

DURHAM • CHAPEL HILL • CARRBORO

**DCHC**

METROPOLITAN PLANNING ORGANIZATION

PLANNING TOMORROW'S TRANSPORTATION

# Transportation Performance Measures

## HIGHWAY SAFETY (PM1)

David Miller, DCHC MPO

Brian Murphy, NCDOT Traffic Safety Unit

MPO Board

January 23, 2024

# DCHC MPO TPM Adoption Dates

Transportation Performance Measure	Adoption Cycle	Most Recent Adoption	Next Required Adoption
Transit Asset Management	4 years	September 2022	Coordinate with MTP Update
<b>Highway Safety (PM1)</b>	<b>1 year</b>	<b>January 2023</b>	<b>February 27 2024*</b>
Bridge and Pavement Condition (PM2)	4 years	May 2023	June 2027*
System Performance/Reliability (PM3)	4 years	May 2023	June 2027*

\* MPO adoption is due 180 days after NCDOT adoption

# FHWA Performance Measures

## PM1 – Highway Safety

1. Number of fatalities
2. Fatality rate
3. Number of serious injuries
4. Serious injury rate
5. Number of non-motorized fatalities and serious injuries

## PM2 – Pavement and Bridge Condition

Adopted May 10, 2023

6. Interstate pavement in Good condition
7. Interstate pavement in Poor condition
8. Non-Interstate NHS pavement in Good condition
9. Non-Interstate NHS pavement in Poor condition
10. NHS bridges in Good condition
11. NHS bridges in Poor condition

## PM3 – System Performance/ Reliability

Adopted May 10, 2023

12. Travel time reliability on the Interstate
13. Travel time reliability on the non-Interstate NHS
14. Truck travel time reliability on the Interstate System



**NORTH CAROLINA**  
Department of Transportation

# Traffic Safety Data Trends / Performance Measures

Brian Murphy

Traffic Safety Systems Engineer

January 2024

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Presentation Overview

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**Statewide Data Trends**

**2**

**DCHC MPO Data Trends**

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**Safety Performance Measures**

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**Safety Data Resources**

**5**

**Questions / Discussion**

# Statewide Data Trends

- State Population
- Vehicle Miles Travelled
- Fatalities
- Serious Injuries
- Pedestrian Fatal and Serious Injuries
- Bicycle Fatal and Serious Injuries

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**Statewide Data Trends**

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**DCHC Data Trends**

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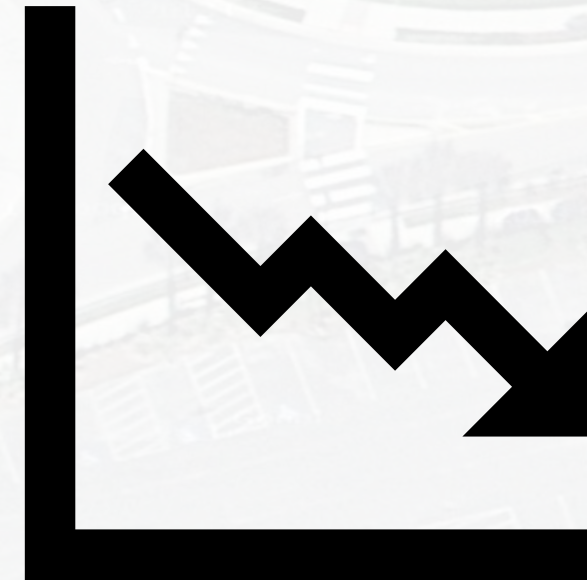
**Safety Data Resources**

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**Questions / Discussion**

# SHSP Goal

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



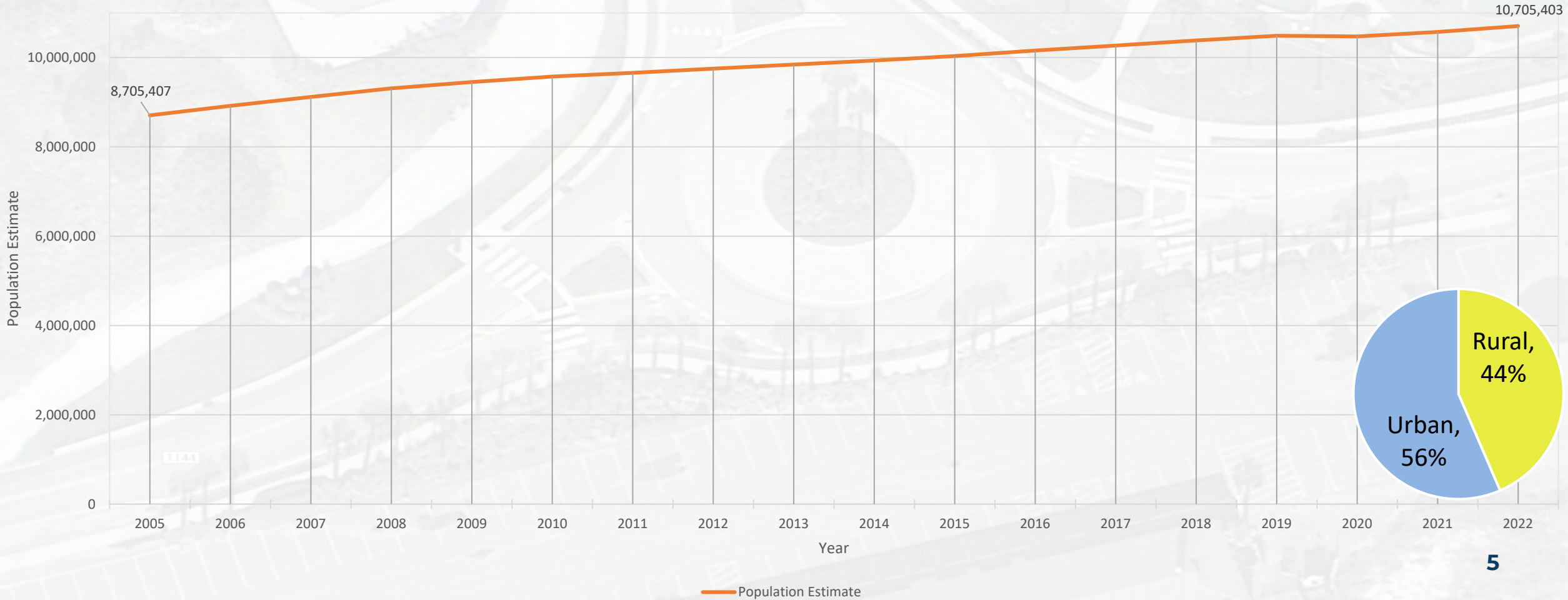
2019 North Carolina  
Strategic Highway  
Safety Plan



December 2019

# State Population

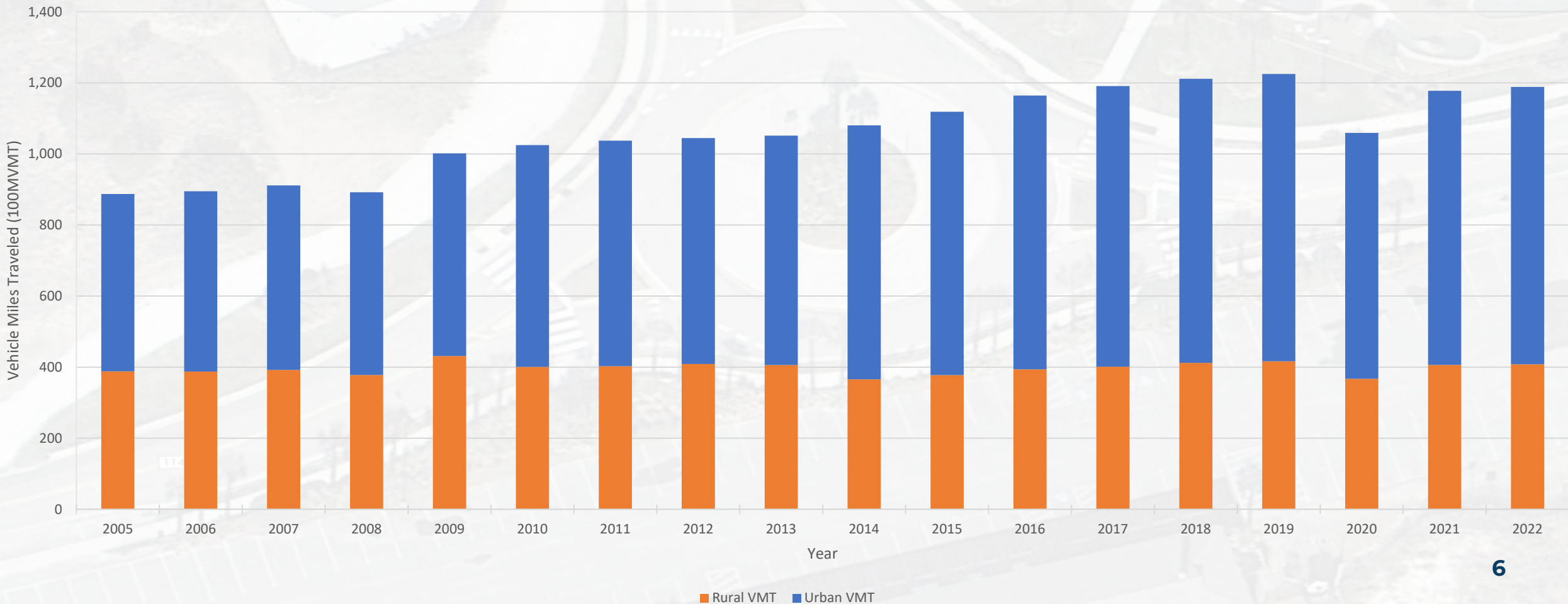
State Population Estimates by Year  
(2005 - 2022)





