



NORTH CAROLINA

Department of Transportation



Traffic Safety Data Trends / Performance Measures

Brian Mayhew

John Grant

Brian Murphy

Presentation Overview

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**Statewide
Data Trends**

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**Durham Chapel
Hill Carrboro
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**Safety
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**Questions /
Discussion**

Statewide Data Trends

- Population
- Vehicle Miles Traveled
- Fatalities
- Serious Injuries
- Pedestrian Fatal and Serious Injuries
- Bicycle Fatal and Serious Injuries
- Total Reported Crashes

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SHSP Goal

- Reduce all fatalities and serious injuries by half by 2035, moving towards zero by 2050.



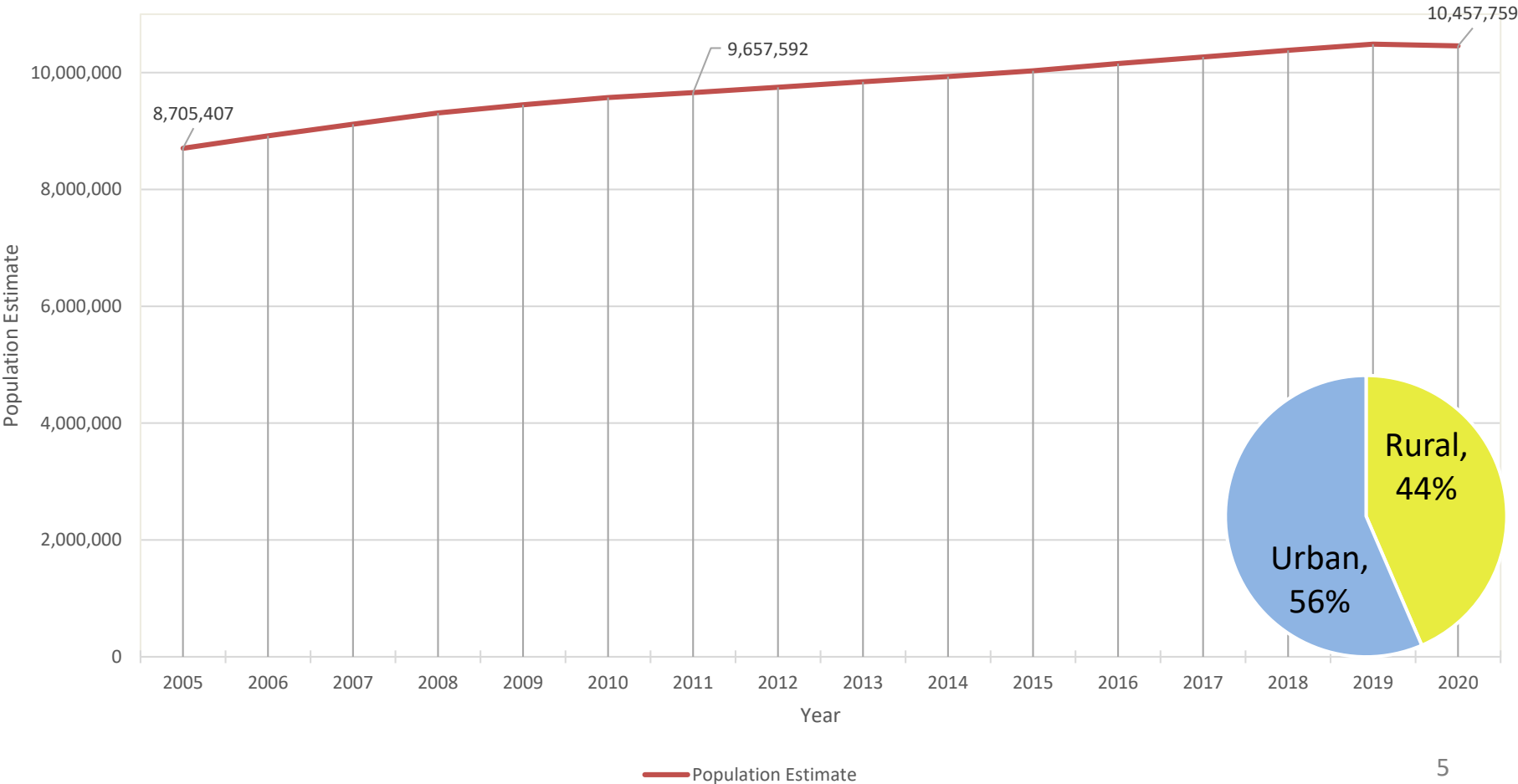
2019 North Carolina
Strategic Highway
Safety Plan



December 2019

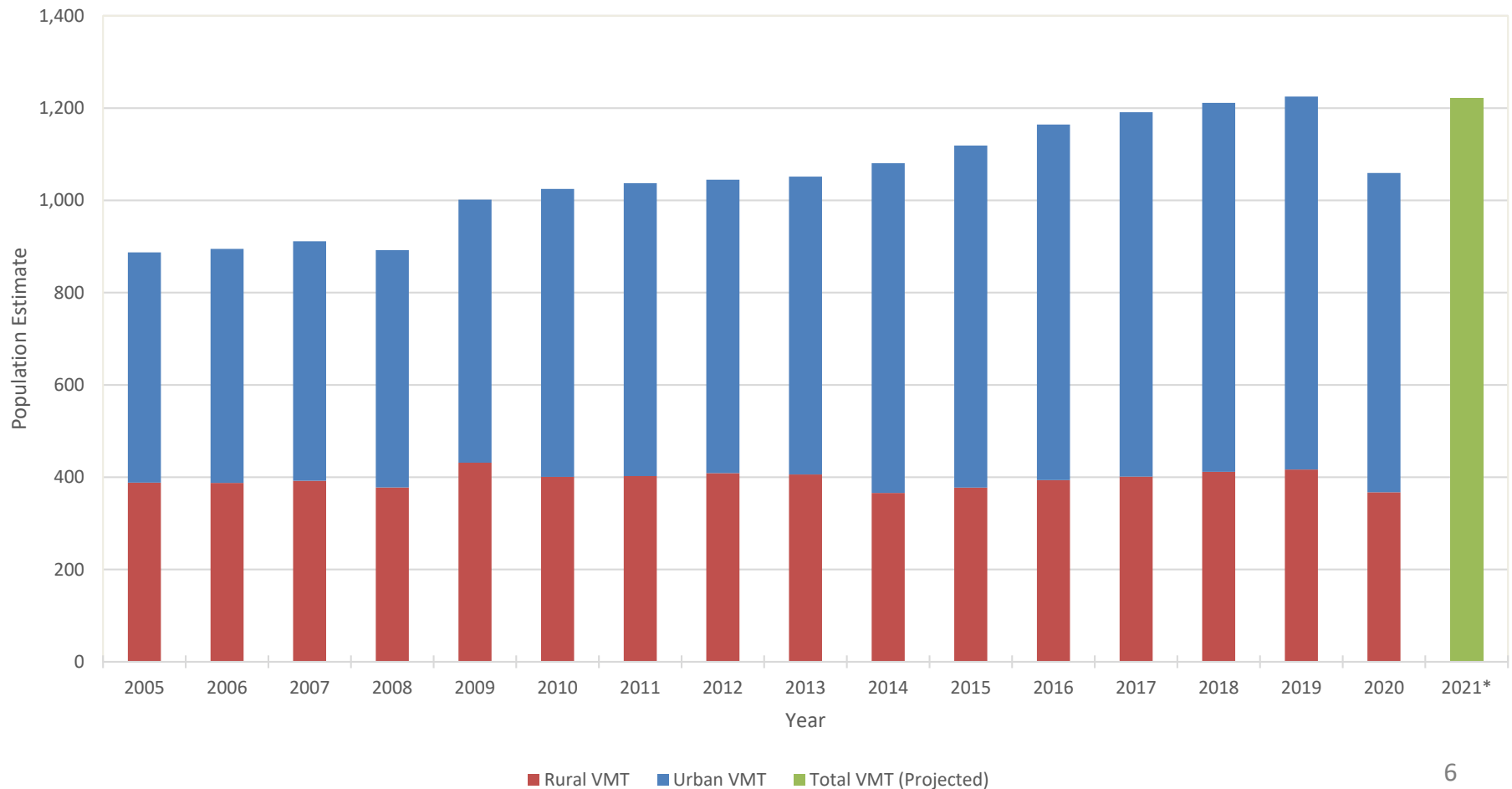
State Population

State Population Estimates by Year
(2005 - 2020)

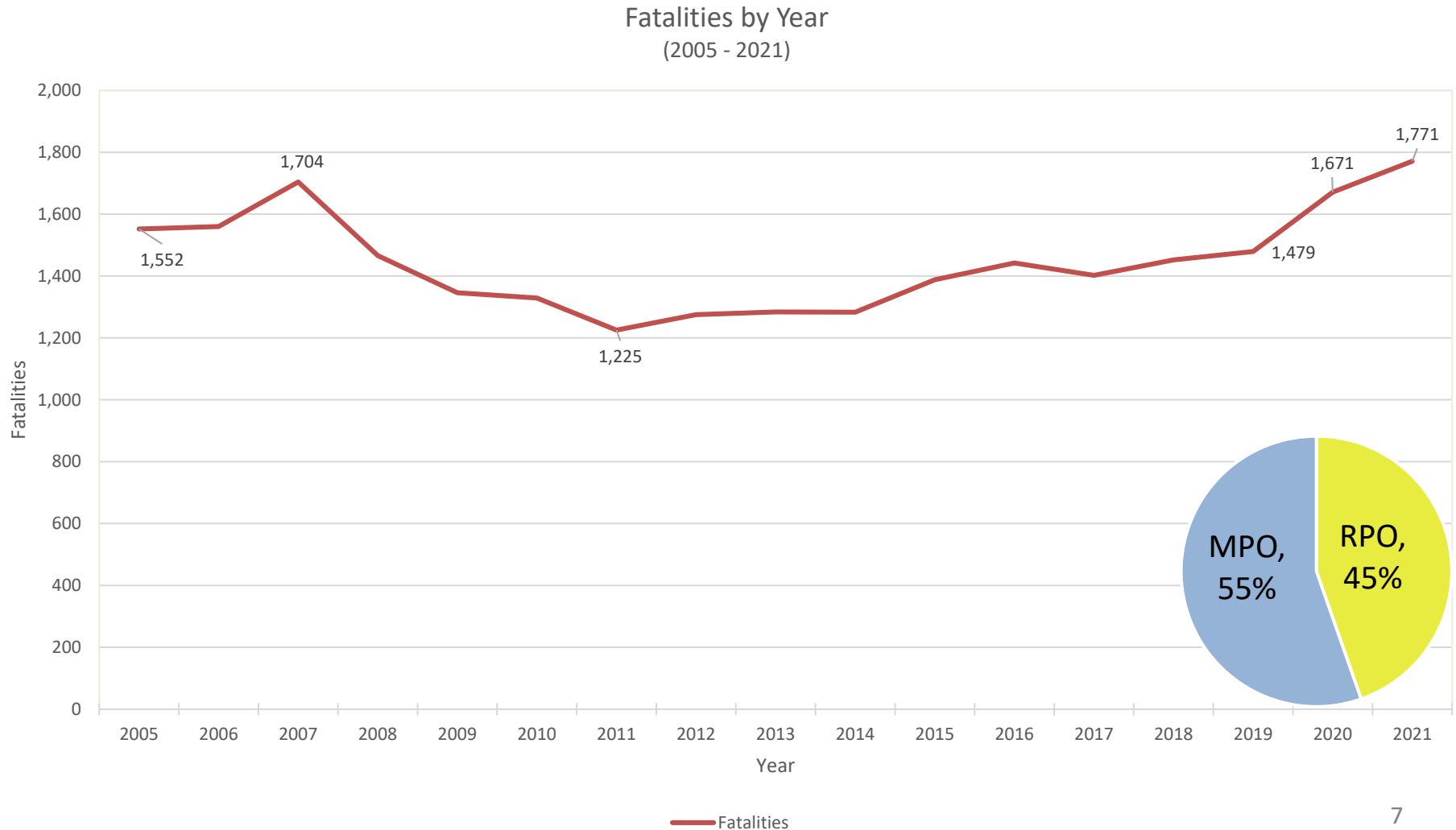


Vehicle Miles Traveled (VMT)

