Public Health Data Report: Traffic Crash Deaths in Multnomah County

Taking a Safe System approach to address traffic-related fatality trends & contributing factors

Multnomah County, 2020 - 2021

August 2023

Multnomah County
Health Department

Acknowledgements

The data presented in this report represent real people – members of our community. The victims of traffic crashes are sisters, brothers, mothers, fathers, and friends in our county.

Executive Summary

Rates of traffic-related fatalities are on the rise throughout the United States and in the Portland Metro Region. In the region, traffic-related crashes are the leading cause of unintentional injury and death for people aged 5-24 and second leading cause of unintentional injury and death for those aged 25-84. Rising traffic fatality rates in the region are largely driven by growing pedestrian fatalities, the impacts of which are disproportionately experienced by Black, Indigenous, and people of color (BIPOC), people with lower incomes, and people likely experiencing houselessness. As traffic safety throughout the region continues to decline, transportation planning agencies and decision-makers need to shift interventions away from the focus on individual behavior change and enforcement to creating a safe transportation system through design, operation, and transportation policy.

In this report, we present a summary of regional traffic-related fatality trends and contributing factors, findings from our analysis of Medical Examiner (ME) reports on traffic fatalities, and the need for transportation planning agencies and policymakers to adopt a Safe System approach to transportation system design and operation. Among our key findings from our analysis of traffic fatality trends and ME reports are:

- Trends & Contributing Factors
  - BIPOC, people over the age of 65, and people with lower-incomes experience higher risk of death from traffic crashes than the rest of the population.
  - Arterial roadways in the region host the majority of serious and fatal crashes, accounting for 77% of all fatal and incapacitating pedestrian crashes.
  - Pedestrian fatalities are experiencing the most substantial increases out of all crashes by mode of transportation.
  - Motor vehicle design trends are leading to a greater number of larger, heavier vehicles on our roadways, such as SUVs and light trucks, which are associated with a higher risk of pedestrian morbidity and mortality.

- ME Reports on Traffic Fatalities
  - Excessive speed was a factor in 42% of traffic fatalities between 2020-2021
  - 24% of decedents in traffic-related crashes between 2020-2021 were likely experiencing houselessness.
  - Pedestrian and bicycle deaths were more likely to occur among persons likely experiencing houselessness due to high exposure both from living in near-road environments and from consistent exposure resulting from being outside the majority of their days and nights.

- ➢ Toxicology tests indicated that 84% of decedents tested positive for at least one substance. This dropped to 74% when excluding cannabinoids.
- ➢ The proportion of deaths with substances present was highest in pedestrians and people in motor vehicles.
- ➢ While toxicology reports show the presence of substances, positive tests do not necessarily indicate intoxication and our findings do not compare the rates of substance use among decedents with that of the general population.

All traffic-related fatalities are preventable and no death in our transportation system is an acceptable nor an inevitable cost of greater mobility. Our discussion of a Safe System approach in this report is intended to shift the conversation from individual responsibility to roadway design and policy choices that turn inevitable human errors into deaths on our roadways. In consideration of regional traffic fatality trends and adoption of a Safe System approach, our recommendations as a Local Public Health Authority for improving traffic safety through design, operation, and policy focus on:

- ❖ Safe Speeds
- ❖ Safe Vehicles
- ❖ Safe Road Users
- ❖ Safe Roads
- ❖ Optimizing Emergency Medical Services
- ❖ Safe Mobility for all Modes of Transportation

Implementing these recommendations would reduce the likelihood of drivers making errors on our roads, and ensure that the mistakes that do occur are less likely to result in injury. Creating a safe transportation system is a responsibility shared by those who design it, those who operate it, and all those who use it. By building a culture of safety we can reduce the risk and severity of traffic crashes throughout the region.

Background

More people died in traffic-related crashes in 2020 in the United States than any year since 2007, even with a decrease in the number of miles traveled during the COVID-19 pandemic.[1] The United States is unique among wealthy countries in this trend. Traffic crash deaths are eminently preventable, and other parts of the world have been highly successful in preventing them.[2] Transportation and law enforcement agencies report an increase in extreme speeding, single-vehicle crashes, and crash victims who appear to be experiencing homelessness.[3] Despite the abundance of information about traffic crashes and in-depth knowledge of solutions, many traffic safety efforts tend to focus on individual responsibility rather than systemic risk.

With traffic fatality rates continuing to rise steadily in Oregon since 2013,[4] we are in need of traffic safety interventions in Multnomah County to address risk holistically. A Safe System approach is grounded in interrelated principles for addressing traffic safety:

- Making the necessary changes to our transportation system
- Acknowledging the shared responsibility and accountability of transportation system operators and road users
- Curbing the reliance on enforcement to ensure safety

This report informs traffic safety interventions in Multnomah County by describing the principles of a Safe System approach, detailing current traffic crash trends and contributing factors. This report also outlines findings from Multnomah County's analysis of Medical Examiner (ME) reports on traffic fatalities. Information from the deaths of victims is intended to contribute to our broader understanding of local traffic crashes, not to detract from a systems approach to road safety

Safe System Approach

A Safe System approach to transportation system design expands the focus beyond behavior change among road users. Instead, this approach lowers risk to drivers, cyclists and pedestrians through infrastructure and operational changes.[5] This approach is interdisciplinary and international, resulting from the work and research of agencies and professionals across jurisdictions and fields of study. Adopting Safe Systems thinking is not just a public health approach to addressing a common cause of death, but also an intervention by transportation planning agencies and decision-makers to improve traffic safety at a systems level. Use of a Safe System approach is based upon the underlying concepts that:

- No death or serious injury is acceptable within a transportation system.
- Fast mobility should not come at the expense of safety.
- People make mistakes, some of which result in crashes.
- Human bodies are highly vulnerable to serious injury and death in traffic crashes, even at lower speeds.

