New Hampshire Department of Transportation

Keeping New Hampshire Moving

Roadway Data Inventory

User Guide

A quick reference guide to NHDOT's Geographical Information System **ROADS** Layer then how that Data is presented as Information

Roadway Data Inventory User Guide

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INTRODUCTION

The NH Department of Transportation Geographical Information System Group resides in the Planning Bureau and manages the base Roads Layer, which serves as the foundation for Asset Management which is responsible for calculating official mileage reports. All other layers such as Pavement conditions, Bridge conditions, Traffic, and Crash data reside on top of that layer. The GIS section works with the MATS (Managing Assets for Transportation Systems) section in bringing Work Accomplishments into spatial data as well as Community Assistance which manages several State and Federal programs, through a Project tracking system called ProMis.

This user guide is intended to be a reference for understanding how the NH Department of Transportation's Planning GIS section manages the state's **roadway** data with various administrative and physical attributes and functions.

Each attribute will be explained along with data collections, update frequency, level of accuracy and relevance to other attributes and how they translate into various reports and maps.

Before using this Guide, let's define a few terms:

Roadway Section

This manual will often refer to roadway sections. A roadway section is defined as a section of roadway (line segment) connecting two points or nodes (see below). GIS Users will recognize these sections as anchor sections, however, due to the wide demographic that this manual serves, the Roadway Data Inventory (RDI) committee settled on "roadway section" as the most intuitive naming convention. This convention is also congruent with the Road Surface Management System, RDI's sister program.

Nodes

Nodes are most commonly created at intersections. Town nodes are assigned a number in sequential order, starting from 1 in each town. NHDOT holds a database of all nodes in the state. This database contains town node number, but also uses a Unique ID for each individual node, which eliminates any duplicate numbers in the system.

Direction of Observation

Unless otherwise noted, the direction of observation is in increasing order or route milepost.

SECTION I – Administrative and Location Information

Administrative and Location data is essential information that is collected and maintained for each roadway. The data represents references that identify a section, location, as well as its functions and classifications, collected from the first break (usually an intersection) of a roadway section to the second (ending) break of that section. This data serves to identify and classify all of the roadways in the State of New Hampshire.

Administrative and Location Data covered in this section:

Statewide Route Identifier (SRI)

NHDOT / NHDOS Official Street

Hi-Order Route

Street Name | Street Aliases

Node 1 and Node 2

Town ID | Town Name

County ID | County Name

Regional Planning Commission ID | RPC Name

Legislative Class

Ownership

Summer Maintenance Agreement

Winter Maintenance Agreement

Level of Winter (Plow) Service

Highway Tiers

National Highway System

Functional System

HPMS:

- Facility Type
- Thru Lanes
- Ownership

Federal Truck Designation

Traffic Counter ID Number

Annual Average Daily Traffic

Toll

STATEWIDE ROUTE IDENTIFER (SRI)

Statewide Route Identifier (SRI) is a 10-digit identification number assigned to each roadway

---

Assignment Naming Process formula is: **PTTTRRRRSD, where**

P = ROUTE PREFIX

Y = Slip Ramp
R = Ramp
T = Turnpike
I = Interstate
U = US Route
S = State Route
N = Non numbered State Route
C = Circle
L = Local
F = Federal
M = Maintenance road (non-public)
P = Private
Z = Maintenance road (out of State) Only Plow Level and Winter_Maint. Others=0

TTT = TOWN IDENTIFICATION NUMBER

- Three digit town identification number (See Appendix A for full list of NH Towns)
  - For example, Concord's Town ID # is '099'. See page 15 for details.

RRRR = ROUTE NUMBER

- Sequential in each Town. Right justified and zero-filled.
- For numbered routes, the route number is the route's numerical index
  (i.e. for Route 101A, RRRR=0101)
- For Turnpikes, RRRR= the Turnpike's initials or abbreviation, right justified and zero-filled.
  Turnpike Names: 'FEET' = FE Everett 'STAR' = Blue Start "SP" = Spaulding

S = ROUTE SUFFIX

- i.e. State Routes: 101A, 11B, 11C
- If none, S = "_"

STATEWIDE ROUTE IDENTIFER (SRI) (continued)

D = Secondary Direction of Divided Highways

- S = South
- W = West
- _ = Bi-directional or primary direction of divided highway (North or East Bound)

The NHDOT surveys all State and Federal Highways from South to North or from West to East. This directionality is known as the **direction of inventory**.

The direction of inventory delineates the northbound or eastbound barrel or a divided highway system as the primary direction.

Southbound and Westbound barrels are considered secondary, and are delineated by an "S" or "W" as the 10th character or their SRI.

RAMPS

Ramps do not follow typical SRI structure. The structure for these is shown in the table below:
For Ramps servicing L (Local) or N (Non numbered State routes) → **RPTTTSDEEA**
Where EE = the exit number, A is the section lettering (A, B, C, etc.)

For instance, Bow Center Rd/Logging Hill Rd/South St/Woodhill Rd., Bow, NH (which is composed of 28 anchor sections, and has four unique street names) has an SRI of **N0510050__** along its entire length. Each section is given the same SRI as the continuous route because they are segments of a single roadway.

Data Accuracy: High **Source**: Manually generated (NHDOT)

Exceptions | Special Circumstances:

- For each new road, the Route Number is assigned in ascending sequential order from the penultimate.
- All slip ramps for L and N roads are manually assigned a sequential SRI in each town.
- Topology is included in state and federal route systems. No topology is included in L or P roads. (aerial photograph is included)

HI-ORDER ROUTE

Many routes run concurrently in New Hampshire for at least a portion of their length.

In order to prevent confusion among transportation and public safety officials, NHDOT has ordered all concurrent routes, based on their route type (see "Statewide Route Identifier"). From this order, NHDOT has identified the route of highest magnitude, or the high-order route, on each section. This ordering allows for consistent reference to sections with concurrent routes.

Definition

The high order route (SRI) of the roadway section is the higher order route when concurrent routes exist. Concurrent SRI's may exist on a single roadway section, and a complex algorithm determines the high order route, with considerations to route order (Y, R, T, I, U, S, N, C…), direction, and suffix.

- Turnpikes take precedence over concurrent Interstate sections
- Route may not take presence over a ramp or slip-ramp designation.

Our rules on 'Z' roads will be

- Any SRI route outside NH boundaries that we track for plow route interest
- All administrative attributes will be zero or null with the exception of winter maintenance and plow route
- Will carry the Winter maintenance and plow route attribute.

Data Type Text – name of hi-order route

Data Accuracy Constant updates

STREET NAME

Our roads are named and affirm a unique and positive location of that roadway section in reference to all other roads, the town, the county, the state, the country, the world. Road names are also the method by which most people identify a road, and do their daily navigating. The Department of Transportation keeps a reconciled database of road names on file in the Roads layer, which is updated by the Department of Safety, Regional Planning Commissions, and municipalities.

This communication and conglomeration of data allows for the greatest possible level of comfort and safety for each and every driver and rider on New Hampshire's roadways.

Definition
Street is the name of each respective road. As supplied by municipalities and the Department of Safety. The DOT database has been reconciled with the NH Department of Safety Emergency 911 road name database. There are still discrepancies between locally accepted names and E911 names.

Source: NHDOT, NHDOS

Data Accuracy: Constant update

For a complete list of United States Postal Service road name suffixes and their abbreviations, see Appendix B.

STREET ALIASES

With over 106,000 roadway sections in the state, there are bound to be some discrepancies across the independent databases that each organization uses to store and process roadway data. NHDOT has partnered with the University of New Hampshire's Technology Transfer Center to work towards complete coverage of the state road network for all users.

Road names have been submitted by the municipalities and RPCs to populate this STREET_ALIASES field. By keeping not only the state-accepted name, but the local aliases in the Roads database, we hope to ensure a greater level of security and accessibility to emergency, postal, and utility services.

Data Type	Text
Source:	NHDOT, updates from municipalities
Data Accuracy	Constant updates

Exceptions | Special Circumstances
May differ from STREET due to discrepancies in survey or in lexical tendencies.

NODE 1 AND NODE 2

Without nodes, the line sections in the Roads layer could not exist.

The nodes define the geometry of sections, which are joined to form SRI_ Hi-Order Routes, Roads, and other linear layers.

Nodes are defined at intersections and at Municipal boundary lines or at significant changes in roadway characteristics.

NODE1 A node that defines the start point of a section of roadway along a roadway under the same name.

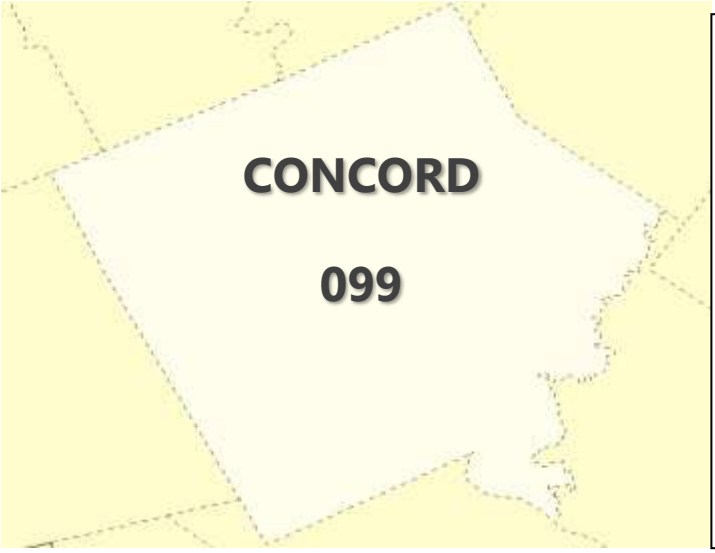
NODE 2 A node that defines the terminal end of a roadway section.

Nodes are assigned a number in sequential order, starting from "1" in each town.

Nodes are never deleted, but they can be retired.

Data Type Numerical – Town Node Number (AC_NUM)

TOWN IDENTIFICATION NUMBER | TOWN NAME



TOWN_ID a 3-digit ID (odd numbered) assigned to each NH town by NHDOT. See Appendix A for full list of TOWN_ID codes and names.

Source: NHDOT

TOWN_NAME The name of the NH town or city through which the roadway or roadway section passes. Populated by the TOWN_ID field.

Source: Town Charters

New Hampshire's town and city names carry the diverse heritage of the Granite State. Often dating back to the original families who settled a region, the local history in each name gives each New Hampshire town a unique identity among the rest of the state. These names also serve an important purpose in the NHDOT RDI system: Town names and their matching ID's allow state agencies to easily search for features within a town or group of related towns. With this ability, agencies such as the Department of Transportation can focus funding in the areas where it is most needed, as well as easily identifying which town a piece of data belongs in, increasing safety and efficiency.

Note that many towns have "subtowns" or villages (such as Winnisquam or Penacook) that are not represented with a TOWN_ID due to the fact that they are not municipally incorporated.

Data Type	**TOWN_ID**	Numerical 3-digit auto-generated as the first 3 digits in the SID field of 'Anchorsections' (See Appendix A). From there, they populate TOWN_ID field of the Roads layer attribute table.
	TOWN_NAME	text – Full town name is auto-generated in the TOWN_NAME field.

COUNTY IDENTIFICATION NUMBER | COUNTY NAME

COUNTY_ID - Odd, 3-digit code (001-019) denoting in which NH County the roadway section lies.

Source: NHDOT generated

COUNTY_NAME - the name of the county in which the roadway or roadway section lies.

Populated by COUNTY_ID field.

The ten New Hampshire counties separate the state into a secondary level of administrative division. The counties are responsible for several administrative duties that encompass all of the municipalities in their jurisdiction.

Table 1: County ID Codes and County Names

County_ID	County Name
001	Belknap
003	Carroll
0035	Cheshire
007	Coos
009	Grafton
011	Hillsborough
013	Merrimack
015	Rockingham
017	Strafford
019	Sullivan

REGIONAL PLANNING COMMISSION (RPC) IDENTIFICATION NUMBER | NAME

Regional Planning Commissions are required by New Hampshire Statue to prepare regional master plans, compile housing needs assessments, and review documents of regional impact.

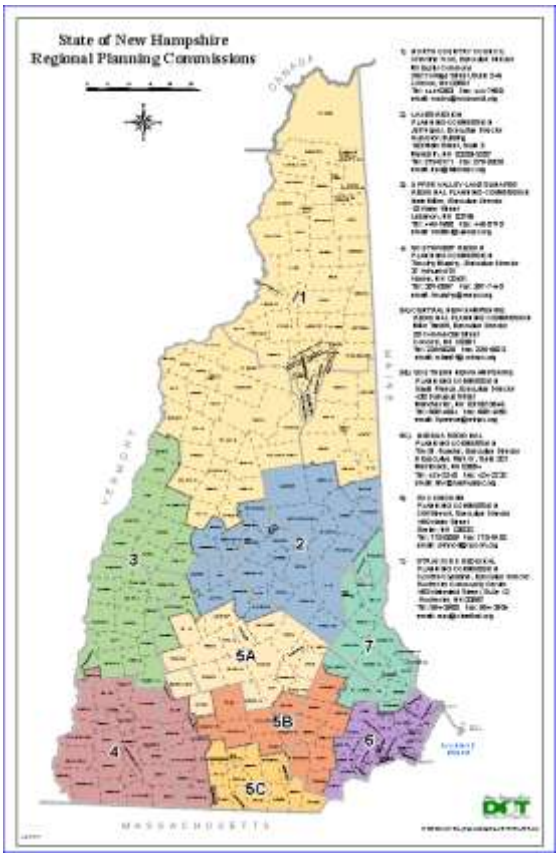


Table: RPC_ID Codes and Regional Planning Commission Names

RPC_ID	RPC_NAME
1	NORTH COUNTRY COUNCIL
2	LAKES REGION PLANNING COMMISSION
3	UPPER VALLEY-LAKE SUNAPEE REGIONAL PLANNING COMMIS
4	SOUTHWEST REGION PLANNING COMMISSION
5A	CENTRAL NH PLANNING COMMISSION
5B	SOUTHERN NH PLANNING COMMISSION
5C	NASHUA REGIONAL PLANNING COMMISSION
6	ROCKINGHAM PLANNING COMMISSION
7	STRAFFORD REGIONAL PLANNING COMMISSION

LEGISLATIVE CLASS

RSAs 229:5 V, 230:3, 230:4

Legislative classification allows the state of New Hampshire to delineate roadways as:

- Class I — Primary Highways
- Class IIa — State-Aid Secondary Highways (Class IIa)
- Class IIb — Secondary Highways owned and maintained by municipalities
- Class III — Recreational Roads
- Class IV — Roads in Compact Areas
- Class V — Local Roads
- Class VI — Local Roads, not maintained (subject to bars and gates)
- Class VII — Federal Roads
- Class 0 — NHDOT GIS designation for privately owned and maintained roads

Note: Please see next page for completed RSA

<u>Date Names</u>

LEGIS_CLASS	Classification of roadways using Roman numerals: I – VII
LC_LEGEND	Code used for mapping purposes to simplify Legislative class grouping. Codes are: State, Private, Local, Recreation, Federal, and Not Maintained
LC_II_TYPE	Designates Class II State Aid Highways as improved or unimproved portion of state highway.

NOTE:
New Hampshire Legislative Class is completely unassociated with Federal Highway Function System.

LEGISLATIVE CLASS (continued)

Municipalities in which compact areas may be established:

Amherst, Bedford, Berlin, Claremont, Concord, Derry, Dover, Durham, Exeter, Franklin, Goffstown, Hampton, Hanover, Hudson, Keene, Laconia, Lebanon, Londonderry, Manchester, Merrimack, Milford, Nashua, Pelham, Portsmouth, Rochester, Salem, Somersworth

Legislative Class- Revised Statues Annotated (RSA)

Class I - Primary Highways: Owned and maintained by the state.

Class II - Secondary Highways: Divided into two categories:

2A - RSA 230:3 Class II State Aid Highways; Improved Portions. – The department of transportation shall assume full control and pay the costs of reconstruction and maintenance of all class II highways which have been improved to the satisfaction of the commissioner of transportation.

2B – RSA 230:4 Unimproved Portions. – All other class II highways shall be maintained by the city or town in which they are located, and may be improved to the satisfaction of the commissioner of transportation with the use of state aid funds.

Class III - Recreational Roads: All recreational roads leading to, and within, state reservations designated by the legislature

Class IV - Compact Roads: All highways within the compact sections of cities and towns listed in the sidebar. The compact section of any such city or town shall be the territory within such city or town where the frontage on any highway, in the opinion of the commissioner of transportation, is mainly occupied by dwellings or buildings in which people live or business is conducted, throughout the year and not for a season only.

Class V - Local Roads: Owned and maintained by the municipality.

Class VI – Non-maintained Local Roads: Owned by the municipality. Not maintained.

Class VII - Federal Roads: Owned and maintained by the Federal Government

NOTE: Roadways with a legislative class of "0" are Private Roadways

OWNERSHIP | OWNERSHIP_DESCR

Sometimes, roadways are damaged beyond the realm preventative maintenance.

Natural phenomena, unexpected loadings, and repetitive wear-and-tear can cause deterioration and distresses in a roadway that warrant significant repair or replacement efforts.

When the need for repair maintenance or reconstruction to a roadway arises, it is important for all of the parties involved to know on whom the responsibility lies to complete it and to fund it.

With Ownership data effectively catalogued, large maintenance and reconstruction projects can be accomplished in a timely manner.

OWNERSHIP designates the party financially responsible for major roadway repairs such as destroyed culverts.

Data Type: Text | Numeric **Source:** NHDOT Operations **Accuracy**: High

- For numeric codes, first digit indicates highway district # (1-6 for standard highway districts, or 8 for turnpikes), while remaining digits indicate shed # within the district
- Alphanumeric codes include VT (State of Vermont), MAINE (State of Maine), DRED (maintained by Department of Resources and Economic Development), TOWN (maintained by the town), NM (not maintained) or PRIVATE.

OWNERSHIP_DESCR - Classifies ownership into categories

Data Type: Text

District, Turnpikes, Town, DRED, Private, State of Vermont, State of Maine

SUMMER MAINTENANCE AGREEMENT

In the summer months, it is important for roadway maintenance agencies, such as the Department of Transportation, and municipal highway departments to repair the damage done to roadways during the winter.

Summer maintenance includes preventative, repair maintenance, and rehabilitation, and focuses on pothole, culvert, and shoulder maintenance.

SUMMER MAINTENANCE AGREEMENT

Designates the party responsible for summer-based maintenance, such as pot-hole filling, culvert upkeep, etc.

Just as with winter maintenance responsibilities, summer maintenance responsibilities do not always fall to the agency that owns the roadway.

The NHDOT makes many agreements with other agencies to exchange summer maintenance duties based on usage and efficiency. These agreements are mutually beneficial and increase the coverage of summer restoration and improvement efforts.

Data Type: Text/Numeric

- For numeric codes, first digit indicates highway district # (1-6 for standard highway districts, or 8 for turnpikes), while remaining digits indicate shed # within the District
- Alphanumeric codes include VT (State of Vermont), MAINE (State of Maine), DRED (maintained by Department of Resources and Economic Development), TOWN (maintained by the town), NM (not maintained) or PRIVATE.

Source: NHDOT Operations

Accuracy: High

WINTER MAINTENANCE AGREEMENT

Winter maintenance allows for safe travel on New Hampshire roadways in the inclement weather during the winter months.

From snow removal and roadway treatment (including salting and sanding) to pothole filling and storm clean up, the responsibility of winter maintenance on our roadways is a large one.

WINTER MAINTENANCE AGREEMENT

Designates the party responsible for winter-based maintenance such as plowing and roadway treatment.

This responsibility does not necessarily fall to the entity that owns the road. NHDOT often makes agreements with other agencies (such as municipal public works departments or the Vermont Agency of Transportation) to maintain each other's roadways. These agreements work to ensure continuity and efficiency in winter maintenance efforts and improve the safety of winter travel.

Data Type: Text | Numeric

- For numeric codes, first digit indicates highway district # (1-6 for standard highway districts, or 8 for turnpikes); while remaining digits indicate shed # within the district.
- Alphanumeric codes include VT (State of Vermont), DRED (maintained by Department of Resources and Economic Development), TOWN (maintained by the town), NM (not maintained) or PRIVATE.

Source: NHDOT Operations

Accuracy: High

LEVEL OF WINTER (PLOW) SERVICE

NHDOT strategically prioritizes its winter maintenance efforts using a system of designated winter maintenance service guidelines, commonly referred to as "plow level."

The levels are shown in the table below:

Code	Description
1	Highways on the Interstate and Turnpike Systems and those highways carrying 15,000 vehicles or more daily should have full width bare pavement as soon as practical after a winter storm terminates.
2	Highways on the State system and carrying 5,000 to 15,000 vehicles daily should have full width bare pavement as soon as practical after a winter storm terminates.
3	Highways on the State system carrying 1,000 to 5,000 vehicles daily should have some bare pavement as soon as practical after a winter storm terminates.
4	Highways on the State highway system carrying less than 1,000 vehicles daily should have bare pavement in left wheel tracks near the center of the highway as soon as practical after the winter storm. Included in this classification are highways carrying less than 500 vehicles daily for which snow-covered pavement is deemed acceptable.

These designations have been determined by traffic volume primarily but have been modified to include consideration of posted speed, highway grade, truck volume, accessibility to hospitals and emergency services, special events, second and/or third shifts at major industrial complexes and major commercial traffic generators as well as to establish continuity between highway districts.

Data Type: Numerical – Code for plow level as show above.

Source: NHDOT Operations

Accuracy: High

HIGHWAY TIERS

The New Hampshire Department of Transportation (NHDOT) is focused on managing the state's road network as efficiently and effectively as possible. While every road is critical to the people and businesses that rely upon it, each road serves a different number of users and provides different levels of mobility.
Grouping based on similarities such as connectivity, regional significance, and winter maintenance requirements provides a common framework for analysis of condition and performance, investment levels, and operation and maintenance levels.

To strategize the investment of scarce resources, the Department has categorized New Hampshire's road system into the following **Tiers:**

Tier 1 – Interstates, Turnpikes and Divided Highways

Interstates, Turnpikes, and NH Route 101 between Bedford and Hampton support the highest traffic volumes and speeds in the entire state. These multi-lane, divided highways convey the majority of commuter, tourist, and freight traffic throughout the state.

Tier 2 – Statewide Corridors

Statewide Corridors, like US 202 or NH 16, carry passengers and freight between regions of the state as well as to and from neighboring states. These roads can have moderate to high traffic volumes, particularly during morning and afternoon commutes. While functionally similar, condition and features of these corridors vary the most out of any Tier. Some of these roads are formally constructed higher-speed facilities while others are more rural roads that became high use roads as surrounding neighborhoods and communities developed.

Tier 3 – Regional Transportation Corridors

Regional Transportation Corridors provide travel within regions, access statewide corridors, and support moderate traffic volumes at moderate speeds. Good examples include NH 112 and NH 155.

HIGHWAY TIERS (Continued)

Tier 4 – Local Connectors

Secondary highways and unnumbered routes as well as the bridges along them are local connectors that provide travel between and within communities. Traffic on local connectors, such as NH 141 or Bean Rd in Moultonborough, is usually low volume and low speed.

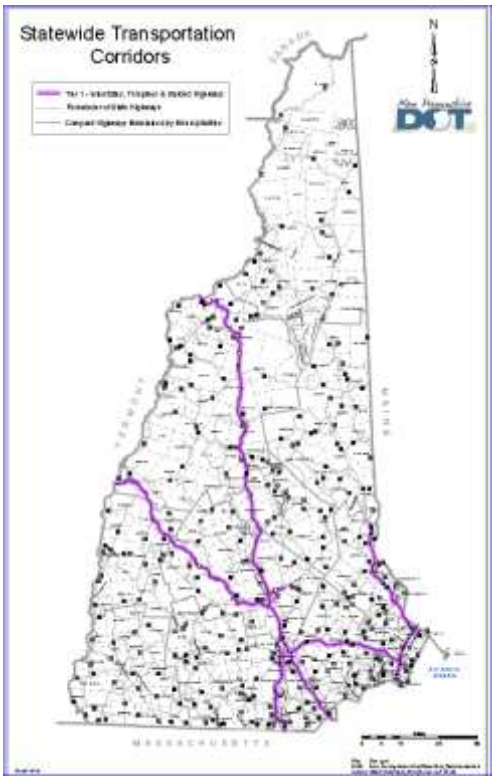
Tier 5 – Local Roads

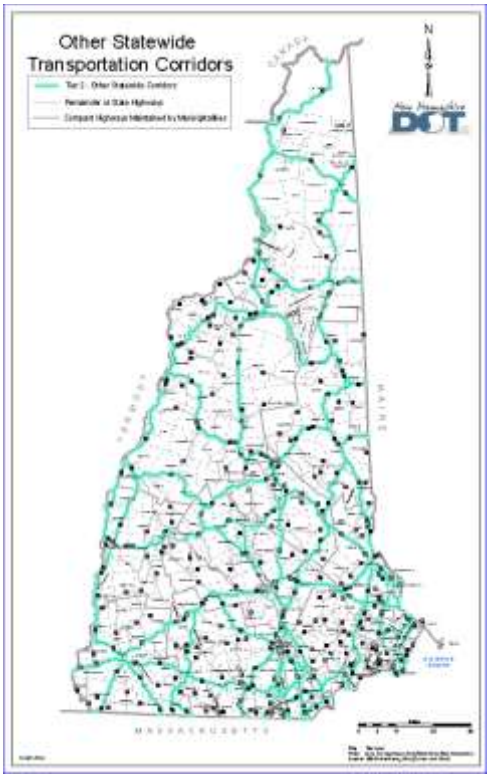
Locally owned roads and bridges or State owned roads within compact limits provide varying travel functions and are maintained by communities. Traffic volumes and speeds can vary on local roads.

Good examples include North State St in Concord or Elm St in Manchester. Though, the Department does not maintain local road and bridges, it does provide assistance to communities.

Tier 6 – Off Network

The Department needs to track work accomplished on off network assets such as park'n' rides, patrol shed, or rest stop parking lots. Please see Tiers 1-4 on pages 65-69.





NATIONAL HIGHWAY SYSTEM (NHS)

The National Highway System was established in 1995 as a strategic network of highways connecting most locations in the United States.

NHS comprises the Eisenhower Interstate Highway System and certain other Federal and State routes, and services major public transportation hubs such as bus terminals, train stations, airports, and ports. It constitutes only a small portion of the nation's roadways, but carries a major portion of the nation's traffic. NHS also plays a pivotal role in the Strategic Highway Network, linking major military installations in the United States.

Data Name: NHS Denotes classification of a roadway section in the National Highway System.

Data Type: Numerical (0-9) as shown in table below

Source: Highway Performance Monitoring System (HPMS)

Data Accuracy: High

Code	Description
9	Major Ferry Terminal
8	Major Pipeline Terminal
7	Major Public Transportation Terminal
6	Major Inner City Bus Terminal
5	Major Rail/Truck Terminal
4	Major Amtrak Station
3	Major Port Facility
2	Major Airport
1	Non-connector NHS
0	NOT part of NHS

Data Name: NHS_DESCR Describes the NHS classification of road (see description above)

Data Name: IS_NHS Yes/No text field, denotes whether a road is part of NHS or not.

FUNCTIONAL SYSTEM

The Functional System is the Federal Highway Administration (FHWA) and arrived Functional Classification System.

The functional classification of public roadways is coded according to the functional system. The combination of functional system and urban/rural destination translates to an equivalent functional classification. The functional classification attribute will eventually be phased out from the Roads attribute inventory.

Data Name: FUNCT_SYSTEM
Functional grouping of classification of the roadways according to the levels of Mobility (through) and access (destination) that they provide.

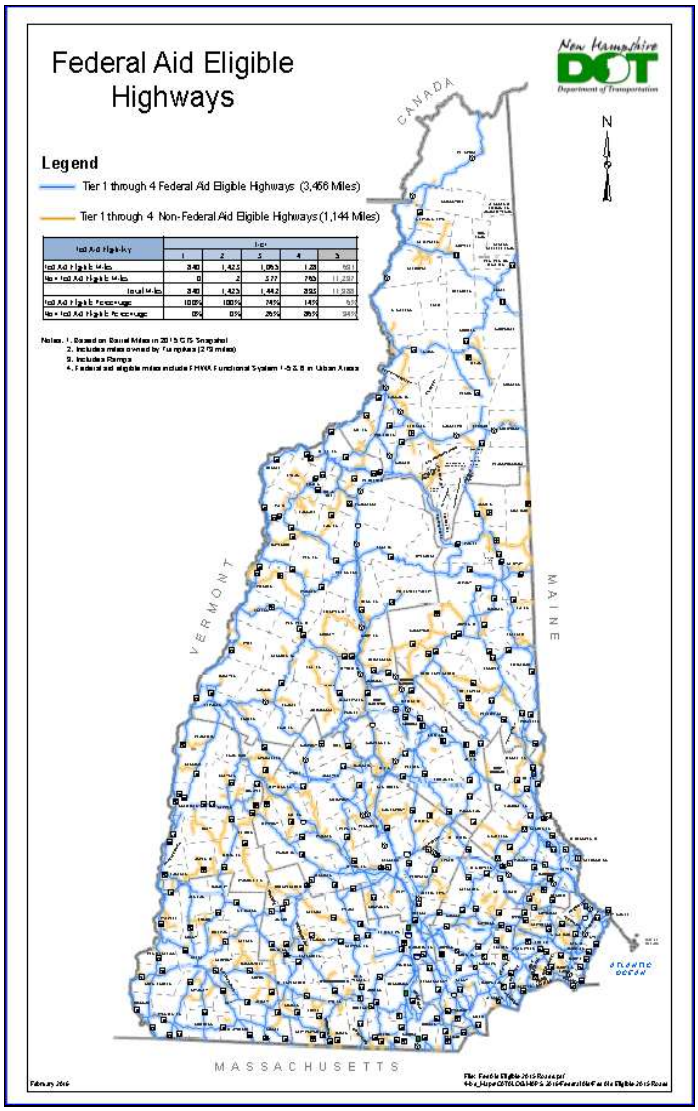
Data Type: Numerical (see table below)

Source: Auto-generated (NHDOT/FHWA) using Functional Classification and Urban ID attributes.

Data Accuracy: High

Number	Description
0	Non-Public Roads (NH Only)
1	Principal Arterial - Interstate
2	Principal Arterial – Other Freeway | Expressway
3	Principal Arterial - Other
4	Minor Arterial
5	Major Collector
6	Minor Collector
7	Local

IS_FED_AID



This attribute designates Federal Aid Eligibility.

Codes : 0= Not Eligible
1= Eligible

Here is the code for populating IS_FED_AID,

An automated process populates this field using The FUNCTIONAL SYSTEM attribute (see previous page)

If Function_System IN (0,6,7) → 0

If Function_System IN (1,2,3,4,5) → 1

Data Name:	IS_FED_AID
Data Type	Numerical (0,1)
Source:	Auto-generated (NHDOT/FHWA) using Functional System codes
Data Accuracy	High

HPMS (HIGHWAY PERFORMANCE MONITORING SYSTEM) FACILITY TYPE

Identification of Facility types in the Roads layer to connect HMPS data for analysis.

