

# **SOUTHWEST NH TRANSPORTATION ADVISORY COMMITTEE**

## **US 202 North & South Corridors**

May 2, 2016

- This marks the fourth in a series of discussions SWRPC is holding on Corridors identified in *Southwest Connects*, the new Long Range Transportation Plan for Southwest New Hampshire. The meeting will feature the US 202 North and South Corridors.
- As part of this series SWRPC staff has reached out to municipalities that are part of the Corridors by inviting municipal elected officials and municipal staff, as well as State legislators representing communities that are part of the Corridor.
- The purpose of the Corridor meetings is to familiarize the TAC with each corridor as well as get feedback from state and local officials and municipal staff about the priority challenges and opportunities of each Corridor, in order to inform future transportation project programming and planning initiatives.
- Officials that are able to come to the meeting can participate in the conversation directly with SWRPC staff and TAC. We know that many people have busy schedules and many people are not able to attend our meetings. In an effort to reach people that are not able to attend, SWRPC will send the presentation, any handouts and meeting minutes to those officials and staff.
- We will also provide municipal and state officials SWRPC staff contact information so that they may follow up with comments and questions regarding the materials sent to them.

## Presentation Outline

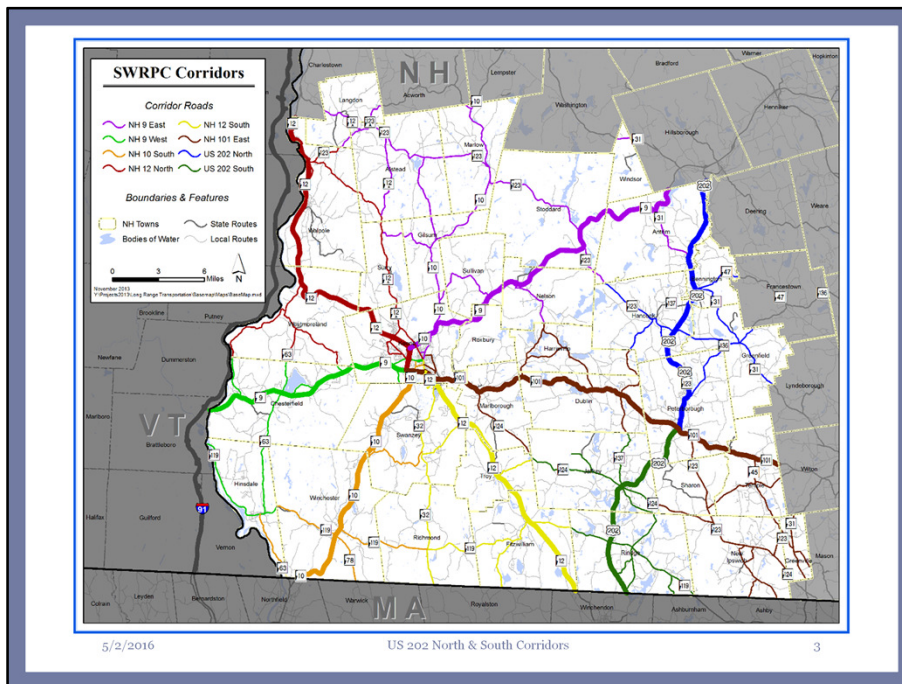
- Corridor Features and Location
- Population
- Commuting & Economy
- Housing & Land Use
- Travel & Vehicle Trends
- Performance Measures
- Challenges & Opportunities
- Past & Future Projects

