

APPENDIX

Stakeholder Outreach

Stakeholder Outreach: Presentations and Meeting Notes

- *Stakeholder Meeting 1 – September 19, 2023*
- *Highway Safety Improvement Program Committee Meeting – October 19, 2023*
 - *Stakeholder Meeting 2 – October 26, 2023*
- *NHDOT Front Office Meeting – October 30, 2023*

Stakeholder Meeting 1 - September 19, 2023



NHDOT

Vulnerable Road User Safety Assessment

Advisory Committee Meeting # 1
September 19, 2023





AGENDA



1 Welcome + Introductions



2 Vulnerable Road User Safety Assessment Overview



3 Scope of Work



4 Summary of Baseline Conditions



5 Next Steps





01 || WELCOME + INTRODUCTIONS



PROJECT TEAM



- ↳ **Bill Lambert, PE**
State Highway Safety Administrator
- ↳ **Corey Spetelunas, PE**
Asst Safety Engineer
- ↳ **Gerry Bedard, PE**
Active Transportation Engineer



- ↳ **Mike Dugas, PE**
Project Manager
- ↳ **Carolyn Radisch, AICP**
Senior Transportation Planner
- ↳ **Nicole Rogers, PE**
Project Engineer, GIS Analyst



- ↳ **Michelle Marshall**
NH Division, Safety/Area Engineer



02 || VRU SAFETY ASSESSMENT OVERVIEW



WHAT IS A VULNERABLE ROAD USER?

*A Vulnerable Road User is defined by FHWA as “a non-motorist with a Fatality Analysis Reporting System (FARS) person attribute code for **pedestrian, bicyclist, other cyclist, and person on personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist...**” It is important to note that unlike other organizations including the National Highway Traffic Safety Administration (NHTSA) and the National Safety Council, FHWA does not include motorcyclists among VRUs.*



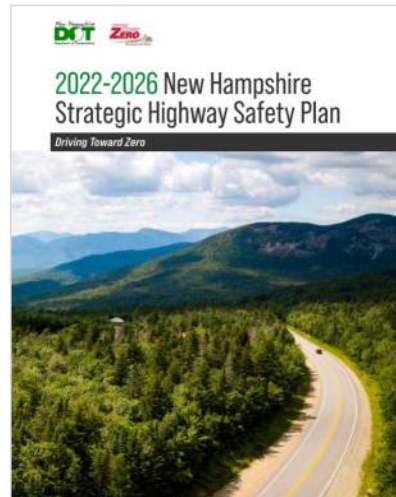
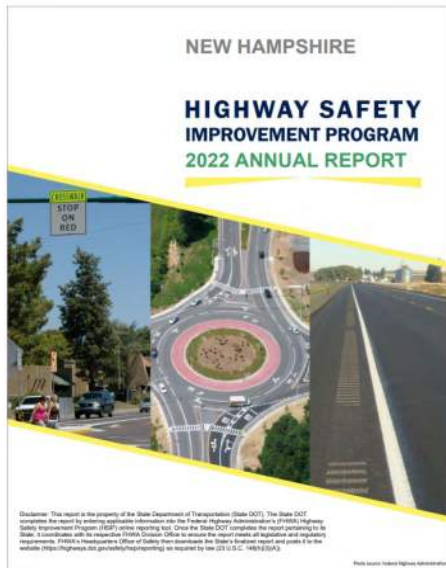
FEDERAL REQUIREMENTS

As a condition of the 2021 Bipartisan Infrastructure Law (BIL), also known as Infrastructure Investment and Jobs Act (IIJA), all states are required to develop a VRU Safety Assessment as part of their Highway Safety Improvement Program (HSIP). The assessment should include the following elements:

- **Data-driven process to identify areas of high-risk for vulnerable road users.** Specifically, the State must perform a quantitative analysis of VRU fatalities and serious injuries.
- **Consult with local governments, MPOs, and regional transportation planning organizations that represent high-risk areas.**
- **Develop program of projects/strategies** to reduce safety risks to vulnerable road users in areas identified as high-risk
- **Consider Safe System Approach**
- **Due to FHWA November 15, 2023**



PREVIOUS NHDOT + LOCAL EFFORTS



NHDOT

Statewide Transportation Improvement Program

ADA Title II Transition Plan

Context Sensitive Design Approach

Complete Streets Approach

Funding Programs

Transportation Alternatives (TAP)

HSIP (15% to bike / ped)

RPCs and MUNICIPALITIES

Complete Streets Policies/Plans/Guidelines

Bike / Ped Plans





03 || SCOPE OF WORK



SCOPE OF WORK

Task 2 Quantitative Analysis of VRU Safety Risks

- Describe the analysis methods to be used to identify VRU risks while considering crash history, infrastructure characteristics, and socio-economic factors
- Map VRU risk on the statewide road network



Task 4 Program of Projects + Strategies

- Evaluate the recommended spot improvement candidates produced by the Regional Planning Commissions
- Develop and map potential systemic improvements focused on sites with high potential for VRU crash reduction



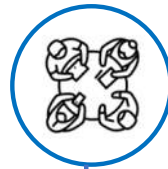
Task 6 VRU Safety Assessment

Develop written report to documents findings of Tasks 1-5



Task 1 Data Collection and Analysis

- Gather crash data regarding fatalities and injury crashes for the 2017-2022 time period
- Evaluate fatal and injury crash data to reveal trends and to compare the safety of VRU to overall safety performance



Task 3 Consultation with Stakeholders

- Identify and engage appropriate stakeholders
- Hold two (2) stakeholder meetings
- Meet with NHDOT Front Office
- Document Consultations

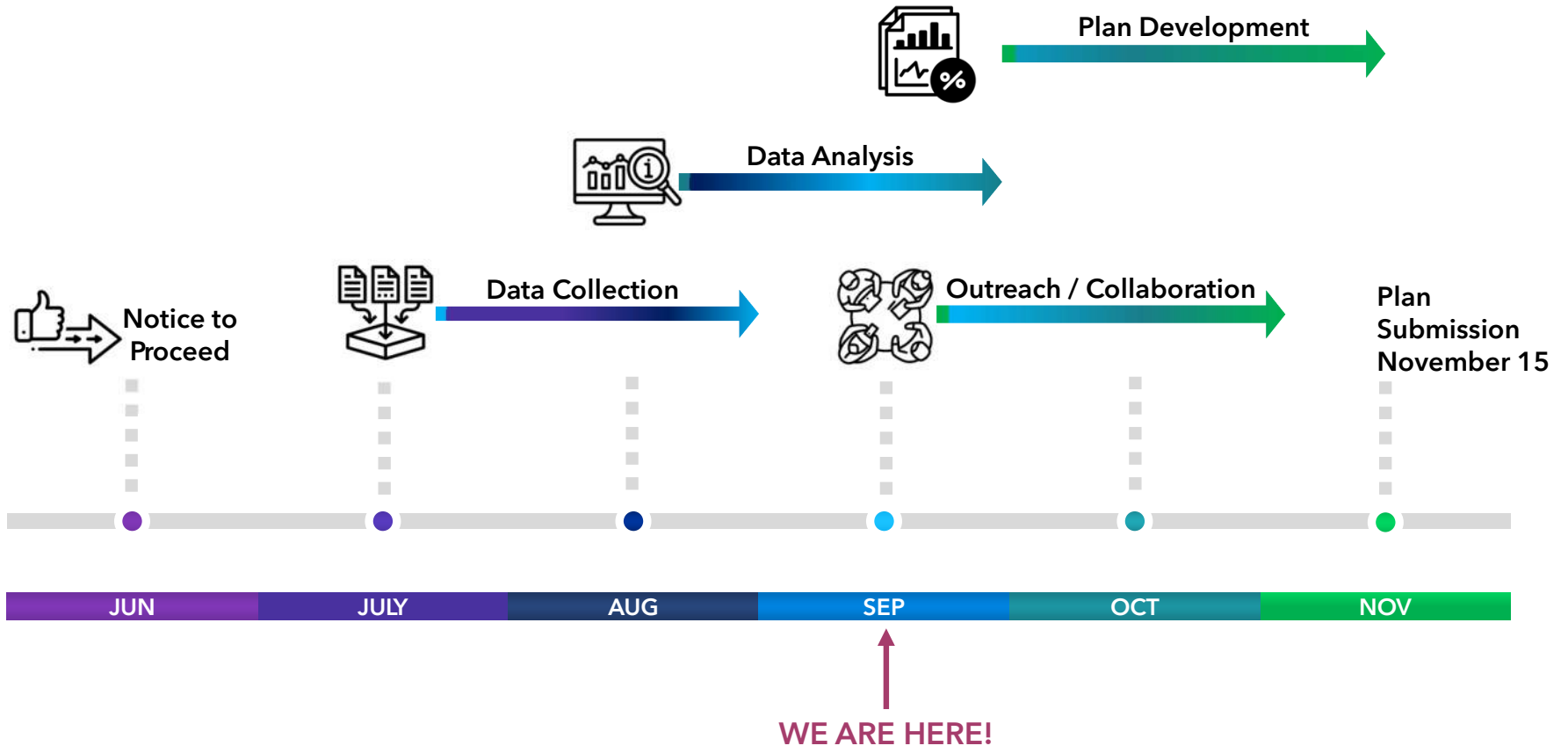


Task 5 Safe System Approach

- Gather data regarding the Safe System Approach from FHWA and other state DOTs
- Summarize findings and present to NHDOT



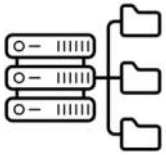
SCHEDULE



04 || SUMMARY OF BASELINE CONDITIONS



AVAILABLE DATA + LIMITATIONS



DATA SOURCES

Crash Data

- NH Department of Safety Crash Data 2017-2022
- NHDOS - DMV Run Lists 2017-2022
- National Highway Traffic Safety Administration (NHTSA) FARS Data 2017-2022

Infrastructure Data

- NHDOT GIS Roadway Inventory - Roadway Classification, Volumes, Speed, Roadway Features

Socio-Economic Data

- US Census Demographic Data - Income, Racial Makeup, Auto Availability, Environmental Justice Communities
- EPA EJ Screen Tool
- FHWA - Socioeconomic and Equity Analysis Maps
- CDC - Social Vulnerability Index

Land Uses

- NHDOT GIS Data - Schools, Recreation Areas/Points, Community Centers, Transit Stops, etc.

CHALLENGES + LIMITATIONS

- Frequency of Crashes
- Exposure Data
- Underreported Data
- Unknown Data
- Inconsistent Data
- Time Constraints!

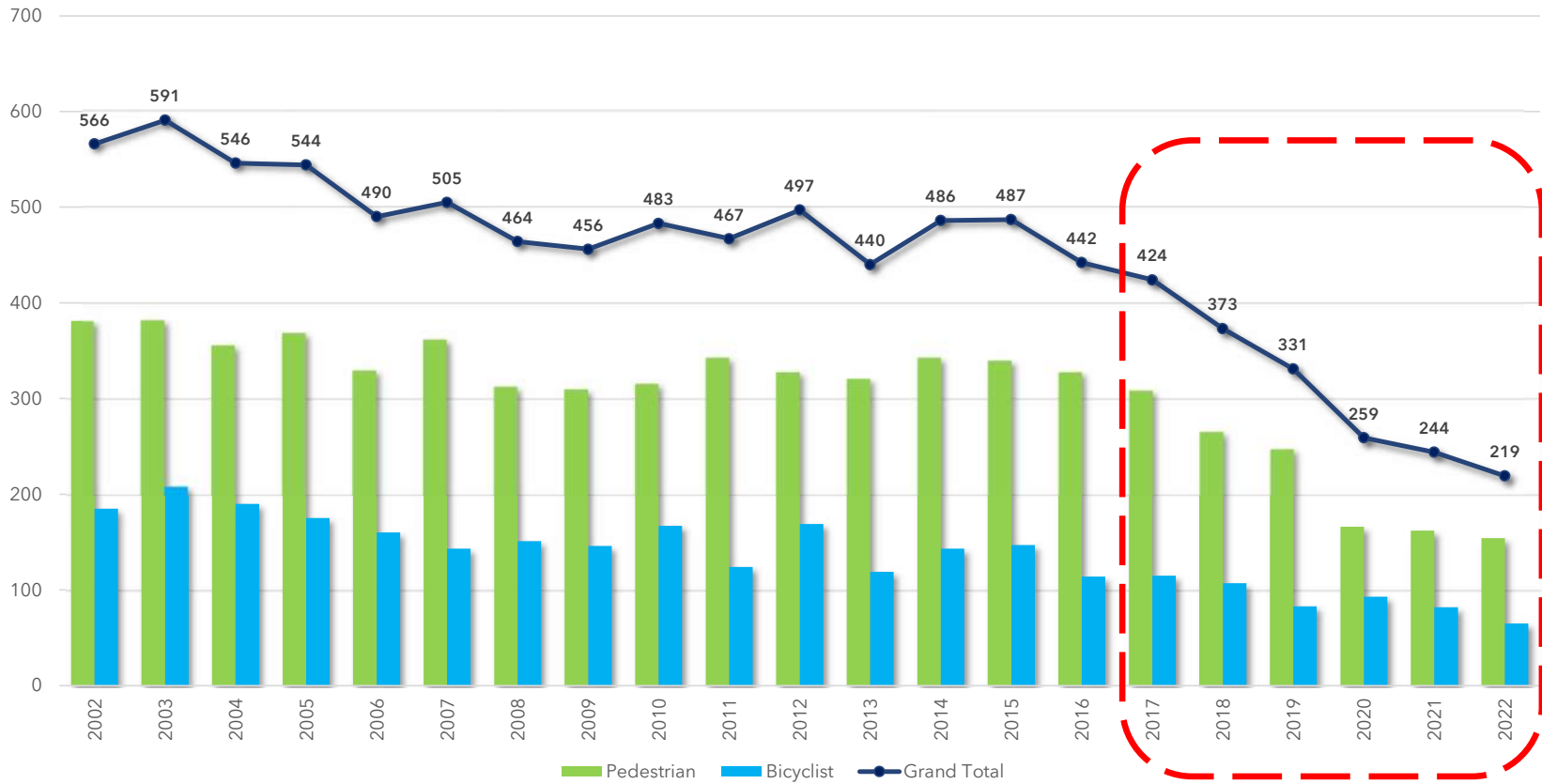
- Lack of Individual Demographic Data

- All States doing this for the first time at the same time!



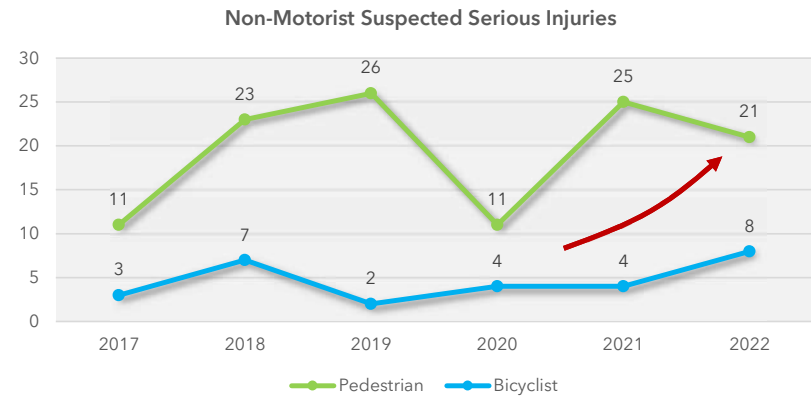
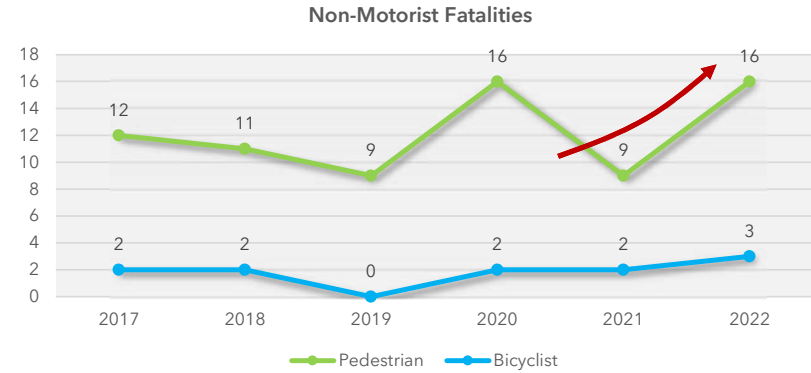
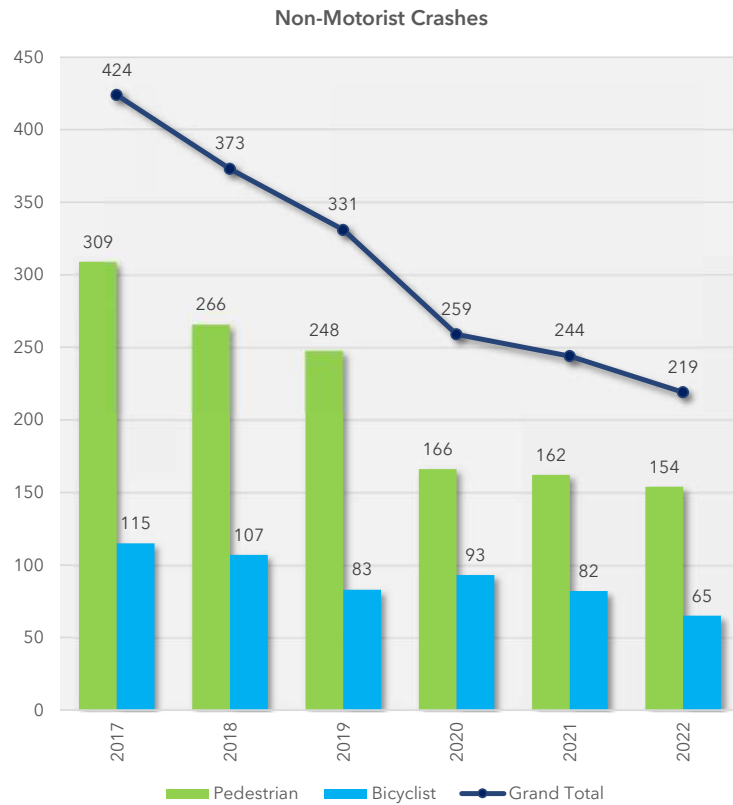
2002-2022 TRENDS - NH

Non-Motorist Crashes



Source: NHDOS Crash Data 2017-2022
 NHDOT Vulnerable Road User Safety Assessment

2017-2022 TRENDS- NH



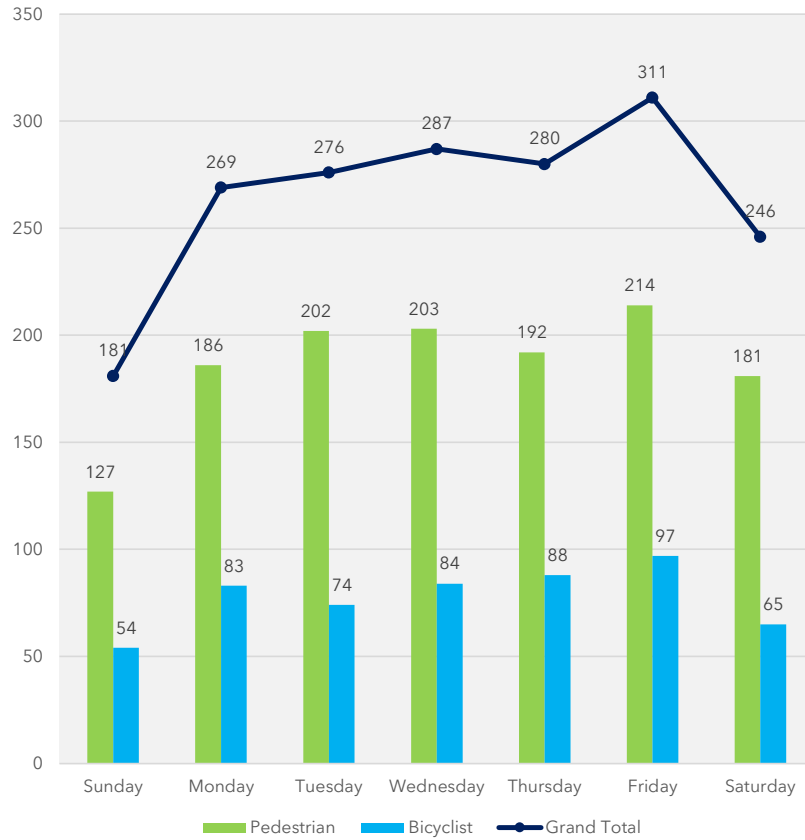
There was a steep decline in VRU crashes in 2020 (a reflection of COVID and absence of normal traffic volume). However, there is a marked increase of pedestrian fatalities and serious injuries as well as bicyclist serious injuries.



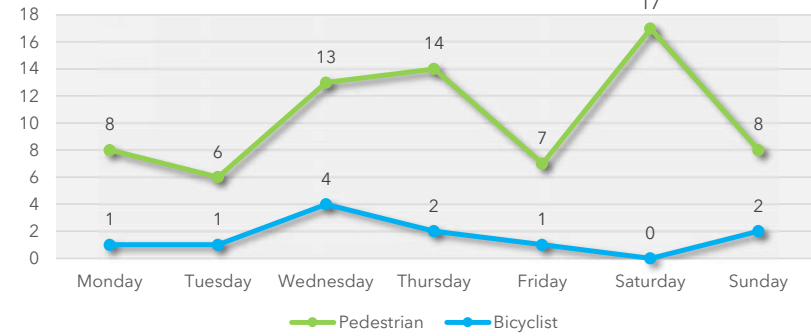
2017-2022 TRENDS-NH



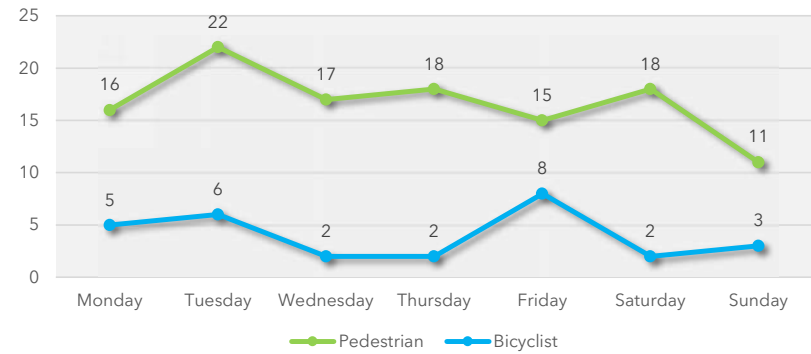
VRU Crash Day of Week



Non-Motorist Fatalities

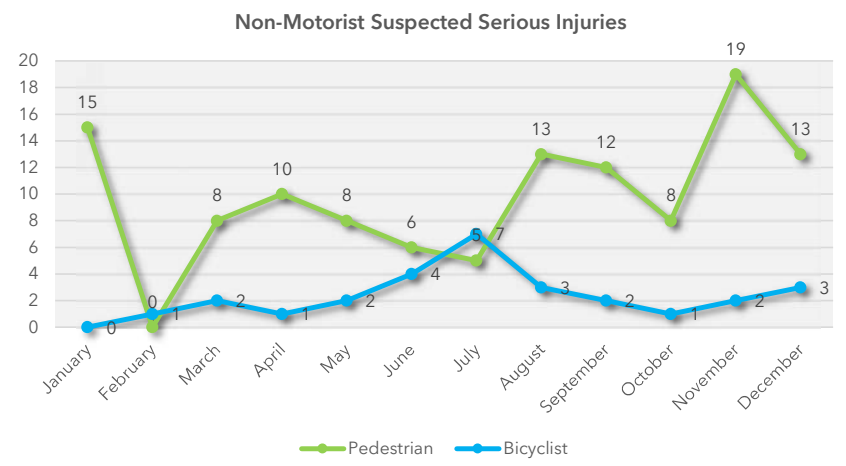
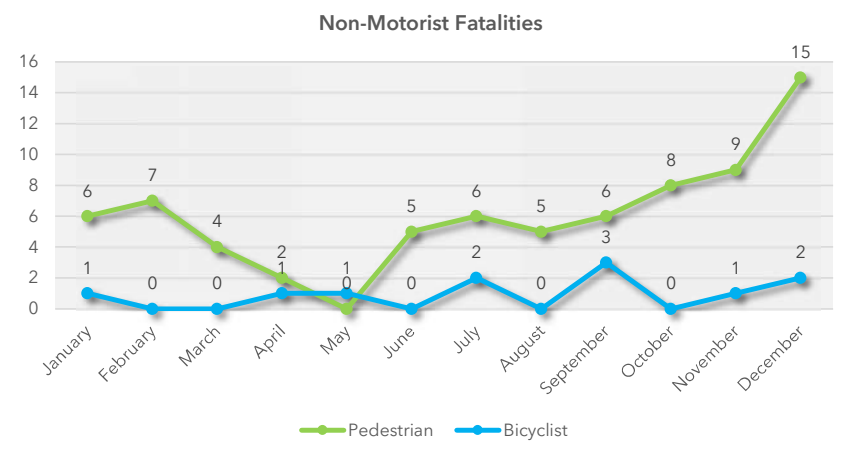
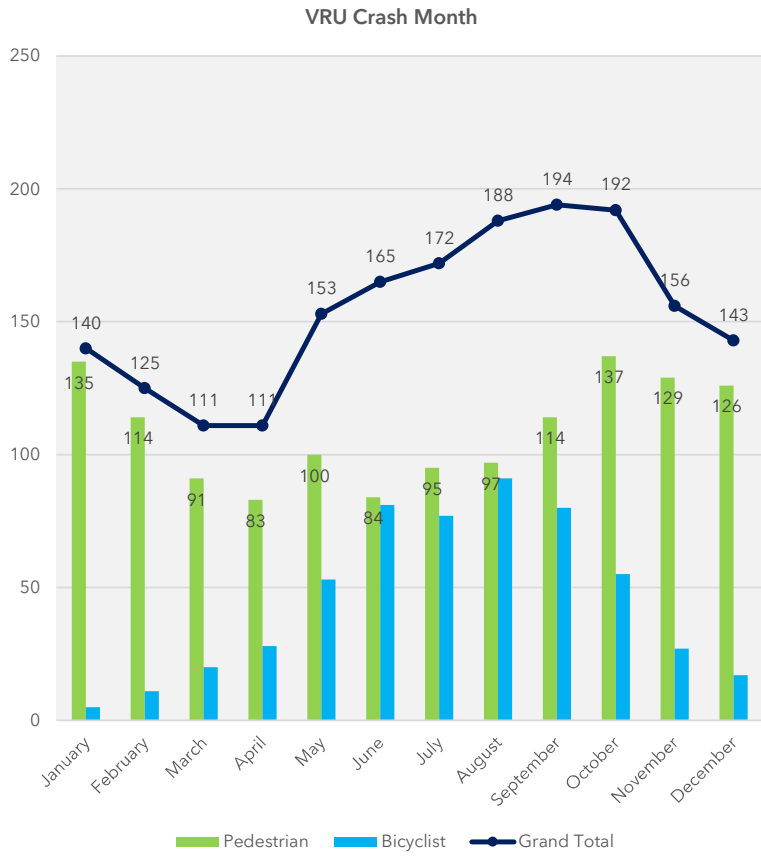


Non-Motorist Suspected Serious Injuries



Crashes typically occur more frequently Wednesday - Saturday.

2017-2022 TRENDS-NH



Ped crashes are typically highest during the winter months perhaps due to lighting conditions and sight distance issues caused by snowbanks. Bike crashes are typically highest during the summer months when bike activity is the highest.