North Carolina VMT Estimates by Year
(2005 - 2021)

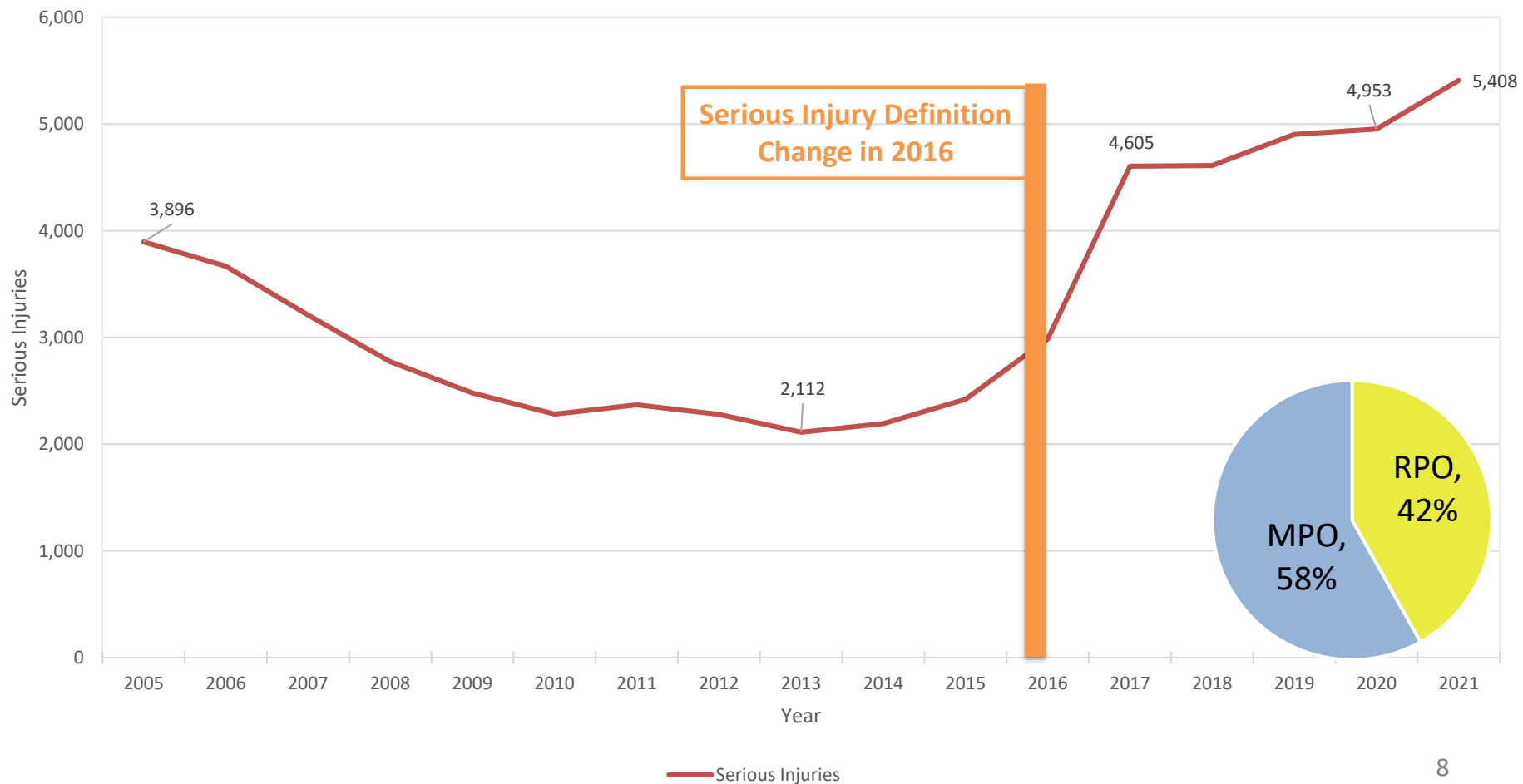


Fatalities



Serious Injuries (A Type – Disabling)

Serious Injuries (A Type Injuries) by Year
(2005 - 2021)



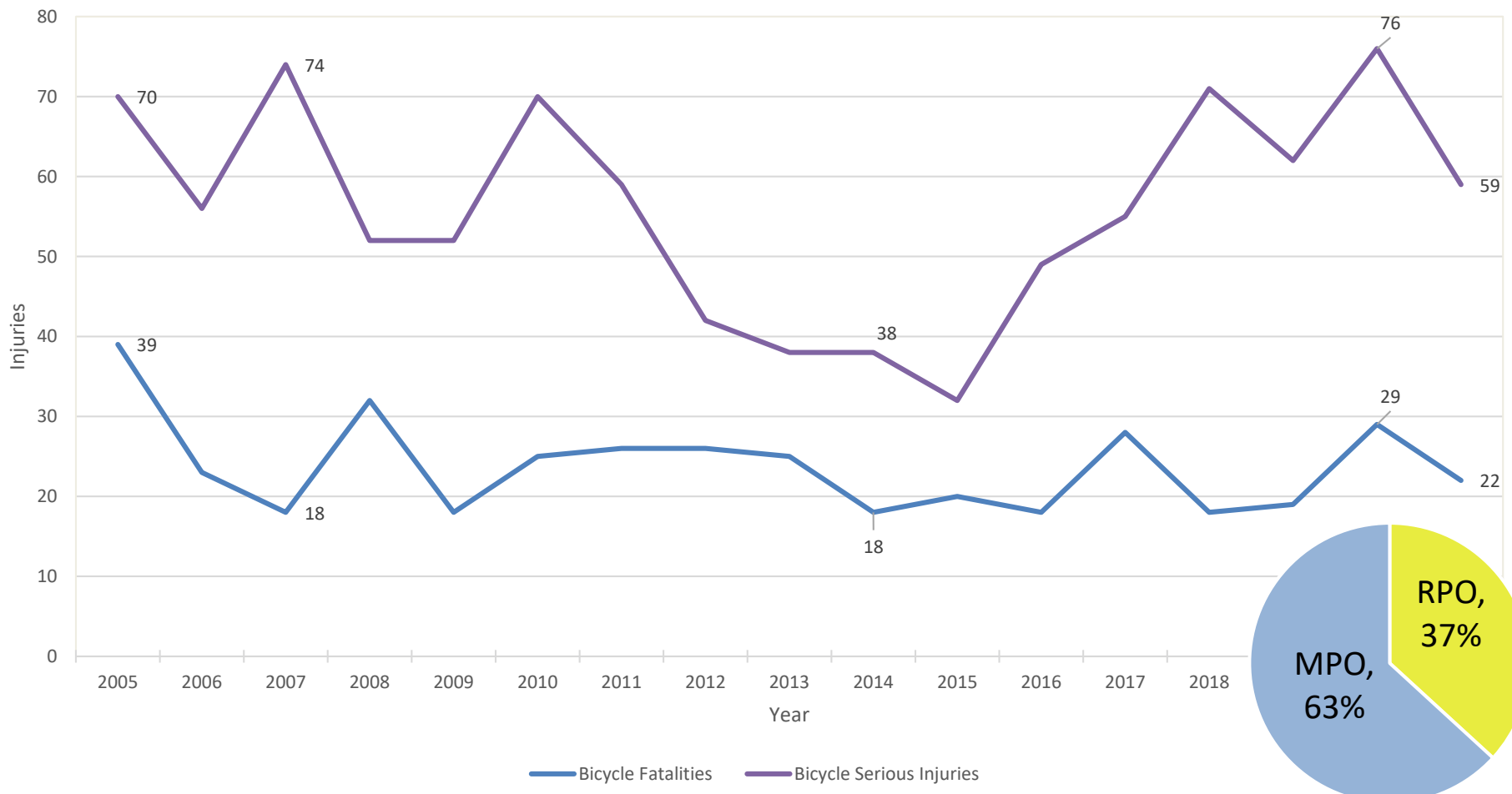
Pedestrian Fatalities and Serious Injuries

Pedestrian Fatalities and Serious Injuries by Year
(2005 - 2021)