- ❖ Transportation system operators and road users share the responsibility to lower the risk of serious or fatal crashes.
- ❖ Transportation systems need to be proactive and address safety through improving the entire system.
- ❖ Key risk factors contributing significantly to crashes must be identified and understood.[6]

Leading transportation investments with these concepts allows planning agencies and policymakers to create a transportation system which reduces the likelihood and severity of crashes while holding all transportation system operators and road users responsible for collective safety and well-being. Transportation plans and policies taking a Safe System approach thus acknowledge the need to enhance safety and accountability through design, operation, and behavior based on the concepts embedded in its framework.

Like many jurisdictions, the City of Portland has adopted Vision Zero, a goal to end all deaths and serious injuries from transportation. The application of a Safe System framework is characterized by two Vision Zero concepts: reducing human error and protecting fragile human bodies from the forces of fast-moving, heavy vehicles. To reduce the likelihood of human error, transportation planning agencies and decision-makers need to ensure that system users are separated in space, for example, by providing separate lanes for cars, bicycles, and pedestrians. Adopting this approach also ensures that system users are separated in time, for example by using stop lights to give each set of users a time when they are entitled to the roadway. Finally, by taking a Safe System approach, transportation planners and policymakers can improve user awareness, attentiveness, and performance through changes to streets, like marked crossings, and changes to vehicles, like alcohol detection systems.[6] These principles ensure that a transportation system has separate spaces for different modes of transportation, shared spaces that can support different system users at different times, and maximal visibility with minimized distraction and impairment.

While a Safe System approach aims to reduce the likelihood of error, it acknowledges that errors can happen. It pairs a focus on reducing errors with anticipating them and accommodating for the risk of serious injury can minimize harm. To anticipate error and accommodate for injury tolerance, transportation plans and policies aligned with a Safe System approach implement tactics to reduce speeds and possible impact forces. [6] Reducing speeds near exposed transportation system users, such as pedestrians and cyclists, can lessen both the likelihood and severity of a crash. The World Health Organization found that a 1% increase in average speeds increases the risk of fatal crashes by 4%. Accordingly, they recommend a maximum speed limit of 30mph for urban roads with mixed traffic.[7] Portland and many other cities have moved to lower speed limits on residential streets, posted at 20mph or lower. Similarly, infrastructural changes which separate modes of transportation provide barriers which can reduce the severity of crashes by reducing impact forces. Adding roundabouts reduces the

speed and angle of vehicles at intersections, diminishing the kinetic energy passed to other vehicles and road users in the event of a collision.[6]

Summary of Regional Trends & Contributing Factors

In the Portland Metro Region, traffic-related crashes are the leading cause of unintentional injury and death for people aged 5-24 and second leading cause of unintentional injury and death for those aged 25-84. And the number of fatalities continues to rise. Additionally, the risk of fatality from traffic crashes is unevenly distributed throughout the region, with Black, Indigenous, and people of color (BIPOC), people over the age of 65, and people with lower incomes experiencing a higher risk of death than the rest of the population.[8] Regional traffic crash reports and related scientific literature have identified many different contributing factors to rising traffic fatality trends. Some of the major factors explored by local agencies are:

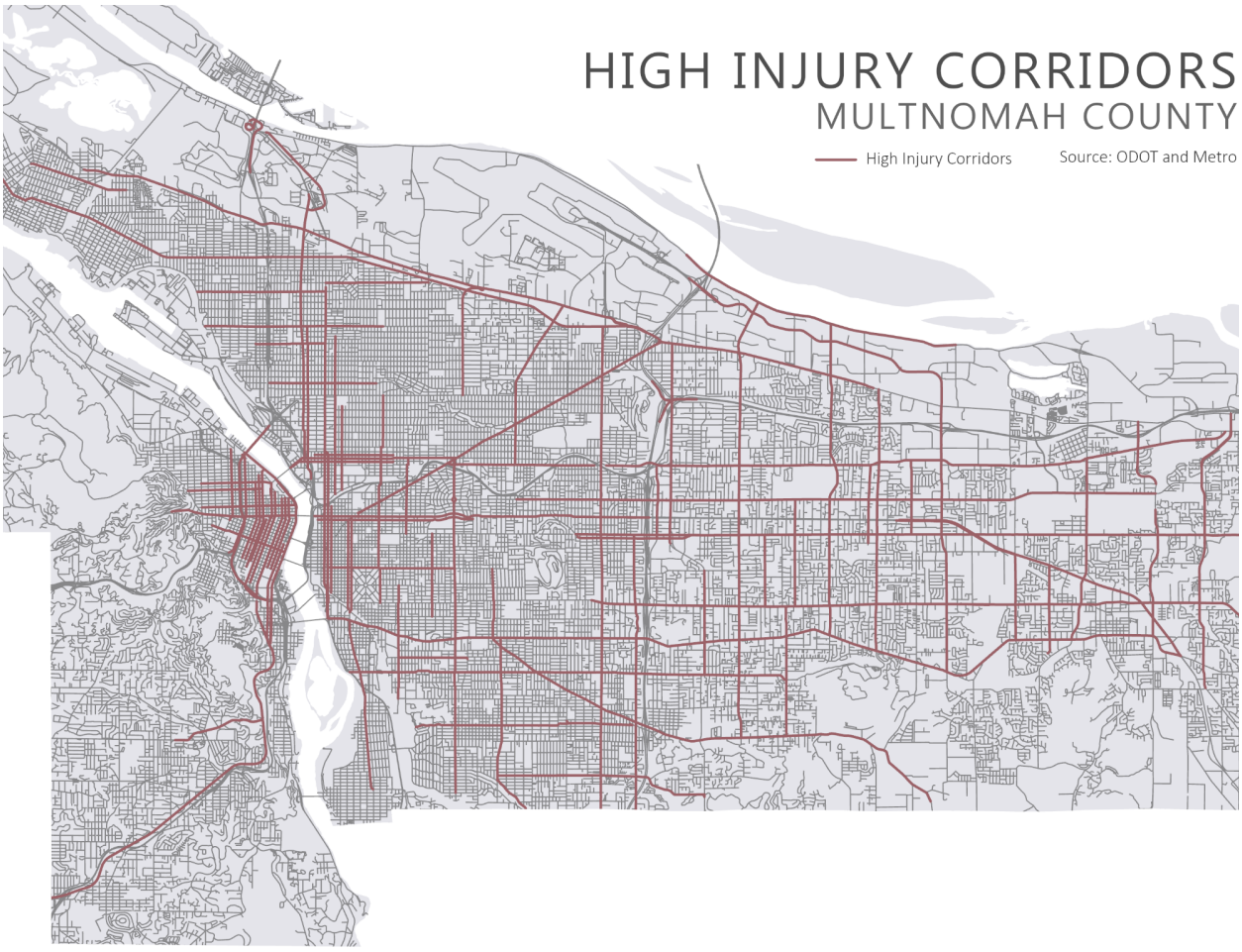
- Roadway classification (e.g. arterial, neighborhood street, etc.)
- Number of lanes
- Road surface condition
- Quality and presence of bicycle & pedestrian infrastructure
- Transportation mode
- Month & time of day
- Weather
- Lighting
- Urban-rural classification
- Driver age and gender
- Crash type
- Excessive speed
- Traffic volume & density
- Intoxication
- Race & ethnicity
- Houselessness status
- Land use & urban sprawl
- Vehicle design

