

CALCULATING STATE-MAINTAINED MILEAGE

USING ROUTE CHARACTERISTICS GIS DATA

The field names in this document reference the data from the [Route Characteristics file geodatabase](#). Route Characteristics is the North Carolina Department of Transportation Linear Referencing System data with detailed roadway characteristic data, by route milepost. It is published quarterly. The first quarter publication is released in February of each year and is the authoritative mileage information for the previous calendar year.

CENTERLINE MILES

- 1) The length field is **MPLength** and the units are miles. **Shape_Length** should not be used for mileage calculations.
- 2) Restricted Access (**RestrictedAccess**) identifies roads, or sections of roads that are inaccessible to the public on military bases and should be excluded from public mileage calculations. Use the query below to remove roads with restricted access.
 - a. RestrictedAccess IS NULL
- 3) Only the inventory direction of roads and couplets should be counted towards the overall mileage, using the field Route Inventory (**RouteInventory**).
 - a. Inventory directions are Inventory and Clockwise. All bidirectional and one-way roads are inventory direction, and one side of all divided roads (roads with medians) are the inventory direction.
 - b. Couplets are non-inventory sides of divided routes that function as independent one-way roadways and thus are considered inventory routes for mileage calculations. They can be identified with the Facility Type field (**FcltyType**), using the query below.
 - c. RouteInventory IN ('0','8') OR FcltyType = 'Couplet'

CALCULATING NCDOT MILEAGE

This section contains information about calculating mileage owned by the North Carolina Department of Transportation (NCDOT), also known as state-maintained roads.

- 1) Valid NCDOT route classes (**RouteClass** field) are Interstates (1), US Routes (2), NC Routes (3) and Secondary Routes (4).
 - a. Ramps (80), Rest Areas (81) and Projected Routes (9) are state-maintained roads but do not count towards official mileage and should not be used in mileage calculations.
 - b. Use this query to identify NCDOT route classes for mileage calculations: RouteClass IN ('1','2','3','4')

- 2) There are some roads with NCDOT route classes that are not owned by NCDOT and should be removed from state-maintained mileage calculations. These are identified by the Ownership field (**OwnerType**). As of 2024, there were 21.04 miles of roads (in the inventory direction) with Secondary and NC route classes maintained by other agencies (National Park Service, Marines and Army).
 - a. **OwnerType IS NOT NULL** can be used to identify these road sections; **RouteClass in ('1','2','3','4')** and **OwnerType IS NULL** identifies only NCDOT roads.
- 3) As of 2024 1st quarter, the total state-maintained mileage was 80,479.

To calculate NCDOT state-maintained centerline mileage, use this query:

```
RouteClass IN ('1','2','3','4') AND (RouteInventory IN ('0','8') OR FcltyType = 'Couplet')
AND OwnerType IS NULL AND RestrictedAccess IS NULL
```

The total length is the sum of the MPLength field.

NON-SYSTEM DATA (PARTIAL DATASET)

There is currently not enough information in Route Characteristics to calculate all publicly maintained non-system mileage accurately. The information below can be used to identify which non-system roads have been classified in the NCDOT LRS data. It does not represent all publicly maintained non-system roads in the state. If the Ownership information is null, then the road has not yet been classified, and the owner of the road is unknown.

- 1) Non-system route classes (**RouteClass** field) are Non-System (5), Other State Agency (6), and Federal (7).
 - a. Non-System Ramps (82) should not be used in mileage calculations.
 - b. As mentioned previously, there are around 20 miles of state-maintained route classes (NC and SR) that are owned by federal public agencies that need to be included in non-system mileage calculations.
 - c. There are discrepancies between the Route Class field and the ownership of the road. For example, there may be routes that have a Route Class value of 6 (Other State Agency) that are owned by a Federal Agency (e.g. Air Force), and there may be routes that have a Route Class value of 5 (Non-System) that are owned by a state agency (e.g. Wildlife Resources Commission). These are errors that will be resolved over time.
- 2) The Facility Type field (**FcltyType**) can be used to remove segments that are not considered roads and should not be included in public mileage calculations. These include segments or portions of segments that are outside of North Carolina, that are located where roads do not exist, driveways, alleys, railroads, trails, greenways, golfcart paths, parking lots, etc. Use the query below to remove them.
 - a. `FcltyType <> 'Miscellaneous'`