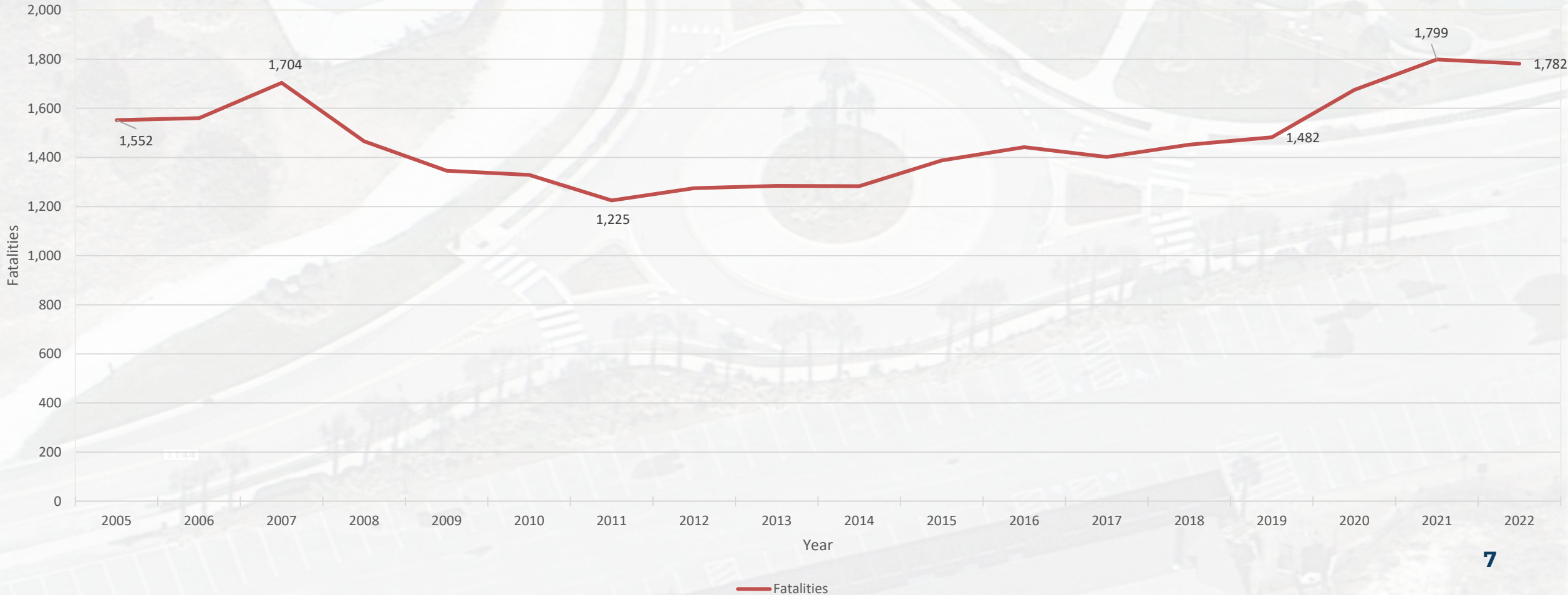
# Vehicle Miles Traveled (VMT)

North Carolina VMT Estimates by Year  
(2005 - 2022)



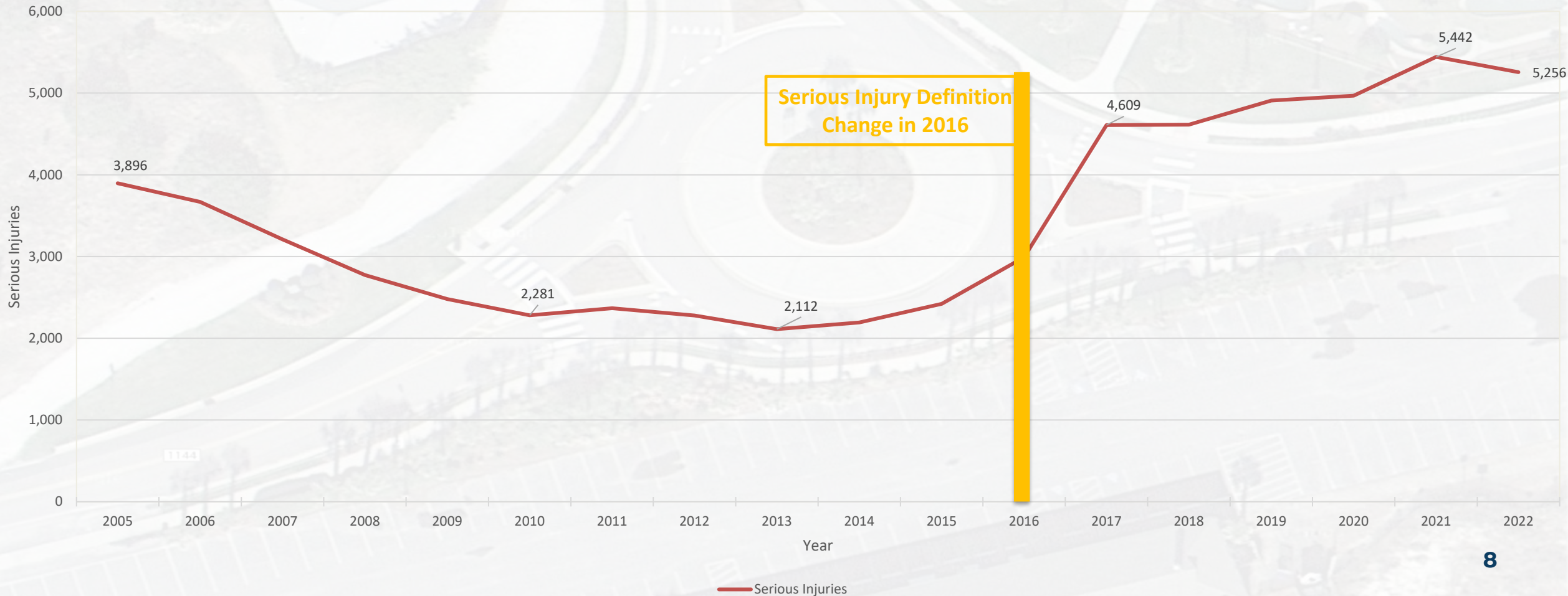
# Fatalities

Fatalities by Year  
(2005 - 2022)



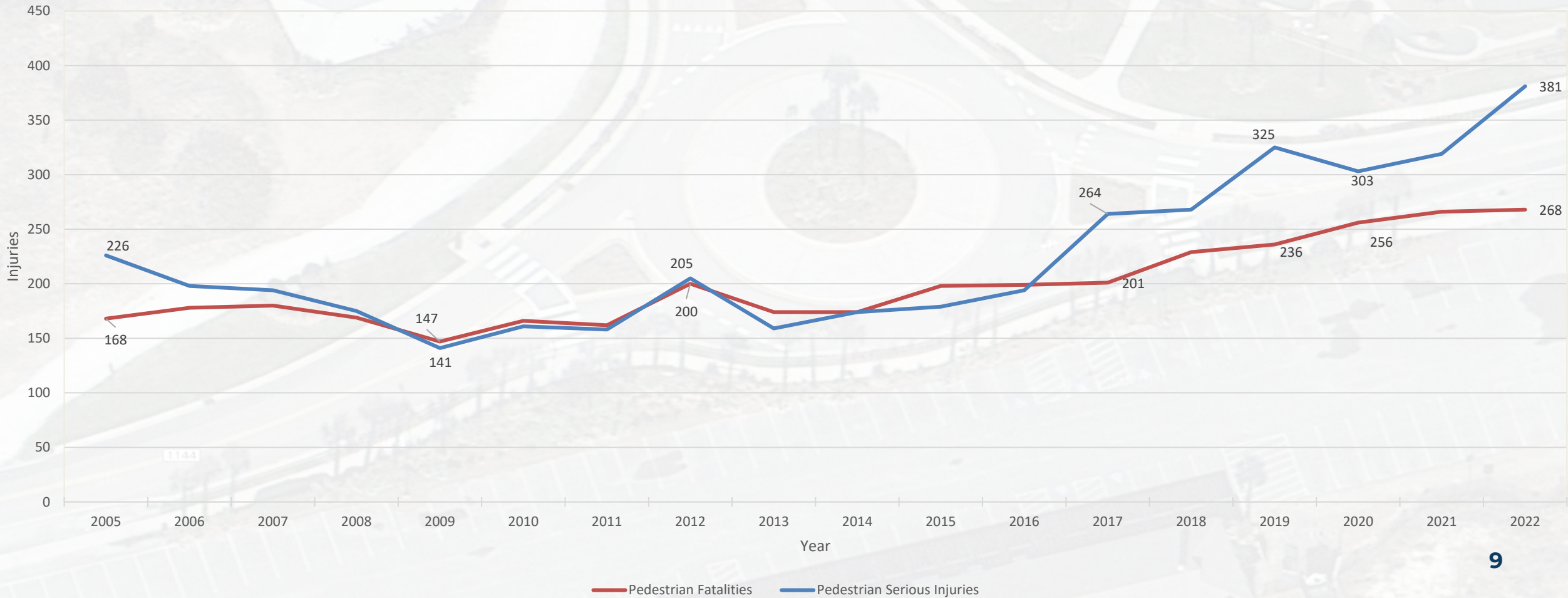
# Serious Injuries (A Type – Disabling)