Many of these variables relating to traffic safety in the region were explored in detail in the 2018 Metro State of Safety Report. While all of these factors have been analyzed to help understand traffic fatality trends and their disproportionate public health burden, three have emerged as major factors:

- Roadway type and mode of transportation
- Disproportionate impacts by race/ethnicity, socioeconomic status, and housing status
- Motor vehicle design and traffic density

Arterial roadways & high speeds are a risk

The literature on traffic fatalities trends in both the Metro Region and City of Portland identifies arterial roadways as the location for a majority of serious crashes[4] and thus fatalities. These arterial roads host high traffic volumes, high speeds, and are difficult to cross for pedestrians and bicyclists, accounting for 77% of fatal and incapacitating pedestrian crashes.[4] The primary driver of increasing traffic fatality trends in the region appear to be pedestrian fatalities, as pedestrian fatalities represent the most substantial increases out of all crashes by mode of transportation. [9]



Source: Oregon Metro. (2017). *Appendix to the Regional Transportation Safety Strategy: High Injury Corridors & Intersections Report*. https://www.oregonmetro.gov/sites/default/files/2018/05/25/high-injury-corridors-report-April-2017.pdf

Disproportionate impacts

Throughout the Portland Metro Region and the city of Portland, traffic fatalities are disproportionately impacting people of color and low-income populations. In the 2018 Regional Transportation Plan, Metro found that census tracts with a greater density of people of color,

people with low-incomes, and people speaking English as a second language than the regional average experience 67% of the region's pedestrian fatalities and serious injuries, 72% of bicycle fatalities and serious injuries, and 64% of all traffic fatalities and serious injuries, despite only 56% of the region's population living in these areas.[9] In the state of Oregon, American Indian and Alaska Native populations experience the highest average rate of traffic fatalities[8] and in the city of Portland, Black and Hispanic/Latino populations are disproportionately represented in the 2021 traffic fatalities data.[3] Pedestrian and traffic fatalities also disproportionately impact the houseless community, as 70% of pedestrian deaths and 33% of all traffic deaths in the city of Portland in 2021 were likely members of the houseless community.[3]

These disparities in traffic safety experienced by people of color in Multnomah County are the result of past discriminatory policies and practices which have fueled continued trends of segregation and displacement. People of color in Multnomah County continue to be displaced into neighborhoods with substandard infrastructure and dangerous streets, often lacking sidewalks, crosswalks, street lighting, and adequate access to public transit.[10] Black or African American people in Multnomah County experience additional safety concerns in our public spaces and transportation systems due to road user bias, such as failure to yield to Black pedestrians in crosswalks. Black or African American people also experience the highest rates of racially biased crime and law enforcement stops, creating substantial personal safety concerns when traveling throughout the county.[10]

More driving and heavier vehicles are a risk for pedestrians

Our review of the current literature found that pedestrian fatalities appear to be growing nationally. Also, near-road environments are more dangerous for bicyclists and pedestrians in the United States than in similar countries since Americans tend to walk less than people in other countries yet experience a greater number of pedestrian fatalities.[11] Two potential contributing factors to growing traffic fatalities are vehicle design trends and the high traffic density on American roads. The proportion of motor vehicles defined as light trucks and sport utility vehicles (SUVs) on U.S. roads increased from 16.4% in 1980 to 50% in 2005 and continues to climb.[12] Due to their increased height, weight, rigidity, and limited driver visibility, light trucks and SUVs are associated with a greater risk of pedestrian morbidity and mortality in the event of a collision and were responsible for 81% of pedestrian fatalities between 2018 and 2019.[11] Traffic density has also been associated with increases in traffic pedestrian fatalities, with every 10,000 vehicle miles traveled (VMT) per mi^2 of roadway increase resulting in an 8.8% increase in pedestrian fatalities.[13, 14]

