



This report outlines the 2019 paving program accomplishments and 2019 roadway condition data. The paving program does not account for large capital projects or drag shim maintenance operations. Therefore, the accomplishments and expenditures referenced herein do not include those miles. This report was prepared by the NHDOT Pavement Management Committee and approved by the Work Order Work Group.

ANNUAL REPORT 2019

NHDOT Paving Program and Pavement Condition



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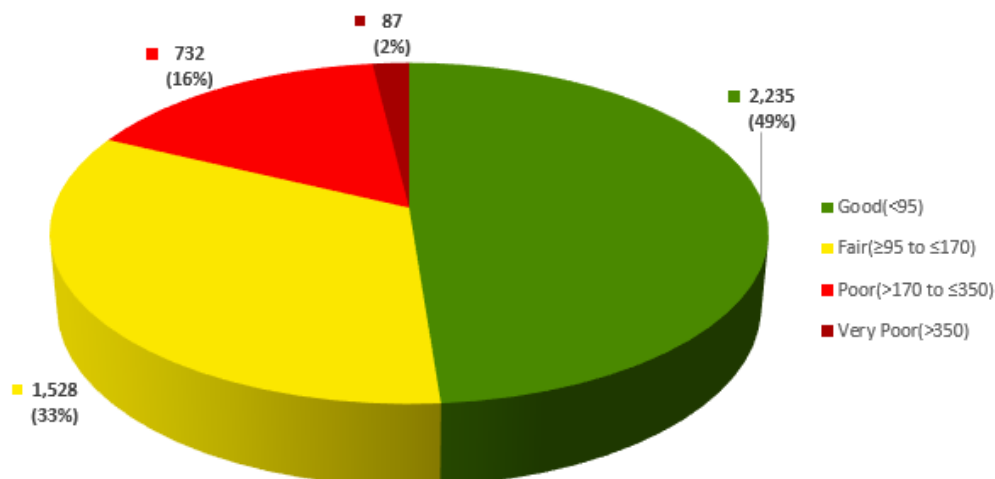
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Executive Summary

The New Hampshire Department of Transportation (NHDOT) is focused on managing the State’s road network as efficiently and effectively as possible. Most roads in New Hampshire are surfaced with asphalt pavements. As such, pavement is one of the largest assets that the NHDOT manages, second only to the State’s bridges.

Roughness is the metric used to determine pavement condition on all roads managed by the NHDOT. Roughness is how the road feels to the motoring public and is measured according to the International Roughness Index (IRI). As a road becomes more rough, the IRI value increases. As such, “Good” roads have low IRI, while “Poor” roads have high IRI. The NHDOT uses an automated data collection vehicle to conduct pavement condition surveys every year on those roads that are federally designated as part of the National Highway System (NHS). Pavement condition surveys are conducted once every two years on all other roadways maintained by the State. Roads are categorized in either “Good” (IRI<95), “Fair” (IRI ≥ 95 to ≤ 170), “Poor” (IRI > 170 to ≤ 350), or “Very Poor” (IRI > 350) condition.

2019 Statewide Pavement Condition



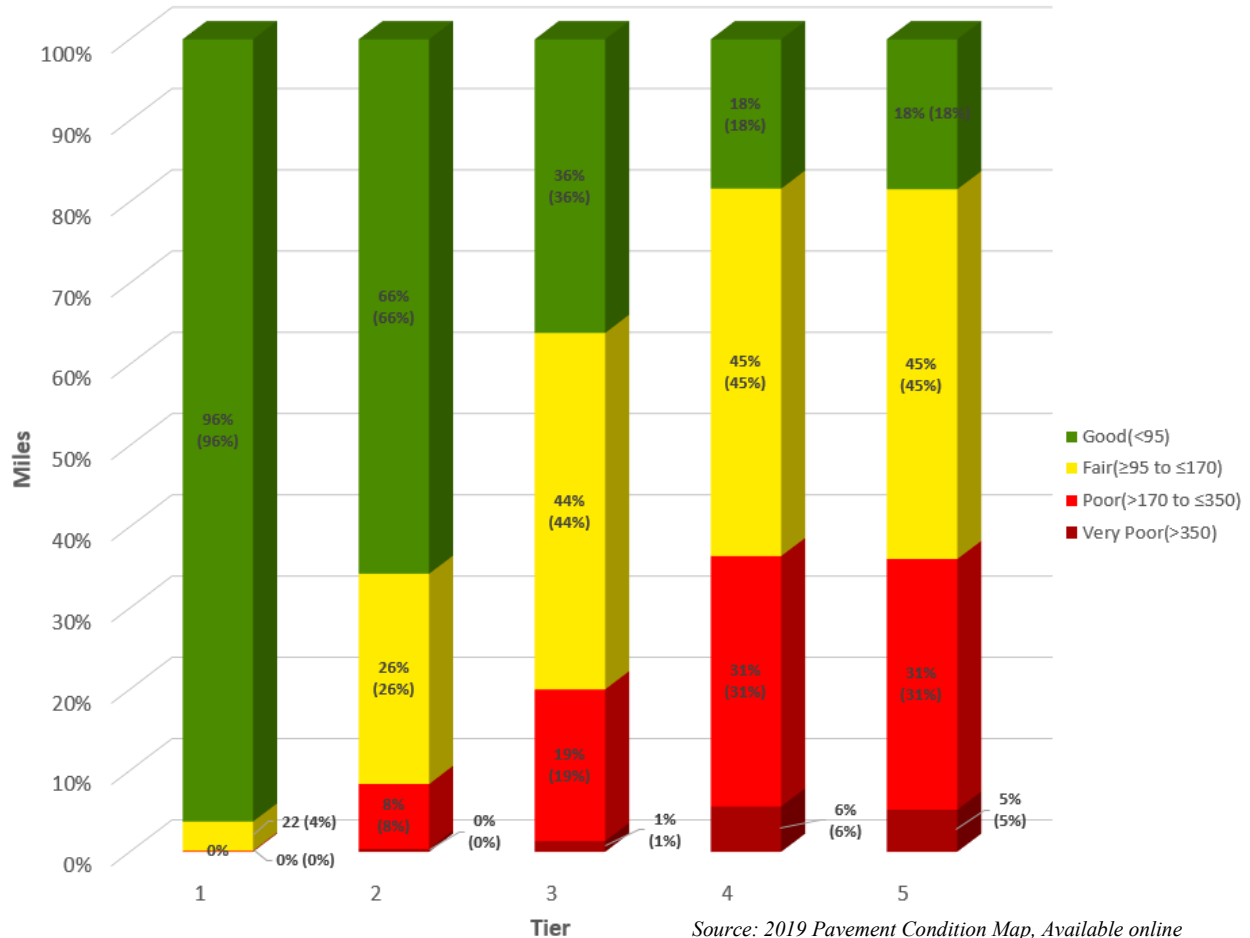
Source: 2019 Pavement Condition Map, available online
 Note: In 2019, 324 miles of the New Hampshire Highway System went unrated. This includes ramps and unpaved gravel roadways. Miles may not sum due to rounding.

The inventory of State maintained roads on file with the NHDOT contains 4,606 centerline miles in 2020. For analysis of pavement condition and performance as well as for maintenance and investment planning, the State maintained roadway miles are grouped and prioritized in “Tiers.” Tiers group the State’s roads based on similarities such as connectivity, regional significance, and winter maintenance requirements. Tier 1 roads consist of interstates, turnpikes, and other divided highways. Tier 2 and Tier 3 roads consist of statewide and regional transportation corridors, respectively. Tier 4 roads are local connectors, secondary highways, and non-numbered routes. The New Hampshire Highway System also includes 299 miles of roads classified pursuant to RSA 229:5 as Compact Highways (Tier 5). These are State owned highways that are maintained by the cities and towns where they reside. The municipality assigns their own maintenance strategy and

TIER 1	845 MILES
TIER 2	1,429 MILES
TIER 3	1,439 MILES
TIER 4	893 MILES
TIER 5	299 MILES
STATEWIDE TOTAL	4,905 MILES

resurfacing schedule to these roads, which may or may not align with the investment schedule adopted by the NHDOT.

2019 Pavement Condition by Tier

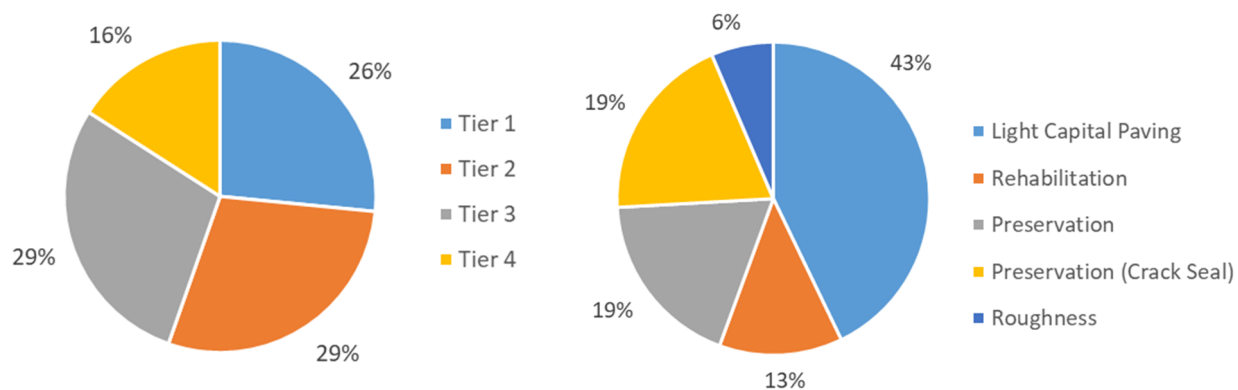


The road network in New Hampshire required a massive investment of public funds over many decades. In order to maximize the useful life of that prior investment, along with current and future investments, the NHDOT has developed strategies for different types of roads. In addition, the NHDOT maintains a rolling three-year plan for the State’s paving investments, which is known as the Three-Year Paving Program. The Preservation Strategy utilizes a variety of low-cost pavement treatments to keep “Good” roads in good working condition for as long as possible. Light Capital Paving Strategy (LCP) is used on roads that are in reasonable condition but are not suitable for preservation. LCP uses low-cost treatments to protect pavement that has developed cracking or other distresses, thus extending the useful life of the pavement. Periodic paving on a 6 to 8-year cycle occurs over the long-term to keep these roads in serviceable condition. The Roughness Paving Strategy was created to address roadways that have deteriorated to Very Poor condition. Very Poor roadways are deemed unacceptable by the NHDOT and the motoring public. This strategy restores the roadway to Fair condition so future LCP strategies can be used to maintain serviceability. The NHDOT’s goal is to eliminate this strategy over time. The Rehabilitation Strategy is employed to restore poor pavements to a like-new condition whereby the Preservation Strategy can be used to keep the roadway in Good condition. These activities are generally moderate-cost and take considerably longer to complete than the other strategies. Therefore, the NHDOT evaluates Rehabilitation candidates

on a case-by-case basis. Finally, Reconstruction Strategy effectively builds a new Good condition road. Reconstruction projects are not part of the annual paving program. These projects are limited to larger capital improvement type projects and are funded separately from the resurfacing program. Reconstruction has a high-cost, and is not a priority strategy because NHDOT is seeking to maximize the effectiveness of limited paving budgets and Reconstruction can be cost prohibitive.

In 2019, the paving program treated approximately 648 miles of roads in New Hampshire. The work was distributed across all six maintenance Districts in the State and also included approximately 21 miles of work along New Hampshire Turnpikes. The work improved the condition of roads in each Tier and utilized the full complement of paving strategies.

2019 Paving Accomplishments



Source: Pavement History Layer

In 2017, the NHDOT established a Task Force which worked to identify performance goals for the various Tiered roadways. Every year, the NHDOT compares the current condition of the roadway network back to these established goals in order to report the state-of-the-system to stakeholders.

Tier Based Condition Goals

	Tier 1	Tier 2	Tier 3	Tier 4
Good/Fair Goal	100%	90%	80%	65%
Good Goal	95%	65%	-	-
Poor Goal	-	10%	20%	35%
Very Poor Goal	-	1%	1%	2%

2019 State-of-the-System

	Tier 1	Tier 2	Tier 3	Tier 4
Good/Fair Goal	100%	92%	80%	63%
Good Goal	96%	66%	-	-
Poor Goal	-	8%	19%	31%
Very Poor Goal	-	0%	1%	6%

Source: Pavement Management System COND_CCR_2020

NHDOT Highway Tiers – Definitions

The New Hampshire Highway System is grouped into Tiers for the purpose of prioritizing investments, dedicating funding sources, and developing performance goals. The various Tiers, defined below, include highways that are designated as part of the National Highway System and those that are not. The Tiers group roads based on similarities, such as connectivity, regional significance, and traffic level.

Tier 1 – Interstates, Turnpikes, and Divided Highways These highways support the highest traffic volumes and speeds in the State. Divided highways convey the majority of commuter, tourist, and freight traffic throughout the State. As such, these are the highest priority roads and achieve the best condition ratings statewide.