5/2/2016

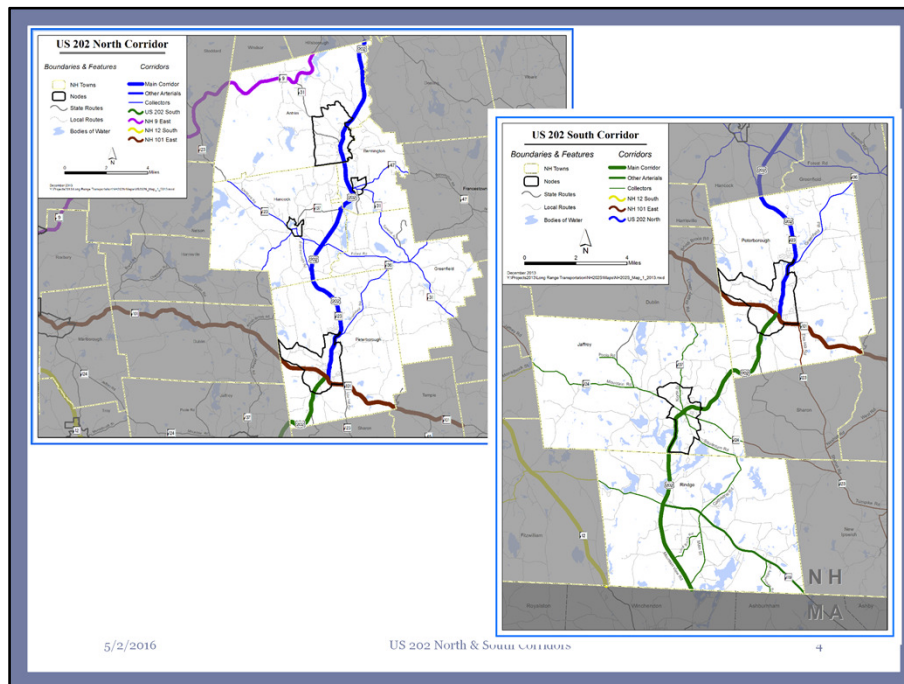
US 202 North & South Corridors

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- Today's presentation will begin with an orientation and description of the US 202 North and South Corridors including characteristics of the people that live there, how people travel along the corridor, economic characteristics of the corridor, and a description of housing activity and land use in the corridor system.
- NHDOT and USDOT are in the process of adopting performance measures for the transportation system in an effort to better connect funding allocation with state and federal goals. We will talk about these performance measures in the context of the Corridor.
- This presentation will cover the major challenges and opportunities for the Corridor as expressed in *Southwest Connects*.
- Then we will present past and future transportation projects and planning initiatives associated with the Corridor.
- We have set aside approximately 45 minutes to go through the presentation.

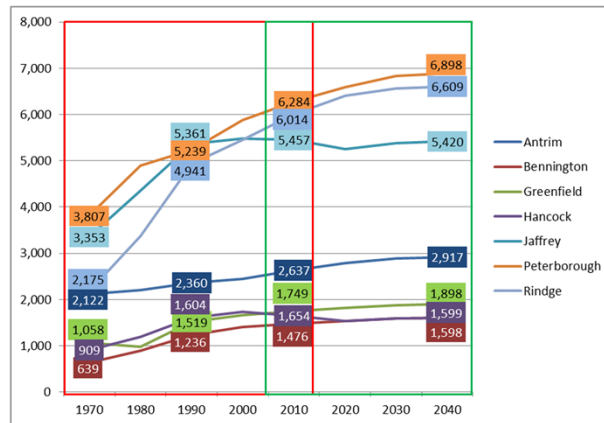


- This is a map of Southwest NH showing the eight corridors that were identified in *Southwest Connects*, with each Corridor represented by a different color.
- Corridors are based on data SWRPC collected recognizing direction of travel patterns, traffic volumes, federal highway classifications (federally recognized arterials and collectors) and connections between major origins and destinations inside and outside of the Southwest Region.
- Since highway travel is by far the predominant mode of transportation, Corridors are represented with what the Plan calls backbone arterials highways as well as collector roads that link to the arterial highways. While the highway system is the central framework of each Corridor, the Plan recognizes modes of transportation that use the highway network (pedestrians, bicyclists and community transportation) as well as other transportation infrastructure that interact with the Corridor (active rail lines, rails to trails, intermodal transportation centers, sidewalk networks in downtowns or villages).
- Every town in the Southwest Region is part of at least one Corridor. Notice Peterborough which is linked by the blue, dark green, and brown corridors (US 202 North, US 202 South and NH 101 East Corridor respectively).