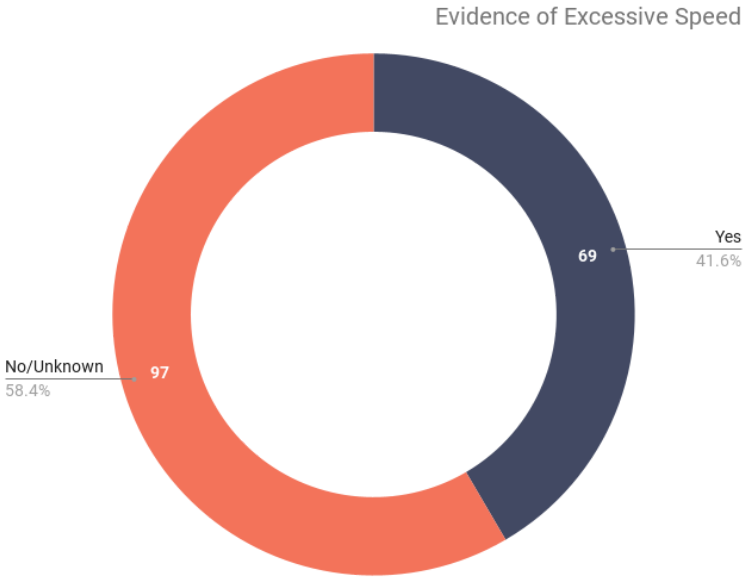
Summary of Findings from Medical Examiner Reports

Although transportation agencies regularly report on traffic crash characteristics, datasets often experience a two-year delay, and agencies may not have access to alternative data sources. Medical Examiner (ME) reports, in contrast to more widely used traffic data, can provide a more

robust description of traffic crash fatalities and fill in the gaps left behind by the limitations of law enforcement datasets.

To further our understanding of traffic fatalities in Multnomah County, we combined data from ME death investigations, death certificates, and referenced law enforcement crash reports to explore demographic characteristics of decedents and three variables of interest: speed, houselessness, and intoxication. Through use of ME reports, we found a total of 170 deaths which met our inclusion criteria for traffic-related death occurring in Multnomah County between 2020 and 2021. By mode of travel, motor vehicle (N=80, 47%) was the most common, followed by pedestrian (N=62, 36%). More males died (N=124, 73%) compared to females, and the highest percentage of traffic-related deaths occurred in people 25-34 years of age (N=44, 26%). The majority of decedents were non-Hispanic (N=145, 86%) and of white race (N=133, 79%). The proportion of decedents of Hispanic ethnicity (11.8% of the population, 14% of total traffic fatalities) and Black race (5.3% of the population, 9% of total traffic fatalities) was greater than the population proportion of these groups (American Community Survey 2020 5-year estimates). We also examined demographic data by year (2020 vs. 2021) and found no significant differences between years; the similar demographics of decedents suggests that broad patterns have been sustained across the two years, and it is useful to think of these crashes in a pooled group.

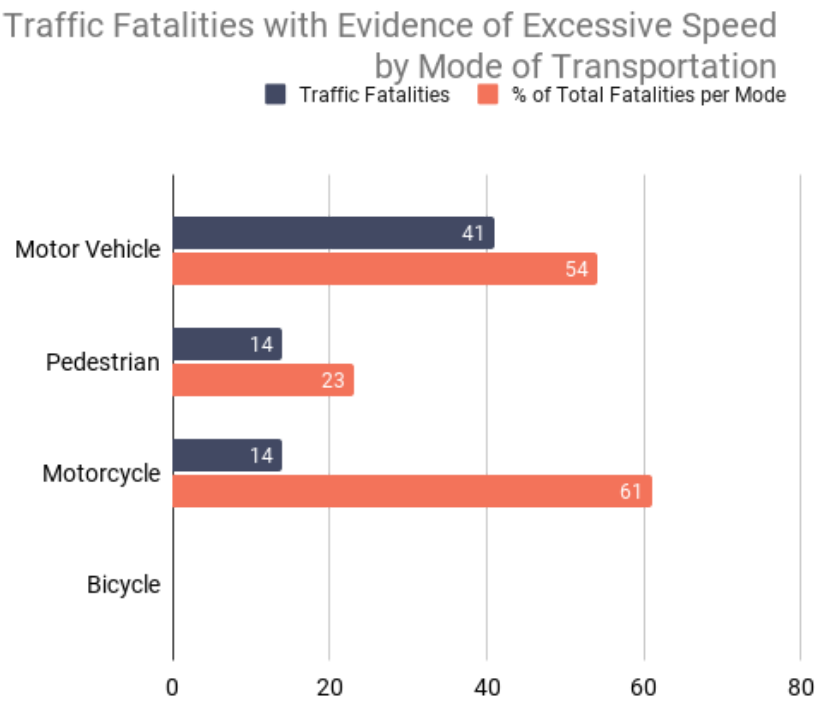
Excessive Speed



In 2020-2021, about 2 out of 5 (42%) crashes showed evidence of excessive speed. Evidence of excessive speed was not significantly different across the two year time period. In its 2020 Vision Zero Report [15], the Portland Bureau of Transportation (PBOT) found that 43% of crash deaths were related to excessive speed, nearly identical to the proportion reported here. PBOT data do not cover the entire county, and data on excessive speed was not reported in 2021. However, the 2021 report from PBOT [3] did report that 78% of traffic fatalities occurred on Portland roads with speed limits over the WHO recommendation of 30 mph for urban roads.