Tier 2 – Statewide Corridors Statewide corridors, like US 4, US 202, or NH 16, carry passengers and freight between regions of the State as well as to and from neighboring states. Tier 2 roads can have moderate to high traffic volumes. For the most part, Tier 2 consists of roads that were built with calculated gravel and pavement thickness, surface and subsurface drainage, and appropriate width for the traffic level. There are some Tier 2 roads, however, that have evolved organically over time and are considered “unbuilt.” The built versus unbuilt realization is important because the long term performance varies greatly between the two facilities. Further, the treatment selection and treatment cycle/timing to maintain a built road is often much different than that for an unbuilt road.

Highway Tiers		Centerline Miles
Statewide Corridors	Divided Highway System (Tier 1)	845
	Statewide Corridors (Tier 2)	1,429
Regional Corridors and Local Connectors	Regional Corridors (Tier 3)	1,439
	Local Connectors (Tier 4)	893
Local Roads	Compact Highways (Tier 5)	299
Total - New Hampshire Highway System		4,905

Based on the 2020 HPMS snapshot

Tier 3 – Regional Transportation Corridors Tier 3 highways like NH 112, NH 10, and NH 108 provide travel within regions, access to statewide corridors, and support moderate traffic volumes at moderate speeds. Most of the Tier 3 roads across the State are unbuilt roads. A small minority of the Tier 3 network consists of built roads.

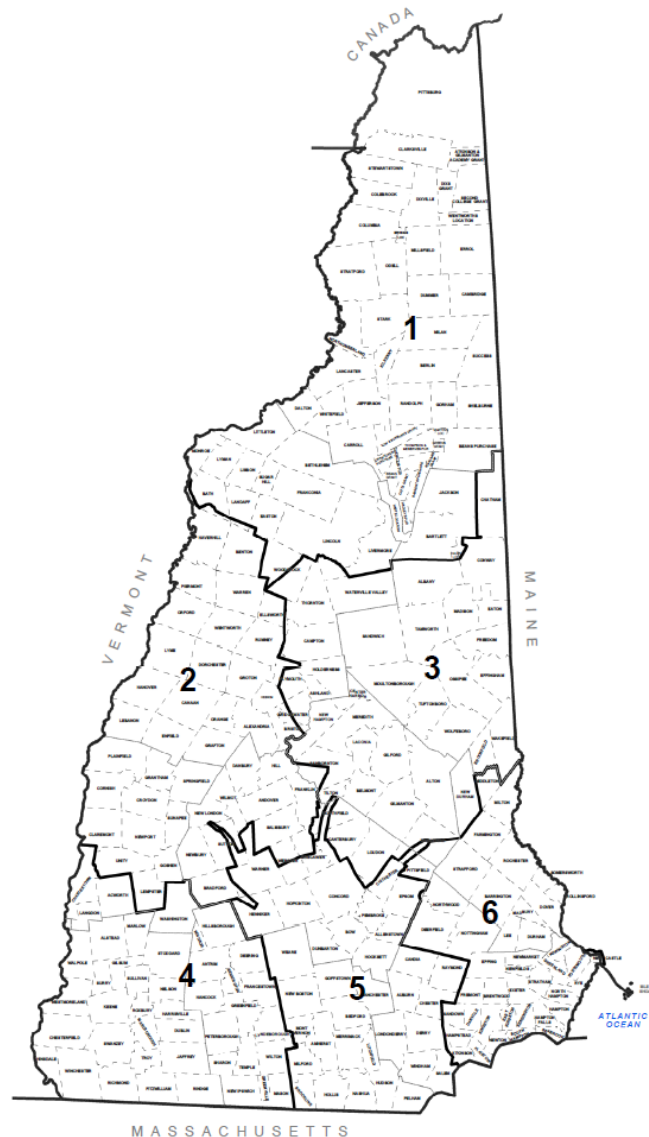
Tier 4 – Local Connectors Tier 4 roads include secondary highways and unnumbered routes like NH 141 and Bean Road in Moultonborough. These are local connectors and they provide travel between and within communities. Tier 4 roads are the worst roads in the State in terms of long term pavement performance. This is because Tier 4 roads are primarily unbuilt, lacking geometry and proper surface and subsurface drainage.

Tier 5 – Local Roads Tier 5 roads are State owned roads within urban compact limits pursuant to RSA 229:5 and provide varying travel functions. Tier 5 roads are owned by the State of New Hampshire, but they are maintained by municipalities. The NHDOT does provide financial assistance to communities for work along these roads. Traffic volumes and speed can vary on local roads.

Roadway Maintenance District Mileage

In order to more efficiently maintain the State's roadways, the State of New Hampshire is divided into six maintenance districts. Each District has its own District office complete with engineering, technical, and clerical staff. These NHDOT employees manage the day-to-day operations within their respective Districts.

District offices provide support to many of the NHDOT's Bureaus at the main office in Concord. This includes support to the Bureau of Materials and Research, Pavement Management Section during the planning and preparation of the Paving Program. District Engineers take direct part in the selection of paving sections. Further, District Engineers participate in the review of those sections in the field, along with engineering staff from the Pavement Management Section, in order to determine the appropriate paving treatment and timing for the section based on existing conditions.



Maintenance Ownership	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5 (Compacts)	Statewide Total	% of Statewide Total
District 1	79	311	173	188		750	15%
District 2	74	227	251	161		712	15%
District 3	106	247	268	195		816	17%
District 4		199	294	129		622	13%
District 5	285	248	192	121		846	17%
District 6	47	181	259	88		575	12%
Municipality		1	0	4	299	304	6%
Turnpikes	254	17	1	1		273	6%
Other (DRED)				6		6	0%
Grand Total	845	1429	1439	893	299	4905	100%

Source: 2020 HPMS Snapshot

Condition Classification

The NHDOT uses a specialized data collection vehicle to collect real time data on our roadway system. The specialized data collection vehicle is operated by two engineering technicians who drive predetermined routes and collect data using the vehicle's laser sensors and cameras. The data collection vehicle collects pavement condition data in a single lane at highway speeds. On divided highways, condition data is collected in both directions. On all other roads, data is collected only in the primary direction. The primary direction is generally south to north and west to east. Road condition information includes ride smoothness (roughness), wheel path rutting, longitudinal and transverse cracking, heading, cross slope, and locational data (GPS). The vehicle also collects right-of-way imagery and downward facing pavement images which are all tied to the GPS location data.



Road condition information is collected over a two-year cycle. Roads that are designated part of the National Highway System (NHS) are collected every year. Non-NHS roads are collected once every two years. Historically, road condition data has been collected by NHDOT staff using Department owned data collection vehicles. Currently, the NHDOT owns two data collection vehicles. The current fleet is operating utilizing significantly out of date technology and have reached the end of useful life. In 2019, the NHDOT undertook an effort to replace both of the existing data collection vehicles with one new vehicle. Further, the decision was made to outsource the network data collection to a data collection vendor. The data collection vendor will replace the function of the vehicle pictured above. The vendor will drive the same mileage traditionally driven by NHDOT staff, and will provide the same condition data to the NHDOT. The new data collection technology transitions from 2D imaging to 3D imaging to measure wheel path rutting and cracking distresses. This transition allows for fully automated crack detection and analysis, which replaces a manual crack rating process in place today. The NHDOT anticipates being able to report yearly pavement condition data to the public much earlier than accustomed due to these automation advancements and other efficiencies.

The NHDOT uses road roughness to describe pavement condition. Roughness is the ride smoothness felt by the motoring public. The metric used to determine road roughness is the International Roughness Index (IRI). IRI increases as roughness increases. A road that is said to be in “Good” condition has a low IRI. Roads that are said to be in “Poor” condition have much higher IRI values. Since IRI is a measurement of how the road feels as it is driven by motorists, it is a very understandable condition metric for reporting. Pavement engineers at the NHDOT, however, use all of the data collected by the vehicle when analyzing individual sections for performance and investment strategies.

Pavement Condition Classification



Good



Fair



Poor



Very Poor

Pavement Strategy Definitions and Priorities

In order to maximize the useful life of prior investments, and in order to maximize the benefits of both current and future investments, a variety of strategies were adopted by the NHDOT for different types of roads.

Preservation Strategy – “Keeping Good roads Good” A variety of low-cost pavement treatments are used to keep roads in good working condition for as long as possible. Preservation treatments extend the useful life of the road, are low-impact, and usually limit construction disruption to only a few weeks. Preservation treatments, however, can only be used on roads that are already in good condition, which makes their use very time sensitive. Generally speaking, preservation treatments are applied to roads 8 to 12 years following the previous surface treatment.

Light Capital Paving Strategy – “Keeping roads in working order” The NHDOT uses Light Capital Paving (LCP) for roads that are in reasonable condition, but are not suitable for Preservation Strategy. This strategy of preventative maintenance uses low-cost treatments to protect the pavement that has developed cracking distresses or other flaws, thus extending the useful life of the pavement. Periodic paving (every 5-7 years on average) will occur over the long-term to keep the road in a reasonable condition because LCP does not completely fix the pavement’s needs.

Roughness Paving Strategy – “Keeping roads functional and acceptable” While the Preservation Strategy and LCP Strategy focus on cyclical paving of Good roads and reasonable pavement, the focus of the Roughness Strategy is solely on very rough roads. When Roughness Strategy is proposed, the road has reached or is about to reach a point where the road is so rough that the public is dissatisfied. The road, at that point, is difficult to maintain in the winter months and safety is becoming a concern. Roughness Strategy restores a minimum standard for State-maintained roads, is low-cost, and construction typically only takes one season. This strategy is a one-time investment. A LCP strategy will maintain the roadway after the initial Roughness Strategy investment.

Rehabilitation Strategy – “Restoring Poor pavements” The result of the Rehabilitation Strategy is a “new” pavement that is suitable for the Preservation Strategy in years to come. Rehabilitation Strategy is not suitable for every road that needs attention and particular site conditions can significantly affect the cost or how long the rehabilitated road will last. These activities are generally moderate-cost and may take several months or multiple seasons to complete. The NHDOT evaluates Rehabilitation Strategy candidates on a case-by-case basis. Like Roughness Strategy, Rehabilitation is a one-time investment strategy.

Reconstruction – “Building a Good road” The road network in New Hampshire has evolved and developed organically over many decades. As a result, many roads do not have constructed foundations with calculated gravel thickness and drainage infrastructure. These roads present a challenge for sustainability because no investment in them, short of reconstruction, will last for very long. Reconstruction Strategy has a high-cost and often can take more than a year to complete. This activity is not a priority of the pavement strategy because NHDOT is seeking to maximize the effectiveness of limited paving budgets and reconstruction can be cost prohibitive.

The table below shows the paving priorities for the NHDOT. These priorities seek to provide the most benefit to the public based on a limited budget. Roadway Tiers and pavement strategies combine when prioritizing roadway needs for the paving program.

Pavement Strategies	Tier 1	Tier 2	Tier 3	Tier 4
Preservation	High	High	High	High
Roughness Paving	-	High	Moderate	Moderate
Light Capital Paving	-	High	Moderate	Moderate
Rehabilitation	High	Moderate	Low	Low
Reconstruction	-	-	-	-

Condition Goals

The Federal government, through the National Highway Performance Program (NHPP), set national performance goals for pavement conditions. This helped facilitate State DOTs to maintain their NHS system in a state of good repair. To support this goal, national minimum standards of performance (Performance Measure Rules) for interstate pavements were established. Specifically, State DOTs may not exceed 5% Poor condition for interstate pavements. Penalties were established for States that do not meet this minimum threshold. NHDOT’s interstate pavement condition data is submitted to the Federal Highway Administration annually through the Highway Performance Management System (HPMS). HPMS guides the NHDOT’s pavement condition data collection and standardizes the data collection nationally.

In 2017, the NHDOT established a Task Force to evaluate the network pavement condition and establish realistic performance goals for all of the State’s paved roadways, including interstate pavements. Condition goals were based on ride smoothness (IRI), rutting, and cracking percent. These are the three metrics that the NHDOT reports to HPMS every April. The metric thresholds used in target setting are those found in the Code of Federal Regulations, with the exception of the Very Poor condition designation for IRI, which was adopted internally at the NHDOT in order to implement the Roughness Strategy with the paving program and eliminate those roads in the worst condition. For the most part, only IRI, Rutting, and Cracking Percent are used. The State of New Hampshire no longer has any exposed concrete roads, so the Faulting metric is no longer applicable in the State. Occasionally, the NHDOT will use PSR to report pavement condition to the FHWA on select sections where data was not collected using a data collection vehicle. Those sections are rare and therefore the PSR metric was not used in target setting. The final condition goals established by the Task Force for the New Hampshire road network were separated by Tier and are summarized below.