Serious Injuries (A Type Injuries) by Year  
(2005 - 2022)



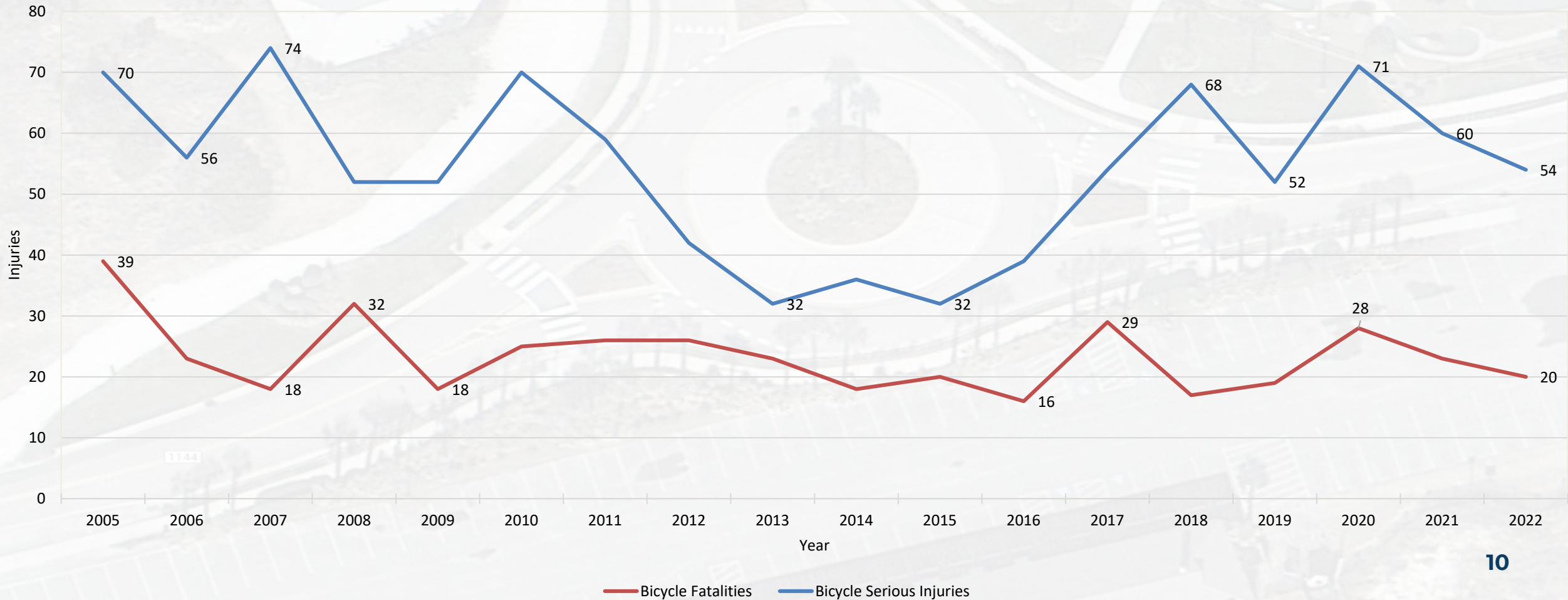
# Pedestrian Fatalities and Serious Injuries

Pedestrian Fatalities and Serious Injuries by Year  
(2005 - 2022)



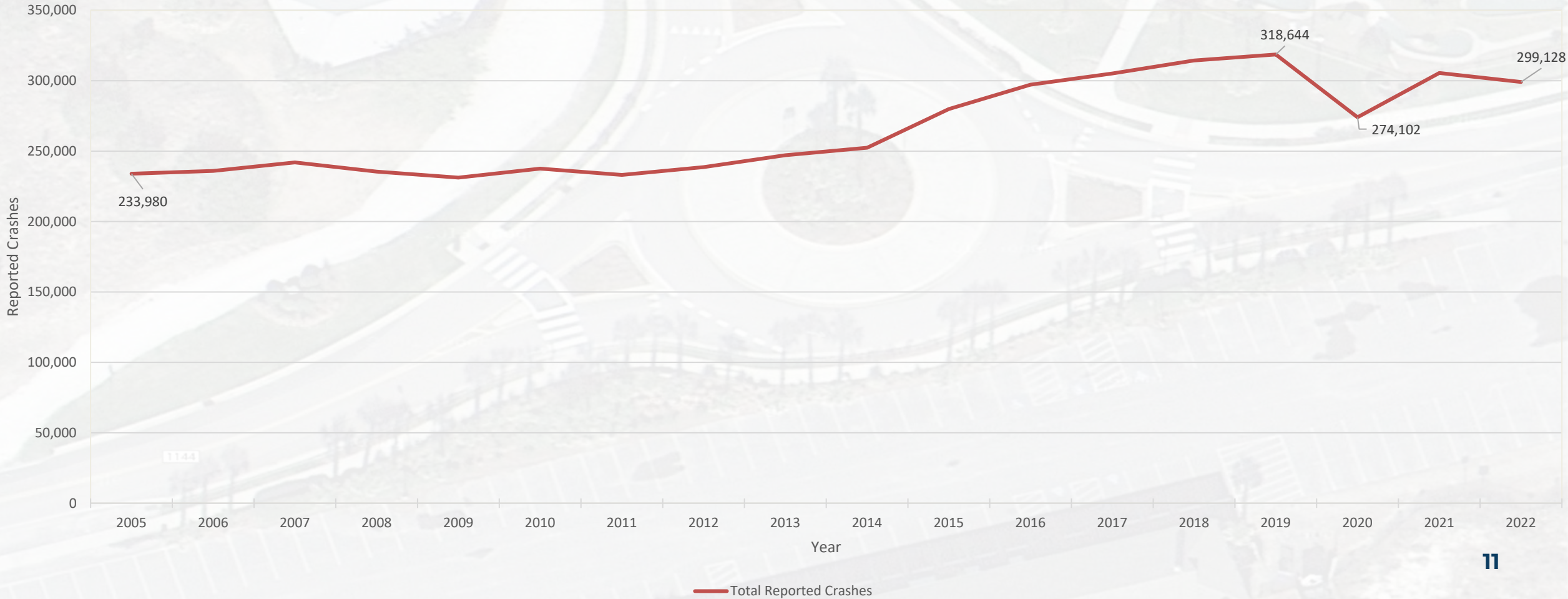
# Bicycle Fatalities and Serious Injuries

Bicycle Fatalities and Serious Injuries by Year  
(2005 - 2022)



# Reported Crashes

Reported Crashes by Year  
(2005 - 2022)