2017-2022 CRASH BREAKDOWN

1,305 545

1,850
VRU Crashes

FATALITIES

  **73**  **11**

SUSPECTED SERIOUS INJURIES

  **117**  **28**

SUSPECTED MINOR/POSSIBLE INJURIES

  **556**  **282**

PDO/UNKNOWN

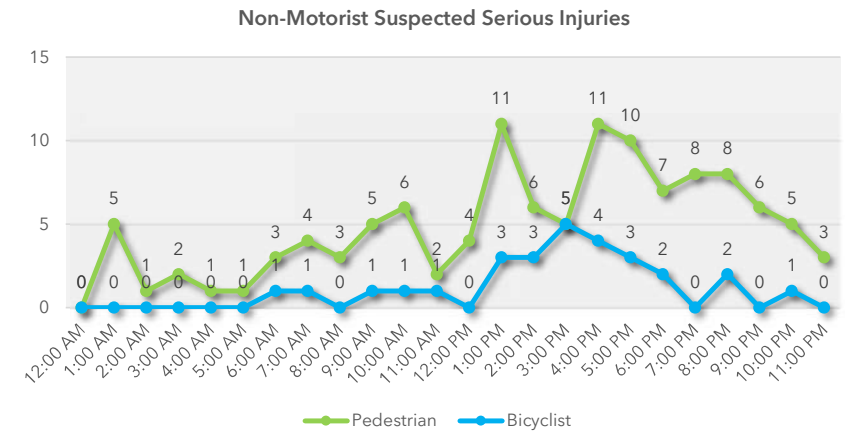
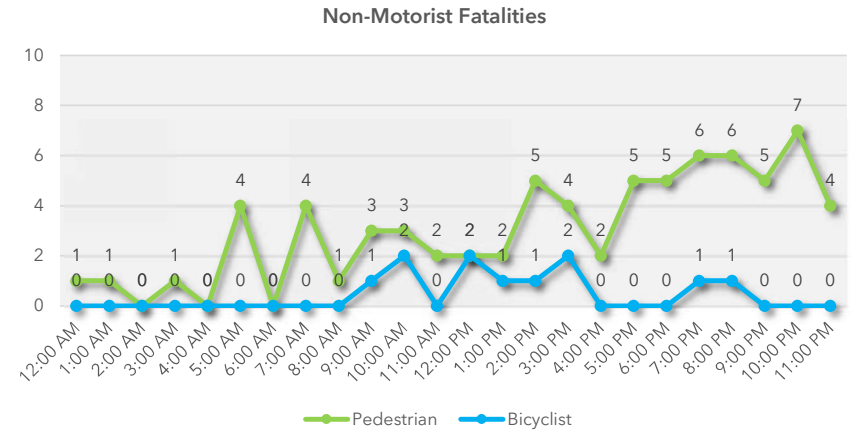
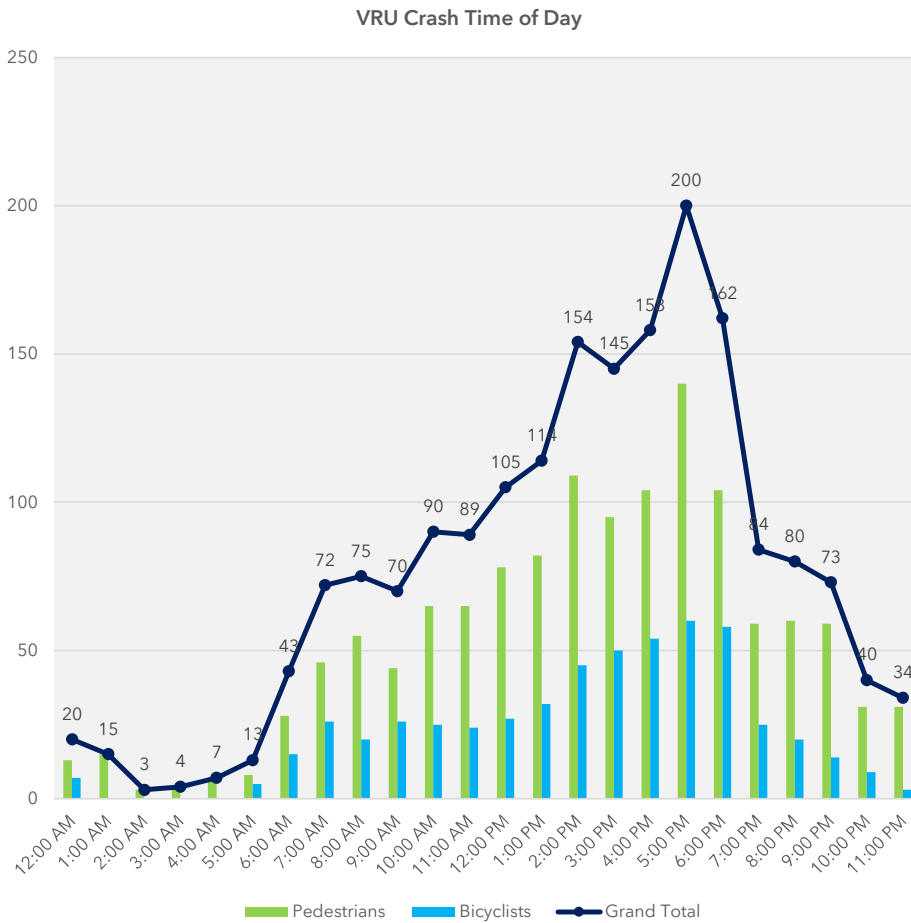
  **559**  **224**

SEVERE
DESIGNATION
12% of VRU CRASHES

58%
of VRU involved in
crashes were injured
to some degree



2017-2022 TRENDS-NH

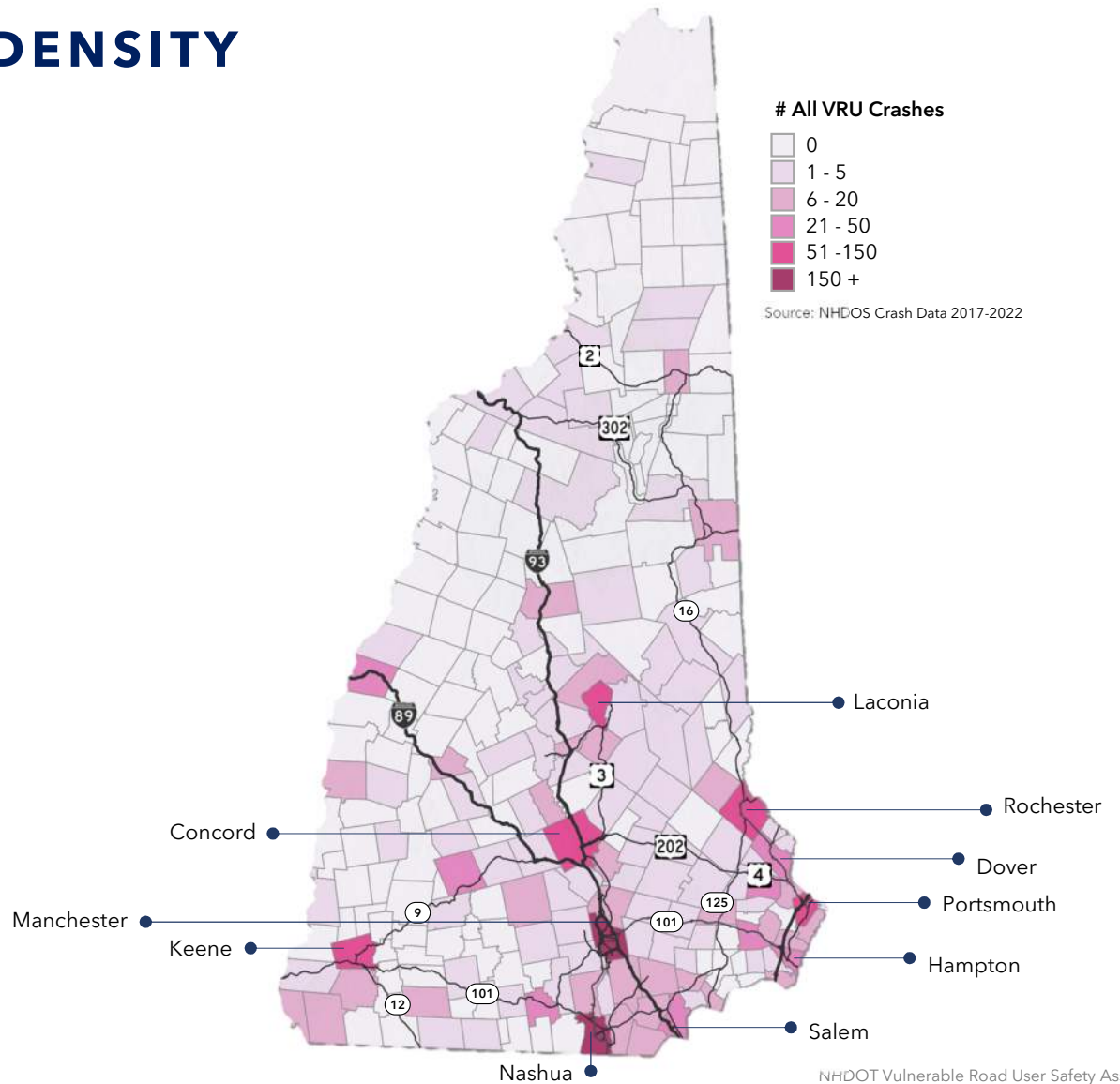


VRU Crashes typically highest during PM peak commute period

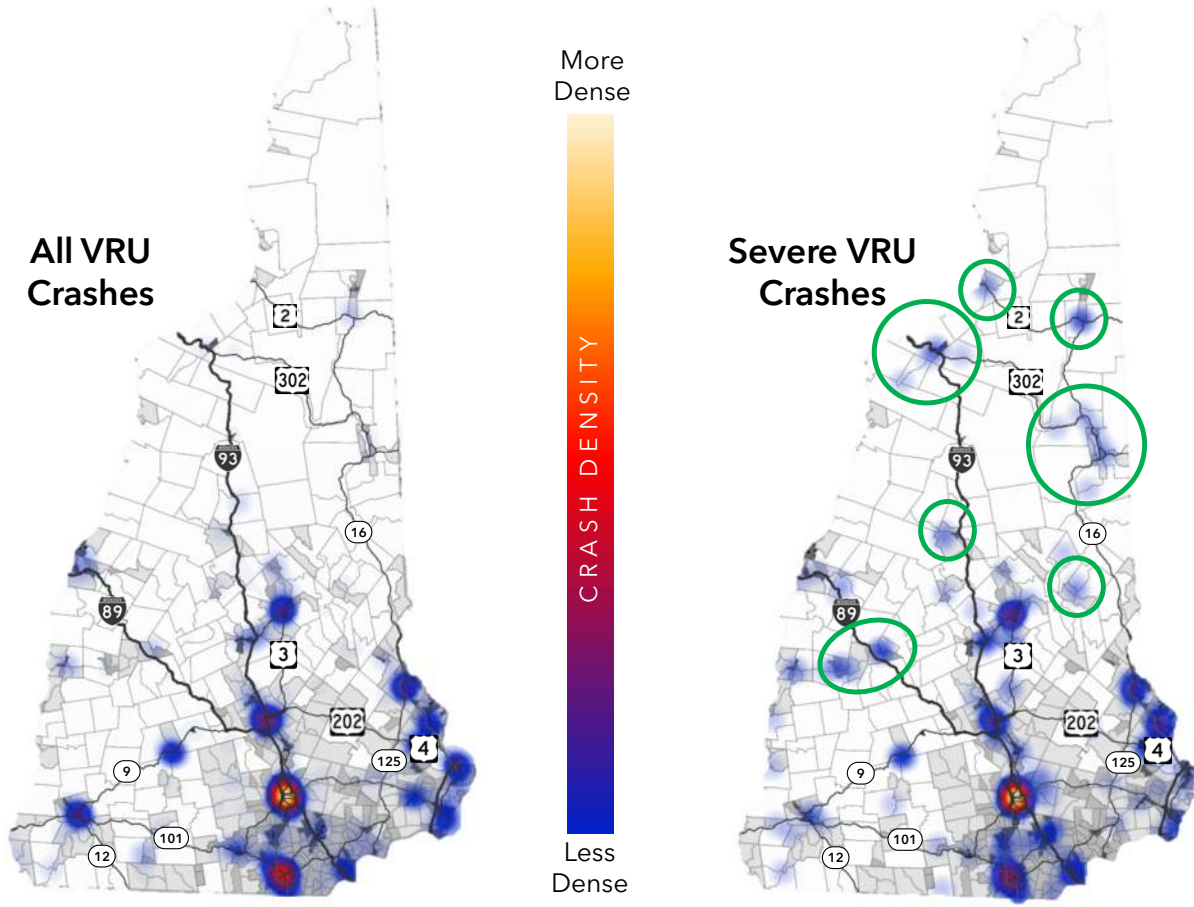


2017-2022 CRASH DENSITY

- 1 Manchester
- 2 Nashua
- 3 Concord
- 4 Laconia
- 5 Keene
- 6 Rochester
- 7 Portsmouth
- 8 Dover
- 9 Hampton
- 10 Salem



2017-2022 CRASH DENSITY

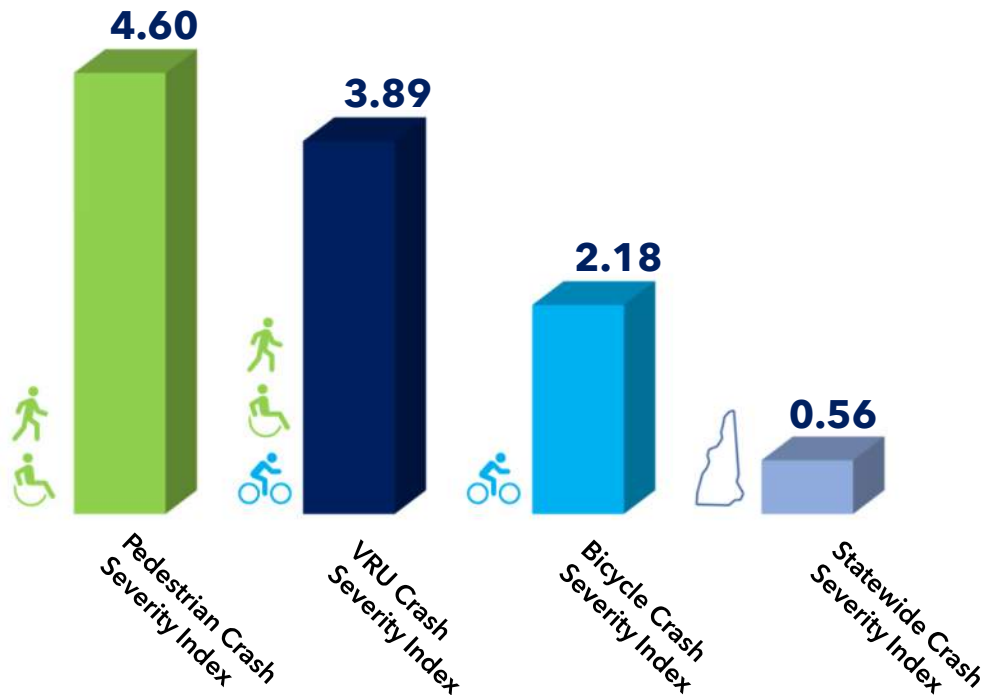


The map indicates that while the urban areas have higher numbers of VRU crashes, there are higher concentrations of severe injuries occurring in rural areas



2017-2022 SEVERITY INDEX

$$\text{Severity Index} = \frac{(66.7 \times \text{Fatal}) + (3.53 \times \text{Serious Injury}) + (1.29 \times \text{Minor Injury}) + (0.73 \times \text{Possible Injury}) + (0.12 \times (\text{PDO} + \text{Unknown}))}{\text{Total Crashes or Injuries}}$$



VRU-Involved crashes tend to be **much more severe** than the average crash in New Hampshire.

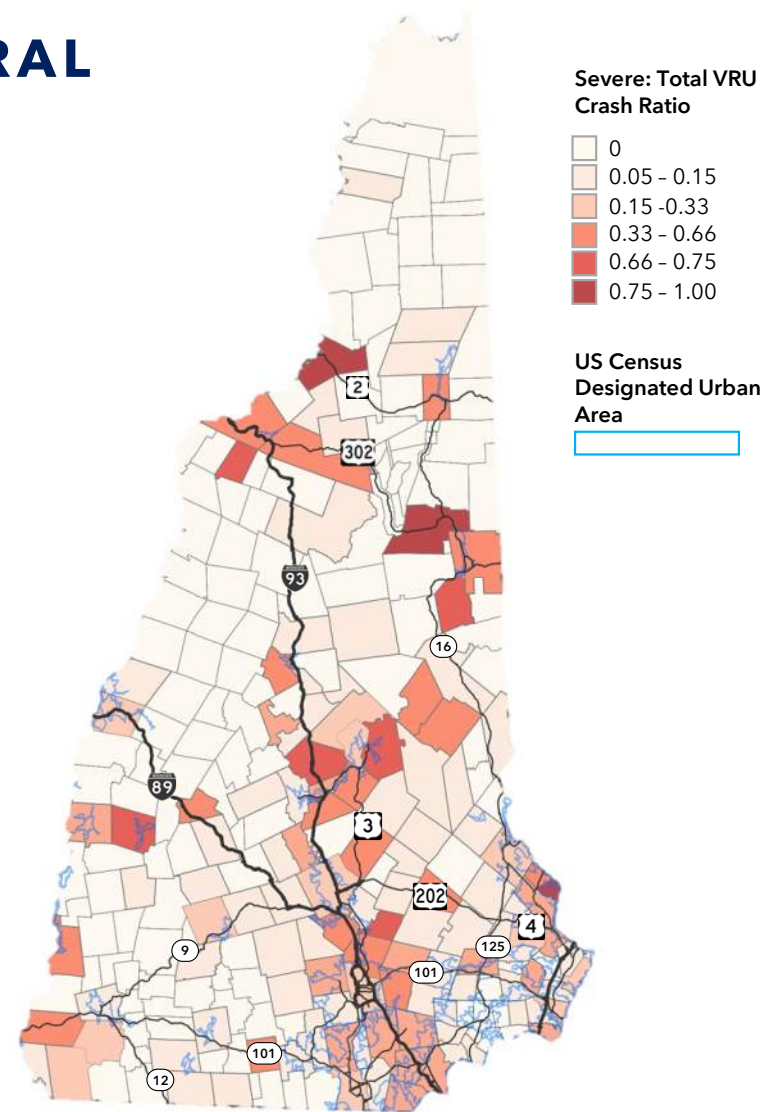
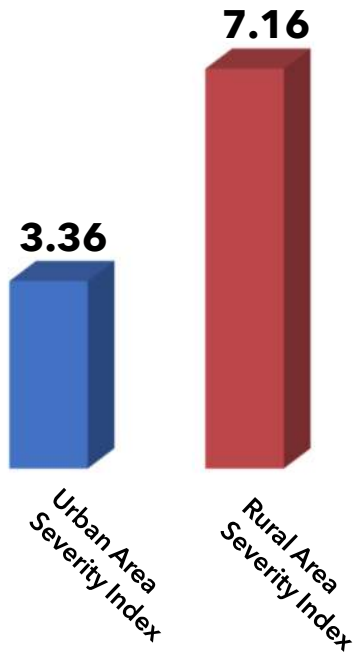
*Source: Montana Department of Transportation Traffic and Safety Bureau



SEVERITY INDICES: URBAN vs RURAL

86% of crashes involving VRUs occurred in Urban Areas.

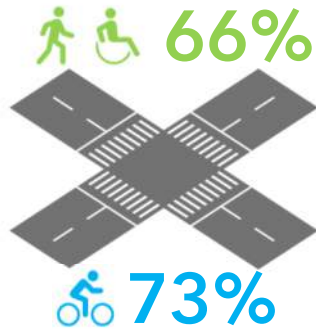
However, crashes in rural areas tend to be much more severe than those in urban areas.



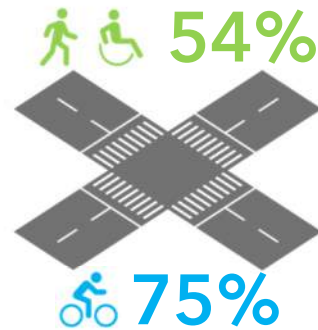
Source: NHDOS Crash Data 2017-2022
NHDOT Vulnerable Road User Safety Assessment



2017-2022 VRU CRASHES AT INTERSECTIONS

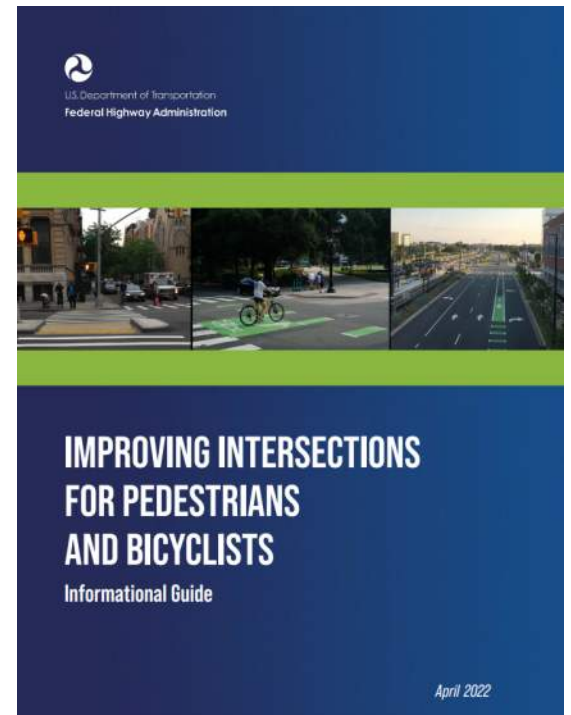


FATAL VRU CRASHES
Occurring at an Intersection



SERIOUS VRU CRASHES
Occurring at an Intersection

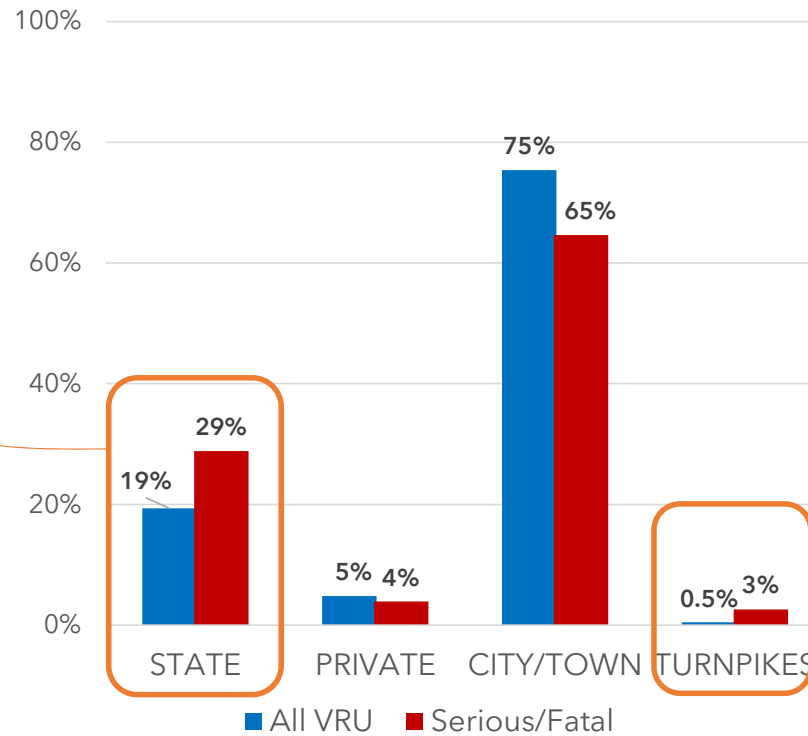
*Total number of VRU crashes occurring at an intersection not reported due to data inconsistencies.



2017-2022 VRU CRASHES BY ROADWAY OWNERSHIP

ROADWAY OWNERSHIP

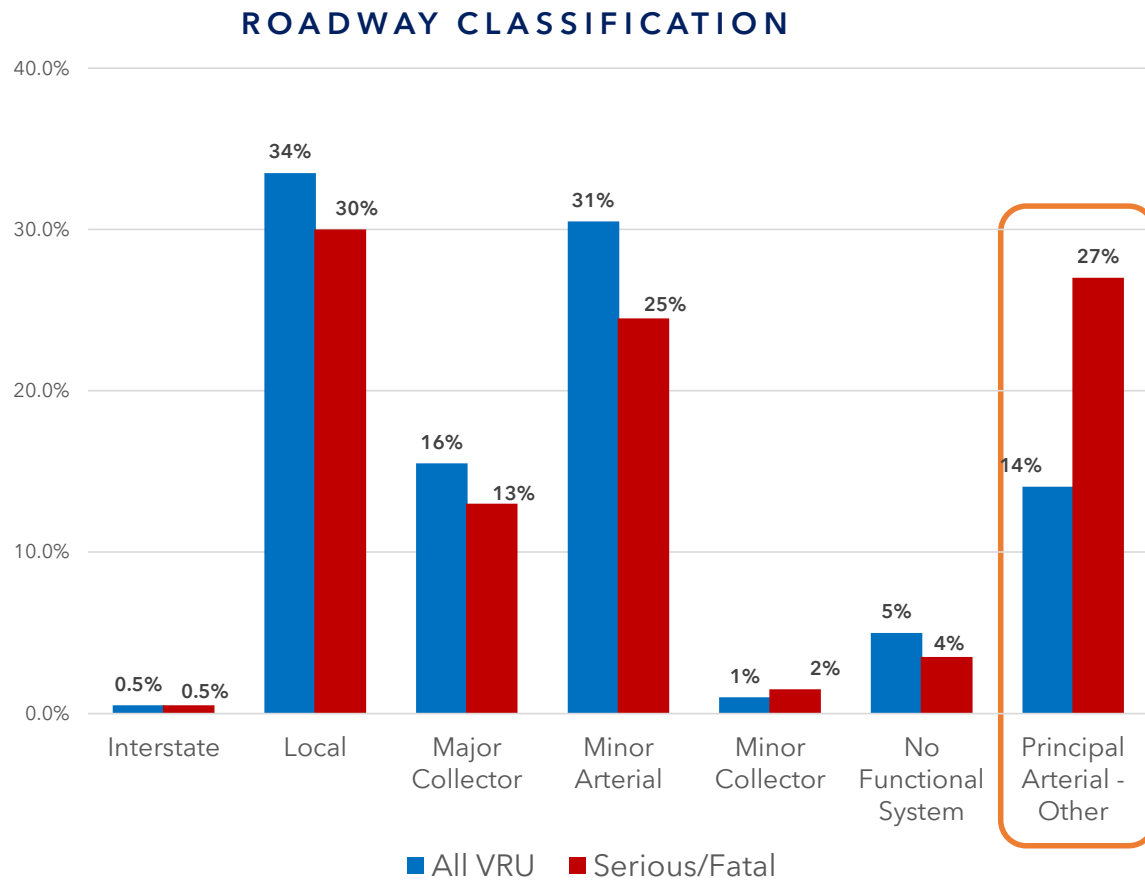
State owned roads typically higher speed, high volume roads.



Important to note that there were a handful of severe VRU crashes on turnpikes.



2017-2022 VRU CRASHES BY ROADWAY CLASSIFICATION

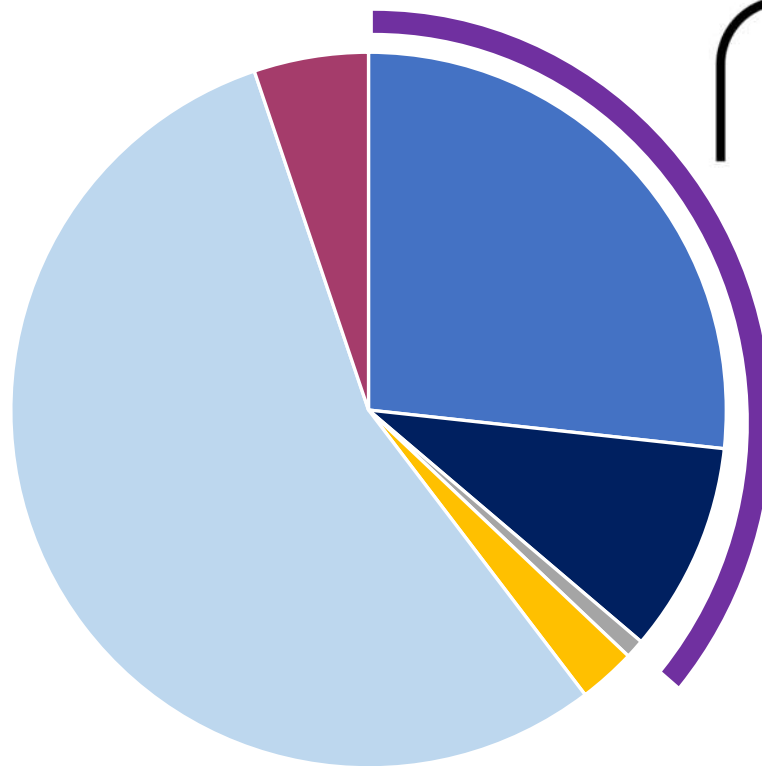


Principal arterials typically serve higher speeds + higher volumes which may result in more severe crashes.



2017-2022 VRU CRASHES BY LIGHTING AND WEATHER CONDITIONS

- Dark-Lighted/
Dark -Street Light On
- Dark-Non-Lighted/
Dark-Street Light Off
- Dark-No
Street Light
- Daylight
- Dawn
- Dusk



39%

of **Severe** VRU
crashes reported
dark conditions



13%

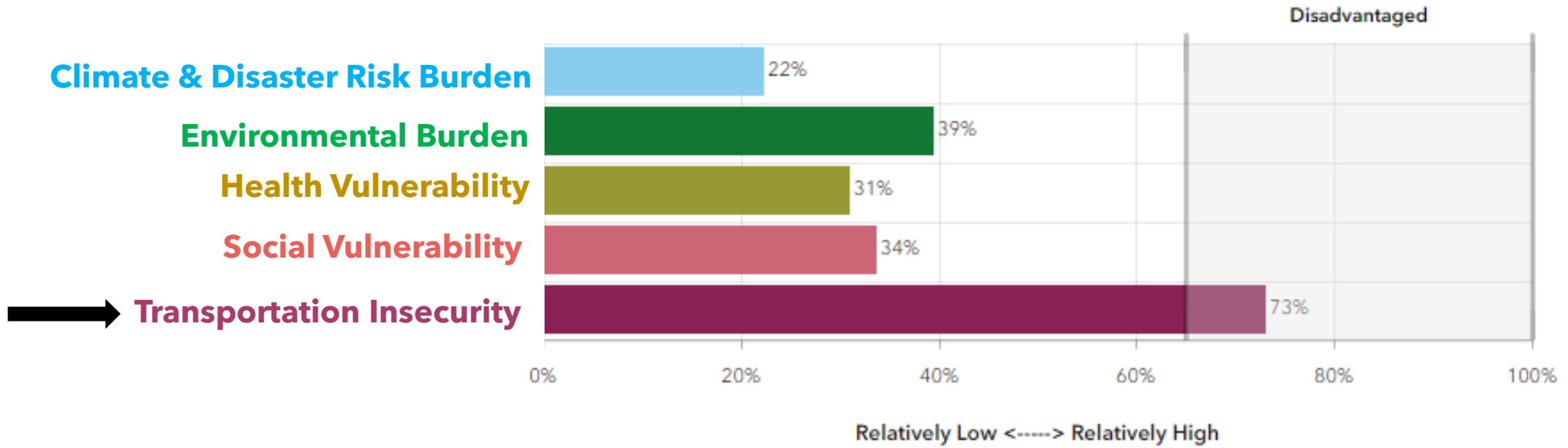
of **Severe** VRU crashes occurred
in wet/icy conditions



DEMOGRAPHIC VULNERABILITY FACTORS

USDOT - EQUITABLE TRANSPORTATION TOOL

Overall Disadvantage Component Scores - Percentile Ranked



Approximately **73% of census tracts in NH experience transportation insecurity** - indicating that many communities experience high transportation costs, a lack of multimodal infrastructure, and low walkability / bikeability making it difficult to get where one needs to go to meet the needs of daily life regularly, reliably, and safely.



DEMOGRAPHIC VULNERABILITY

USDOT - OVERALL DISADVANTAGED COMMUNITIES



1.4 M

Total Population Living in NH



218.9 K

Total Population Living in Census Tracts Identified as Disadvantaged by USDOT



17%

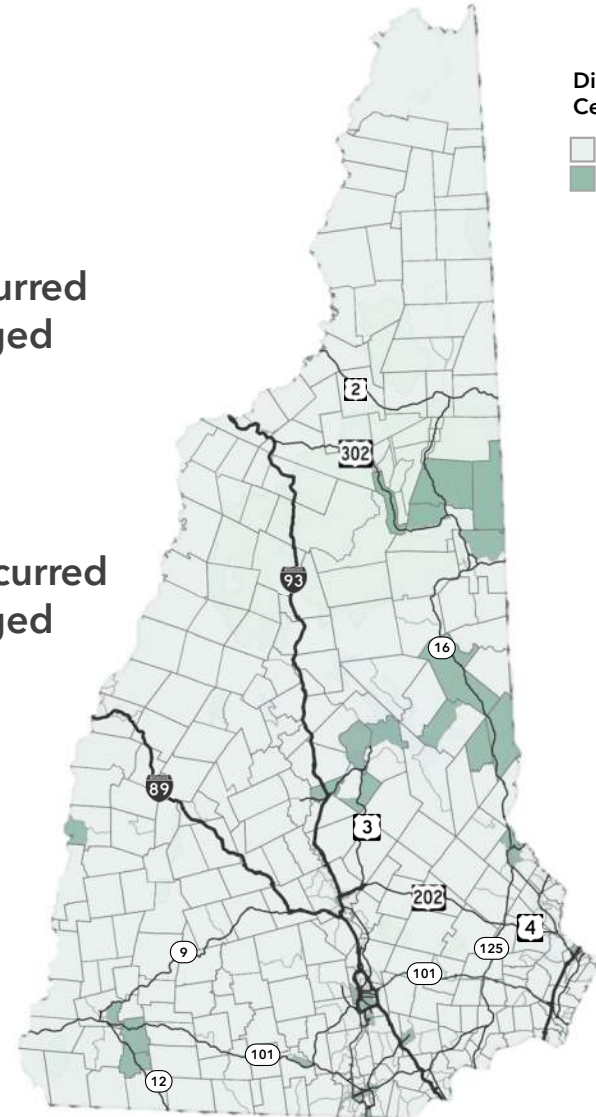
% of State Population Living in Census Tracts Identified as Disadvantaged

40%

Total VRU Crashes occurred within a disadvantaged community

34%

Severe VRU Crashes occurred within a disadvantaged community

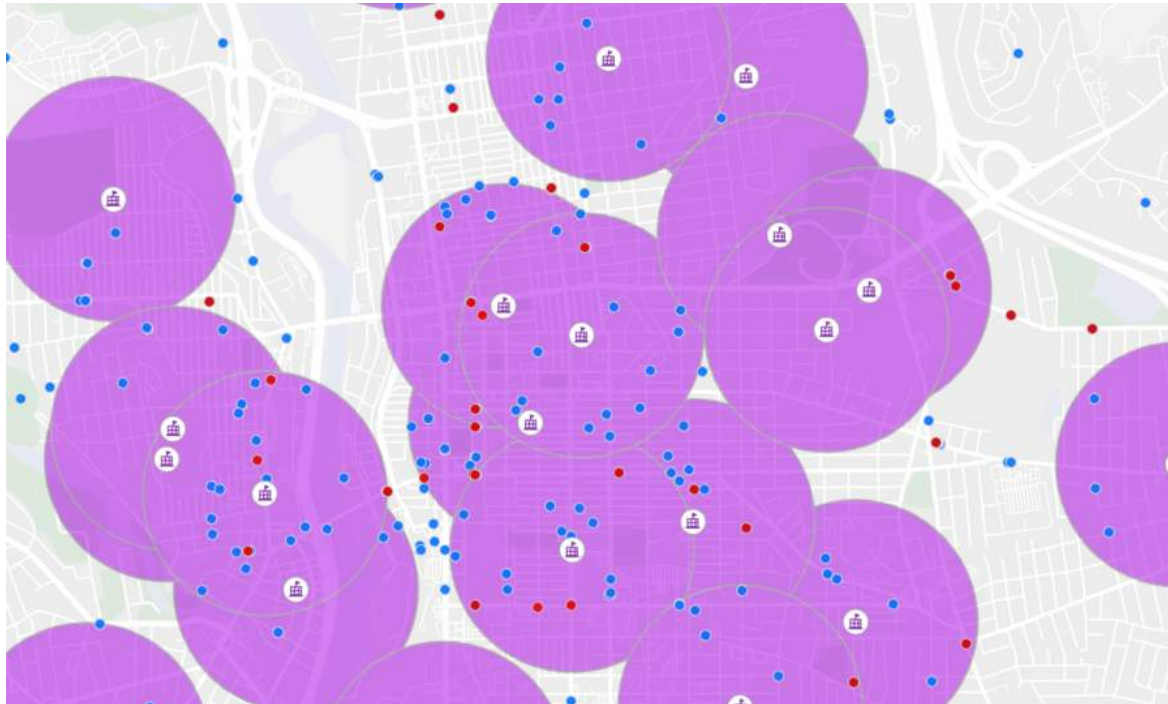


Disadvantaged Census Tracts

No
Yes



2017-2022 SCHOOL PROXIMITY



44%
of all VRU crashes
were within 2,000
feet of a school



2017-2022 INDIVIDUAL DATA - FATALS



20%

of pedestrian fatalities involved pedestrians under the influence of drugs or alcohol.