Rating	Good	Fair	Poor
IRI <i>(inches/mile)</i>	<95	95-170	>170
PSR* <i>(0.0-5.0 value)</i>	≥4.0	2.0-4.0	≤2.0
Cracking Percent <i>(%)</i>	<5	<i>CRCP: 5-10 Jointed: 5-15 Asphalt: 5-20</i>	<i>>10 >15 >20</i>
Rutting <i>(inches)</i>	<0.20	0.20-0.40	>0.40
Faulting <i>(inches)</i>	<0.10	0.10-0.15	>0.15

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Tier 1 Performance Goals

- 100% minimum Good/Fair condition for IRI
- 95% minimum Good condition for IRI
- 95% minimum Good/Fair condition for rutting
- 95% minimum Good/Fair condition for Cracking Percent

Tier 2 Performance Goals

- 90% minimum Good/Fair condition for IRI
- 65% minimum Good condition for IRI

- 10% maximum Poor condition for IRI
- <1% maximum Very Poor condition for IRI. The target was complete elimination of Very Poor condition by the close of the 2018 construction season.

Tier 3 Performance Goals























- 80% minimum Good/Fair condition for IRI
- 20% maximum Poor condition for IRI
- <1% maximum Very Poor condition for IRI. The target is elimination of Very Poor condition by the close of the 2020 construction season.



Tier 4 Performance Goals



- 65% minimum Good/Fair condition for IRI
- 35% maximum Poor condition for IRI
- <2% maximum Very Poor condition for IRI. The target is complete elimination of Very Poor condition by the close of the 2022 construction season.

On a yearly basis, the Pavement Management Section prepares a Condition Map and compares the current condition of the network to the various Tiers.

Current Condition and Trends

Tier	Condition Goal (IRI)	2016	2017	2018	2019	4-Year Change	Desired Trend
1	95% Min. Good	97%	97%	96%	96%		
	65% Min. Good	61%	63%	63%	66%		
2	90% Min. Good/Fair	87%	87%	87%	92%		
	10% Max Poor	12%	11%	11%	8%		
	<1% Very Poor	1%	2%	2%	0%		
3	80% Min. Good/Fair	64%	75%	76%	80%		
	20% Max Poor	30%	22%	21%	19%		
	<1% Very Poor	6%	3%	3%	1%		
4	65% Min. Good/Fair	45%	47%	64%	63%		
	35% Max Poor	38%	37%	30%	31%		
	<2% Very Poor	17%	16%	6%	6%		

Tier	Condition Goal (Rutting)	2016	2017	2018	2019	4-Year Change	Desired Trend
1	95% Min. Good/Fair	98%	97%	100%	99%		

Tier	Condition Goal (Cracking %)	2016	2017	2018	2019	4-Year Change	Desired Trend
1	95% Min. Good/Fair	100%	98%	97%	98%		

Source: Annual Pavement Condition Maps (2016, 2017, 2018, and 2019), Available online

Funding

Funding for the maintenance of New Hampshire’s roadway network is generally provided by four sources: Federal funding, Betterment funding, Turnpike funding and Senate Bill 367 (SB367) funding.

Senate Bill 367 Funding

Senate Bill 367 (SB367) provides funding for important transportation investments around the State. The measure added 4.2 cents to the road toll in 2014 for use on specific projects and programs, including paving and bridge projects. Most is dedicated to debt service for the reconstruction of I-93 from Salem-Manchester. SB367 is expected to sunset in 2034 when the debt service related to the I-93 improvements is fully paid for. In 2016, the NHDOT applied for and received \$200M in Transportation Infrastructure Financing Innovation Act (TIFIA) loan funds for the purpose of completing the I-93 Salem to Manchester project. The loan duration is 18 years with the first 9 years deferring principal payments. The deferment of principal payments allows the NHDOT to use more of the SB367 funds to support resurfacing projects. Since 2014, over 1,213 miles of roadway resurfacing at a cost of approximately \$88.6M has been accomplished using these funds.

Betterment Funding

NH RSA 235:23-a established a Highway and Bridge Betterment Program. The program is funded by \$0.03 per gallon of the road toll collected under NH RSA 260:32. 88% of the program funds are distributed to each of the six state Highway Maintenance Districts based on the percentage of the total state-maintained bridges on these state highways found in each District. The remaining 12% of the funds are distributed to each city, town and unincorporated community as explained in NH RSA 235:23-I.

The purpose of the Betterment Program was to provide funds to ensure adequate maintenance and improvement of the New Hampshire highway system not supported by Federal Aid. Betterment funds are used to support highway construction, reconstruction, resurfacing, highway maintenance, bridge construction, bridge reconstruction and bridge maintenance projects. The Department breaks up the Betterment Program into categories to allow the Department to target specific areas such as bridge repair, drainage, resurfacing, traffic signals, and standalone projects.

Betterment funding allocations are dispersed to each of the six highway maintenance districts for each Betterment category. These allocations are based on the projected revenue from the gas tax and are used to plan the projects within each district.

Federal Funding

The NHDOT receives funding annually from the Federal Highway Administration (FHWA) to carry out federal aid eligible infrastructure improvements and construction projects. Not all roads in New Hampshire are eligible to receive Federal funding, as is evidenced from the table to the right.

Tier	Federal Aid Eligible (Miles)		Total
	NO	YES	
1		845	845
2	0	1428	1429
3	377	1062	1439
4	765	128	893
Compacts	12	287	299
Statewide Total	1154	3750	4905

Source: 2020 HPMS Snapshot

Turnpike Funding

The Turnpike System is an enterprise system managed by the NHDOT. It is comprised of approximately 90 miles of roadway (Spaulding Turnpike, Blue Star Turnpike (I-95), and Central Turnpike/F.E. Everett Turnpike). The Turnpike System is supported by revenue generated from tolls paid by motorists at the toll plazas, and to a small extent, fines and administrative fees paid for toll violations. Turnpike funds can ONLY be used on the Turnpike System.

Condition Summary

Road condition data is collected every year by the NHDOT and reported to the Federal Highway Administration through the Highway Performance Management System (HPMS). Roads that are a part of the National Highway System (NHS) are collected every year. Roads that are not part of the NHS are collected once every two years. Correspondingly, it takes two years of data collection to prepare a complete snapshot of the condition of the New Hampshire highway system. Generally speaking, the International Roughness Index (IRI) is the metric used by the NHDOT to describe the health of the network. However, information regarding rut depth in the wheel paths and wheel path cracking are also reported. Below is a snap shot of the health of the New Hampshire highway system, based on information gathered in 2018 and 2019.

2019 Statewide Condition by Tier (IRI, Rutting, and Cracking Percent)

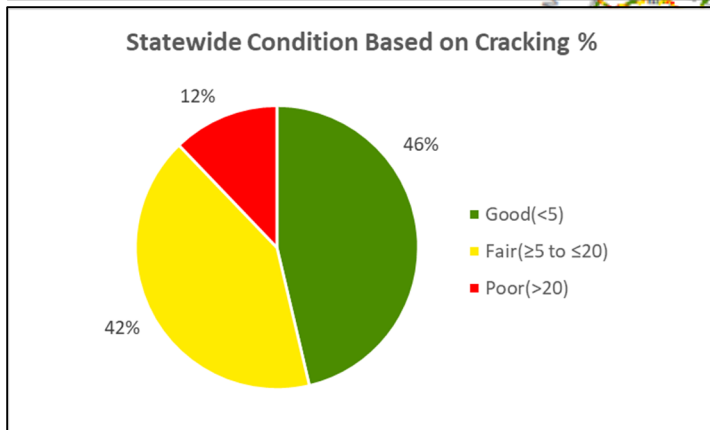
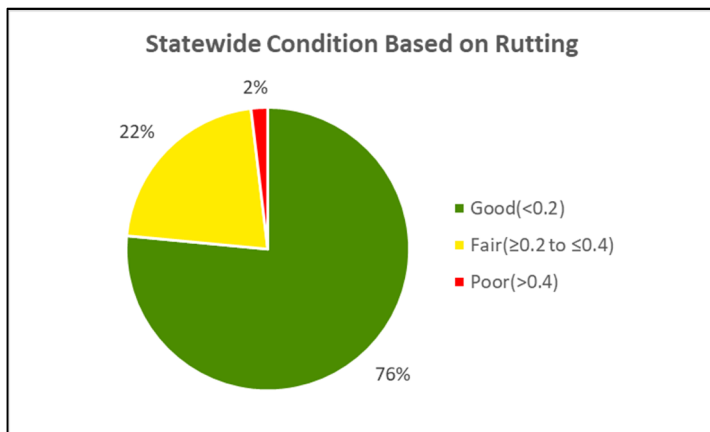
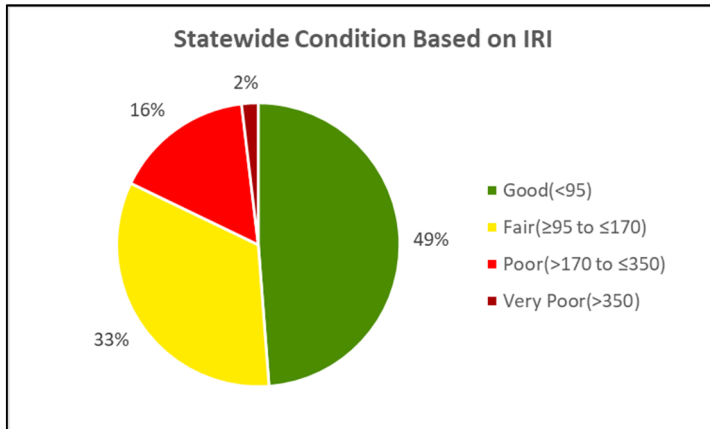
Condition (IRI)	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Statewide	
	Miles	Miles	Miles	Miles	Miles	Miles	% of State
Good(<95)	595	911	519	156	55	2,235	49%
Fair(≥ 95 to ≤ 170)	22	359	629	383	135	1,528	33%
Poor(>170 to ≤ 350)	1	110	268	261	91	732	16%
Very Poor(>350)	0	5	19	47	15	87	2%
Not Rated	228	43	4	46	3	324	
Grand Total	845	1,429	1,439	893	299	4,905	100%

Condition (Rutting)	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Statewide	
	Miles	Miles	Miles	Miles	Miles	Miles	% of State
Good(<0.2)	485	1,040	1,177	613	190	3,504	76%
Fair(≥ 0.2 to ≤ 0.4)	128	324	241	208	89	990	22%
Poor(>0.4)	4	22	17	26	17	87	2%
Not Rated	228	43	4	46	3	324	
Grand Total	845	1,429	1,439	893	299	4,905	100%

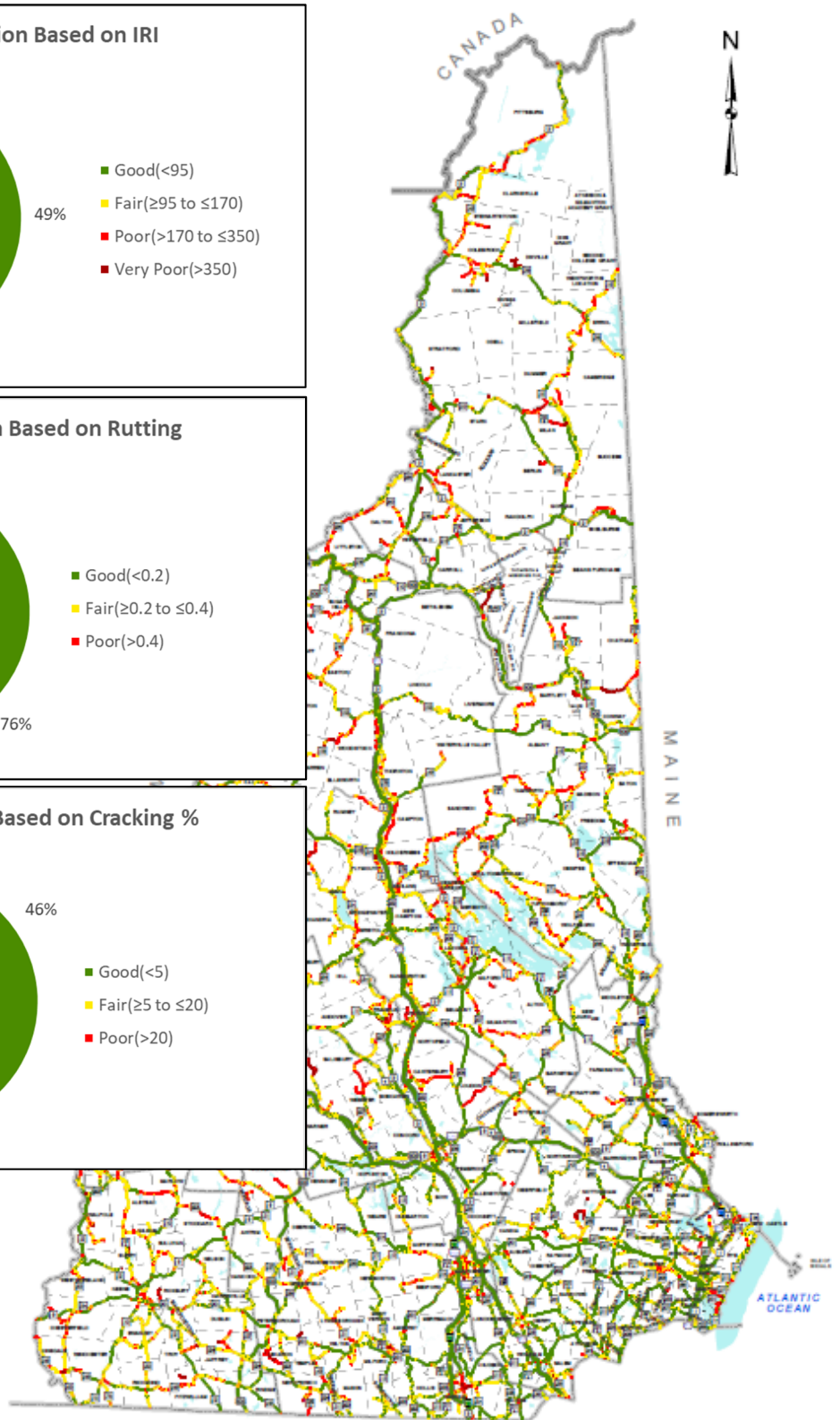
Condition (Cracking %)	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Statewide	
	Miles	Miles	Miles	Miles	Miles	Miles	% of State
Good(<5)	517	671	491	313	129	2,121	46%
Fair(≥ 5 to ≤ 20)	87	573	740	384	118	1,902	42%
Poor(>20)	14	142	204	150	48	558	12%
Not Rated	228	43	4	46	3	324	
Grand Total	845	1,429	1,439	893	299	4,905	100%