Data Name: HPMS_FACILITY_TYPE

Data Type Include same description as the Functional system

Source: First populated from HPMS 2014 data submission. Updated manually.

Accuracy: High

Code	Description	
1	One-Way Roadway	Roadway that operates with traffic moving in a single direction during non-peak period hours.
2	Two-Way Roadway	Roadway that operates with traffic moving in both directions during non-peak period hours.
4	Ramp	Non-mainline junction or connector facility contained within a grade-separated interchange.
5	Non Mainline	All non-mainline facilities excluding ramps.
6	Non Inventory Direction	Individual road/roads of a multi-road facility that is/are not used for determining the primary length for the facility.
7	Planned/Unbuilt	Planned roadway that has yet to be constructed.

HPMS THRU LANES

Data inventoried to identify the number of thru lanes designated as thru-traffic. The data is primarily used for apportionment, administrative, legislative, analytical, and national highway database purposes and are populated for all Federal-aid highways including ramps located within grade-separated interchanges.

Thru lanes data *does not* account for auxiliary lanes (e.g. collector-distributor lanes, weaving lanes, frontage road lanes, parking and turning lanes, acceleration/deceleration lanes, toll collection lanes, truck climbing lanes and shoulders.)

Technical Note:

For dual-carriageways, zeros are inputted into the HMPS_TRHU_LANES field belonging to the non-inventory direction (i.e. Southbound or Westbound routes where HMPS_FACILITY_TYPE is equal to 6). The number of through lanes observed in the non-inventory direction is added to the number of through lanes observed in the corresponding Northbound or Eastbound routes.

Valid Codes:

Number of HMPS_THRU_LANES - (0,1,2,3,4,5,6,7,8,9,10)

Data Name: HPMS_THRU_LANES

Data Type Numerical

Source: Highway Performance Monitoring System (HPMS) Field Manual

Accuracy: High

HPMS OWNERSHIP

HMPS Ownership data is maintained to identify entities having legal ownership of Federal-aid roadways. The following table from Chapter 4 of the HMPS Field Manual is included below to show applicable HMPS Ownership codes with descriptions.

Code	Description
1	State Highway Agency
3	Town or Township Highway Agency
4	City or Municipal Highway Agency
21	Other State Agency
31	State Toll Road
64	U.S. Forest Service

Data Name: HMPS_OWNERSHIP

Data Type: Text

Source: Highway Performance Monitoring System (HPMS) Field Manual

Accuracy: High

TRAFFIC COUNTER IDENTIFICATION NUMBER

Identification number of the traffic counter in use on the roadway section

Traffic counters are used on many state-maintained roadways in order to assess the amount of wear-and-tear on a roadway, and for traffic-safety studies.

Constructed of several pressurized rubber hoses and a specialized counting device, a traffic counter can count either the number of axles or the number of vehicles that cross-over the counter.

Data Name: COUNTER_ID

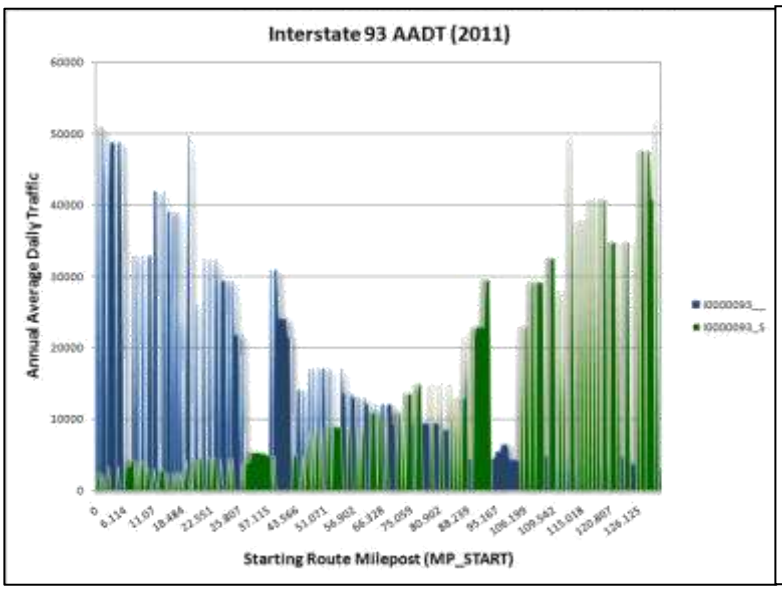
Data Type: ID number

Source: Manually-generated (NHDOT Bureau of Traffic)

Accuracy: High

ANNUAL AVERAGE DAILY TRAFFIC

Annual Average Daily Traffic (AADT) is the data collected for the FHWA's Highway Performance Monitoring System.



The data, represented in number of vehicles per day (averaged over the course of a year), is used for apportionment, administrative, legislative, analytical, and national highway database purposes.

All federal-aid highways, including ramps, located within grade-separated interchanges are surveyed for annual average daily traffic.

Data Name: AADT (Annual Average Daily Traffic)

Data Type: Numerical – number of vehicles

Source: NHDOT, municipalities, Regional Planning Commissions, HPMS

Accuracy: High

Data Name: AADT_CURR_YEAR (year which AADT was last updated)

Data Type: Numerical – Year (YYYY)

Source: NHDOT

Accuracy: High

FEDERAL TRUCK DESIGNATION

Denotes designation (or lack thereof) as a truck route, under Federal regulatory 23 CFR.

Trucking carries an enormous amount of the nation's goods from manufacturing and production centers to the populous. Without trucking, high-demand goods would remain stranded at major air, sea, or rail-based transportation hubs.

FHWA allocates certain roadways as federally designated truck routes through their Highway Performance Monitoring System (HPMS), in order to increase efficiency in trucking and in civilian traffic flow.

Data Name	TRK_ROUTE	Data Name:	IS_TRK_ROUTE
Data Type:	Numerical (see table below)	Data Type	Text - Yes/No
Source:	HPMS		
Accuracy	High		

Code	Description
0	Non-designated Truck Route
1	Designated Truck Route

TOLL

A code for roadway section that requires a fee to access or exit from on the NH Turnpike System.

The New Hampshire Turnpike System presently consists of 167 centerline miles of limited access highway, 71 centerline miles of which are part of the US Interstate Highway System, comprising of approximately 656 total lane miles.

The Turnpike system has 3 limited access highways:

- Blue Star (I-95)
- Spaulding Turnpike
- F.E.Everett Turnpike

The Turnpike System since its inception in 1950 has contributed to the development of New Hampshire. It has been a major factor in the growth of tourism in the state.

Data Name: TOLL

Data Type: Numerical - 0, 1 (see below)

Source: HPMS

Accuracy High

Data Name: IS_TOLL

Data Type: Text – Yes/No

Code	Description
0	No Toll Charged
1	Toll Charged

SECTION II – Physical Road Attributes

A roadway section exists only between two ***nodes***. Physical roadway characteristics define the shape, feel, and use of a roadway, and are considered in a roadway's design, maintenance, and safety designations. These characteristics are recorded as a predominant value within a roadway section. Predominant means the most common value of a characteristic within a given roadway section. Physical roadway characteristics are the characteristics most often used by the general public as they describe the section.

Physical characteristics are largely surveyed by municipalities during road inventory and Road Surface management System (RSMS) survey. Alternately, some data may be collected by NHDOT via Windshield Survey or through analysis of high-resolution aerial imagery. Some characteristics are collected as part of the Highway Performance Monitoring System (HPMS).

<u>Attributes in this section include:</u>

Section Length	Surface Type	Roadway Width
Lane Width	Number of Auxiliary Lanes	Shoulder Type and Width
Direction Way	Median Type and Width	Number of Lanes

SECTION LENGTH

The length of the roadway section, in miles, measured to the nearest 0.0001 mile.

Section Length is the basis of some of the most valuable pieces of information that the Roads layer has to offer. Without the length of each and every roadway section, various mileages could not be calculated and tabulated in the SRI_Hi-Order Routes layer. Without the length of a roadway or roadway system at our command, maintenance calculations would prove inaccurate, and thousands of dollars would go to waste. With the length of a section immediately at our command, our efficiency in both labor and materials is greatly increased.

Data Name: SECT_LENGTH

Date Type: Numerical – Auto generated

Accuracy: High

SURFACE TYPE

The surface type of roadway section (Paved, Unpaged)

For maintenance and usage purposes, the surface type of a roadway or roadway section is paramount. Everyone from plow and maintenance crews to motorcyclists, bicyclists, and every day motorists need to know beforehand the surface of the roadway they will be interfacing with. Knowing if a roadway section is paved or not helps avoid unfortunate consequences, including misplaced maintenance and motor vehicle accidents.

Code	Description
1	Paved
2	Unpaved

Paved
Asphalt-surfaced roadway, but also includes other treated surfaces such as brick, cobblestone, timber, or concrete. (Code 1)

Unpaved
Includes non-surfaced roadways such as gracel and/or dirt.

Data Type: Code number from table above

Source: Windshield / Aerial imagery

Accuracy: Medium

SURFACE TYPE - AERIAL IMAGERY

Examples:

Bi-directional U, S, or L road

Well-maintained, striped, paved surface

US Route 4 - Lee

Private Road: 2 lanes, private, unmarked road

Fitts Farm Dr., Durham

Local Road: Rural, 2 lane, unpaved road. Narrow, less maintained

Villanova Dr. - Concord

Local Road – Rural, 2 lane, unpaved, Wide: Well-maintained

Abbott Rd - Concord

ROADWAY WIDTH

Paved Roadways – The total width of the pavement measured from edge of pavement to edge of pavement, including paved shoulders, designated bike lanes, painted medians, and parking ***DO NOT INCLUDE*** positive barrier medians or curbed medians. Measured perpendicular to the path of travel to the nearest foot.

Unpaved Roadways – Total width of the visible travel way, as determined from visual inspection. Measured perpendicular to the path of travel, to the nearest foot.

Roadway width is essential in virtually all NHDOT maintenance calculations. Estimations for winter maintenance materials, such as road salt, as well as estimations for plow routes are all based on values calculated from roadway width. Resurfacing and other paving estimations are also completed using values derived from roadway width.

Standards for these calculations can be found in the Appendix D of this manual.

Data Name: ROADWAY_WIDTH

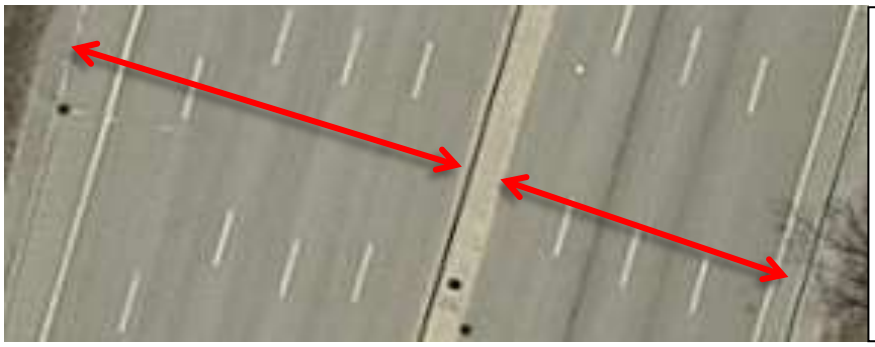
Date Type Numerical – number of feet

Source: NHDOT or municipality. Collected via Aerial imagery or Windshield survey

Accuracy: Low

ROADWAY WIDTH – AERIAL IMAGERY

With positive barrier median



Roadway width, measured from the edge of pavement to edge of pavement, including the maintained and surfaced shoulders on each side. Notice the concrete barrier median is NOT included in roadway width.

With auxiliary lane

Roadway width, measured from edge of pavement to edge of pavement, including the maintained and surfaced shoulders on each side. Notice the shared-left-turn lane **is** included in the roadway width.

Unpaved roadway

Roadway width, measured from edge of travelable roadway surface to edge of travelable roadway surface.

NUMBER OF LANES

Total number of lanes, includes both directions of a roadway.
Auxiliary lanes, such as truck lanes, turning lanes, and passing lanes are included.

The roadway network in the state of New Hampshire contains a wide array of roadway types, from interstate highways to unmaintained dirt roads. The feature that perhaps varies the most over the many varieties of roadways is the number of lanes. It is used (in conjunction with barrel miles) to estimate lane miles, salt lane miles, and plow miles. These estimated calculations are used to estimate maintenance costs *(for more info, see Appendix D)*.

Data Name: NUM_LANES

Data Type: Numerical – integers only

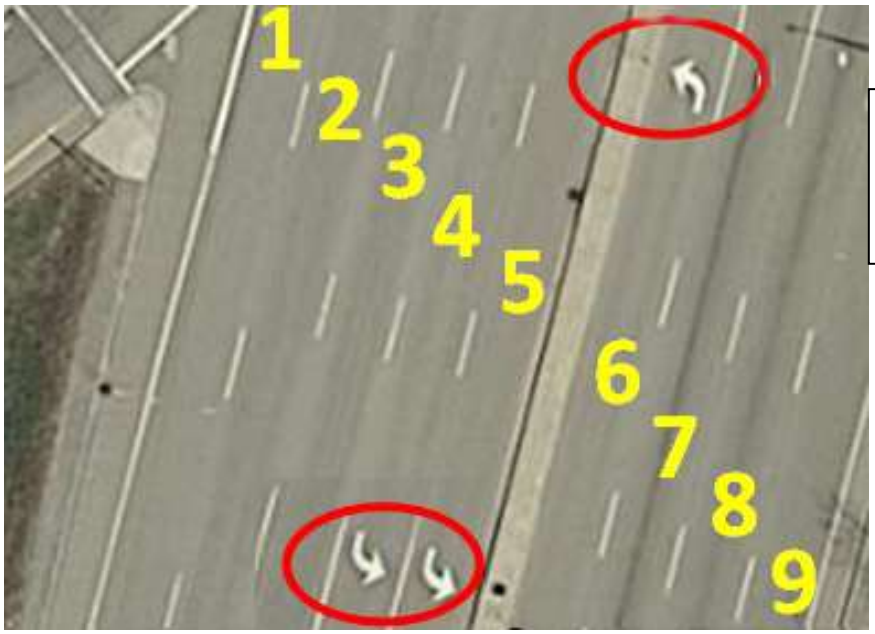
Source: Municipal / Aerial imagery

Accuracy: Low

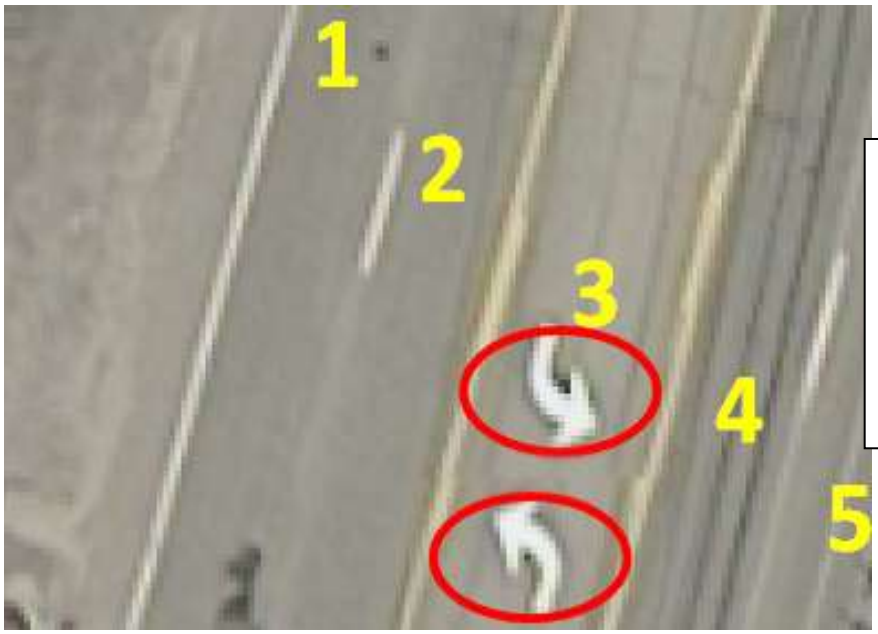
Exceptions / Special Circumstances

Roadways with no pavement markings should be recorded as two(2) lanes, unless the roadway width is 12 feet or less. In this case, the roadway section should be recorded as one (1) lane.

NUMBER OF LANES – AERIAL IMAGERY



In this example, the roadway would be documented as a nine lane roadway, with 3 auxiliary lanes, circled in red.



In this example, this roadway would be documented as a four lane roadway with one auxiliary lane. Notice the continuous-shared-left-turn lane is only counted as one lane.

NUMBER OF AUXILIARY LANES

The number of auxiliary lanes in a roadway section, of the total number of lanes.

Since the total number of lanes is used in calculations for roadway maintenance, NHDOT inventories all of the lanes of a road, be they through lanes or auxiliary lanes. To that end, NHDOT also delineates how many of the total lanes are auxiliary lanes, to aid in emergency planning, traffic flow analysis, and safety design. The types of auxiliary lanes are listed in the table below:

Type of Lane	Description
Truck Lane	"Slow" Lane for trucks, usually found on steep grades. Often mistaken as a passing lane. Signed with "SLOW TRAFFIC KEEPS RIGHT".
Turning Lane	Lane that permits motorists to turn without blocking the through-way. These are generally found in areas with higher speed limits and/or low visibility. Turn lanes are striped, and are marked with a large, white, curved arrow that points in the direction which the turn is permitted
Shared Left Turn Lane (Center)	Center lanes of a roadway, where opposing traffic may make a left turn.

Data Name: NUM_AUX_LANES

Data Type: Numerical – number of lanes

Accuracy: Low

LANE WIDTH

A traffic lane is a portion of the roadway used to channel traffic. Traffic lanes are separated from other portions of the highway by striping.

With Pavement Markings:
The average width of a given section, delineated by pavement markings measured to the nearest foot.

Without pavement markings:
The width of travel lanes based on intent of the surface layout from visual inspection or designated by NHDOT or Town.

See 'Rule of Thumb' table below

Lane width is used for administrative decisions regarding roadway usage. In conjunction with other elements of roadway design, it is a deciding factor in speed limit designation and other safety regulations. It is also considered in cost estimation for maintenance and construction projects. While lane width measurement on clearly marked roadways is relatively straightforward, delineation on unmarked roads can be somewhat ambiguous. In an effort to achieve consistency in lane measurements on unmarked roads, NHDOT has instituted a "Rule of Thumb" for unmarked lane measurement, which is shown in the table below.

Lane Width Rule of Thumb

Surface Width	Lane Width and Shoulder Widths
Width ≤ 16′	Lane: One (1) lane @ 8 – 12 feet, as measured Shoulders: None
16′< Width ≤ 28′	Lanes: Two (2) lanes @ ½ pavement width each Shoulders: None
Width > 28′	Lanes: Two (2) lanes @ 12 feet each Shoulders: Half of remaining surface width (each)

Data Name: LANE_WIDTH

Data Type Numerical - # of feet

Accuracy: Low

LANE WIDTH – AERIAL IMAGERY

Typical Situations

With pavement markings:
By measuring from the centerline to the fog line using a digital measuring tool on aerial imagery, a lane width of 12 feet can be determined for this roadway section.

The roadway pictured at left is narrow for a two-lane roadway, with an unpaved surface width of only 16 feet. In this case, lane width is considered to be 8 feet each, with no shoulders.

Exceptions / Special Circumstances

Without pavement markings:
By measuring from the curb on the right to the edge of pavement on the left using a digital measuring tool on aerial imagery, a lane width of 12 feet can be determined for this roadway section.

NOTE: This is a one-way roadway.

The roadway pictured at left is wide with an unpaved surface width of 24 feet. In this case, lane width is considered to be 12 feet each, with no shoulders.

SHOULDER TYPE (LEFT AND RIGHT)

The type of shoulder bordering the roadway surface on the right or left (in the direction of inventory, respectively).

The shoulders of a roadway offer many advantages to pedestrians, cyclists, motorists, and Emergency Services. They often provide a sufficient analog in the absence of designated sidewalks, bike lanes, or roadside parking.
Paved shoulders are considered in calculation of plow routes for winter maintenance.

Table 2: Shoulder Types

Code	Description
1	None; no shoulder exists
2	Paved shoulder
3	Unpaved shoulder
4	Combination shoulder

Data Name: SHLDER_TYPE_RIGHT
SHLDER_TYPE_LEFT
Data Type: Numerical, Code number (see above table)
Source: Windshield Survey / Aerial Imagery

Accuracy: Low

For Roadway Inventory, shoulders to the right in direction of inventory are *generally* considered to be to the right when traveling Northward or Eastward, unless otherwise noted.

As such, shoulders to the left are considered to be to the left while traveling in in the direction of inventory.

If the direction of inventory is questionable, use the direction of increasing SRI Mileposts.

NOTES:

- Combination and unpaved shoulders are not guaranteed ty any means to be structurally sound, and their widths should be taken only as an estimate, rather than a design specification.

SHOULDER TYPE – AERIAL IMAGERY

Code 1 – No Shoulder

The shoulder does not exist on this roadway. Shoulders are not considered when surveying a gravel (or other unpaved) roadway, such as this one.

Code 2 – Paved Shoulder

The shoulder is of the same material as the roadway surface. As seen in this aerial imagery.

Code 3 – Unpaved Shoulder

The shoulder of this well maintained roadway is easily distinguishable as being a different color than the paved surface. From this information, we can tell that the shoulders on this roadway are surfaced with gravel.

Code 4 – Combination Shoulder

On this roadway, one can clearly see the two foot paved shoulder (which is homogeneous with the roadway surface) and the clear boarder with the gravel shoulder, which extends four feet to the left and two feed to the right. This pattern creates what is known as the combination shoulder or 'Combo', the predominant shoulder type in the state.

SHOULDER WIDTH (LEFT AND RIGHT)

The measured width of the shoulder to the right or left (in the direction of inventory), to the nearest foot.

A wide enough shoulder may be used as a breakdown area for stranded motorists, offering a safe area in which to assess damage and request assistance. In the absence of designated parking, the shoulder may be used as an alternative parking area in certain (especially rural) areas, as well as access points for Emergency Services vehicles.

Collecting the width of the shoulder is vital because it allows agencies to determine what uses the shoulder is suitable for. It is also essential in the calculation of maintenance mileage.

Shoulders to the right of the roadway in the direction of inventory are generally considered to be to the right when traveling a roadway northward or eastward, unless otherwise noted. As such, shoulders to the left are considered to be to the left while traveling in the direction of inventory.

Due to the variable and temporary nature of a shoulder, particularly one of gravel and/or earth, the shoulder width is often determined using windshield survey. Shoulders are assessed from the painted lane line (or the visible edge of an unmarked travel lane) to the outer edge of the maintained shoulder. This border can be the break of the slope, or another natural barrier such as growth of vegetation. Shoulder information is not collected on Local or Private Roadways.

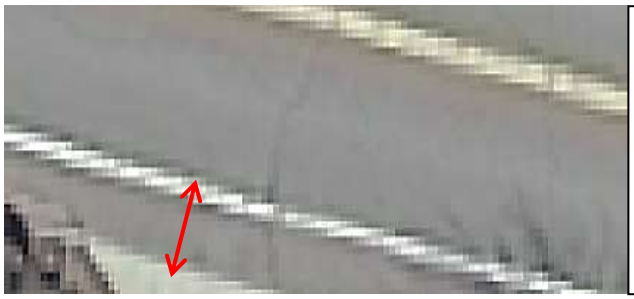
Data Name: SHLDR_WIDTH_RIGHT, SHLDR_TYPE_LEFT

Data Type: Numerical, number of feet

Data Source: Windshield Survey / Aerial Imagery

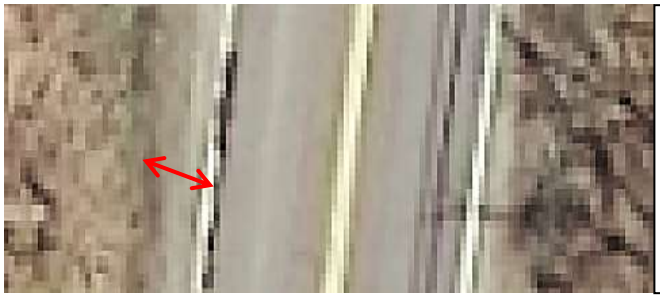
Accuracy: Low

SHOULDER WIDTH – AERIAL IMAGERY



The shoulder is the same material as the roadway surface. The shoulder width is measured from the edge of pavement to the center of the white 'fog' line.

The shoulder does not exist on this roadway. Shoulders are not considered when surveying a gravel (or other unpaved) roadway such as this.



In the case of a gravel shoulder on well-marked roadways, the width is measured from the edge of pavement out to the shoulder break or edge of the maintained shoulder. This border may include a change in material, or natural border, such as rock shelf or vegetation growth.

On this roadway, one can clearly see the two foot paved shoulder (which is homogeneous with the roadway surface) and the clear boarder with the gravel shoulder, which extends four feet to the left and two feed to the right. This pattern creates what is known as the combination shoulder or 'Combo', the predominant shoulder type in the state.

In this case SHLDR_RIGHT would be recorded as '4' and SHLDR_LEFT would be recorded as '6'.

DIRECTION WAY

The direction way code describes one and two way sections of roadway.

Possibly the most important piece of information necessary when considering travel on a roadway section is whether the roadway is bidirectional or not. What would happen if someone unknowingly went the wrong direction on a divided highway or used the opposing lane on a two-way roadway as a continuous passing lane? The direction of a one-way roadway is important to the public as they plan routes throughout the state, and is also important to state agencies as they devise maintenance routes and other service coverage.

Direction Way Codes

Code	Description
1	One-way
2	Two-way

Date Name: DIRECTION_WAY

Date Type: Numerical, see codes in above table

Source: Windshield Survey / Aerial Imagery

Accuracy: High

MEDIAN_TYPE

The portion of a divided highway separating the traveled way for traffic in opposing directions.
A positive barrier normally consists of a guardrail or a concrete "Jersey-type" barrier. A line of closely spaced (large) trees or of thick, impenetrable shrubbery on most of a section might also be considered a positive barrier median. Turning lanes or bays are not considered medians unless a median exists on the major portion of the roadway, and the turning lanes/bays are cut into the median at intersection, entrances to commercial enterprises, etc.

Type 1 - Curb

Type 2 – Positive Barrier

Type 3 - Unprotected

Type 4 - None

Data Name: MEDIAN_TYPE

Data Type: Numerical, Codes 1-4 (see above examples)

Source: Windshield Survey / Aerial Imagery

Accuracy Low

SECTION III – Data Presented as Information

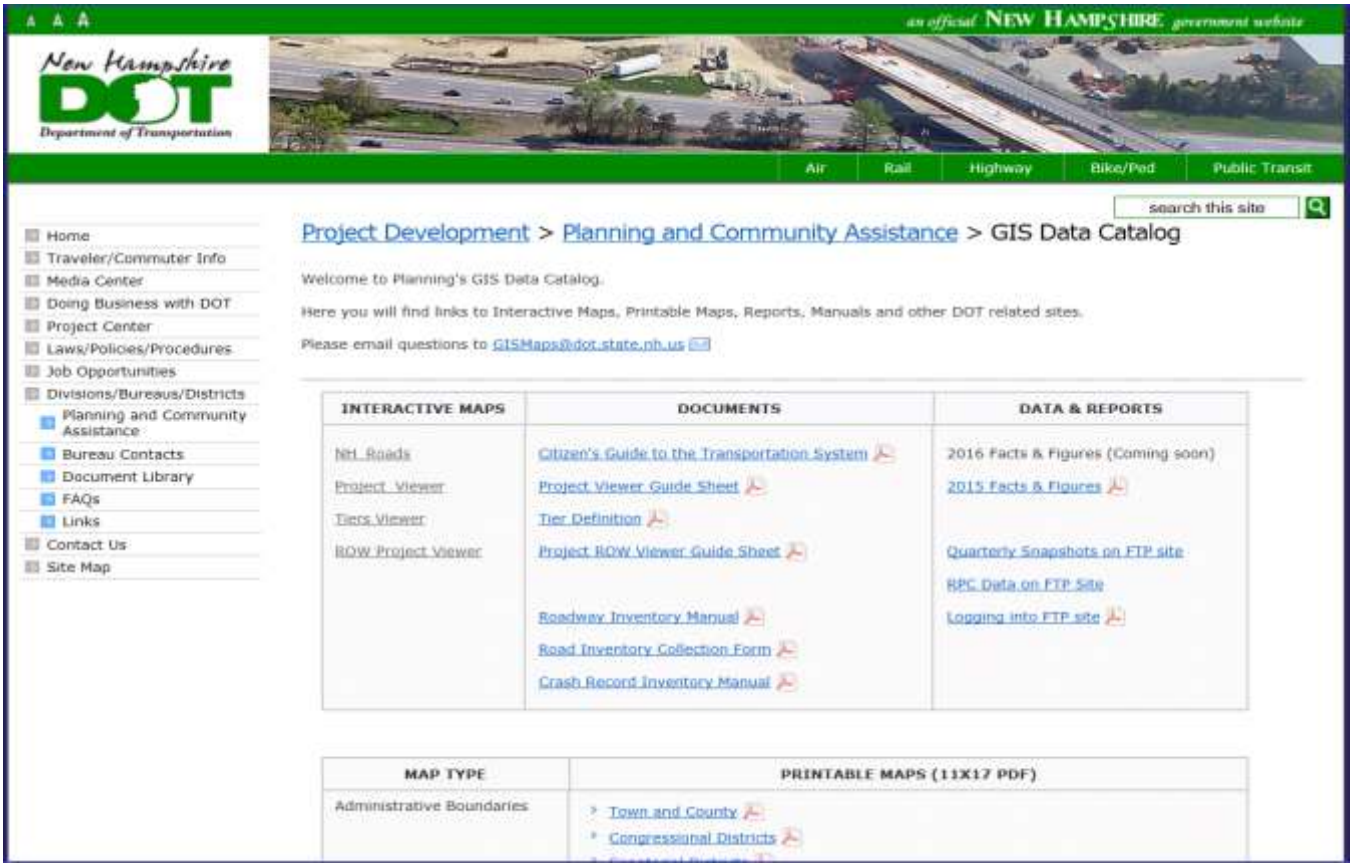
It is one thing to collect and manage NH's GIS Roadway data. It is another to present it in a report, map viewer, or map that is helpful to State Agencies, the Legislature, and New Hampshire citizens.

This section will showcase several of those presentations.

Much of the GIS Planning Bureau's data is published on this website:

http://www.nh.gov/dot/org/projectdevelopment/planning/gis-data-catalog/index.htm

Here you can find Map viewers, reports, such as yearly Facts & Figures, maps and guides to using the data.



FACTS & FIGURES REPORT

New Hampshire DOT
Department of Transportation
Keeping New Hampshire Moving

2016 Facts & Figures
Roads & Highways Mileages

The Roads and Highway system is the backbone of the transportation system moving people, goods, and services within the State of New Hampshire. New Hampshire's public road system consists of 16,597 miles.

The State Highway System (Legislative classes I,II,III) is defined as all roads owned by the state, whether maintained by the state or other public authorities. This system includes Interstates, Turnpikes, Numbered Highways, Non-numbered Highways, Traffic circles, Ramps, and Recreational roads. If all miles driven each day in New Hampshire were totaled, it would wrap around the earth well over 1.000 times. 77% of those miles are traveled on the State maintained highways. The State Highway System has 4,596 miles.

