

# North Carolina Highway Projects Safety Scoring, North Carolina Department of Transportation, Prioritization 7.0, July, 2023

## Geodatabase Feature Class



**Tags** North Carolina Department of Transportation (NCDOT), Strategic Prioritization Office of Transportation (SPOT), Prioritization 7.0 (P7), Safety, Class Density Ratio, Severity Index, Critical Crash Rate Ratio, SPOT Scoring, P7, State Transportation Implementation Plan (STIP), Transportation.

### Summary

This data set is comprised of sections of North Carolina roads and highways with respective safety scores based on crash data from the last 5 calendar years (2018-2022).

For further information about domains and fields used in SPOT see the SPOT P7 Domains document here:

### Description

#### Section Safety Scoring

**Section Scoring:** Points for highway section projects are scored based on three components: 1) Crash Density Ratio – The crash density of the study area versus the average crash density of similar facilities; 2) Severity Index; and 3) Critical Crash Rate Ratio – The actual crash rate for the study area versus the critical crash rate. The point breakdown for each component is shown in the table below. The points from the three safety score components are added, and then the sum is divided by three. The project areas with the higher scores are considered to have the poorer highway safety performance.

#### Crash Density Ratio Severity Index1 Critical Crash Rate Ratio2

Points	Range	Range	Range
100	---- 1.15	76.80– 4.65	---- 0.80
66.7	1.15- 0.55	4.65– 2.85	0.80< – 0.45
33.3	0.55- 0.20	2.85– 1.20	0.45– 0.20
0	0.20– 0.00	1.20– 1.00	0.20– 0.00

Any segment with 0 crashes but a severity score of 0.99 will be updated to a severity score of 0.00

Segments with crashes and no Average Daily Traffic (ADT) currently have a rate score of -1, the rate score will be updated to 0.20

Traffic volume counts are not available for all sections of the state-maintained system. A large percentage of the secondary route system functionally classified as Local is not part of NCDOT’s count program. This accounts for almost 30,000 miles of the state system. For highway sections without traffic volume counts the following alternative scoring

system will be used for the Critical Crash Rate Ratio Score: 1) a section with no crashes will receive a crash rate score of 0; 2) a section with at least one crash will receive a crash rate score of 33.7.

The overall safety score is based on the weighted average of the crash density score, the severity index score, and the critical crash rate score.

$$\text{Segments} = (\text{Crash Density} \times 33\%) + (\text{Severity Index} \times 33\%) + (\text{Critical Crash Rate} \times 33\%)$$

Other notes:

The latest 5 calendar years (2018-2022) of crash data were used.

Routes having a mileposted crash percentage of 60% or lower were not scored. However, they are still represented on the map as a black line and have values of "NA" for the crash counts and scores. These are provided as an fyi so that the end user will know which sections were not scored due to crash mileposting issues.

Sections of routes that have atypical cross sections (e.g. 3 through lanes with a continuous center turn lane) are not given a score because statewide average crash rates are not available for these cross sections.

Other Scoring Notes:

1. For new location projects, the user must select a parallel route.
2. For projects that involve municipal streets, the user should contact the NCDOT Prioritization Office.
3. For projects that are spot locations, the user should contact the NCDOT Prioritization Office.

## Fatal+A, B+C, and PDO crashes are derived and is used as part of score for Prioritization 7.0.

For the purposes of the Strategic Planning Office of Transportation Prioritization 7.0 project, data is not updated after December 2022

<https://xfer.services.ncdot.gov/gisdot/metadata/spot/NCDOT%20SPOT%20Prioritization%207%20Online%20Domain%20Reference.pdf>

## Credits

North Carolina Department of Transportation GIS Unit, Strategic Prioritization Office of Transportation (SPOT)

## Use limitations

The North Carolina Department of Transportation shall not be held liable for any errors in this data. This includes errors of omission, commission, errors concerning the content of the data, and relative and positional accuracy of the data. This data cannot be construed to be a legal document. Primary sources from which this data was compiled must be consulted for verification of information contained in this data.

SPOT Online is the NC Department of Transportation's online project prioritization evaluation system. All data used for scoring and evaluating projects, including scores and preliminary point-in-time cost estimates either generated by the SPOT Online application or provided by the user, are only intended for use in the Department's Strategic Prioritization Process. All SPOT Online project data will be used for preliminary level planning, scoring, and evaluation purposes only, and must undergo further review prior to use in the Department's programming process. By entering SPOT Online, the user hereby acknowledges this statement.