5%

of VRU fatalities involved driver impairment.



45%

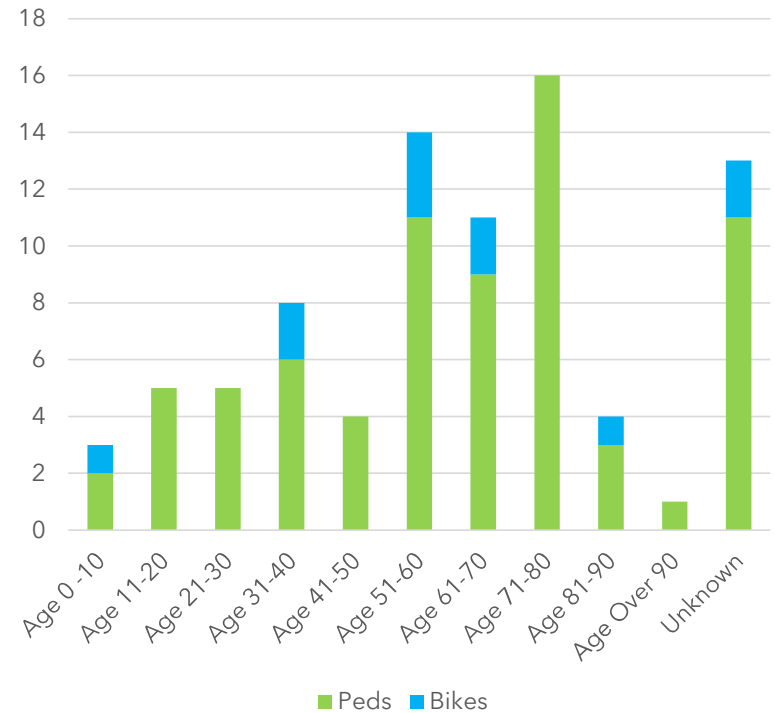
of bike fatalities involved cyclists not wearing a helmet.



30%

of VRU fatalities were people aged 65+

VRU FATALITIES BY AGE GROUP



2017-2022 SUMMARY OF FINDINGS

- 1. Recent Upward Trend in Severe Crashes.** Long-term decline in VRU crashes – BUT – recent upward trends in fatalities and serious injuries.
- 2. VRU Crashes Proportional to Population.** Number of VRU crashes are proportional to population.
- 3. VRU Crashes more Severe on Average.** ‘Severity Index’ shows that VRU crashes are much more severe than average crashes, and rural more severe than urban.
- 4. Rural VRU Crashes more Severe.** Rural VRU crashes tend to be more severe than urban crashes.
- 5. Intersections are a Focus of VRU Concern.** Severe crashes are most often at intersections (3/4 bikes, 2/3 peds).
- 6. Principal Arterials are a Focus of VRU Concern.** Principal arterials have disproportionately severe VRU crashes.
- 7. Dark Lighted Conditions are a Focus of VRU Concern.** Darkness are factors in severe crashes.
- 8. Proximity to Disadvantaged Communities.** 40% of VRU crashes occur in disadvantaged communities.
- 9. Proximity to Schools.** 44% of VRU crashes occur within walking distance of schools.

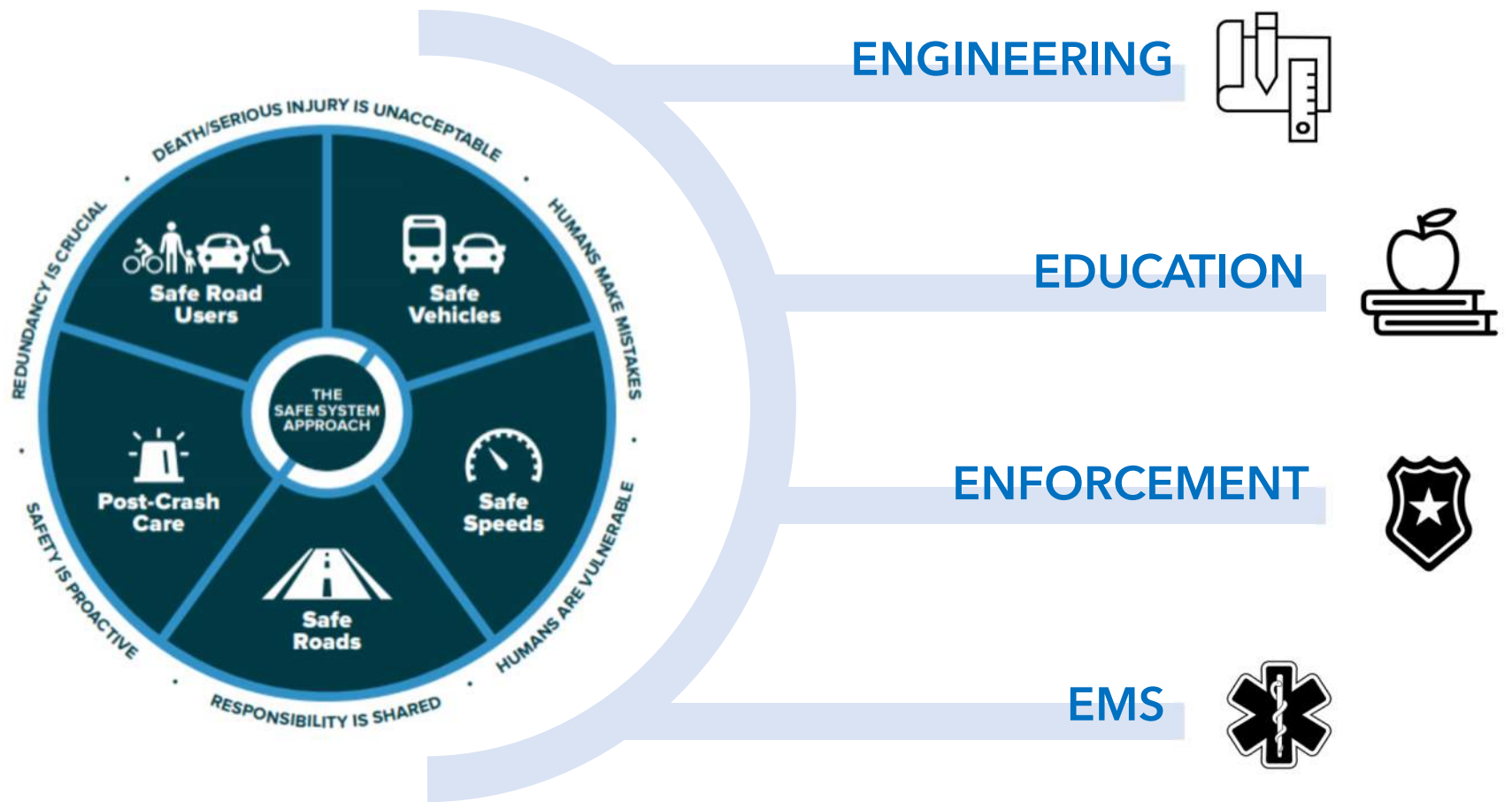




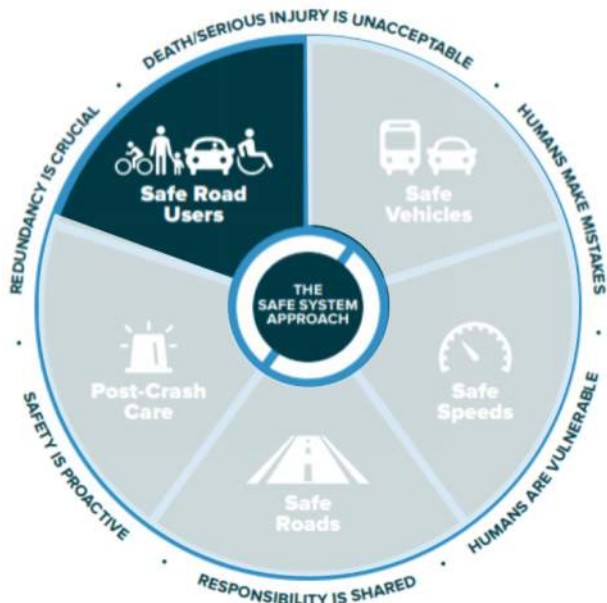
05 || VRU STRATEGIES



VRU STRATEGIES-SAFE SYSTEM APPROACH (FHWA)



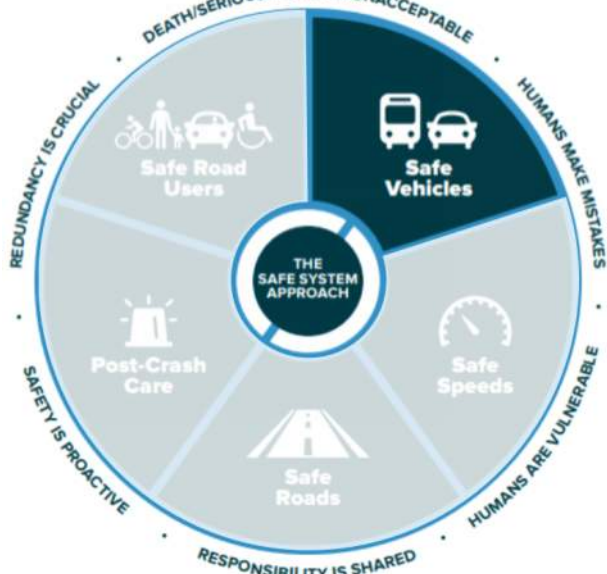
VRU STRATEGIES



- Increase pedestrian & bicycle visibility
- Encourage proper equipment
- Reduce driver & non-motorist impairment
- Enhanced Work zone visibility



VRU STRATEGIES



- Support infrastructure for advanced vehicle detection technologies
- Reduce hazard of vehicle size / front-end design
- Address quiet electric vehicles



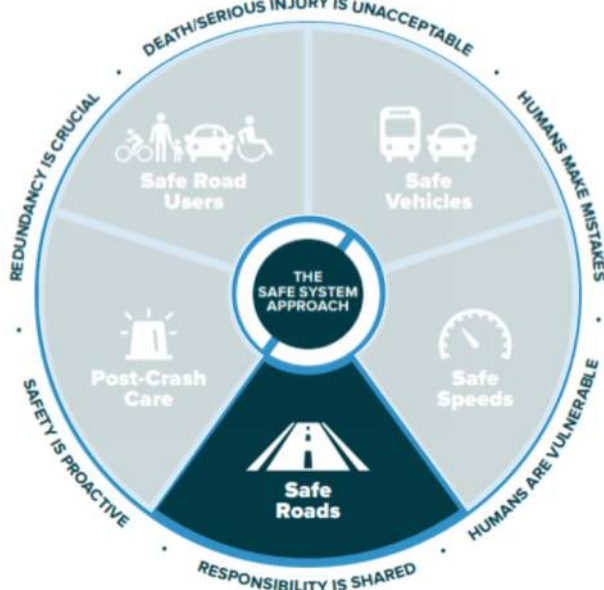
VRU STRATEGIES



- Review Speed Zones and implement special speed zones where applicable (schools, work zones, high demand areas)
- Implement traffic calming features where appropriate
- Increased or more targeted enforcement



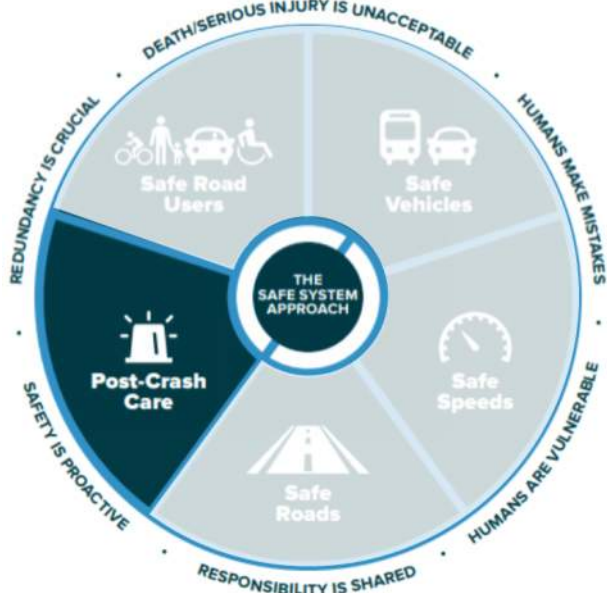
VRU STRATEGIES



- Implement pedestrian and bicycle infrastructure
 - Off-street facilities (sidewalks, shared use paths, separated bike lanes)
 - Crossing Improvements - Visibility, crossing distances, lighting, accessibility, etc.
 - Bicycle Accommodations - shoulder widths, dedicated facilities, etc.
 - Design roads (new & reconst.) for target speed



VRU STRATEGIES



- Improve Access to Emergency and Trauma Care
- Database enhancements



VRU STRATEGIES

SPOT IMPROVEMENTS

- High Risk Intersections
- High Risk Corridors
- High Risk Crossings

SYSTEMIC IMPROVEMENTS

- Safe System
 - Urban Corridors
 - Uncontrolled Pedestrian Crossings
 - Rail Trail Crossings
 - Material Procurement
- Database Improvements - Quality and Availability





06 || NEXT STEPS



NEXT STEPS



On-going Quantitative Analysis of VRU Safety Risks

- Describe the analysis methods to be used to identify VRU risks while considering crash history, infrastructure characteristics, and socio-economic factors
- Map VRU risk on the statewide road network



Program of Projects + Strategies

- Review the recommended spot improvement candidates produced by the Regional Planning Commissions
- Develop and map potential systemic improvements focused on sites with high potential for VRU crash reduction



Safe System Approach

- Gather data regarding the Safe System Approach from FHWA and other state DOTs
- Summarize findings and present to NHDOT



VRU Safety Assessment

Develop written report to document findings of Tasks 1-5

Stakeholder
Outreach



MEETING NOTES

September 19, 2023

2:00 PM

PROJECT: NHDOT
Vulnerable Road User (VRU) Safety Assessment
GPI #NEX-2021430.08

LOCATION: Teams

PURPOSE: Stakeholder Meeting 1

ATTENDEES:

NHDOT:

Bill Lambert – State Safety Engineer
Charles Willeke – Municipal Highways Engineer
Corey Spetelunas – Highway Safety Project Manager
Bill Watson – Administrator, Planning and Community Assistance
Gerry Bedard – Active Transportation Engineer
Jim Marshall – Administrator, Highway Design

Greenman-Pedersen, Inc:

Mike Dugas Carolyn Radisch

Others:

Colin Lentz – Strafford RPC
Scott Bogle – Rockingham PC
J.B. Mack – Southwest Region PC
John Clegg – NH Office of Highway Safety
Paul Ruggiero – NH OHS
Dave Topham – Bike-Walk Alliance of NH
Ian Marsh – NH Division of Motor Vehicles
Christopher Vetter – Commander, NH OHS
Rebecca Sky – NH Council on Aging
David Henderson – National Safety Council
Jay Minkarah – Nashua RPC
Alexis Bly – Dartmouth Health Injury Prevention Center
Thom O'Connor – NHDHHS, Bureau of Elderly and Adult Services
Jim Esdon - Dartmouth Health Injury Prevention Center
Scott Boisvert – Tri-County CAP
Mark Davie – Strafford RPC
Rachel Lakin – NH DHHS, Bureau of Elderly and Adult Services

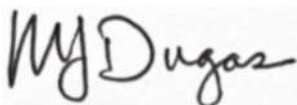
DATE PREPARED: September 20, 2023

The meeting recording and transcript are available on the NHDOT website.
Additional comments and observations to supplement the transcript:

1. Colin Lentz: Mapping for bicycle level of traffic stress was prepared for the recently updated NH Pedestrian and Bicycle plan and might be useful to VRU assessment. Also, it might be informative to map how many crashes involve the combined conditions of darkness and winter.
2. Gerry Bedard: He noted that 200 crashes occurred at 5 pm. It might be informative to analyze these crashes also by month since for half the year 5 pm is in darkness.
3. C. Lentz: It is ironic that walkable and bikeable communities generate more non-motorized traffic (i.e., exposure) and thus would likely have more crashes. Could have an area that appears very safe in terms of VRU crashes, but it may be because it is so unsafe, there are no pedestrians and/or bicyclists.
4. Steve Boisvert: Suggested that crash severity be mapped per capita by county to supplement the heat mapping.
5. Scott Bogle questioned the figure regarding the proportion of VRU crashes that occur at intersections, as it is contradictory of NHTSA findings. GPI will confirm or correct the figures.
6. G. Bedard: Stated that while a high number of bicycle crash victims may have been unhelmeted, we must avoid the appearance of placing the blame for the crash on the victims. Helmet use isn't always a determining factor in the severity of a crash with a motor vehicle.
7. Jay Minkarah: He asked if the risk results are different for bikes and peds with respect to crashes in varying lighting conditions. The data tends to show the greater risk is to peds. In general, VRU analysis links bikes and peds but they have different needs. He added that the crashes in the 71-80 age group are alarming and should be considered in the design of safety treatments.
8. J.B. Mack: He questioned whether the urban area boundaries were based on 2010 or 2020 census data (he suspected 2010, because the new criteria in the 2020 census significantly altered the results). GPI will confirm the data source. He also noted that all arterials (not only the principal arterials) appear to be a VRU risk.
9. Corey Spetelunas observed that 75% of VRU crashes occur in daylight or in dark lighted conditions, perhaps due to the higher exposure at these times and locations.
10. C. Lentz: He noted that the NH MPOs are proceeding with safety action plans via the Safe Streets for All (SS4A) program. He suggested that VRU risk data be incorporated, if possible, into the selection criteria for TAP projects and road safety audits.
 - a. Bill Watson stated that a material procurement program appears to be an efficient means of focusing VRU improvements on disadvantaged communities and populations.
 - b. C. Spetelunas added that NHDOT plans to incorporate VRU considerations in some fashion into the RSA selection criteria that are under revision now.
11. S. Bogle mentioned that JoAnne Miles-Holmes will provide data summarizing hospitalizations related to bicycling. He asked if this data could be used to supplement the risk analysis. He also asked, with regard to the higher crash severity seen in rural areas, if these crashes are occurring where State highways traverse town centers. GPI received the hospitalization data from JoAnne on 9/29. JoAnne states that the data is summarized by county and has been "de-identified, so there is no way to link it or correlate it directly to the DMV data." GPI will investigate rural crash locations to try to identify the road contexts where these crashes are occurring.

These notes constitute our understanding of the discussions and conclusions reached. Please advise us within ten (10) days, in writing, of any exceptions or corrections.

Respectfully submitted,



Michael Dugas, P.E.
Cc: All Attendees

HSIP Committee Meeting - October 19, 2023

VULNERABLE ROAD USER SAFETY ASSESSMENT

HSIP Committee
October 19, 2023

DRAFT

Agenda

- Project Team
- Vulnerable Road User (VRU) Safety Assessment Overview
- Summary of Baseline Conditions
- VRU Strategies
- Next Steps

Project Team



- ↳ **Bill Lambert, PE**
State Highway Safety Administrator
- ↳ **Corey Spetelunas, PE**
Asst Safety Engineer
- ↳ **Gerry Bedard, PE**
Active Transportation Engineer



- ↳ **Michelle Marshall**
NH Division, Safety/Area Engineer

GPI

- ↳ **Mike Dugas, PE**
Project Manager
- ↳ **Carolyn Radisch, AICP**
Senior Transportation Planner
- ↳ **Nicole Rogers, PE**
Project Engineer, GIS Analyst

A photograph of a residential street with trees, a speed limit sign, and a person walking a dog. The image is overlaid with a semi-transparent green filter. The text "VRU SAFETY ASSESSMENT OVERVIEW" is centered in white, bold, sans-serif font.

VRU SAFETY ASSESSMENT OVERVIEW

DRAFT

What is a Vulnerable Road User?

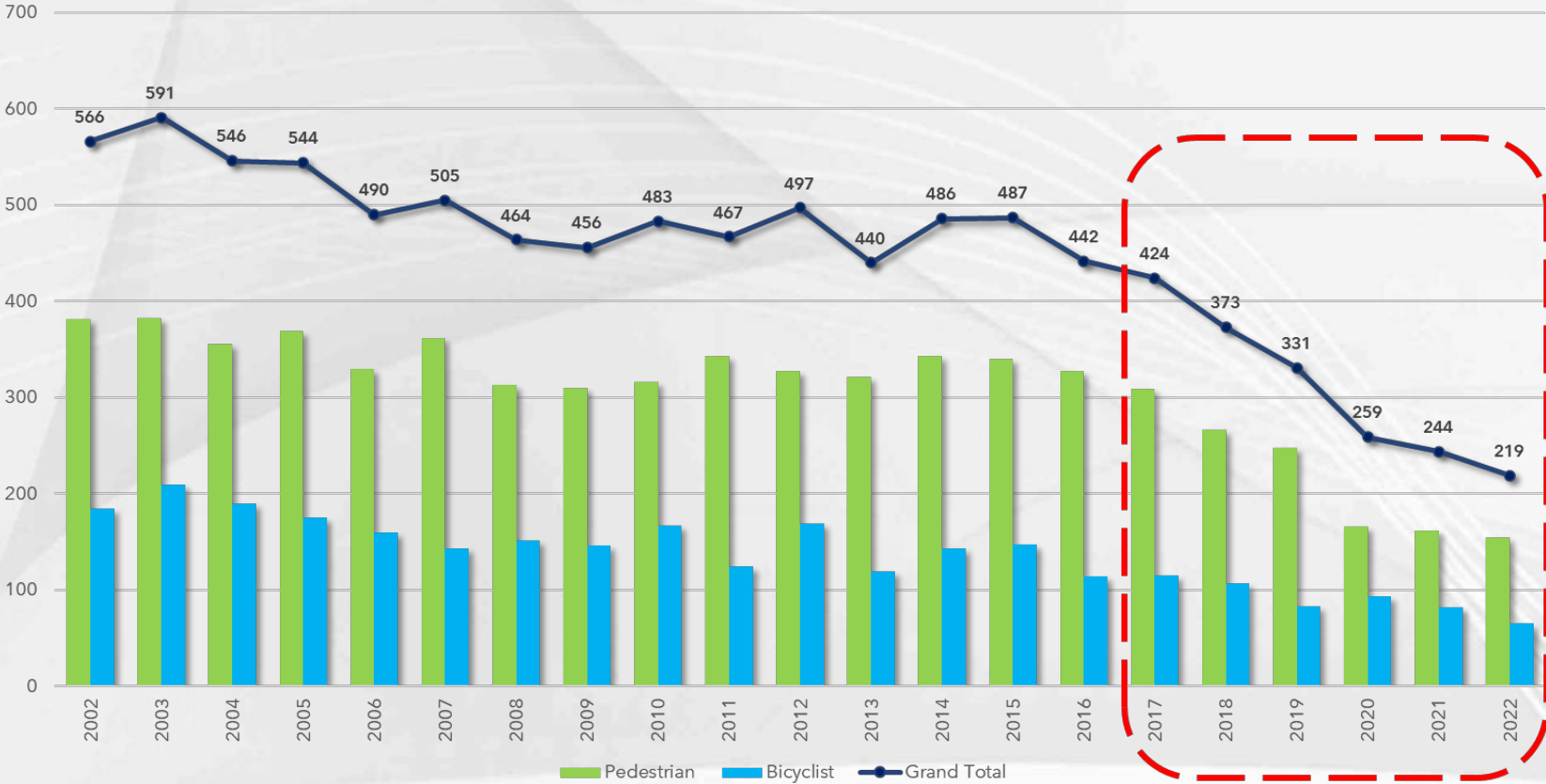
A Vulnerable Road User is defined by FHWA as “a non-motorist with a Fatality Analysis Reporting System (FARS) person attribute code for **pedestrian, bicyclist, other cyclist, and person on personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist...**”

It is important to note that unlike other organizations including the National Highway Traffic Safety Administration (NHTSA) and the National Safety Council, FHWA does not include motorcyclists among VRUs.



Trends

Non-Motorist Crashes



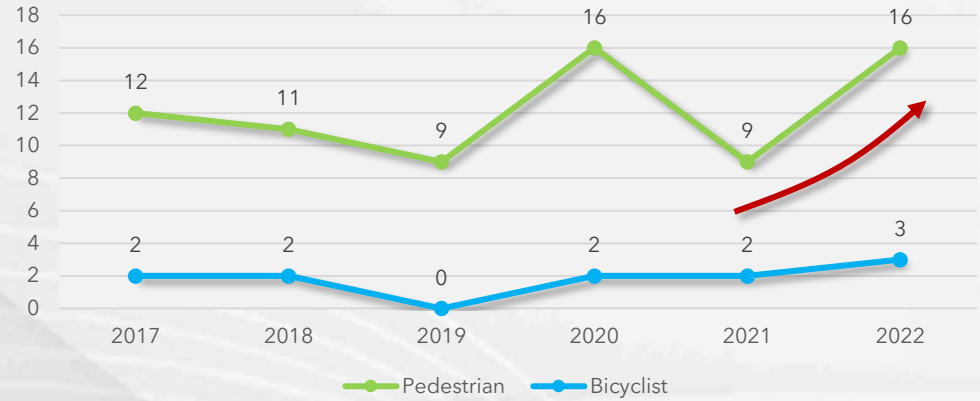
DRAFT

Trends

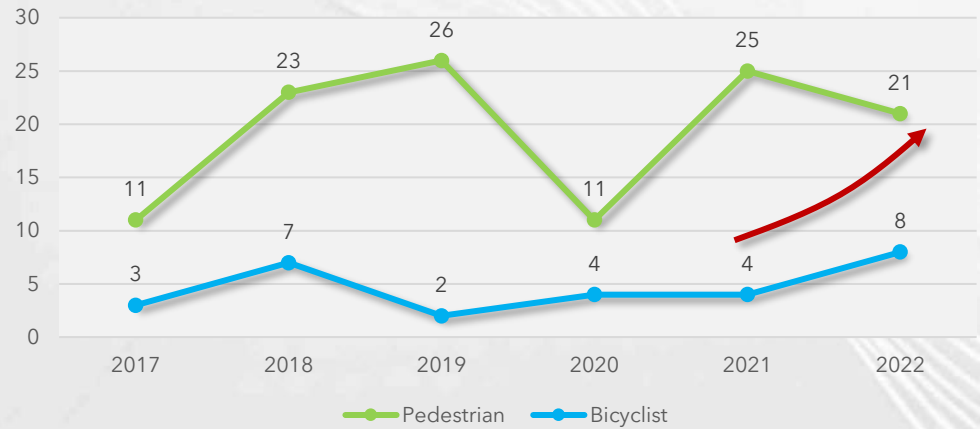
Non-Motorist Crashes



Non-Motorist Fatalities



Non-Motorist Suspected Serious Injuries



DRAFT

Federal Requirements

2021 Bipartisan Infrastructure Law (BIL)

- **Data-driven process to identify areas of high-risk for vulnerable road users.** Specifically, the State must perform a quantitative analysis of VRU fatalities and serious injuries.
- **Consult with local governments, MPOs, and regional transportation planning organizations that represent high-risk areas.**
- **Develop program of projects/strategies** to reduce safety risks to vulnerable road users in areas identified as high-risk
- **Consider Safe System Approach**
- **Due to FHWA November 15, 2023**

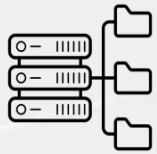


A photograph of a residential street with trees, a speed limit sign, and a person walking a dog. The image is overlaid with a semi-transparent green filter. The text 'BASELINE CONDITIONS SUMMARY' is centered in white, bold, sans-serif font.

BASELINE CONDITIONS SUMMARY

DRAFT

Available Data + Limitations



DATA SOURCES

Crash Data

- NH Department of Safety Crash Data 2017-2022
- NHDOS - DMV Run Lists 2017-2022
- National Highway Traffic Safety Administration (NHTSA) FARS Data 2017-2022

Infrastructure Data

- NHDOT GIS Roadway Inventory - Roadway Classification, Volumes, Speed, Roadway Features

Socio-Economic Data

- US Census Demographic Data - Income, Racial Makeup, Auto Availability, Environmental Justice Communities
- EPA EJ Screen Tool
- FHWA - Socioeconomic and Equity Analysis Maps
- CDC - Social Vulnerability Index

Land Uses

- NHDOT GIS Data - Schools, Recreation Areas/Points, Community Centers, Transit Stops, etc.