QUICK FACTS

- **16,597** miles — Public road miles in the State of NH, classified under RSA 229:5
- **4,596** miles — State maintained Highway System
- **12,001** miles — Town maintained roadways (includes Compact roads)
- **303** miles — Compact Roads (state owned maintained by communities) are included in Tier 5
- **Centerline miles** — Length of centerline of bi-directional highways and each barrel of divided highways.

The New Hampshire Department of Transportation is focused on managing the state's road network as efficiently and effectively as possible. While every road is critical to the people and businesses that rely upon it, each road also serves a different number of users and provides different levels of mobility. Grouping based on similarities such as connectivity, regional significance, and winter maintenance requirements provide a common framework for analysis of condition and performance, investment levels, and operations | maintenance levels. To strategize the investment of scarce resources, the Department has categorized New Hampshire's road system into **Tiers.**

TIERS

Roads are grouped by similarities, such as connectivity, regional significance, and winter maintenance requirements to help in strategizing resource investments.

	Highway Tiers			Centerline Miles
Public Roads System	Statewide Corridors	Divided Highway System	(Tier 1)	840
		Arterial Roadway System	(Tier 2)	1424
	Regional Corridors and Local connectors	Regional Corridors	(Tier 3)	1439
		Local Connectors	(Tier 4)	893
			Sub Total	**4,596**
	Local Roads	Local Roads	(Tier 5)	12,001
			Total	**16,597**

NH Department of Transportation: Bureau of Planning, GIS Section — Data source: GISOWNER_ASSET_2016_ROADS (1/5/2016) — April 12, 2016

TIERS

By Public Authority

State Highway groups are based on like functions.

Tier 1 **Interstates, Turnpikes, Divided Highways** (RT101, Bedford to Hampton)

Tier 2 **Statewide Corridors** Examples: US202, NH16

Tier 3 **Regional Transportation Corridors** (Examples: NH112, NH155)

Tier 4 **Local Connectors** (Secondary highways and Non-numbered routes. Examples: NH 141 or Bean Rd, Moultonborough)

Tier 5 **Local Roads**

		Centerline Miles					
	Public Authority	**Tier 1**	**Tier2**	**Tier3**	**Tier4**	**Tier5**	**Subtotals**
STATE	Districts 1	79	311	174	187		751
	Districts 2	74	226	251	162		712
	Districts 3	106	246	268	197		817
	Districts 4	0	198	294	129		622
	Districts 5	281	246	192	121		840
	Districts 6	49	180	259	86		574
	Turnpikes	252 [1]	16	1	1	1 [2]	271
	DRED				5		5
	Town				4 [3]		4
	Subtotal	840	1,424	1,439	893		**4,596**
TOWN	Towns	Local Roads				12,001	**12,001**
		Total NH Public Roads					**16,597**

[1] Includes Turnpike ramps
[2] Hilton Park Rd. in Dover
[3] Boulder Rd. in Madison

DISTRICT & TURNPIKE MILES

Ownership is the party responsible for funding, repair, or reconstruction of an asset.

Summer Maintenance is responsible for repair or preventative maintenance and rehabilitation.

Winter Maintenance is responsible for snow removal, winter treatment, pothole filling and storm cleanup.

Road Attribute	District		Turnpikes	
	Centerline	Lane	Centerline	Lane
Ownership	4,315	8,599	272	622
Summer Maintained	4,315	8,600	272	621
Winter Maintained	3,969	7,918	276	625

NH Department of Transportation: Bureau of Planning, GIS Section Data source: GISOWNER_ASSET_2016_ROADS (1/5/2016) April 12, 2016

LEGISLATIVE CLASS

The State system consists of 4,596 miles of State owned highways.
Class IV (compact town roads) highways are part of the State system, which municipalities maintain.
All Interstates and Turnpikes are designated as Class I highways.

Public Roads System		Legislative Class		Centerline Miles
	State	Primary State System	(Class I)	2,344
		Secondary State System	(Class II)	2,204
		Recreational State Roads	(Class III)	48
			Sub Total	**4596**
		Compact Roads	(Class IV)	303
	Town	Town Roads	(Class V)	11,698
			Sub Total	**12,001**
			Total Public Roads	**16,597**

TURNPIKES

The NH Turnpike System consists of 167 miles of limited access highway, 71 miles of which are part of the Interstate Highway System.

The Blue Star Turnpike (I-95) and the Spaulding Turnpike make up the Eastern Turnpike.
The F.E. Everett is also known as the Central Turnpike.

Turnpike	Turnpike (Mainline)	Centerline Miles
Eastern Turnpike	Blue Star (I-95)	32
	Spaulding	56
Central Turnpike	F.E. Everett	79
	Total Turnpike Mainline	**167**

NATIONAL HIGHWAY SYSTEM (NHS)

The federal designated National Highway System comprises 1,255 miles of the State's highway system including Interstates, Turnpikes and other priority highways.

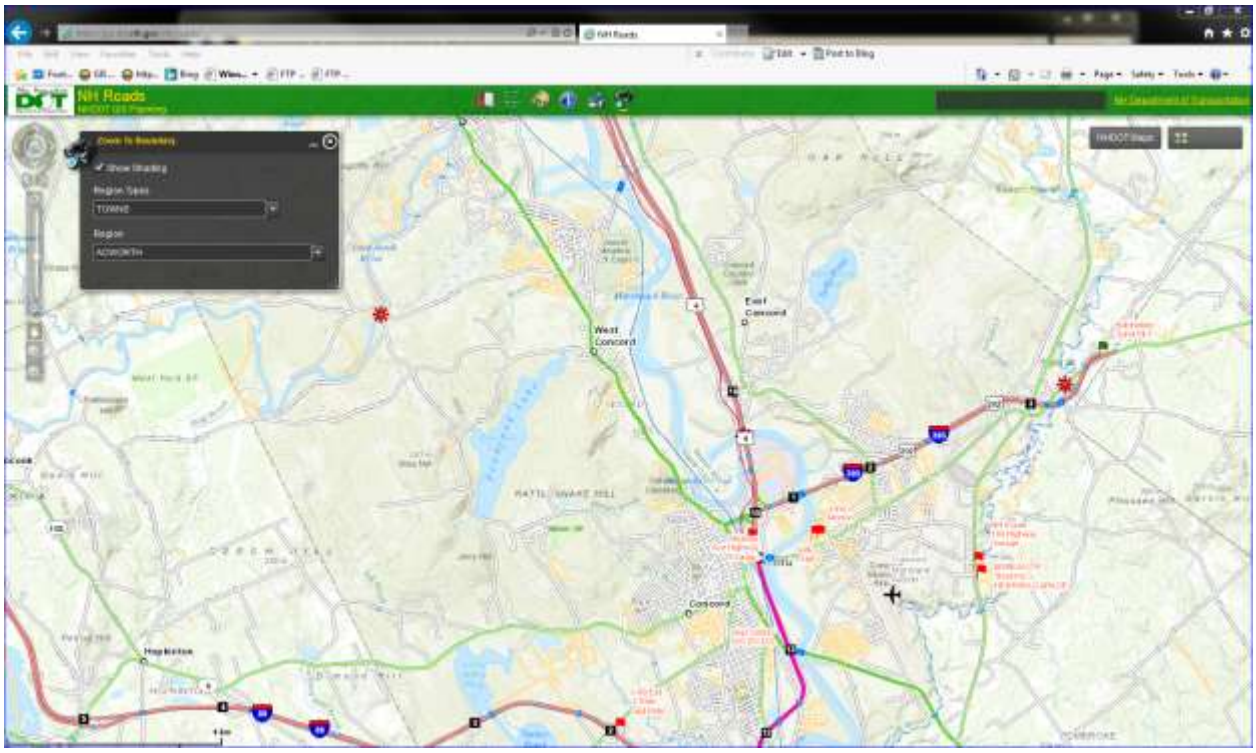
The NHS supports New Hampshire's mission-critical applications for public safety, emergency preparedness, and transportation as well as provides a network of highway across the country connecting population and economic centers and intermodal facilities by providing a continuous travel corridor from state to state.

Route Type	Centerline Miles
Turnpikes	167
Interstate	381
US Routes	210
State Numbered Routes	457
Traffic Circles, Non-Numbered State Routes, Local Roads	32
Ramps	8
Total NHS	**1,255**

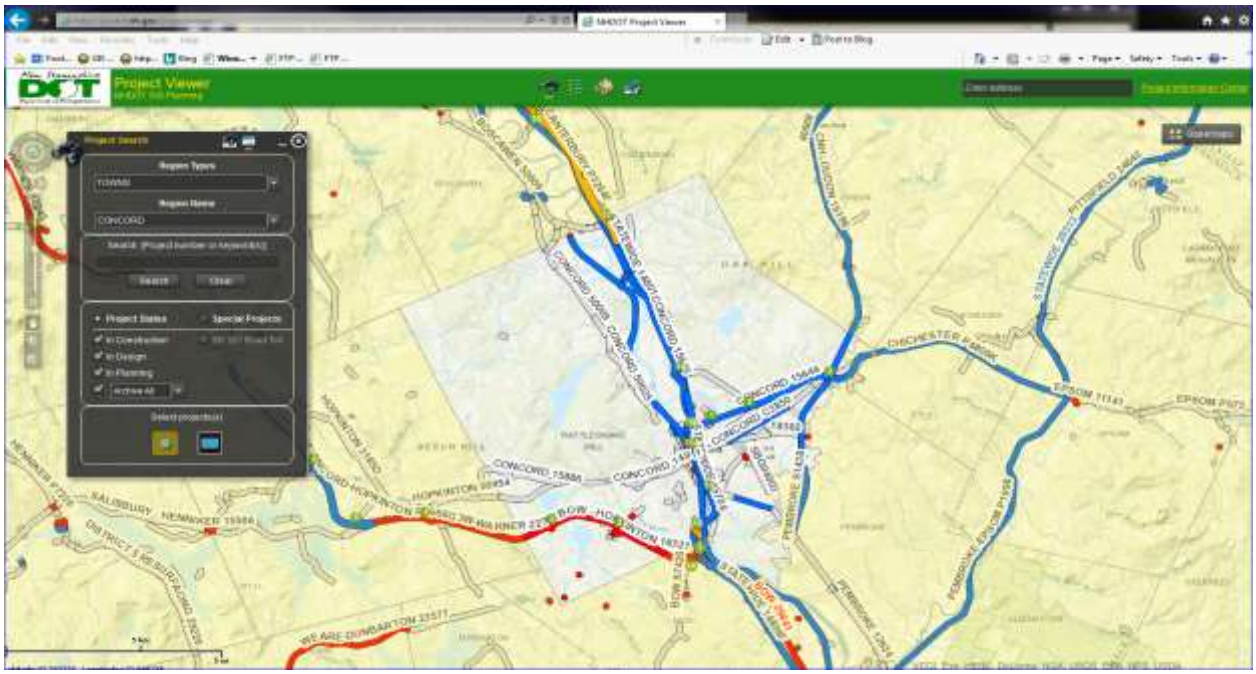
NH Department of Transportation: Bureau of Planning, GIS Section Data source: GISOWNER_ASSET_2016_ROADS (1/5/2016) April 12, 2016

MAP VIEWERS

Use **NH ROADS** to show Roads attributes

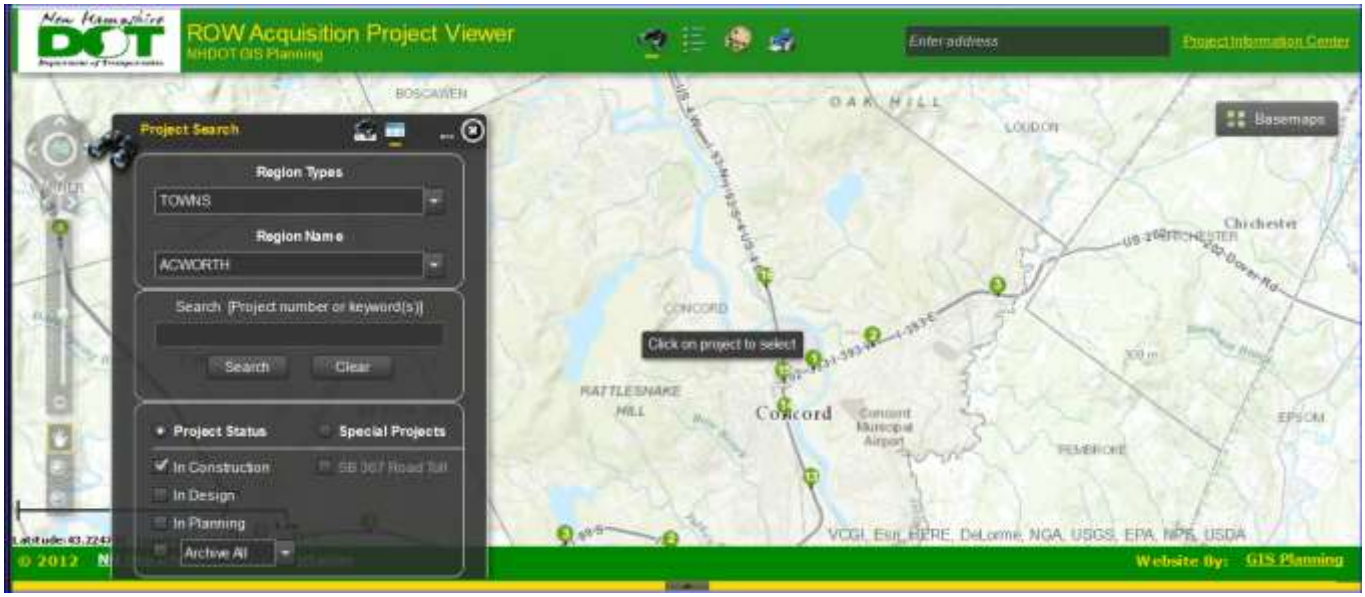


Use **Project Viewer** to display historical and current projects.



The **Tiers Viewer s**hows the breakdown of Tier priority roads.

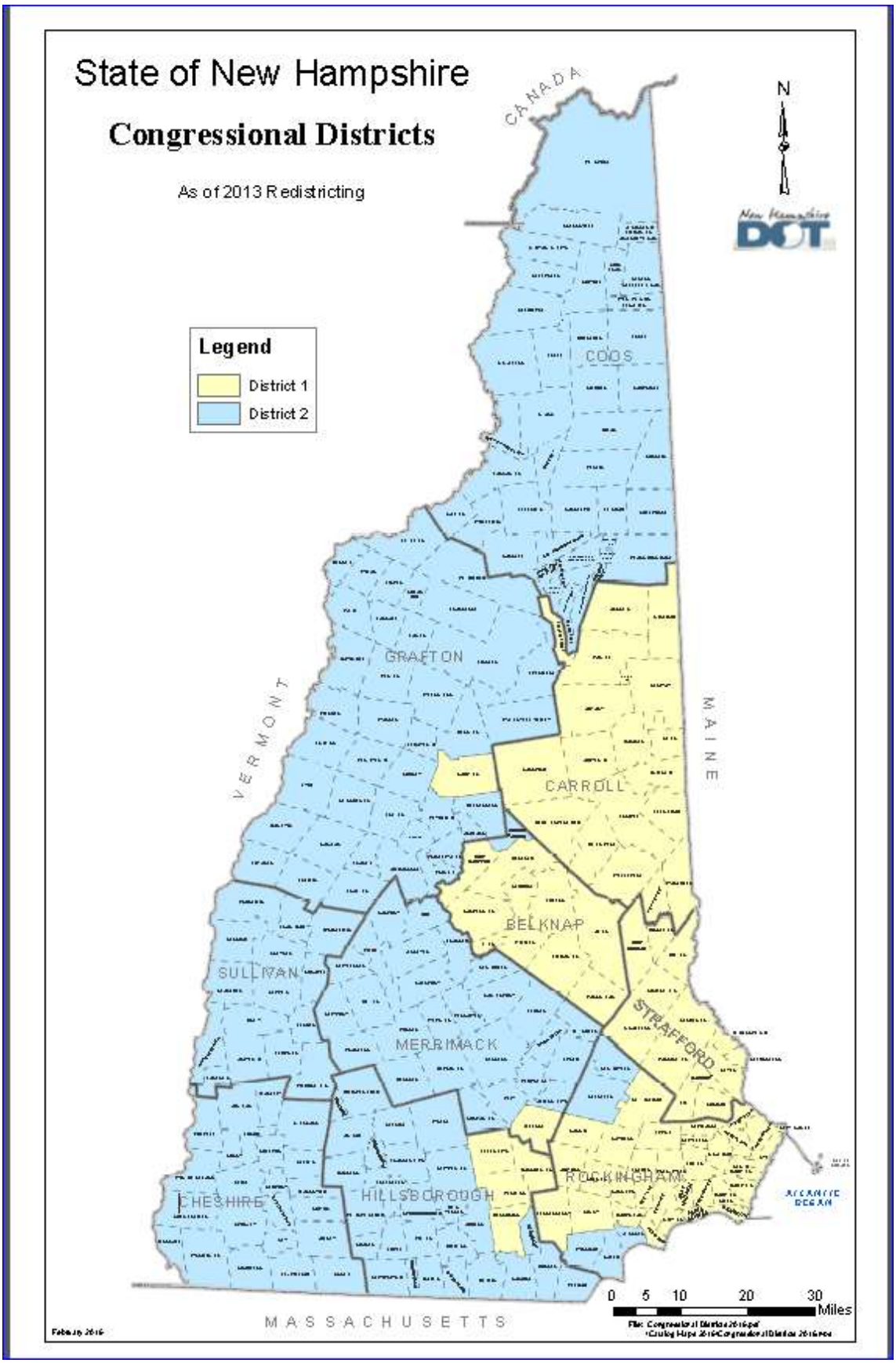
The **ROW Acquisition Project Viewer.**

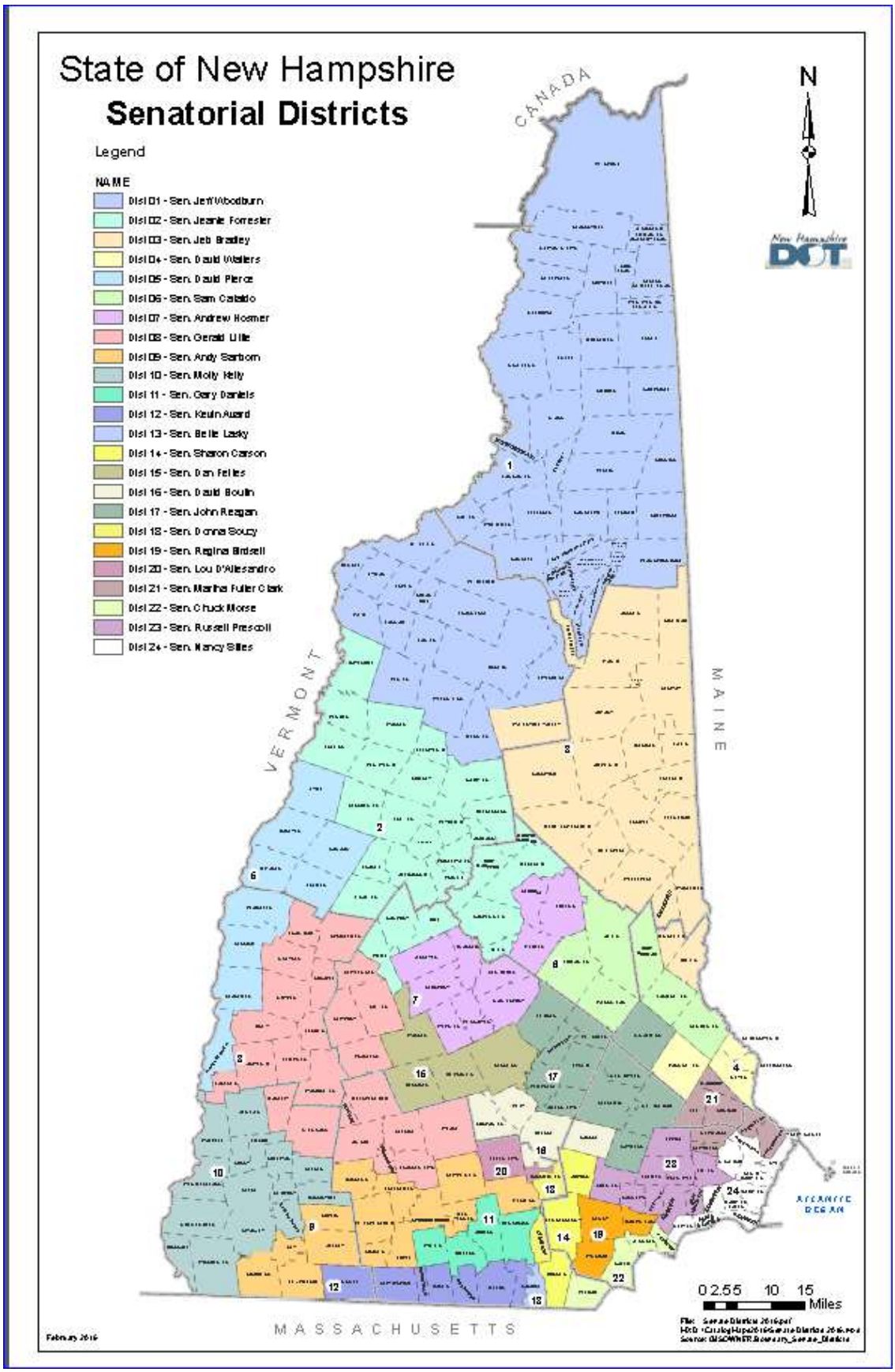


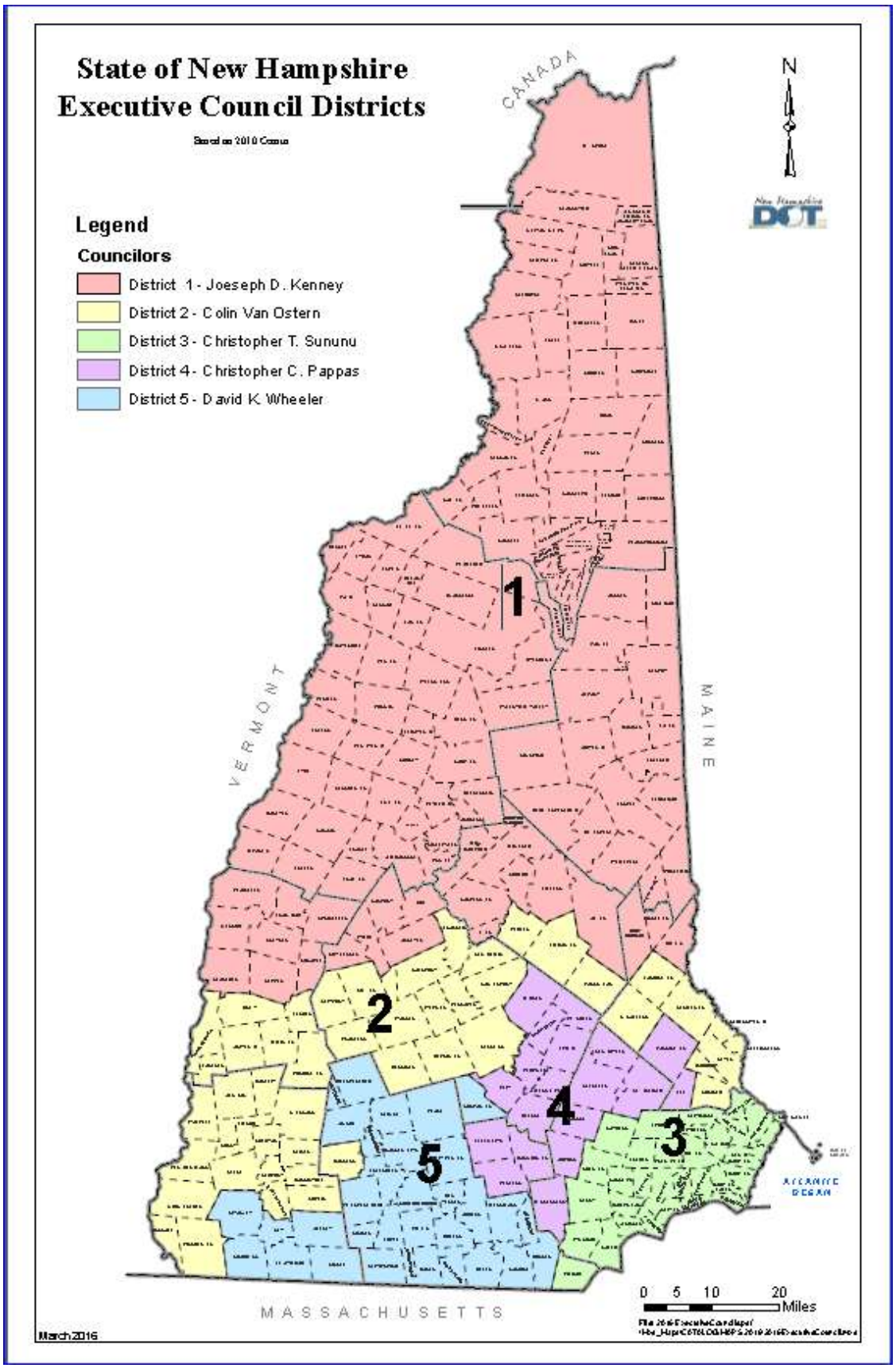
MAPS

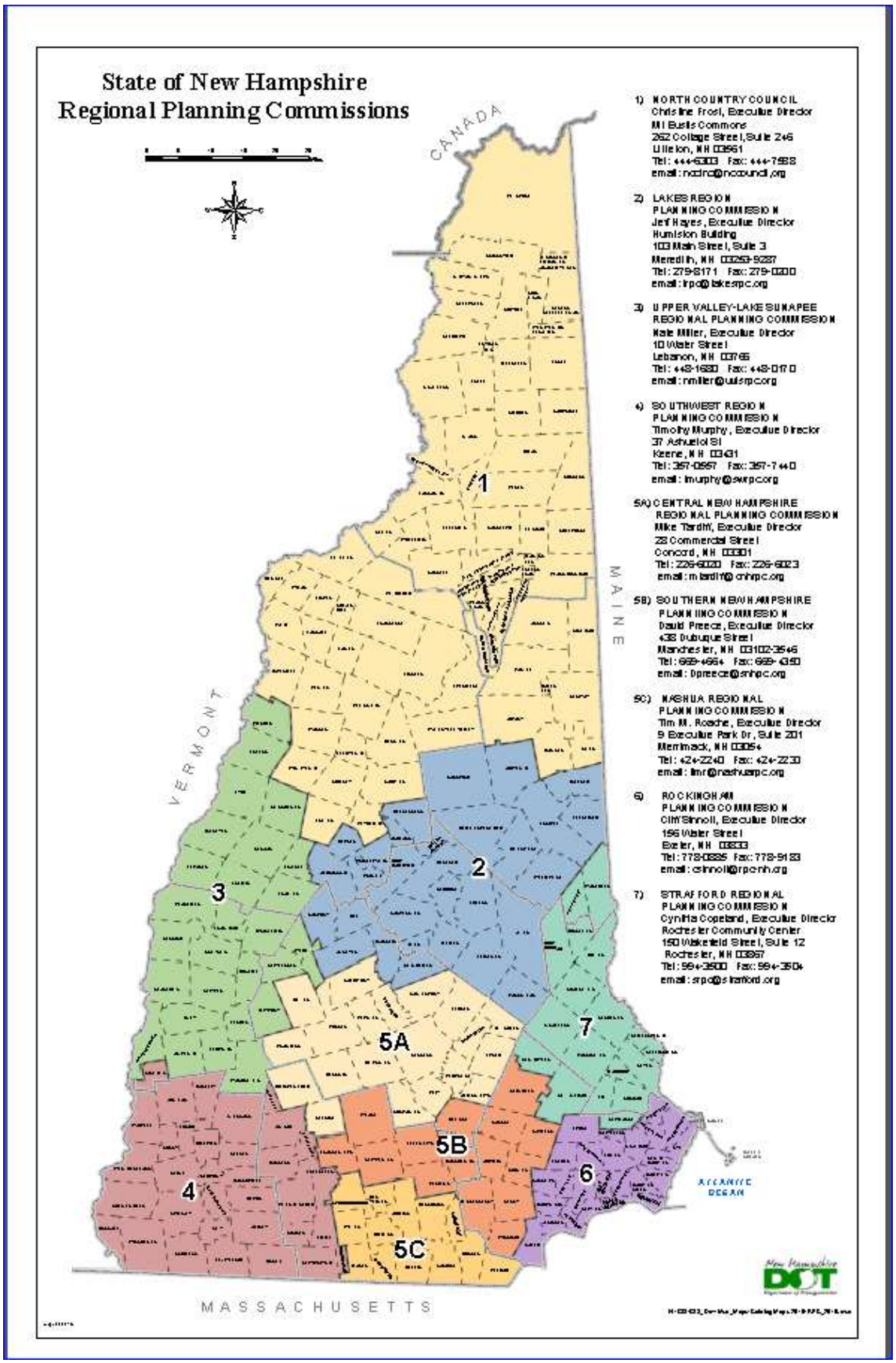
A Sampling of GIS Data Catalog

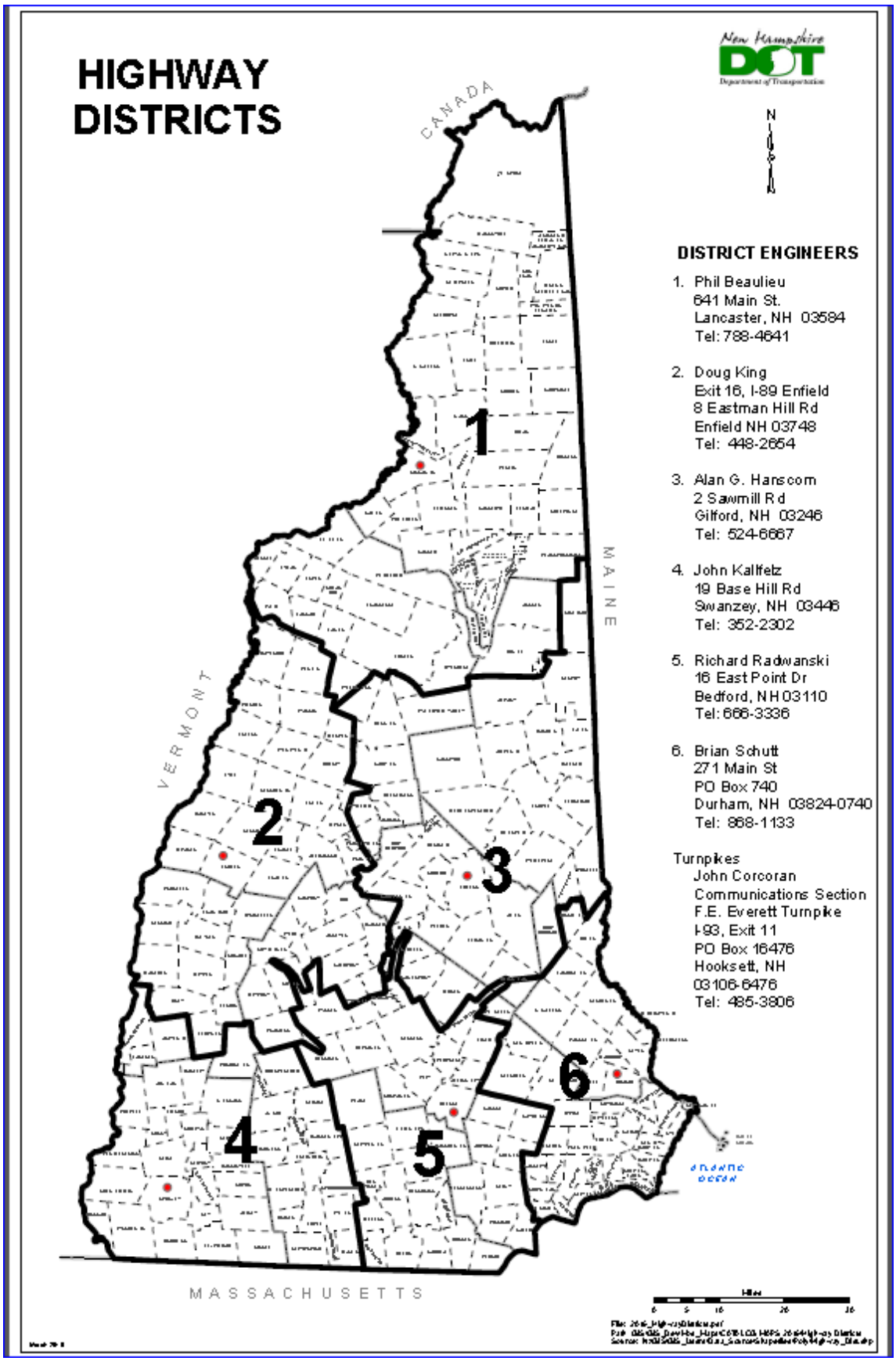
State of New Hampshire
Town & County
0 5 10 20 30
Miles
N
CANADA
COOS
GRAFTON
CARROLL
VERMONT
MAINE
BELKNAP
SULLIVAN
STRAFFORD
MERRIMACK
ROCKINGHAM
CHESHIRE
HILLSBOROUGH
ATLANTIC OCEAN
MASSACHUSETTS