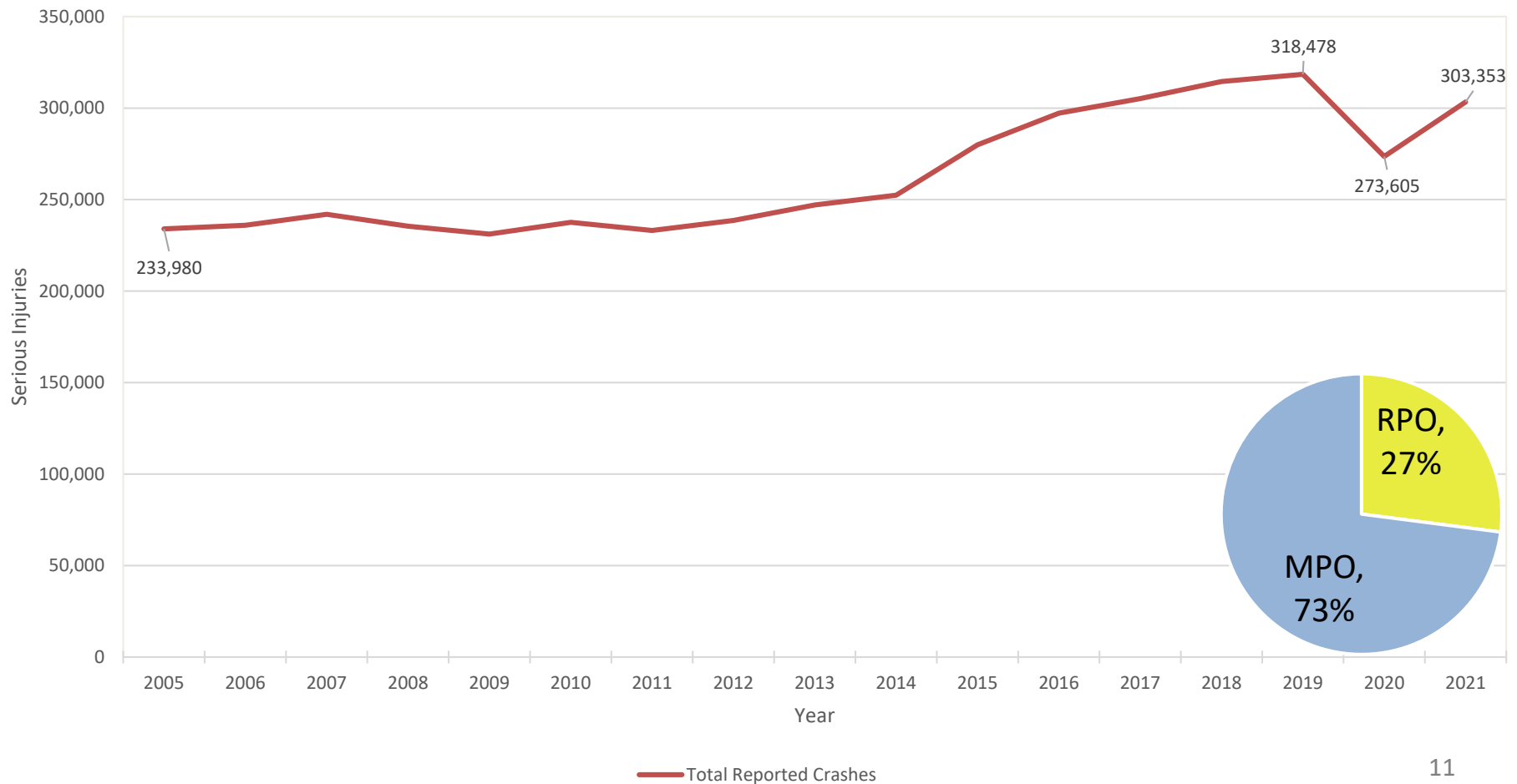
Bicycle Fatalities and Serious Injuries

Bicycle Fatalities and Serious Injuries by Year
(2005 - 2021)



Reported Crashes

Reported Crashes by Year
(2005 - 2021)



Durham Chapel Hill Carrboro MPO Data Trends

- Vehicle Miles Traveled
- Total Reported Crashes
- Fatalities
- Serious Injuries
- Bicycle and Pedestrian Fatal and Serious Injuries
- Pedestrian Crashes
- Unbelted Fatalities and Serious Injuries
- Breakdown by Municipality within the Durham Chapel Hill Carrboro MPO

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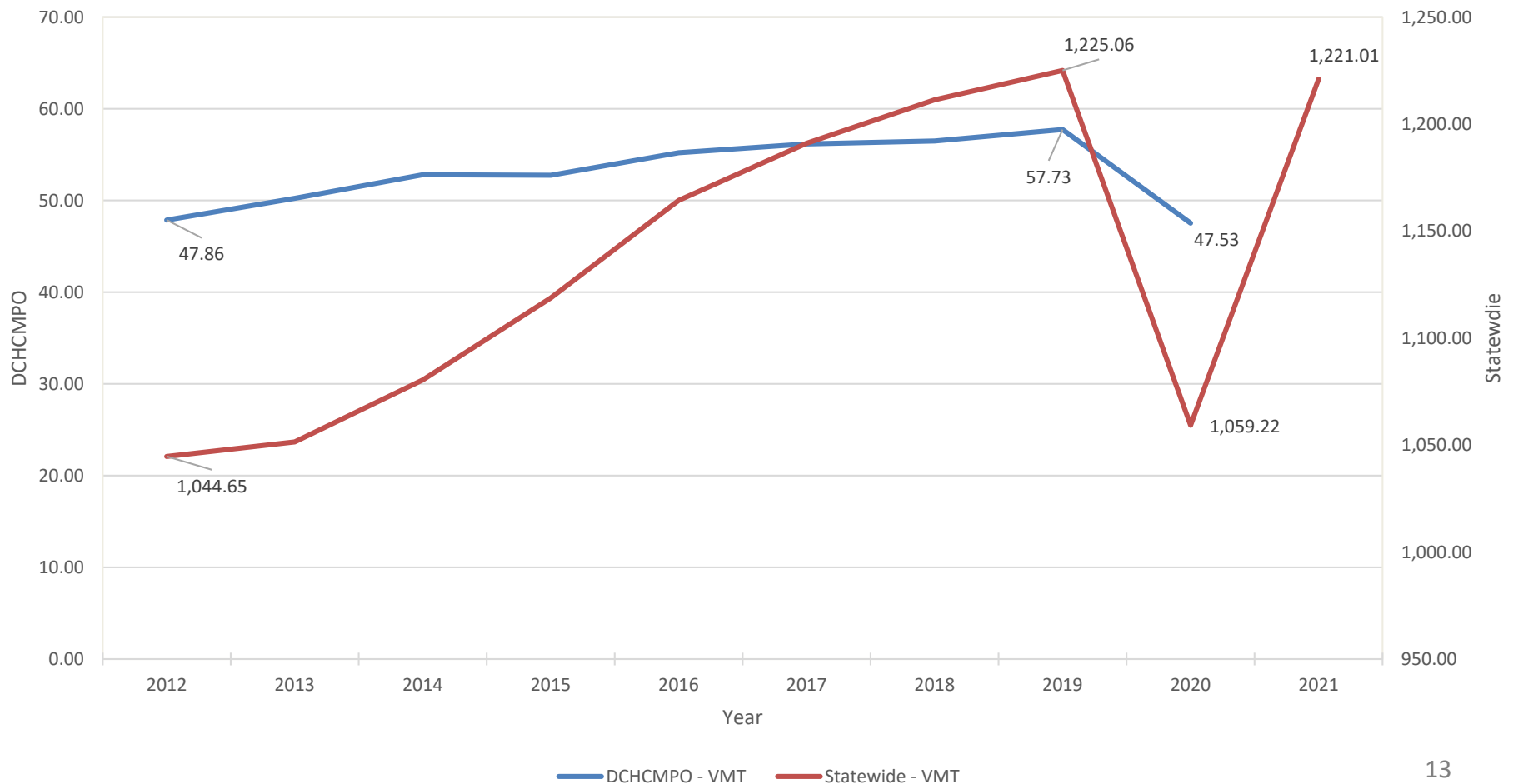
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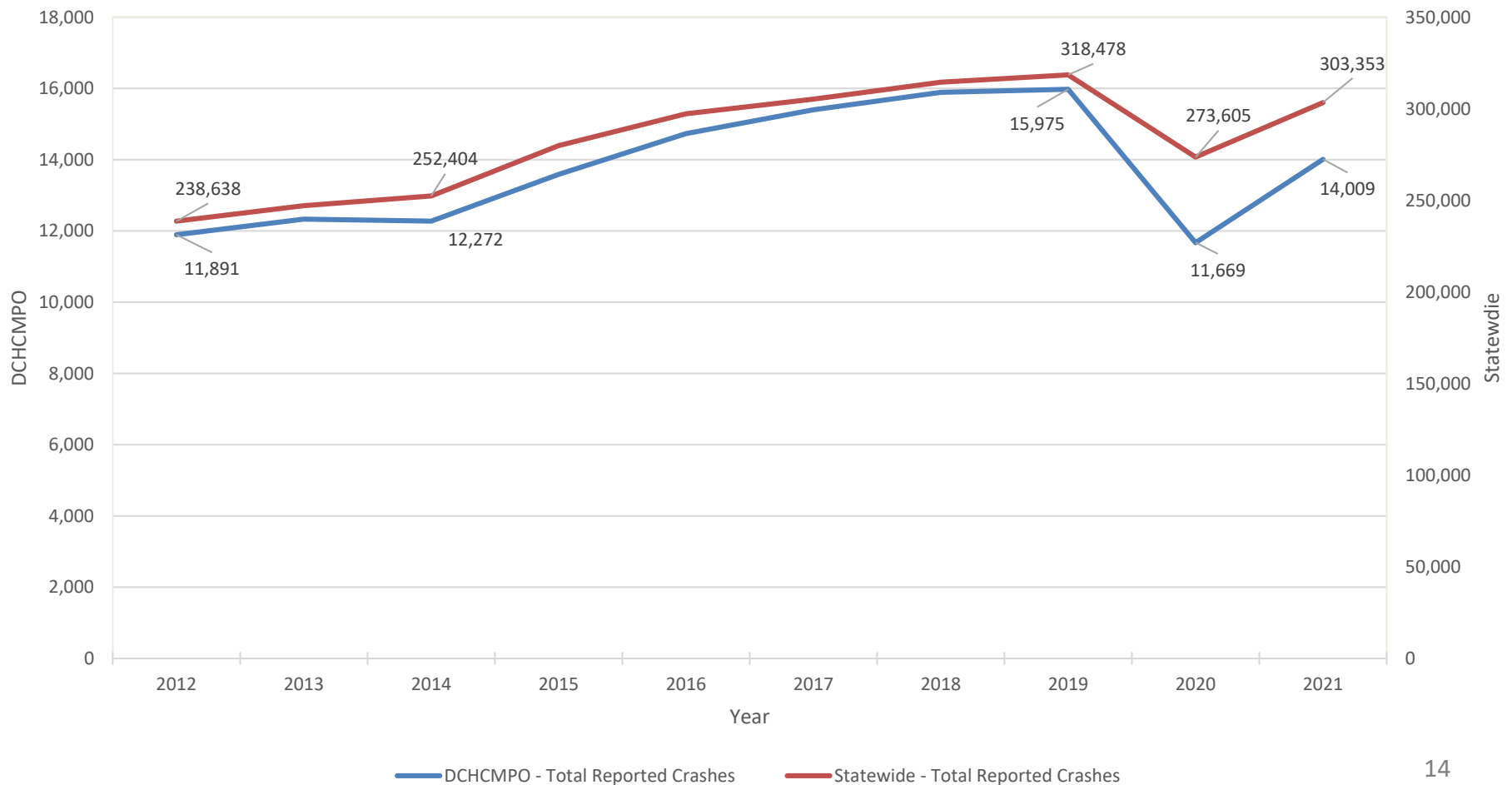
Vehicle Miles Traveled

Vehicle Miles Traveled (100 MVM) by Year
(2012 - 2020)