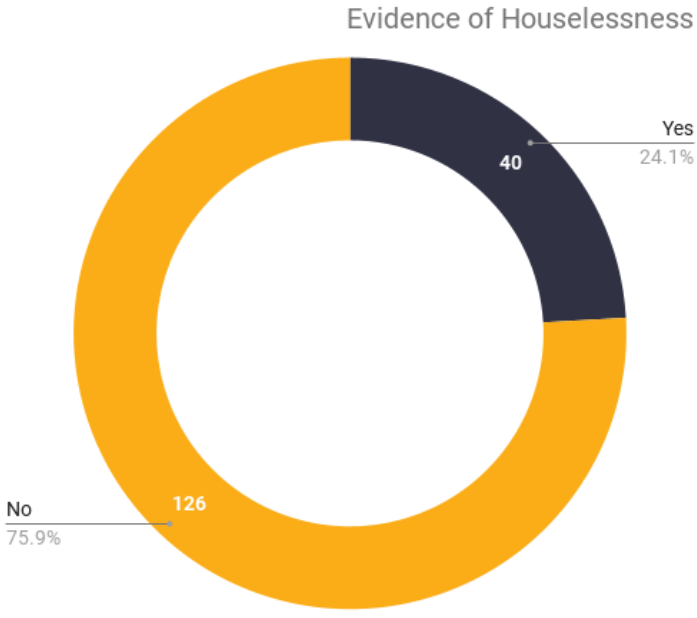
A Safe System approach can prevent traffic fatalities attributable to excessive speed. Interventions, such as road designs that slow the speed of traffic and lowering the speed limit to 30 mph on urban roads, can reduce the likelihood of collisions and the severity of crashes when

they occur. A Safe System approach to address excessive speeds considers the transportation system as a whole and makes the necessary infrastructural, design, and operational changes which reduce speeds. Reliance on enforcement for compliance with speed limits has pitfalls. Ensuring reduced speeds through enforcement of lowered speed limits continues to place the responsibility of safety on road users alone rather than addressing the responsibility of system operators to create a safer transportation system. Traffic enforcement also creates additional safety concerns for members of Multnomah County's BIPOC population, especially Black or African American residents, who continue to experience a greater likelihood of biased traffic stops from law enforcement, contributing to greater levels of interaction with the criminal justice system.[10]

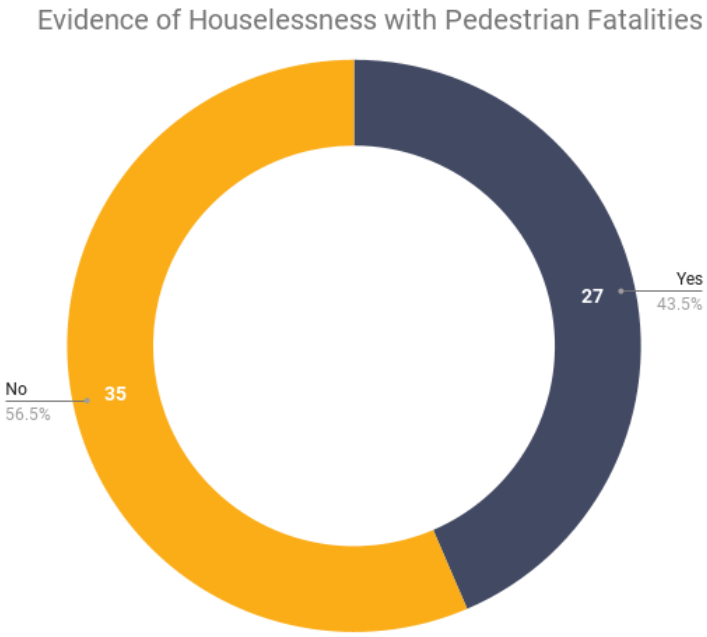


Houselessness

Nearly a quarter of decedents, or 40 out of 159, were likely experiencing houselessness. The proportion of decedents likely experiencing houselessness was higher in 2021 compared to 2020, but this difference was not statistically significant. The proportion of all traffic deaths with evidence of houselessness (24%) is somewhat lower than that reported by the Portland Bureau of Transportation in 2021 (33%) [3]. PBOT data do not cover the entire county, and data on houselessness was not reported in 2020. Pedestrian and bicycle deaths were also more likely to occur in persons experiencing houselessness, showing that pedestrians who died in traffic crashes were disproportionately likely to be experiencing houselessness. This



finding is consistent with Public Health's understanding of risk, because people experiencing houselessness have continuous exposure to vehicles and tend to live in near-road environments. A higher exposure to a risk factor (vehicles) will put a group at higher risk for a severe outcome compared to a group with lower exposure to the risk factor.

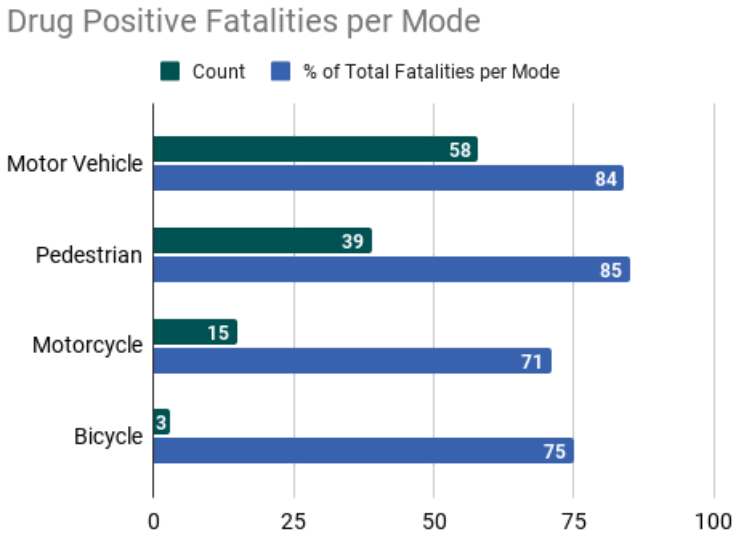


Of the 62 pedestrian deaths examined, 26 (42%) of decedents were experiencing houselessness. Of these, one person was sleeping in a tent adjacent to the roadway and one person was on the sidewalk. Three were crossing train tracks. The remaining 21 decedents were traveling in, across, or near a roadway.