## Extent

**West** -84.421464  
**East** -75.418363  
**North** 36.615122  
**South** 33.751362

## Scale Range

**Maximum (zoomed in)** 1:5,000

**Minimum (zoomed out)** 1:150,000,000

## Topics and Keywords

**Themes or categories of the resource** Transportation

**Content type** Downloadable Data

**Theme keywords** Safety, Crash Density Ratio, Severity Index, Critical Crash Rate Ratio, SPOT Scoring, Highways, Safety Scoring, Mobility and Safety, North Carolina Department of Transportation (NCDOT), Strategic Prioritization Office of Transportation (SPOT), Prioritization 7.0 (P7), State Transportation Implementation Plan (STIP), Transportation.

### Thesaurus

**Title** User

**Publication date** 2023-07-17 00:00:00

**Place keywords** North Carolina

### Thesaurus

**Title** User

**Publication date** 2023-07-17 00:00:00

## Citation

**Title** North Carolina Highway Projects Safety Scoring, North Carolina Department of Transportation, Prioritization 7.0, July, 2023

**Alternate titles** Safety

**Publication date** 2023-07-17 00:00:00

**Presentation formats** digital map

## Citation Contacts

### Responsible party - resource provider

**Organization's name** North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT)

### Contact information

#### Phone

**Voice** 919.707.4742

#### Address

**Type** postal

**Delivery point** Century Center Building B, 1020 Birch Ridge Drive

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

**e-mail address** spot@ncdot.gov

#### Hours of service

8am-5pm, M-F

### Contact instructions

Phone or email

### Responsible party - originator

**Organization's name** Traffic Safety Unit

**Contact's position** Transportation Mobility and Safety

### Contact information

#### Phone

**Voice** (919) 814-5000

#### Address

**Type** postal

**Delivery point** 1561 Mail Service Center

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

#### Contact instructions

Phone

### Resource Details

**Dataset languages** English (UNITED STATES)

**Dataset character set** utf8 - 8 bit UCS Transfer Format

**Spatial representation type** vector

**Processing environment** Version 6.2 (Build 9200) ; Esri ArcGIS 10.8.1.14362

### Credits

North Carolina Department of Transportation GIS Unit, Strategic Prioritization Office of Transportation (SPOT)

### ArcGIS item properties

**Name** Safety

**Location** file://\DOT\DFSROOT01\GROUPS-GISCC\GIS-SpatialDataMgmt\Metadata\Spot\BackupSchemaProd20231218\P7\_Data.gdb

**Access protocol** Local Area Network

### Extents

#### Extent

##### Temporal extent

**Date and time** 2019-09-01 00:00:00

#### Extent

##### Geographic extent

##### Bounding rectangle

## Extent type

Extent used for searching

**West longitude** -84.421464

**East longitude** -75.418363

**North latitude** 36.615122

**South latitude** 33.751362

**Extent contains the resource** Yes

## Extent in the item's coordinate system

**westBL** 406980.080300

**eastBL** 3051823.000300

**southBL** 42564.600200

**northBL** 1042848.119800

**exTypeCode** Yes

## Resource Points of Contact

### Point of contact - originator

**Organization's name** Traffic Safety Unit

**Contact's position** Transportation Mobility and Safety

### Contact information

#### Phone

**Voice** (919) 814-5000

#### Address

**Type** postal

**Delivery point** 1561 Mail Service Center

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

### Contact instructions

Phone

## Resource Maintenance

### Resource maintenance

**Update frequency** annually

**Scope of the updates** dataset

### Maintenance contact - point of contact

**Organization's name** Traffic Safety Unit

**Contact's position** Transportation Mobility and Safety

### Contact information

#### Phone

**Voice** (919) 814-5000

## Address

**Type** postal

**Delivery point** 1561 Mail Service Center

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

## Contact instructions

Phone

## Resource Constraints

### Constraints

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### Security constraints

**Classification** unclassified

**Classification system** none

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## Spatial Reference

### ArcGIS coordinate system

**Type** Projected

**Geographic coordinate reference** GCS\_North\_American\_1983

**Projection** NAD\_1983\_StatePlane\_North\_Carolina\_FIPS\_3200\_Feet

### Coordinate reference details

#### ProjectedCoordinateSystem

**WKID** 102719

**XOrigin** -121841900

**YOrigin** -93659000

**XYScale** 10000

**ZOrigin** 0

**ZScale** 1

**MOrigin** 0

**MScale** 10000000

**XYTolerance** 0.00020000000000000001

**ZTolerance** 0.001

**MTolerance** 1.9999999999999999e-07

**HighPrecision** true

**LatestWKID** 2264

#### WKT

```
PROJCS["NAD_1983_StatePlane_North_Carolina_FIPS_3200_Feet",GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Lambert_Conformal_Conic"],PARAMETER["False_Easting",2000000.002616666],PARAMETER["False_Northing",0.0],PARAMETER["Central_Meridian",-79.0],PARAMETER["Standard_Parallel_1",34.33333333333334],PARAMETER["Standard_Parallel_2",36.16666666666666],PARAMETER["Latitude_Of_Origin",33.75],UNIT["Foot_US",0.3048006096012192],AUTHORITY["EPSG",2264]]
```