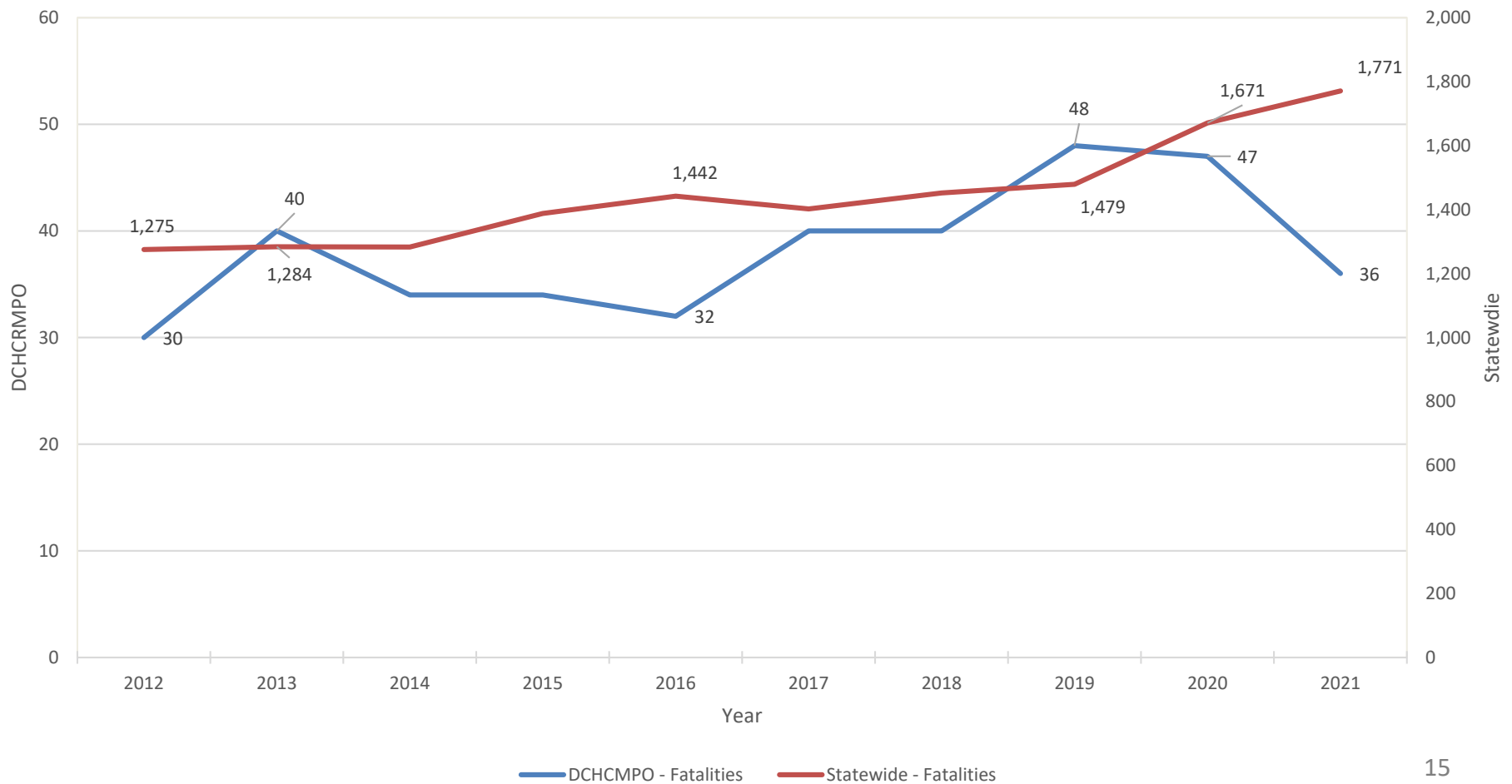
Total Reported Crashes

Total Reported Crashes by Year
(2012 - 2020)

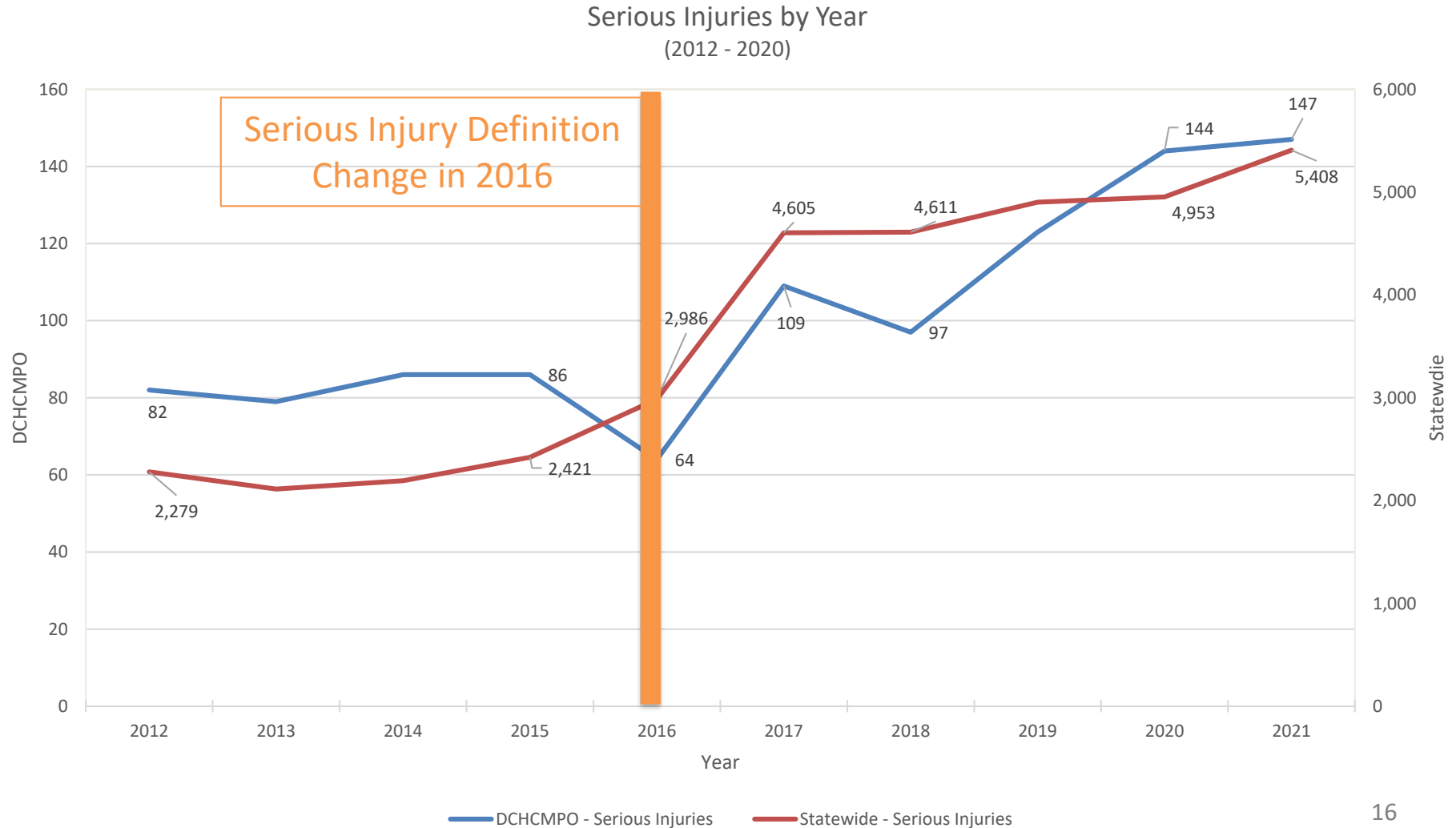


Fatalities

Fatalities by Year
(2012 - 2020)

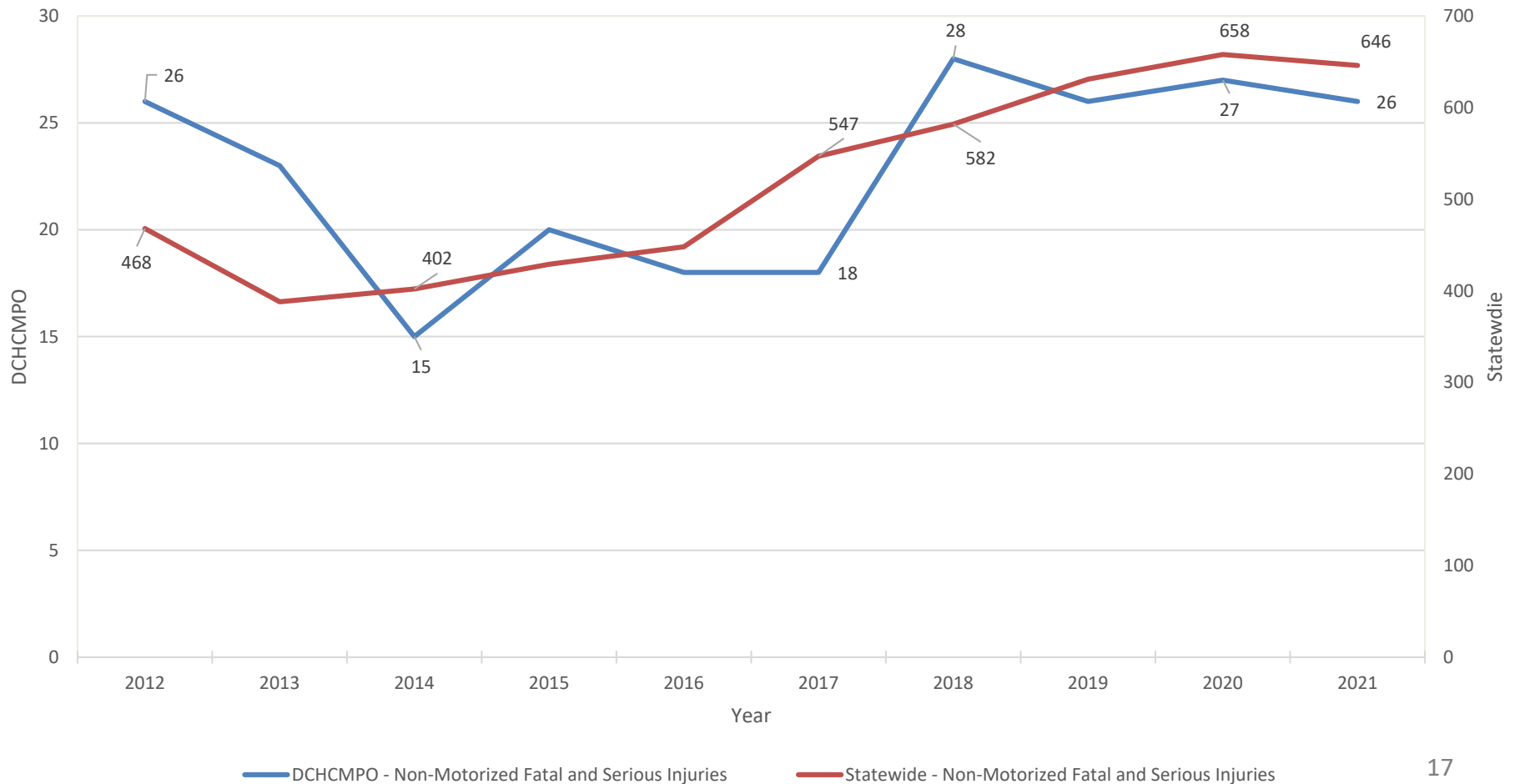


Serious Injuries (A Type – Disabling)