Under a Safe System approach, the disproportionate impact of traffic and pedestrian fatalities experienced by members of the houseless community can be mitigated. Changing system design and operation to include safe pedestrian spaces, appropriate lighting, and slower speeds can reduce the likelihood and severity of crashes. However, members of the houseless community continue to experience the greatest exposure to traffic, and with greater exposure to any risk factor comes greater risk of severe, adverse health outcomes. Therefore, addressing the risk of traffic fatalities for the houseless community needs more upstream solutions, such as access to affordable housing and social services, in addition to safer near-road environments.

Intoxication

For the 159 records where toxicology results were available, 84% had at least one substance present (drug positive) [ethanol/alcohol, cannabinoids, opioids, methamphetamine, amphetamine, cocaine, benzodiazepines, other opioids]. We separately analyzed cannabinoids because it is less



indicative of intoxication at the time of death since it can be detected in the body for a long period of time after use.[16] If results for cannabinoids are excluded, 74% had at least one positive drug. An important aspect of interpreting these data is the distinction between a detectable quantity of a substance, and the quantity that can cause impairment. For all substances except alcohol, we do not know whether decedents were intoxicated to the point of impairment. Furthermore, we do not know the extent to which the prevalence of intoxicants among decedents differs from the population as a whole. The proportion of deaths with substances present was higher for both pedestrian (86%) and motor vehicle deaths (86%) compared to motorcycle deaths (71%), whether or not cannabinoids are included. In its 2020 Vision Zero Report, PBOT documented 20% of total traffic deaths related to impairment.[15] The most recent data from the Oregon Department of Transportation (ODOT) indicated that the driver had been drinking alcohol in 38% fatal crashes in Multnomah County in 2019.[17] This is much lower than the 74% of drug positive results identified in this report, even without taking into account intoxication of other parties involved in a crash. This is in part due to the long lag time of blood test results, making it difficult for crash investigators to collect information on decedents who die at the scene of a crash. For the 159 decedents with blood alcohol testing results, 99 (62%) had no detectable level of ethanol, indicating no alcohol consumption. For the remaining 60 decedents, pedestrians (n=20) had the highest mean ethanol concentration of 0.209 g/dL (0.209% BAC), followed by motor vehicle occupants (n=35) (0.158 g/dL or 0.158% BAC). Of the 62 decedents listed as drivers of motor vehicles with alcohol test results, 45% had nonzero alcohol, and 34% were above the legal limit. The legal definition of impairment for those operating a vehicle in Oregon is 0.08% blood alcohol content (BAC). There is no legal limit for people not operating a vehicle. Among driver decedents who tested positive for alcohol, the average BAC was approximately twice the legal limit.

While toxicology results indicate the presence of a substance, positive tests do not equate to intoxication and may not explain why crashes occurred. Many substances can be detected by toxicology tests days after use, meaning that decedents with positive results may not have been intoxicated at the time of the accident.

Intoxicated driving increases the risk of severe and fatal injuries and taking a Safe System approach to mitigate these risks needs to focus on preventing intoxicated driving from occurring. Policies and regulations, such as alcohol detection and ignition interlock systems to prevent impaired driving, and programs and applications which incentivize safe behaviors can act as strategies for mitigating the operation of vehicles while intoxicated.[5] As with our other findings, system design and operational changes, like safe pedestrian environments, safe and visible road crossings, accessible and frequent public transit services, and road design that limits speed, can reduce the likelihood and severity of traffic crashes for those outside of motor vehicles, intoxicated or not.

The circumstances faced by people experiencing houselessness may increase the risk of traffic fatality. Access to stable housing, primary and behavioral healthcare, and violence prevention

efforts have an important role to play in addition to a Safe System approach to lower injury risk from traffic crashes.

Discussion

Traffic crash deaths are a leading cause of death in Multnomah County. The trend is increasing and there are widening racial disparities. Deaths from traffic crashes represent a significant public health threat, with more than 100 people killed every day in the United States, contributing to billions of dollars of medical and work loss costs (~$640 million in 2018 for Oregon) and with traumatic impacts on survivors and loved ones.[19, 20] Our region is one of many across the United States that saw a large rise in traffic related deaths during the COVID-19 pandemic despite fewer cars on the road.[21] Many factors are likely to have contributed, such as an increase in both reckless driving and dangerous behaviors, both of which are enabled by a system that lacks basic elements to lower risk.[14]

The consensus among experts is that a Safe System approach is an effective solution. A Safe Systems approach guides safety improvements through design, operation, behavior change, and shared responsibility for the well-being of all road users. Human error in our transportation systems should be expected and adoption of a Safe System approach can mitigate these mistakes. As traffic fatality rates rise in Multnomah County, it is clear that we cannot rely on an inadequate and inequitable strategy of enforcing safe behavior on our roads. Instead, investments are needed so that system operators and transportation planning agencies can make lasting changes to our transportation system. Our transportation agencies and system users have a shared responsibility to ensure safety in Multnomah County. How our system is designed, maintained, and operated defines how it can safely be used, and when paired with coinciding behavior change interventions, can create a culture of safety that reduces the risk and severity of traffic crashes. For transportation agencies to fully realize the safe systems approach, a sustained commitment and adequate resources are needed. Over time, funding for major retrofits is necessary to make safe systems a reality.

While the findings from our examination of ME reports offer no new information on the role of excessive speeding in traffic fatalities, our findings related to houselessness and intoxication do offer new insight into traffic fatality trends in Multnomah County. However, these findings need to be viewed as drivers of health due to factors outside of our transportation system. Public health is focused on creating a safe transportation system through street design, but we are acutely aware of the need to also address contextual factors such as housing, mental and behavioral health, substance abuse, and cost of living.

Recommendations

Taking into account the findings from regional trends, medical examiner data, and the consensus view of Safe Systems as the most promising set of solutions, we developed the

following recommendations. These have been drafted in consultation with the Multnomah County Public Health Advisory Board (MCPHAB) and reflect actions that the County can take. These recommendations are intended to balance the County's limited role as a transportation agency with its more expansive role as a Local Public Health Authority.