# Durham – Chapel Hill – Carrboro MPO Data Trends

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

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Trends

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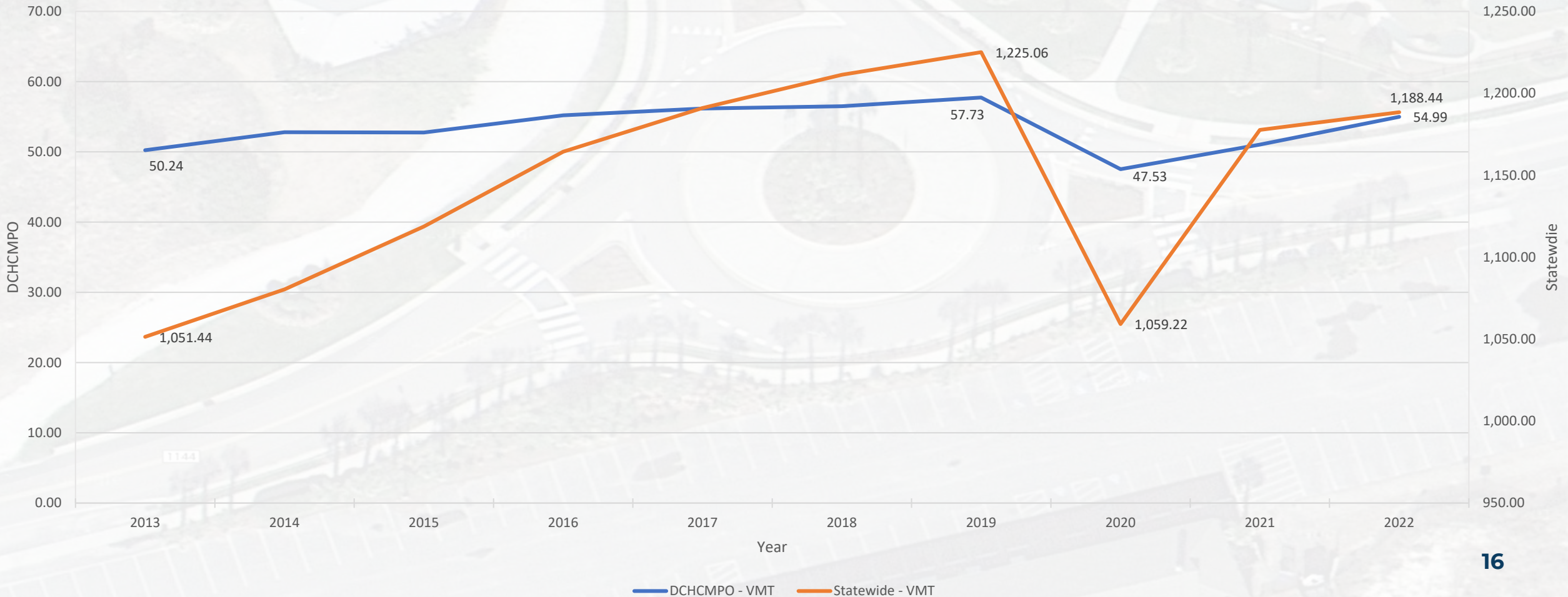
Safety Data  
Resources

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# Vehicle Miles Traveled (VMT)

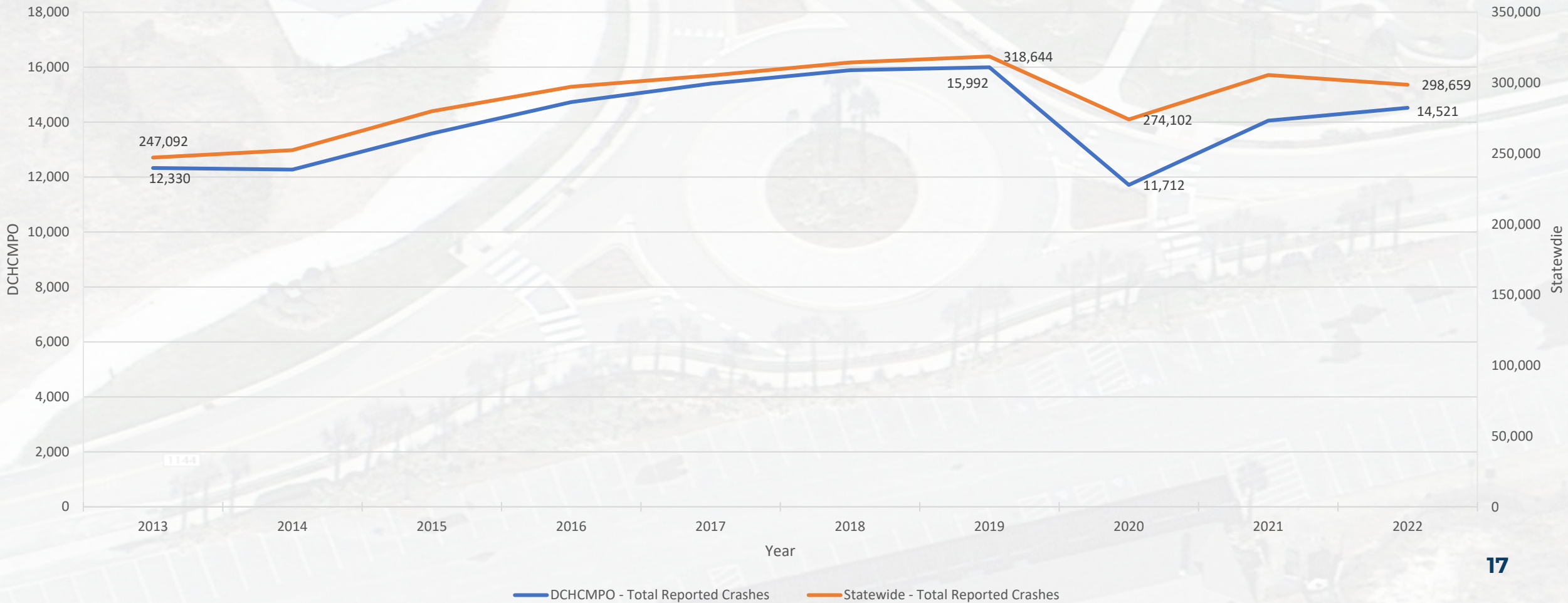
Vehicle Miles Traveled (100 MVM) by Year  
(2012 - 2022)





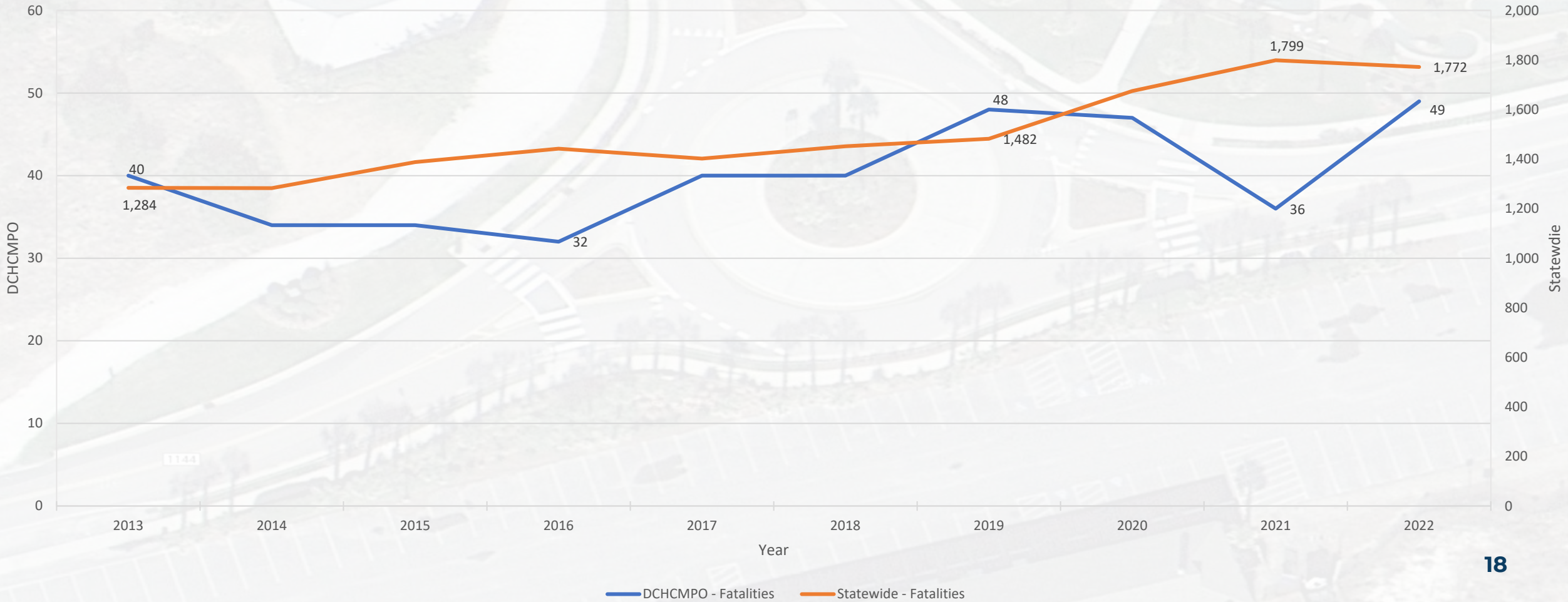
# Reported Crashes

Total Reported Crashes by Year  
(2012 - 2022)