CHALLENGES + LIMITATIONS

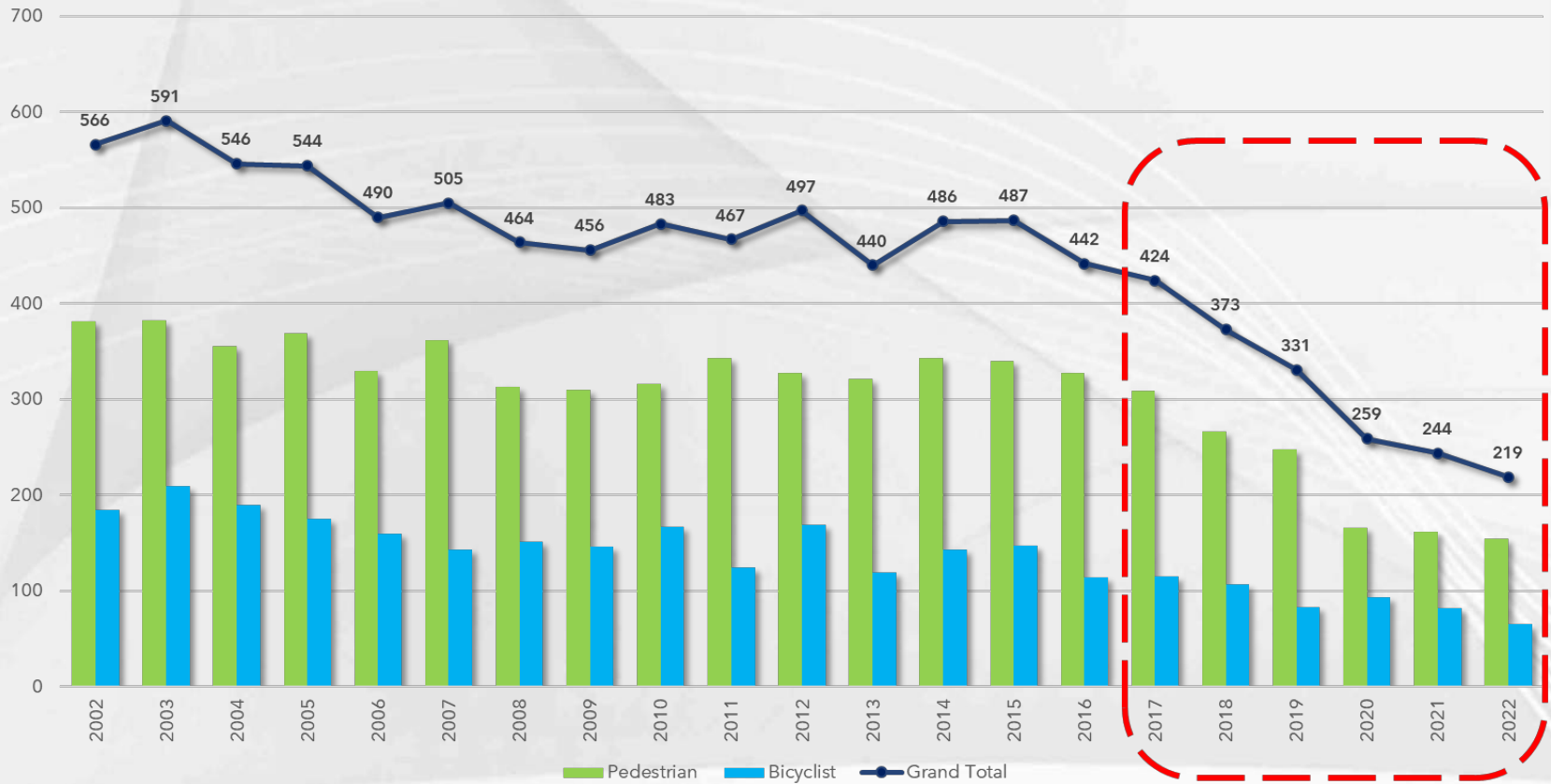
- Frequency of Crashes
- Exposure Data
- Underreported Data
- Inconsistent Data
- Unknown Data
- Time Constraints!

- Lack of Individual Demographic Data

- All States doing this for the first time at the same time!

Trends

Non-Motorist Crashes



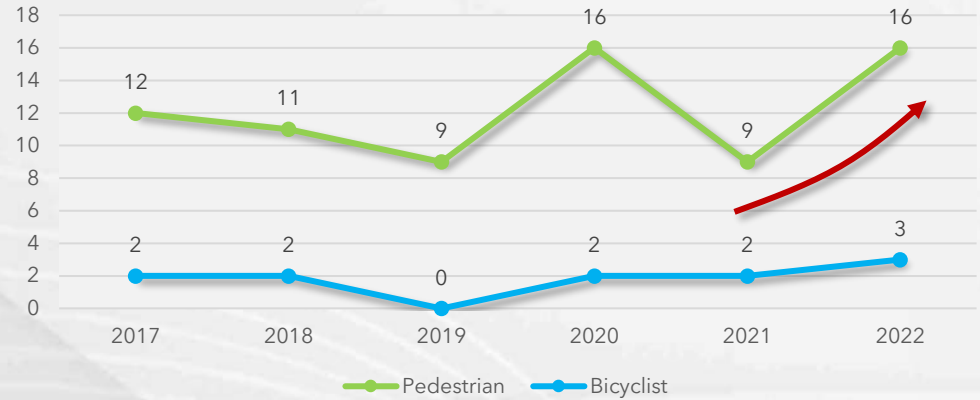
DRAFT

Trends

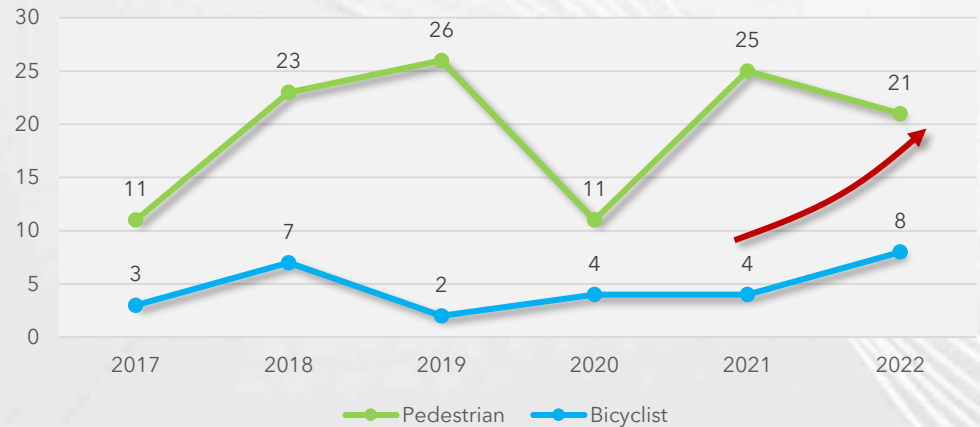
Non-Motorist Crashes



Non-Motorist Fatalities



Non-Motorist Suspected Serious Injuries



There was a steep decline in VRU crashes in 2020 (a reflection of COVID and absence of normal traffic volume). However, there is a marked increase of pedestrian fatalities and serious injuries as well as bicyclist serious injuries.

DRAFT

Crash Severity

1,305 545

1,850
VRU Crashes

FATALITIES

  **73**  **11**

SUSPECTED SERIOUS INJURIES

  **117**  **28**

SUSPECTED MINOR/POSSIBLE INJURIES

  **556**  **282**

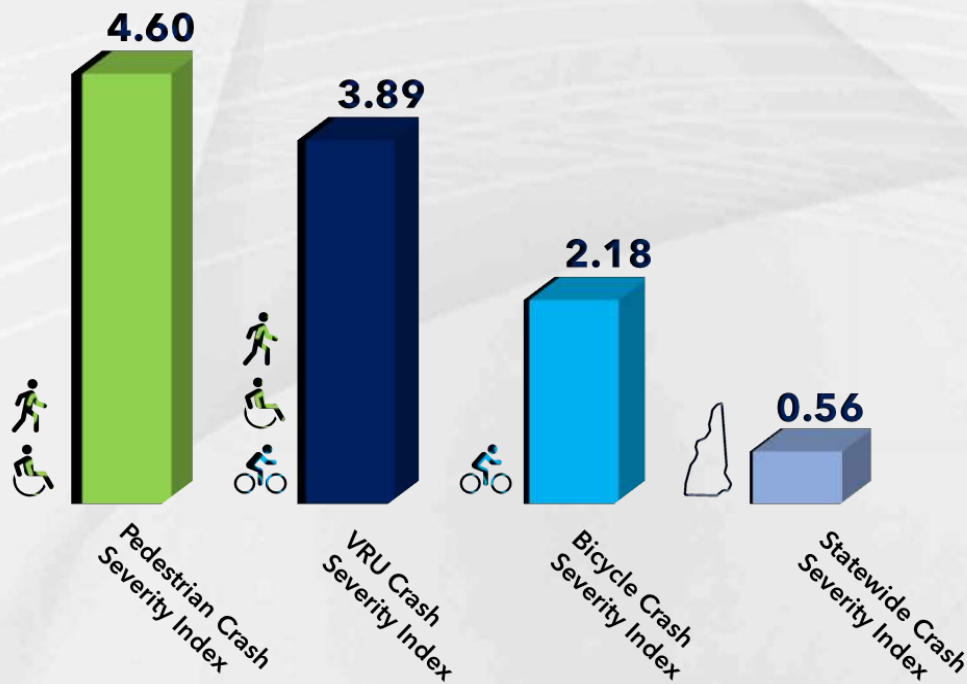
PDO/UNKNOWN

  **559**  **224**

SEVERE
DESIGNATION
12% of VRU CRASHES

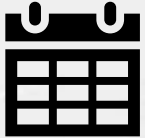
58%
of VRU involved in
crashes were injured
to some degree

Crash Severity



VRU-Involved crashes tend to be **much more severe** than the average crash in New Hampshire.

Questions to ask...



When are crashes occurring?



In what conditions are crashes occurring?



Where are crashes occurring?



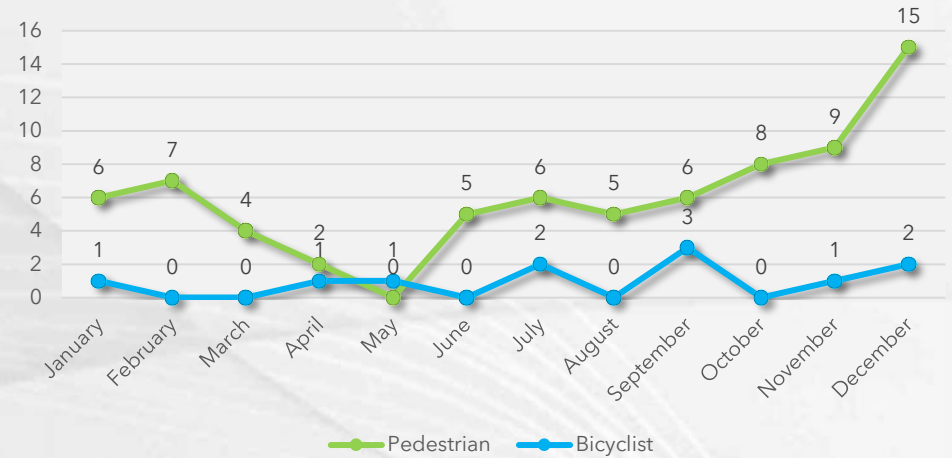
Who is involved?



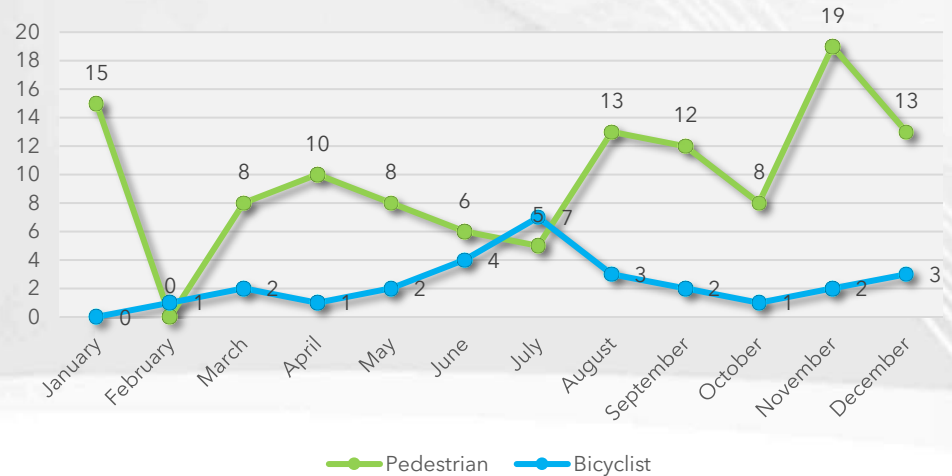
When are crashes occurring?

Ped crashes are typically highest during the winter months perhaps due to lighting conditions and sight distance issues caused by snowbanks. Bike crashes are typically highest during the summer months when bike activity is the highest.

Non-Motorist Fatalities



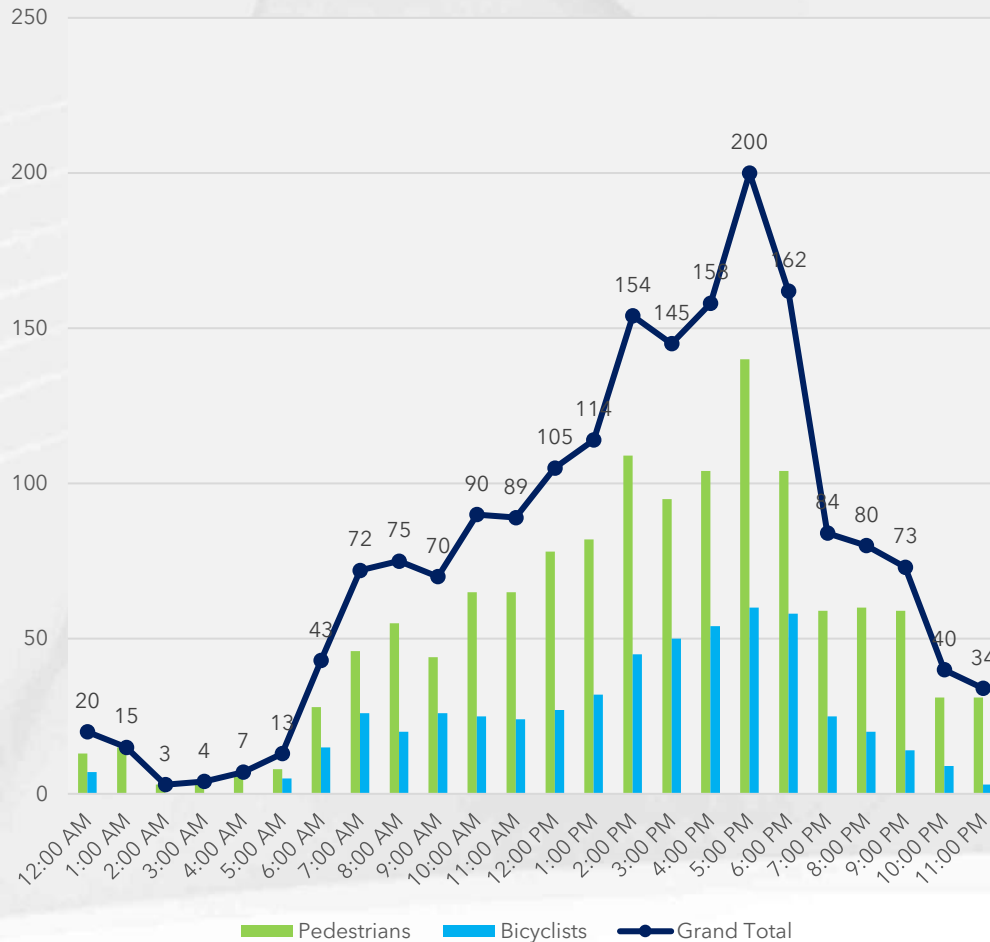
Non-Motorist Suspected Serious Injuries





When are crashes occurring?

VRU Crash Time of Day



Month	% of 5 PM Ped Crashes
Jan	20%
Feb	6%
Mar	5%
Apr	7%
May	6%
Jun	5%
July	5%
Aug	4%
Sep	9%
Oct	6%
Nov	14%
Dec.	14%

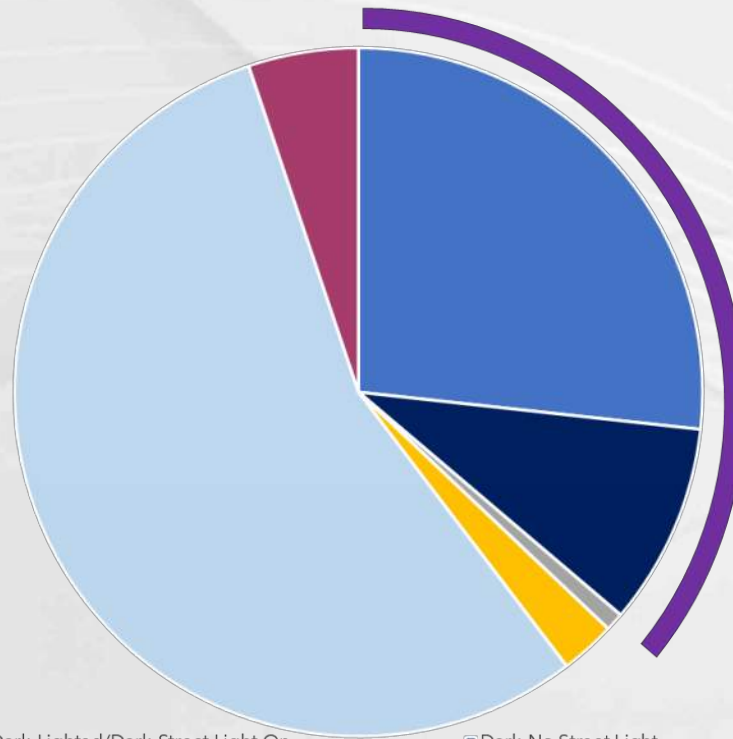
OVER 50%

DRAFT



In what conditions?

- Dark-Lighted/
Dark -Street Light On
- Dark-Non-Lighted/
Dark-Street Light Off
- Dark-No
Street Light
- Daylight
- Dawn
- Dusk



39%
of **Severe** VRU
crashes reported
dark conditions

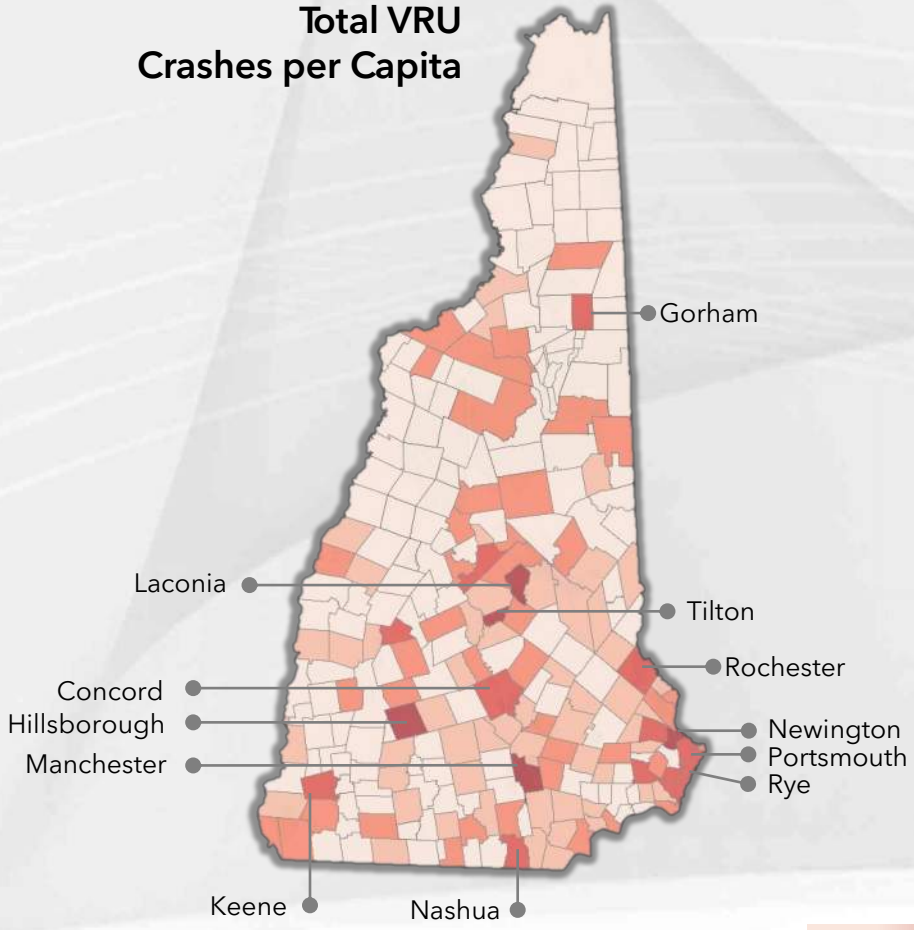


13%
of **Severe** VRU crashes occurred
in wet/icy conditions

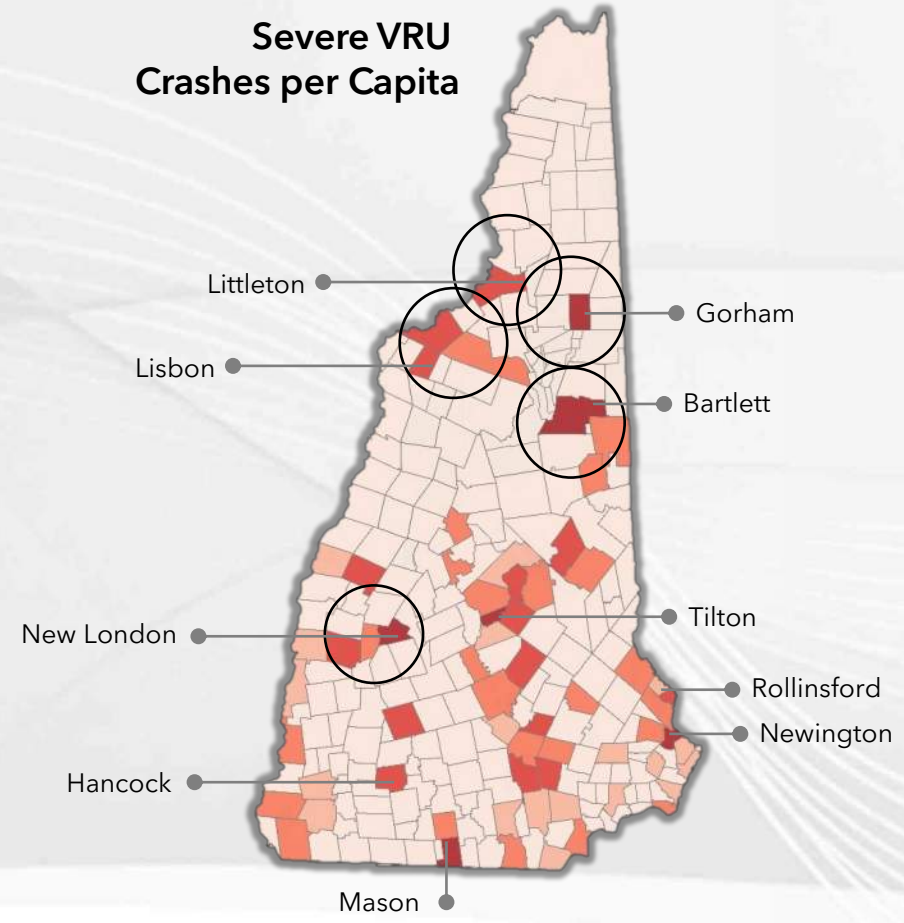


Where are crashes occurring?

Total VRU Crashes per Capita



Severe VRU Crashes per Capita

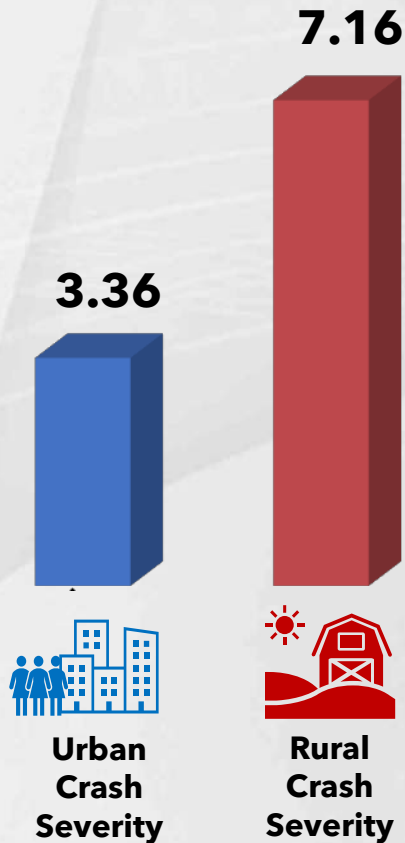


Low High

DRAFT



Where are crashes occurring?



Higher Speed Limits



Limited Infrastructure



Lower Population Density / Driver Behavior



Lack of Street Lighting



Limited Public Transportation

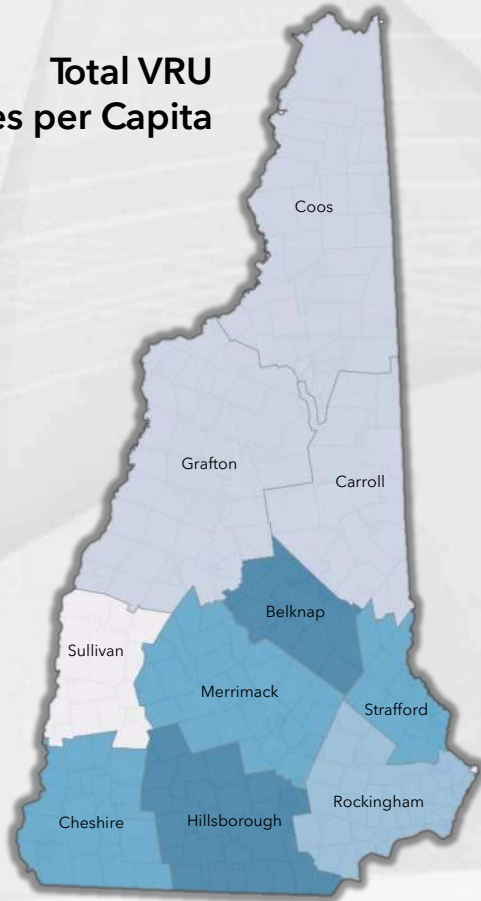


Limited Access to Healthcare / Longer Response Times

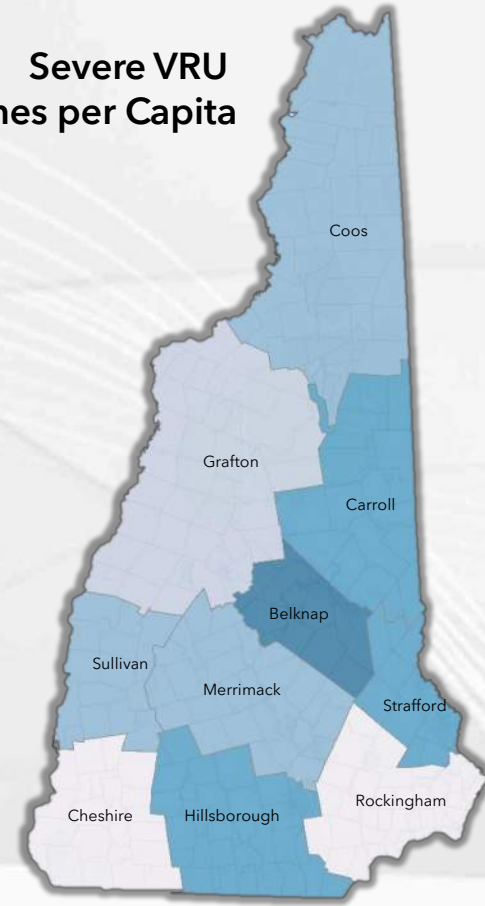


Where are crashes occurring?

Total VRU
Crashes per Capita



Severe VRU
Crashes per Capita



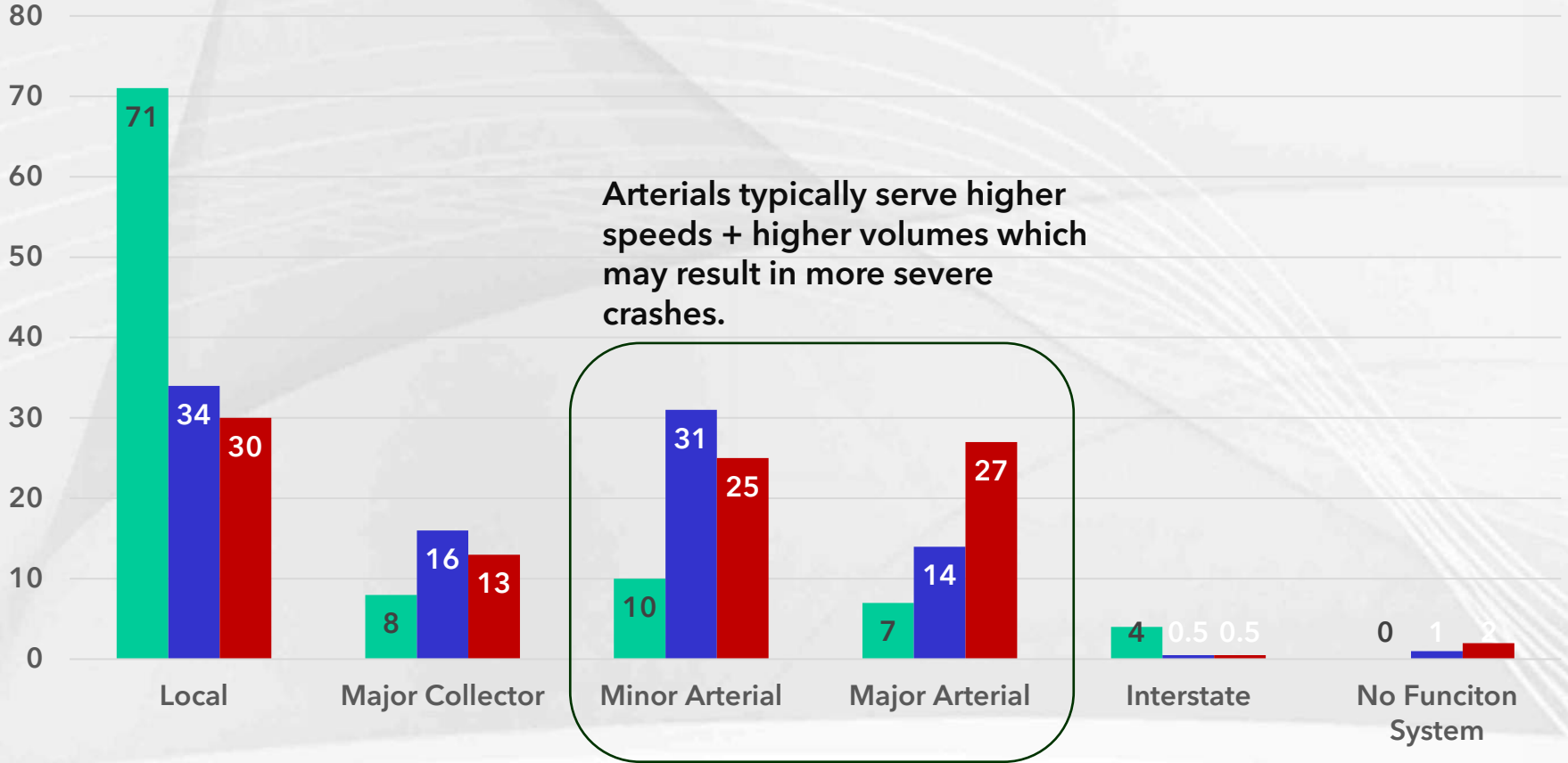
Low High

DRAFT



Where are crashes occurring?