Source: Pavement Management System COND_CCR_2020

2019 Statewide Condition (all reported metrics)

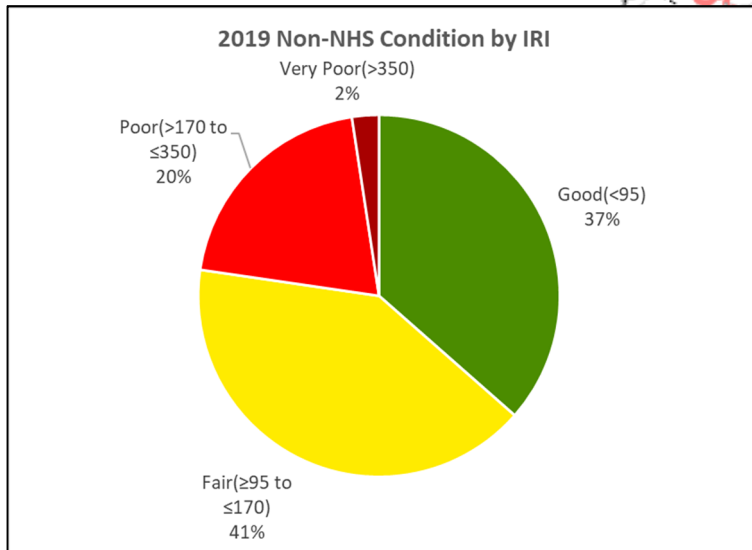
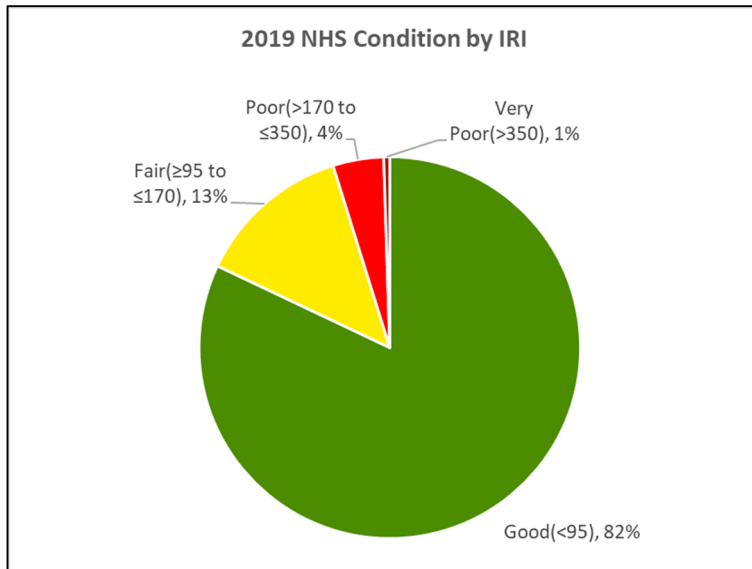