- 3) The Facility Type field can be used to remove segments that are owned by a public entity but are not considered roads and should not be included in mileage calculations. Examples of this classification include a driveway to a public utilities company, roads within a city or county park, roads on public school property. Use the query below to remove these segments.
 - a. `FcltyType <> 'Public Facility'`
- 4) Or use the query below to remove both categories (segments that are not roads and public facilities).
 - a. `FcltyType NOT IN ('Miscellaneous', 'Public Facility')`
- 5) Private roads do not count towards public mileage calculations. They can be identified using the Owner Type (**OwnerType**) field. Use the query below to remove private roads (Private-Residential and Private-Other):
 - a. `OwnerType NOT IN (98, 99)`
- 6) Only roads with the Owner Type field (**OwnerType**) populated have been verified. If Owner Type is null, the Ownership is unknown. Use the query below to identify non-system roads with known ownership. It includes NC and Secondary Routes so that the 20+ miles of NCDOT route classes owned by other agencies are included.
 - a. `RouteClass in ('3', '4', '5', '6', '7') AND OwnerType IS NOT NULL`
- 7) For information on all publicly maintained non-system roads, see the Mileage Publications section of this document.

Use the following query to identify publicly maintained non-system roads that have been classified in the LRS data:

```
RouteClass in ('3', '4', '5', '6', '7') AND OwnerType IS NOT NULL AND OwnerType NOT IN (98, 99) AND
RestrictedAccess IS NULL AND (RouteInventory IN ('0', '8') OR FcltyType = 'Couplet')
AND FcltyType NOT IN ('Miscellaneous', 'Public Facility')
```

LANE MILES

Lane Miles is the length of the roads multiplied by the number of lanes. It is a better measurement of the amount of pavement than centerline miles.

- 1) The lane miles field is **LaneMiles**.
- 2) Unpaved roads are excluded from lane mileage calculations and can be identified by the Surface Type field (**SrfcType**). This query identifies only paved roads and assumes missing data are paved roads, which is a safe assumption for state-maintained roads.
 - a. `(SrfcType IS NULL OR SrfcType <> 'Unpaved')`

- 3) The current paradigm for calculating lane miles is to double the through lanes (**ThruLaneCount**) in the inventory direction on divided roads and to not count the lane miles in the non-inventory direction. Divided roads are identified using the Travel Direction (**TravelDirection**) and Facility Type (**FcltyType**) fields.
 - a. Undivided Roads: (TravelDirection = 'Both' OR FcltyType IN ('Couplet', 'One Way'))
 - b. Divided Roads: (TravelDirection = 'One-way' AND FcltyType IS NULL)
- 4) As of 2014 1st quarter, there were 166,883 lane miles of state-maintained roads.

To calculate NCDOT state-maintained lane mileage, use these queries:

Undivided Roads:

```
RouteClass IN ('1','2','3','4') AND (RouteInventory IN ('0','8') OR FcltyType = 'Couplet')
AND OwnerType IS NULL AND RestrictedAccess IS NULL
AND (SrftType IS NULL OR SrftType <> 'Unpaved')
AND (TravelDirection = 'Both' OR FcltyType IN ('Couplet', 'One Way'))
```

Divided Roads:

```
RouteClass IN ('1','2','3','4') AND (RouteInventory IN ('0','8') OR FcltyType = 'Couplet')
AND OwnerType IS NULL AND RestrictedAccess IS NULL AND (SrftType IS NULL OR SrftType <> 'Unpaved')
AND (TravelDirection = 'One-way' AND FcltyType IS NULL)
```

Multiply the sum of the LaneMiles field from the Divided Roads query by 2 and add it to the sum of the **LaneMiles** field from the Undivided Roads query.

MILEAGE PUBLICATIONS

The following publications are available on the NCDOT Connect Site under the [Road Inventory Data and Reports](https://connect.ncdot.gov/resources/State-Mapping/Pages/Road-Inventory-Data-and-Reports.aspx) page (<https://connect.ncdot.gov/resources/State-Mapping/Pages/Road-Inventory-Data-and-Reports.aspx>). The reports contain mileage information for system and non-system roads for past and present conditions.

NCDOT Maintained Mileage by System: total public mileage, state-maintained and non-system by year, updated annually.

Quarterly Mileage Report: state-maintained mileage by county and route class, paved and unpaved, updated quarterly and in Excel format.

Highway Road Mileage: collection of mileage reports broken down by various characteristics. Reports show state-maintained mileage, except for the PR-528, which is all public road mileage.

For questions about calculating mileage, or for assistance with specific mileage requests, please contact the HGMO section of the North Carolina Department of Transportation, Operations Program Management Unit using [Contact Us](#).