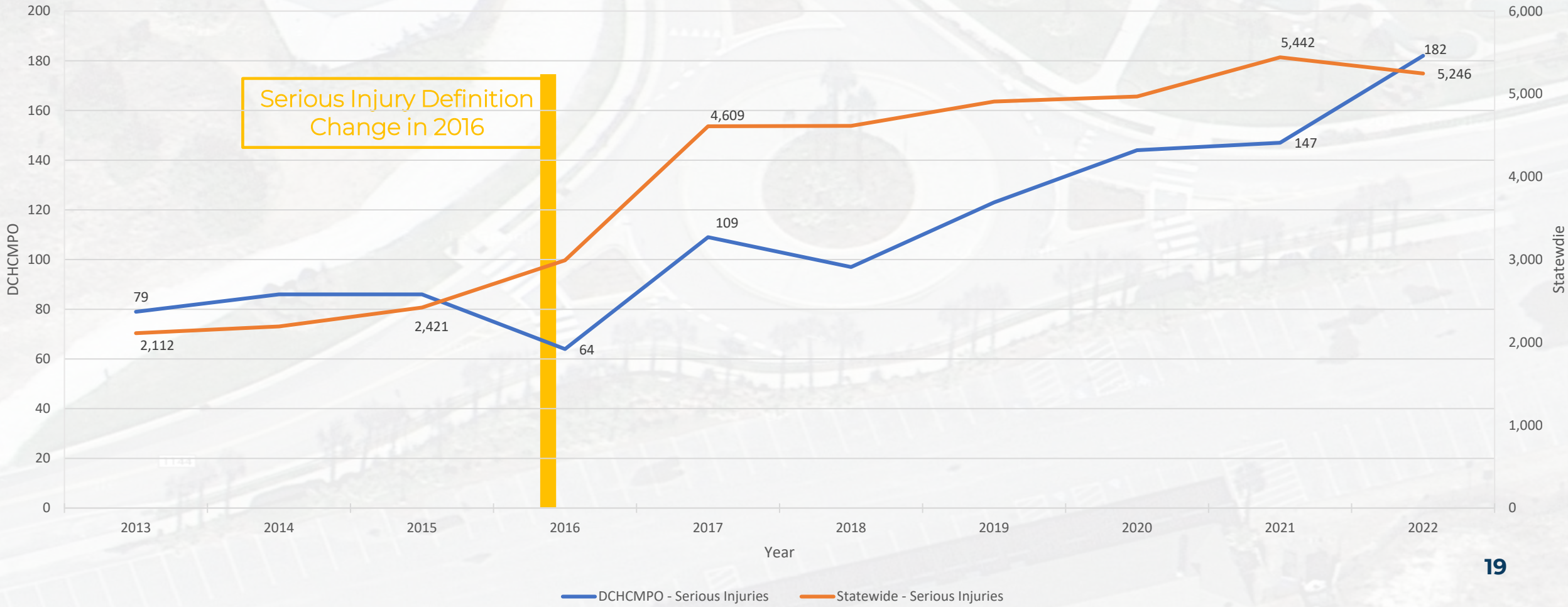
# Fatalities

Fatalities by Year  
(2012 - 2022)



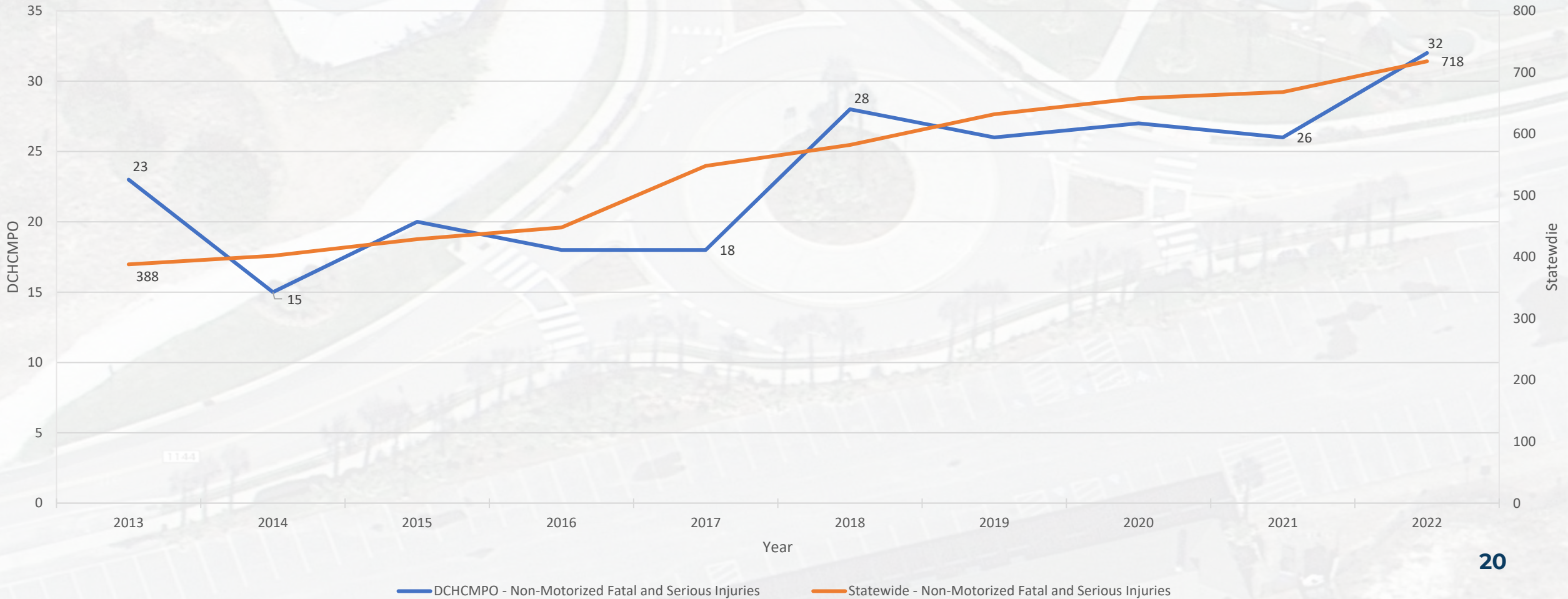
# Serious Injuries (A Type – Disabling)

Serious Injuries by Year  
(2012 - 2022)



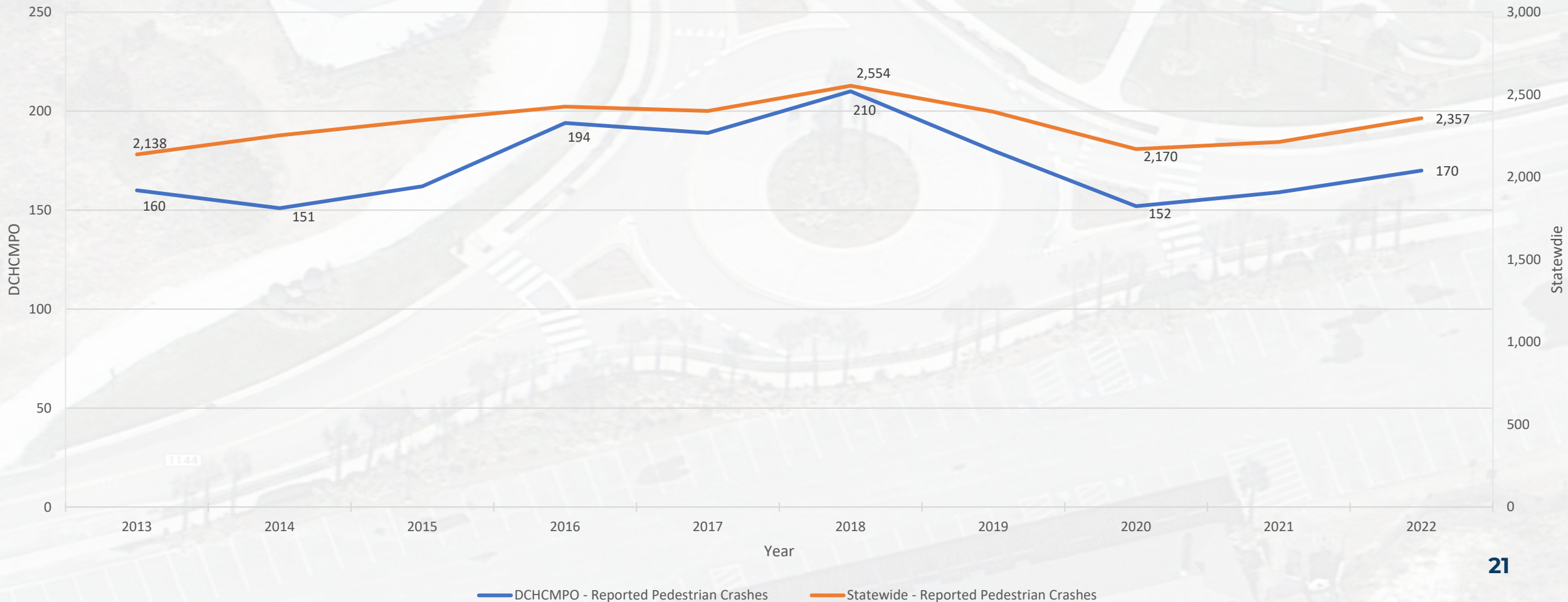
# Non-Motorized Fatalities and Serious Injuries