Source: Pavement Management System
COND_CCR_2020

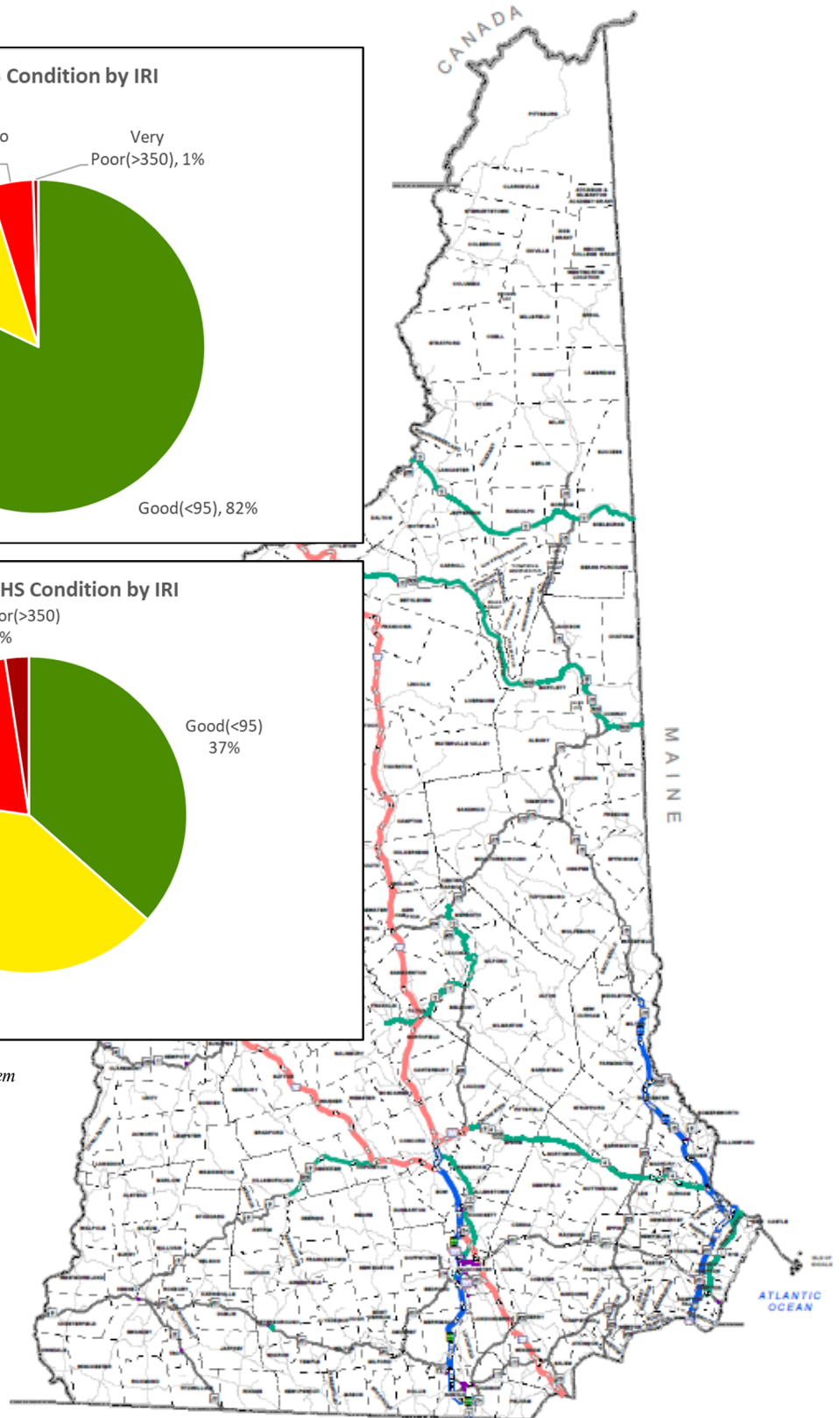


Source: Annual Pavement Condition Map (IRI), available online

2019 Statewide Condition (IRI) for NHS versus Non-NHS Roads

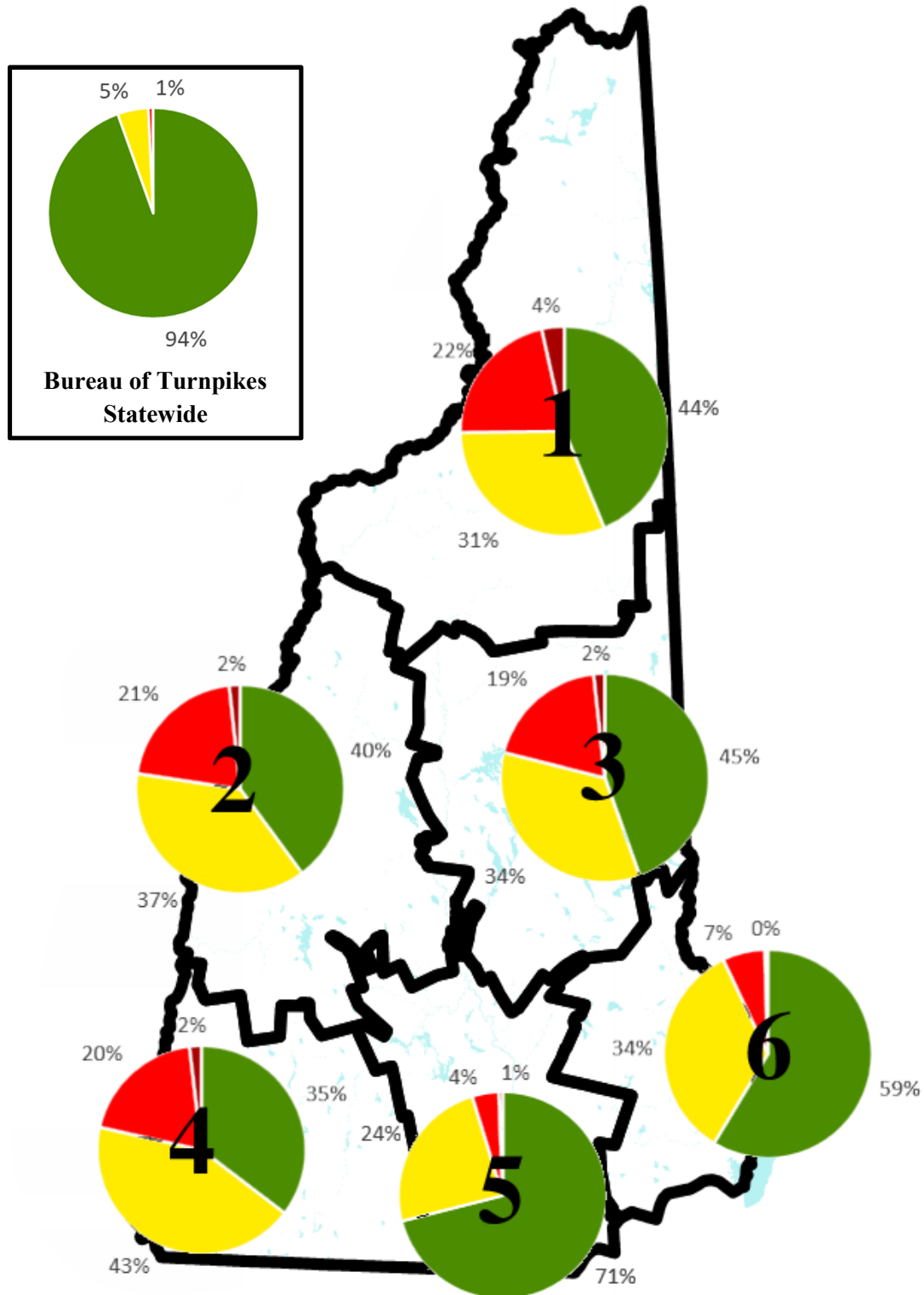


Source: Pavement Management System
 COND_CCR_2020

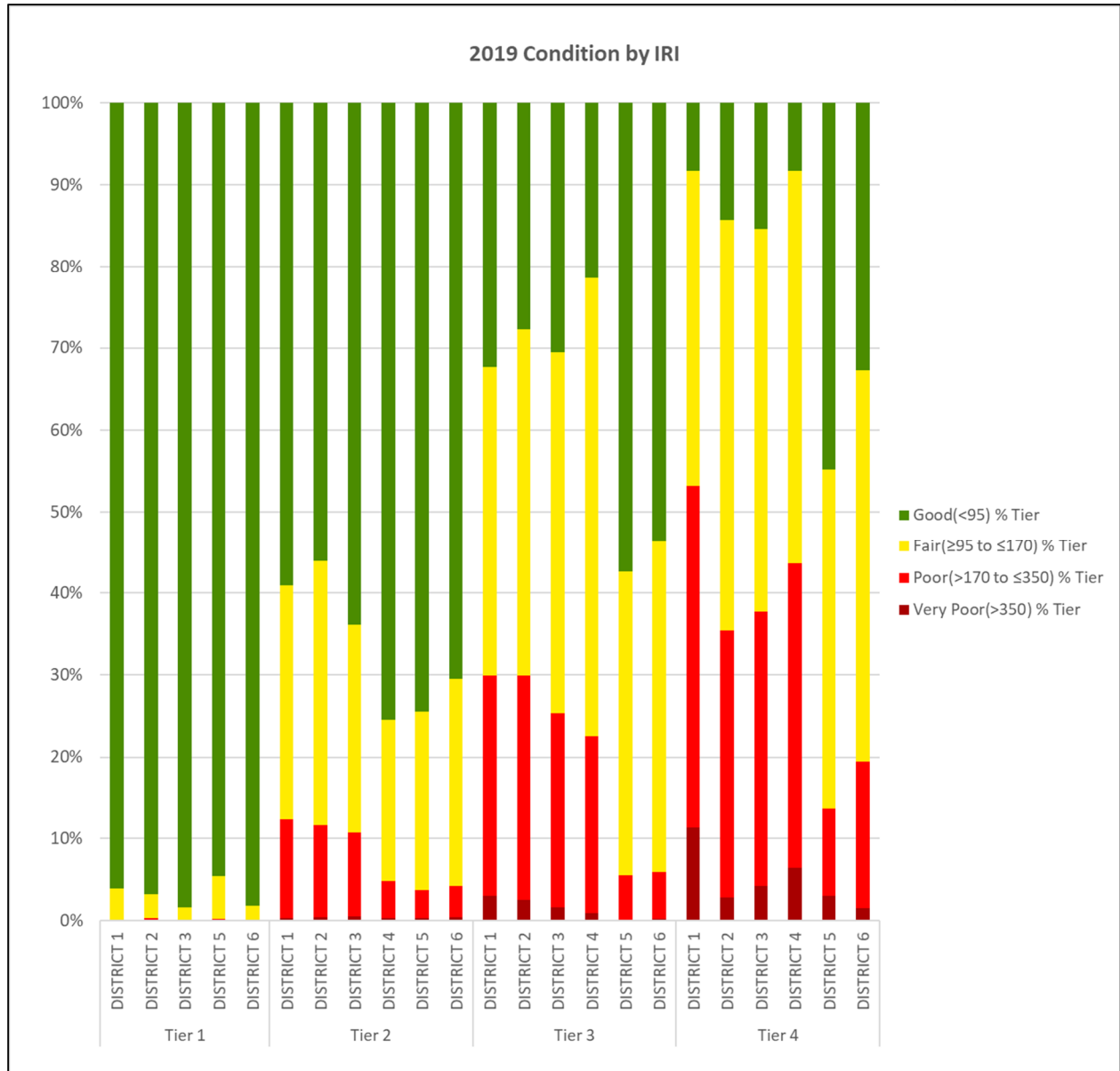


Source: National Highway System Map

Statewide Condition (IRI) by Maintenance District



Source: Pavement Management System COND_CCR_2020



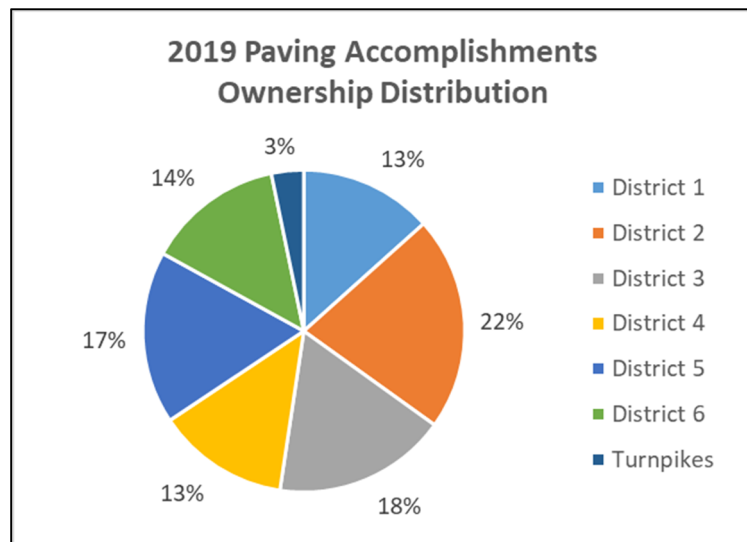
Source: Pavement Management System COND_CCR_2020

2019 Paving Accomplishments

In 2019, the NHDOT planned, designed, permitted, and completed approximately 648 miles of roadway preservation, preservation crack seal, maintenance, and rehabilitation projects. Road work stretched across the State from south to north and from west to east, and extended to all six maintenance districts and both the central and eastern turnpikes. The work in planning and designing the road improvements is a joint effort between the Maintenance Districts and the Bureaus of Materials and Research, Highway Design, and Turnpikes at the NHDOT. Several breakdowns of the 2019 accomplishments from the paving program are shown in this Section.

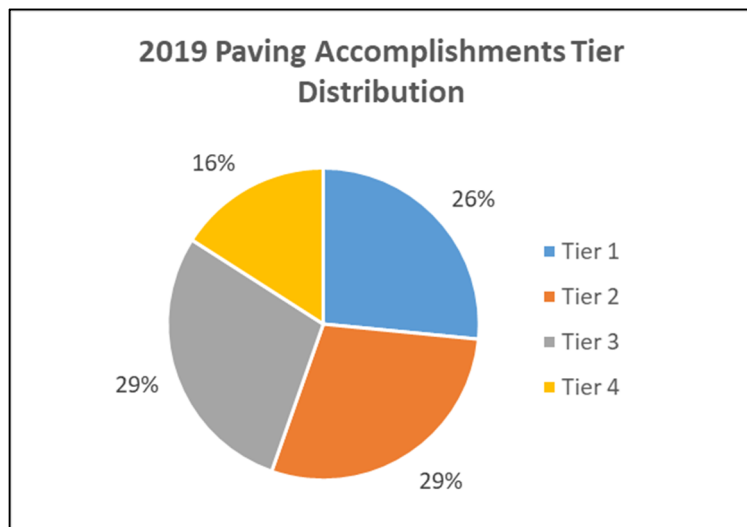
Ownership	Miles
District 1	87
District 2	140
District 3	113
District 4	86
District 5	113
District 6	89
Turnpikes	21
Statewide Total	648

Source: Pavement History Layer



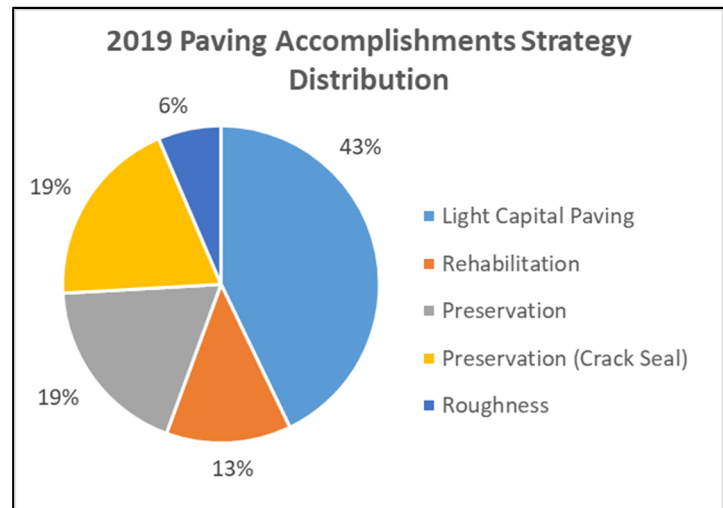
Tier	Miles
Tier 1	172
Tier 2	187
Tier 3	186
Tier 4	103
Statewide Total	648

Source: Pavement History Layer



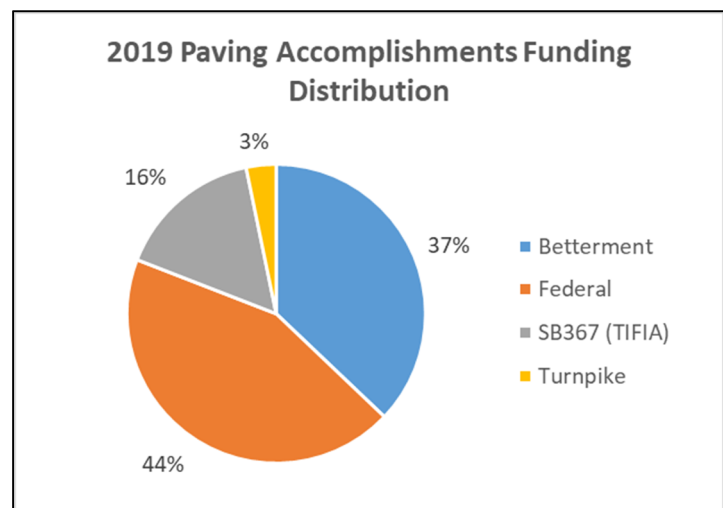
Strategy	Miles
Light Capital Paving	278
Rehabilitation	83
Preservation	120
Preservation (Crack Seal)	126
Roughness	42
Statewide Total	648

Source: Pavement History Layer



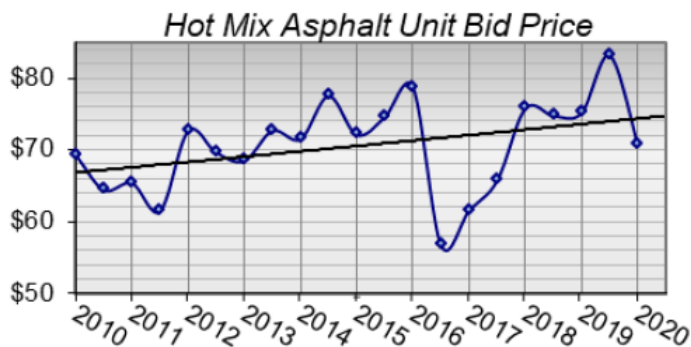
Funding Source	Miles
Betterment	241
Federal	284
SB367 (TIFIA)	103
Turnpike	21
Statewide Total	648

Source: Pavement History Layer



Historic Condition and Accomplishments

As shown in the graphics that follow, the miles of roadway resurfaced or treated on a yearly basis in New Hampshire can vary significantly. This is primarily based on the variability in investment level and the cost of construction in any given year. The NHDOT maintains a rolling three-year paving plan that financially constrains the budget as presented in the NHDOT’s Ten Year Plan (available online). Historically, the three-year program targets a minimum of 505 miles per year. This is an estimate of the minimum number of miles required in order to maintain the existing condition of the State’s roadway network. The maintenance of a three-year paving plan allows the NHDOT to stay ahead of construction with planning, designing, and permitting projects for future years. These “on-shelf” shovel-ready projects