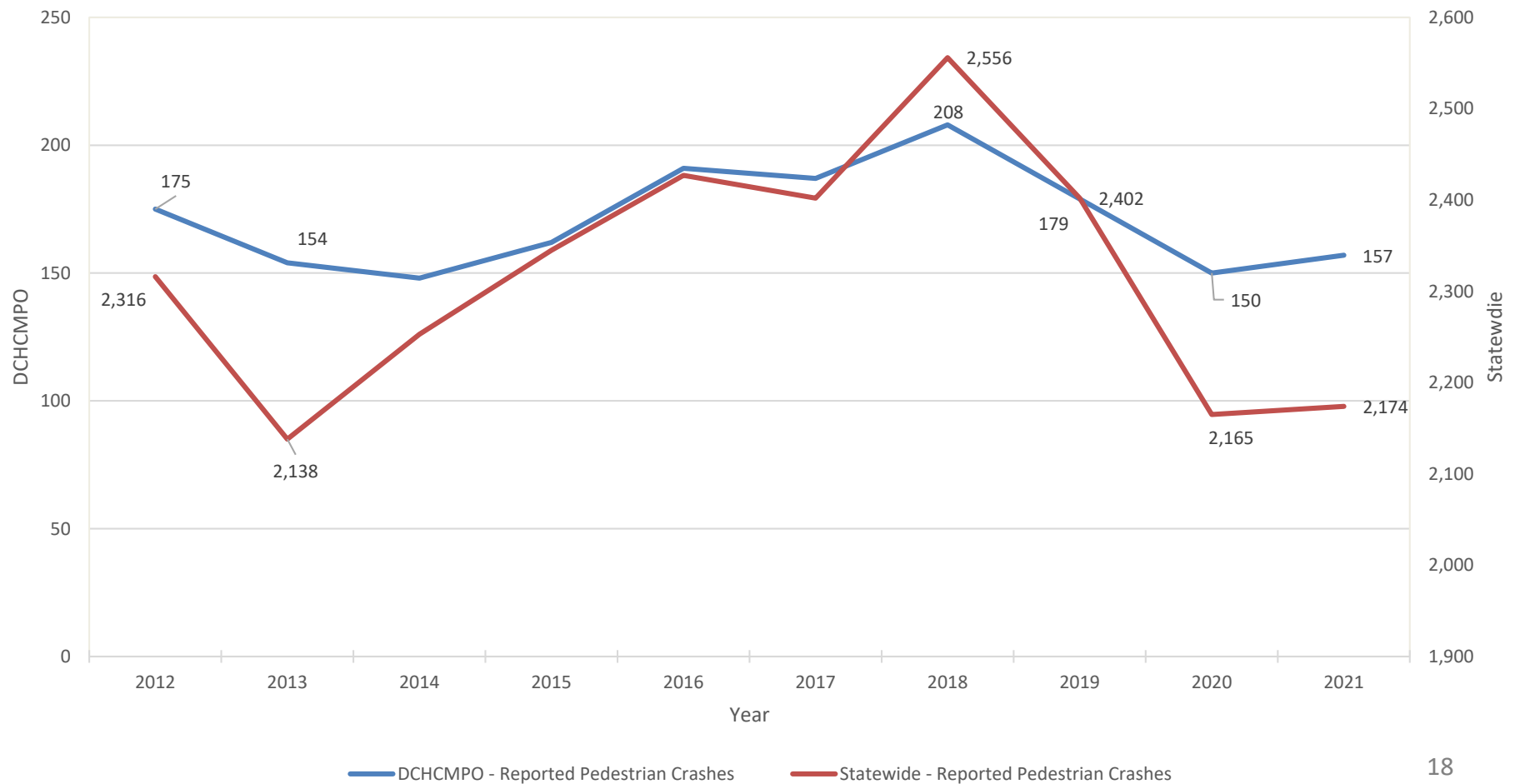
Non-Motorized Fatal and Serious Injuries

Non-Motorized Fatal and Serious Injuries by Year
(2012 - 2020)



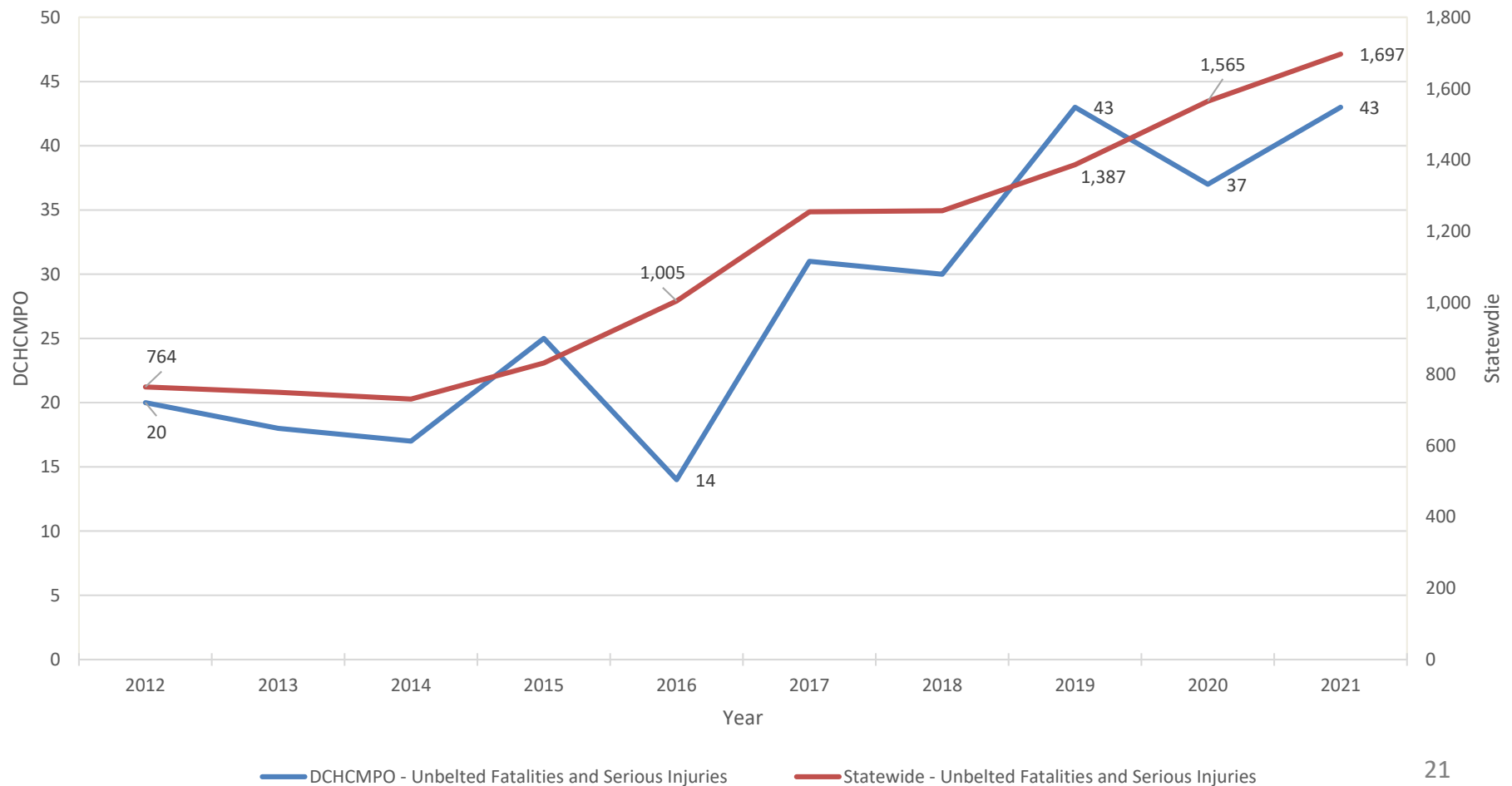
Pedestrian Crashes

Reported Pedestrian Crashes by Year
(2012 - 2020)



Unbelted Fatalities and Serious Injuries

Unbelted Fatalities and Serious Injuries by Year
(2012 - 2020)



Breakdown by Municipality within the Durham Chapel Hill Carrboro MPO (2012 – 2021)

| Municipality | Total Reported Crashes | Fatal Crashes | Serious Injury Crashes |
|--------------|------------------------|---------------|------------------------|
| Carrboro | 1,531 | 5 | 5 |
| Chapel Hill | 9,306 | 13 | 38 |
| Durham | 97,419 | 192 | 400 |
| Efland | 31 | 0 | 0 |
| Hillsborough | 2,242 | 2 | 11 |
| Rougemont | 55 | 0 | 0 |
| <i>Rural</i> | <i>27,161</i> | <i>148</i> | <i>393</i> |
| Total | 137,745 | 360 | 847 |

Safety Performance Measures - Background

- MAP-21 / FAST Act Rulemaking
 - Requires State DOTs and MPOs to set targets for 5 Highway Safety Improvement Program (HSIP) safety performance metrics
 - Final Rules published in the Federal Register March 2016; effective April 2016

| HSIP Safety Targets | |
|---------------------|-----------------------------------------------------------------------|
| 1 | Number of fatalities |
| 2 | Rate of fatalities |
| 3 | Number of serious injuries |
| 4 | Rate of serious injuries |
| 5 | Number of non-motorized fatalities and non-motorized serious injuries |

- Targets:
 - Are based on 5 year rolling averages
 - Are for calendar years
 - Are established annually

Safety Performance Measures - Background

- Target reporting dates:
 - State: August 31st with annual HSIP report
 - MPO: February 27th



Safety Performance Measures - Background

- How are targets set?
 - Up to each State and MPO
 - MPO can adopt State methodology, or come up with their own



State Safety Performance Measures

- Goal: Reduce fatalities and serious injuries by half by 2035
- Target: Where do we need to be in 2022 (current target setting year) to reach this goal by 2035?
 - Number of fatalities in 2018 = 1,437
 - To reduce fatalities by 50% in 2035 = 718
 - 5 year rolling average of fatalities in 2020 = 1,428.8
 - 2022 fatality target: 1,254.9

State Safety Performance Measures

Fatalities Performance Measure



Safety Performance Measures – Assessment

- Assessment of Significant Progress
 - FHWA will determine whether a State DOT has met or made significant progress toward meeting HSIP safety targets
 - CY 2019 targets were assessed in early 2021
 - FHWA will not directly assess MPO progress towards meeting HSIP safety targets



Safety Performance Measures - Assessment

- Assessment of Significant Progress (cntd)
 - FHWA assessed NCDOT's CY 2019 safety targets in early 2021
 - Based on FHWA's review, North Carolina has not met or made significant progress toward achieving its safety performance targets.