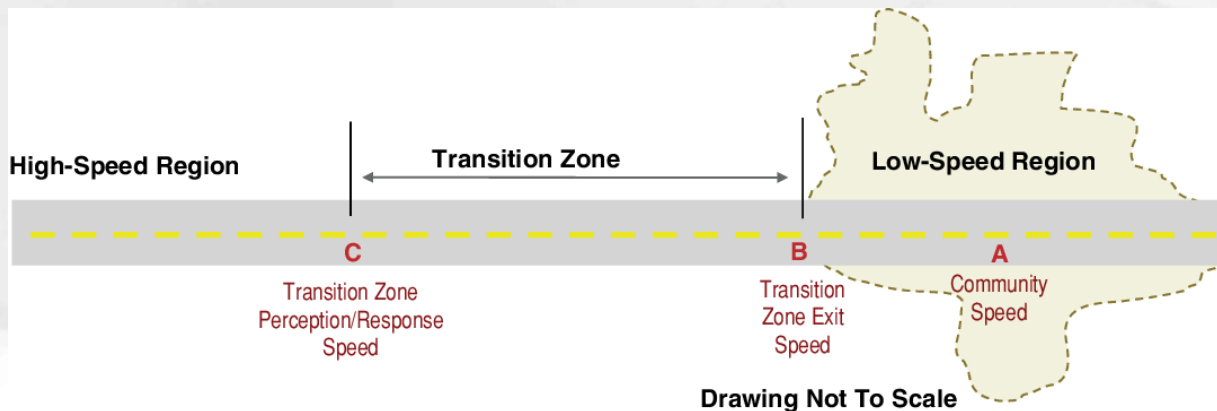
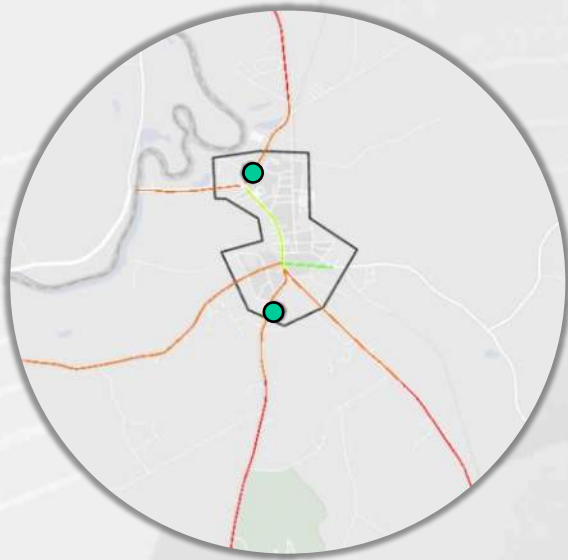
■ % of Road Network ■ % All VRU Crashes ■ Severe VRU Crashes



DRAFT



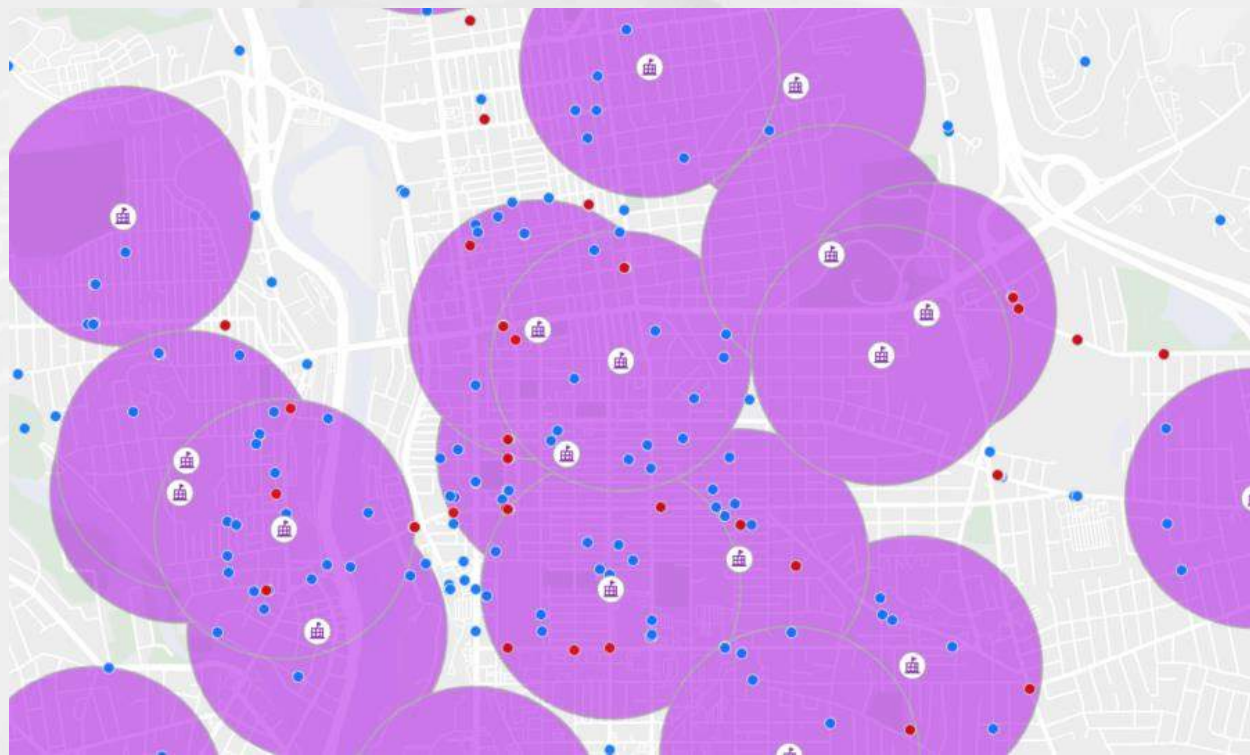
Where are crashes occurring?



DRAFT



Where are crashes occurring?



44%
of all VRU
crashes were
within 2,000
feet of a school



Who is involved?



1.4 M

Total Population Living in NH

40%

Total VRU Crashes occurred within a disadvantaged community



218.9 K

Total Population Living in Census Tracts Identified as Disadvantaged by USDOT

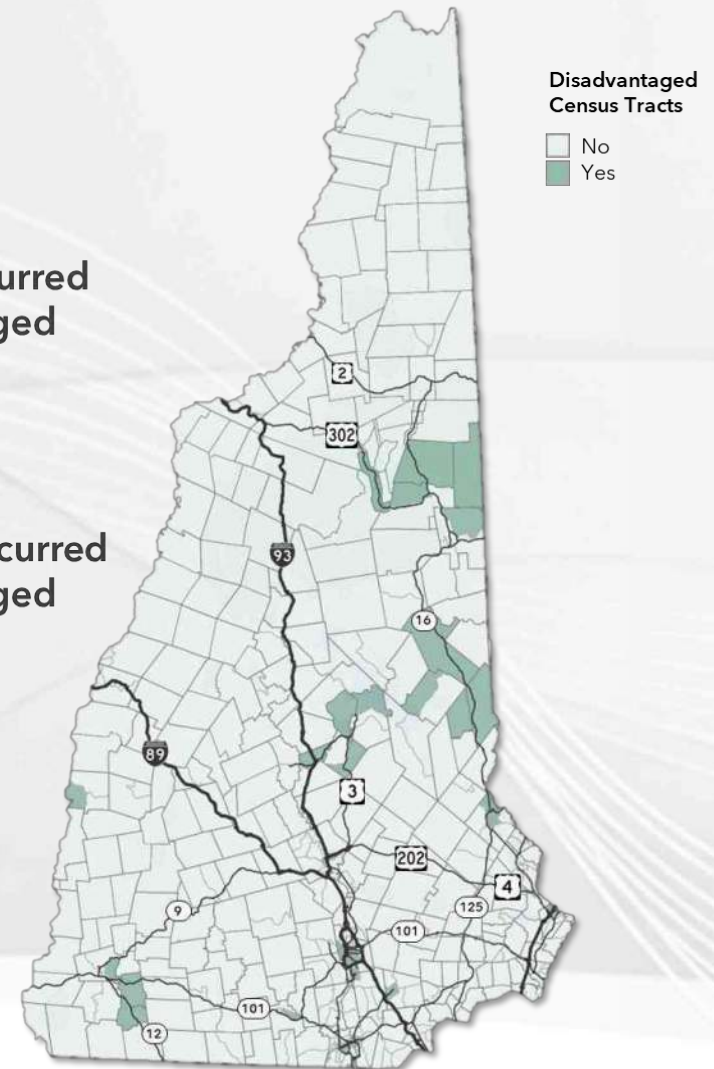
34%

Severe VRU Crashes occurred within a disadvantaged community



17%

% of State Population Living in Census Tracts Identified as Disadvantaged





Who is involved?



20%

of pedestrian fatalities involved pedestrians under the influence of drugs or alcohol.



5%

of VRU fatalities involved driver impairment.



45%

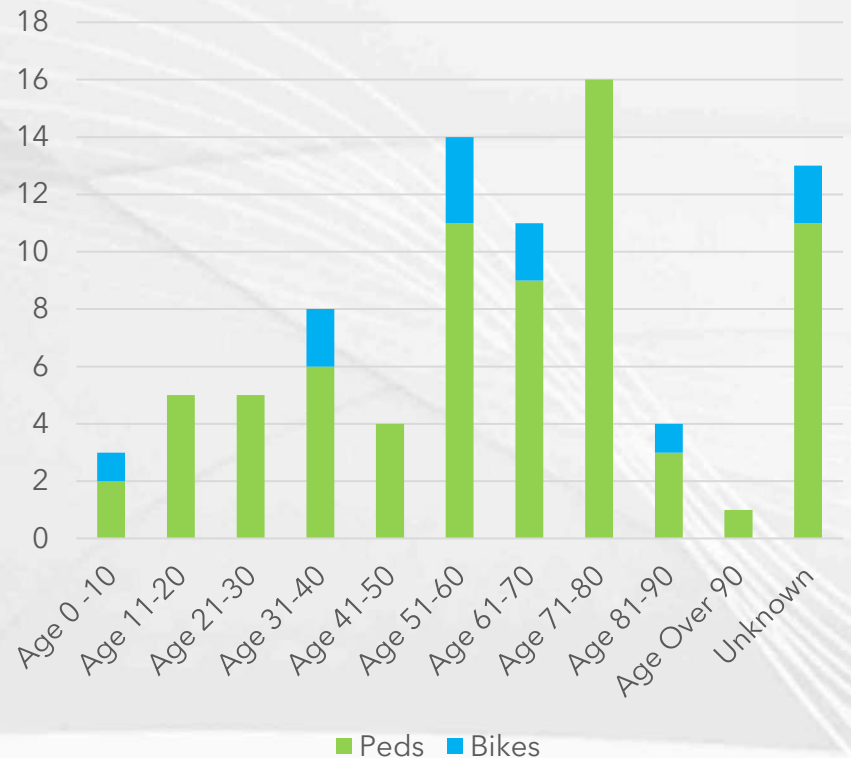
of bike fatalities involved cyclists not wearing a helmet.



30%

of VRU fatalities were people aged 65+

VRU FATALITIES BY AGE GROUP



Important Takeaways



Number of VRU crashes are proportional to population, i.e. more frequent in urban areas



Darkness is a critical factor in severe VRU crashes



Rural VRU crashes tend to be more severe than urban crashes



40% of VRU crashes occurred in disadvantaged communities



Principal and minor arterials have disproportionately severe VRU crashes



44% of VRU crashes occur within walking distance of schools



Severe VRU crashes commonly occur in transition zones approaching community centers



30% of VRU fatalities were people aged 65+

VRU Strategies

SPOT IMPROVEMENTS

- High Injury Network - Proven Safety Countermeasures

SYSTEMIC IMPROVEMENTS

- Systemic Risk Approach - Program and Strategies
 - Complete Streets
 - Material Procurement Programs
 - Safety Education Campaigns
 - Prioritization/Funding
 - Database Improvements - Quality and Availability



Next Steps



Program of Projects + Strategies

- Develop and map potential systemic improvements focused on sites with high potential for VRU crash reduction



Safe System Approach

- Gather data regarding the Safe System Approach from FHWA and other state DOTs
- Summarize findings and present to NHDOT



VRU Safety Assessment

Develop written report to document findings of Tasks 1-5

ONGOING OUTREACH

DRAFT

Questions?

Michael Dugas

mdugas@gpinet.com

603.374.7915

Nicole Rogers

nrogers@gpinet.com

978.570.2985

MEETING NOTES

October 19, 2023

1:00 PM

PROJECT: NHDOT
Vulnerable Road User Safety Assessment
GPI #NEX-2021430.08

LOCATION: Virtual – Microsoft Teams

PURPOSE: HSIP Committee

ATTENDEES:

NHDOT:

Corey Spetelunas- HSIP Project Manager
Jim Marshall – Highway Design
Mark Kirouac – Highway Maintenance
Stuart Thompson - Traffic

FHWA:

Michelle Marshall

Others:

Meghan Theriault – Gilford DPW
Phil Warren – City of Berlin
Meghan Butts – Upper Valley Lake Sunapee RPC
Henry Underwood – Southwest RPC
Scott Bogle – Rockingham PC

Greenman-Pedersen, Inc:

Nicole Rogers

DATE PREPARED: October 20, 2023

N. Rogers delivered a comprehensive overview of the safety assessment process by discussing the content contained within the attached PowerPoint presentation. This included insights into the ongoing data analysis, an exploration of the strategies and programs designed to tackle high-risk areas and vulnerable populations. The following topics were deliberated upon during the meeting:

1. In regard to crashes with unknown crash severity reported, the NH Department of Health and Human Services (NHDHHS) has been working with hospital emergency department data to better understand and identify VRU serious injuries. It is recommended to integrate hospital data with crash data to gain deeper insights into the nature and severity of injuries sustained by vulnerable road users.
2. In regard to underreported VRU crashes, it is recommended that NHDOT work collaboratively with NH Department of Safety (NHDOS) to improve crash reporting procedures to better capture VRU crash data. This is a recommendation brought forth in both the Strategic Highway Safety Plan and Ped/Bike Plan.
3. The VRU Assessment analysis shows a prevalence of crashes where high speed roads transition into village centers. These roads are often state owned; however, NHDOT's policy has been that the state

does not have the resources to maintain ped/bike infrastructure (crosswalks, bike lane markings, pedestrian beacons) on state highways. It is recommended that this policy be revisited.

4. There is a significant percentage of impairment among VRU users involved in severe crashes. It is recommended that the VRU Assessment include a strategy to reduce impairment through substance avoidance education, targeted communication campaigns, and partnerships with social service agencies. It would be interesting to compare driver impairment to non-motorist impairment.
5. It is recommended that roadway characteristic data also be improved in addition to crash data. Attributes such as pedestrian and bicycle infrastructure as well as shoulder widths/conditions are very beneficial for numerous efforts. It should be noted that an effort to update shoulder widths is currently underway.
6. In regard to crash data, it would be beneficial to collect data pertaining to plowing conditions, e.g., shoulder was plowed or sidewalk was not plowed, etc.

These notes constitute our understanding of the discussions and conclusions reached. Please advise us within ten (10) days, in writing, of any exceptions or corrections.

Respectfully submitted,

Nicole Rogers

Nicole Rogers, P.E.
Cc: All Attendees

Stakeholder Meeting 2 - October 26, 2023

VULNERABLE ROAD USER SAFETY ASSESSMENT

Stakeholder Meeting #2
October 26, 2023

Agenda

- Introductions
- VRU Assessment Recap
- High Injury Network
- High Risk Trends
- Programs / Strategies
- Next Steps

Project Team



- ↳ **Bill Lambert, PE**
State Highway Safety Administrator
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Asst Safety Engineer
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VRU SAFETY ASSESSMENT OVERVIEW

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- **Consider Safe System Approach**
- **Due to FHWA November 15, 2023**



Scope of Work

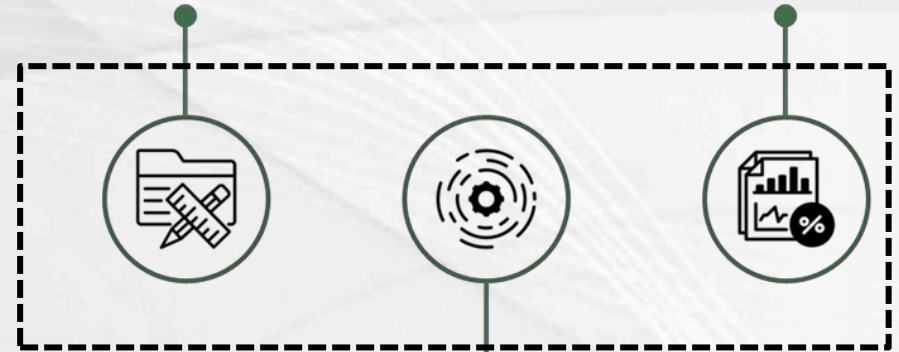
Task 2 Quantitative Analysis of VRU Safety Risks

- Describe the analysis methods to be used to identify VRU risks while considering crash history, infrastructure characteristics, and socio-economic factors
- Map VRU risk on the statewide road network



Task 4 Program of Projects + Strategies

- Evaluate the recommended spot improvement candidates produced by the Regional Planning Commissions
- Develop and map potential systemic improvements focused on sites with high potential for VRU crash reduction



Task 6 VRU Safety Assessment

Develop written report to documents findings of Tasks 1-5



Task 1 Data Collection and Analysis

- Gather crash data regarding fatalities and injury crashes for the 2017-2022 time period
- Evaluate fatal and injury crash data to reveal trends and to compare the safety of VRU to overall safety performance



Task 3 Consultation with Stakeholders

- Identify and engage appropriate stakeholders
- Hold two (2) stakeholder meetings
- Meet with NHDOT Front Office
- Document Consultations



Task 5 Safe System Approach

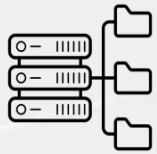
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BASELINE CONDITIONS RECAP

Available Data + Limitations



DATA SOURCES

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Infrastructure Data

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CHALLENGES + LIMITATIONS

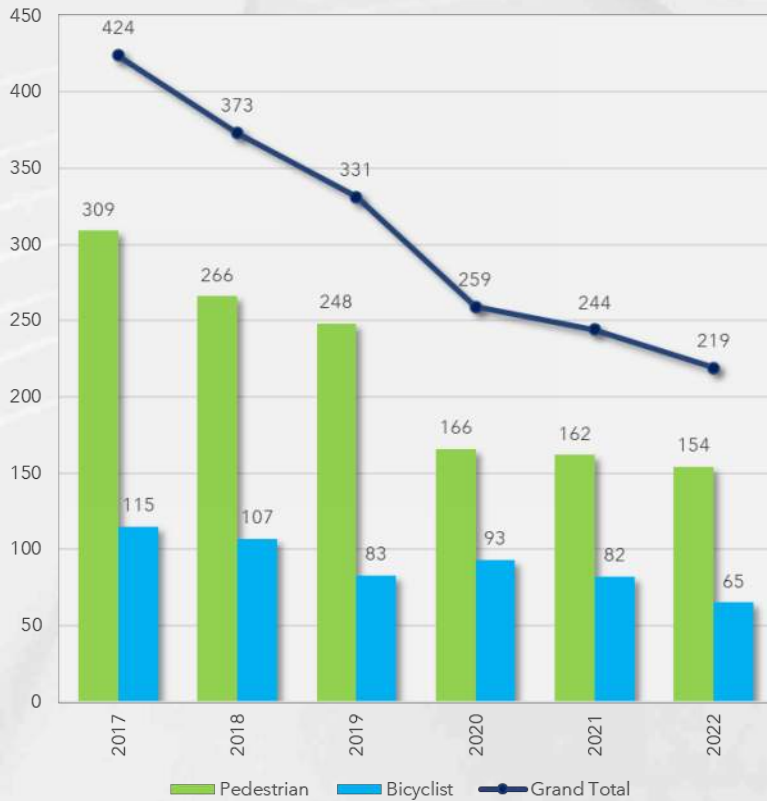
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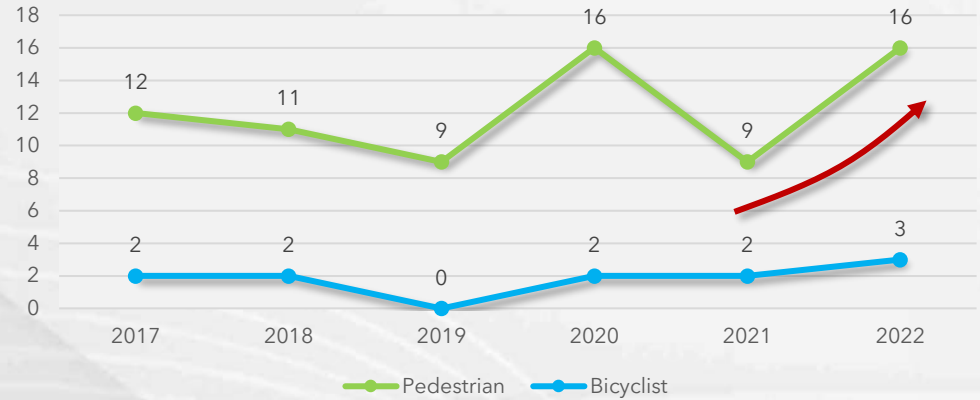
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Trends

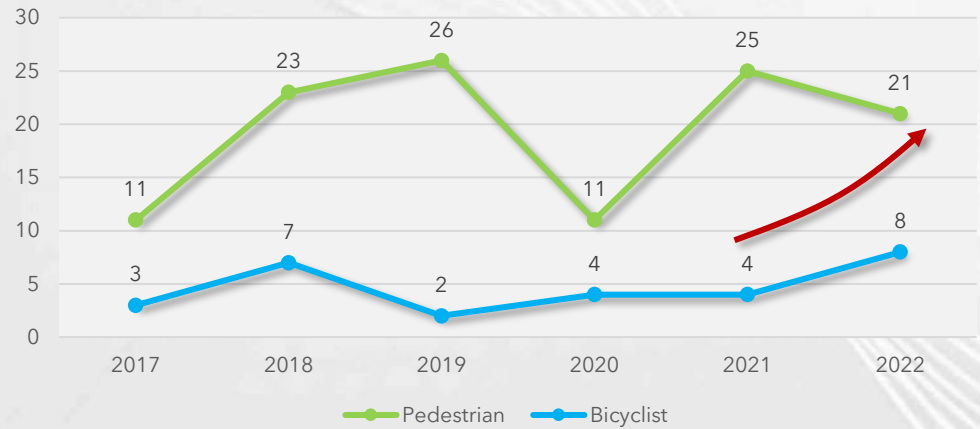
Non-Motorist Crashes



Non-Motorist Fatalities



Non-Motorist Suspected Serious Injuries



Crash Severity

FATALITIES

  73  11

SUSPECTED SERIOUS INJURIES

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PROPERTY DAMAGE ONLY

  380  147

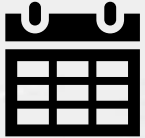
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12%
SEVERE
DESIGNATION
12% of VRU CRASHES

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crashes
were injured
to some
degree

72%
possible if
unknown
crashes
resulted in
injury

Questions to ask...



When are crashes occurring?



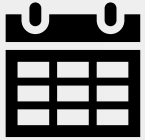
In what conditions are crashes occurring?



Where are crashes occurring?



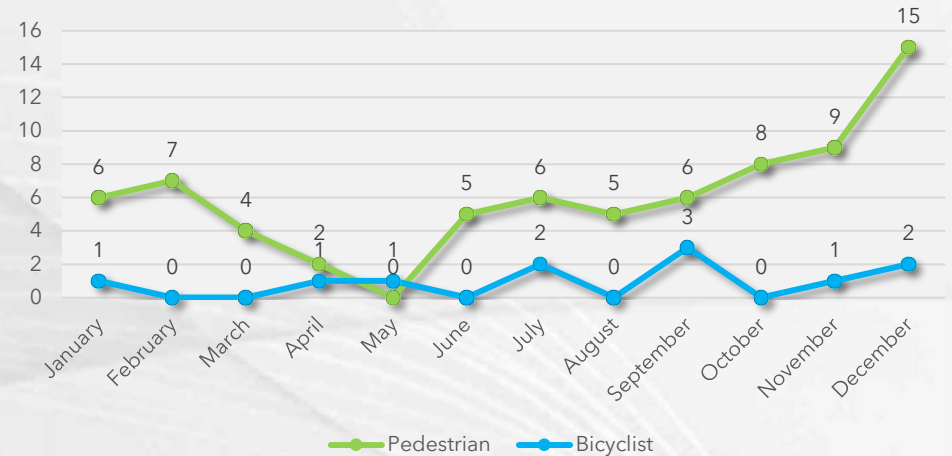
Who is involved?



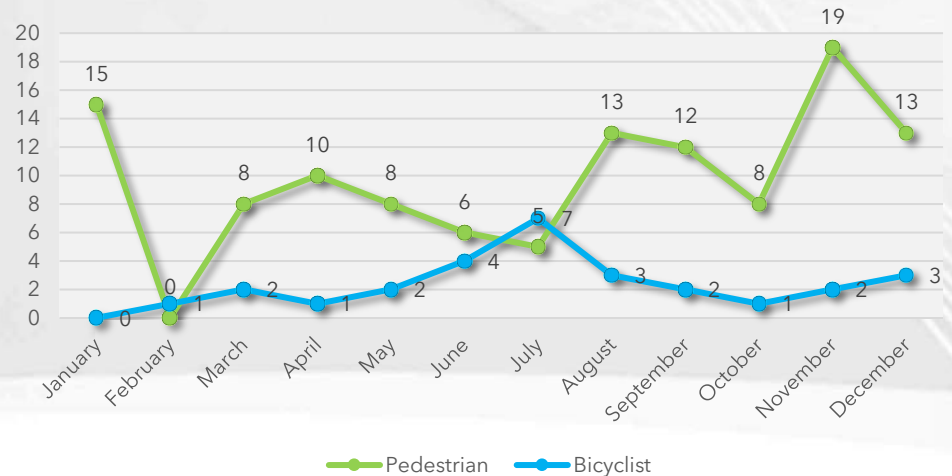
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Non-Motorist Fatalities



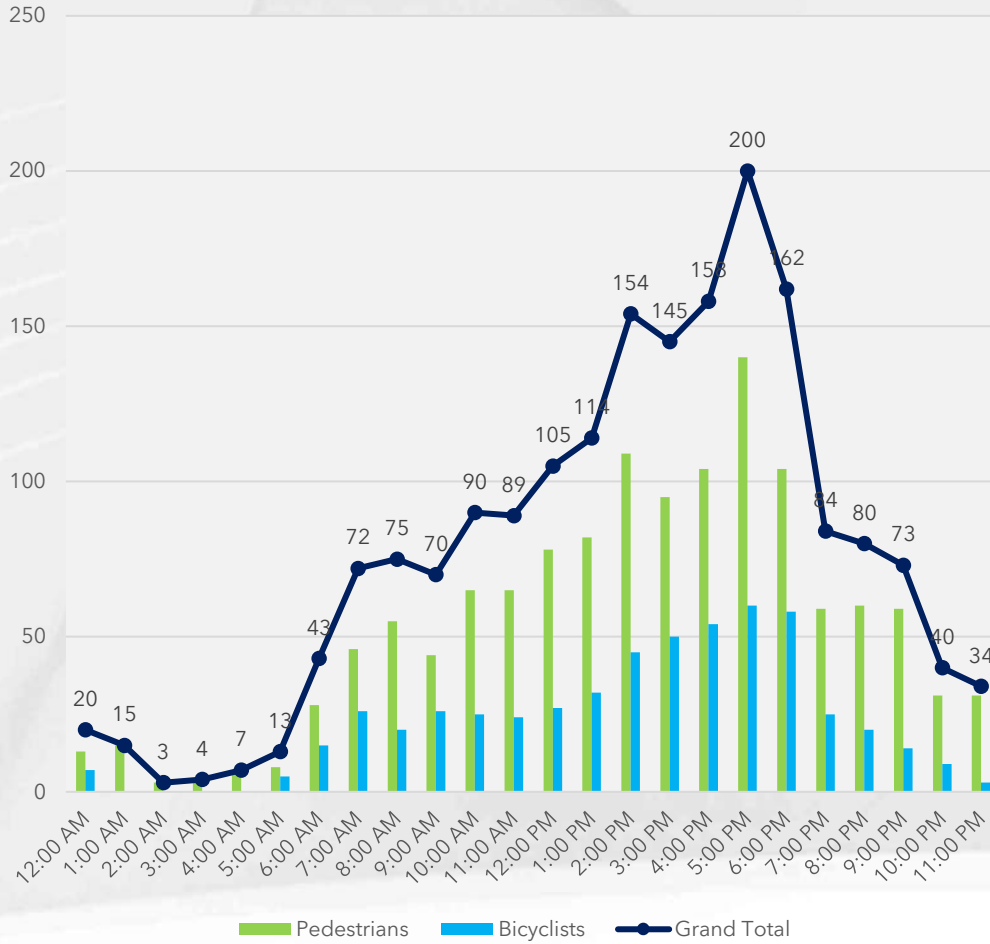
Non-Motorist Suspected Serious Injuries





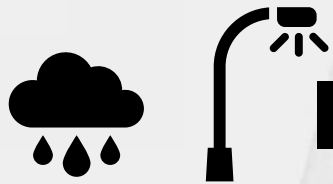
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Jun	5%
July	5%
Aug	4%
Sep	9%
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Nov	14%
Dec	14%

OVER 50%



In what conditions?

