concept of a Safe System approach to transportation safety.

The City of Oslo also looked at certain land uses, such as schools and high-density mixed-use areas, that may cause pedestrians and bicyclists to be particularly vulnerable in making roadway decisions. On a city-wide scale, city officials put safety standards around schools, including limiting speeds to 30 kilometers per hour (km/hr) (18 miles per hour [mph]), installing speed humps to slow speeds, and reducing pedestrian crossing distances to 8 meters (m) (26 feet [ft.]). In high density mixed-use areas with many pedestrians and bicyclists present where closing streets to cars is not an option, the City of Oslo considers approaches such as limiting speeds through roadway interventions, or limiting traffic by implementing one-way streets. Roadway interventions the City of Oslo considers include narrowing and shifting lanes with vertical elements, installing tight curb radii requiring drivers to turn at intersections more slowly, ensuring streets have separated bicycle facilities wherever possible, and designing wide sidewalks to allow many pedestrians to walk. Transportation experts in Oslo have found that these interventions make for a more complex street environment where drivers are forced to pay attention, drive slower, and be cautious of pedestrians and bicyclists.

The City of Oslo owns the vast majority of roadways with [within] in city limits. Having clear ownership makes it easier for Oslo officials to evaluate safety and make design decisions. However, City of Oslo officials must also still work under Norwegian policies and standards, such as the *Norwegian Public Roads Administration Handbook 300* which sets the rules for uniform traffic control devices, much like the *Manual on Uniform Traffic Control Devices* (MUTCD) in the United States. But Oslo maintains its own road, street, and bicycle infrastructure design handbooks. In the last

revision, the standard sidewalk width was increased from 2.5 to 3 m (8 to 10 ft.), to accommodate increasing pedestrian traffic. From a local goal-setting standpoint, owning the majority of right-of-ways in Oslo also makes it easier to set aggressive targets for safety and mobility. Oslo has a modal share of 31 percent for walking, and seven percent for cycling (2018), but aims for a cycling modal share of 25 percent in 2025.³ Oslo has a well-functioning public transit system, with a 29 percent modal share.

Oslo implemented a congestion charge in 2018 and installed 52 new toll gates in a system that emulates road pricing. The road tolls finance a large part of the investments and operations in walking, cycling, public transit, and road safety. Most road safety measures are implemented by the Agency of Urban Environment directly, without having to get political approval of funding for smaller individual projects, including replacing parking with bike lanes, lowering speed limits, and building bump outs and speed humps.

Norwegian law prioritizes pedestrians having the right of way on all pedestrian crossings, and jaywalking is not considered a punishable offence in Norway. On city streets, most drivers will expect pedestrians to start crossing on unsignalized crossings without even looking for a car. The City of Oslo goes above and beyond to ensure pedestrians can always be seen. Intersections are a key area where transportation professionals in Oslo make design decisions based on pedestrian visibility, such as installing bump outs at intersections where parked cars or turning lanes obstruct sight lines. Oslo also requires high visibility ladder style crosswalks at all pedestrian crossings. Often, the City of Oslo will take a step-wise approach typically in two to three stages, such as starting with temporary contraflow bike lanes on a one way street, then removing parking to install a permanent one-way separated cycle track.

While the city has the authority to set speed limits as it sees fit, it prioritizes control of vehicle speeds by physical measures rather