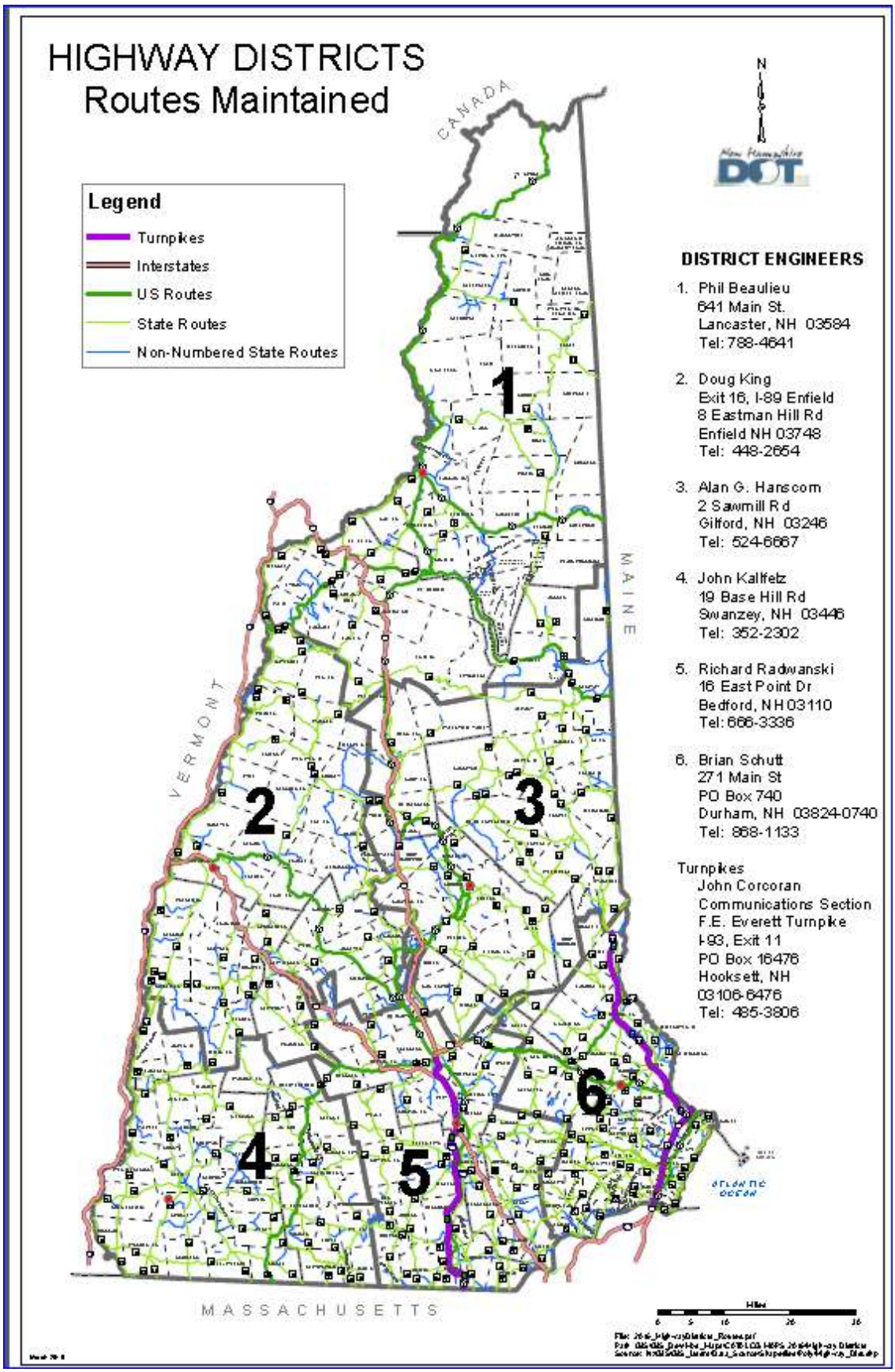

State of New Hampshire
Congressional Districts
As of 2013 Redistricting
Legend
District 1
District 2
CANADA
N
COOS
GRAFTON
VERMONT
MAINE
CARROLL
BELKNAP
SULLIVAN
STRAFFORD
MERRIMACK
ROCKINGHAM
CHESHIRE
HILLSBOROUGH
ATLANTIC OCEAN
MASSACHUSETTS
0 5 10 20 30
Miles


State of New Hampshire
Senatorial Districts
Legend
NAME
Dist 01 - Sen. Jeff Woodburn
Dist 02 - Sen. Jeanie Forrester
Dist 03 - Sen. Jeb Bradley
Dist 04 - Sen. David Watters
Dist 05 - Sen. David Pierce
Dist 06 - Sen. Sam Cataldo
Dist 07 - Sen. Andrew Hosmer
Dist 08 - Sen. Gerald Little
Dist 09 - Sen. Andy Sanborn
Dist 10 - Sen. Molly Kelly
Dist 11 - Sen. Gary Daniels
Dist 12 - Sen. Kevin Avard
Dist 13 - Sen. Bette Lasky
Dist 14 - Sen. Sharon Carson
Dist 15 - Sen. Dan Feltes
Dist 16 - Sen. David Boutin
Dist 17 - Sen. John Reagan
Dist 18 - Sen. Donna Soucy
Dist 19 - Sen. Regina Birdsell
Dist 20 - Sen. Lou D'Allesandro
Dist 21 - Sen. Martha Fuller Clark
Dist 22 - Sen. Chuck Morse
Dist 23 - Sen. Russell Prescott
Dist 24 - Sen. Nancy Stiles
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
N
0 2.5 5 10 15
Miles
February 2016


State of New Hampshire
Executive Council Districts
Based on 2010 Census
Legend
Councilors
District 1 - Joeseph D. Kenney
District 2 - Colin Van Ostern
District 3 - Christopher T. Sununu
District 4 - Christopher C. Pappas
District 5 - David K. Wheeler
CANADA
N
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
1
2
3
4
5
0 5 10 20
Miles
March 2016


State of New Hampshire
Regional Planning Commissions
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
1
2
3
4
5A
5B
5C
6
7
1) NORTH COUNTRY COUNCIL
Christine Frost, Executive Director
Mt Eustis Commons
262 College Street, Suite 246
Littleton, NH 03561
Tel: 444-6303 Fax: 444-7588
email: ncdinc@ncocouncil.org
2) LAKES REGION
PLANNING COMMISSION
Jeff Hayes, Executive Director
Humiston Building
103 Main Street, Suite 3
Meredith, NH 03253-9237
Tel: 279-8171 Fax: 279-0200
email: lrpc@lakesrpc.org
3) UPPER VALLEY-LAKE SUNAPEE
REGIONAL PLANNING COMMISSION
Nate Miller, Executive Director
10 Water Street
Lebanon, NH 03766
Tel: 443-1630 Fax: 443-0170
email: nmiller@uvlsrpc.org
4) SOUTHWEST REGION
PLANNING COMMISSION
Timothy Murphy, Executive Director
37 Ashuelot St
Keene, NH 03431
Tel: 357-0557 Fax: 357-7440
email: tmurphy@swrpc.org
5A) CENTRAL NEW HAMPSHIRE
REGIONAL PLANNING COMMISSION
Mike Tardif, Executive Director
23 Commercial Street
Concord, NH 03301
Tel: 226-6020 Fax: 226-6023
email: mtardif@cnhrpc.org
5B) SOUTHERN NEW HAMPSHIRE
PLANNING COMMISSION
David Preece, Executive Director
438 Dubuque Street
Manchester, NH 03102-3546
Tel: 669-4664 Fax: 669-4350
email: Dpreece@snhpc.org
5C) NASHUA REGIONAL
PLANNING COMMISSION
Tim M. Roache, Executive Director
9 Executive Park Dr, Suite 201
Merrimack, NH 03054
Tel: 424-2240 Fax: 424-2230
email: tmr@nashuarpc.org
6) ROCKINGHAM
PLANNING COMMISSION
Cliff Sinnott, Executive Director
156 Water Street
Exeter, NH 03833
Tel: 778-0885 Fax: 778-9183
email: csinnott@rpcnh.org
7) STRAFFORD REGIONAL
PLANNING COMMISSION
Cynthia Copeland, Executive Director
Rochester Community Center
150 Wakefield Street, Suite 12
Rochester, NH 03867
Tel: 994-3500 Fax: 994-3504
email: srpc@strafford.org


HIGHWAY DISTRICTS
New Hampshire DOT
Department of Transportation
N
CANADA
MAINE
VERMONT
MASSACHUSETTS
1
2
3
4
5
6
DISTRICT ENGINEERS
1. Phil Beaulieu
641 Main St.
Lancaster, NH 03584
Tel: 788-4641
2. Doug King
Exit 16, I-89 Enfield
8 Eastman Hill Rd
Enfield NH 03748
Tel: 448-2654
3. Alan G. Hanscom
2 Sawmill Rd
Gilford, NH 03246
Tel: 524-6667
4. John Kallfelz
19 Base Hill Rd
Swanzey, NH 03446
Tel: 352-2302
5. Richard Radwanski
16 East Point Dr
Bedford, NH 03110
Tel: 666-3336
6. Brian Schutt
271 Main St
PO Box 740
Durham, NH 03824-0740
Tel: 868-1133
Turnpikes
John Corcoran
Communications Section
F.E. Everett Turnpike
I-93, Exit 11
PO Box 16476
Hooksett, NH
03106-6476
Tel: 485-3806
Miles


HIGHWAY DISTRICTS
Routes Maintained
Legend
Turnpikes
Interstates
US Routes
State Routes
Non-Numbered State Routes
CANADA
VERMONT
MAINE
MASSACHUSETTS
1
2
3
4
5
6
N
DOT
DISTRICT ENGINEERS
1. Phil Beaulieu
641 Main St.
Lancaster, NH 03584
Tel: 788-4641
2. Doug King
Exit 16, I-89 Enfield
8 Eastman Hill Rd
Enfield NH 03748
Tel: 448-2654
3. Alan G. Hanscom
2 Sawmill Rd
Gilford, NH 03246
Tel: 524-6667
4. John Kallfelz
19 Base Hill Rd
Swanzey, NH 03446
Tel: 352-2302
5. Richard Radwanski
16 East Point Dr
Bedford, NH 03110
Tel: 666-3336
6. Brian Schutt
271 Main St
PO Box 740
Durham, NH 03824-0740
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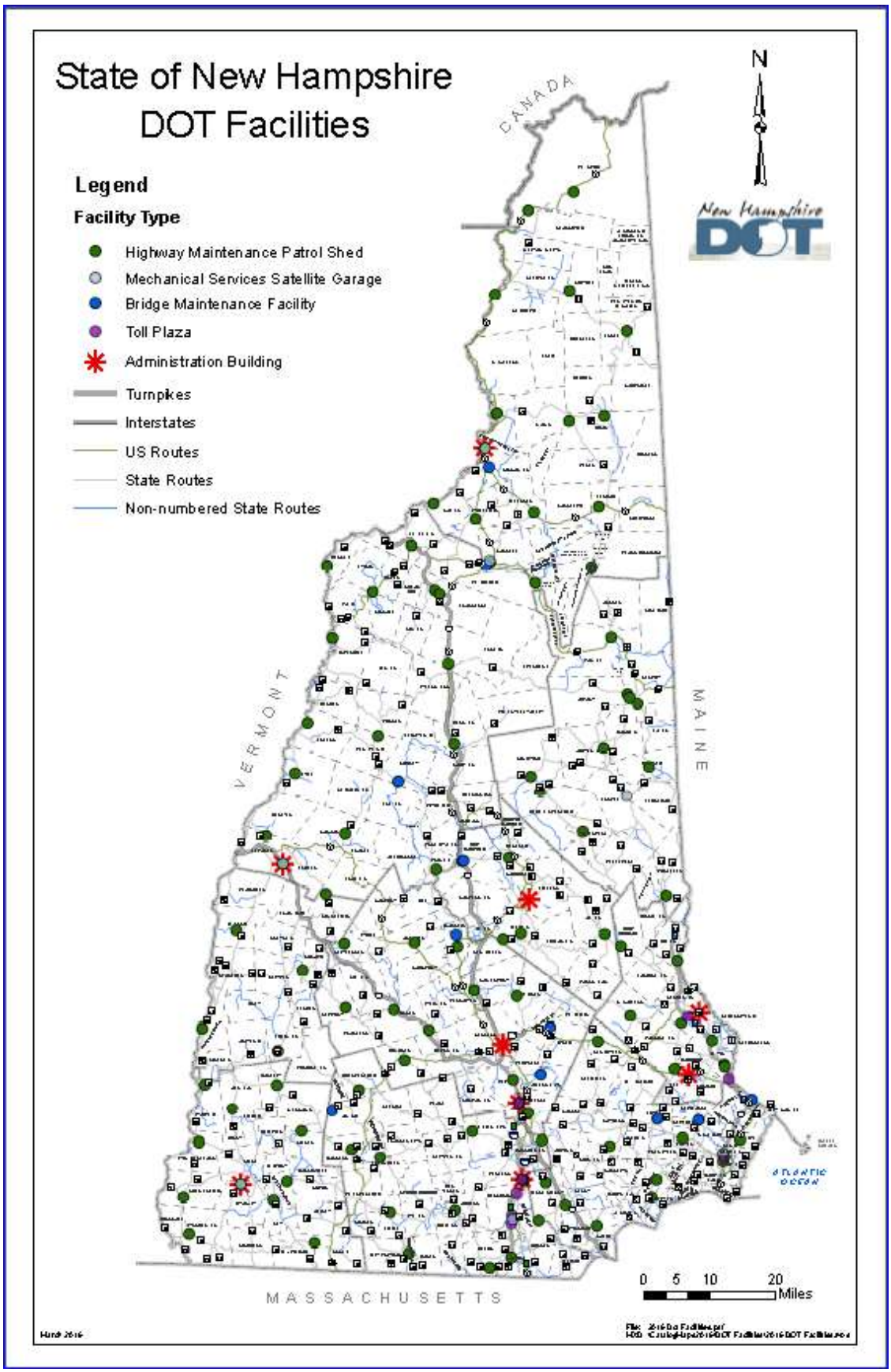
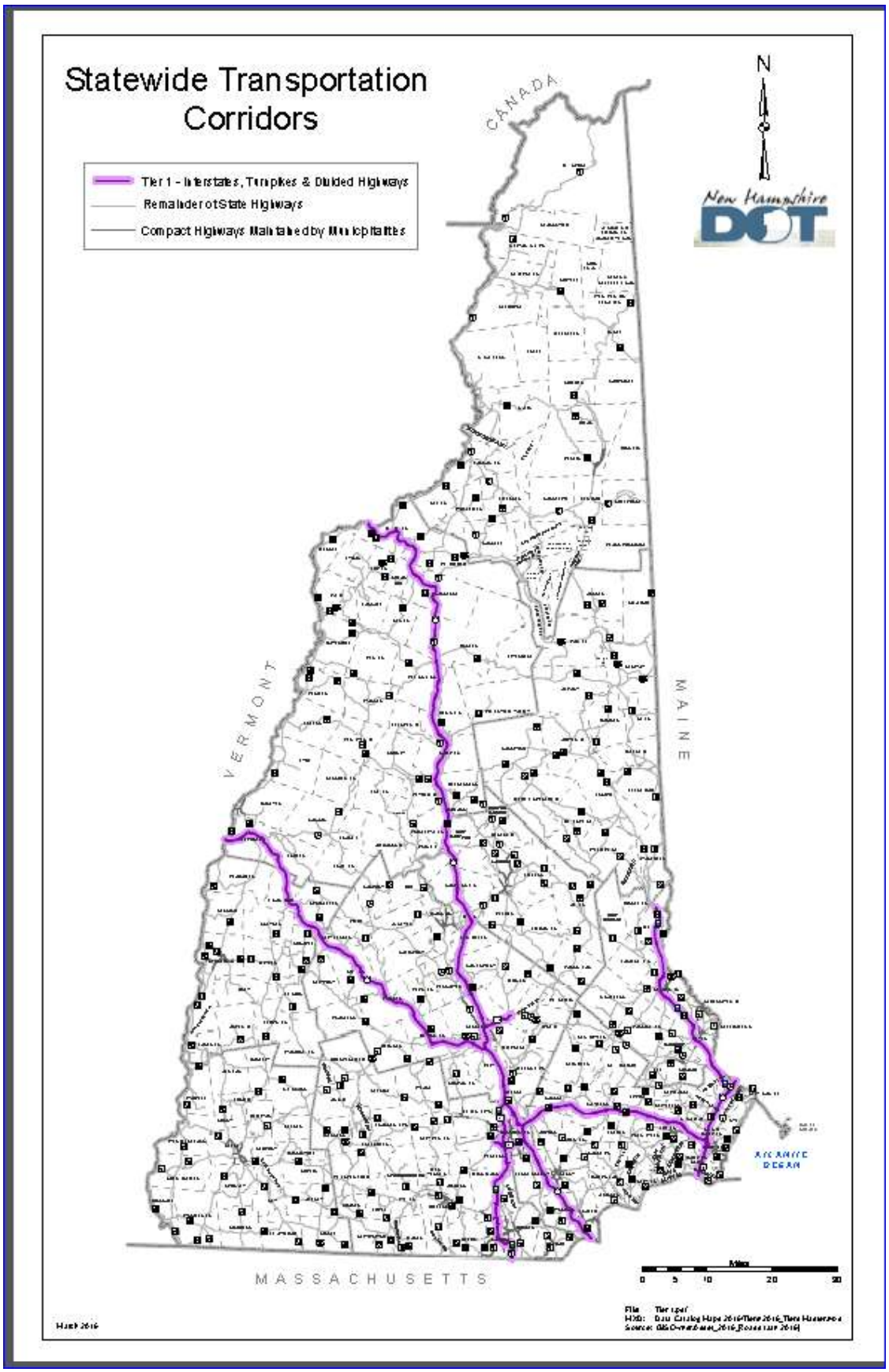
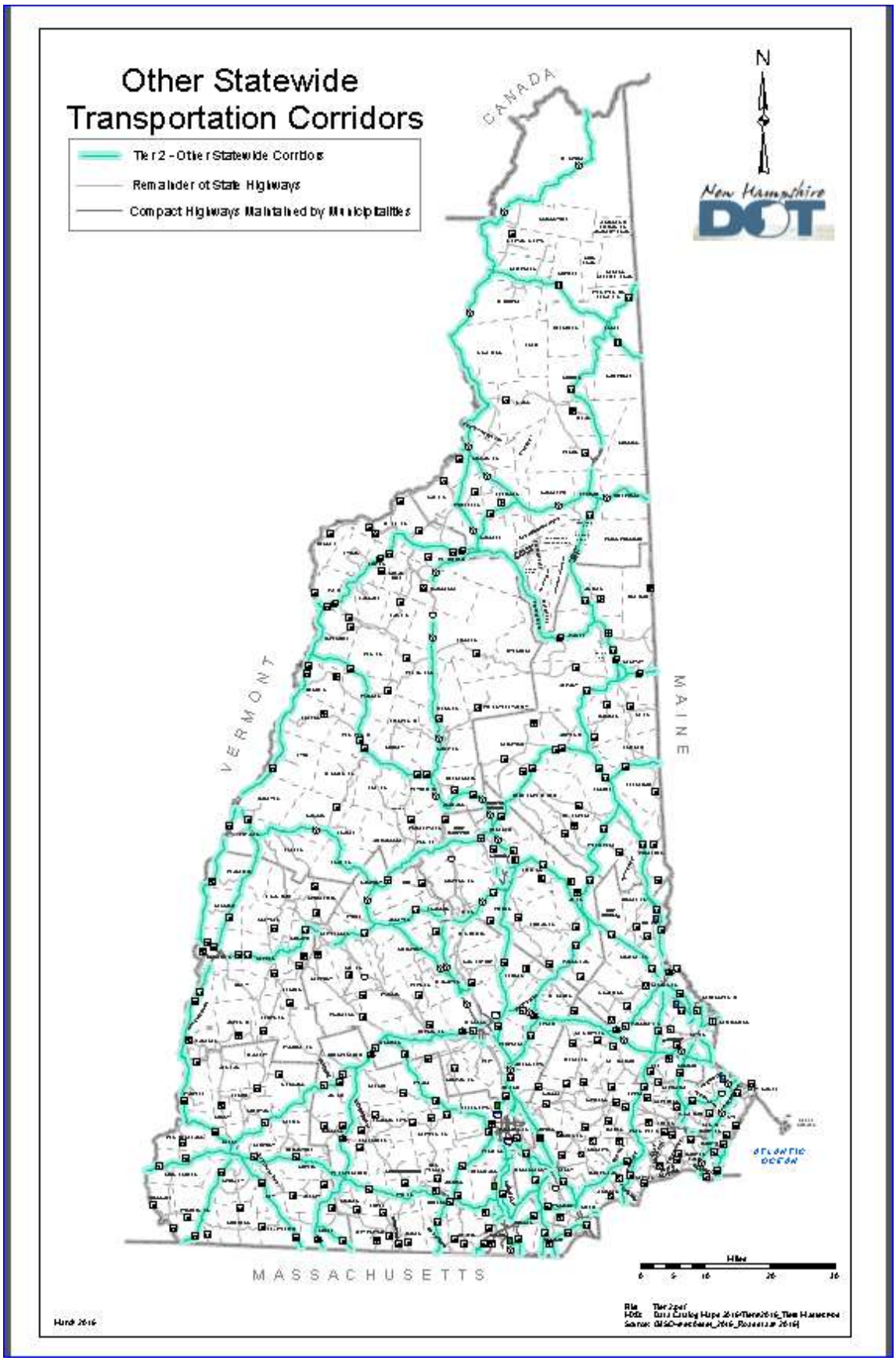
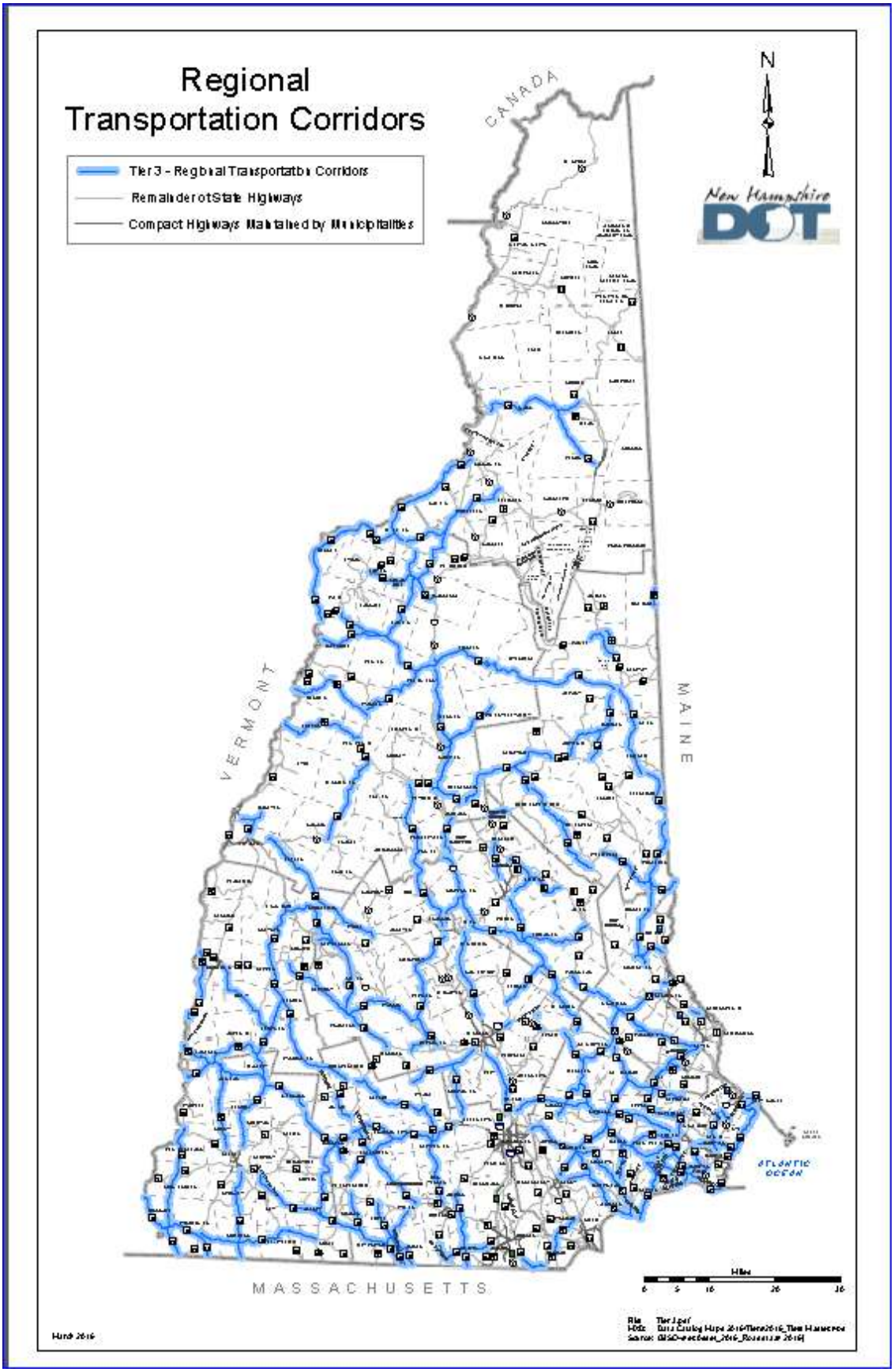
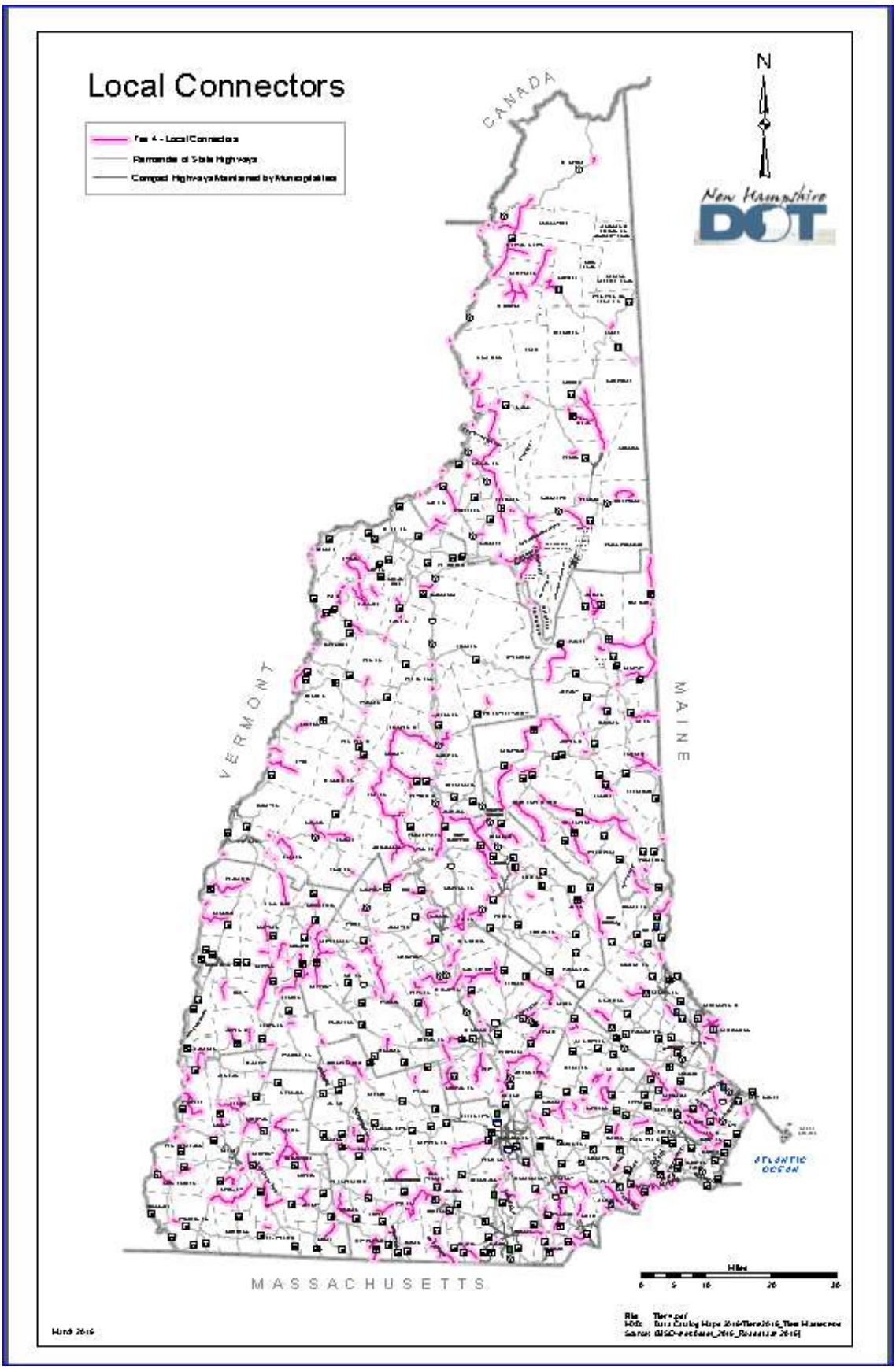
Turnpikes
John Corcoran
Communications Section
F.E. Everett Turnpike
I-93, Exit 11
PO Box 16476
Hooksett, NH
03106-6476
Tel: 485-3806
Miles