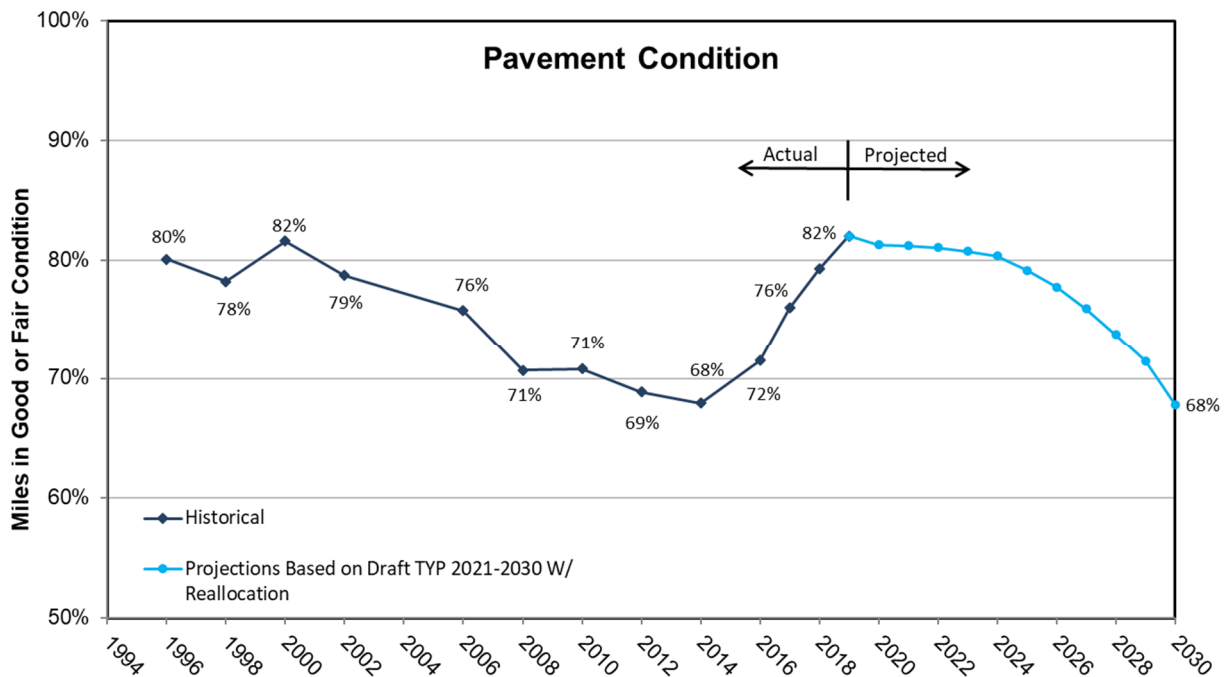
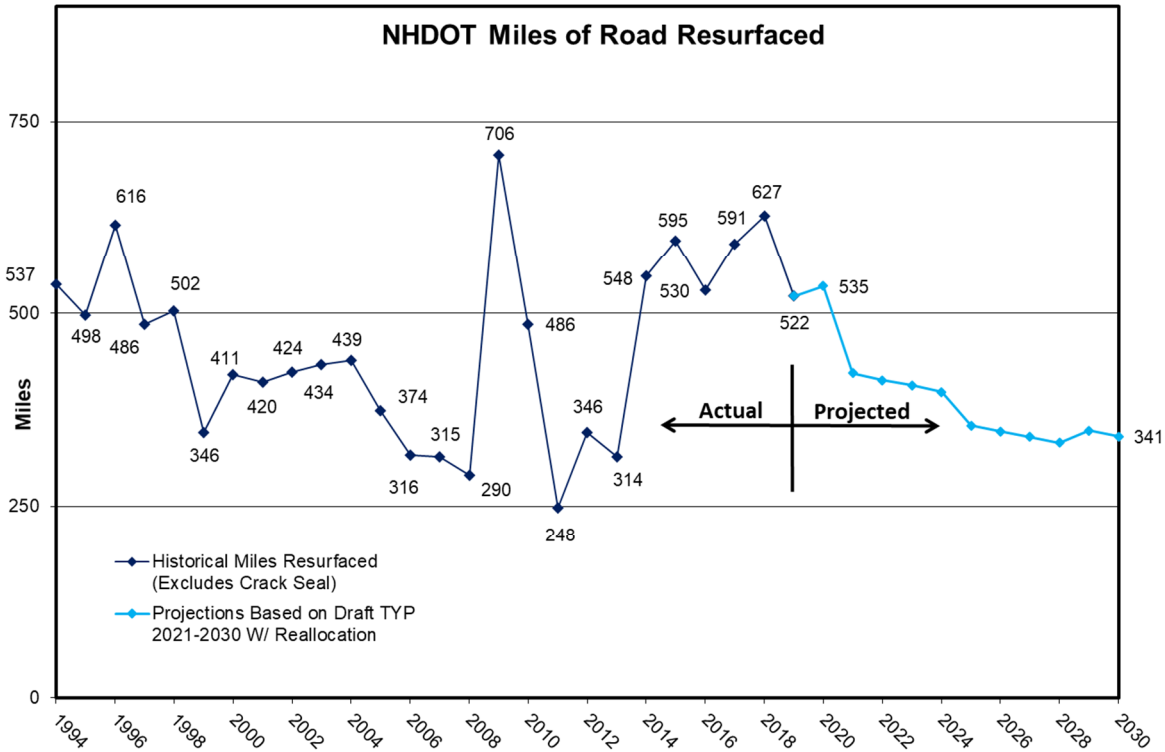
Source: “Construction Cost Index, New Hampshire Department of Transportation” NHDOT Bureau of Construction, December 31, 2019

are important in case the Federal government releases additional funds for these projects that historically have become available at the end of the fiscal year due to de-obligation and redistribution of funds. The same occurs at the State level from time to time, so shovel ready projects are available and ready for advertisement.

In some years, due to additional funding, the paving target is exceeded. In other years, the achievements fall short of the target. In 2009, for instance, a dramatic increase in miles resurfaced is noted due to ARRA funding that became available during that time. The impact of SB367 funding, as another example, is evidenced by the increase in paving accomplishments and the dramatic improvement of the overall pavement condition following the passing of that additional funding in 2014. Over the past five years, the NHDOT has exceeded the 505 mile target every year. This is a result of the prioritization of paving projects within the NHDOT and consistent receipt of additional funding, both State and Federal. In 2019, accomplishments met the target. Advertised projects for 2019 exceeded the target, but several projects have 2020 completion dates and won’t be completed until the 2020 construction season.

In some years, due to additional funding, the paving target is exceeded.

In other years, the achievements fall



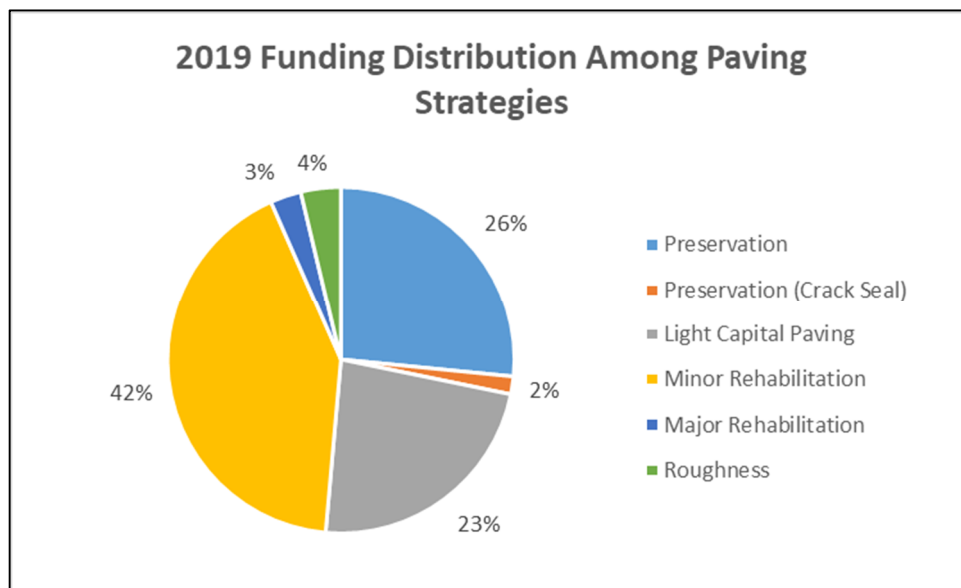
Looking ahead, the NHDOT expects that the State will benefit from above average road conditions over the next five years, with the percentage of miles in Good or Fair condition exceeding 80%. Based on the recommended level of investment in the 2021 through 2030 Ten Year Plan, the percentage of miles in Good or Fair condition is expected to decline in the later years of the plan by as much as 15%.

Expenditures

In 2019, the NHDOT invested over \$95 million into 648 miles of resurfacing and crack sealing projects. This investment required the planning, design, permitting and advertisement of 25 different construction contracts consisting of 180 individual sections.

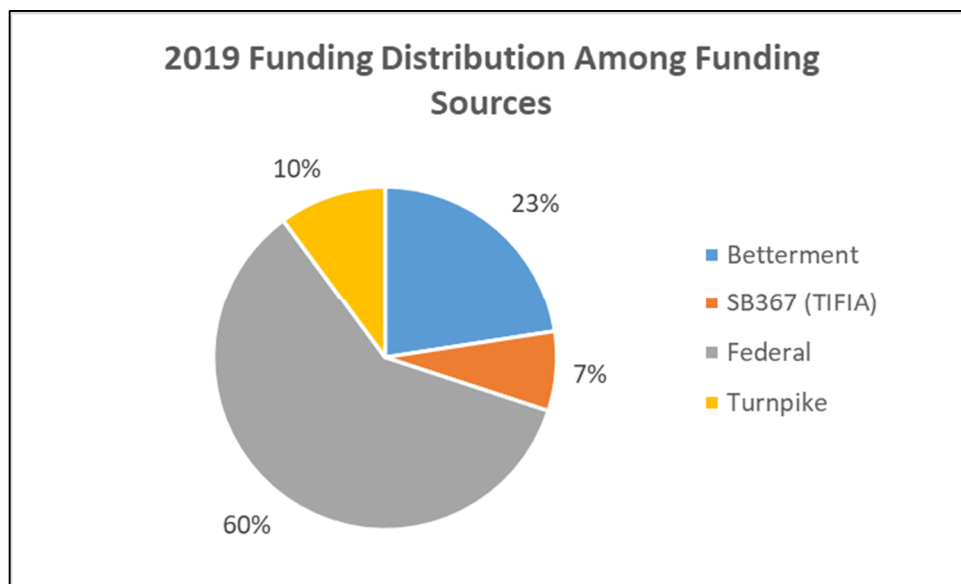
NHDOT’s paving program is largely focused on the preservation of Good condition pavements. In 2019, nearly 1/3 of the total investment statewide was spent on preservation strategies. This includes treatments such as thin lift overlays, chip seals, and crack sealing. Nearly 1/2 of the year’s investment was spent on rehabilitation strategies. These projects consisted primarily of milling existing pavement and then inlaying new pavement, bringing the road surface back to Good condition so that it can be maintained, moving forward, using preservation strategies. The remainder was spent on Light Capital Paving and Roughness paving strategies. These projects rely predominantly on a thin 3/4-inch overlay treatment.

Strategy	Investment
Preservation	\$ 25,305,365.86
Preservation (Crack Seal)	\$ 1,570,237.78
Light Capital Paving	\$ 22,093,403.26
Minor Rehabilitation	\$ 39,967,051.16
Major Rehabilitation	\$ 2,745,131.50
Roughness	\$ 3,556,090.72
Total Investment	\$ 95,237,280.28



The NHDOT relies heavily on funding from the Federal Government. Over half of the accomplishments in 2019 were funded using federal dollars. The Betterment program supported 22% of the 2019 accomplishments, with nearly \$21.5 million dollars from the State gas tax. Other State funding from SB 367 gas taxes contributed over \$7 million and supported 7.5% of the paving program.

Funding Source	Investment
Betterment	\$ 21,486,344.75
SB367 (TIFIA)	\$ 7,112,214.10
Federal	\$ 57,003,870.15
Turnpike	\$ 9,634,851.27
Total Investment	\$ 95,237,280.28

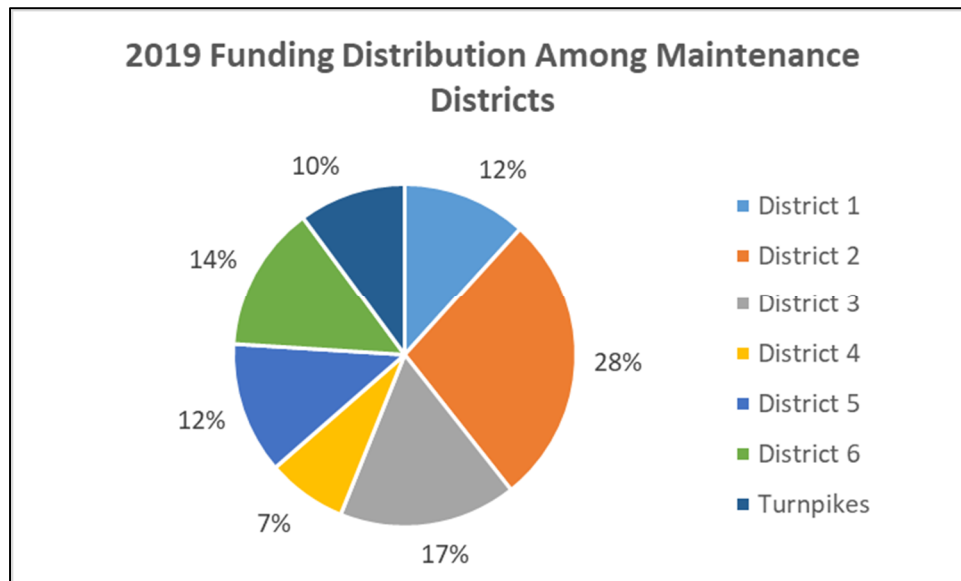


Accomplishments in 2019 were spread across all four Tiers of the State Highway System, meaning that a healthy mix of work along interstates, turnpikes, numbered and unnumbered State routes, and US routes was completed. Further, the work was spread across the State based on the critical needs of the six individual Maintenance Districts.

Tier	Investment
Tier 1	\$ 37,891,142.23
Tier 2	\$ 34,345,758.91
Tier 3	\$ 15,757,609.89
Tier 4	\$ 6,847,670.47
Other	\$ 395,098.77
Total Investment	\$ 95,237,280.28

“Other” – Driveway and parking lot paving at State owned facilities and/or on urban compact sections (19629) where State maintenance was required.