Dark-Lighted/
Dark -Street Light On

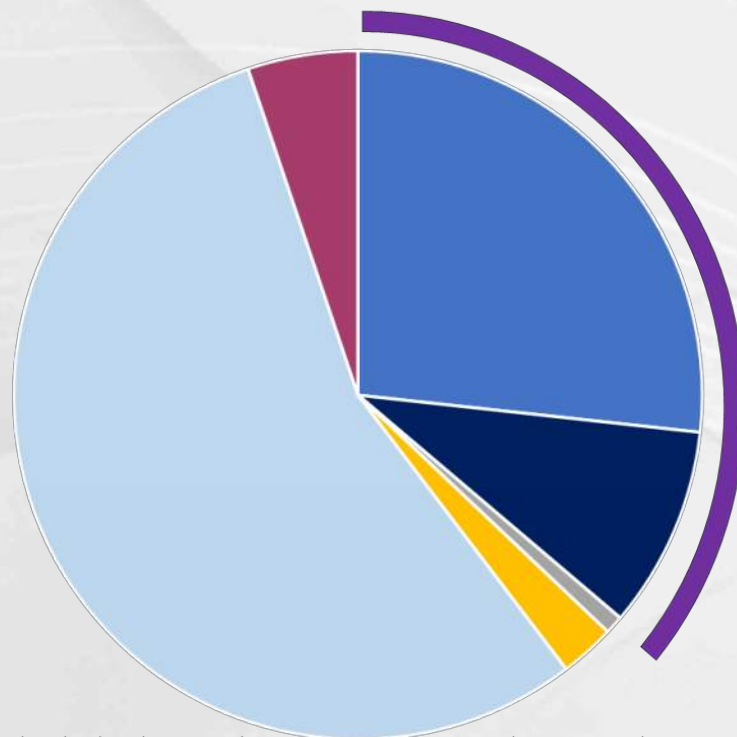
Dark-Non-Lighted/
Dark-Street Light Off

Dark-No
Street Light

Daylight

Dawn

Dusk



Dark-Lighted/Dark-Street Light On

Dark-No Street Light

Dark-Non Lighted/Dark-Street Light Off

Dawn

Daylight

Dusk

39%

of **Severe** VRU
crashes reported
dark conditions



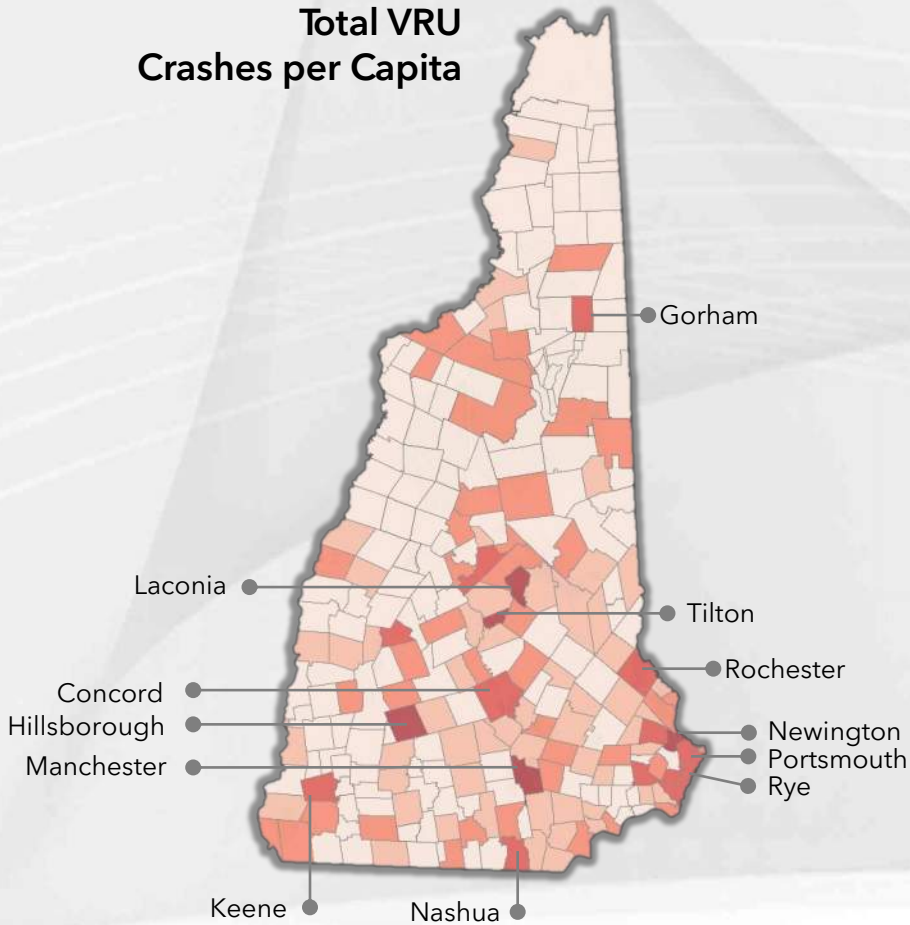
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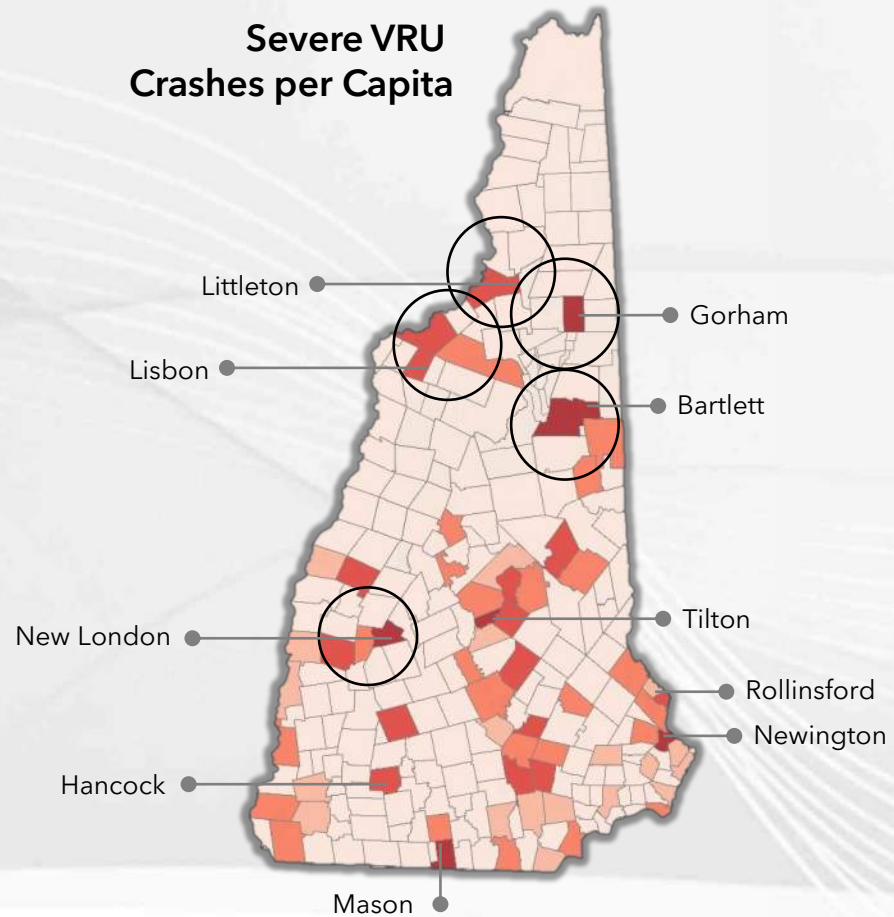


Where are crashes occurring?

Total VRU Crashes per Capita



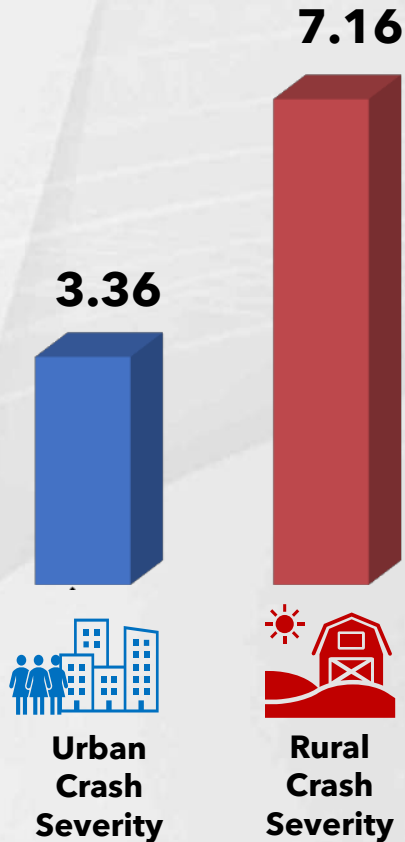
Severe VRU Crashes per Capita



Low High



Where are crashes occurring?



Higher Speed Limits



Limited Infrastructure



Lower Population Density / Driver Behavior



Lack of Street Lighting



Limited Public Transportation

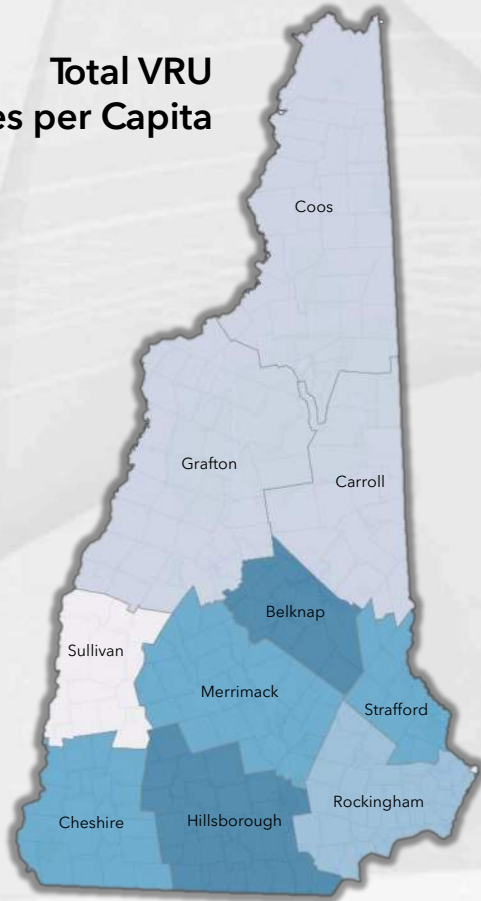


Limited Access to Healthcare / Longer Response Times

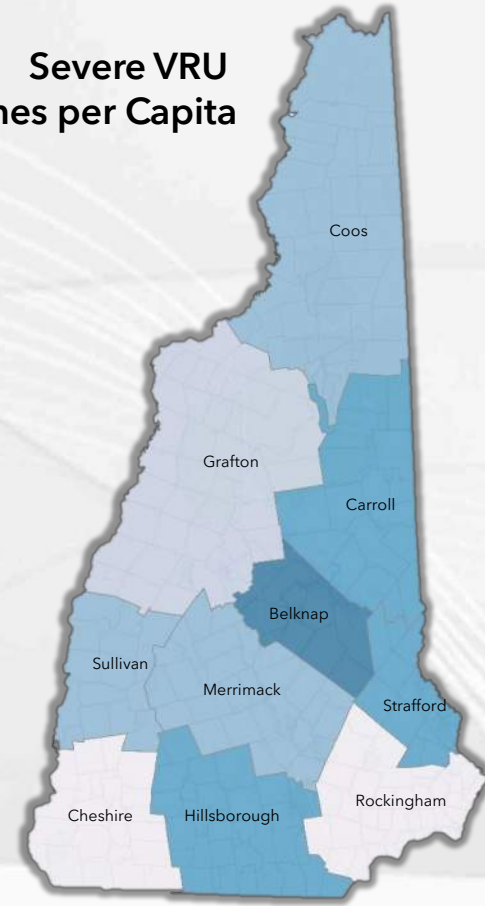


Where are crashes occurring?

Total VRU
Crashes per Capita



Severe VRU
Crashes per Capita



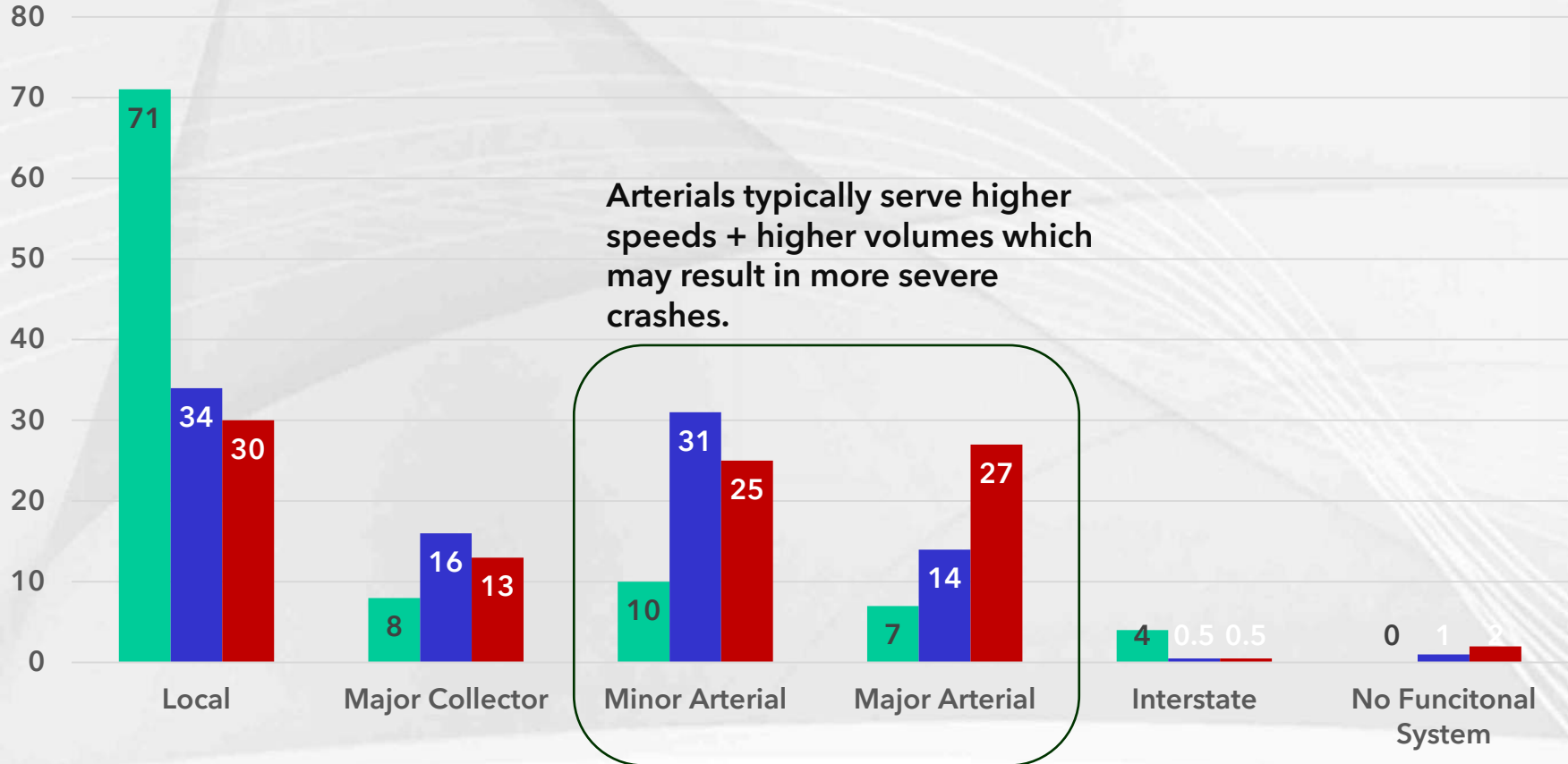
Low High

DRAFT



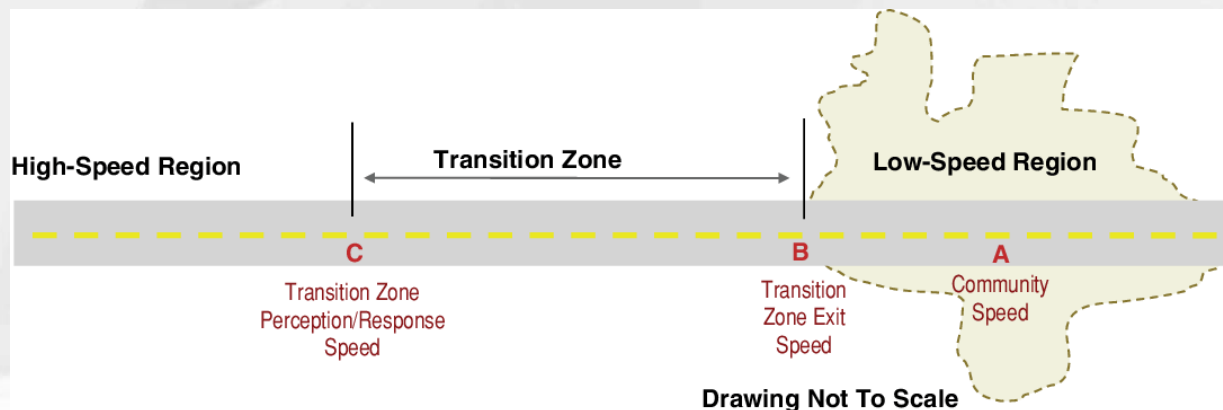
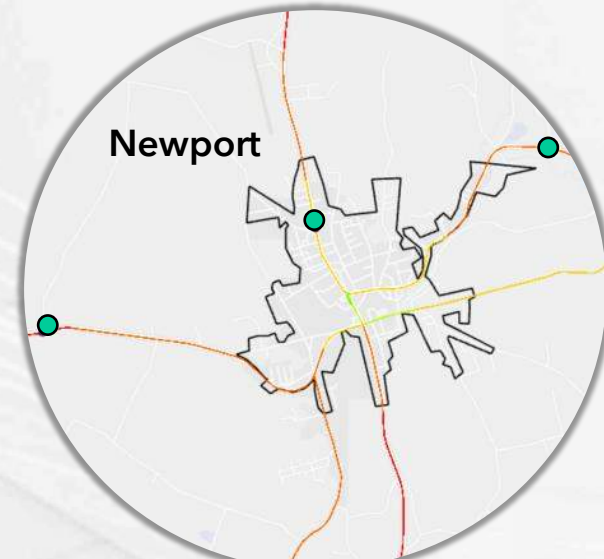
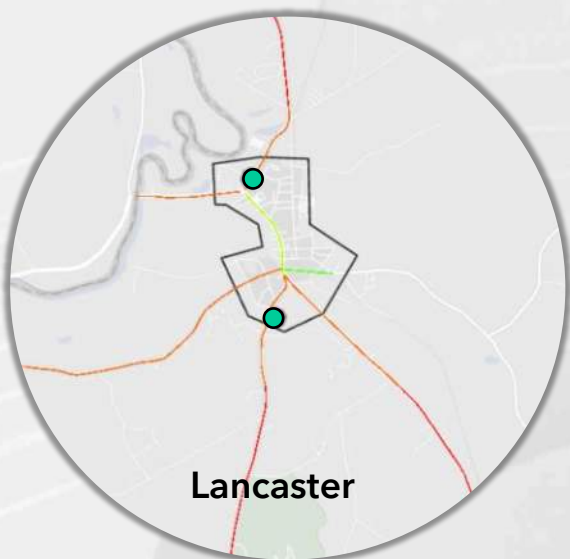
Where are crashes occurring?

■ % of Road Network ■ % All VRU Crashes ■ % Severe VRU Crashes





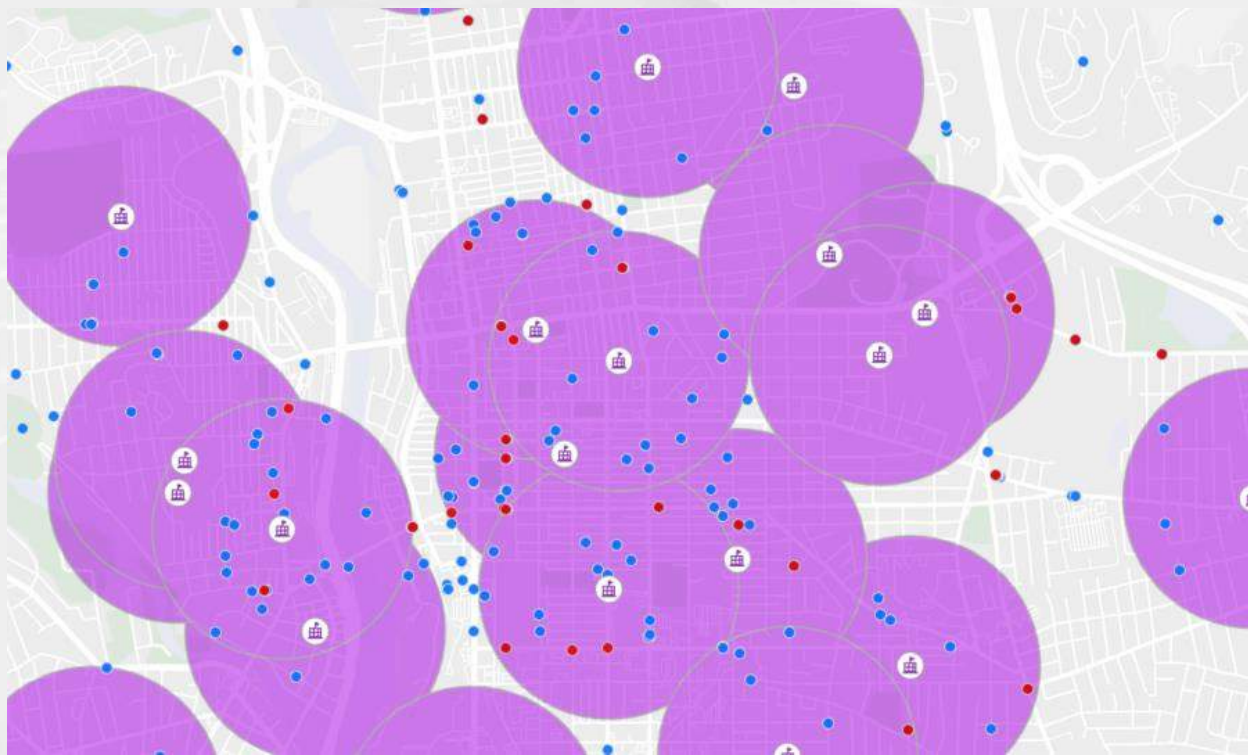
Where are crashes occurring?



- VRU Crash
- ⬡ NH Designated Community Center
- Free-Flow Speed
 - 21-29
 - 30-35
 - 36-45
 - 46 - 59



Where are crashes occurring?



44%
of all VRU
crashes were
within 2,000
feet of a school



Who is involved?



1.4 M

Total Population Living
in NH



218.9 K

Total Population Living in Census
Tracts Identified as Disadvantaged
by USDOT



17%

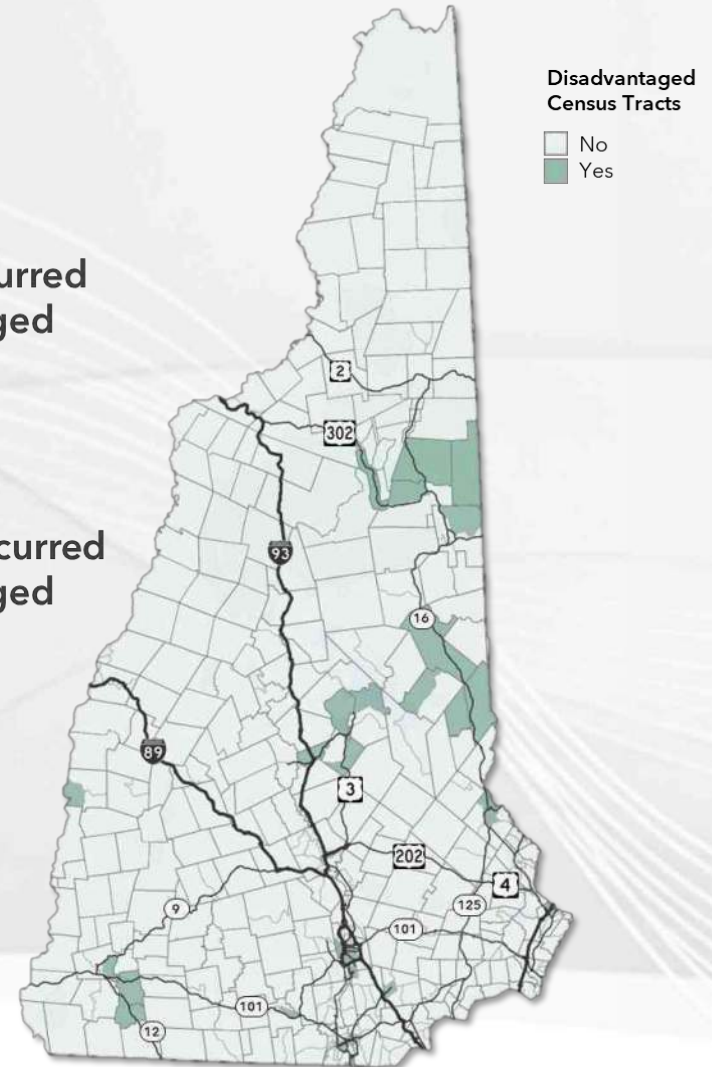
% of State Population Living in
Census Tracts Identified as
Disadvantaged

40%

Total VRU Crashes occurred
within a disadvantaged
community

34%

Severe VRU Crashes occurred
within a disadvantaged
community





Who is involved?



20%

of pedestrian fatalities involved pedestrians under the influence of drugs or alcohol.



5%

of VRU fatalities involved driver impairment.



45%

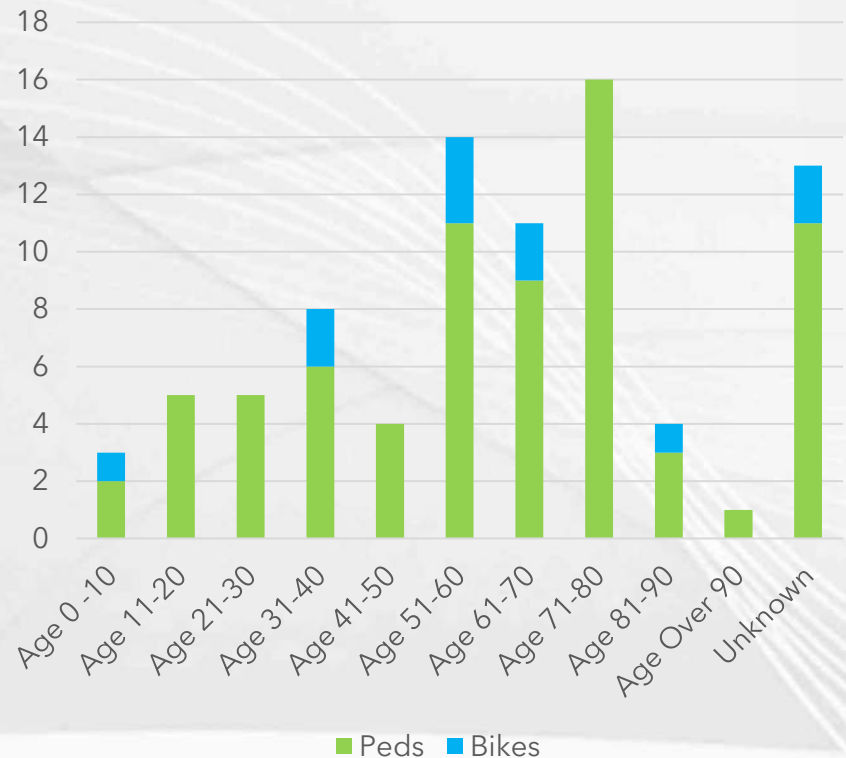
of bike fatalities involved cyclists not wearing a helmet.



30%

of VRU fatalities were people aged 65+

VRU FATALITIES BY AGE GROUP



High Risk Areas + Populations



Number of VRU crashes are proportional to population, i.e. more frequent in urban areas



Darkness is a critical factor in severe VRU crashes



Rural VRU crashes tend to be more severe than urban crashes



40% of VRU crashes occurred in disadvantaged communities



Principal and minor arterials have disproportionately severe VRU crashes



44% of VRU crashes occur within walking distance of schools



Severe VRU crashes commonly occur in transition zones approaching community centers



30% of VRU fatalities were people aged 65+

HIGH INJURY NETWORK

Pedestrian HIN

Pedestrian Severity Index



0 20

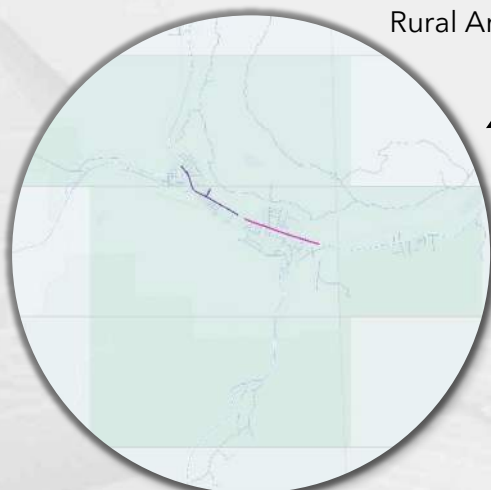
Statistically Significant Hot Spot

Pedestrian Crash Concentration

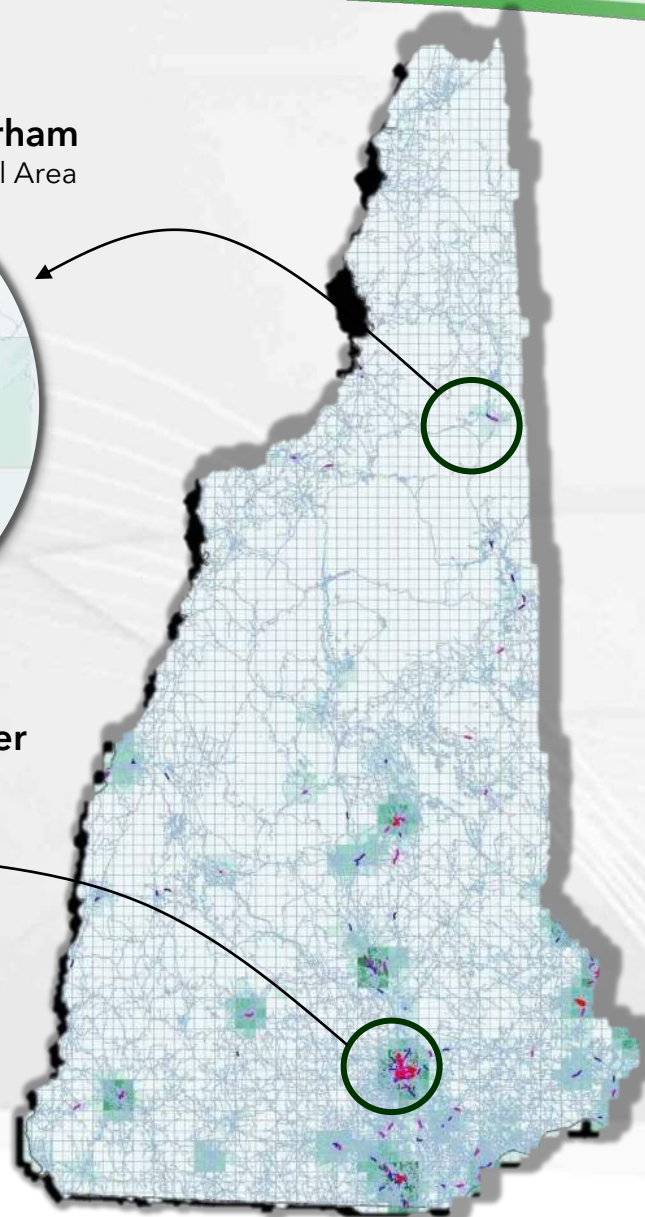
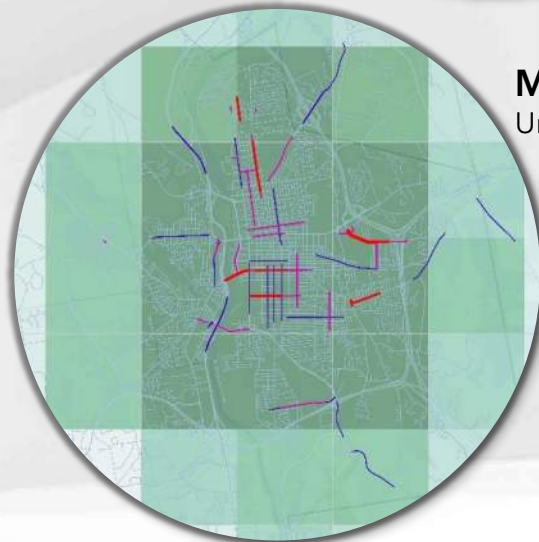


Low High

Gorham
Rural Area



Manchester
Urban Area



Bicycle HIN

Bicycle Severity Index



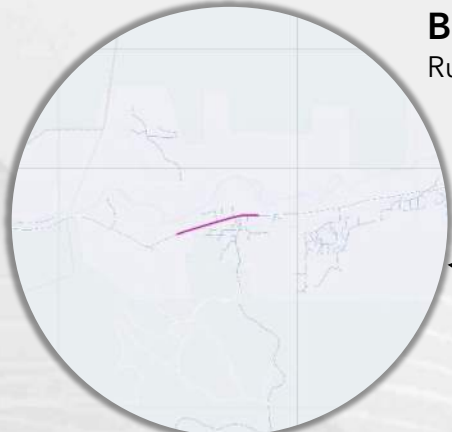
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Statistically Significant Hot Spot

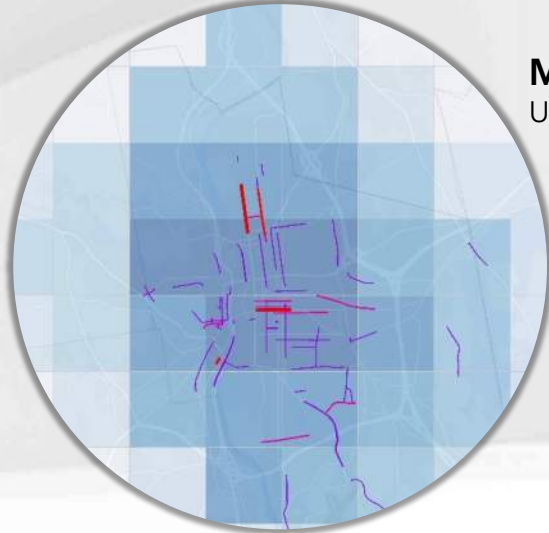
Bicycle Crash Concentration



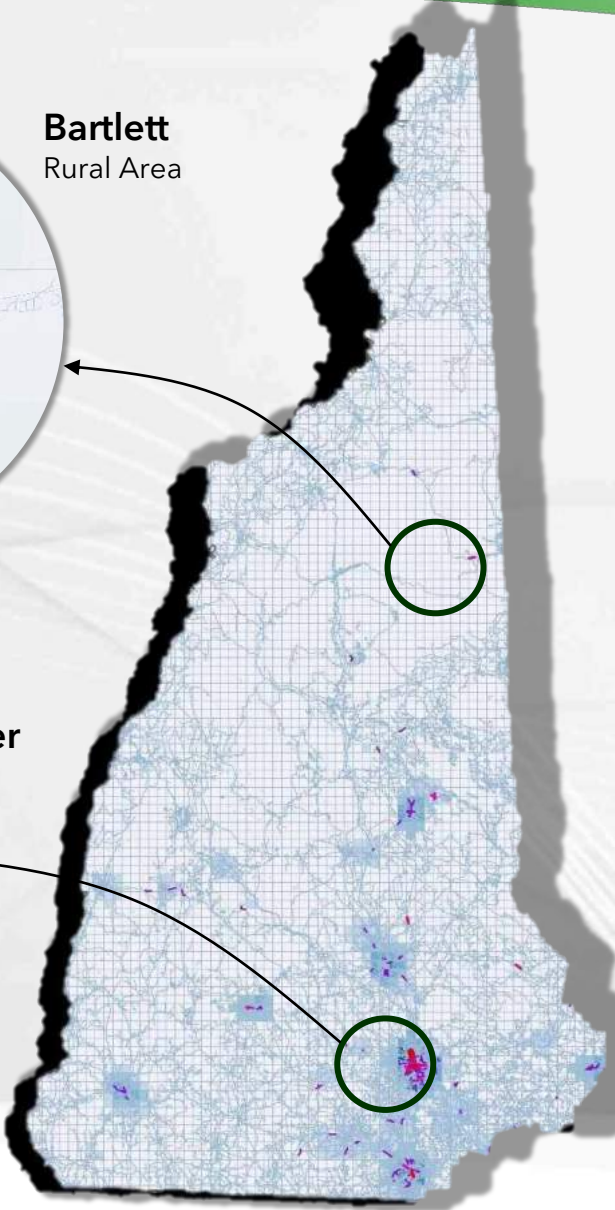
Low High



Bartlett
Rural Area



Manchester
Urban Area



VRU STRATEGIES

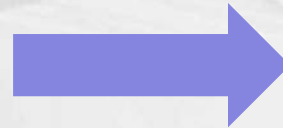
Crash Severity

FATALITIES

  **73**  **11**

SUSPECTED SERIOUS INJURIES

  **117**  **28**



1 BILLION

\$ 1,043,788,600.00

Comprehensive Crash Cost
over 2017-2022 Period

174 MILLION

\$ 173,964,766.67

Average Annual
Comprehensive Crash Cost

VRU Strategies

SPOT IMPROVEMENTS

- High Injury Network - Proven Safety Countermeasures

SYSTEMIC IMPROVEMENTS

- Systemic Risk Approach - Program and Strategies



STRATEGY 01

Enhance pedestrian and bicyclist safety along the high injury network.