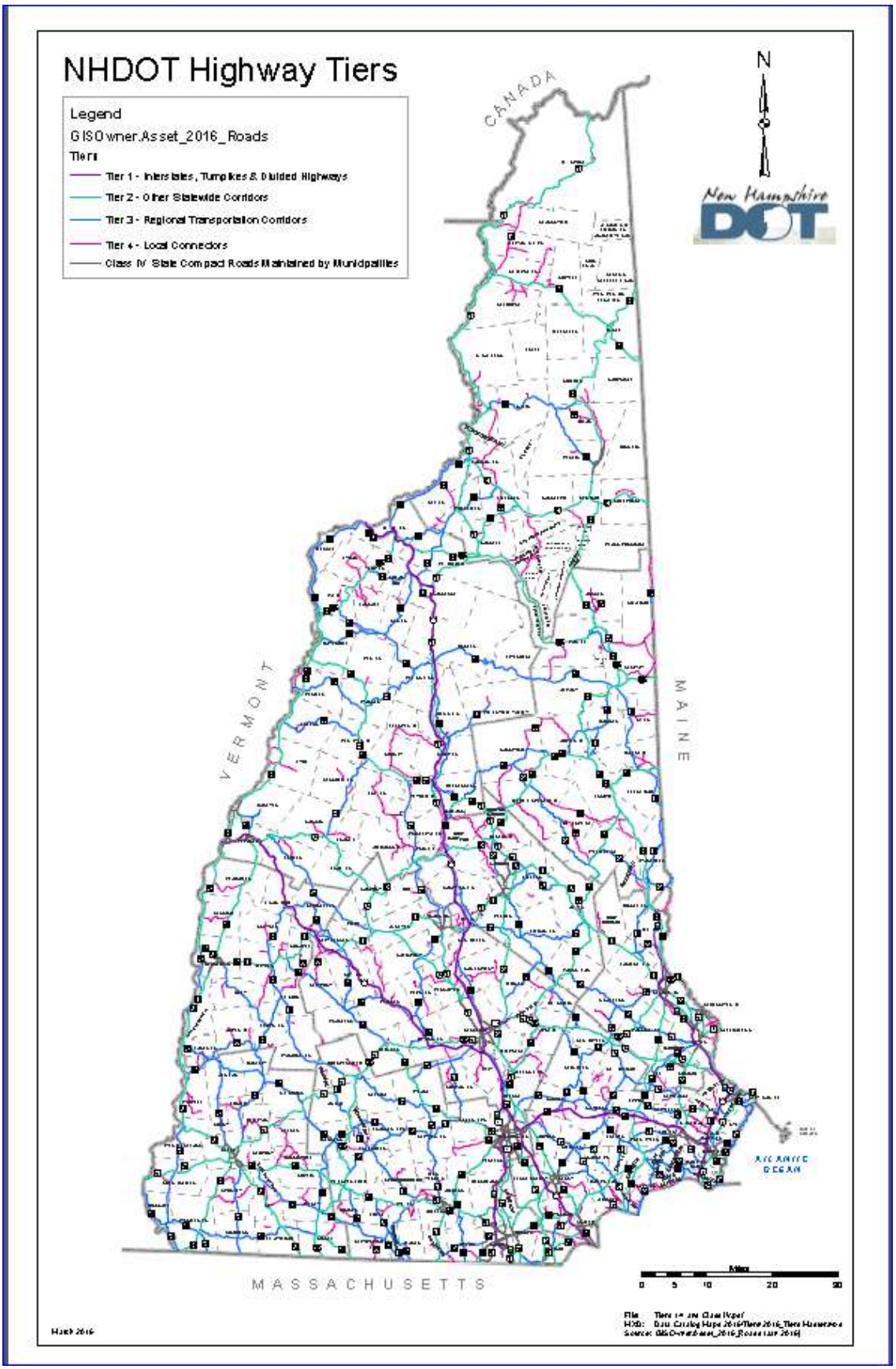

State of New Hampshire
DOT Facilities
Legend
Facility Type
Highway Maintenance Patrol Shed
Mechanical Services Satellite Garage
Bridge Maintenance Facility
Toll Plaza
Administration Building
Turnpikes
Interstates
US Routes
State Routes
Non-numbered State Routes
N
New Hampshire DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
0 5 10 20
Miles

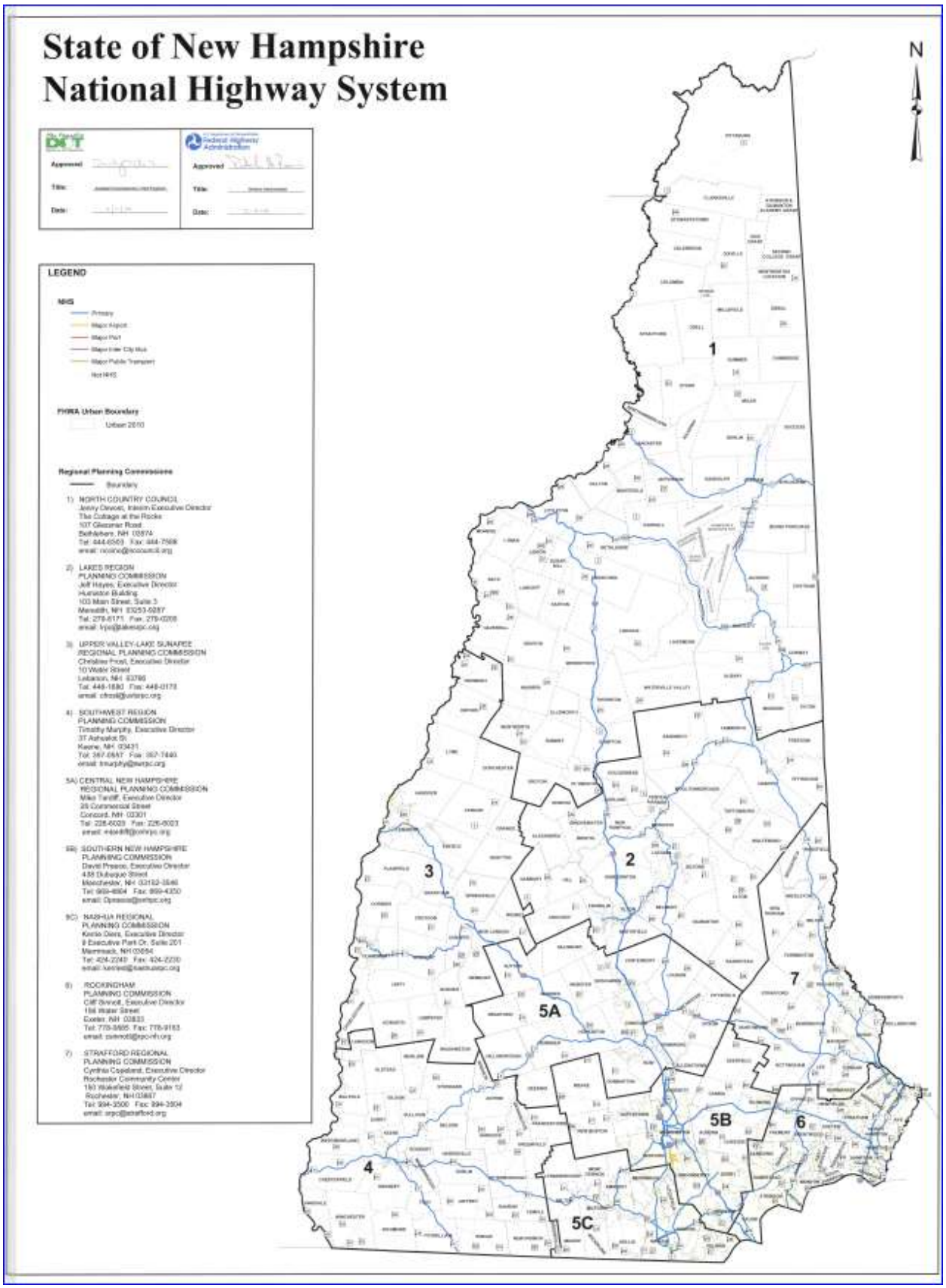

Statewide Transportation Corridors
Tier 1 - Interstates, Turnpikes & Divided Highways
Remainder of State Highways
Compact Highways Maintained by Municipalities
N
New Hampshire DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Miles
0 5 10 20 30
March 2016


Other Statewide
Transportation Corridors
Tier 2 - Other Statewide Corridors
Remainder of State Highways
Compact Highways Maintained by Municipalities
N
New Hampshire
DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Miles


Regional
Transportation Corridors
Tier 3 - Regional Transportation Corridors
Remainder of State Highways
Compact Highways Maintained by Municipalities
N
New Hampshire
DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Miles


Local Connectors
Tier 4 - Local Connectors
Remainder of State Highways
Compact Highways Maintained by Municipalities
N
New Hampshire
DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Miles
0 5 10 20 30


NHDOT Highway Tiers
Legend
GISOwner.Asset_2016_Roads
Tiers
Tier 1 - Interstates, Turnpikes & Divided Highways
Tier 2 - Other Statewide Corridors
Tier 3 - Regional Transportation Corridors
Tier 4 - Local Connectors
Class IV State Compact Roads Maintained by Municipalities
N
New Hampshire
DOT
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Miles
0 5 10 20 30
March 2016


State of New Hampshire
National Highway System
N
LEGEND
NHS
Primary
Major Airport
Major Port
Major Inter City Bus
Major Public Transport
Not NHS
FHWA Urban Boundary
Urban 2010
Regional Planning Commissions
Boundary
1) NORTH COUNTRY COUNCIL
Jenny Devoid, Interim Executive Director
The Cottage at the Rocks
107 Glessner Road
Bethlehem, NH 03574
Tel: 444-6569 Fax: 444-7568
email: ncoinc@ncocouncil.org
2) LAKES REGION
PLANNING COMMISSION
Jeff Hayes, Executive Director
Humiston Building
103 Main Street, Suite 3
Meredith, NH 03253-5287
Tel: 279-8171 Fax: 279-0200
email: lrpc@lakesrpc.org
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email: cfrost@uvlsrpc.org
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email: tmurphy@swrpc.org
5A) CENTRAL NEW HAMPSHIRE
REGIONAL PLANNING COMMISSION
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Concord, NH 03301
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5B) SOUTHERN NEW HAMPSHIRE
PLANNING COMMISSION
David Preece, Executive Director
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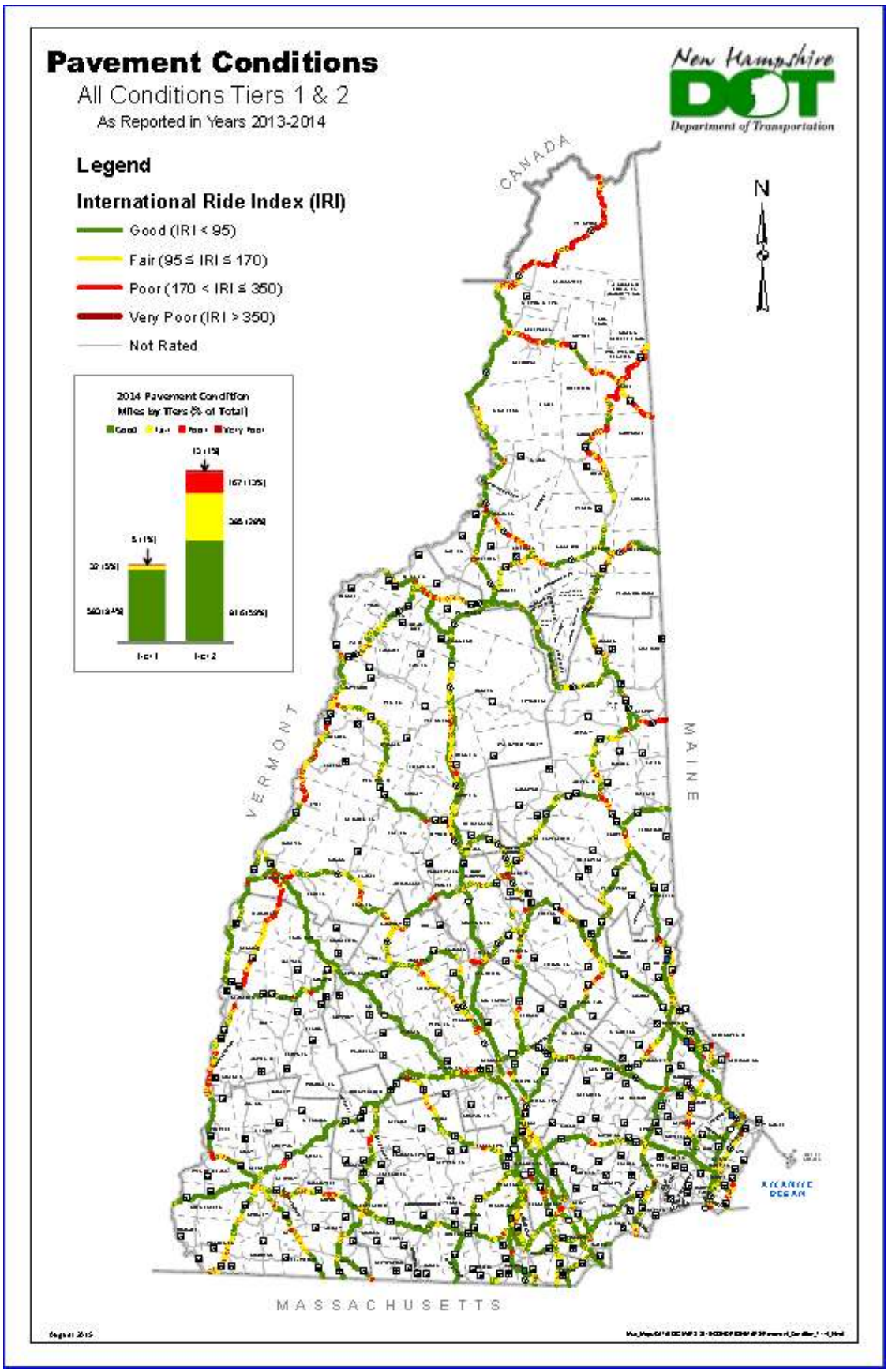
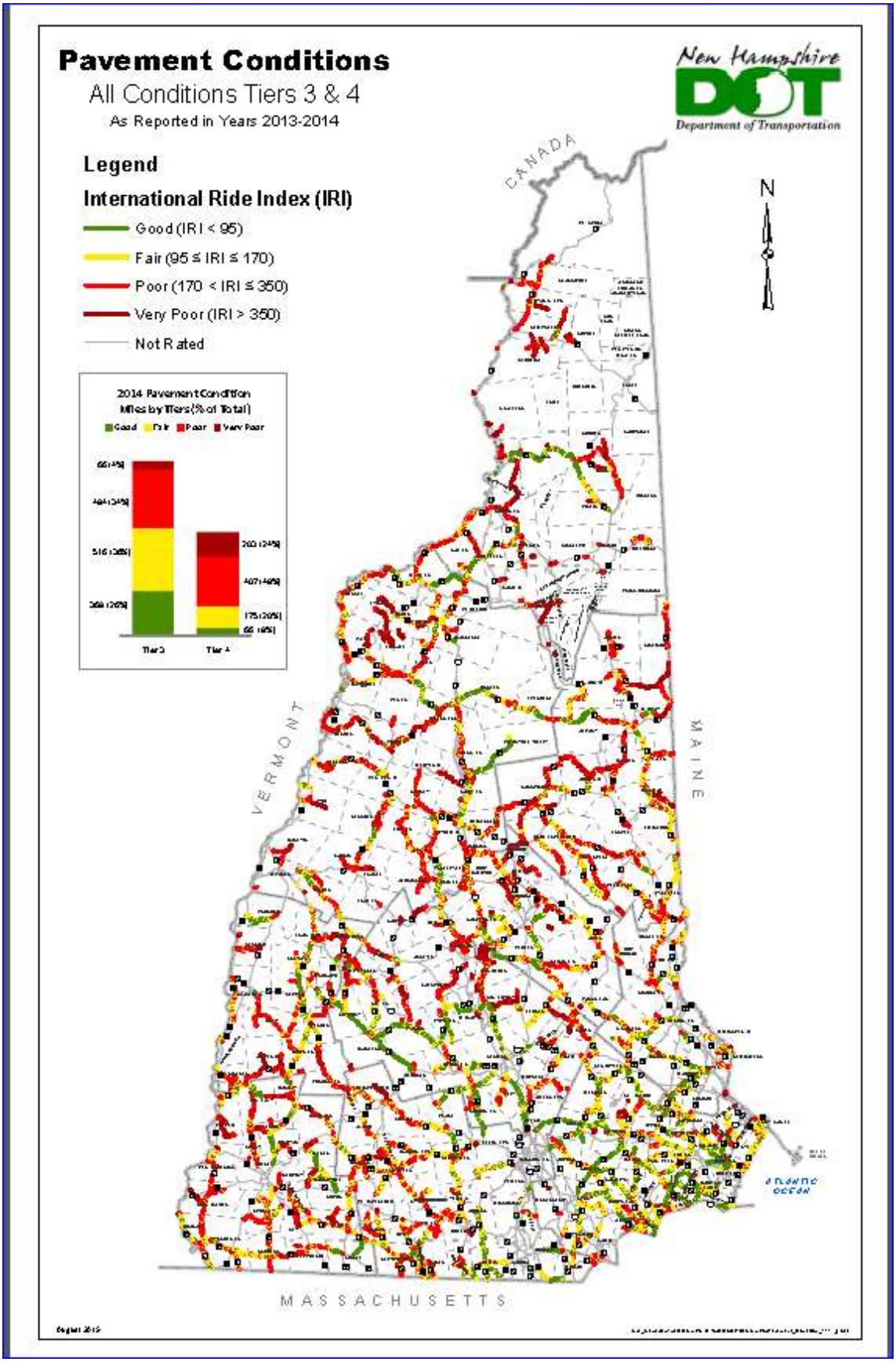
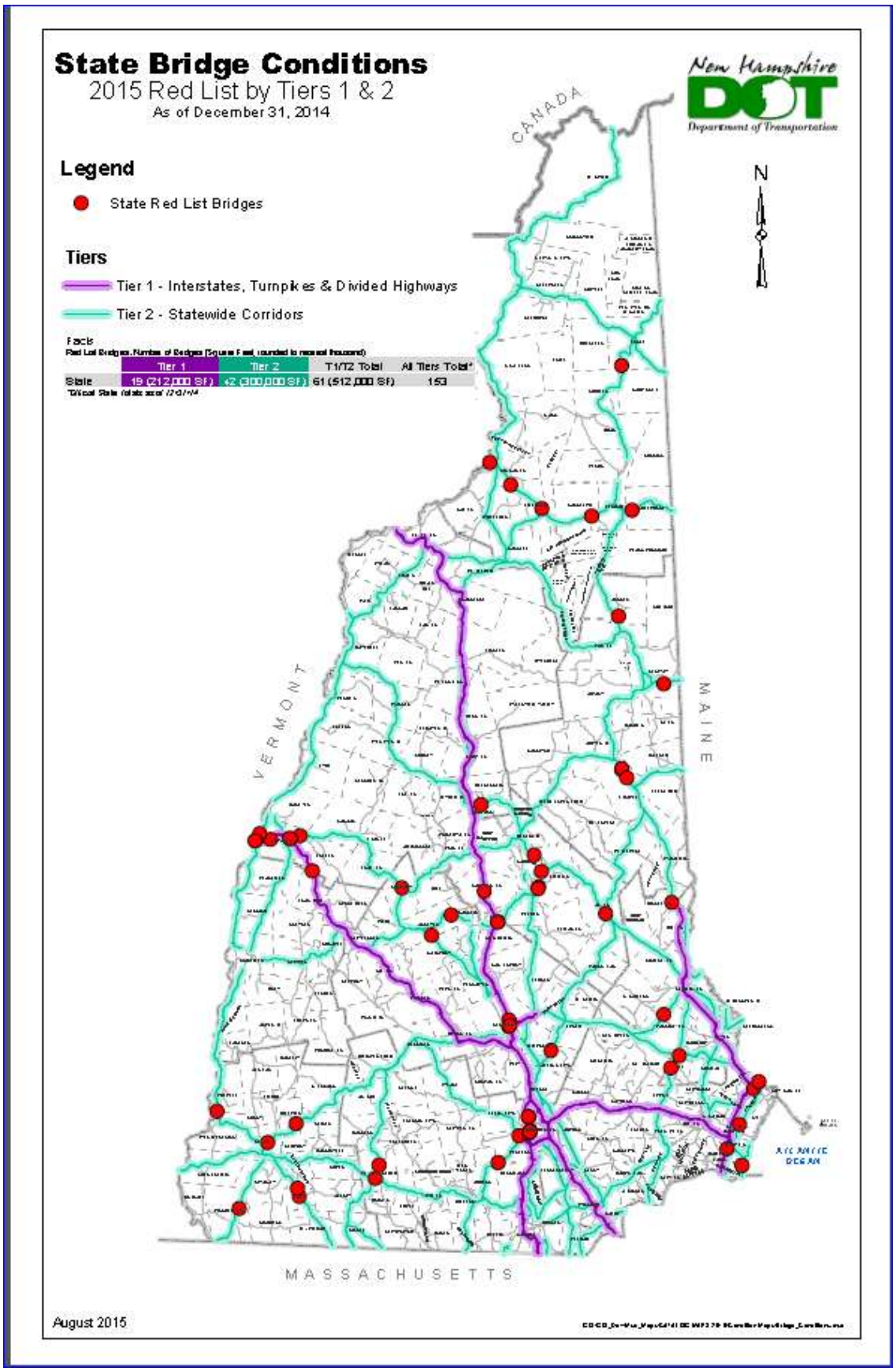
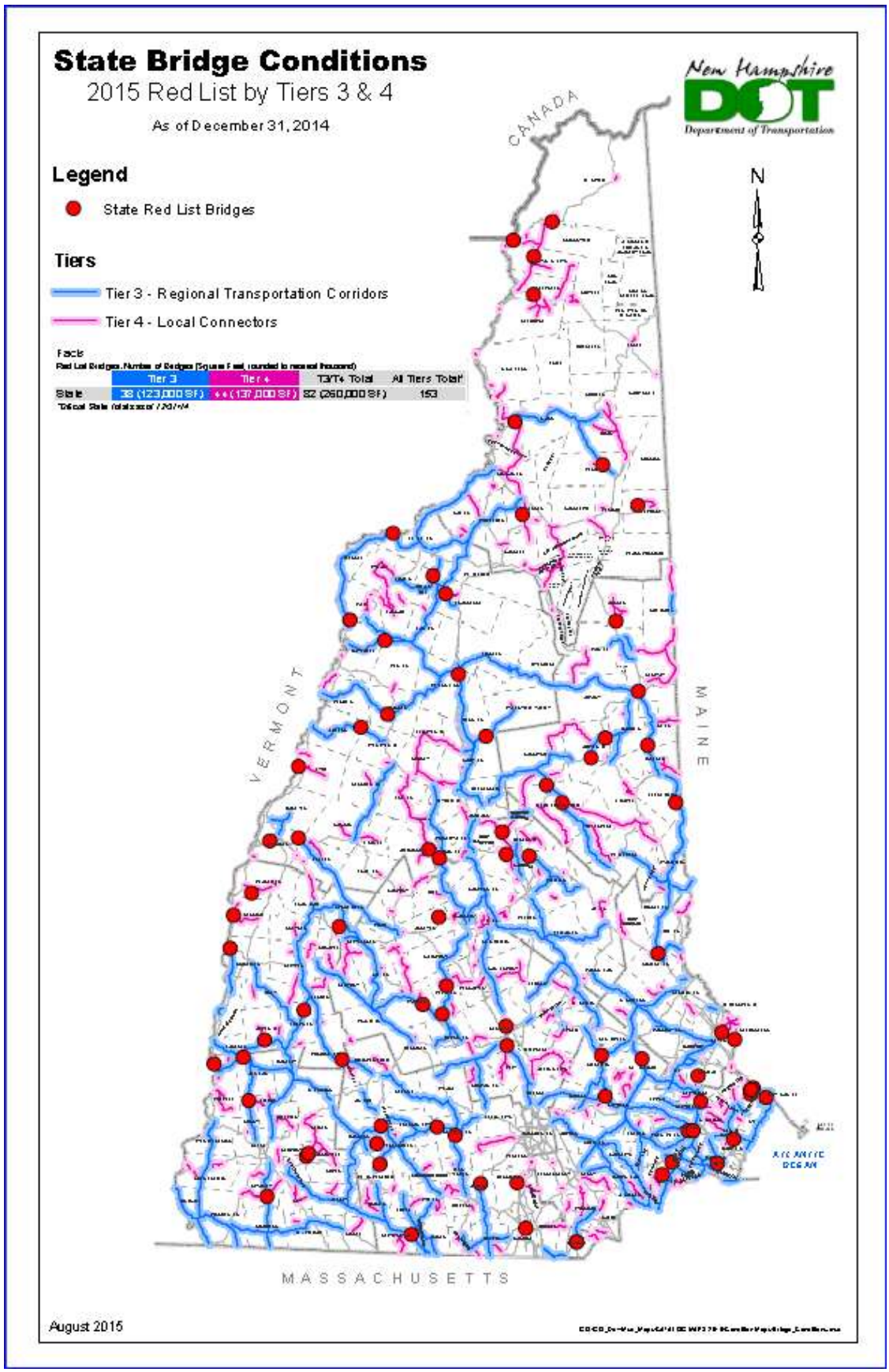
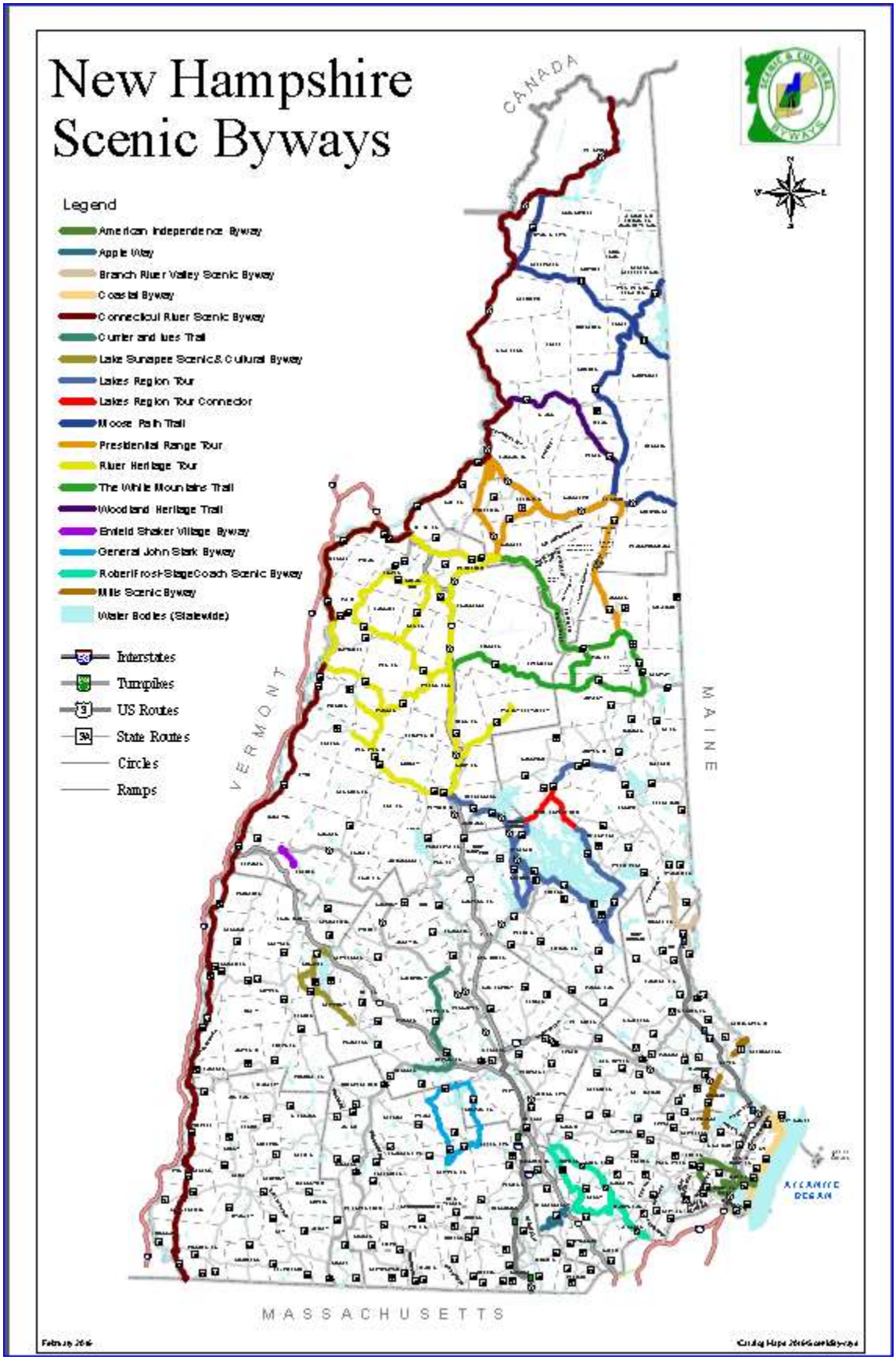
Manchester, NH 03102-3546
Tel: 669-4664 Fax: 669-4350
email: Dpreece@snhrpc.org
5C) NASHUA REGIONAL
PLANNING COMMISSION
Kevin Dixon, Executive Director
9 Executive Park Dr, Suite 201
Merrimack, NH 03054
Tel: 424-2240 Fax: 424-2230
email: kevinx@nashuarpc.org
6) ROCKINGHAM
PLANNING COMMISSION
Cliff Sinnott, Executive Director
156 Water Street
Exeter, NH 03833
Tel: 778-0885 Fax: 778-9183
email: csinnott@rpc-nh.org
7) STRAFFORD REGIONAL
PLANNING COMMISSION
Cynthia Copeland, Executive Director
Rochester Community Center
150 Wakefield Street, Suite 12
Rochester, NH 03867
Tel: 994-3500 Fax: 994-3504
email: srpc@strafford.org
1
2
3
4
5A
5B
5C
6
7