Assessment of Statewide Targets

| Performance Measures | 5-year Rolling Averages | | | Target Achieved? | (Actual) Better than Baseline? | Met or Made Significant Progress? |
|----------------------------------------------------------------|-------------------------|-------------|-------------|------------------|--------------------------------|-----------------------------------|
| | Target | Actual | Baseline | | | |
| | 2015 - 2019 | 2015 - 2019 | 2013 - 2017 | | | |
| Fatalities (5 Year Average) | 1,214.7 | 1,410.0 | 1,363.0 | No | No | No |
| Fatality Rate (5 Year Average) | 1.097 | 1.192 | 1.214 | No | Yes | |
| Serious Injuries (5 Year Average) | 2,490.6 | 4,078.4 | 2,860.8 | No | No | |
| Serious Injury Rate (5 Year Average) | 2.228 | 3.422 | 2.522 | No | No | |
| Non-motorized Fatalities and Serious Injuries (5 Year Average) | 403.7 | 515.6 | 436.2 | No | No | |

Safety Performance Measures - Assessment

- Assessment of Significant Progress (cntd)
 - FHWA assessed NCDOT's CY 2019 safety targets in early 2021
 - Based on FHWA's review, North Carolina has not met or made significant progress toward achieving its safety performance targets.

“Assessment” of Durham Chapel Hill Carrboro MPO Targets

| Performance Measures | 5-year Rolling Averages | | | Target Achieved? | (Actual) Better than Baseline? | Met or Made Significant Progress? |
|----------------------------------------------------------------|-------------------------|-------------|-------------|------------------|--------------------------------|-----------------------------------|
| | Target | Actual | Baseline | | | |
| | 2015 - 2019 | 2015 - 2019 | 2013 - 2017 | | | |
| Fatalities (5 Year Average) | 31.5 | 38.8 | 36.0 | No | No | No |
| Fatality Rate (5 Year Average) | 0.601 | 0.695 | 0.675 | No | No | |
| Serious Injuries (5 Year Average) | 73.5 | 95.8 | 84.8 | No | No | |
| Serious Injury Rate (5 Year Average) | 1.399 | 1.716 | 1.586 | No | No | |
| Non-motorized Fatalities and Serious Injuries (5 Year Average) | 17.0 | 22.4 | 19.4 | No | No | |

Resources

- Metropolitan Planning Organization Safety Performance Measures Fact Sheet
 - https://safety.fhwa.dot.gov/hsip/spm/docs/mpo_factsheet.pdf
- FHWA Safety Target Setting Resources
 - https://safety.fhwa.dot.gov/hsip/spm/target-setting_resources.cfm
- North Carolina Strategic Highway Safety Plan
 - <https://spatial.vhb.com/ncdotshsp/>
- North Carolina Highway Safety Improvement Program (HSIP)
 - <https://connect.ncdot.gov/resources/safety/pages/nc-highway-safety-program-and-projects.aspx>

Resources

- MPO / RPO Crash Data

- <https://connect.ncdot.gov/resources/safety/Pages/Crash-Data.aspx>

Crash Data and Maps
Crash data, organized by type, ranking, overall cost, and maps and other resources for analysis.

Connect NCDOT
BUSINESS PARTNER RESOURCES

Doing Business | Bidding & Letting | Projects | **Resources** | Local Governments

Asset Management | Environmental | Geotechnical | GIS | Hydraulics | Materials & Tests | Photogrammetry | Specifications | Structures | **Traffic Safety**

Crash Data

- ✓ Name
- Crash Type : City / County Ranking (43)
- Crash Type : County Crash Profiles (818)
- Crash Type : Crash Costs (19)
- Crash Type : Crash Facts by Year (56)
- Crash Type : Crash Rates (29)
- Crash Type : MPO / RPO Crash Data (19)**

NC_PerformanceMeasuresData_2018Targets_Winston-SalemUrbanAreaMPO

Employee Directory
Staff contacts for Transportation Safety and Mobility.

Links
Work Zone Data
Work Zone Crashes by County

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

DATE: September 11, 2020

TO: Eluid De Jesus, AICP
Transportation Planner, Greenville Urban Area Metropolitan Planning Organization

FROM: Brian Mayhew, PE, CPA
State Traffic Safety Engineer
Transportation Mobility & Safety Division

SUBJECT: Safety Performance Measures – FHWA Assessment and 2021 Targets

Background

Effective April 14, 2016, the Federal Highway Administration (FHWA) established five highway safety performance measures in accord with regulations set forth in the Federal MAP-21 and FAST Act transportation funding bills. These performance measures are:

1. Number of fatalities;
2. Rate of fatalities per 100 million vehicle miles traveled;
3. Number of serious injuries;
4. Rate of serious injuries per 100 million vehicle miles traveled; and
5. Number of combined non-motorized fatalities and non-motorized serious injuries.

These targets are established annually, are based on 5 year rolling averages, and are for calendar years. North Carolina state targets are set in agreement with our Strategic Highway Safety Plan (SHSP) (<https://portal.vhb.com/ncdotshsp/>) goals. The SHSP goals are developed through collaborative efforts of a diverse group of stakeholders including state, regional, and local partners (including MPOs). The goal of the most recent (2019) SHSP is to reduce fatalities and serious injuries by half by 2035, moving towards zero by 2050.

North Carolina Safety Performance Target Achievement Determination

In early 2020, FHWA completed an assessment of target achievement for NCDOT's calendar year (CY) 2018 safety targets, based on the 5-year averages for 2014-2018 for each measure. As per 23 CFR 490.211(c)(2), a State Department of Transportation (DOT) has met or made significant

| Measure | 2014-2018 Average | 2019 Target | 2019 Actual | 2020 Target | 2020 Actual |
|------------------|-------------------|-------------|-------------|-------------|-------------|
| Fatalities | 1.0 | 0.5 | 0.6 | 0.5 | 0.6 |
| Serious Injuries | 1.0 | 0.5 | 0.6 | 0.5 | 0.6 |
| Combined | 1.0 | 0.5 | 0.6 | 0.5 | 0.6 |

Resources

- **Planning Organization Resources**

- <https://www.ncdot.gov/initiatives-policies/safety/traffic-safety/Pages/Planning-Organization-Resources.aspx>

- **North Carolina Strategic Highway Safety Plan**

- <https://spatial.vhb.com/ncdotshsp/>

- **Highway Safety Improvement Program (HSIP)**

- Our HSIP program is our primary method of identifying locations that are likely to produce a safety project. Locations are flagged if they exceed certain criteria and have patterns that we believe are correctable.
- Link to webpage with description of program and tabular reports: <https://connect.ncdot.gov/resources/safety/pages/nc-highway-safety-program-and-projects.aspx>
- Link to mapped HSIP locations for the last 5 years: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=bb6dd277ce6247438fc096200141949a>

- **Total Crash Frequency Grouped By Intersection**

- This product contains planning level crash data grouped by intersection. This data should not be used for detailed design decisions.
 - Special consideration should be given to data at ramps or loop locations.
- Link to ArcGIS Online mapped data: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=dc944f1c834f49a18479c17df1f783b9>

- **Planning Level Safety Scoring Data**

- This product contains planning level crash data for each half mile section of roadway. This data should not be used for detailed design decisions. This is the dataset that is used to score projects from a safety perspective as they go through the STI process.
- Link to ArcGIS Online mapped data: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=7415a4df4df1468585225bc74a77369b>

- **Fatal and Severe Injury Crashes**

- This product contains fatal and severe injury crashes mapped for the last 10 years.
- Link to ArcGIS Online mapped data: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=9a25021dbe91427a92f2eca57bd71ee2>

- **Bicycle and Pedestrian Crash Data**

- This product contains bicycle and pedestrians crashes mapped for years 2007 through 2020.
- Link to ArcGIS Online mapped data: <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b4fcdc266d054a1ca075b60715f88aef>

- **Safety Project Mapping**

- This product displays completed, funded, and on-hold spot safety and hazard elimination projects since 2019, and is updated quarterly.
- Link to mapped safety project locations: <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=3f8b32844ad04673b391033a86496852>

- **Spot Mobility Project Mapping**

- This product displays completed, funded, and on-hold spot mobility projects since 2019, and is updated quarterly.
- Link to mapped safety project locations: <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=af5150835edb4502a26762e966cb5dfa>

Safety Funding and Projects

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NCDOT Safety and Mobility Programs

Three Project Funding Sources

| HSIP (Highway Safety Improvement Program) | Spot Safety | Spot Mobility |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|
| \$74M Per Year | \$12.1M Per Year | \$14.2M Per Year |
| Federal Funds | State Funds | State Funds |
| Soft cap of \$1M per project (>\$1M requires advance approval from State Traffic Engineer) | \$400K cap per project | \$750K cap per project |
| B/C based prioritization and systemic investments | Prioritization is based on the Spot Safety Index | Prioritization is based on the Spot Mobility Index |
| Selected bi-annually | Selected quarterly | |