Top recommendations with MCPHAB support:

1. **Change the system** by adopting a safe speed policy and making investments in proven traffic-calming street designs.
2. **Reduce harm** while we advance long term system change by expanding automated enforcement, reforming fines & fees, and exploring unarmed traffic enforcement.

Overarching/Public Health Functions

1. Convene interagency partners.
2. Assure regular data reporting to update and evaluate analysis.
3. Gather data to understand kinetic energy involved in crashes.
4. As a guiding principle, prioritize changes to environments (roadways) in areas of the County with a history of underinvestment or a concentration of people who have been displaced, especially before any changes to policies implemented through enforcement.

Safe Speeds

1. Establish a county-wide policy goal of a 30 mph maximum on urban streets, supported by investments in proven traffic calming improvements. Convene cities and County Transportation Division to identify pathways to achieving this goal, such as technical assistance or shared consulting services among jurisdictions. Continue to support street design that lowers speeds on all streets, especially in residential settings.
2. Increase the use of automated speed enforcement. Convene cities to encourage increased use of automated speed enforcement and advocate for more local authority to deploy speed enforcement cameras. Pair this with ongoing reforms to fines and fees, and technical assistance to smaller cities.
3. Explore models of unarmed traffic enforcement with MCSO and local jurisdictions.

Safe Vehicles

1. Advocate for state-level policies adopting intelligent speed technology systems and alcohol detection systems in new vehicles.
2. Advocate for national-level pedestrian safety standards for vehicles (i.e. safety standards that protect people outside of the vehicle, not just the vehicle occupants).
3. Create incentives to reduce the size and weight of vehicles:
    a. Work with the state and cities to establish a higher registration charge for heavier and taller non-commercial vehicles. Experience suggests that any mitigation programs for low-income households should be administered at the state level.

    b. Work with cities to enforce restrictions on large vehicles parked near corners.
    c. Work with publicly owned parking facilities to increase charges for large vehicles or reduce the availability of spaces for large vehicles.
    d. Advocate for state-level policies that index citation amounts to the height and weight of the vehicle.
4. Prioritize purchases in the County fleet that minimize vehicle size and weight, and maximize visibility/sightlines for people walking and rolling in the right of way.

Safe Road Users

1. Continue investments in stable housing, harm prevention, and behavioral health.
2. Advocate for a state-level policy of reducing the legal limit for alcohol to a Blood Alcohol Content of 0.05.
3. Identify permanent funding for County Safe Routes To School and other safety programs.

Safe Roads

1. Update the County's Design and Construction Manual to integrate a Safe Systems approach and best practices in safety countermeasures.
2. Leverage roles in East Multnomah County Transportation Committee (EMCTC), Metro Joint Policy Advisory Committee on Transportation (JPACT), and ODOT Region 1 Area Commission on Transportation (ACT) to prioritize evidence-based roadway design treatments that right-size streets, reduce speeds, and maximize separation of modes on urban arterials.
3. Work with local partners to develop a Safety Action Plan for East County to evaluate and collaboratively prioritize effective safety strategies across the cities that can be used to coordinate pilot projects and set the agencies up for more funding opportunities. Strategies might include improving street crossings and access to transit, assessing lighting and setting standards, or piloting traffic calming improvements.
4. Advocate for grants and other revenue sources that can be used for capital projects to fill gaps and improve the safety of pedestrian and bike facilities on our arterials and implement proven safety countermeasures.

Optimize Emergency Medical Services

1. Complete a scan of best practices for EMS response times to crash sites and an assessment of needs.
2. Use planned data exchange to link EMS response activities and hospital outcomes.

Safe Mode Split

1. Leverage roles in EMCTC, JPACT, MPAC, and ODOT Region 1 ACT to prioritize plans and projects that reduce VMT and increase access to transit. Oppose projects that increase or do not decrease VMT.
2. Update County's transportation road rules to be consistent with the proposed Regional Mobility Policy as guidance becomes available.

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Appendix - Limitations & Methods

Limitations

There are some limitations to this analysis that should be noted. Chart review was required to extract data from medical examiner and law enforcement reports. Although one experienced epidemiologist recorded this information in a systematic fashion, it is still a manual process that could be subject to error. In addition, *absence of evidence* of both speed and homelessness does not necessarily imply that these factors were not present and associated with the fatal crash. We did not attempt to utilize other data sources, such as from the Joint Office of Homeless Services, to further investigate homelessness; as such, values in this report may differ from future Domicile Unknown reports. Further, toxicology testing itself does not necessarily reflect impairment, because impairment can depend on multiple factors (size, gender, age, tolerance). We did not try to categorize drug levels, even when quantitative results were available. Previous research[1] has shown that the contribution of drugs to crash risk is lower than from that of alcohol, so results from toxicology *should not necessarily be overemphasized* over other results. There were still 16 deaths where toxicology results were still pending, and it is possible that final results, when available, could affect key findings. Finally, results of toxicology tests and speed in this analysis *do not imply fault*; not all impaired decedents in motor vehicle crashes were drivers, and speed in motor vehicle crashes was not delineated between the decedent vehicle or another vehicle that may have been involved, whether or not that driver died (both transportation agency reports and law enforcement reports are better suited to tracking this type of information). We are unable to tell the relationship between the amount of excessive speed and mortality because it is not reliably coded in the data that are available.