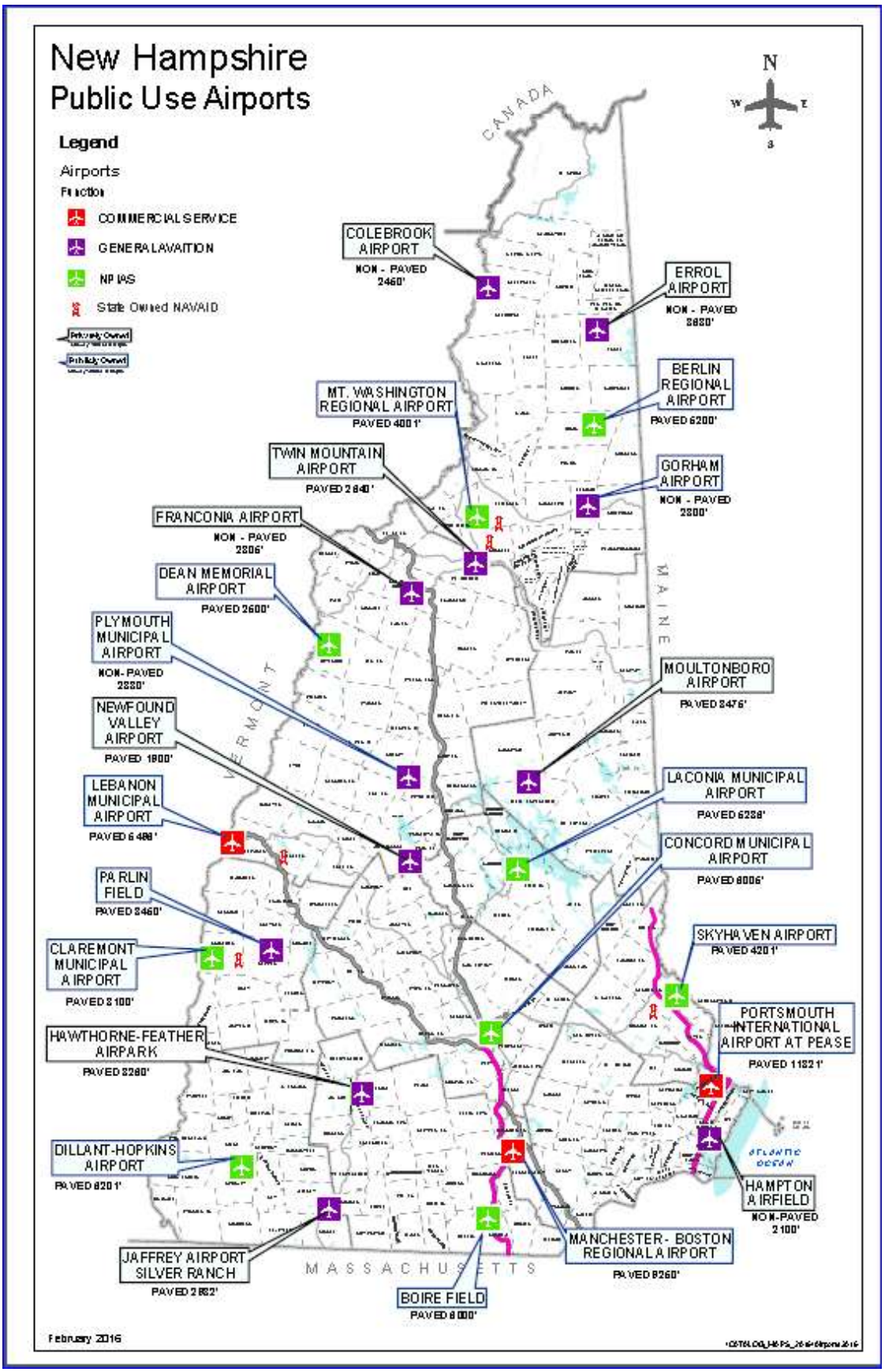

Pavement Conditions
All Conditions Tiers 1 & 2
As Reported in Years 2013-2014
New Hampshire DOT
Department of Transportation
Legend
International Ride Index (IRI)
Good (IRI < 95)
Fair (95 ≤ IRI ≤ 170)
Poor (170 < IRI ≤ 350)
Very Poor (IRI > 350)
Not Rated
2014 Pavement Condition
Miles by Tiers (% of Total)
CANADA
N
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN

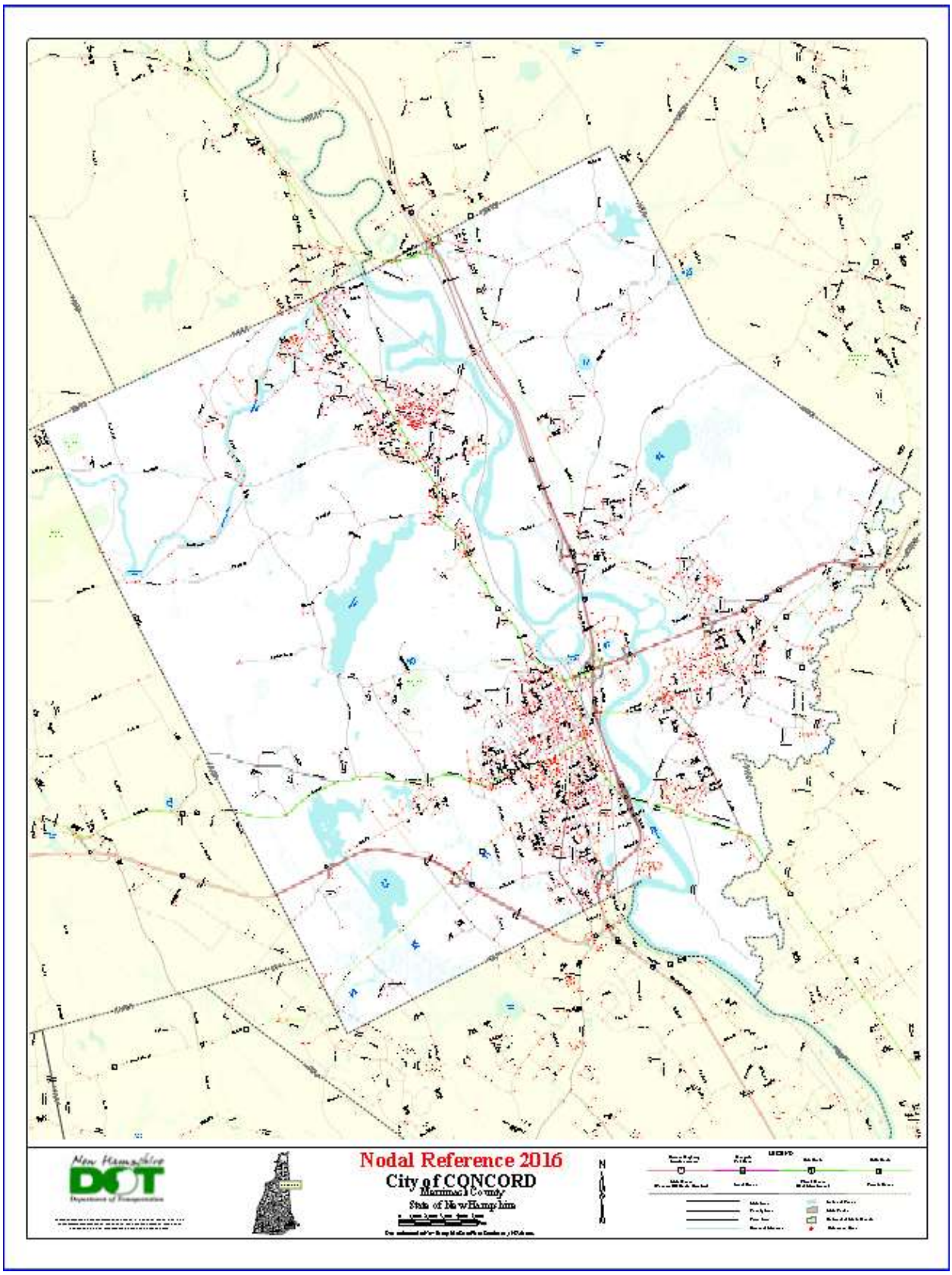

Pavement Conditions
All Conditions Tiers 3 & 4
As Reported in Years 2013-2014
New Hampshire DOT
Department of Transportation
Legend
International Ride Index (IRI)
Good (IRI < 95)
Fair (95 ≤ IRI ≤ 170)
Poor (170 < IRI ≤ 350)
Very Poor (IRI > 350)
Not Rated
2014 Pavement Condition
Miles by Tiers (% of Total)
Good
Fair
Poor
Very Poor
Tier 3
Tier 4
CANADA
N
VERMONT
MAINE
MASSACHUSETTS

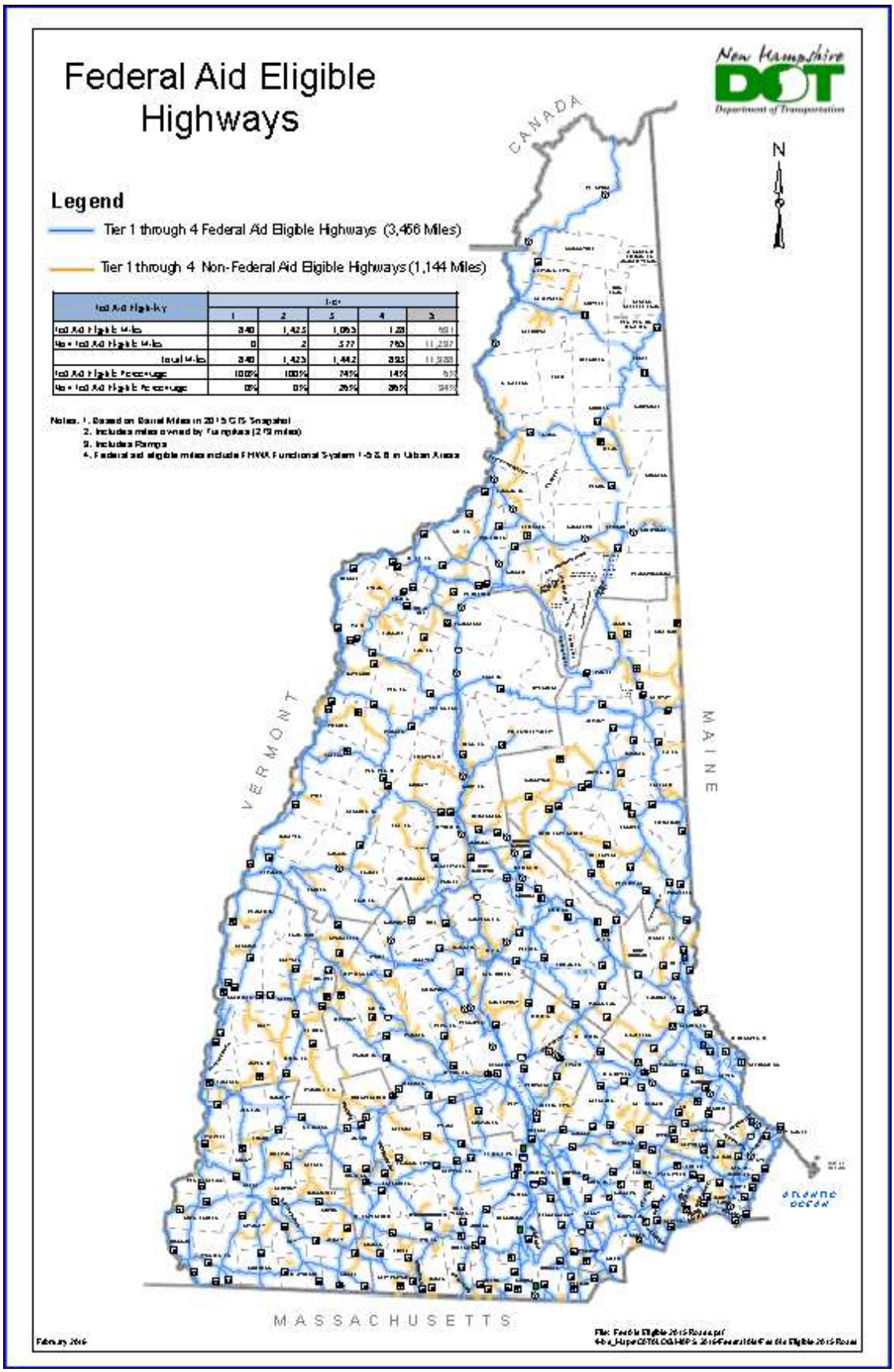

State Bridge Conditions
2015 Red List by Tiers 1 & 2
As of December 31, 2014
New Hampshire DOT
Department of Transportation
Legend
State Red List Bridges
Tiers
Tier 1 - Interstates, Turnpikes & Divided Highways
Tier 2 - Statewide Corridors
Facts
Red List Bridges, Number of Bridges (Square Feet, rounded to nearest thousand)
Tier 1
Tier 2
T1/T2 Total
All Tiers Total*
State
19 (212,000 SF)
42 (300,000 SF)
61 (512,000 SF)
153
CANADA
VERMONT
MAINE
MASSACHUSETTS
N
August 2015


State Bridge Conditions
2015 Red List by Tiers 3 & 4
As of December 31, 2014
New Hampshire DOT
Department of Transportation
Legend
State Red List Bridges
Tiers
Tier 3 - Regional Transportation Corridors
Tier 4 - Local Connectors
Facts
Red List Bridges, Number of Bridges (Square Feet, rounded to nearest thousand)
Tier 3
Tier 4
T3/T4 Total
All Tiers Total*
State
38 (123,000 SF)
44 (137,000 SF)
82 (260,000 SF)
153
*Total State (statewide) 7/31/14
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
N
August 2015


New Hampshire
Scenic Byways
Legend
American Independence Byway
Apple Way
Branch River Valley Scenic Byway
Coastal Byway
Connecticut River Scenic Byway
Currier and Ives Trail
Lake Sunapee Scenic & Cultural Byway
Lakes Region Tour
Lakes Region Tour Connector
Moose Path Trail
Presidential Range Tour
River Heritage Tour
The White Mountains Trail
Woodland Heritage Trail
Enfield Shaker Village Byway
General John Stark Byway
Robert Frost-StageCoach Scenic Byway
Mills Scenic Byway
Water Bodies (Statewide)
Interstates
Turnpikes
US Routes
State Routes
Circles
Ramps
CANADA
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN


New Hampshire
Public Use Airports
Legend
Airports
Function
COMMERCIAL SERVICE
GENERAL AVIATION
NPIAS
State Owned NAVAID
N
W
E
S
CANADA
VERMONT
MAINE
MASSACHUSETTS
COLEBROOK AIRPORT
NON - PAVED 2460'
ERROL AIRPORT
NON - PAVED 3830'
BERLIN REGIONAL AIRPORT
PAVED 6200'
MT. WASHINGTON REGIONAL AIRPORT
PAVED 4001'
TWIN MOUNTAIN AIRPORT
PAVED 2840'
GORHAM AIRPORT
NON - PAVED 2300'
FRANCONIA AIRPORT
NON - PAVED 2806'
DEAN MEMORIAL AIRPORT
PAVED 2600'
PLYMOUTH MUNICIPAL AIRPORT
NON-PAVED 2330'
MOULTONBORO AIRPORT
PAVED 2476'
NEWFOUND VALLEY AIRPORT
PAVED 1900'
LEBANON MUNICIPAL AIRPORT
PAVED 6488'
LACONIA MUNICIPAL AIRPORT
PAVED 6238'
CONCORD MUNICIPAL AIRPORT
PAVED 8006'
PARLIN FIELD
PAVED 2460'
CLAREMONT MUNICIPAL AIRPORT
PAVED 3100'
SKYHAVEN AIRPORT
PAVED 4201'
PORTSMOUTH INTERNATIONAL AIRPORT AT PEASE
PAVED 11321'
HAWTHORNE-FEATHER AIRPARK
PAVED 3280'
DILLANT-HOPKINS AIRPORT
PAVED 6201'
HAMPTON AIRFIELD
NON-PAVED 2100'
JAFFREY AIRPORT SILVER RANCH
PAVED 2862'
MANCHESTER - BOSTON REGIONAL AIRPORT
PAVED 9250'
BOIRE FIELD
PAVED 8000'
February 2016


Nodal Reference 2016
City of CONCORD
Merrimack County
State of New Hampshire
N


Federal Aid Eligible Highways
New Hampshire DOT
Department of Transportation
N
CANADA
Legend
Tier 1 through 4 Federal Aid Eligible Highways (3,466 Miles)
Tier 1 through 4 Non-Federal Aid Eligible Highways (1,144 Miles)
VERMONT
MAINE
MASSACHUSETTS
February 2016

Section IV - ArcMap User Basics

NHDOT Roads Network - The Components

The NHDOT Roads Network is composed of four unique parts: Nodes, Anchorsections, Bridge Points, and SRI Routes. Each part carries its own set of attributes and rules for creation, modification, and verification. Definitions for each component are as follows:

Nodes
Nodes are the foundation of the NHDOT GIS system. A node is a ***point*** feature, and is most commonly created at an intersection. AnchorSections (see below) must start and end with a node, and must break at a node. Nodes are assigned two different ID numbers: a state "Nodes ID" and a Town "AC Number". Town AC Numbers are assigned in sequential order, starting from 1 in each town. State Nodes ID's are assigned sequentially as well, but reflect all of the nodes in the state (past and present).This convention eliminates any duplicate "Nodes ID" numbers in the system

Nodes (and consequently, AnchorSection breaks) should be located at the following places:

- o All roadway intersections
- o Changes in classification of a road (Functional Class, Legislative Class, etc.)
- o Where roadways meet railways and the railroad bed is visible in aerial imagery.
- o Changes in maintenance responsibility (winter, summer, or ownership) of the roadway
- o Where roads cross municipal, county, state, or national boundaries.
- o The ends of roadways.

Nodes should NOT be located at the following places:

- o Bridge points
- o Highway overpasses and other non-intersections where roadways cross
- o Man-made features, such as power lines or monuments.
- o Roads that are no-longer catalogued by state or municipal agencies.
- o Where roads or intersections have been redesigned and/or rebuilt, and the roadway no longer exists in that location.

AnchorSections – AnchorSections are the linear connectors in the NHDOT system. They originate and terminate at nodes, and can ONLY exist between two nodes. AnchorSections make up the parts of an SRI Route. They carry their own individual data on such items as number of lanes, lane width, and other physical,
administrative and spatial attributes. AnchorSections cannot run concurrently. Only one section may exist in any given space.

Bridge Points – Bridge points are placed by NHDOT at the location of all bridges. This includes historic structures, closed structures, and town-owned/maintained structures. AnchorSections do not break at Bridge Points and Nodes should not be placed on the same location as a Bridge point.

SRI Routes – From one end to the other, an SRI route is unbroken by Nodes or other features. All AnchorSections that run along a given SRI must be joined to form the underlying SRI Route(s), and no gaps may be created.

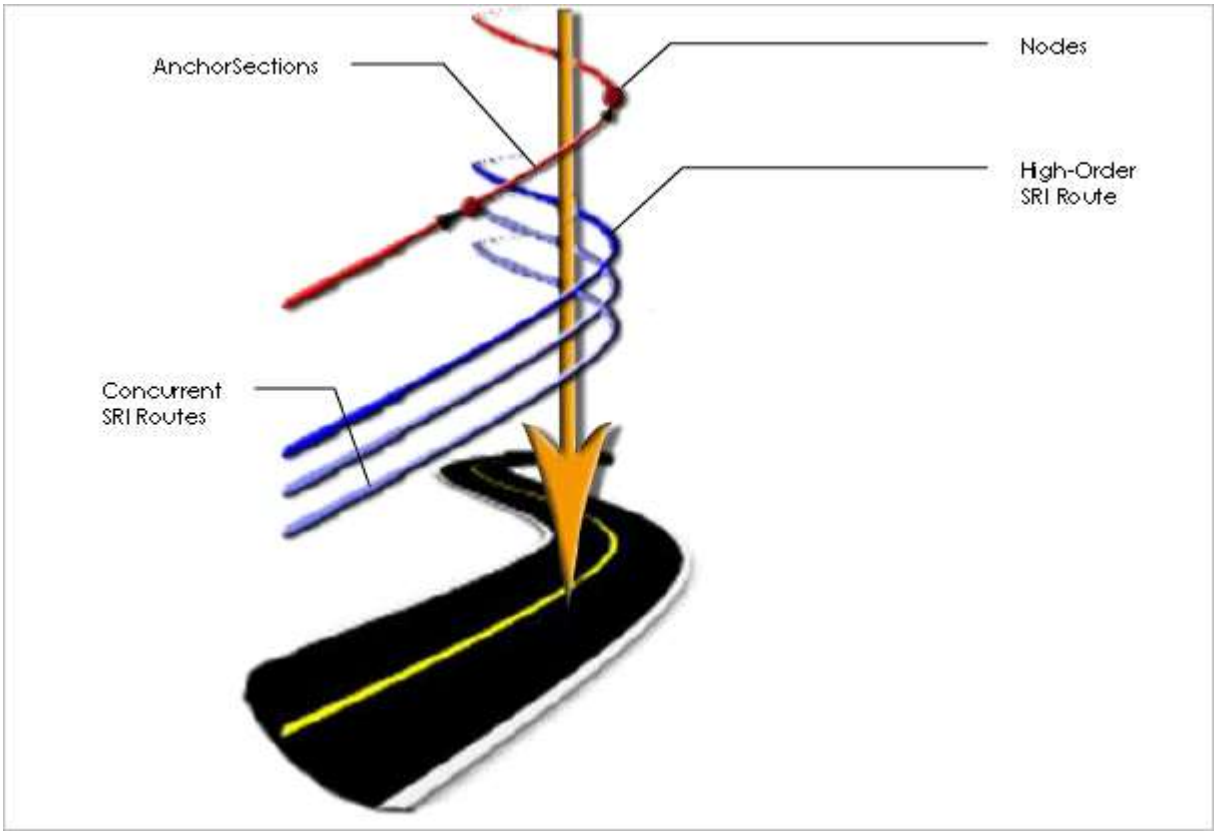
Topology Rules

There are some specific rules that need to be observed when creating and modifying features in the NHDOT GIS System. These rules have been incorporated into the *topology* of the roads layer, and if they are not followed at anypoint, a script will find and highlight the errors. The rules are as follows:

1. AnchorSections and their underlying SRI Routes must share **ALL** vertices.
2. There must be a node at either end of an AnchorSection
3. An AnchorSection **MUST** break at a node.
4. The beginning and ending vertices of AnchorSections and SRI routes must fall on nodes.
5. There cannot be gaps between AnchorSections, or anywhere along an SRI Route.
6. Bridge points and nodes cannot occupy the same space.

Concurrent Routes

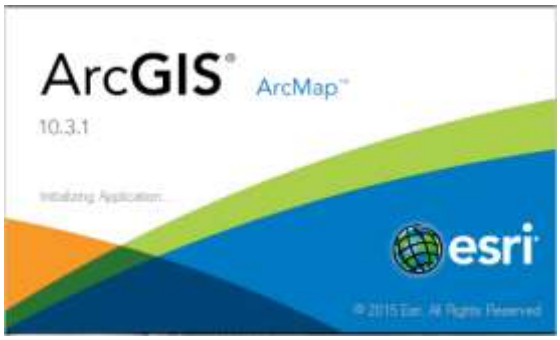
Concurrent routes are defined as sections where two or more numbered routes run along the same roadway. In these circumstances, the primary route is derived using the Hi-Order route system, which ranks routes based on their route type, and their functionality. Theoretically, there can be an infinite number of concurrent routes on a given roadway, as long as all of the concurrent routes are numbered (State, US, Interstate, or Turnpike). There must be a separate SRI-Route line segment for each individual route in a concurrent section



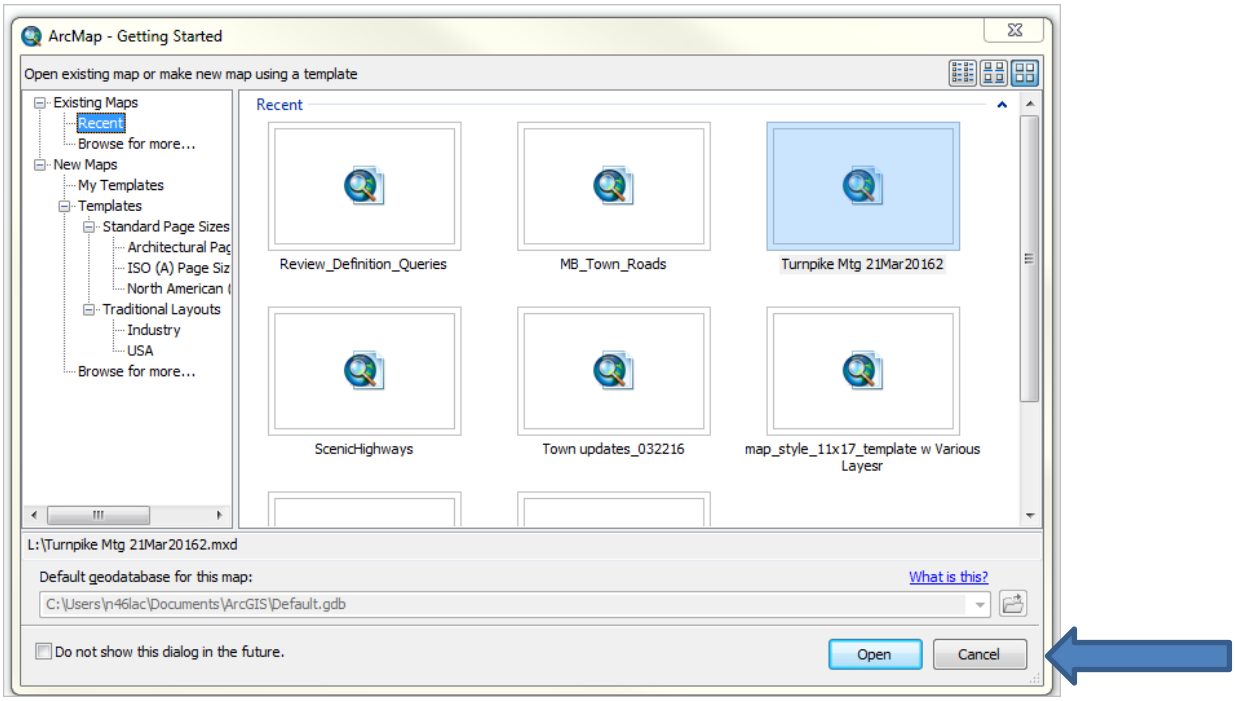
Getting Started in ArcMap

1. Open ArcMap Look for this icon either on your desktop or in ArcGIS folder under Programs

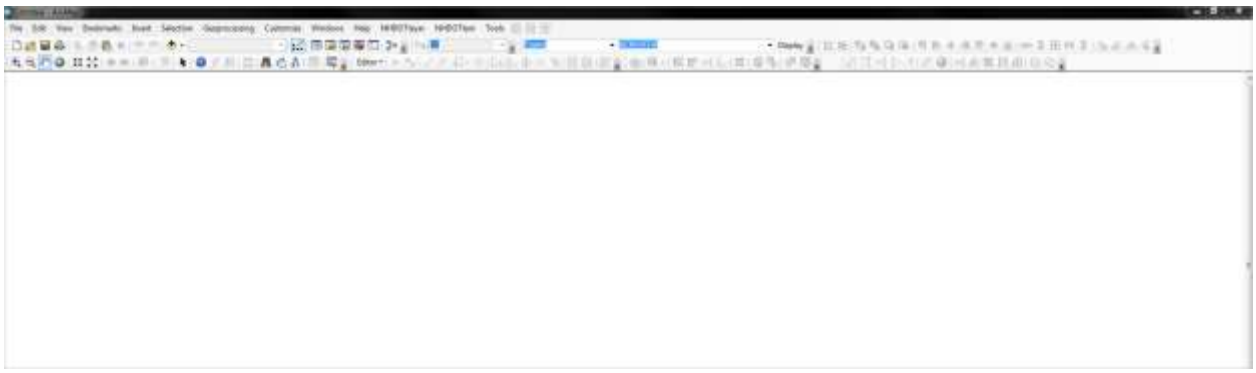
You will see this splash screen



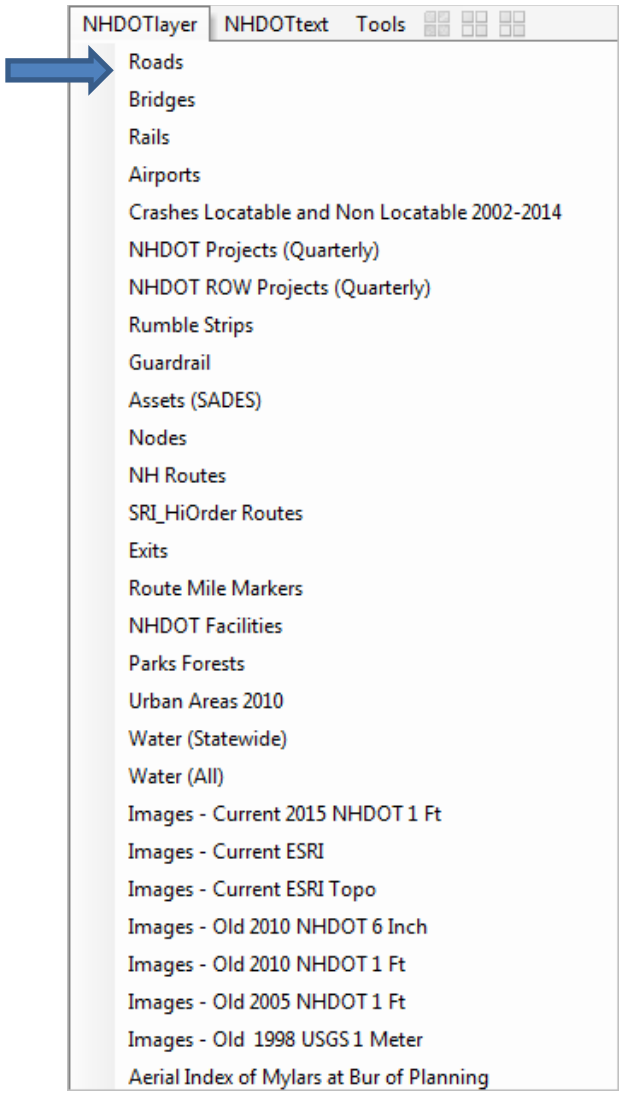
Next, you'll see a Getting Started screen. **Click cancel.**



This is a blank file. An ArcGIS file is saved in .MXD format.