- As I said earlier, the Corridors we will be speaking about today are the US 202 North and South Corridors. The US 202 North Corridor is represented in blue and the US 202 South Corridor is represented in dark green.
- In our region, the corridor extends from US 202 in Antrim at the Antrim/Hillsborough town line down to the NH/MA State Line in Rindge. (Although the Southwest Region jurisdiction stops at these boundaries, it makes sense to think of Route 202 extending all the way to NH 9 in Hillsborough and South to at least MA Route 2)
- The US 202 North Corridor includes major collectors NH 31, NH 123 and NH 136 as well as minor collectors NH 47, 2<sup>nd</sup> NH Turnpike and Peterborough Road.
- The US 202 South Corridor includes the minor arterial NH 119, major collector NH 123, and minor collectors NH 137, Dublin Rd/Poole Rd, Stratton Rd/Squantam Rd, Cathedral Road, Payson Hill Rd/Main Street and Lord Brook Road/Middle Winchendon Road.
- Towns that are recognized as part of this corridor include Antrim, Bennington, Greenfield, Hancock, and Peterborough in the US 202 North Corridor and Peterborough, Jaffrey and Rindge in the US 202 South Corridor.
- In our plan we used census designated places as a way to describe town centers that are part of the corridor. These are denser places where walkability and bikeability and a sense of place are extremely desirable and where transportation policy decisions should be context sensitive. Census designated areas along the corridor include the town centers of Antrim, Bennington, Hancock, Peterborough and Jaffrey.

## Population: Past & Future



Source: US Census and NH Office of Energy and Planning

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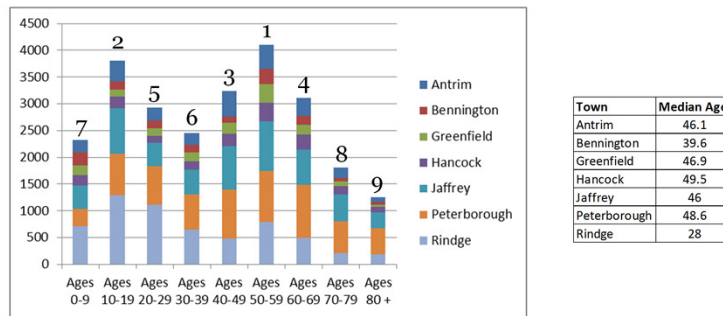
US 202 North & South Corridors

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- I want to start by talking about population change on the Corridor.
- Overall, the US 202 Corridor towns grew at about the same pace as the rest of NH between 1970 and 2010, the time period shown in the red box. The State growth rate was 78% during this period, compared to the average growth rate for the US 202 towns which was 87%. *Actually, you may be interested to know that the corridor communities and NH were growing faster than the US as a whole during this period. The US grew at a rate of 52% during the same period. While most of the towns grew fast, Antrim did grow slower during this period--at a rate of 25%. Bennington and Rindge both grew very fast at a rate of 131% and 177%, respectively.*
- You can see from the chart that Peterborough, Jaffrey and Rindge have shifted position in population level over the last several decades.
- In the smaller towns lower in the chart, Greenfield and Hancock have shifted population rank over the last several decades as well.
- Today towns range in size from about 1,500 people in Bennington to about 6,300 people in Peterborough.
- Demographers project that growth will be slow from here on in until 2040, the time period shown in the green box. The average growth rate for the thirty-year

period from 2010 to 2040 is expected to be around 6%, however, demographers are predicting that Hancock and Jaffrey may actually lose population.