District	Investment
District 1	\$ 11,191,903.49
District 2	\$ 26,285,533.82
District 3	\$ 15,945,380.27
District 4	\$ 7,171,404.18
District 5	\$ 11,780,796.60
District 6	\$ 13,227,410.63
Turnpikes	\$ 9,634,851.27
Total Investment	\$ 95,237,280.28



Source: Information in this section was gathered from the NHDOT's Integrated Project Development database (iPD).



Appendix

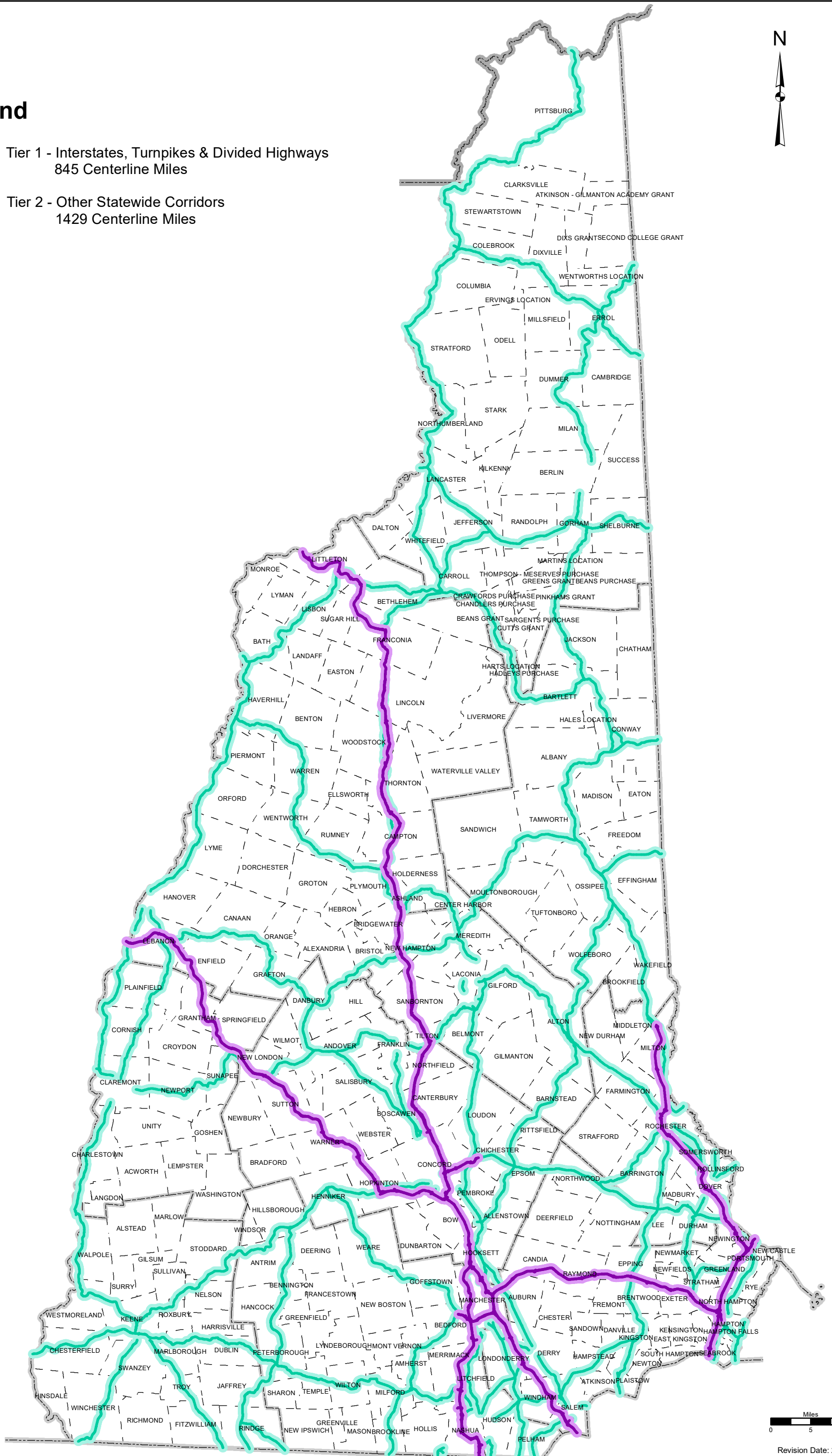
1. Tiers 1 & 2 *Interstate and Other Statewide Transportation Corridors Map*
2. Tiers 3 & 4 *Regional Transportation Corridors & Local Corridors Map*
3. National Highway System *Miles by Route Type Map*
4. Pavement Condition *All Conditions Statewide Map*
5. Federal Aid Eligible Roads

Tiers 1 & 2

Interstate & Other Statewide Transportation Corridors

Legend

-  Tier 1 - Interstates, Turnpikes & Divided Highways
845 Centerline Miles
-  Tier 2 - Other Statewide Corridors
1429 Centerline Miles





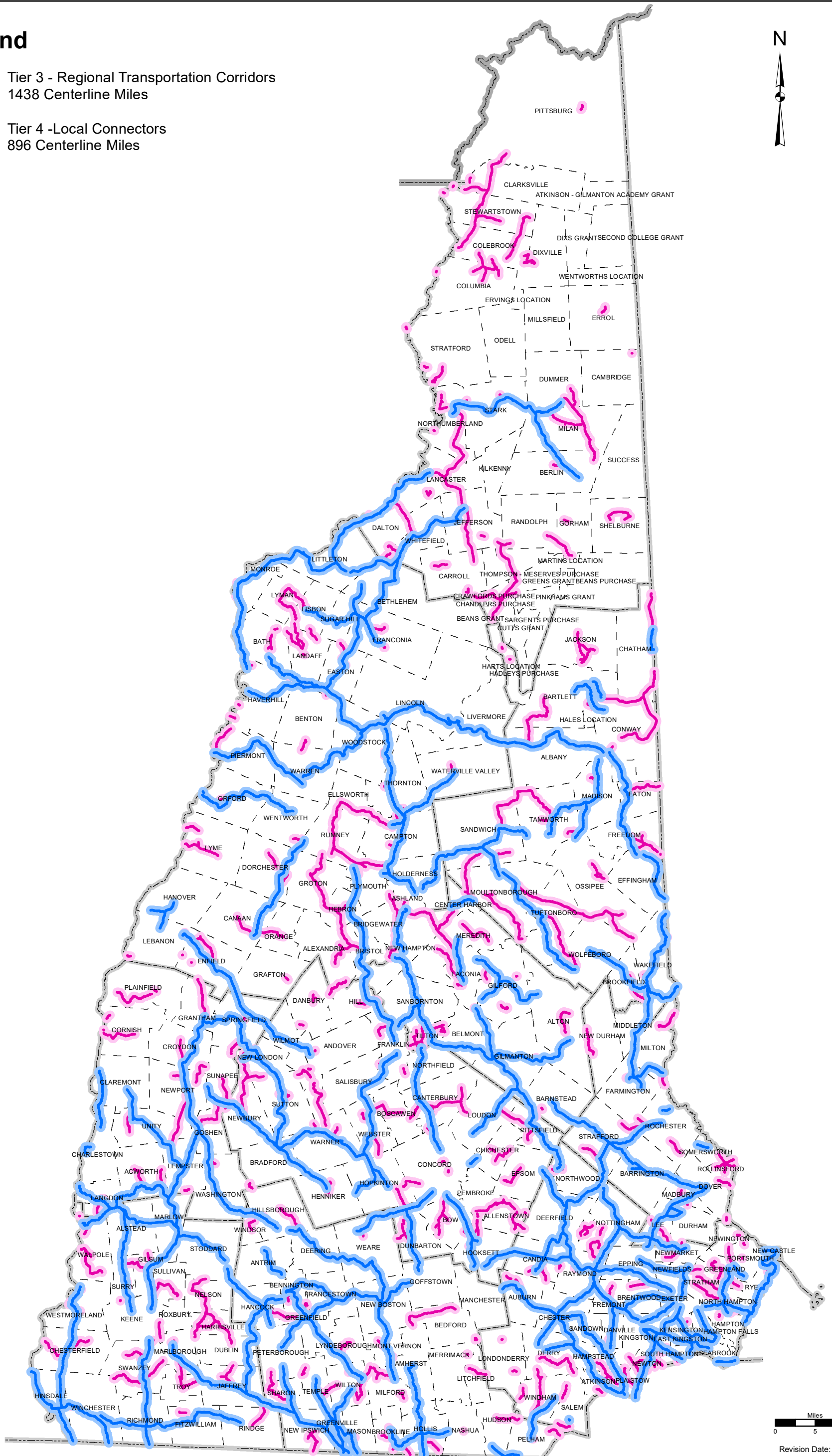
Tiers 3 & 4

Regional Transportation Corridors & Local Connectors



Legend







-  Tier 3 - Regional Transportation Corridors
1438 Centerline Miles
-  Tier 4 - Local Connectors
896 Centerline Miles




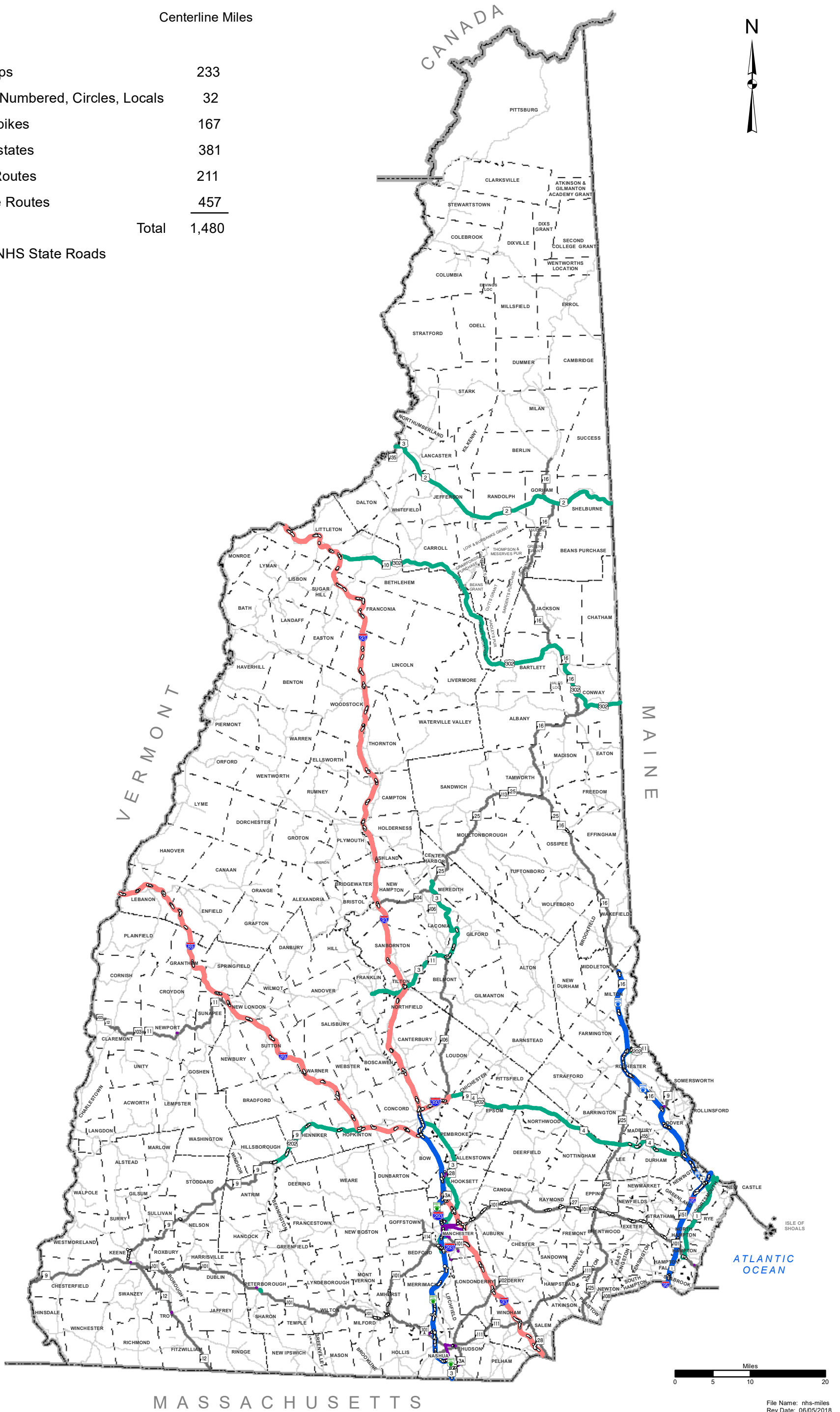
Miles
0 5 10
Revision Date: 2020

National Highway System

Miles by Route Type

	Centerline Miles
 Ramps	233
 Non-Numbered, Circles, Locals	32
 Turnpikes	167
 Interstates	381
 US Routes	211
 State Routes	457
Total	1,480