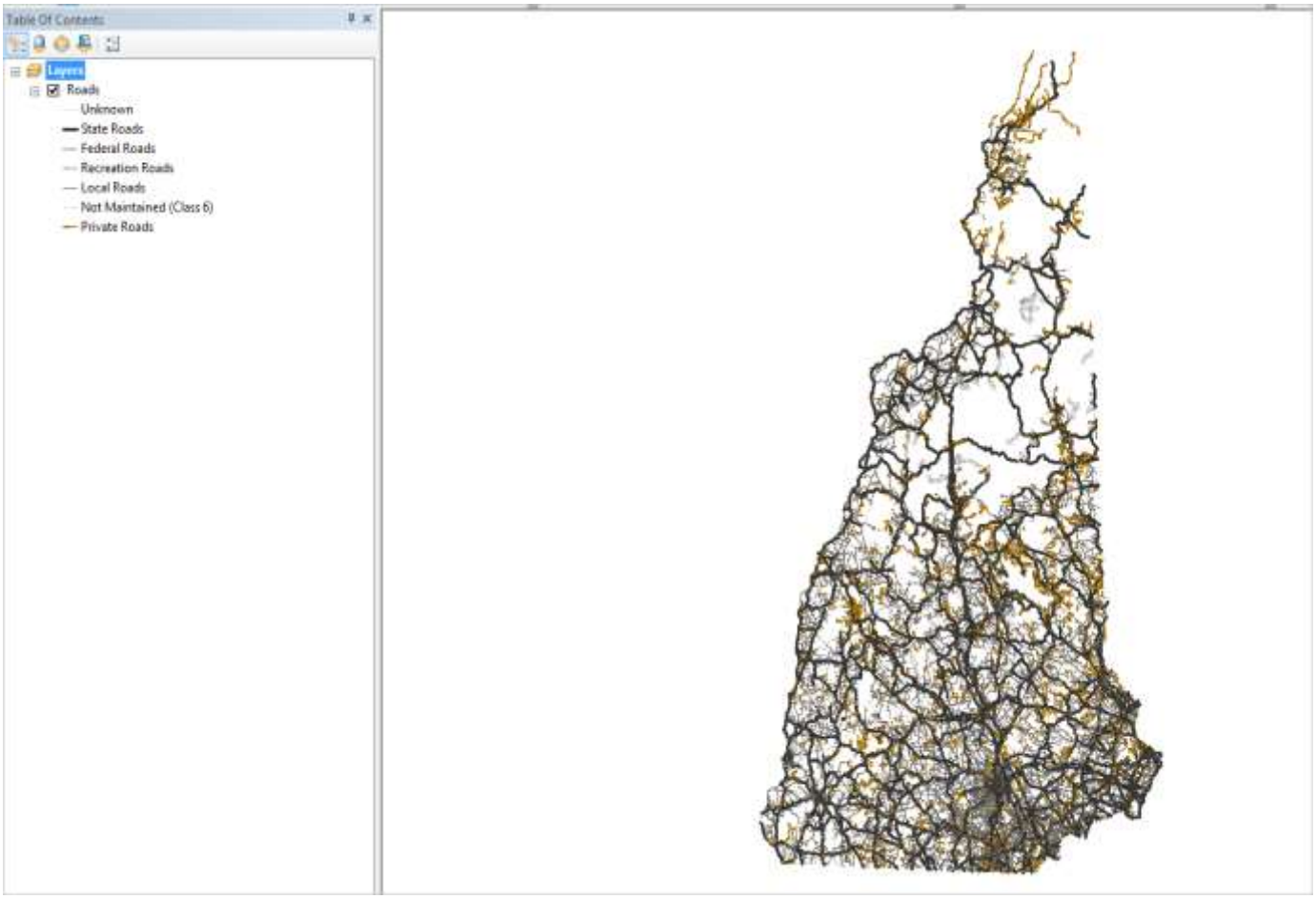


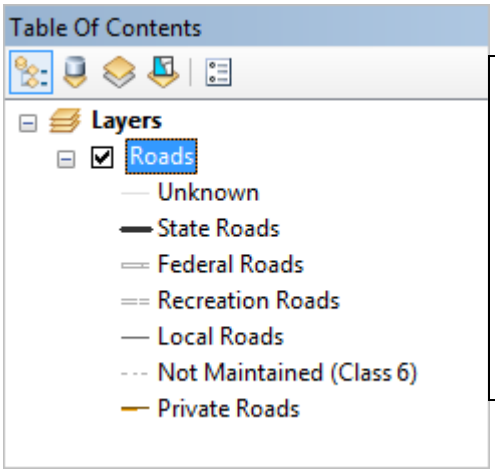
For most folks using GIS, they are not editing and can use dropdown menu:



Let's look at the Roads layer …

This is what you will see when you click on Roads layer. It brings in all NH roads.





This is the Symboligy for ROADS

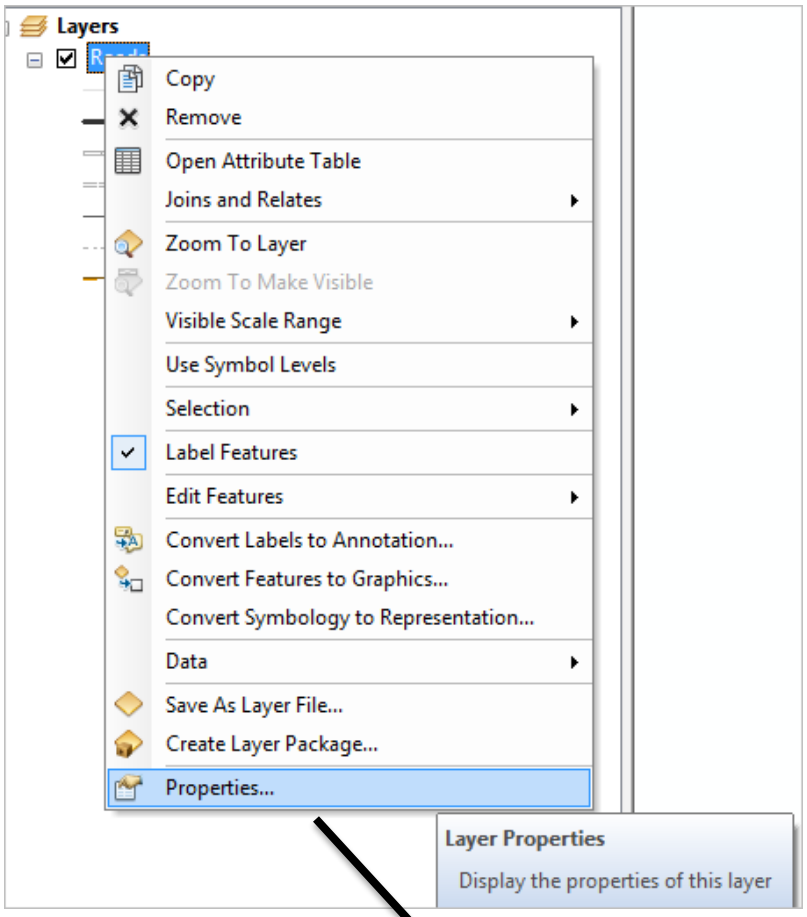
Single click on **Roads,**

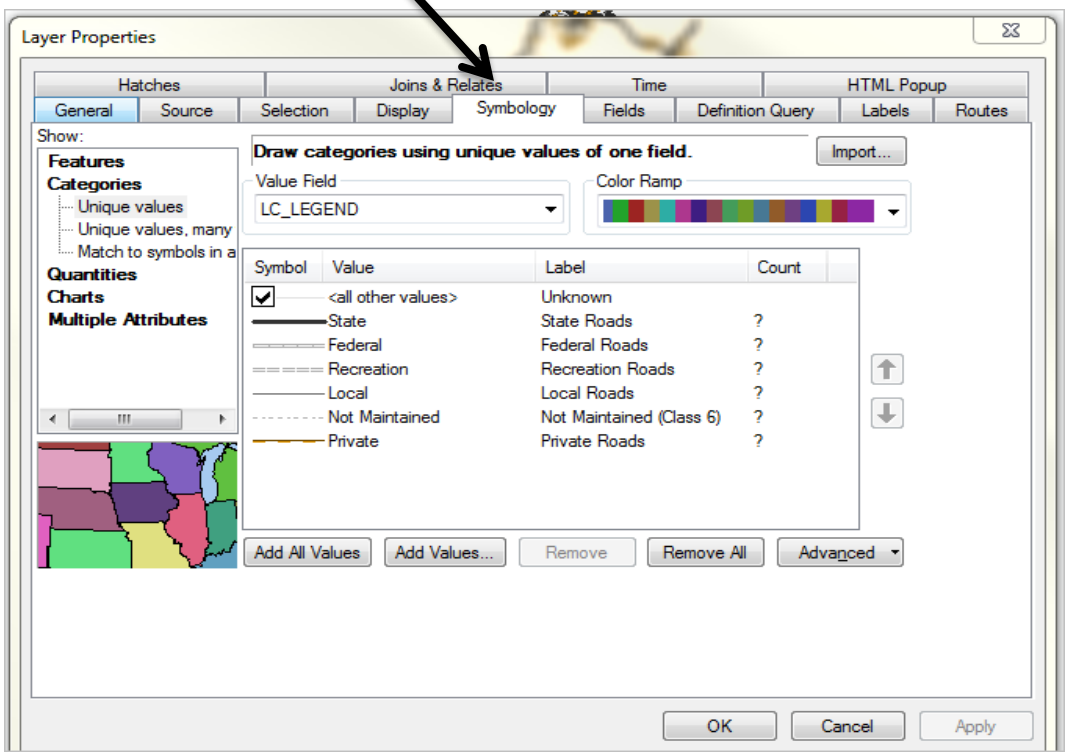
then right click to get to **Properties.**

See next page…

This is the Table of Contents icon. When you click this, the Table of Contents appears on left.

If you right click the Roads Layer, then Properties…you can see Symbology tab.

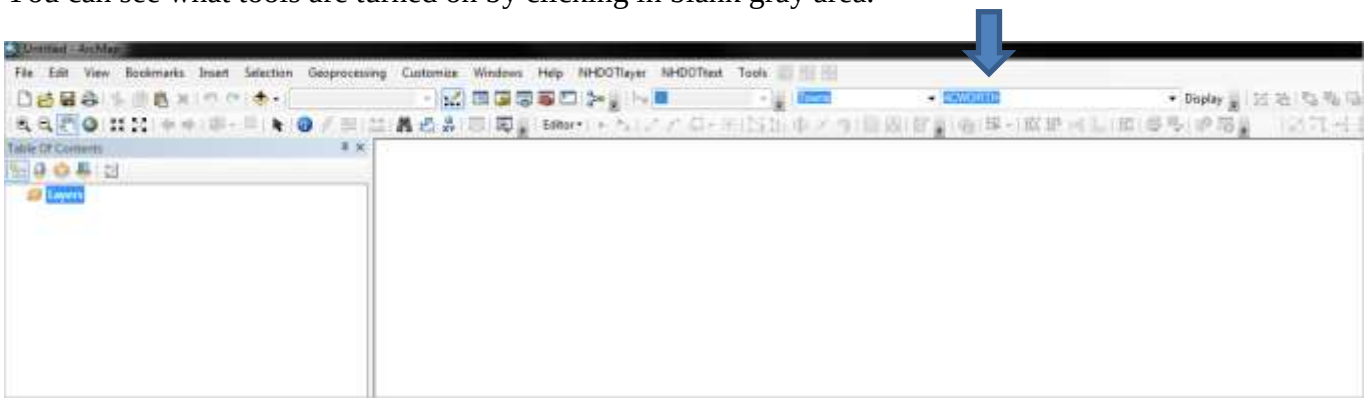


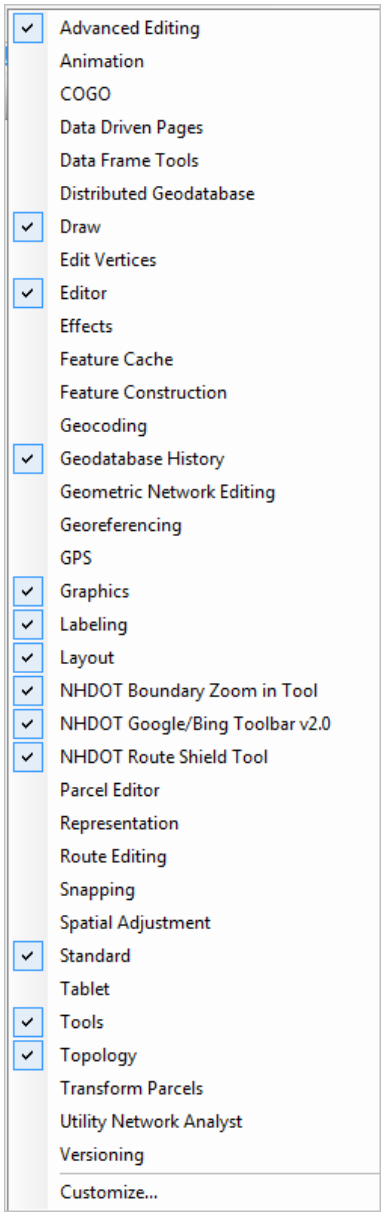


From the Symbology box, we can see that symbols are setup by the attribute

LC_LEGEND

You can see what tools are turned on by clicking in blank gray area.





You can turn on tools by clicking on function.

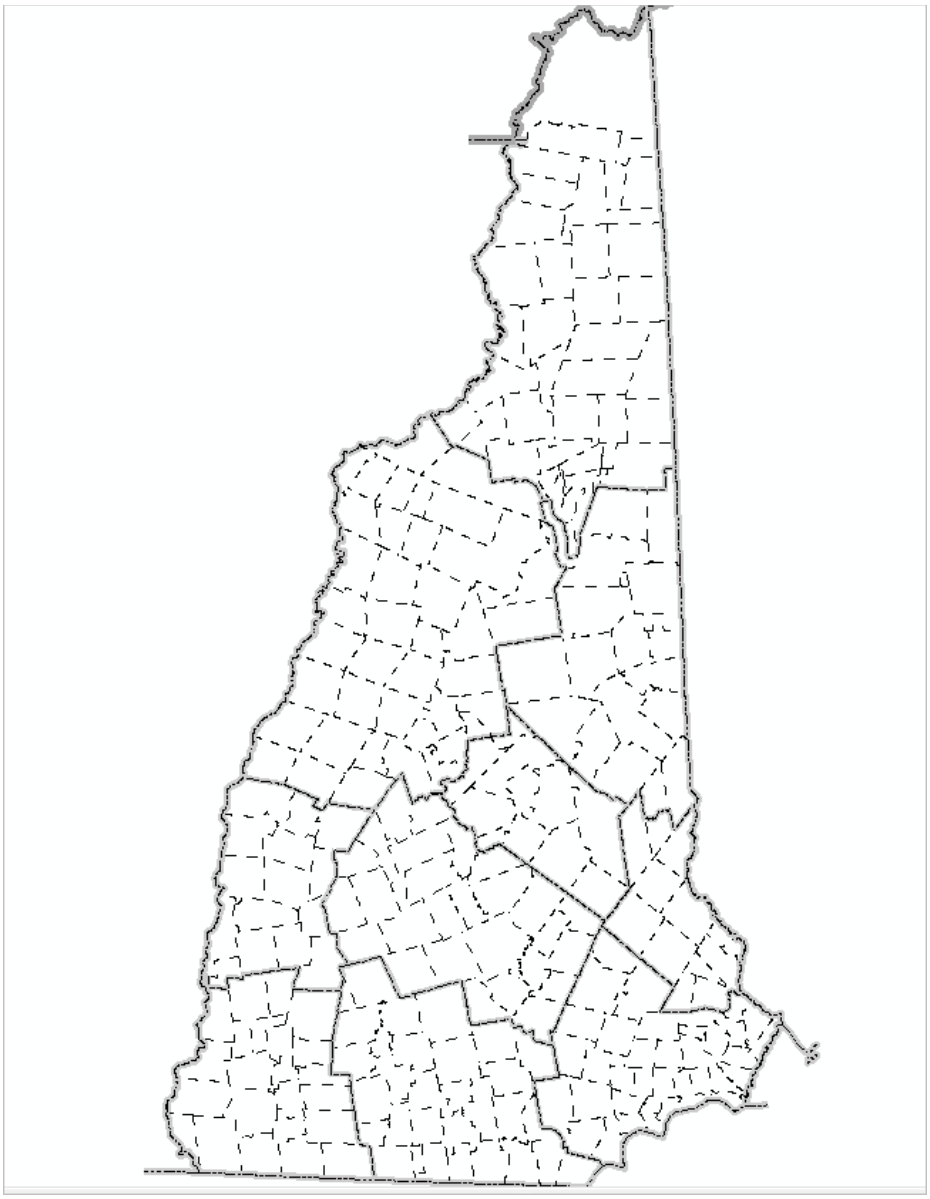
Tool is turned ON when you see a check mark.

Try adding and removing tools to see how your screen changes.

This is the NHDOT Boundary Zoom in Tool

With a blank .MXD, by clicking the Display button

You will see the State boundaries

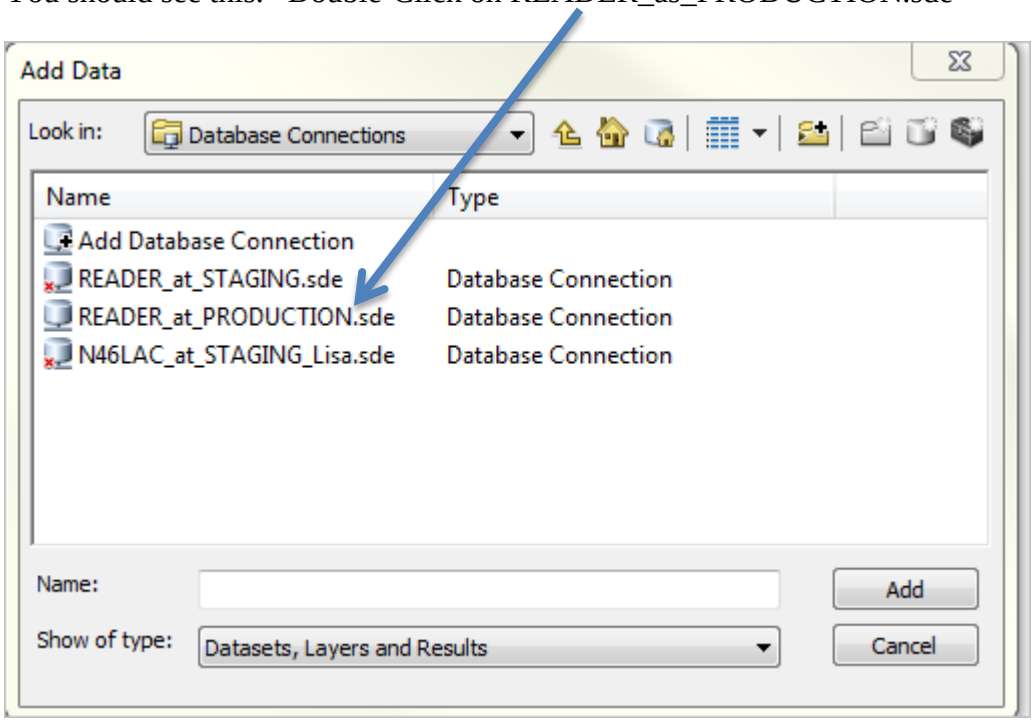


You can see different boundaries in this dropdown, including Towns, Counties, Troops (State), RPC (Regional Planning Commissions) and Districts (Highway).

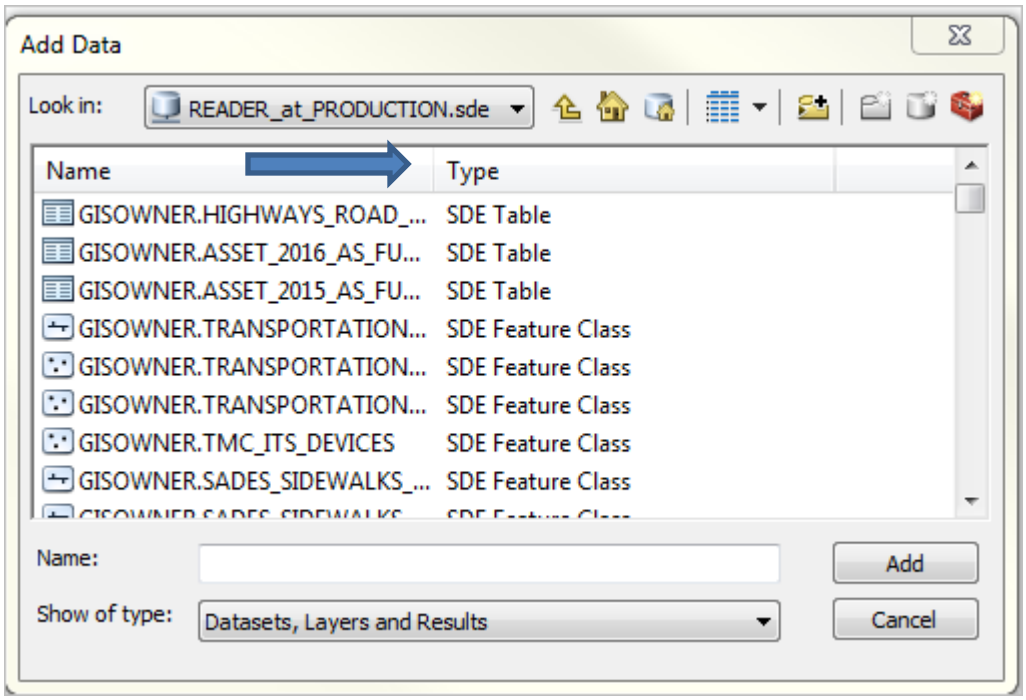
You can add multiple layers to an MXD.

To see other layers to add, click on the Add Data button.

You should see this. Double-Click on READER_as_PRODUCTION.sde



You should now see this. Slide line before 'Type" to expand Name column.



To save your .MXD,

Click on File,

Save As …

then navigate to where you would like to save file.

SECTION V Appendices

Appendix A: New Hampshire Town Codes

The following table contains the NHDOT town codes and their associated town names. More information on these town codes can be obtained by contacting the GIS Section at the NHDOT Bureau of Planning.

Code	Town Name	Code	Town Name	Code	Town Name
1	ACWORTH	71	CANDIA	141	EFFINGHAM
3	ALBANY	73	CANTERBURY	143	ELLSWORTH
5	ALEXANDRIA	75	CARROLL	145	ENFIELD
7	ALLENSTOWN	77	CENTER HARBOR	147	EPPING
9	ALSTEAD	79	CHANDLERS PURCHASE	149	EPSOM
11	ALTON	81	CHARLESTOWN	151	ERROL
13	AMHERST	83	CHATHAM	153	EXETER
15	ANDOVER	85	CHESTER	155	FARMINGTON
17	ANTRIM	87	CHESTERFIELD	157	FITZWILLIAM
19	ASHLAND	89	CHICHESTER	159	FRANCESTOWN
21	ATKINSON	91	CLAREMONT	161	FRANCONIA
23	AUBURN	93	CLARKSVILLE	163	FRANKLIN
25	BARNSTEAD	95	COLEBROOK	165	FREEDOM
27	BARRINGTON	97	COLUMBIA	167	FREMONT
29	BARTLETT	99	CONCORD	169	GILFORD
31	BATH	101	CONWAY	171	GILMANTON
33	BEANS GRANT	103	CORNISH	173	GILSUM
35	BEANS PURCHASE	105	CRAWFORDS PURCHASE	175	GOFFSTOWN
37	BEDFORD	107	CROYDON	177	GORHAM
39	BELMONT	109	DALTON	179	GOSHEN
41	BENNINGTON	111	DANBURY	181	GRAFTON
43	BENTON	113	DANVILLE	183	GRANTHAM
45	BERLIN	115	DEERFIELD	185	GREENFIELD
47	BETHLEHEM	117	DEERING	187	GREENLAND
49	BOSCAWEN	119	DERRY	189	GREENS GRANT
51	BOW	121	DIXVILLE	191	GREENVILLE
53	BRADFORD	123	DORCHESTER	193	GROTON
55	BRENTWOOD	125	DOVER	195	HAMPSTEAD
57	BRIDGEWATER	127	DUBLIN	197	HAMPTON
59	BRISTOL	129	DUMMER	199	HAMPTON FALLS
61	BROOKFIELD	131	DUNBARTON	201	HANCOCK
63	BROOKLINE	133	DURHAM	203	HANOVER
65	CAMBRIDGE	135	EAST KINGSTON	205	HARRISVILLE
67	CAMPTON	137	EASTON	207	HARTS LOCATION
69	CANAAN	139	EATON	209	HAVERHILL
211	HEBRON	295	MEREDITH	379	PORTSMOUTH
213	HENNIKER	297	MERRIMACK	381	RANDOLPH
215	HILL	299	MIDDLETON	383	RAYMOND

217	HILLSBOROUGH	301	MILAN	385	RICHMOND
219	HINSDALE	303	MILFORD	387	RINDGE
221	HOLDERNESS	305	MILLSFIELD	389	ROCHESTER
223	HOLLIS	307	MILTON	391	ROLLINSFORD
225	HOOKSETT	309	MONT VERNON	393	ROXBURY
227	HOPKINTON	311	MONROE	395	RUMNEY
229	HUDSON	313	MOULTONBOROUGH	397	RYE
231	JACKSON	315	NASHUA	399	SALEM
233	JAFFREY	317	NELSON	401	SALISBURY
235	JEFFERSON	319	NEW BOSTON	403	SANBORNTON
237	KEENE	321	NEWBURY	405	SANDOWN
239	KENSINGTON	323	NEW CASTLE	407	SANDWICH
241	KILKENNY	325	NEW DURHAM	409	SEABROOK
243	KINGSTON	327	NEWFIELDS	411	SHARON
245	LACONIA	329	NEW HAMPTON	413	SHELBURNE
247	LANCASTER	331	NEWINGTON	415	SOMERSWORTH
249	LANDAFF	333	NEW IPSWICH	417	SOUTH HAMPTON
251	LANGDON	335	NEW LONDON	419	SPRINGFIELD
253	LEBANON	337	NEWMARKET	421	STARK
255	LEE	339	NEWPORT	423	STEWARTSTOWN
257	LEMPSTER	341	NEWTON	425	STODDARD
259	LINCOLN	343	NORTHFIELD	427	STRAFFORD
261	LISBON	345	NORTH HAMPTON	429	STRATFORD
263	LITCHFIELD	347	NORTHUMBERLAND	431	STRATHAM
265	LITTLETON	349	NORTHWOOD	433	SULLIVAN
267	LIVERMORE	351	NOTTINGHAM	435	SUNAPEE
269	LONDONDERRY	353	ORANGE	437	SURRY
271	LOUDON	355	ORFORD	439	SUTTON
273	LOW & BURBANKS GRANT	357	OSSIPEE	441	SWANZEY
275	LYMAN	359	PELHAM	443	TAMWORTH
277	LYME	361	PEMBROKE	445	TEMPLE
279	LYNDEBOROUGH	363	PETERBOROUGH	447	THOMPSON-MESERVES P.
281	MADBURY	365	PIERMONT	449	THORNTON
283	MADISON	367	PINKHAMS GRANT	451	TILTON
285	MANCHESTER	369	PITTSBURG	453	TROY
287	MARLBOROUGH	371	PITTSFIELD	455	TUFTONBORO
289	MARLOW	373	PLAINFIELD	457	UNITY
291	MARTINS LOCATION	375	PLAISTOW	459	WAKEFIELD
293	MASON	377	PLYMOUTH	461	WALPOLE

				State/Country Codes	
463	WARNER	483	WILMOT		
465	WARREN	485	WILTON	600	New Hampshire
467	WASHINGTON	487	WINCHESTER	700	Maine
469	WATERVILLE VALLEY	489	WINDHAM	800	Massachusetts

471	WEARE	491	WINDSOR	900	Vermont
473	WEBSTER	493	WOLFEBORO	950	Canada
475	WENTWORTH	495	WOODSTOCK		
477	WENTWORTHS LOCATION	497	SARGENTS PURCHASE		
479	WESTMORELAND	499	SUGAR HILL		
481	WHITEFIELD				

Appendix B: Street Name Abbreviations

(Ref.: US Postal Service Publication 28, Appendix C and National Emergency Number Association (NEMA))

: USPS Street Name Suffixes and Abbreviations

Suffix	Abbreviation	Suffix	Abbreviation	Suffix	Abbreviation
Alley	ALY	Courts	CTS	Glen	GLN
Annex	ANX	Cove	CV	Glens	GLNS
Arcade	ARC	Coves	CVS	Grove	GRV
Avenue	AVE	Creek	CRK	Groves	GRVS
Bayou	BYU	Crescent	CRES	Harbor	HBR
Beach	BCH	Crest	CRST	Harbors	HBRS
Bend	BND	Crossing	XING	Haven	HVN
Bluff	BLF	Crossroad	XRD	Heights	HGTS
Bluffs	BLFS	Crossroads	XRDS	Highway	HWY
Bottom	BTM	Curve	CURV	Hill	HL
Boulevard	BLVD	Dale	DL	Hills	HLS

Branch	BR	Dam	DM	Hollow	HOLW
Bridge	BRG	Divide	DV	Inlet	INLT
Brook	BRK	Drive	DR	Island	IS
Brooks	BRKS	Drives	DRS	Islands	ISS
Burg	BG	Estate	EST	Isle	ISLE
Burgs	BGS	Estates	ESTS	Junction	JCT
Bypass	BYP	Expressway	EXPY	Junctions	JCTS
Camp	CP	Extension	EXT	Key	KY
Canyon	CYN	Extent ions	EXTS	Keys	KYS
Cape	CPE	Fall	FALL	Knoll	KNL
Causeway	CSWY	Ferry	FRY	Knolls	KNLS
Center	CTR	Field	FLD	Lake	LK
Centers	CTRS	Fields	FLDS	Lakes	LKS
Circle	CIR	Flat	FLT	Land	LAND
Circles	CIRS	Flats	FLTS	Landing	LNDG
Cliff	CLF	Ford	FRD	Lane	LN
Cliffs	CLFS	Fords	FRDS	Light	LGT
Club	CLB	Forest	FRST	Lights	LGTS
Common	CMN	Forge	FRG	Loaf	LF
Commons	CMNS	Forges	FRGS	Locks	LCK
Corner	COR	Fork	FRK	Lodge	LDG
Corners	CORS	Forks	FRKS	Prairie	PR
Course	CRSE	Fort	FT	Radial	RADL
Court	CT	Freeway	FWY	Ramp	RAMP
Garden	GDN	Loop	LOOP	Ranch	RNCH
Gardens	GDNS	Mall	MALL	Rapid	RPD
Gateway	GTWY	Manor	MNR	Rapids	RPDS

Rest	RST	Passage	PSGE	Village	VLG
Ridge	RDG	Path	PATH	Shoal	SHL
Ridges	RDGS	Pike	PIKE	Shore	SHR
River	RIV	Pine	PNE	Shores	SHRS
Road	RD	Pines	PNES	Skyway	SKWY
Roads	RDS	Place	PL	Spring	SPG
Route	RTE	Plain	PLN	Spur	SPUR
Row	ROW	Plains	PLNS	Spurs	SPUR
Rue	RUE	Plaza	PLZ	Square	SQ
Run	RUN	Point	PT	Squares	SQS
Manors	MNRS	Points	PTS	Station	STA
Meadow	MDW	Port	PRT	Stravenue	STRA
Meadows	MDWS	Ports	PRTS	Stream	STRM
Mews	MEWS	Trace	TRCE	Street	ST
Mill	ML	Track	TRAK	Streets	STS
Mills	MLS	Traffic way	TRFY	Summit	SMT
Mission	MSN	Trail	TRL	Terrace	TER
Motorway	MTWY	Trailer	TRLR	Throughway	TRWY
Mount	MT	Tunnel	TUNL	Villages	VLGS
Mountain	MTN	Turnpike	TPKE	Ville	VL

Mountains	MTNS	Underpass	UPAS	Vista	VIS
Neck	NCK	Union	UN	Walk	WALK
Orchard	ORCH	Unions	UNS	Walks	WALK
Oval	OVAL	Valley	VLY	Wall	WALL
Overpass	OPAS	Valleys	VLYS	Way	WAY
Park	PARK	Viaduct	VIA	Ways	WAYS
Parkway	PKWY	View	VW	Well	WL
Parkways	PKWYS	Views	VWS	Wells	WLS
Pass	PASS				

Appendix C: Slip Ramp Identification Guide

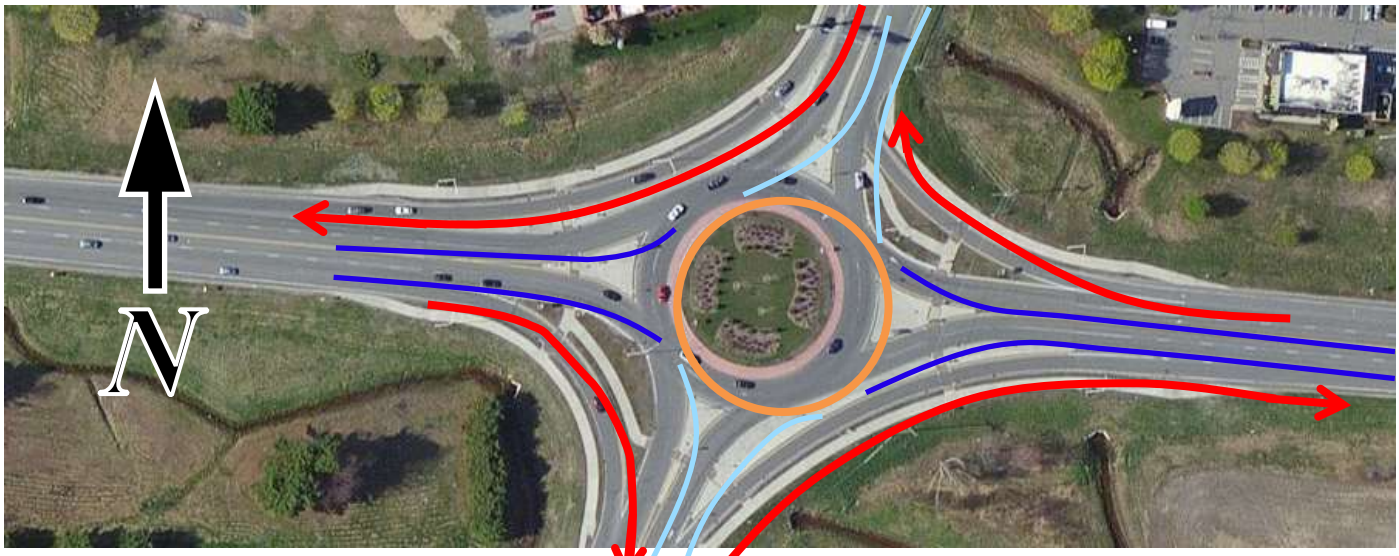
Slip ramps are a subset of ramps designed to ease congestion by providing smoother transitions between main roadways (generally part of the state and federal highway systems) in situations that do not require traditional intersections. Slip ramps always diverge from a primary ramp or roadway. The key difference between primary and slip ramps is that primary ramps can be accessed from either direction, even if the access path crosses opposing traffic; slip ramps are one-way, single-lane connectors to other roadways, and can only be accessed by diverging from another roadway in the same direction of travel. Slip ramps always create an island with their primary ramp.