Non-Motorized Fatal and Serious Injuries by Year  
(2012 - 2022)



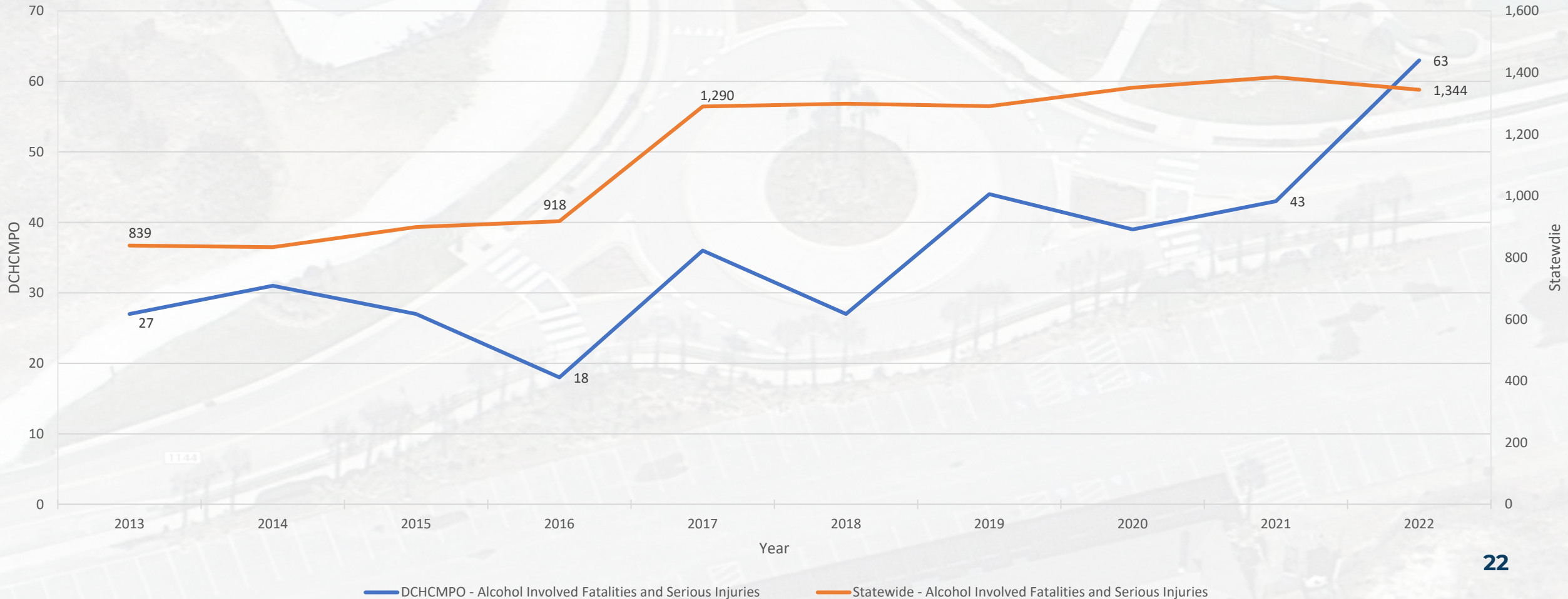
# Reported Pedestrian Crashes

Reported Pedestrian Crashes by Year  
(2012 - 2022)



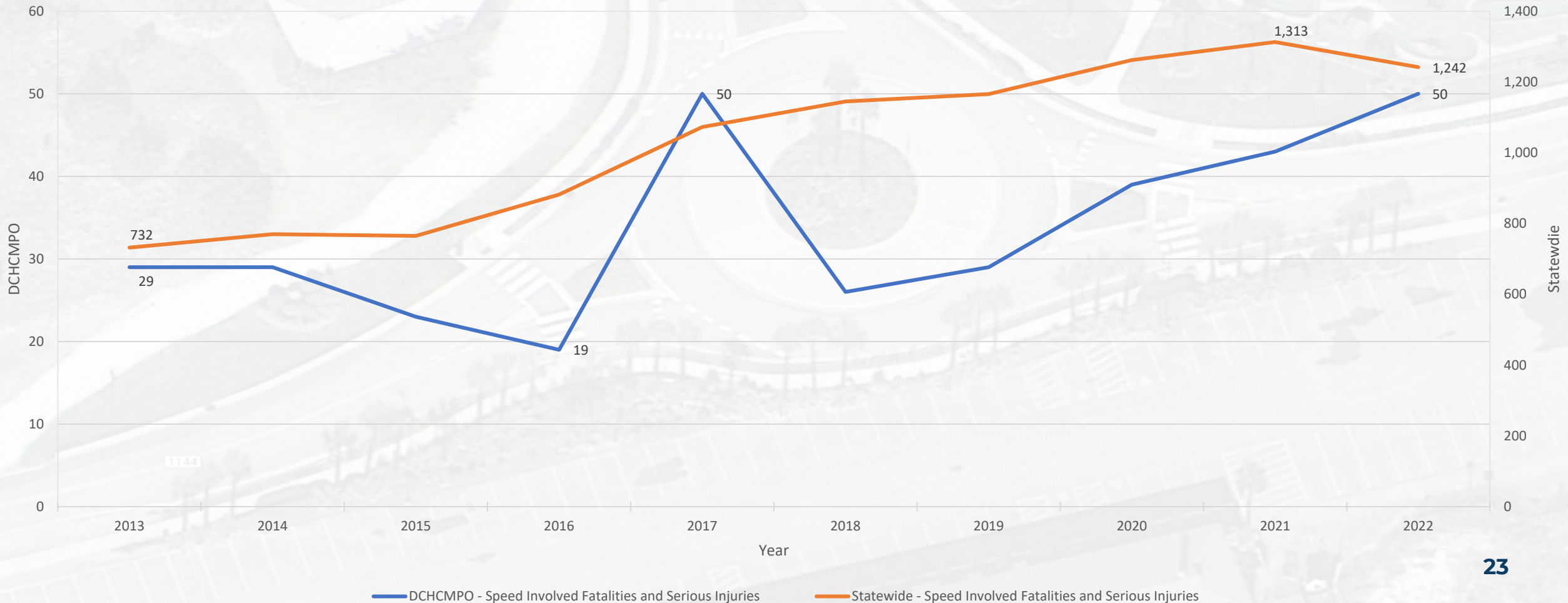
# Alcohol Involved Fatalities and Serious Injuries

Alcohol Involved Fatalities and Serious Injuries by Year  
(2012 - 2022)



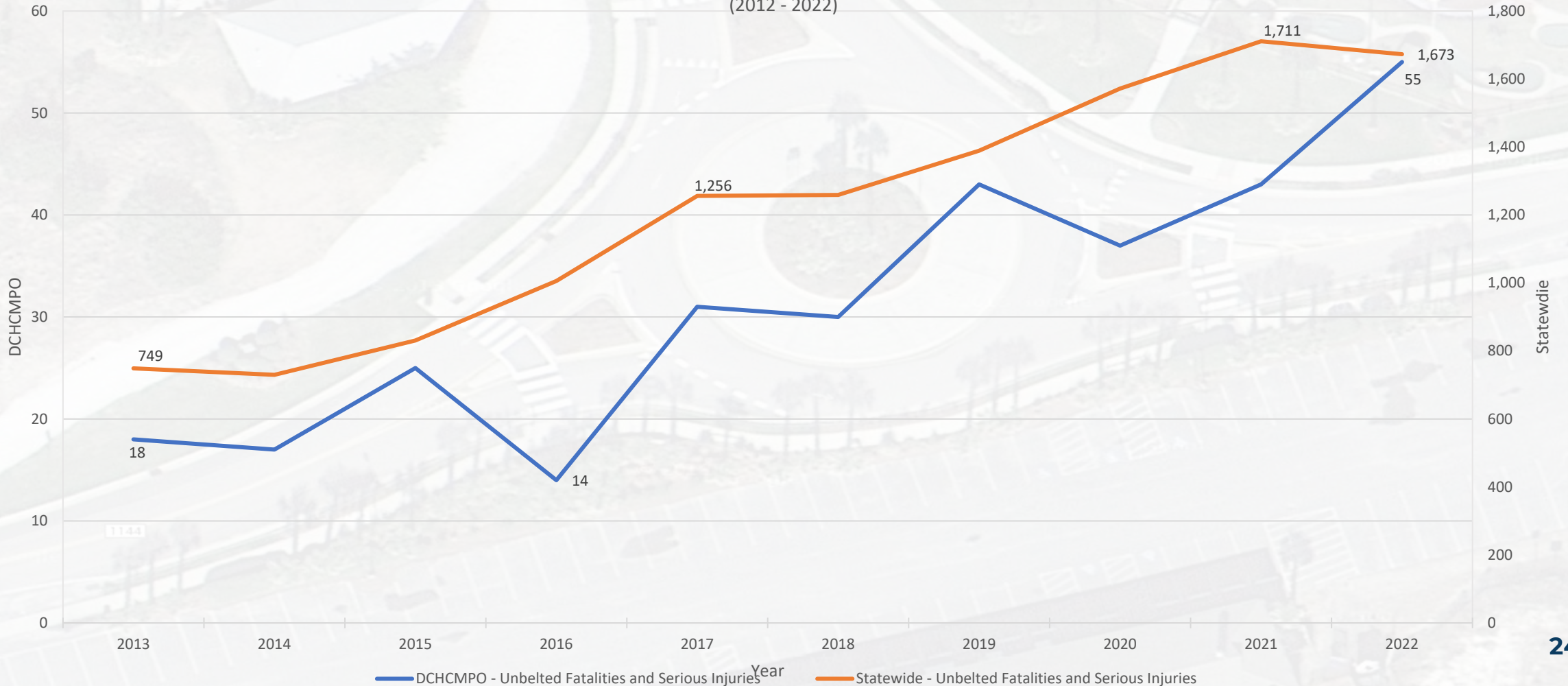
# Speed Involved Fatalities and Serious Injuries