 Non-NHS State Roads



Pavement Condition

All Conditions Statewide

As Collected in Years 2018-2019

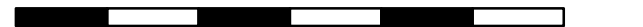
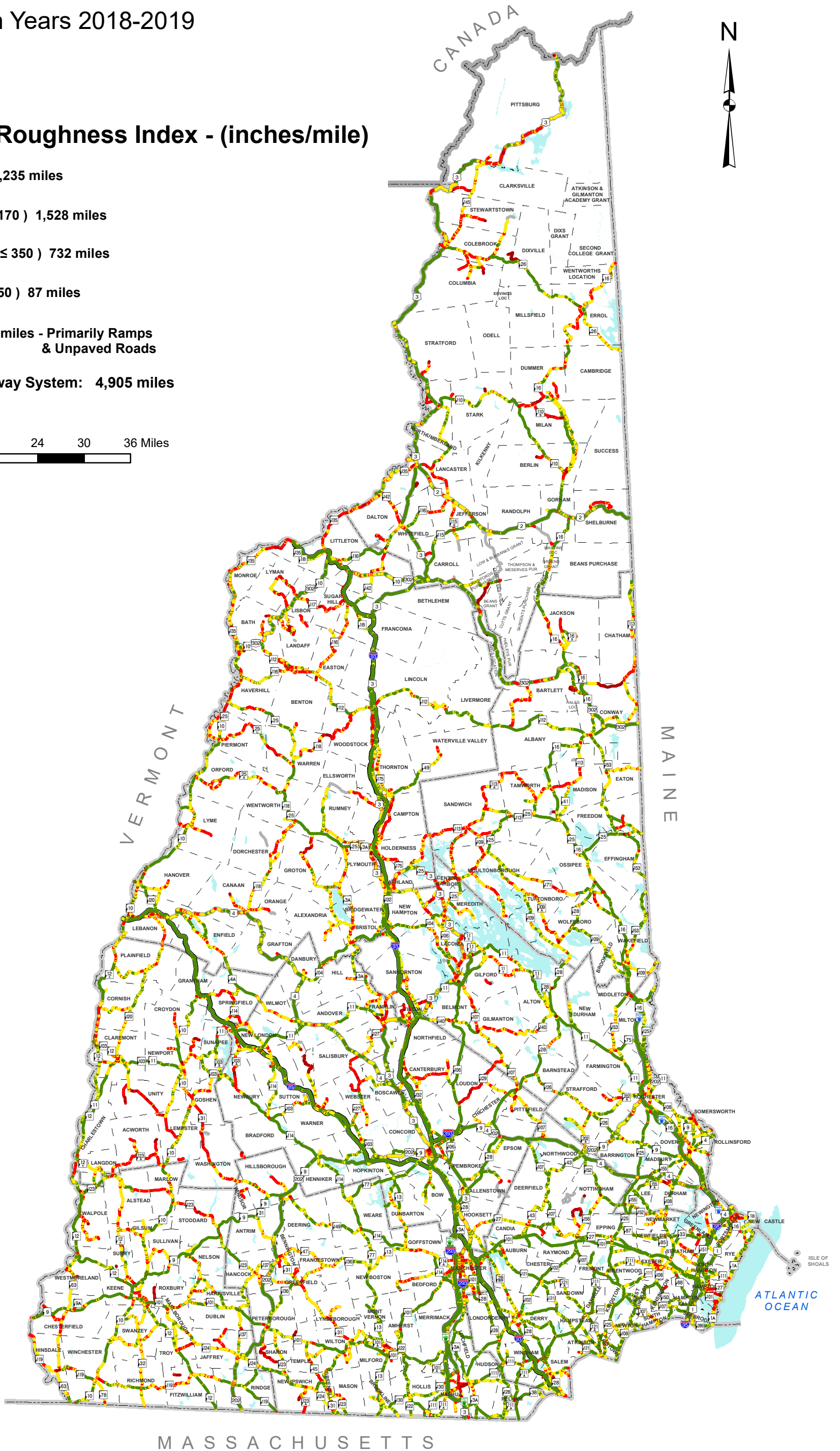
Legend

International Roughness Index - (inches/mile)

- Good (< 95) 2,235 miles
- Fair (≥ 95 to ≤ 170) 1,528 miles
- Poor (> 170 to ≤ 350) 732 miles
- Very Poor (> 350) 87 miles
- Not Rated 324 miles - Primarily Ramps & Unpaved Roads

New Hampshire Highway System: 4,905 miles

0 3 6 12 18 24 30 36 Miles

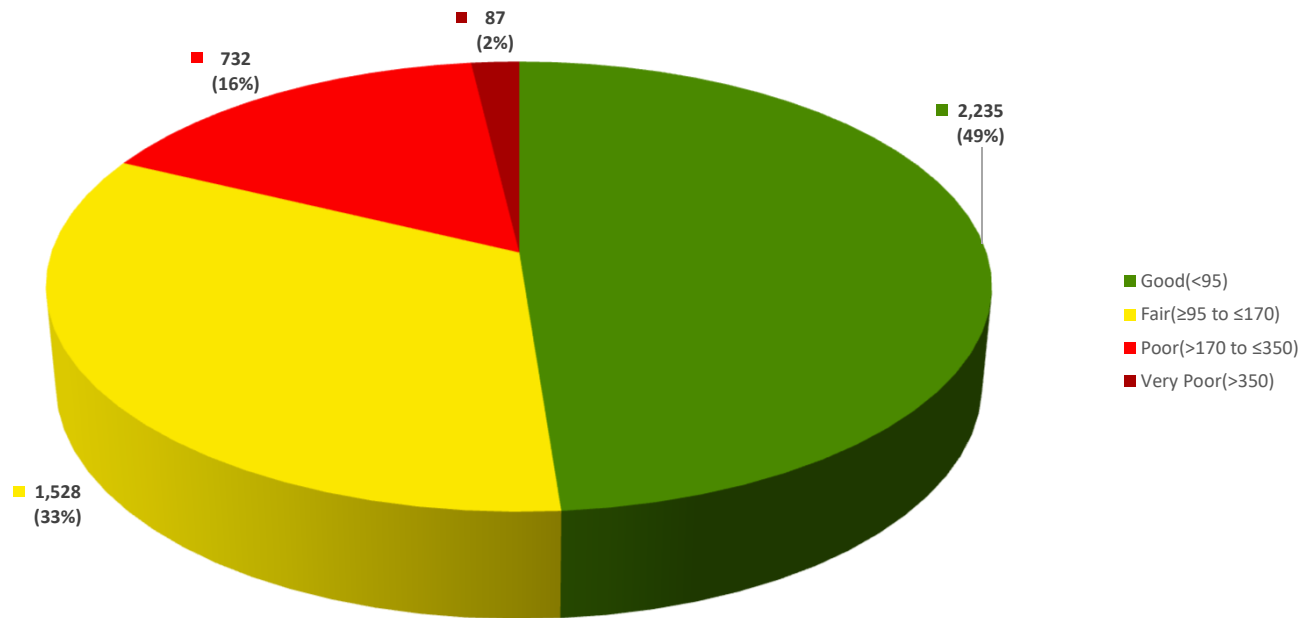



**Pavement Condition
Collection Year 2019
(based on IRI)**

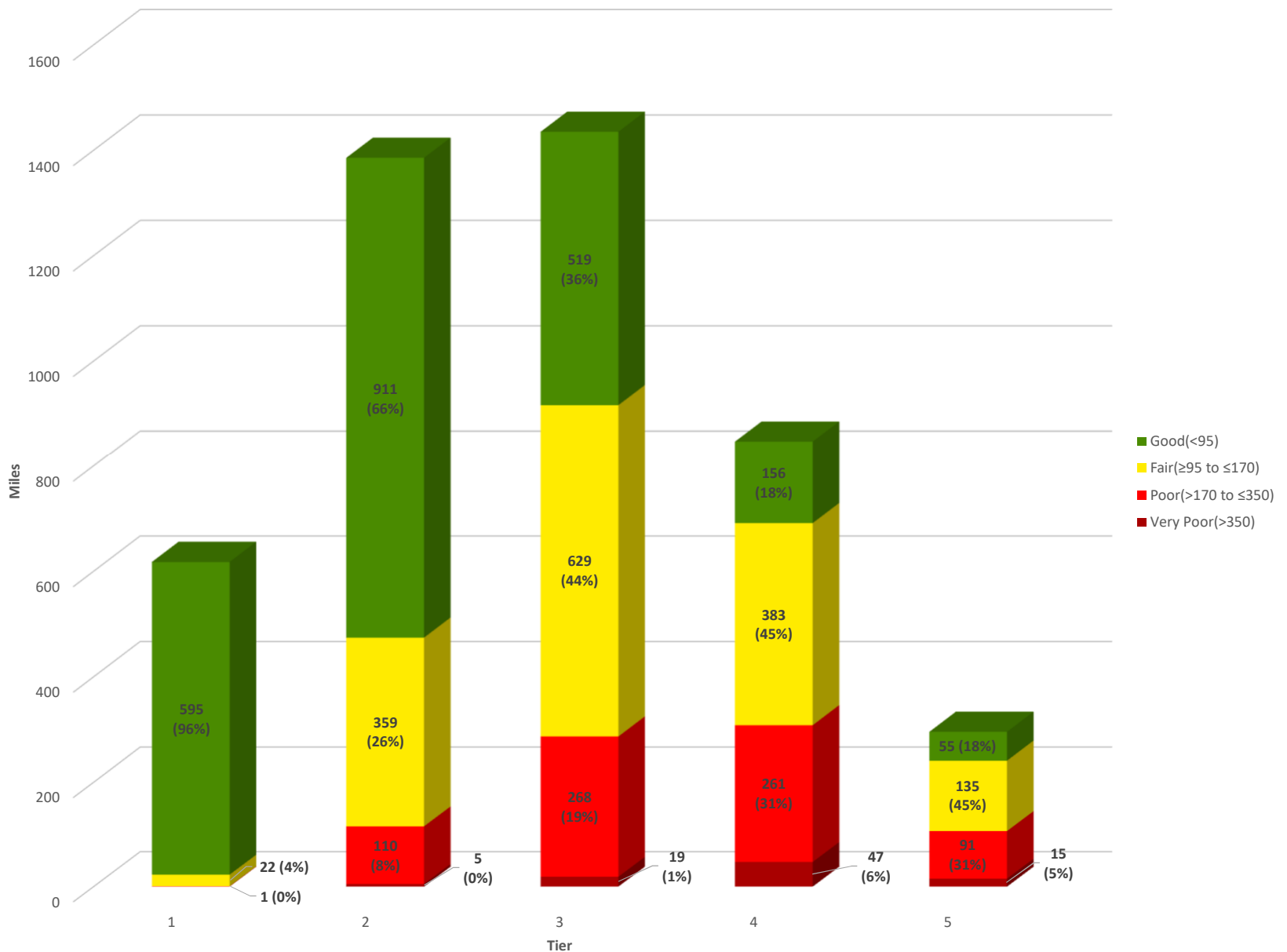
Condition	Tier 1		Tier 2		Tier 3		Tier 4		Compact		Statewide	
	Miles	% of Tier	Miles	% of Tier	Miles	% of Tier	Miles	% of Tier	Miles	% of Tier	Miles	% of Tier
Good(<95)	595	96%	911	66%	519	36%	156	18%	55	18%	2,235	49%
Fair(≥95 to ≤170)	22	4%	359	26%	629	44%	383	45%	135	45%	1,528	33%
Poor(>170 to ≤350)	1	0%	110	8%	268	19%	261	31%	91	31%	732	16%
Very Poor(>350)	0	0%	5	0%	19	1%	47	6%	15	5%	87	2%
Not Rated	228		43		4		46		3		324	
Statewide	845	100%	1,429	100%	1,439	100%	893	100%	299	100%	4,905	100%

Notes: Not Rated - Ramps and gravel roads are not collected
 Compact - Highways that are part of the state system, maintained by municipalities
 Miles are barrel miles
 Miles may not sum due to rounding
 Collection Cycle:
 - NHS, including Interstates and Turnpikes, collected in 2019
 - Unnumbered roads collected in 2018.
 - Non-NHS numbered routes collected in 2019

Statewide Condition Mileage



Tier Condition Mileage



Federal Aid Eligible Roads

Legend

- Tier 1-4 Federal Aid Eligible Highways (3,460 Miles)
- Tier 1-4 Non-Federal Aid Eligible Highways (1,142 Miles)

Fed Aid Eligibility	Tier				
	1	2	3	4	5
Fed Aid Eligible Miles	844	1426	1,062	128	692
Non Fed Aid Eligible Miles	0	0	376	766	11,327
Total Miles	844	1,426	1,438	894	12,019
Fed Aid Eligible Percentage	100%	100%	74%	14%	6%
Non-Fed Aid Eligible Percentage	0%	0%	26%	86%	94%

- Notes: 1. Based on Barrel miles in 2018 Snapshot
 2. Includes miles owned by Turnpikes (273)
 3. Includes Ramps
 4. Federal Aid Eligible miles include FHWA Functional System 1-5 and 6 in Urban Areas
 5. Tier 5 Roads not shown include Class 4 and Class 5 Roads.