### Reference system identifier

**Value** 2264

**Codespace** EPSG

**Version** 6.12(9.0.0)

## Spatial Data Properties

### Vector

**Level of topology for this dataset** geometry only

## Geometric objects

**Feature class name** Safety

**Object type** composite

**Object count** 178877

## ArcGIS Feature Class Properties

**Feature class name** Safety

**Feature type** Simple

**Geometry type** Polyline

**Has topology** FALSE

**Feature count** 178877

**Spatial index** TRUE

**Linear referencing** TRUE

## Data Quality

### Scope of quality information

**Resource level** dataset

### Data quality report - Conceptual consistency

#### Conformance test results

**Test passed** Yes

#### Result explanation

The dataset is converted to file geodatabase (FGDB) format using tools in ArcGIS. Quality checks were performed by the Strategic Prioritization Office of Transportation (SPOT) and the North Carolina Department of Transportation Geographic Information Systems Unit and errors were accepted as within business range or identified as exceptions.

#### Product specification

**Title** NCDOT Geospatial Data Specifications

**Publication date** 2023-07-17 00:00:00

## Lineage

### Lineage statement

The data were further manipulated by the North Carolina Department of Transportation Geographic Information Systems Unit and/or the North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT) to produce the required data for Prioritization 7.0.

### Process step

#### Description

Points for highway section projects are scored based on three components: 1) Crash Density Ratio – The crash density of the study area versus the average crash density of similar facilities; 2) Severity Index; and 3) Critical Crash Rate Ratio – The actual crash rate for the study area versus the critical crash rate.

### Process contact - processor

**Organization's name** North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT)

#### Contact information

## Phone

**Voice** 919.707.4742

## Address

**Type** postal

**Delivery point** Century Center Building B, 1020 Birch Ridge Drive

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

**e-mail address** spot@ncdot.gov

## Hours of service

8am-5pm, M-F

## Contact instructions

Phone or email

## Process step

### Description

Data is manipulated by the GIS unit

## Process contact - processor

**Organization's name** North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT)

## Contact information

### Phone

**Voice** 919.707.4742

### Address

**Type** postal

**Delivery point** Century Center Building B, 1020 Birch Ridge Drive

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**Country** US

**e-mail address** spot@ncdot.gov

## Hours of service

8am-5pm, M-F

## Contact instructions

Phone or email

## Process step

### Description

Metadata is updated for publication

## Distribution

## Distributor

### Contact information - distributor

**Organization's name** North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT)

#### Contact information

##### Phone

**Voice** 919.707.4742

##### Address

**Type** postal

**Delivery point** Century Center Building B, 1020 Birch Ridge Drive

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

**e-mail address** spot@ncdot.gov

##### Hours of service

8am-5pm, M-F

#### Contact instructions

Phone or email

## Distribution format

**Version** ArcGIS 10.3

**Name** File Geodatabase Feature Class

## Transfer options

### Online source

**Online location (URL)** <https://connect.ncdot.gov/resources/gis/Pages/GIS-Data-Layers.aspx>

## Fields

### Details for object Safety

**Type** Feature Class

**Row count** 178877

#### Definition

For visual representation of highway section projects safety scoring.

#### Definition source

NCDOT

### Field OBJECTID

**Alias** OBJECTID

**Data type** OID

**Width** 4

**Precision** 0

**Scale** 0

### Field description

Internal feature number.

### Description source

Esri

### Description of values

Sequential unique whole numbers that are automatically generated.

## Field Rte\_Id

**Alias** Rte\_Id

**Data type** String

**Width** 11

**Precision** 0

**Scale** 0

### Field description

The 11-digit route number is a route naming convention used by NCDOT

### Description source

NCDOT

### Description of values

Positive real numbers that are manually generated

## Field BegMp1

**Alias** BegMp1

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### Field description

Route milepost at the beginning of the reference

### Description source

NCDOT

### Description of values

No domain

## Field ExistingKCrashes

**Alias** ExistingKCrashes

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### **Field description**

The combined number of Fatal and "A-type" injury crashes on the section.

### **Description source**

NCDOT

### **Description of values**

No domain

## **Field ExistingBCcrashes**

**Alias** ExistingBCcrashes

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### **Field description**

The combined number of "B-type" and "C-type" injury crashes on the section.

### **Description source**

NCDOT

### **Description of values**

No domain

## **Field ExistingPDOcrashes**

**Alias** ExistingPDOcrashes

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### **Field description**

The number of property damage only crashes on the section.