Speed Involved Fatalities and Serious Injuries by Year  
(2012 - 2022)



# Unbelted Fatalities and Serious Injuries

Unbelted Fatalities and Serious Injuries by Year  
(2012 - 2022)





## Breakdown by Municipality within the Durham – Chapel Hill – Carrboro MPO (2013 – 2022)

Municipality	Total Reported Crashes	Fatal Crashes	Serious Injury Crashes
Carrboro	1,549	6	5
Chapel Hill	9,475	17	38
Durham	98,661	201	427
Efland	24	0	0
Hillsborough	2,376	3	14
Rougemont	56	0	0
<i>Rural</i>	<i>28,334</i>	<i>150</i>	<i>447</i>
Total	140,475	377	931

# Safety Performance Measures

- Background
- Assessment
- 2024 Safety Performance Measures

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# 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 28<sup>th</sup>



# 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



# SHSP Goal

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

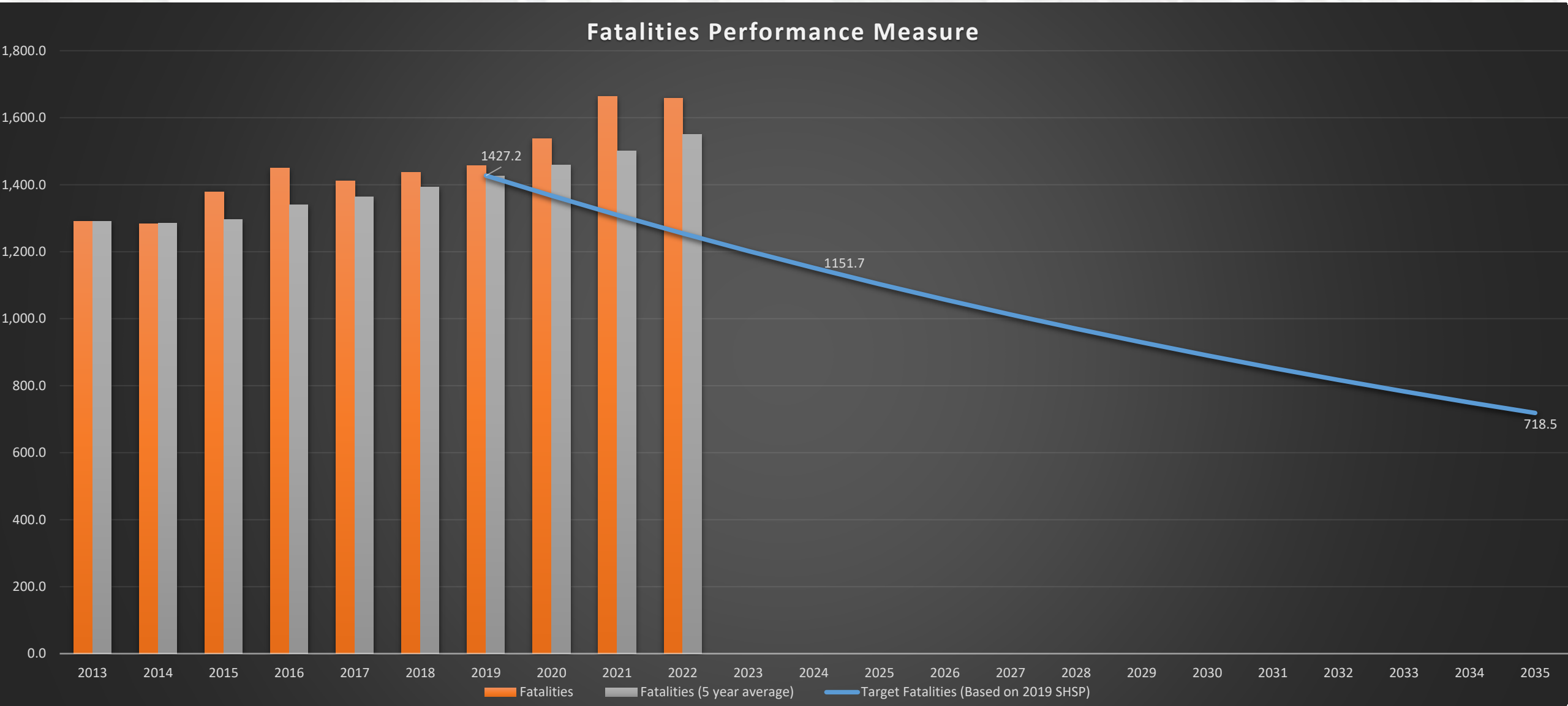


2019 North Carolina  
Strategic Highway  
Safety Plan



December 2019

# Safety Performance Measures - Background



## Safety Performance Measures - Background

### Assessment of Significant Progress:

- FHWA will determine whether a State DOT has met or made significant progress toward meeting HSIP safety targets
  - CY 2021 targets were assessed in early 2023
- FHWA will not directly assess MPO progress towards meeting HSIP safety targets





# Safety Performance Measures - Background

## Assessment of Significant Progress (cntd):

- FHWA assessed NCDOT's CY 2021 safety targets in early 2023
- 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			
	2017 - 2021	2017 - 2021	2015 - 2019			
Fatalities (5 Year Average)	1,309.9	1,501.2	1,426.8	No	No	No
Fatality Rate (5 Year Average)	1.105	1.284	1.206	No	No	
Serious Injuries (5 Year Average)	3,656.1	4,898.4	3,905.0	No	No	
Serious Injury Rate (5 Year Average)	3.065	4.186	3.278	No	No	
Non-motorized Fatalities and Serious Injuries (5 Year Average)	504.4	624.0	537.6	No	No	

# Safety Performance Measures - Background

## Assessment of Significant Progress (cntd):

- FHWA assessed NCDOT’s CY 2021 safety targets in early 2023
- **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			
	2017 - 2021	2017 - 2021	2015 - 2019			
Fatalities (5 Year Average)	35.8	42.2	38.8	No	No	No
Fatality Rate (5 Year Average)	0.640	0.789	0.695	No	No	
Serious Injuries (5 Year Average)	86.9	124.0	95.8	No	No	
Serious Injury Rate (5 Year Average)	1.553	2.340	1.716	No	No	
Non-motorized Fatalities and Serious Injuries (5 Year Average)	20.7	25.8	22.4	No	No	

# Durham – Chapel Hill – Carrboro MPO Safety Performance Measures

## Durham – Chapel Hill – Carrboro MPO HSIP Safety Measures

Year	Fatalities	Fatality Rate	Serious Injuries	Serious Injury Rate	Non-motorized Fatalities and Serious Injuries
2008	34	0.746	98	2.150	29
2009	28	0.608	66	1.432	10
2010	30	0.628	57	1.194	13
2011	26	0.542	70	1.459	15
2012	30	0.627	82	1.713	26
2013	40	0.796	79	1.573	24
2014	34	0.644	86	1.629	15
2015	34	0.645	86	1.630	21
2016	32	0.580	64	1.159	18
2017	40	0.712	109	1.941	19
2018	40	0.708	97	1.717	28
2019	48	0.831	123	2.131	26
2020	47	0.989	144	3.029	29
2021	36	0.706	147	2.881	27
2022	49	0.891	182	3.310	33

## 2024 Durham – Chapel Hill – Carrboro MPO HSIP Safety Targets

- If adopting the State’s methodology of reducing fatalities and serious injuries by half by the year 2035