HSIP Program Focus

Fatality and Serious Injury share by SHSP emphasis areas

Roadway Departure

55%

Intersection

31%

Pedestrian & Bike

18%

Time to Next Fatality or Serious Injury

Roadway Departure

2.6 Hours

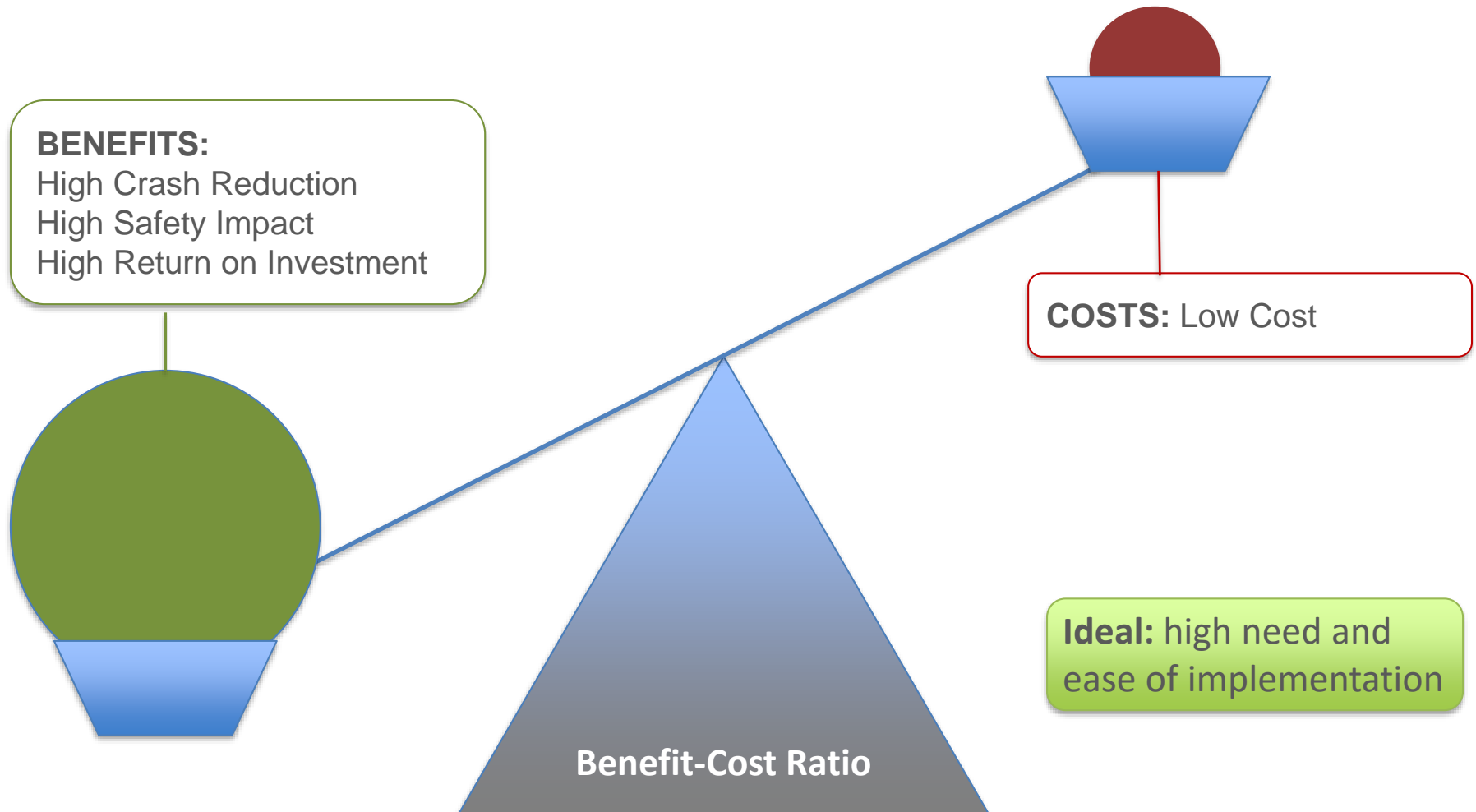
Intersection

4.0 Hours

Pedestrian & Bike

13.4 Hours

Countermeasure Selection

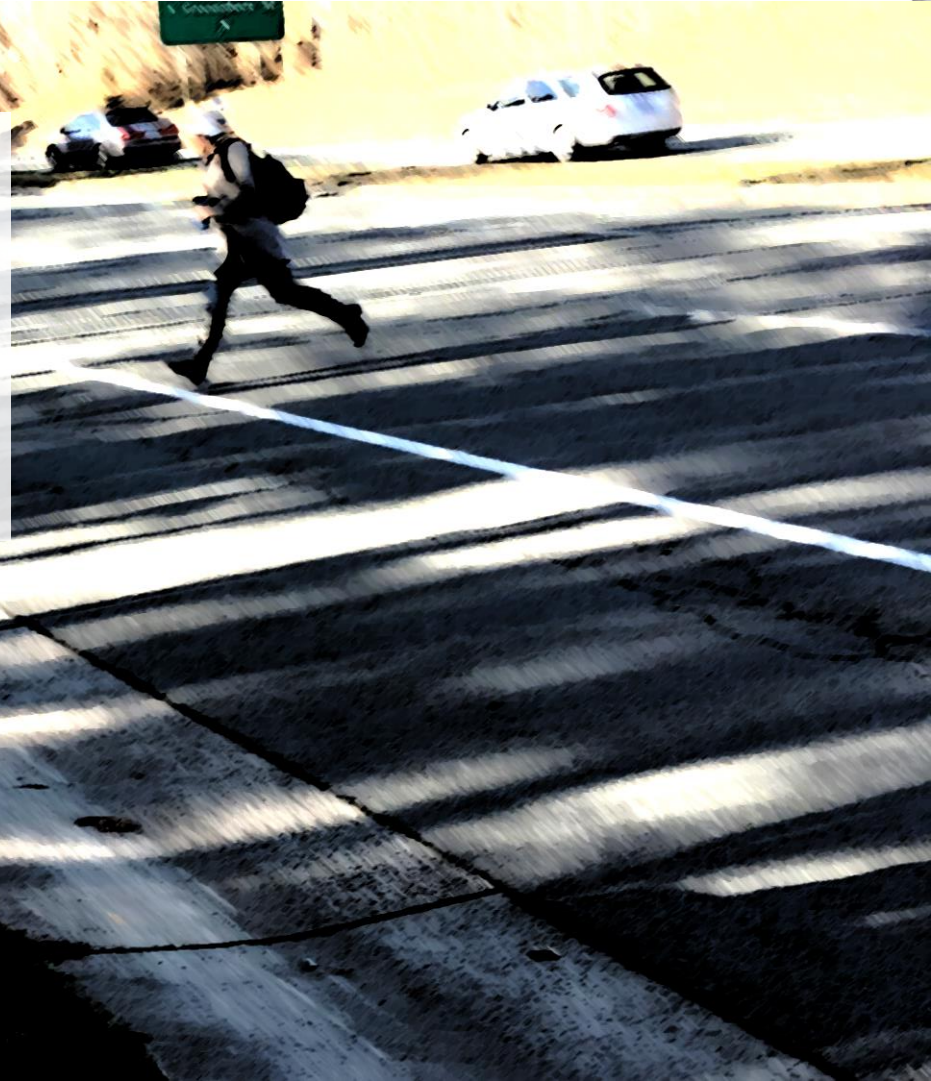


Safety Project Cycle





NC 54 Corridor Bicycle and Pedestrian Safety Study





4.5 miles

Pedestrian Safety Corridor Study Process



Data Collection



Analysis



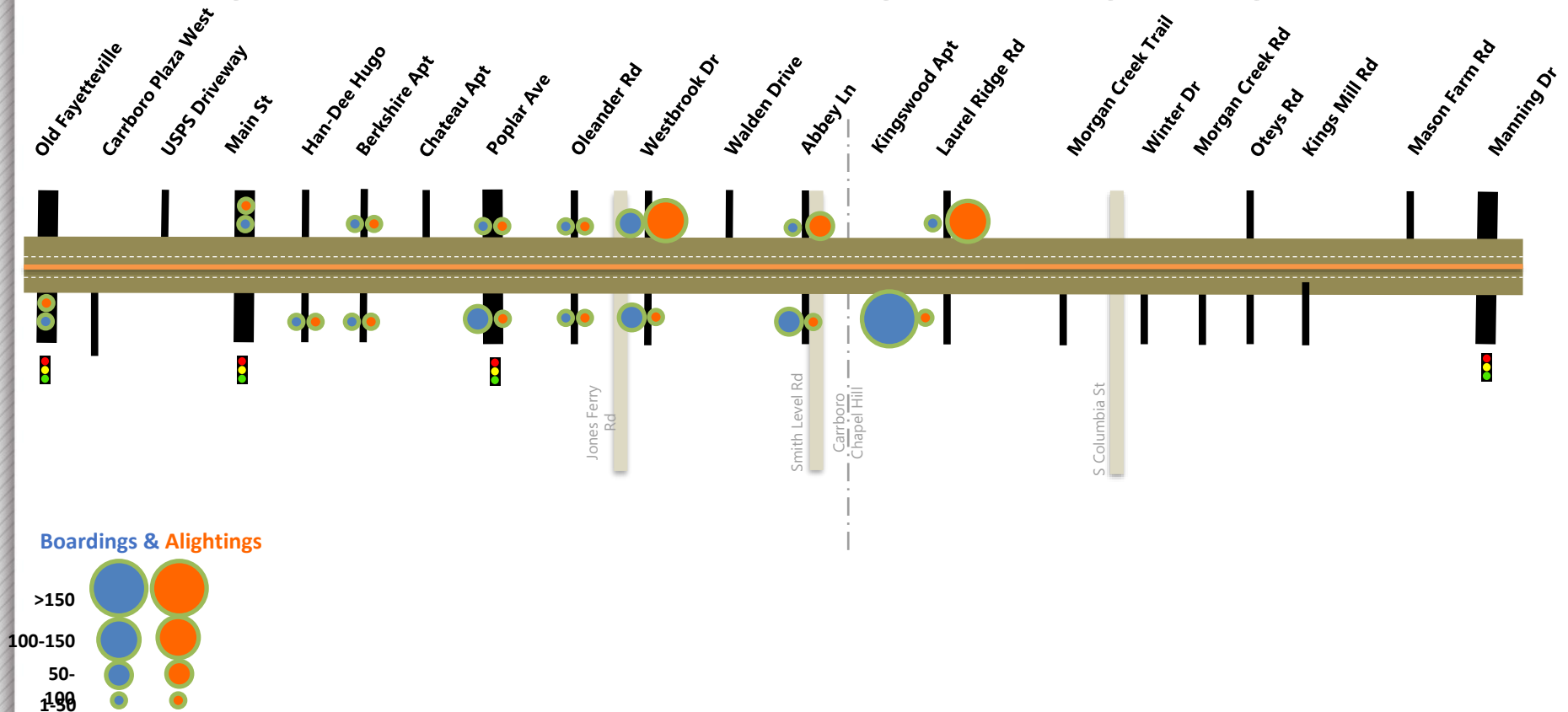
Develop & Test Concepts

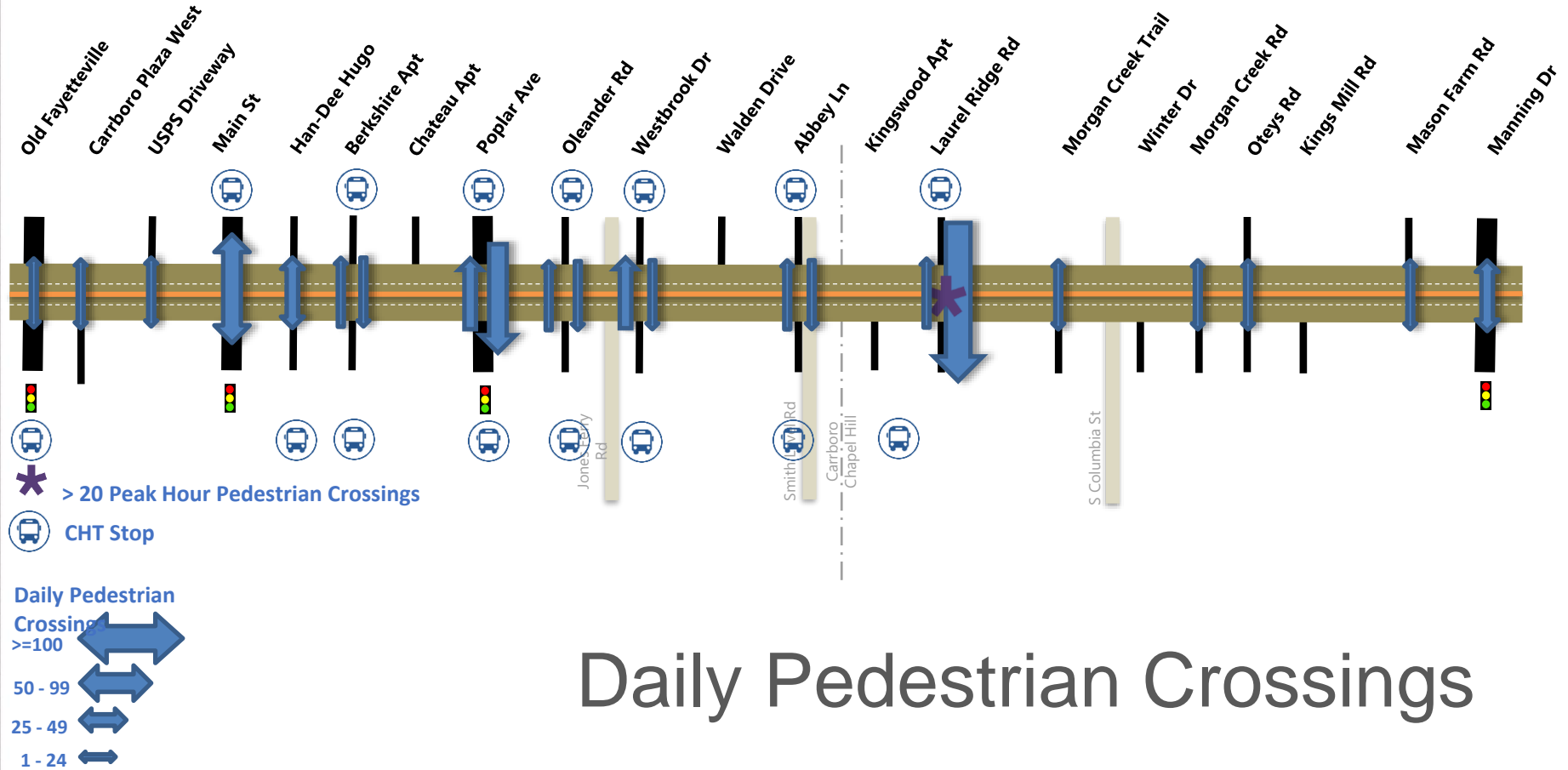


Finalize Recommendations

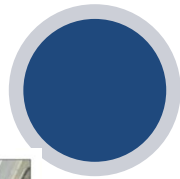


Average Daily CHT Boardings & Alightings





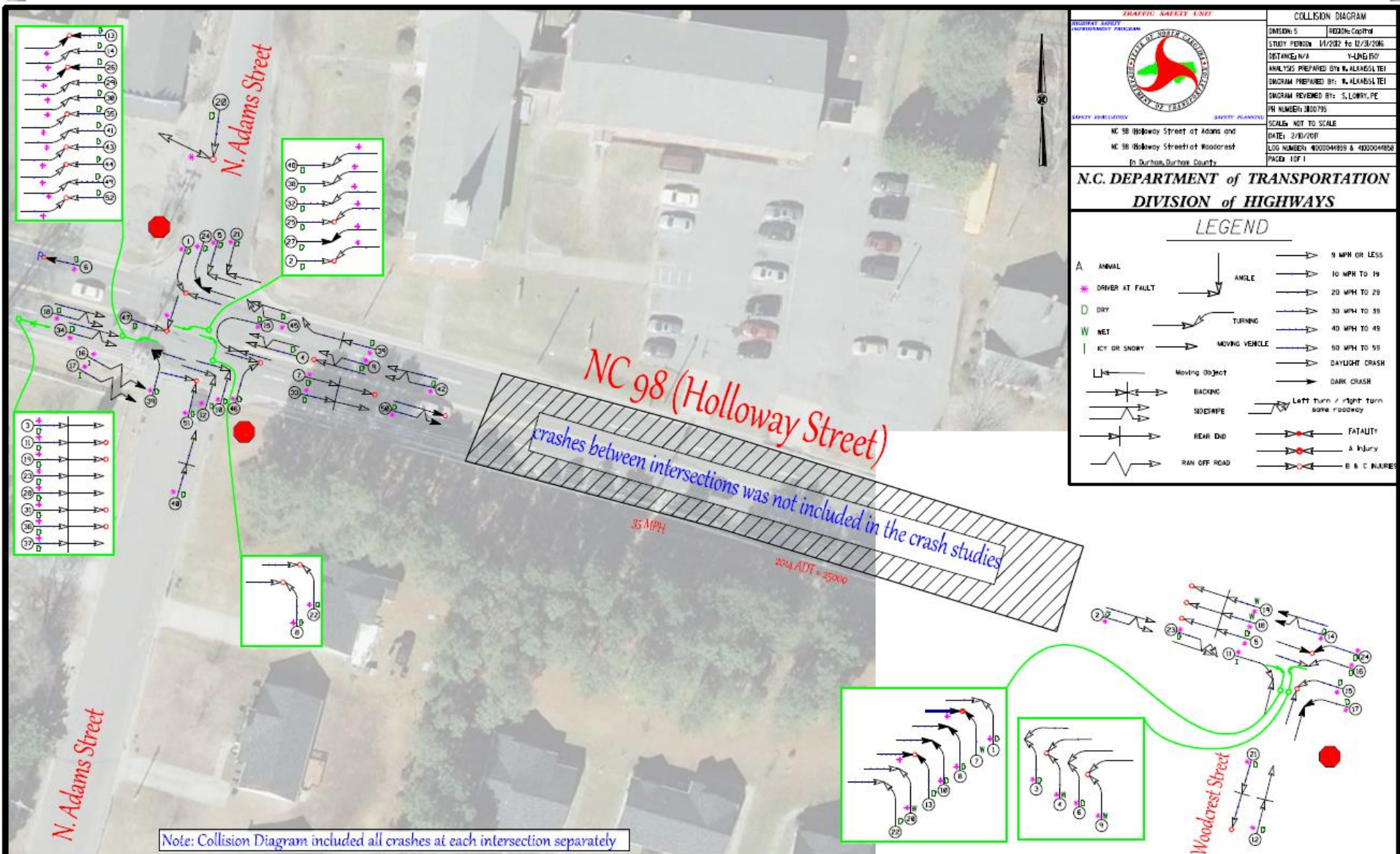
Pedestrian Safety Corridor Study