Action Item # 1 - Develop and implement a comprehensive statewide project dedicated to addressing all state-owned high injury network corridor through the implementation of proven safety countermeasures

Action Item # 2 - Develop and provide a framework to MPOs, RPCs, and Communities to address locally owned corridors on the High Injury Network.

Action Item # 3 - Regularly recreate the High Injury Network on a yearly or bi-yearly basis, considering the most recent crash data, evolving traffic patterns, and the effectiveness of previously implemented countermeasures. This data should be shared with MPOs, RPCs, and local communities.



- 15% of all HIN on state owned roadways
- 85% of all HIN on locally owned roadways

DRAFT

Proven Safety Countermeasures



WALKWAYS



ON- AND OFF-ROAD FACILITIES



RAISED MEDIANS/
PEDESTRIAN REFUGE
ISLANDS



CROSSWALK
VISIBILITY
ENHANCEMENTS



ROAD DIETS



RECTANGULAR
RAPID FLASHING
BEACONS



PEDESTRIAN
HYBRID BEACON
(HAWK SIGNAL)



LEADING
PEDESTRIAN
INTERVAL

Proven Safety Countermeasures



**SETTING
APPROPRIATE
SPEED LIMITS**
(in conjunction with
enforcing roads)



**SPEED SAFETY
CAMERAS**



STREET LIGHTING



**ROAD SAFETY
AUDITS**



**PED AND BIKE
SAFETY ACTION
PLANS**

STRATEGY 02

Identify, adopt, and encourage the use of best practices

Action Item # 1 - Institutionalize a Complete Streets Program Statewide.

Action Item # 2 - Develop an online comprehensive inventory of pedestrian and bicycle safety best practices and policies to be publicly available.

Action Item # 3 - Implement an effort to review and update programs, policies and guidelines to incorporate multi-modal transportation concepts

Action Item # 4 - Encourage local entities to conduct ADA assessment plans, adopt traffic calming procedures/policies, and develop Bicycle and Pedestrian Safety Plans



- 74% of New Hampshire Census Tracts experience Transportation Inequity
- 65% of severe crashes on locally owned roads

DRAFT

STRATEGY 03

Develop a series of programs intended to provide technical assistance to local entities

Safe Routes to School - Continue to improve and support the SRTS program by developing a Signs and Markings program that supports the purchase of school zone equipment.

Road Safety Audit Program - Continue to improve and promote Road Safety Audits.

Quick Build/Demonstration Project - supports the purchase and use of low-cost, short-term traffic control devices/ equipment

Transition Zone - Develop and implement a new safety program that supports the purchase and use of speed management measures known to improve transitional zones (rural to small community centers).

High Risk Crosswalk Program - Aimed to address crosswalk in high risk areas (Schools/Rail Trails/Other Land Uses...)



- 65% of severe crashes on locally owned roads
- 44% of all VRU crashes were within 2,000 feet of a school
- Severe VRU crashes commonly occur in transition zones approaching community centers

DRAFT

STRATEGY 04

Educate State, external partners, and the public about the needs of Vulnerable Road Users.

Action Item # 1 - Develop a statewide safety campaign for pedestrian and bicyclists.

Action Item # 2 - Expand existing training programs to improve education and outreach regarding non-motorized transportation safety issue for state employees and external partners (MPOs, RPCs, Local Communities)

Action Item # 3 - Help reduce impairment through substance avoidance education, targeted communications campaigns and partnerships with social service agencies.

Action Item # 4 - Increase Outreach and Education towards Seniors

Action Item # 5 - Partner with DMV to create a curriculum geared towards walking and biking safety for driver education programs



- 45% of bicyclist fatalities were not wearing a helmet
- 20% of pedestrian fatalities were impaired
- 65% of severe crashes on local roads
- 30% of fatalities were 65+ years old

DRAFT

STRATEGY 05

Improve data collection, data analysis and data accessibility/transparency.

- Action Item # 1** - Enhance Crash Data Collection through collaboration with law enforcement agencies to standardize data collection procedures for pedestrian and bicycle-related crashes which includes the addition of data collection fields
- Action Item # 2** - Enhance Crash Analysis through the development and utilization of a systemic crash analysis methodology
- Action Item # 3** - Create a Crash Data Integration System and Sharing Interface for data accessibility and transparency
- Action Item # 4** - Develop a Statewide Non-Motorized Counting Program



DRAFT

STRATEGY 06

Invest in pedestrian and bicycle safety.

Action Item # 1 - Create a bicycle and pedestrian grant award with an emphasis on equity

Action Item #2 - Update prioritization metrics in TIP/TAP funding to include ped/bike safety

Action Item # 3 - Invest in Research and Development for Safer Vehicles

Action Item # 4 - Invest in Research and Development for Enhanced Post-Crash Trauma Care



- \$174 Million in Average Annual Comprehensive crash Cost over six year study period
- 48% of segments within the HIN is located within historically disadvantaged communities
- 12% of New Hampshire population lives outside of a 30 minute service area of hospital

DRAFT

Next Steps



VRU Safety Assessment

Draft Report to NHDOT by Nov 1.
Final Report to FHWA by Nov. 15

Questions?

Submit comments by 11/6

Michael Dugas

mdugas@gpinet.com

603.374.7915

MEETING NOTES**October 26, 2023****2:00 PM**

PROJECT: NHDOT
Vulnerable Road User (VRU) Safety Assessment
GPI #NEX-2021430.08

LOCATION: Teams

PURPOSE: Stakeholder Meeting 2

ATTENDEES:

NHDOT:

Bill Lambert – State Safety Engineer
Corey Spetelunas – Highway Safety Project Manager
Bill Watson – Administrator, Planning and Community Assistance
Gerry Bedard – Active Transportation Engineer
Jim Marshall – Administrator, Highway Design
Tom Jameson – TAP Manager
Lee Baronas – State Traffic Engineer
Amanda Zatecka – Safety Project Manager
Bill Oldenburg – Director of Project Development

Greenman-Pedersen, Inc:

Mike Dugas

Nicole Rogers

Carolyn Radisch

Others:

Michelle Marshall – FHWA NH Division
Miguel Ramos – FHWA NH Division
Yamilee Volcy – FHWA NH Division
Colin Lentz – Strafford RPC
Scott Bogle – Rockingham PC
J.B. Mack – Southwest Region PC
Dan Hudson – City of Nashua
Tim Blagden – Friends of the Concord-Lake Sunapee Rail Trail
Ian Marsh – NH Division of Motor Vehicles
Jay Minkarah – Nashua RPC
Alexis Bly – Dartmouth Health Injury Prevention Center
Thom O'Connor – NHDHHS, Bureau of Elderly and Adult Services
Sue Centner – Derry Cooperative Alliance for Teen Safety (CATS)
Kürt Blomquist – City of Keene
Marilee Enus – UNH T² Center (NH LTAP)
Bruce Caplain – Bike-Walk Alliance of NH

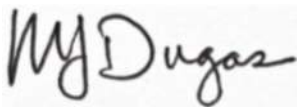
DATE PREPARED: November 1, 2023

The meeting recording and transcript are available on the NHDOT website.
Additional comments and observations to supplement the transcript:

1. Bruce Caplain: asked if the crash data represented collisions between VRUs and motor vehicles or all crashes involving VRUs. N. Rogers responded that most if not all the crashes would have involved motor vehicles. Crash reports for other crashes are likely very seldom.
2. Tim Blagden: Statistics show 44% of VRU crashes are within 2,000' of a school. What are statistics at greater distances such as 3,000' or a mile? N. Rogers answered that other distances were not evaluated as the 2,000' range was meant to represent a reasonable walking distance. Other distances can easily be evaluated with GIS.
3. Gerry Bedard observed that there are no measures intended to reduce motor vehicular volumes such as increased transit or the expansion of traffic demand management measures (e.g., staggered work/school hours).
4. Kürt Blomquist asked how the reporting of crash data can be standardized across the state. M. Dugas answered that the NHDOS continues to expand the statewide use of electronic reporting via their J-1 program. However, the difficulty is that whether the crashes are reported electronically or on paper, the data reported is not always accurate or complete.
5. Colin Lentz reported a recent crash where an errant vehicle struck a bus shelter and waiting passenger. He suggested protecting bus stops to make them safer and more attractive to transit users.
6. Marilee Enus offered the support of the NH LTAP as a liaison to assist with the training of local highway agencies in relevant safety practices. She also noted that if crash data becomes more available in the coming years, NH LTAP may be able to assist with crash analysis and the preparation of reports to support the safety planning needs of communities, as is done in some other states.

These notes constitute our understanding of the discussions and conclusions reached. Please advise us within ten (10) days, in writing, of any exceptions or corrections.

Respectfully submitted,



Michael Dugas, P.E.
Cc: All Attendees

NHDOT Front Office Meeting - October 30, 2023

VULNERABLE ROAD USER SAFETY ASSESSMENT

Front Office Meeting
October 30, 2023

Agenda

- Introductions
- VRU Assessment Recap
- High Injury Network
- High Risk Trends
- Programs / Strategies
- Next Steps

Project Team



- ↳ **Bill Lambert, PE**
State Highway Safety Administrator
- ↳ **Corey Spetelunas, PE**
Asst Safety Engineer
- ↳ **Gerry Bedard, PE**
Active Transportation Engineer



- ↳ **Michelle Marshall**
NH Division, Safety/Area Engineer

GPI

- ↳ **Mike Dugas, PE**
Project Manager
- ↳ **Carolyn Radisch, AICP**
Senior Transportation Planner
- ↳ **Nicole Rogers, PE**
Project Engineer, GIS Analyst

A photograph of a residential street with trees, a speed limit sign, and a person walking a dog. The image is overlaid with a semi-transparent green filter. The text "VRU SAFETY ASSESSMENT OVERVIEW" is centered in white, bold, sans-serif font.

VRU SAFETY ASSESSMENT OVERVIEW

What is a Vulnerable Road User?

A Vulnerable Road User is defined by FHWA as “a non-motorist with a Fatality Analysis Reporting System (FARS) person attribute code for **pedestrian, bicyclist, other cyclist, and person on personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist...**”

It is important to note that unlike other organizations including the National Highway Traffic Safety Administration (NHTSA) and the National Safety Council, FHWA does not include motorcyclists among VRUs.



Federal Requirements

2021 Bipartisan Infrastructure Law (BIL)

- **Data-driven process to identify areas of high-risk for vulnerable road users.** Specifically, the State must perform a quantitative analysis of VRU fatalities and serious injuries.
- **Consult with local governments, MPOs, and regional transportation planning organizations that represent high-risk areas.**
- **Develop program of projects/strategies** to reduce safety risks to vulnerable road users in areas identified as high-risk
- **Consider Safe System Approach**
- **Due to FHWA November 15, 2023**



Scope of Work

Task 2 Quantitative Analysis of VRU Safety Risks

- Describe the analysis methods to be used to identify VRU risks while considering crash history, infrastructure characteristics, and socio-economic factors
- Map VRU risk on the statewide road network



Task 4 Program of Projects + Strategies

- Evaluate the recommended spot improvement candidates produced by the Regional Planning Commissions
- Develop and map potential systemic improvements focused on sites with high potential for VRU crash reduction



Task 6 VRU Safety Assessment

Develop written report to documents findings of Tasks 1-5



Task 1 Data Collection and Analysis

- Gather crash data regarding fatalities and injury crashes for the 2017-2022 time period
- Evaluate fatal and injury crash data to reveal trends and to compare the safety of VRU to overall safety performance



Task 3 Consultation with Stakeholders

- Identify and engage appropriate stakeholders
- Hold two (2) stakeholder meetings
- Meet with NHDOT Front Office
- Document Consultations



Task 5 Safe System Approach

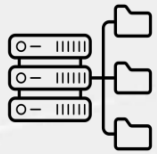
- Gather data regarding the Safe System Approach from FHWA and other state DOTs
- Summarize findings and present to NHDOT



A photograph of a residential street with trees, a speed limit sign, and people walking. The image is overlaid with a semi-transparent green filter. The text "BASELINE CONDITIONS RECAP" is centered in white, bold, sans-serif font.

BASELINE CONDITIONS RECAP

Available Data + Limitations



DATA SOURCES

Crash Data

- NH Department of Safety Crash Data 2017-2022
- NHDOS - DMV Run Lists 2017-2022
- National Highway Traffic Safety Administration (NHTSA) FARS Data 2017-2022

Infrastructure Data

- NHDOT GIS Roadway Inventory - Roadway Classification, Volumes, Speed, Roadway Features

Socio-Economic Data

- US Census Demographic Data - Income, Racial Makeup, Auto Availability, Environmental Justice Communities
- EPA EJ Screen Tool
- FHWA - Socioeconomic and Equity Analysis Maps
- CDC - Social Vulnerability Index

Land Uses

- NHDOT GIS Data - Schools, Recreation Areas/Points, Community Centers, Transit Stops, etc.

CHALLENGES + LIMITATIONS

- Frequency of Crashes
- Exposure Data
- Underreported Data
- Inconsistent Data
- Unknown Data
- Time Constraints!

- Lack of Individual Demographic Data

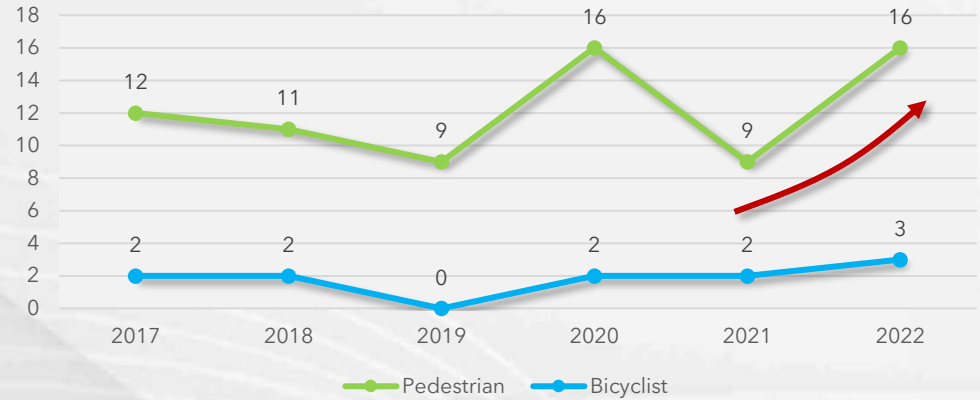
- All States doing this for the first time at the same time!

Trends

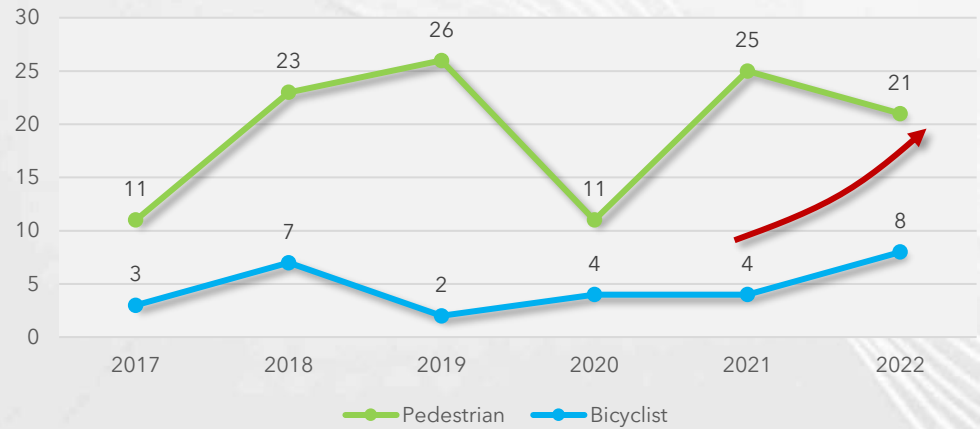
Non-Motorist Crashes



Non-Motorist Fatalities



Non-Motorist Suspected Serious Injuries



Crash Severity

FATALITIES

  **73**  **11**

SUSPECTED SERIOUS INJURIES

  **117**  **28**

SUSPECTED MINOR/POSSIBLE INJURIES

  **556**  **282**

UNKNOWN

  **179**  **77**

PROPERTY DAMAGE ONLY

  **380**  **147**

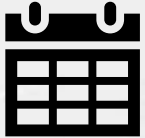
1,305  545 
1,850
VRU Crashes

12%
SEVERE
DESIGNATION
12% of VRU CRASHES

58%
of VRU
involved in
crashes
were injured
to some
degree

72%
possible if
unknown
crashes
resulted in
injury

Questions to ask...



When are crashes occurring?



In what conditions are crashes occurring?



Where are crashes occurring?

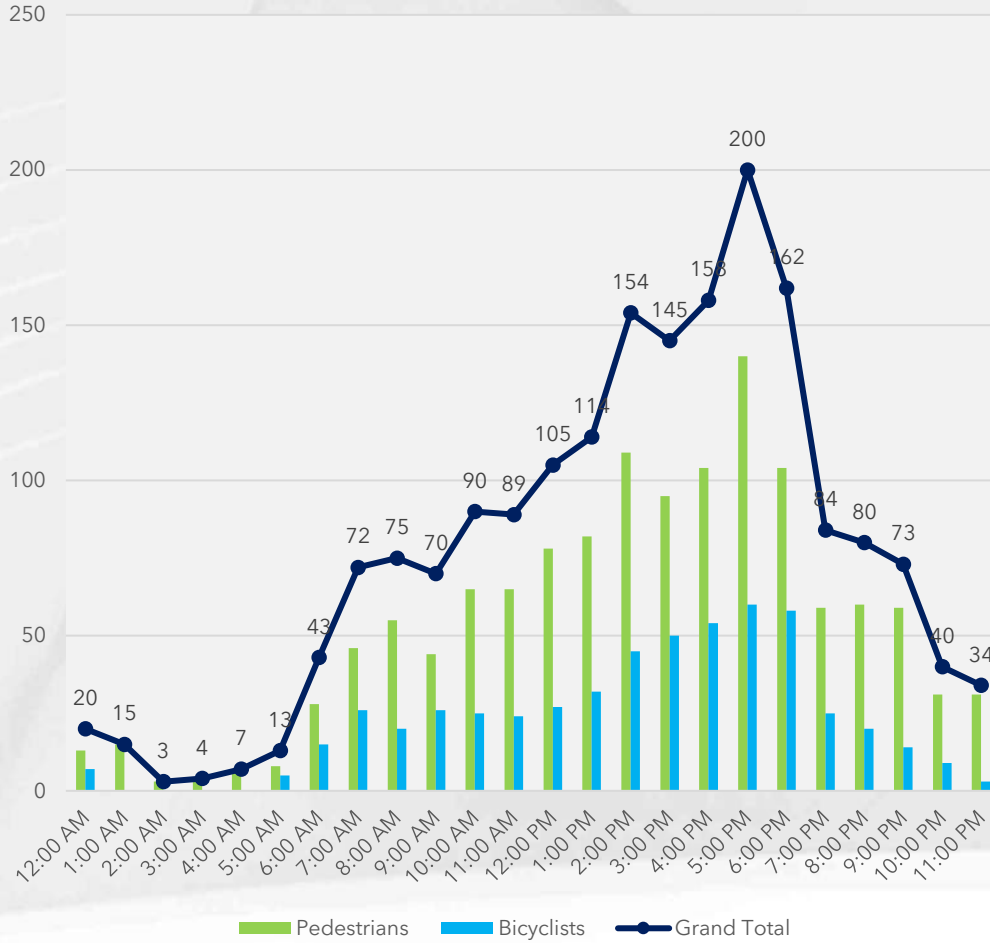


Who is involved?



When are crashes occurring?

VRU Crash Time of Day



Month	% of 5 PM Ped Crashes
Jan	20%
Feb	6%
Mar	5%
Apr	7%
May	6%
Jun	5%
July	5%
Aug	4%
Sep	9%
Oct	6%
Nov	14%
Dec	14%

OVER 50%



In what conditions?

Dark-Lighted/
Dark -Street Light On

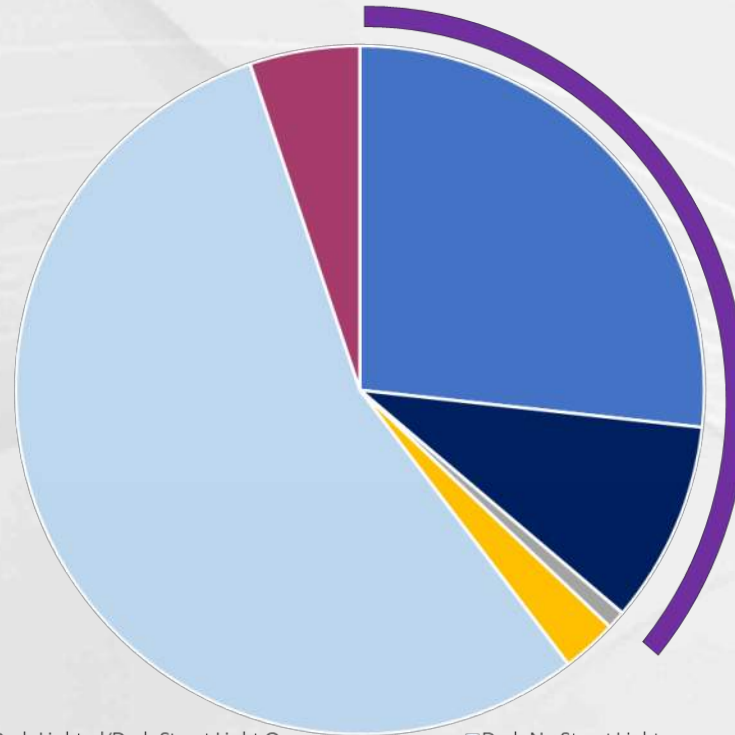
Dark-Non-Lighted/
Dark-Street Light Off

Dark-No
Street Light

Daylight

Dawn

Dusk



Dark-Lighted/Dark-Street Light On Dark-No Street Light
Dark-Non Lighted/Dark-Street Light Off Dawn
Daylight Dusk

39%
of **Severe** VRU
crashes reported
dark conditions

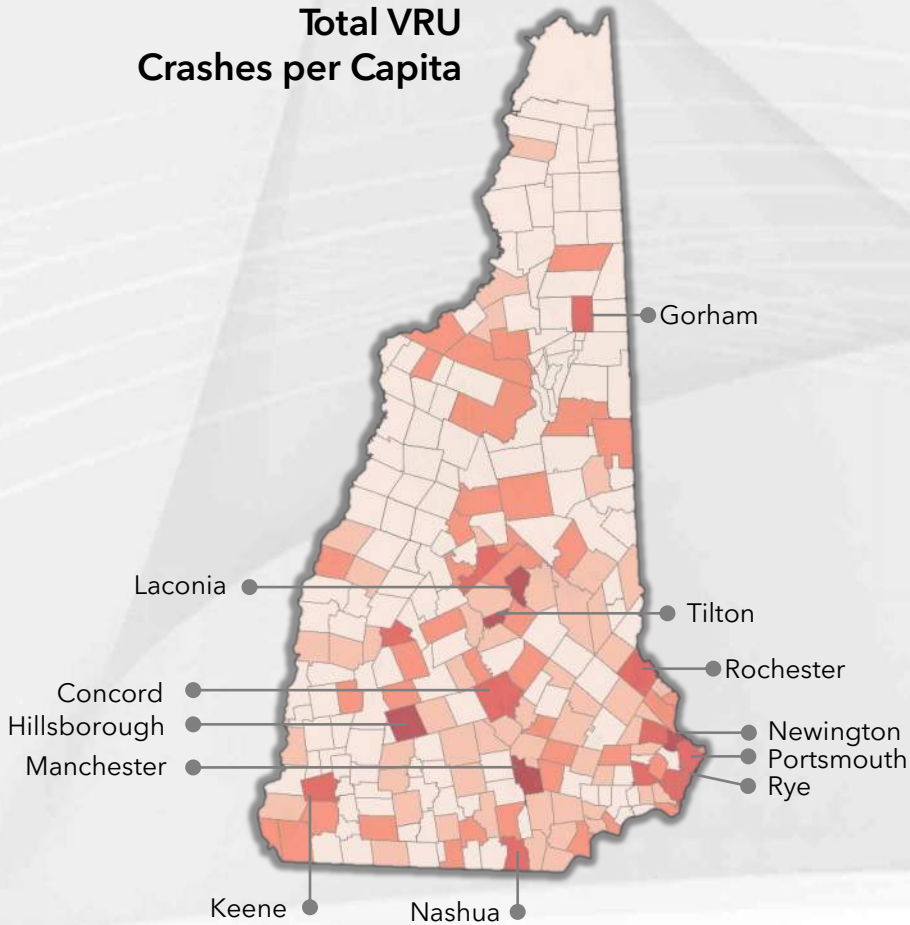


13%
of **Severe** VRU crashes occurred
in wet/icy conditions

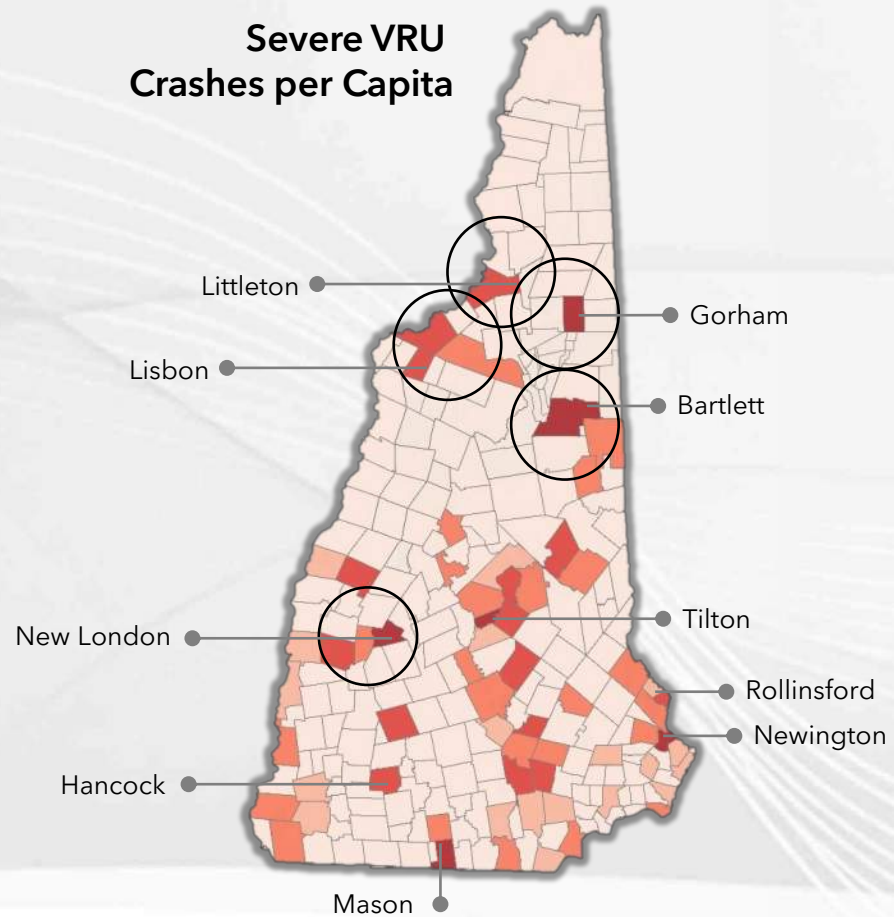


Where are crashes occurring?

Total VRU Crashes per Capita



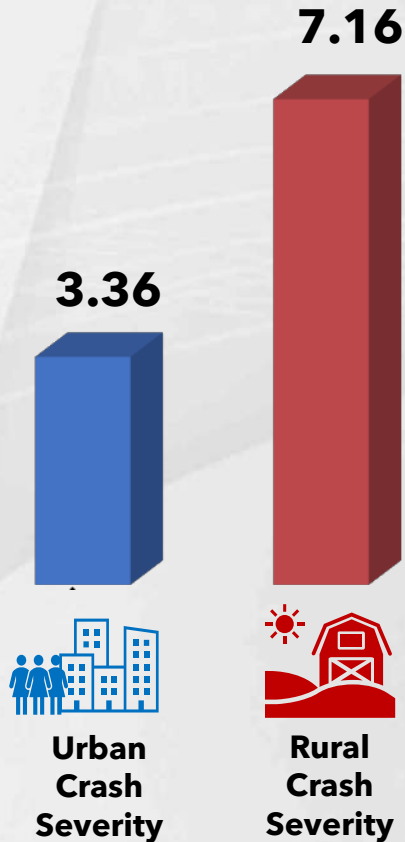
Severe VRU Crashes per Capita



Low High



Where are crashes occurring?