Year	Fatalities (5 Year Average)	Fatality Rate (5 Year Average)	Serious Injuries (5 Year Average)	Serious Injury Rate (5 Year Average)	Non-motorized Fatalities and Serious Injuries (5 Year Average)
2008 - 2012	29.6	0.630	74.6	1.590	18.6
2009 - 2013	30.8	0.640	70.8	1.474	17.6
2010 - 2014	32.0	0.647	74.8	1.514	18.6
2011 - 2015	32.8	0.651	80.6	1.601	20.2
2012 - 2016	34.0	0.658	79.4	1.541	20.8
2013 - 2017	36.0	0.675	84.8	1.586	19.4
2014 - 2018	36.0	0.658	88.4	1.615	20.2
2015 - 2019	38.8	0.695	95.8	1.716	22.4
2016 - 2020	41.4	0.764	107.4	1.995	24.0
2017 - 2021	42.2	0.789	124.0	2.340	25.8
2018 - 2022	44.0	0.825	138.6	2.614	28.6
<b>2024 Target*</b>	<b>31.5</b>	<b>0.563</b>	<b>77.4</b>	<b>1.382</b>	<b>19.3</b>

# Safety Data Resources

- Safety Project Mapping
- Bicycle and Pedestrian Crash Data Dashboard

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# Resources

## **North Carolina Strategic Highway Safety Plan**

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

## **General Safety Data Mapping Site / Dashboards**

- Link to general safety data mapping site. Includes links to dashboards for total crashes, pedestrian and bicycle crashes, and MPO safety performance measures: <https://www.ncdot.gov/initiatives-policies/safety/traffic-safety/Pages/safety-data-maps.aspx>

## **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 Serious 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 pedestrian crashes mapped back to 2007. Link to ArcGIS Online mapped data: <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b4fcdc266d054a1ca075b60715f88aef>
- Link to pedestrian and bicycle dashboard information: <https://ncdot.maps.arcgis.com/apps/dashboards/78046d11cabd4658a4d45b88c52ab8af>

## **Safety Project Mapping**

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

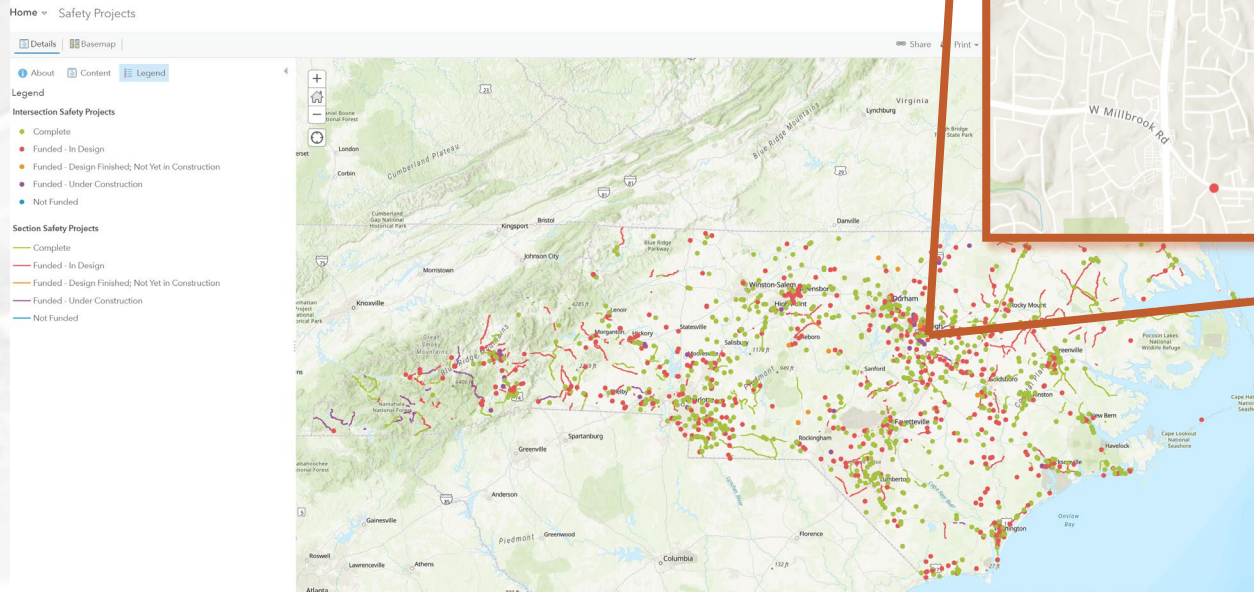
## **Spot Mobility Project Mapping**

- 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 Project Mapping

## Safety Project Mapping

- Projects completed since 2019 are mapped
- All funded, but not completed projects are mapped
- Some systemic or area-wide projects are not mapped
  - e.g. regional guardrail projects, systemic signing projects
- Link: [Safety Project Mapping](#)



Site ID	W-5805C[05-18-52595]1
Number	
Status	In Design
Cost	85,000
Completion Date	
Location Type	Intersection
Type	
Location Description	**Vulnerable User** SR 1820 (Lead Mine Road) at SR 1827 (Lynn Road).
Project Description	Construct pedestrian refuge islands, revise curb ramps, remark crosswalks with Hi-Viz and revise stop bar locations.

# Bicycle and Pedestrian Crash Data Dashboard

## Bicycle and Pedestrian Crash Data Dashboard

- All bicycle and pedestrian crashes geolocated and crash typed since 2007
- Query by boundary, get information on individual crashes
- Link: [Pedestrian and Bicyclist Crash Dashboard](#)

**Pedestrian and Bicyclist Crash Dashboard**  
Explore statewide numbers (default), or select a geography from the options at right

Select Years: 2016 - 2022 | Select an MPO-RPO: All | Select a Division: All | Select a County: All | Select a municipality: Salisbury

### Pedestrian Crashes by Year

Year	Crashes
2016	8
2017	12
2018	14
2019	16
2020	15
2021	14
2022	9

### Bicyclist Crashes by Year

Year	Crashes
2016	7
2017	6
2018	7
2019	5
2020	9
2021	8
2022	12

### Most Common Pedestrian Crash Types

Crash Type	A: Suspected Serious Injury	B: Suspected Minor Injury	C: Possible Injury	K: Killed	O: No Injury
Crossing Roadway - Vehicle Not Turning	~1.0k	~2.8k	~2.0k	~0.8k	~0.4k
Crossing Roadway - Vehicle Turning	~0.8k	~4.0k	~3.0k	~0.2k	~1.0k

### Most Common Bicyclist Crash Types

Crash Type	K: Killed	O: No Injury
Crossing Roadway - Vehicle Not Turning	~0.8	~1.0
Crossing Roadway - Vehicle Turning	~0.2	~1.0
Bicyclist Failed to Yield - Midblock	~0.0	~3.0
Crossing Paths - Other Circumstances	~0.0	~1.0

### All Pedestrian Crashes

Severity	Percentage
A: Suspected Serious Injury	4.4%
B: Suspected Minor Injury	37.7%
C: Possible Injury	36.3%
K: Killed	9.0%

### All Bicyclist Crashes

Severity	Percentage
A: Suspected Serious Injury	1.8%
B: Suspected Minor Injury	48.1%
C: Possible Injury	27.7%
O: No Injury	20.3%

### Map and Details

Map showing crash locations in Salisbury, NC. Pop-up details for Crash ID 104657239:

- Date: 2/24/2016
- City: Salisbury
- County: Rowan
- Crash Alcohol Related: No
- Day of Week: Thursday
- Crash Type Group: Dash / Dart-Out
- Hour: 19
- Crash Location: Intersection-Related
- Crash Severity: C: Possible Injury
- Crash Type: Dash
- Month: February

### Additional Safety Resources

- Downloadable Shapefile of Bike/Ped Crash Locations (ArcGIS Online)
- Safety Data Maps (NCDOT)
- Statewide Crashes Dashboard (ArcGIS Online)

# Questions / Discussion

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# Questions / Discussion



# Thank you!

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Brian Murphy, PE

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Traffic Safety Unit

North Carolina Department of Transportation

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- **Safe Streets for All / Vision Zero Action Plan**
  - Funding received to develop a Safe Streets for All / Vision Zero Action Plan.
  - Atkins hired to develop a scope of work that included feedback from MPO members and stakeholders.
  - RFLOI for consultant services to be advertised in January.
- Current FY2024 UPWP and proposed FY2025 UPWP includes a safety specific task.
- MPO staff attendance at annual Vision Zero Leadership Institute and monthly Vision Zero meetings with MPO members facilitated by UNC Injury Prevention Research Center.

## **TC Recommendation (January 9, 2024):**

- Recommend the MPO Policy Board support the FHWA / NCDOT 2024 safety targets by resolution:
  - › Resolution: MPO agrees to plan and program projects so that they contribute toward the accomplishments of the NCDOT performance targets

## **Board Recommendation (January 23, 2024):**

- Support the FHWA / NCDOT 2024 safety targets by resolution.