Case definition

To create a case definition for "traffic-related" fatalities, we used known crash deaths occurring in the City of Portland (compiled by PBOT) and examined the coding of these deaths in ME data. We included the following cases:

1) Deaths where the autopsy circumstances of death were any value of:

- MVCrash-Bicyclist
- MVCrash-Driver
- MVCrash-Motorcyclist Driver
- MVCrash-Motorcyclist Rider
- MVCrash-Occupant
- MVCrash-Pedestrian

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3893634/pdf/jsad56.pdf

- MVCrash-Rider

2) Deaths where autopsy circumstances of death were:
- Asphyxia-drowning
- Blunt force
- Crushed-pinned

AND the death certificate transportation injury type was pedestrian, driver, or blank

3) Deaths where the autopsy circumstances of death were:
- Transportation-train

AND the death certificate transportation injury type was pedestrian or blank.

To exclude fatalities that didn't occur on Multnomah County roads, we examined the incident address as well as the investigating law enforcement agency and excluded any death that didn't occur within the County. We further excluded fatalities that occurred in parking lots, involved a medical event (e.g., heart attack), involved non-motor vehicles (e.g., tractors), had a manner of suicide or homicide, or had a delayed death of more than 30 days. Questionable cases were reviewed by two investigators to determine inclusion criteria. The decision point about what constitutes a traffic death is not always clear. In this report, three pedestrians who were killed by trains are included in the total count, while these deaths are not typically captured in reporting by transportation agencies (2 of 3 had evidence of homelessness). Further, deaths that are delayed more than 30 days after an incident are not counted; one excluded death was a homeless male who died 7 months after a pedestrian vs. motor vehicle crash. Traffic crashes can have an impact many years after the fact; this report excludes two people that died years after the originating event, who had long and complicated medical histories. Intentional deaths, such as suicide and homicide, are excluded (N=10), but these deaths have a huge impact on victims and their families. Deaths occurring in a parking lot are excluded (N=3), but again, the line between parking lot and road is fairly arbitrary, and one parking lot death was a work-related fatality. It is important to acknowledge the huge burden that all of these deaths have on the community, even if a case definition is not able to fully capture each of them.

Toxicology, speed, and homeless status

Toxicology

For each case, we determined if toxicology results were available, either from hospital records or autopsy (blood drawn either antemortem at the hospital or postmortem at the ME's office). Not all traffic deaths have a full autopsy (e.g., if the person died in a hospital, or the family objected); some have a full autopsy and some have an external exam only. However, most traffic deaths have comprehensive toxicology testing. For ethanol, concentration was described in g/dL; if the level was greater than the assay's limit of 0.400 g/dL then the result was set to

0.400. Drugs were noted as present or absent, even when quantitative results were available. A person's metabolism, tolerance, frequency of use, and other factors can affect drug level concentrations, and for all deaths the cause was determined to be related to the crash itself. Commonly used non-prescription drugs, such as antidepressants, allergy medication, or common pain relievers/anti-inflammatories (e.g., aspirin, ibuprofen) were not counted. Substances were defined as any alcohol (ethanol), methamphetamine, amphetamine, cannabinoids , cocaine or its metabolites, heroin or its metabolites, fentanyl or its metabolites, benzodiazepines, other opioids (e.g., buprenorphine, methadone, oxycodone), and other prescription drugs (e.g., cyclobenzaprine).

Speed

For determination of excessive speed contributing to a crash, we used information from the ME narrative report or the law enforcement report, if one was available. If either of those documents clearly stated that excess speed was involved, or that the vehicle was traveling above the posted speed limit, then the crash was categorized as likely speed related by the epidemiologist. If there was no information available about excessive speed, or the information was not clearly stated that excessive speed contributed to the crash, then the case was categorized as not likely speed related or unknown. This coding does not account for other issues of fault, such as failure to yield, regardless of speed limit. In many crashes, estimated speed was unknown.

Houselessness

For homeless status, we reviewed data from the ME narrative, death certificate address information, law enforcement reports, other uploaded documents, such as medical records, and the MDILog variable "IsHomeless." Occasionally there were discrepancies between the ME report and law enforcement reports, so for those cases the epidemiologist also looked at the decedent's address. If the listed address appeared non-residential (e.g., shelter or substance abuse treatment center), the decedent was coded as likely homeless.

Race and ethnicity

To categorize race and ethnicity, we matched the decedent ME records to vital records to use the determinations from the death certificate. Typically, this information is collected by the funeral director from next of kin or key informant interviews. To be able to compare the population proportion for each group to American Community Survey data, we used comparable groups (Hispanic ethnicity and single race alone). For 2 or more races, confidentiality considerations suppressed more specific groups being listed.

We tabulated descriptive frequencies by year, with use of Chi–square test to examine the difference in categories across the 2 year period (Fisher Exact test if cell sizes were small). Some categories were combined due to low numbers. All analyses were conducted using SAS 9.4 (SAS Institute, Cary, NC).

Appendix - Traffic Fatalities Demographics

Table 1a. Demographics of 170 traffic crash fatalities occurring in Multnomah County, OR in 2020 – 2021 and investigated by the Office of the Multnomah County Medical Examiner.

	Number	**Percent** (%)
Mode of travel		
Bicycle	5	3
Motorcycle	23	14
Pedestrian	62	36
Motor vehicle	80	47
Sex		
Male	124	73
Female	46	27
Age group (years)		
<=15	6	4
16-20	11	6
21-24	10	6
25-34	44	26
35-44	34	20
45-54	30	18
55-64	18	11
65-74	12	7
75+	5	3
Total	**170**	**100**

Table 1b. Race and ethnicity* of 170 traffic crash fatalities occurring in Multnomah County, OR in 2020 – 2021 plus population proportion estimate.

	Number	Percent (%)	Percent of population (%)**
Ethnicity			
Hispanic or Latino	24	14	12
Not Hispanic or Latino	145	86	88
Race			
White	133	79	77
Black/African American	15	9	5
Asian	5	3	8
Other race	6	4	4
Two or more races	8	5	6
Total	**170**	**100**	

*Excludes missing and unknown values-total may not add up to 170

**American community survey 2019 estimates