CONDITION OF NEW HAMPSHIRE ROADS

The life cycle of New Hampshire's roads is greatly affected by the state and local governments' ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

The pavement data in this report, which is for all arterial and collector roads and highways, is provided by the Federal Highway Administration (FHWA), based on data submitted annually by the New Hampshire Department of Transportation and Development on the condition of major state and locally maintained roads and highways. Pavement data for Interstate highways and other principal arterials is collected for all system mileage, whereas pavement data for minor arterial and all collector roads and highways is based on sampling portions of roadways as prescribed by FHWA to ensure the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Statewide, 37 percent of New Hampshire's major roads are in poor or mediocre condition. Twenty percent of New Hampshire's major locally and state-maintained roads are in poor condition and 17 percent are in mediocre condition.[i] Fifteen percent of New Hampshire's major roads are in fair condition and the remaining 49 percent are in good condition.[ii]

Twenty-eight percent of New Hampshire's major locally and state-maintained urban roads and highways have pavements rated in poor condition and 19 percent are in mediocre condition.[iii] Fifteen percent of New Hampshire's major urban roads are rated in fair condition and the remaining 38 percent are rated in good condition.[iv]

Fourteen percent of New Hampshire's major locally and state-maintained rural roads and highways have pavements rated in poor condition and 15 percent are in mediocre condition.[v] Fourteen percent of New Hampshire's major rural roads are rated in fair condition and the remaining 57 percent are rated in good condition.[vi] The chart below details pavement conditions on major urban roads in the state's largest urban areas and statewide.[vii]

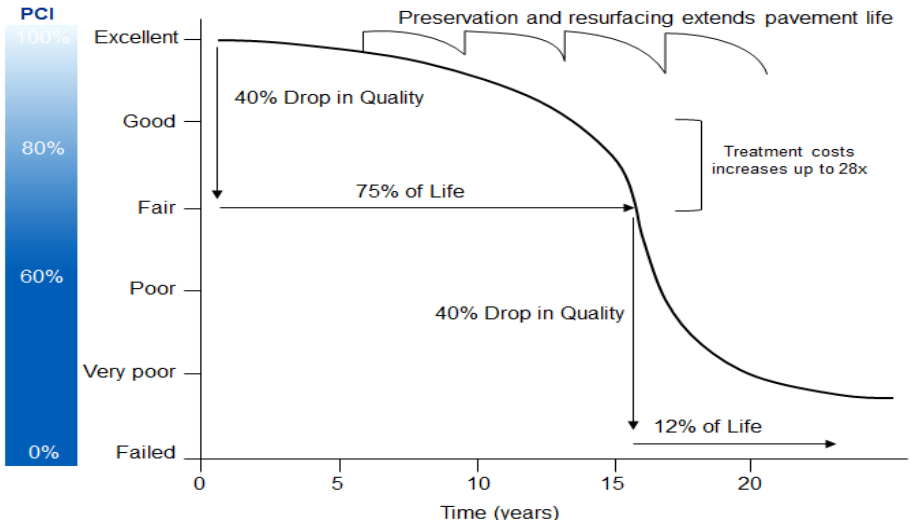
Chart 1. Pavement conditions on major urban roads in New Hampshire's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Dover-Rochester	13%	20%	18%	49%
Manchester	23%	16%	16%	46%
Nashua	19%	17%	16%	48%
Portsmouth	26%	14%	9%	52%
NEW HAMPSHIRE STATEWIDE	**20%**	**17%**	**15%**	**49%**

Source: TRIP analysis of Federal Highway Administration data.

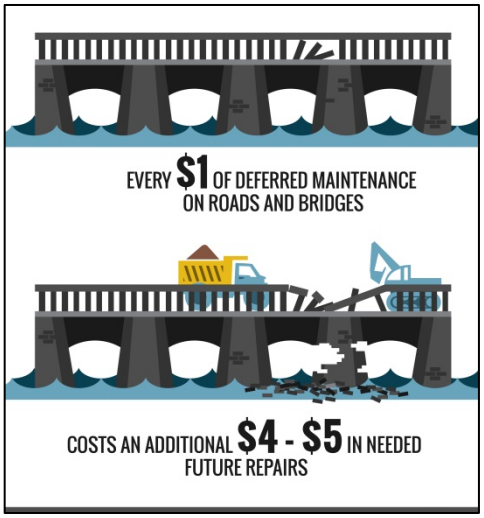
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[viii] As roads and highways continue to age, they will reach a point of deterioration where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

Chart 2. Pavement Condition Cycle Time with Treatment and Cost



Source: South Carolina Department of Transportation (2016). 2016 Maintenance Operations and Performance Analysis Report.

Long-term repair costs increase significantly when road and bridge maintenance is deferred, as road and bridge deterioration accelerates later in the service life of a transportation facility and requires more costly repairs. A report on maintaining pavements found that every $1 of deferred maintenance on roads and bridges costs an additional $4 to $5 in needed future repairs.[ix]



THE COST TO MOTORISTS OF ROADS IN INADEQUATE CONDITION

TRIP has calculated the additional cost to motorists of driving on roads in poor, mediocre or fair condition. When roads are in poor, mediocre or fair condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle operating costs (VOC) include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional VOC borne by New Hampshire motorists as a result of deteriorated road conditions is $553 million annually, an average of $476 per driver statewide.[x] The chart below shows additional VOC per motorist in the state's largest urban areas.

Chart 3. Vehicle operating costs per motorist as a result of driving on deteriorated roads.

Location	VOC
Dover-Rochester	$370
Manchester	$472
Nashua	$433
Portsmouth	$490
NEW HAMPSHIRE STATEWIDE	**$553 Million**

Source: TRIP estimates.

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.[xi] The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's driving cost estimates and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[xii] Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored into TRIP's vehicle operating cost methodology.

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[i] Federal Highway Administration, Highway Statistics 2019 (2020). Pavement condition data is for 2019.
[ii] Ibid.
[iii] Ibid.
[iv] Ibid.
[v] Ibid.
[vi] Ibid.
[vii] Ibid.
[viii] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
[ix] Pavement Maintenance, by David P. Orr, PE Senior Engineer, Cornell Local Roads Program, March 2006.
[x] TRIP calculation.
[xi] Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
[xii] Your Driving Costs. American Automobile Association. 2019.