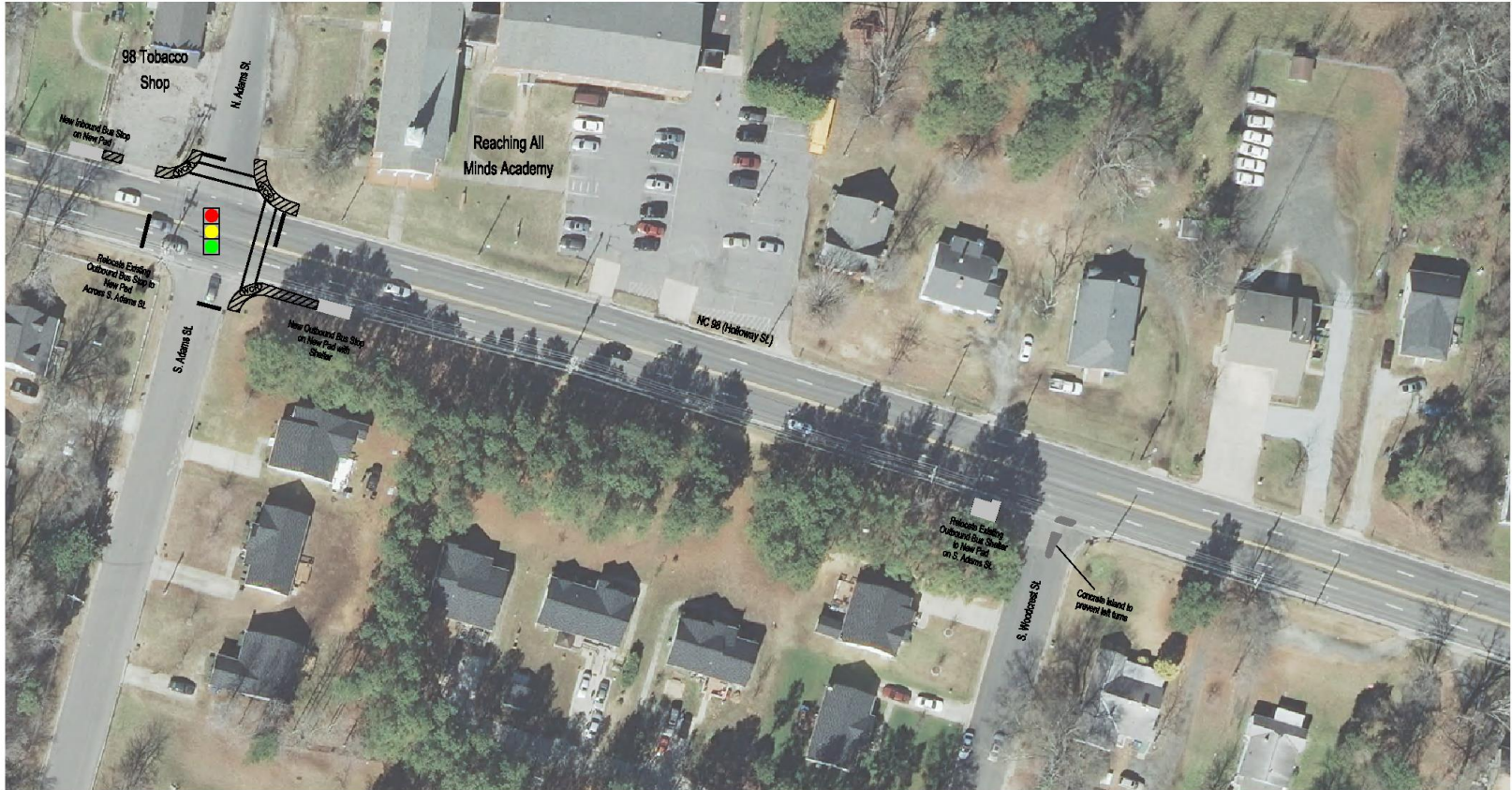


Recommendations



- Improvement at multiple locations along corridor focused on pedestrian crossings. Including improvements at over 8 intersections / transit stops
- Refuge Islands, pedestrian signals, crosswalks, signal improvements, sidewalk, lighting, etc.
- Total funding of over 1.7 M, including over 571K of state safety funds
- Local Government + MPO Federal DG + Safety Funds





NC 98 CORRIDOR IMPROVEMENTS
(ADAMS ST. TO WOODCREST ST.)

Discussion

An aerial photograph of a roundabout with a central island. The island has some trees and a small structure. The roundabout is surrounded by roads and some buildings. The image is faded and serves as a background for the slide.

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Thank you!

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