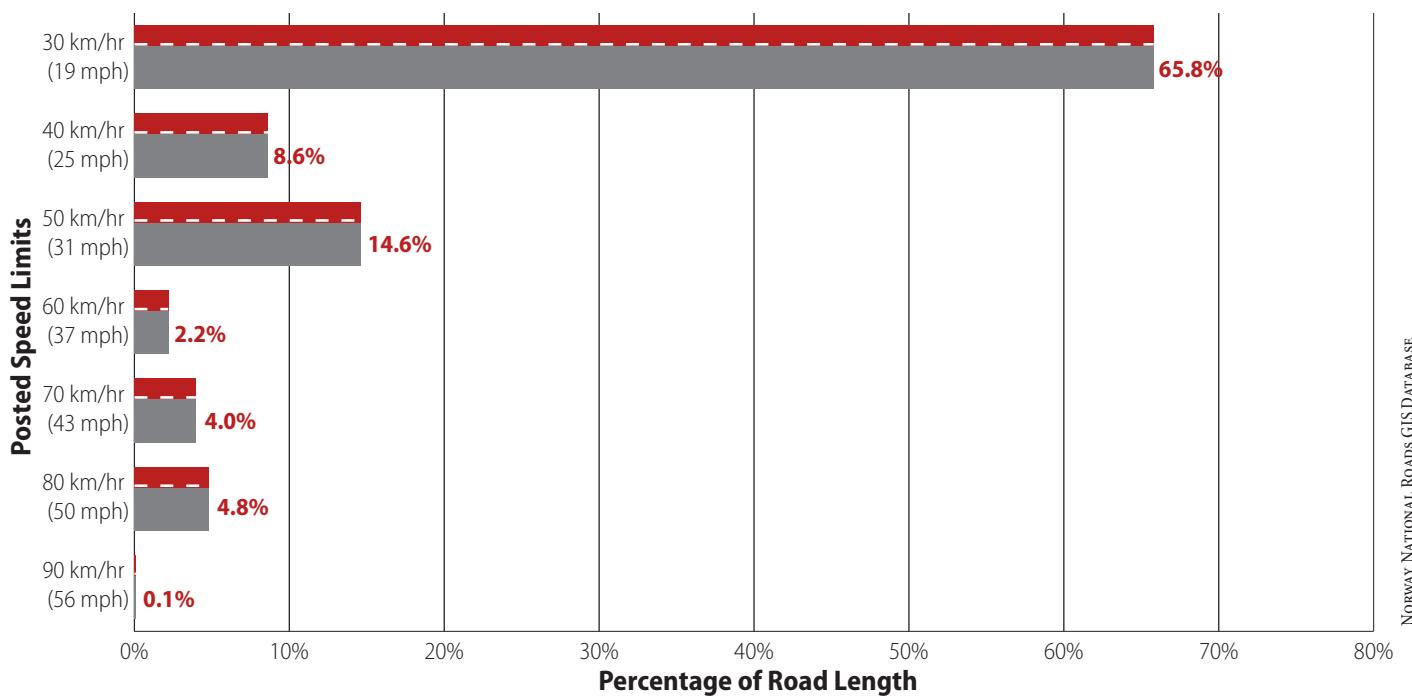


Figure 7. Speed limit breakdown by road length in the City of Oslo, Norway, allows other cities to compare the prevalence of different speed limits.

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than enforcement. In most cases, the city combines revision of speed limits with measures such as speed humps, tighter curb radii and bulb outs, to ensure that an acceptable share of drivers adhere to the new speeds. Arterials are typically posted at 50 km/hr (31 mph), smaller streets with bus traffic are posted at 40 km/hr (25 mph) and local streets at 30 km/hr (19 mph). One factor influencing both traffic, speeds and safety is that few city streets or roads have more than one lane for cars in each direction. Most streets that used to have three or four lanes have had bus lanes or bike lanes installed, so that they now only have one lane for cars. This helps limit traffic, but also makes the act of crossing the street less complex. With only one lane for cars, pedestrians have an easier time placing their attention, and vehicles are less likely to obscure people when crossing.

Since 2015, the city has implemented 50 km (31 miles) of bike lanes, removed parking spaces equivalent to 4,250 cars from its streets, installed around 500 speed humps, and lowered speed limits on many streets. This led to almost two-thirds of the road network now having a speed limit of 30 km/hr (19 mph).⁴ The city government has vowed to make 30 km/hr the standard citywide speed limit in the future.

Below are some statistics that further elaborate Oslo's success focusing on Vision Zero, and the road safety strides recently achieved.

- No vulnerable road users died in 2019, and only one car driver died.⁵
- No school children have died in traffic in decades. There are no records of children between 6 and 15-years-old dying in traffic since digital records began in 1999.⁶
- The risk of fatal or serious road traffic injuries, on a trip-by-trip basis, has fallen 47 percent for cyclists, 41 percent for pedestrians, and 32 percent for drivers between 2014 and 2018. The average number per 1 million trips for cyclists was reduced from 3.19 to 1.7, pedestrians from 0.74 to 0.44, and car occupants from 1.67 to 1.14.⁷

In Norway in 2019, no children died in traffic crashes, and there were only two fatal injuries per 100,000 inhabitants, compared to a death rate of 11.4 per 100,000 inhabitants in the United States.

Now that transportation professionals know it is possible to achieve zero, learning from cities like Oslo and Helsinki, we must all strive to achieve the same goal. We have an obligation to protect all road users, especially vulnerable road users. With a common goal of zero, political priorities, and aggressive standards like Oslo, we can ensure the pedestrian and bicyclists are no longer vulnerable in our cities. We must start now—as Oslo has been prioritizing safety of pedestrians and bicyclists for decades—and decide that even single digit fatalities are not acceptable. Transportation professionals should take these lessons and apply them all over the world so no motorist, pedestrian, or bicyclist need to risk their life just to get from point a to point b. **itej**

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