Higher Speed Limits



Limited Infrastructure



Lower Population Density / Driver Behavior



Lack of Street Lighting



Limited Public Transportation

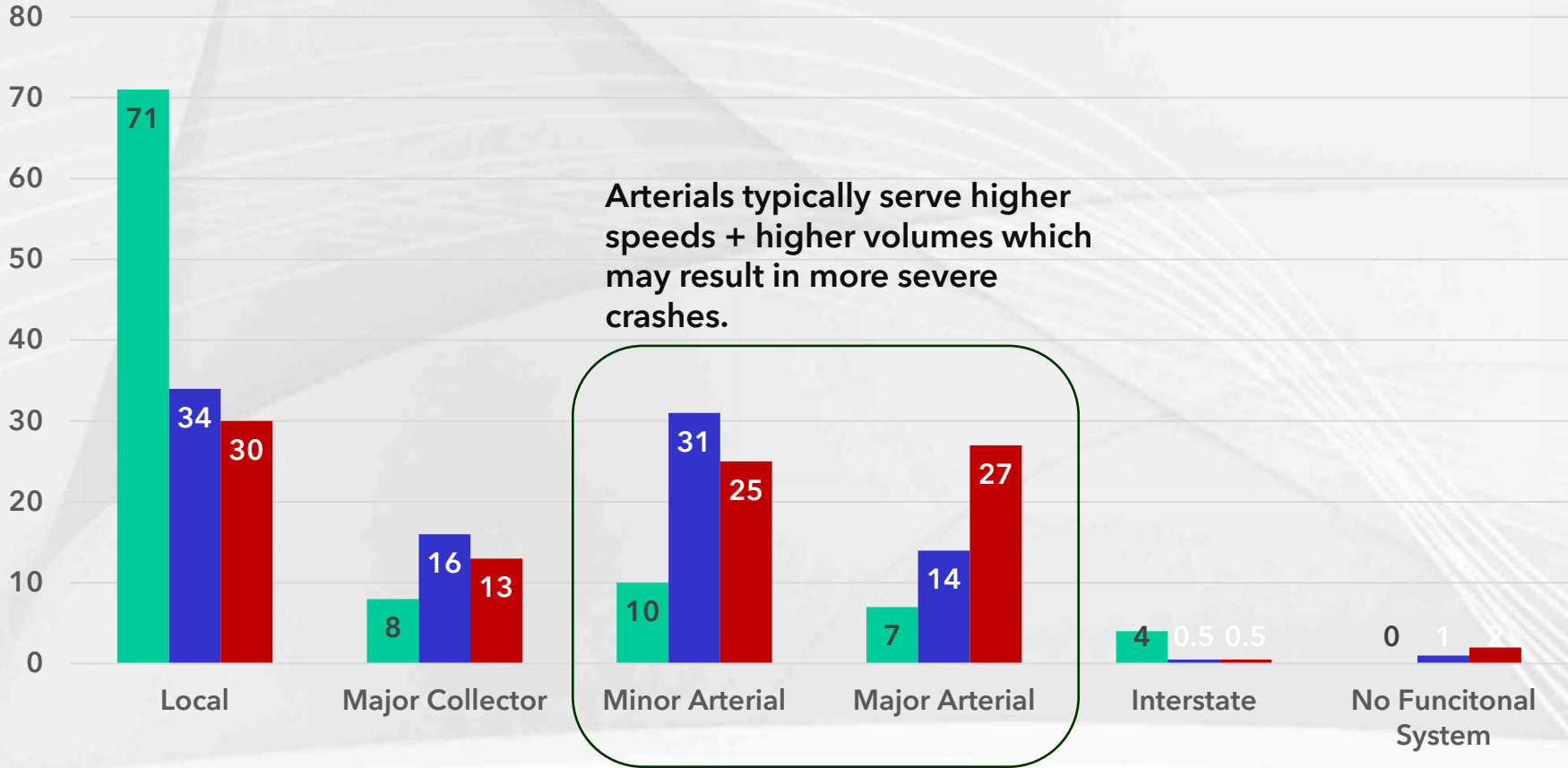


Limited Access to Healthcare / Longer Response Times



Where are crashes occurring?

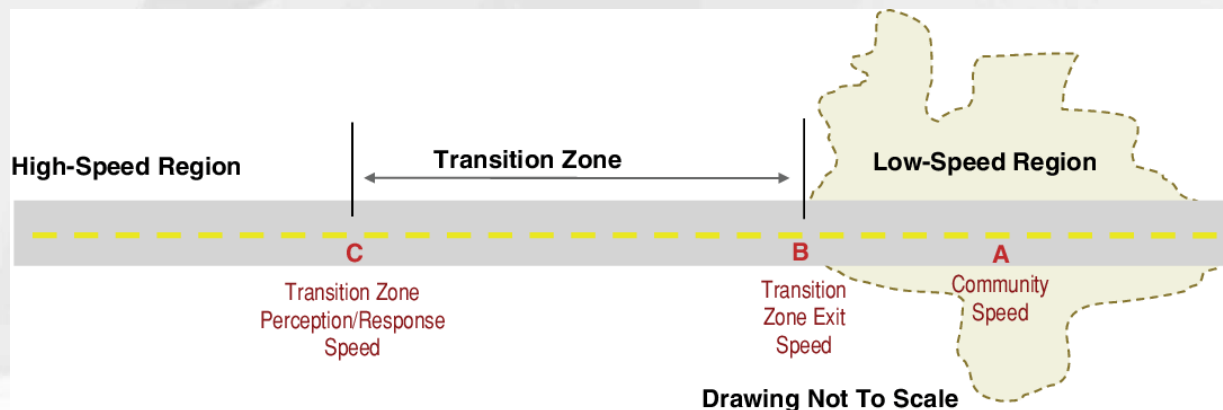
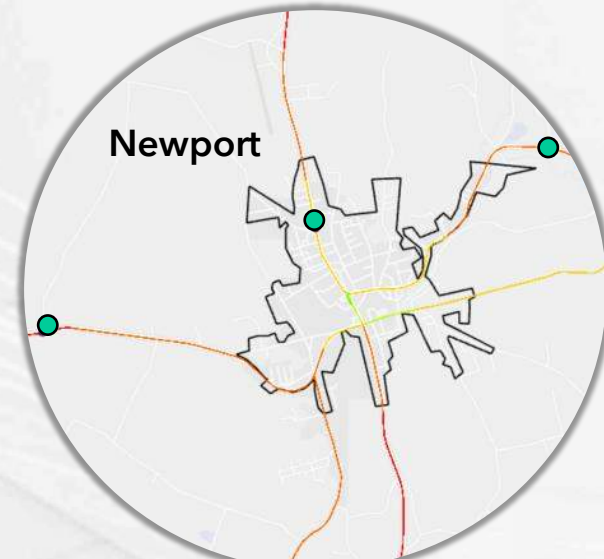
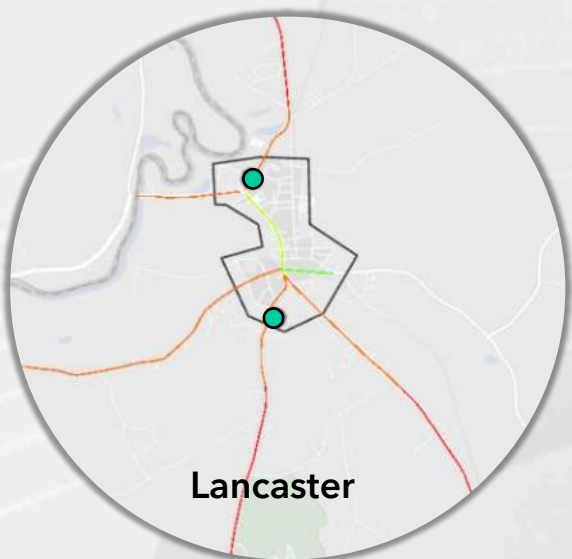
■ % of Road Network ■ % All VRU Crashes ■ % Severe VRU Crashes



Arterials typically serve higher speeds + higher volumes which may result in more severe crashes.



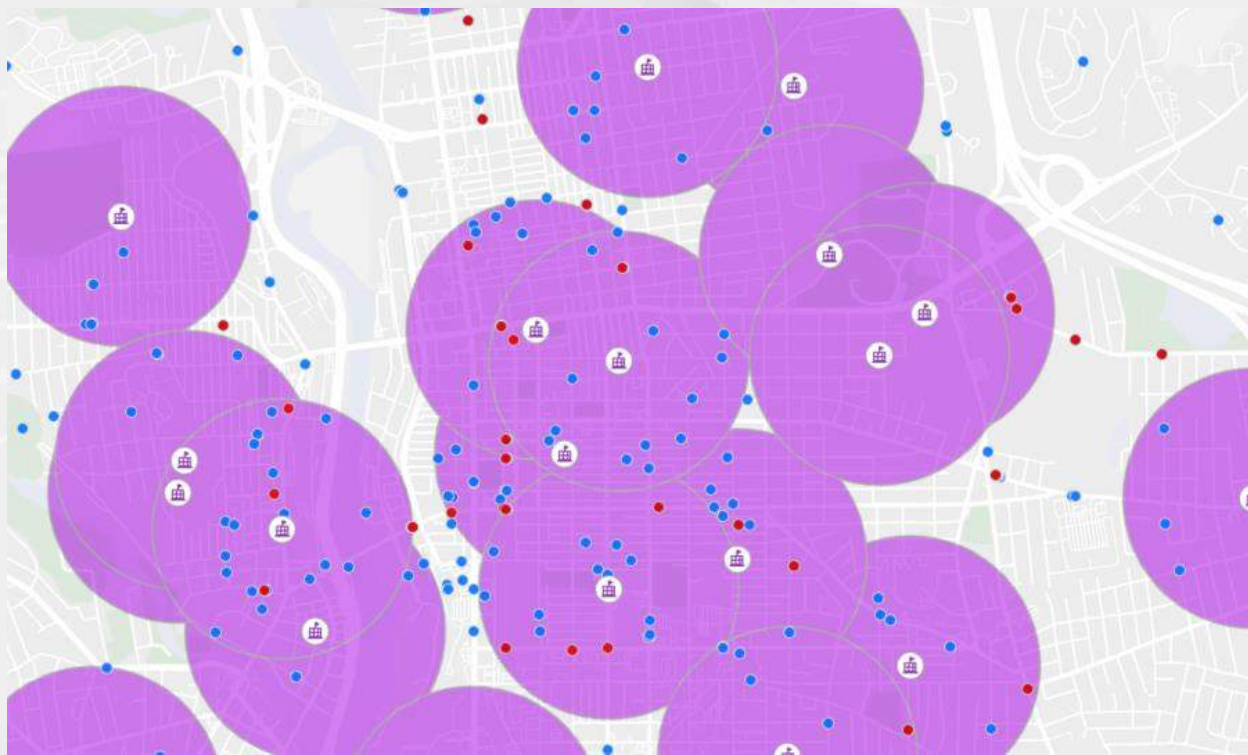
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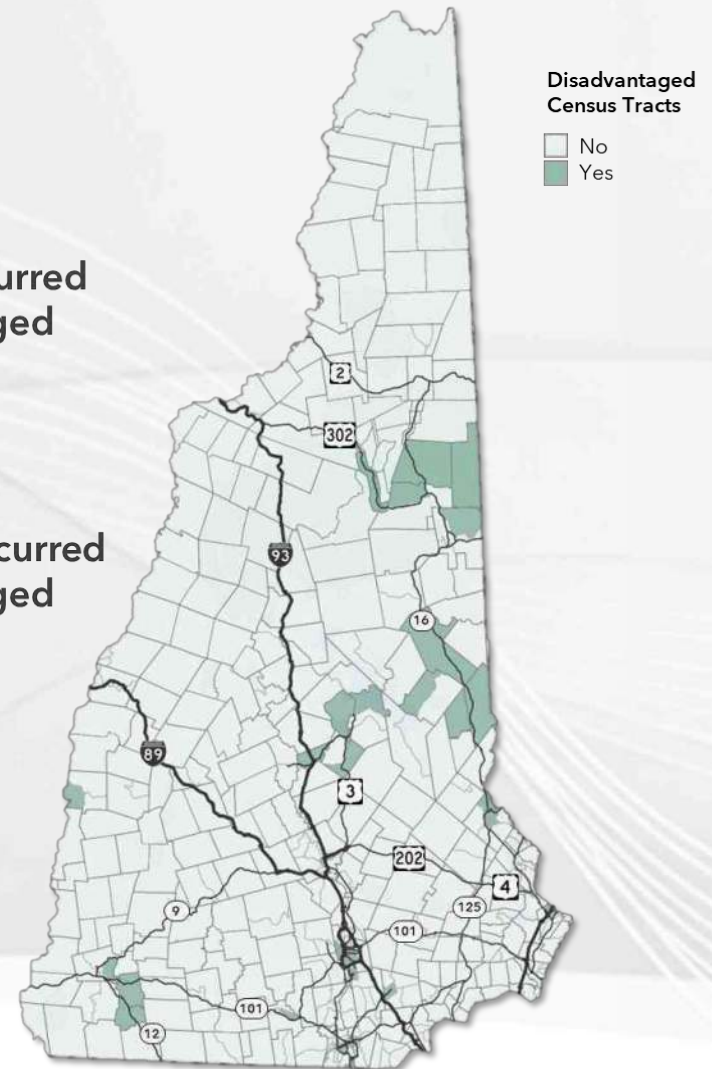
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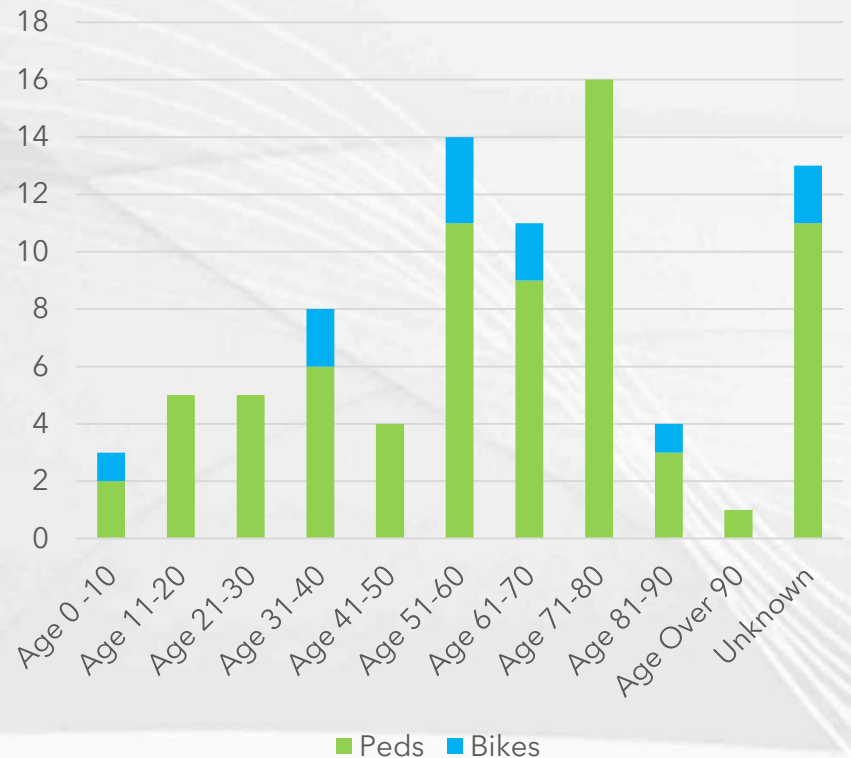
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VRU FATALITIES BY AGE GROUP



High Risk Areas + Populations



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Darkness/visibility is a critical factor in severe VRU crashes, especially for pedestrians



Rural VRU crashes tend to be more severe than urban crashes



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HIGH INJURY NETWORK

Pedestrian HIN

Pedestrian Severity Index



0 20

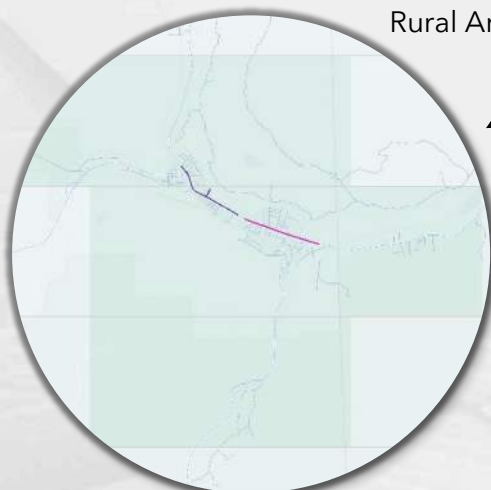
Statistically Significant Hot Spot

Pedestrian Crash Concentration

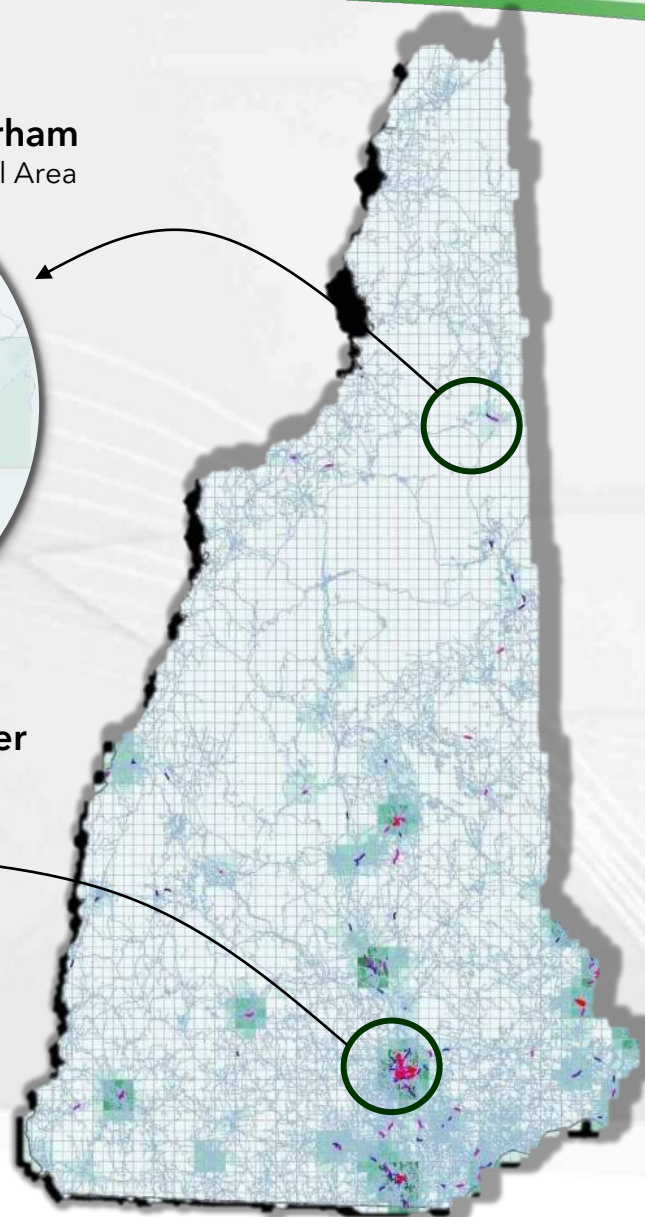
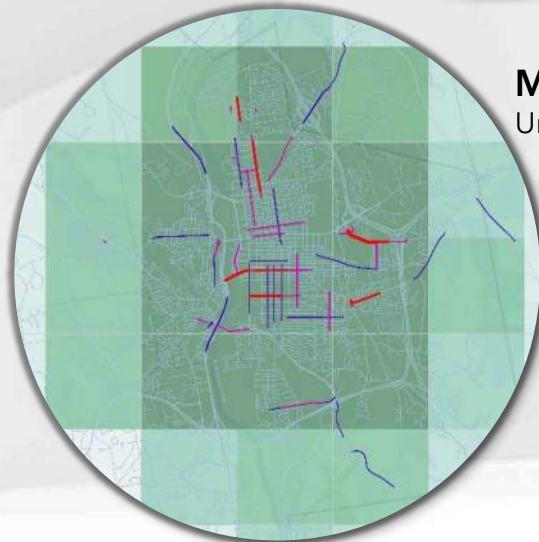


Low High

Gorham
Rural Area



Manchester
Urban Area



Bicycle HIN

Bicycle Severity Index



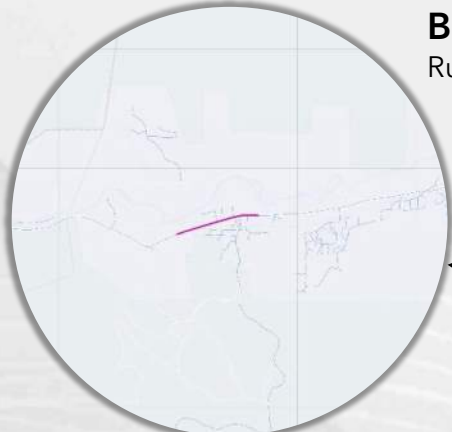
0 15

Statistically Significant Hot Spot

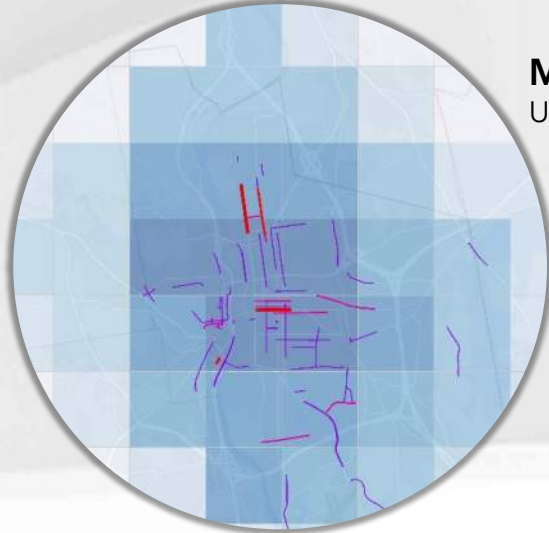
Bicycle Crash Concentration



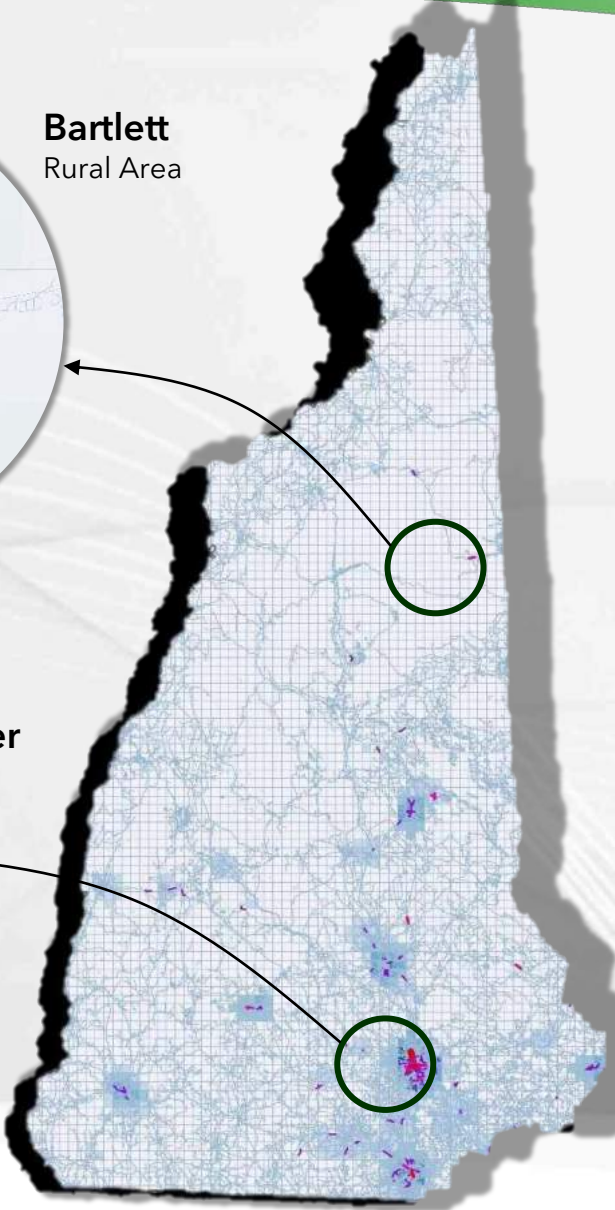
Low High



Bartlett
Rural Area



Manchester
Urban Area



VRU STRATEGIES

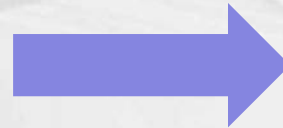
Crash Severity

FATALITIES

  **73**  **11**

SUSPECTED SERIOUS INJURIES

  **117**  **28**



1 BILLION

\$ 1,043,788,600.00

Comprehensive Crash Cost
over 2017-2022 Period

174 MILLION

\$ 173,964,766.67

Average Annual
Comprehensive Crash Cost

VRU Strategies

SPOT IMPROVEMENTS

- High Injury Network - Proven Safety Countermeasures

SYSTEMIC IMPROVEMENTS

- Systemic Risk Approach - Program and Strategies



STRATEGY 01

Enhance pedestrian and bicyclist safety along the high injury network.

Action Item # 1 - Develop and implement a comprehensive statewide project dedicated to addressing all state-owned high injury network corridor through the implementation of proven safety countermeasures

Action Item # 2 - Develop and provide a framework to MPOs, RPCs, and Communities to address locally owned corridors on the High Injury Network.

Action Item # 3 - Regularly recreate the High Injury Network on a yearly or bi-yearly basis, considering the most recent crash data, evolving traffic patterns, and the effectiveness of previously implemented countermeasures. This data should be shared with MPOs, RPCs, and local communities.



- 15% of all HIN on state owned roadways
- 85% of all HIN on locally owned roadways

DRAFT

Proven Safety Countermeasures



WALKWAYS



ON- AND OFF-ROAD FACILITIES



RAISED MEDIANS/
PEDESTRIAN REFUGE
ISLANDS



CROSSWALK VISIBILITY
ENHANCEMENTS



ROAD DIETS



RECTANGULAR RAPID
FLASHING BEACONS



PEDESTRIAN HYBRID
BEACON (HAWK
SIGNAL)



LEADING PEDESTRIAN
INTERVAL



SETTING APPROPRIATE
SPEED LIMITS



STREET LIGHTING



ROAD SAFETY AUDITS



PED AND BIKE SAFETY
ACTION PLANS

STRATEGY 02

Identify, adopt, and encourage the use of best practices

Action Item # 1 - Institutionalize a Complete Streets Program Statewide.

Action Item # 2 - Develop an online comprehensive inventory of pedestrian and bicycle safety best practices and policies to be publicly available.

Action Item # 3 - Implement an effort to review and update programs, policies and guidelines to incorporate multi-modal transportation concepts

Action Item # 4 - Encourage local entities to conduct ADA assessment plans, adopt traffic calming procedures/policies, and develop Bicycle and Pedestrian Safety Plans



- 74% of New Hampshire Census Tracts experience Transportation Inequity
- 65% of severe crashes on locally owned roads

DRAFT

STRATEGY 03

Develop a series of programs intended to provide technical assistance to local entities

Safe Routes to School - Continue to improve and support the SRTS program by developing a Signs and Markings program that supports the purchase of school zone equipment.

Road Safety Audit Program - Continue to improve and promote Road Safety Audits.

Quick Build/Demonstration Project - supports the purchase and use of low-cost, short-term traffic control devices/ equipment

Transition Zone - Develop and implement a new safety program that supports the purchase and use of speed management measures known to improve transitional zones (rural to small community centers).

High Risk Crosswalk Program - Aimed to address crosswalk in high risk areas (Schools/Rail Trails/Other Land Uses...)



- 65% of severe crashes on locally owned roads
- 44% of all VRU crashes were within 2,000 feet of a school
- Severe VRU crashes commonly occur in transition zones approaching community centers

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New Hampshire
DOT
Department of Transportation

STRATEGY 04

Educate State, external partners, and the public about the needs of Vulnerable Road Users.

Action Item # 1 - Develop a statewide safety campaign for pedestrian and bicyclists.

Action Item # 2 - Expand existing training programs to improve education and outreach regarding non-motorized transportation safety issue for state employees and external partners (MPOs, RPCs, Local Communities)

Action Item # 3 - Help reduce impairment through substance avoidance education, targeted communications campaigns and partnerships with social service agencies.

Action Item # 4 - Increase Outreach and Education towards Seniors

Action Item # 5 - Partner with DMV to create a curriculum geared towards walking and biking safety for driver education programs



- 45% of bicyclist fatalities were not wearing a helmet
- 20% of pedestrian fatalities were impaired
- 65% of severe crashes on local roads
- 30% of fatalities were 65+ years old

DRAFT

STRATEGY 05

Improve data collection, data analysis and data accessibility/transparency.

Action Item # 1 - Enhance Crash Data Collection through collaboration with law enforcement agencies to standardize data collection procedures for pedestrian and bicycle-related crashes which includes the addition of data collection fields

Action Item # 2 - Enhance Crash Analysis through the development and utilization of a systemic crash analysis methodology

Action Item # 3 - Create a Crash Data Integration System and Sharing Interface for data accessibility and transparency

Action Item # 4 - Develop a Statewide Non-Motorized Counting Program



DRAFT

STRATEGY 06

Invest in pedestrian and bicycle safety.

Action Item # 1 - Create a bicycle and pedestrian grant award with an emphasis on equity

Action Item #2 - Update prioritization metrics in TIP/TAP funding to include ped/bike safety

Action Item # 3 - Invest in Research and Development for Safer Vehicles

Action Item # 4 - Invest in Research and Development for Enhanced Post-Crash Trauma Care



- \$174 Million in Average Annual Comprehensive crash Cost over six year study period
- 48% of segments within the HIN is located within historically disadvantaged communities
- 12% of New Hampshire population lives outside of a 30 minute service area of hospital

DRAFT

Next Steps



VRU Safety Assessment

Draft Report to NHDOT by Nov 1.
Final Report to FHWA by Nov. 15

Questions?

Submit comments by 11/6

Michael Dugas

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603.374.7915

MEETING NOTES**October 30, 2023****1:00 PM**

PROJECT: NHDOT
Vulnerable Road User Safety Assessment
GPI #NEX-2021430.08

LOCATION: NHDOT
7 Hazen Drive
Concord, NH

PURPOSE: Front Office Meeting

ATTENDEES:**NHDOT:**

Bill Lambert
Corey Spetelunas
Bill Cass
Dave Rodrigue
Bill Oldenburg
Jim Marshall
Tobey Reynolds
Mike Servetas
Susan Klasen
Jennifer Reczek
Loretta Doughty
Tim Boodey
Gerry Bedard
Tim Dunn
Nickie Hunter

FHWA:

Michelle Marshall

Greenman-Pedersen, Inc:

Michael Dugas
Carolyn Radisch
Nicole Rogers

DATE PREPARED: October 31, 2023

M. Dugas and N. Rogers delivered a comprehensive overview of the safety assessment process by discussing the content contained within the attached PowerPoint presentation. This included a summary of the data analysis and an in-depth review of the strategies and programs designed to address high-risk areas and improve the safety of vulnerable populations. The following topics were deliberated upon during the meeting:

- Exercise caution when presenting findings on school proximity crashes within 2,000 foot buffer zones, as the size of these areas makes it challenging to directly associate these crashes with school related foot and bike traffic.
- Consider implementing a prioritization or ranking system for the numerous strategies and action items to enhance clarity and focus moving forward.
- Consider including an action item that recommends the state conduct peer reviews for municipalities, especially those undertaking local projects and pedestrian/bicycle safety initiatives.
- Local communities typically resist lighting at mid-block crossings. The information presented may be used to help convince installation.
- Consider the prominence of work zones as workers are vulnerable road users and these zones are at heightened risk.
- Request to circulate slides and draft report for additional review.

These notes constitute our understanding of the discussions and conclusions reached. Please advise us within ten (10) days, in writing, of any exceptions or corrections.

Respectfully submitted,

Nicole Rogers

Nicole Rogers, P.E.
Cc: All Attendees