### **Description source**

NCDOT

### **Description of values**

No domain

## **Field ExistingTotalCrashes**

**Alias** ExistingTotalCrashes

**Data type** Double  
**Width** 8  
**Precision** 0  
**Scale** 0

### Field description

The total number of crashes on the section.

### Description source

NCDOT

### Description of values

No domain

## Field EndMp1

**Alias** EndMp1  
**Data type** Double  
**Width** 8  
**Precision** 0  
**Scale** 0

### Field description

Route Milepost at the end of the reference

### Description source

NCDOT

### Description of values

No domain

## Field DENSITY\_SC

**Alias** DENSITY\_SC  
**Data type** Double  
**Width** 8  
**Precision** 0  
**Scale** 0

### Field description

Crash Density for segment

### Description source

NCDOT

### List of values

**Value** 0  
**Description** Crash Density of zero/no crashes

**Enumerated domain value definition source** NCDOT

**Value** 33.3

**Description** Low Crash Density

**Enumerated domain value definition source** NCDOT

**Value** 66.7

**Description** Medium Crash Density

**Enumerated domain value definition source** NCDOT

**Value** 100

**Description** High Crash Density

**Enumerated domain value definition source** NCDOT

### Description of values

Crash

### Field SEVERITY\_S

**Alias** SEVERITY\_S

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### Field description

Crash Severity index for segment

### Description source

NCDOT

### List of values

**Value** 0

**Description** Segment with no crashes

**Enumerated domain value definition source** NCDOT

**Value** 33

**Description** Low Crash Severity Index Scoring

**Enumerated domain value definition source** NCDOT

**Value** 66.7

**Description** Medium Crash Severity Index Scoring

**Enumerated domain value definition source** NCDOT

**Value** 100

**Description** High Crash Severity Index Scoring

**Enumerated domain value definition source** NCDOT

### Description of values

Crash severity

## Field RATE\_SCORE

**Alias** RATE\_SCORE

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

### Field description

Statistically derived number which is used as a screening tool to identify locations where crash rates are higher than should be expected for a given facility type and where further engineering investigations may be considered.

### Description source

NCDOT

### List of values

**Value** 0

**Description** No Rate Score

**Enumerated domain value definition source** NCDOT

**Value** 33

**Description** Low Rate Score

**Enumerated domain value definition source** NCDOT

**Value** 66.7

**Description** Medium Rate Score

**Enumerated domain value definition source** NCDOT

**Value** 100

**Description** High Rate Score

**Enumerated domain value definition source** NCDOT

### Description of values

Score

## Field Shape

**Alias** Shape

**Data type** Geometry

**Width** 0

**Precision** 0

**Scale** 0

### Field description

Feature geometry.

## Description source

Esri

## Description of values

Coordinates defining the features.

## Field Shape\_Length

**Alias** Shape\_Length

**Data type** Double

**Width** 8

**Precision** 0

**Scale** 0

## Field description

Length of feature in internal units.

## Description source

Esri

## Description of values

Positive real numbers that are automatically generated.

## Metadata Details

**Metadata language** English (UNITED STATES)

**Scope of the data described by the metadata** dataset

**Scope name** dataset

**Last update** 2024-02-26

## ArcGIS metadata properties

**Metadata format** ArcGIS 1.0

**Metadata style** ISO 19139 Metadata Implementation Specification

**Standard or profile used to edit metadata** ISO19139

**Created in ArcGIS for the item** 2023-12-06 09:11:18

**Last modified in ArcGIS for the item** 2024-02-26 17:08:04

## Automatic updates

**Have been performed** Yes

**Last update** 2024-02-26 17:06:41

## Metadata Contacts

### Metadata contact - resource provider

**Organization's name** North Carolina Department of Transportation Strategic Prioritization Office of Transportation (SPOT)

## Contact information

### Phone

**Voice** 919.707.4742

### Address

**Type** postal

**Delivery point** Century Center Building B, 1020 Birch Ridge Drive

**City** Raleigh

**Administrative area** NC

**Postal code** 27610

**Country** US

**e-mail address** spot@ncdot.gov

### Hours of service

8am-5pm, M-F

### Contact instructions

Phone or email

## Metadata Maintenance

### Maintenance

**Update frequency** annually

**Scope of the updates** dataset

### Maintenance contact - point of contact

**Organization's name** Traffic Safety Unit

**Contact's position** Transportation Mobility and Safety

### Contact information

#### Phone

**Voice** (919) 814-5000

#### Address

**Type** postal

**Delivery point** 1561 Mail Service Center

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**Country** US

#### Contact instructions

Phone

## Metadata Constraints

### Constraints

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## Security constraints

**Classification** unclassified

**Classification system** none

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## Thumbnail and Enclosures

### Thumbnail

#### Thumbnail type

Image file