Ramp and slip ramp entering I-93 southbound from NH 132 in Northfield (Exit 19). The slip ramp (marked in red) can only be accessed while traveling south on NH 132; the primary ramp (marked in green) can be accessed from either direction. The slip ramp terminates when it meets the primary ramp. Note the island created between the primary ramp, the slip ramp, and the diverging route (NH 132).

Ramp and slip ramp entering NH 155A from US 4 in Durham, and ramp entering US 4 from NH 155A. The slip ramp (marked in red) diverges from the primary off-ramp, and can only access the eastbound lane of NH 155A. The primary off-ramp (marked in green) can access either direction. Since the on-ramp can be accessed by traffic from either direction on NH 155A, it is classified as a primary ramp, not a slip ramp.

What is NOT a slip ramp?

Only the slip ramps of major highway routes (Turnpikes, Interstates, US Routes, and State Routes) will be classified. Interior portions of traffic circles, which are accessed by multiple entry points, will not be classified as slip ramps. Any ramp that does not divide will not be classified as a slip ramp, regardless of the directionality of access or egress.



Keene Traffic Circle (shown in orange), at the intersection of NH 101 (**shown in dark blue**) and Winchester St (**shown in light blue**). **The only slip ramps are highlighted in red.** Each can only be entered from one direction, can only exit in one direction, and connects two different roadways. The circle can be accessed from either route in either direction, and can also be exited onto either route in either or their respective directions. None of the sections pictured are classified as a primary ramp.

Interchange between NH 16 (shown in dark blue) and NH 9 (**shown in light blue**) in Dover. Each ramp (**shown in green**) is not a slip ramp. Despite single directions of access and egress, none of the ramps divide, and are therefore classified as primary ramps rather than as slip ramps, as one might have expected.

Appendix D: Mileage Calculations and Specifications

The following are descriptions and specifications for the calculation of various mileages frequently reported by the GIS Section. Each mileage type differs slightly from the others in its purpose and calculation. Some mileage types are based on another mileage type, and every effort has been made to list the types in order of precedence.

Centerline (Barrel) Miles

Description: Length of centerline of bi-directional highways and **both** barrels of divided highways.

Extents: Primary SRI Routes (ramps and slip ramps only as necessary)

Typical Uses: Lane Miles, Equivalent Lane Miles, Salt Lane Miles, Maintenance Lane Miles Equivalent, Winter Lane Miles Equivalent, Dirt Lane Miles, Maintenance Lane Miles.

Lane Miles

Description: Centerline (Barrel) miles multiplied by number of lanes.

Extents: Primary SRI Routes only (no ramps or slip ramps)

Typical Uses: Traffic volume analysis and modeling, Plow Miles

Equivalent Lane Miles

Description: Centerline (Barrel) miles multiplied by paved surface width, divided by 12 feet.

Extents: Primary SRI Routes only (no ramps or slip ramps)

Typical Uses: Summer Maintenance

Salt Lane Miles

Description: Centerline (Barrel) miles plus ramps and slip ramps, multiplied by number of lanes

Extents: Primary SRI Routes, ramps, and slip ramps

Typical Uses: Salting and deicing estimate calculations.

Maintenance Lane Miles Equivalent

Description: Centerline (Barrel) miles plus ramps, multiplied by paved surface width (width of travel way and shoulder widths), divided by 12 feet.

Extents: Primary SRI Routes and ramps

Typical Uses: Summer maintenance estimate calculations

Winter Lane Miles Equivalent

Description: Centerline (Barrel) miles plus ramps and slip ramps, multiplied by paved surface width (width of travel way and shoulder widths), divided by 12 feet.

Extents: Primary SRI Routes, ramps, and slip ramps

Typical Uses: Winter maintenance estimate calculations

Dirt Lane Miles

Description: Centerline miles multiplied by two (2). (Assumes two lanes per unpaved road)

Extents: Primary SRI Routes of **UNPAVED** roads, only.

Typical Uses: Unpaved Roadway estimate calculations

Maintenance Lane Miles

Description: Centerline (Barrel) miles plus ramps and slip ramps, multiplied by number of lanes.

Extents: Primary SRI Routes, ramps, and slip ramps

Typical Uses: Assorted maintenance estimation calculations

A note on concurrent routes:

Concurrent routes: Hi-Order routes with the lowest route number are reported.

a. Hi-Order Route ranking - Turnpike, Interstate, US, State Numbered Routes, State Non-Numbered Routes, Local, Private, and Federal.
b. Ramps are not considered part of routes. Hi-Order routes do not run concurrently with ramps or slip ramps.

See how Fact & Figures Mileage methods, page 93

Appendix E: Excerpts from New Hampshire RSAs (Revised Statues Annotated)

TITLE XX
TRANSPORTATION

CHAPTER 229
HIGHWAY SYSTEM IN THE STATE

Section 229:1

229:1 Highways Defined. – Highways are only such as are laid out in the mode prescribed therefor by statute, or roads which have been constructed for public travel over land which has been conveyed to a city or town or to the state by deed of a fee or easement interest, or roads which have been dedicated to the public use and accepted by the city or town in which such roads are located, or roads which have been used as such for public travel, other than travel to and from a toll bridge or ferry, for 20 years prior to January 1, 1968, and shall include the bridges thereon.
Source. RS 53:7. CS 57:7. GS 68:8. GL 74:8. PS 67:1. PL 74:1. RL 90:1. 1943, 57:1. 1945, 188:1, part 1:1. RSA 230:1. 1967, 283:1. 1981, 87:1, eff. April 20, 1981.

Section 229:2

229:2 Primary Highway System. – There shall be a system of highways known as the "Primary State Highways System'' which shall consist of all existing or proposed highways designated on a map entitled "Primary State Highway System, 1945,'' prepared by the commissioner and filed in the office of the secretary of state.
Source. 1945, 188:1, part 1:2. RSA 230:2. 1981, 87:1, eff. April 20, 1981.

Section 229:3

229:3 Turnpikes and System of Interstate and Defense Highways. – The turnpikes, as established by RSA 237, and the approved national system of interstate and defense highways, shall be a part of the primary state highway system.
Source. RSA 230:2-a. 1961, 4:1. 1981, 87:1, eff. April 20, 1981.

Section 229:4

229:4 Secondary System. – There shall be a system of highways known as the "Secondary State Highway System'' which shall consist of all existing or proposed highways designated on a map entitled "Secondary State Highway System, 1945,'' prepared by the commissioner and filed in the office of the secretary of state.
Source. 1945, 188:1, part 1:3. RSA 230:3. 1981, 87:1, eff. April 20, 1981.

Section 229:5

229:5 Classification. – Highways of the state shall be divided into 7 classes as follows:

I Class I highways shall consist of all existing or proposed highways on the primary state highway system, excepting all portions of such highways within the compact sections of the cities and towns listed in RSA 229:5, V, provided that the portions of the turnpikes and the national system of interstate and defense highways within the compact sections of these cities and towns shall be class I highways.

II Class II highways shall consist of all existing or proposed highways on the secondary state highway system, excepting all portions of such highways within the compact sections of the cities and towns listed in RSA 229:5 V.

III Class III highways shall consist of all recreational roads leading to, and within, state reservations designated by the legislature.

IV Class IV highways shall consist of all highways within the compact sections of cities and towns listed in RSA 229:5, V. The compact section of any such city or town shall be the territory within such city or town where the frontage on any highway, in the opinion of the commissioner of transportation, is mainly occupied by dwellings or buildings in which people live or business is conducted, throughout the year and not for a season only. Whenever the commissioner reclassifies a section of a class I or class II highway as a class IV highway, the commissioner shall prepare a statement of rehabilitation work which shall be performed by the state in connection with the turn back. No highway reclassification from class I or II to class IV shall take effect until all rehabilitation needed to return the highway surface to reputable condition has been completed by the state. Rehabilitation shall be completed during the calendar year preceding the effective date of the reclassification. A copy of the commissioner's statement of work to be performed by the state shall be attached to the notification of reclassification to class IV, and receipt of said statement shall be acknowledged, in writing, by the selectmen of the town, or the mayor of the city, affected by the reclassification. The commissioner of transportation may establish compact sections in the following cities and towns:
Amherst, Bedford, Berlin, Claremont, Concord, Derry, Dover, Durham, Exeter, Franklin, Goffstown, Hampton, Hanover, Hudson, Keene, Laconia, Lebanon, Londonderry, Manchester, Merrimack, Milford, Nashua, Pelham, Portsmouth, Rochester, Salem, Somersworth.

V Class V highways shall consist of all other traveled highways, which the town has the duty to maintain regularly, and shall be known as town roads. Any public highway which at one time lapsed to Class VI status due to 5-years' non-maintenance, as set forth in RSA 229:5, VII, but which subsequently has been regularly maintained and repaired by the town on more than a seasonal basis and in suitable condition for year-round travel thereon for at least 5 successive years without being declared an emergency lane pursuant to RSA 231:59-a, shall be deemed a Class V highway.

VI Class VI highways shall consist of all other existing public ways, and shall include all highways discontinued as open highways and made subject to gates and bars, except as provided in paragraph III-a, and all highways which have not been maintained and repaired by the town in suitable condition for travel thereon for 5 successive years or more except as restricted by RSA 231:3, II.
Federal Highways

Source. 1925, 110:1. PL 83:22. RL 99:24. 1943, 123:1. 1945, 188:1, part 1:4. 1951, 30:1. RSA 230:4. 1955, 333:2. 1957, 181:1, 2, 3. 1961, 4:2. 1973, 418:1-3. 1975, 249:1-3. 1979, 216:1. 1981, 87:1; 443:1. 1983, 131:1. 1985, 235:1-4; 402:6, I (b) (1). 1992, 265:8-10. 1995, 77:1. 1999, 109:1. 2000, 24:1, eff. May 28, 2000.

CHAPTER 231
CITIES, TOWNS AND VILLAGE DISTRICT HIGHWAYS

Repair of Highways by Towns

Section 231:79

231:79 Highways to Summer Cottages; Exemption. – Towns shall be exempt from keeping open and repairing highways to summer cottages from December 10 to April 10.

Source. 1893, 4:1. PL 80:34. RL 96:34. 1945, 188:1, part 16:23. RSA 245:24. 1981, 87:1, eff. April 20, 1

APPENDIX F: Process to prepare FACTS & FIGURES Report

This document serves as a template to recreate mileages for the Facts & Figures report that is published annually by the NH Department of Transportation: Bureau of Planning | GIS Section. New reports can be run after the Annual Snapshot is completed, usually in January, with a format of N46USER.ASSET_YYYY_ROADS.

Numbers reported are: **Tiers** (Summary and Breakdown), **Bridge numbers and conditions** reported by the Bureau of Bridge Design in April, **Turnpike mileage breakdown**, **Legislative Class**, **NHS**, and Centerline and Lanes miles by **District and Turnpikes for Ownership, Summer and Winter Maintenance**.

Scripts will be provided for each section with direction for updates to the annual Facts and Figures.
As new snapshots are taken, the scripts just need to be updated to reflect the current data source.

Submitted by Lisa Chamberlain, GIS Analyst

January, 2016

NOTE *** - New Facts and Figures report proposed for AMPS with
GIS Pilot project in February 2016. – Facts & Figures: Roads and Highways (no bridge data included)

See files in N:\GIS\Data Governance Docs\2016 Facts & Figures Scripts

---

1. Tier Mileages File: Tiers Summary

```
SELECT '1' AS "No.",
       'Tier 1-Interstates, Turnpikes & Divided Hwys' as  Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 1
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '2' AS "No.",
       'Tier 2 - Other Statewide Corridors' as Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 2
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '3' AS "No.",
       'Tier 3 - Regional Transportation Corridors' as  Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 3
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '4' AS "No.",
       'Tier 4 - Local_Connectors' as Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 4
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '5' AS "No.",
       'Tier 5 - Local Roads' as Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 5
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '6' AS "No.",
       'Tier 6 - Off Network Roads' as  Tier_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE tier = 6
```

```
        UNION
SELECT '7' AS "No.",
        'Tier 0 - Private Roads' as Tier_Mileage_Type_2016,
        ROUND(SUM(sect_length),3) as CLine_Miles
        FROM n46user.asset_2016_roads
        WHERE tier = 0
        AND   SUBSTR(sri,1,1) NOT IN ('M','Z'
```

No.	TIER_MILEAGE_TYPE_2016	CLINE_MILES
1	Tier 1-Interstates, Turnpikes & Divided Highways	839.544
2	Tier 2 - Other Statewide Corridors	1424.388
3	Tier 3 - Regional Transportation Corridors	1438.538
4	Tier 4 - Local_Connectors	893.119
5	Tier 5 - Local Roads	12001.017
6	Tier 6 - Off Network Roads	20.593
7	Tier 0 - Private Roads	5518.657

No.	TIER_MILEAGE_TYPE_2016	CLINE_MILES	Rounded	
1	Tier 1-Interstates, Turnpikes & Divided Highways	839.544	840	840
2	Tier 2 - Other Statewide Corridors	1424.388	1,424	1,424
3	Tier 3 - Regional Transportation Corridors	1438.538	1,439	1,439
4	Tier 4 - Local_Connectors	893.119	893	893
5	Tier 5 - Local Roads	12001.017	12,001	4,596
6	Tier 6 - Off Network Roads	20.593	21	
7	Tier 0 - Private Roads	5518.657	5,519	

	Highway Tiers			Centerline Miles
Public Roads System	Statewide Corridors	Divided Highway System	(Tier 1)	840
		Arterial Roadway System	(Tier 2)	1424
	Regional Corridors and Local connectors	Regional Corridors	(Tier 3)	1439
		Local Connectors	(Tier 4)	893
			Sub Total	4,596
	Local Roads	Local Roads	(Tier 5)	12,001
			Total	16,597

2. Tiers Breakdown - File: Tiers Detail

Tiers mileages are broken down by the various Districts and Turnpikes.

```
SELECT ownership_descr,ownership as Patrol_Shed, tier,
       decode (tier,
       '1','Interstates, Turnpikes and Divided Hwys',
       '2','Other Statewide Corridors',
       '3','Regional Transportation Corridors',
       '4','Local_Connectors',
       '5','Local_Roads')

       as Tier_Description,

SUM(sect_length)       as CenterLine_Miles,
SUM(sect_length*num_lanes)    as Lane_Miles

FROM  n46user.asset_2016_roads c
WHERE substr(c.sri,1,1) not in ('M','Z')

GROUP BY ownership_descr,ownership,tier
ORDER BY ownership_descr,ownership,tier
```

Export results to Excel and create a pivot table, using the following format.

Sum of CENTERLINE_MILES	Column Labels						
Row Labels	**0**	**1**	**2**	**3**	**4**	**5**	**Grand Total**
DISTRICT 1		78.968	310.844	173.514	187.434		750.76
DISTRICT 2		73.808	226.067	252.173	161.358		713.406
DISTRICT 3		106.138	246.202	267.774	196.938		817.052
DISTRICT 4			198.342	293.822	129.226		621.39
DISTRICT 5	0.461	279.523	246.272	191.839	120.911		839.006
DISTRICT 6		48.501	180.107	259.073	86.403		574.084
DRED					5.19		5.19
FEDERAL	149.948						149.948
Mass	0.153						0.153
PRIVATE	1641.541						1641.541
TOWN	1537.244		0.449	0.457	3.941	11986.924	13529.015
TURNPIKES	0.046	252.527	16.423	1.265	1.438	0.726	272.425
UNASSIGNED	5.364						5.364
(blank)	2174.532					0.212	2174.744
Grand Total	**5509.289**	**839.465**	**1424.706**	**1439.917**	**892.839**	**11987.862**	**22094.078**

		Centerline Miles					
	Public Authority	**Tier 1**	**Tier2**	**Tier3**	**Tier4**	**Tier5**	**Subtotals**
STATE	Districts 1	79	311	174	187		751
	Districts 2	74	226	251	162		712
	Districts 3	106	246	268	197		817
	Districts 4	0	198	294	129		622
	Districts 5	281	246	192	121		840
	Districts 6	49	180	259	86		574
	Turnpikes	252*	16	1	1	1**	271
	DRED				5		5
	Town				4		4
	Subtotal	840	1,424	1,439	893		**4,596**
TOWN	Towns	Local Roads				12,001	**12,001**
		Total NH Public Roads					**16,597**
		*Includes Turnpike ramps ** Hilton Park road in Dover					

4. Turnpike Miles File: Turnpikes Summary by Type

```
-- Turnpike Miles for Facts & Figures
-- Finds FEET = FE Evererett, 00SP=Spaulding, START=Bluestar

SELECT   substr(c.sri,5,4) AS Turnpike_,
         ROUND(SUM(c.sect_length),3) as Turnpike_Miles

FROM     n46user.asset_2016_roads c
WHERE    substr(c.sri,1,1) in 'T'

GROUP BY substr(c.sri,5,4)
```

Results are rounded

	TURNPIKE_	TURNPIKE_MILES
1	FEET	78.837
2	00SP	56.024
3	STAR	32.383

Round numbers and add to this table on 2nd page

Turnpike

The New Hampshire Turnpike System consists of 167 miles of limited access highway, 71 miles of which are part of the Interstate Highway System. The State's turnpike system is comprised of three limited-access highways: the Blue Star Turnpike (I-95) and the Spaulding Turnpike, which are collectively referred to as the Eastern Turnpike, and the F.E. Everett Turnpike, also known as the Central Turnpike.

System	Turnpike System	Centerline Miles
	Blue Star (I-95)	32
	F.E. Everett	79
	Spaulding	56
	Total	**167**

5. LEGISLATIVE CLASS File: Legis Class Summary

```
SELECT '1' AS "No.",
       'Class I  -  State Primary Roads' as  Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'I'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '2' AS "No.",
       'Class II  -  State Secondary Roads' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'II'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '3' AS "No.",
       'Class III  - State Recreation Roads' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'III'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '4' AS "No.",
       'Class IV  - Compact Roads (Town)' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'IV'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '5' AS "No.",
       'Class V   - Local Roads' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_Class = 'V'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
UNION
SELECT '6' AS "No.",
       'Class VI  - Local Subject to Bars & Gates' as  Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'VI'
UNION
SELECT '7' AS "No.",
       'Class VII  - Federal Roads' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = 'VII'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')

UNION
SELECT '8' AS "No.",
       'Class 0   -  Private Roads' as Legis_Mileage_Type_2016,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE legis_class = '0'
       AND   SUBSTR(sri,1,1) NOT IN ('M','Z')
```

See results next page…

Round numbers and plug into grid below.

Legislative Classes I-III are in State Highway System to get sub-total.
Then add Classes IV and V to get 2nd sub-total and grand total.

		Legislative Class		Centerline Miles
Public Roads System	**State**	Primary State System	(Class I)	2,344
		Secondary State System	(Class II)	2,204
		Recreational State Roads	(Class III)	48
			Sub Total	**4596**
		Compact Roads	(Class IV)	303
	Town	Town Roads	(Class V)	11,698
			Sub Total	**12,001**
			Total Public Roads	**16,597**

6. NHS Mileage File: NHS using 2016 Snapshot

```
-- 2015 NHS ROUTE MILES BY SRI TYPE for Facts & Figures
-- Change source for appropriate yearly snapshot

SELECT '1' AS "No.",
       'Turnpikes' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in 'T'
UNION
SELECT '2' AS "No.",
       'Interstates' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in 'I'
UNION
SELECT '3' AS "No.",
       'US Routes' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in 'U'
UNION
SELECT '4' AS "No.",
       'State Routes' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in 'S'
UNION
SELECT '5' AS "No.",
       'Other (N Routes) ' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in ('N','L','C')
UNION
SELECT '6' AS "No.",
       'Ramps' as NHS_Mileage_Type,
       ROUND(SUM(sect_length),3) as CLine_Miles
       FROM n46user.asset_2016_roads
       WHERE is_nhs in 'YES'
       AND SUBSTR(sri,1,1) in ('R')
ORDER BY "No."
```

No.	NHS_MILEAGE_TYPE	CLINE_MILES
1	Turnpikes	167.244
2	Interstates	380.786
3	US Routes	210.463
4	State Routes	456.568
5	Other (N Routes)	31.846
6	Ramps	8.272

Route Type	**Centerline Miles**
Turnpikes	167
Interstate	381
US Routes	210
State Numbered Routes	457
Traffic Circles, Non-Numbered State Routes, Local Roads	32
Ramps	8
Total	**1,255**

7. Turnpikes Ownership, Summer and Winter Maintained miles

File: District and Turnpike Summary

```
-- District and Turnpikes Summary for Facts & Figures

SELECT 'District Ownership Miles' as Mileage_Type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.ownership,1,1) in ('1','2','3','4','5','6')
AND    c.legis_class in ('I','II','III')

UNION
SELECT 'District Summer Maintained Miles' as Mileage_Type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.summer_maint,1,1) in ('1','2','3','4','5','6')
AND    c.legis_class in ('I','II','III')

UNION
SELECT 'District Winter Maintained Miles' as Mileage_Type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.winter_maint,1,1) in ('1','2','3','4','5','6')
AND    c.legis_class in ('I','II','III')

UNION
SELECT 'Turnpikes Ownership Miles' as Mileage_type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.ownership,1,1) in ('8')
AND    c.legis_class in ('I','II','III')

UNION
SELECT 'Turnpikes Summer Maintained Miles' as Mileage_type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.summer_maint,1,1) in ('8')
AND    c.legis_class in ('I','II','III')

UNION
SELECT 'Turnpikes Winter Maintained Miles' as Mileage_type,
       round(sum(sect_length),3) as CL_Miles, round(sum(sect_length*num_lanes),3) as Lane_Miles
FROM   n46user.asset_2016_roads c
WHERE  substr(c.winter_maint,1,1) in ('8')
AND    c.legis_class in ('I','II','III')
```

MILEAGE_TYPE	CL_MILES	LANE_MILES
District Ownership Miles	4314.893	8599.460
District Summer Maintained Miles	4315.242	8599.733
District Winter Maintained Miles	3968.623	7917.690
Turnpikes Ownership Miles	271.880	622.087
Turnpikes Summer Maintained Miles	271.531	621.448
Turnpikes Winter Maintained Miles	275.834	624.781

Road Attribute	District		Turnpikes	
	Centerline	Lane	Centerline	Lane
Ownership	4,315	8,599	272	622
Summer Maintained	4,315	8,600	272	621
Winter Maintained	3,969	7,918	276	625

GLOSSARY

Anchor Section – An anchor section is a GIS (see GIS) term for a roadway section. An anchor section may exist only between two nodes. Anchor sections are the building blocks for the linear layers in the GIS system, including Roads and SRI Hi-Order Routes. For more information, see the *Metadata for Anchor Sections* guide, published by NHDOT Bureau of Planning.

Auxiliary lane – An auxiliary lane is defined as the portion of the roadway adjoining the traveled way that is used for purposes supplementary to through traffic, such as parking, speed change, turning, storage for turning, weaving, or truck climbing.

Channeled Intersection – An at-grade intersection in which traffic is directed into definite paths by islands.

Divided Highways – A divided highway is a highway with separated lanes for traffic in opposite directions.

FHWA – Federal Highway Administration. The Federal Highway Administration is a government agency instituted to assist state and local government in design, monitoring, and maintenance of federal-aid highways (including the Eisenhower Interstate System and other US routes)

GIS – Geographic Information System. GIS is a system in which features are created as points, lines, or polygons, and are spatially related in a geodesic coordinate system. Although our reference system is linear, GIS is actually based nodally; without nodes, none of the features in GIS could exist. NHDOT's Geographic Information System is edited and maintained through ESRI's ArcGIS software, and is powered by Oracle databases (see Oracle database).

HPMS – Highway Performance Monitoring System. A system maintained by the Federal Highway Administration (see FHWA) that catalogues data on the "extent, condition, performance, use and operating characteristics of the nation's highways.

Interchange – An interchange is a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels.

Intersection – The general area where two or more highways join or cross. There are three types of intersections: intersections at grade, grade separations without ramps, and interchanges.

Median – The portion of a divided highway separating the traveled way for traffic in opposing direction. A positive barrier normally consists of a guardrail or a concrete "Jersey-type" barrier. A line of closely spaced (large) trees or of thick, impenetrable shrubbery on most of a section might also be considered a positive barrier median. Turning lanes or bays are not considered medians unless a median exists on the major portion of the roadway, and the turning lanes/bays are cut into the median at intersection, entrances

to commercial enterprises, etc.

A continuous turning lane is not to be considered a median. Continuous crosshatching that is at least 4 feet wide may be considered a median, however, if a crosshatched portion of a roadway is used as a turning lane it is considered a turning lane, by law, not a median. A curbed median consists of some kind of stone curbing (generally granite, 4 to 10 inches in height) which separates the roadway surface from a concrete, paved, or earthen "island" in the between the opposing travel ways.

NHDOT – New Hampshire Department of Transportation. The New Hampshire Department of Transportation is the state agency in charge of design, construction, and maintenance of all state- owned, funded, or maintained channels of transportation, including roadway, rail, air, and sea. In order to provide an expurgated system of transportation excellence in the Granite State, NHDOT (with the aid of Regional Planning Commissions (see RPC) and municipalities) also assiduously maintains a data system on all transportation channels in the state that are not state owned or maintained.

Node – A node is the most important feature in the GIS (see GIS) system. Nodes are created at the intersections of roadways in the physical world (either during field survey or through aerial imagery) and other breaks in a survey route such as legislative boundaries or notable roadway features such as bridges. Nodes are connected by anchor sections (see anchor section), not vice versa. Nodes may exist without anchor sections, however, anchor sections cannot exist without nodes to start and end them. Nodes give geometry to all of the shapes and features in GIS. Nodes are never deleted, though they may be retired. In this manner, their spatial locations are affirmed in perpetuity.

Oracle Database – Oracle databases are object-relational database maintenance systems which catalogue and relate data. These databases are maintained through computerized routines designed by NHDOT personnel. Oracle databases can be queried using *Structured Query Language* (SQL) to locate data and relationships.

Ramp – The term "ramp" includes all types, arrangements, and sizes of turning roadways that connect two or more legs at an interchange. The components of a ramp are 1) a terminal at each leg, and 2) a connecting road, usually with some curvature, and on a grade. The term interchange indicates that there are one or more grade separations between the interconnecting roadways. Ramp components are also being referred to as deceleration lane (exit terminal), ramp proper, and acceleration lane (entrance terminal). In some cases due to geometric and physical characteristic of highways the entrance terminal may be very short and followed by either a weaving section or an auxiliary lane.

Roadway – The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

RPC – Regional Planning Commission. An RPC obtains state and federal aid to perform maintenance, monitoring, and construction on a local level.

Shoulders – The portion of the roadway contiguous with traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface course.

Slip ramp – An individual turning roadway that is separated from the normal traveled way by an island at a channelized intersection.

Traffic Lane – The portion of the roadway separated from the other portions by two parallel lines to channel vehicles traveling in the same direction. Lane lines are often painted with reflective paint to increase conspicuity.

Traveled way – The portion of the roadway indented for the movement of vehicles, exclusive of shoulders.

Turning roadway – A connecting roadway that connects two intersection legs for turning traffic

Turnpike – A Turnpike is a roadway that is maintained through the money collected on it through tolls. Turnpikes are not the same as an Interstate Highways or US routes, although they may run concurrently, such as the FE Everett Turnpike and Interstate 93.

Weaving section – A Weaving section is a highway segment where the pattern of traffic entering and leaving at contiguous access points result in crossed vehicle paths.

Closing Remarks / Credits

This manual was originally created between May and December 2012. The current revision was completed in 2016. It is reviewed and edited by NHDOT personnel on a regular basis, in conjunction with the quarterly archive data snapshots. It was created in order to help members of the New Hampshire Department of Transportation, outside contractors, and municipal organizations better understand the processes and standards involved in the Road Inventory process, and to aid in the transition to a more universal road network database.

Resources cited include:

Matthew Baker Road Inventory Manual for NHDOT Contract
Federal Highway Administration's Highway Performance Monitoring System Manual
NHDOT Road Inventory Manual Editions 2003 and 2004
Wikipedia.org
FHWA.gov

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