## Population by Age Groups



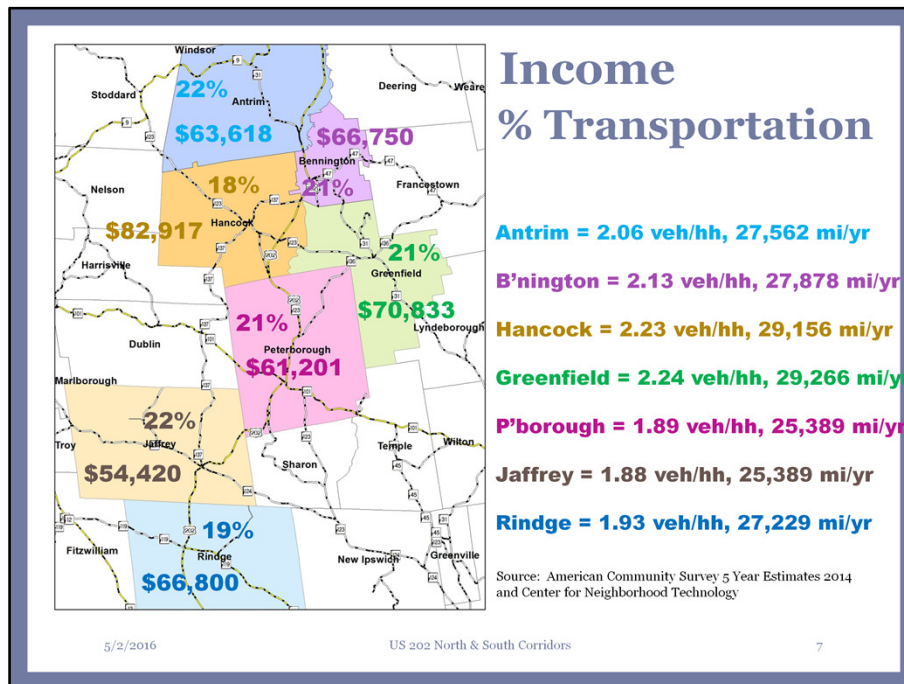
Source: American Community Survey 5 Year Estimates 2014

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US 202 North & South Corridors

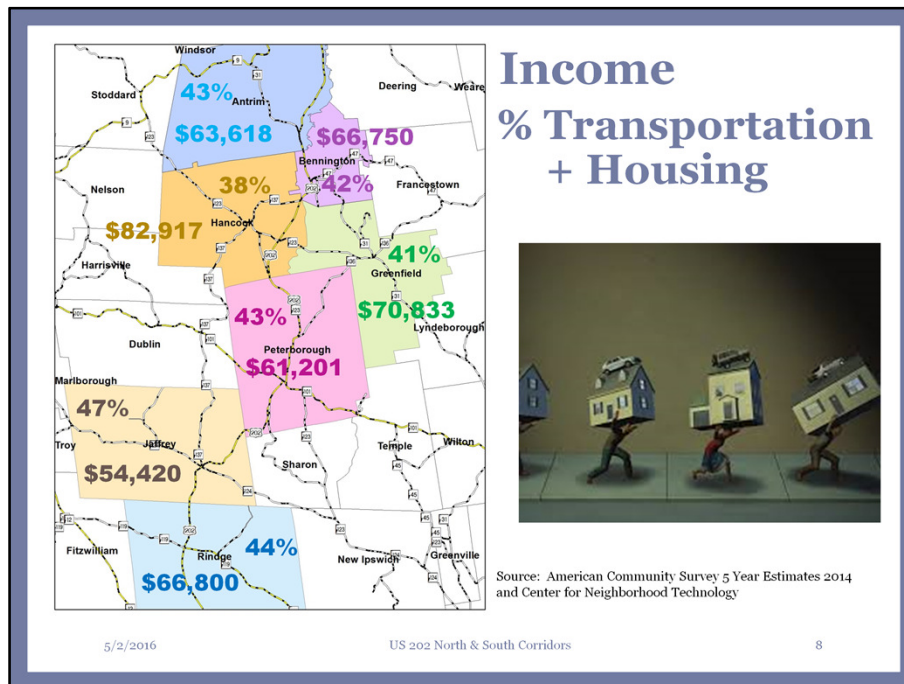
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- I've taken the seven towns in the Corridor to analyze the distribution of age groups by decade
- An large 60+ and older aging population—happening in other parts of Southwest NH—and NH--is also a trend on the US 202 corridor
- Overall the largest age cohort today is the 50-59 year olds--about 16% of the entire population's corridor
- The second largest cohort are 10-19 year olds, followed by 40-49 year olds and 60-69 year olds
- The 10-19 year old cohort—and the 20-29 year old cohort are inflated a good deal by Franklin Pierce University's students
- It brings Rindge's median age down to 28 years old
- Without the college—the top three age cohorts are 40-49, 50-59 and 60-69 year olds



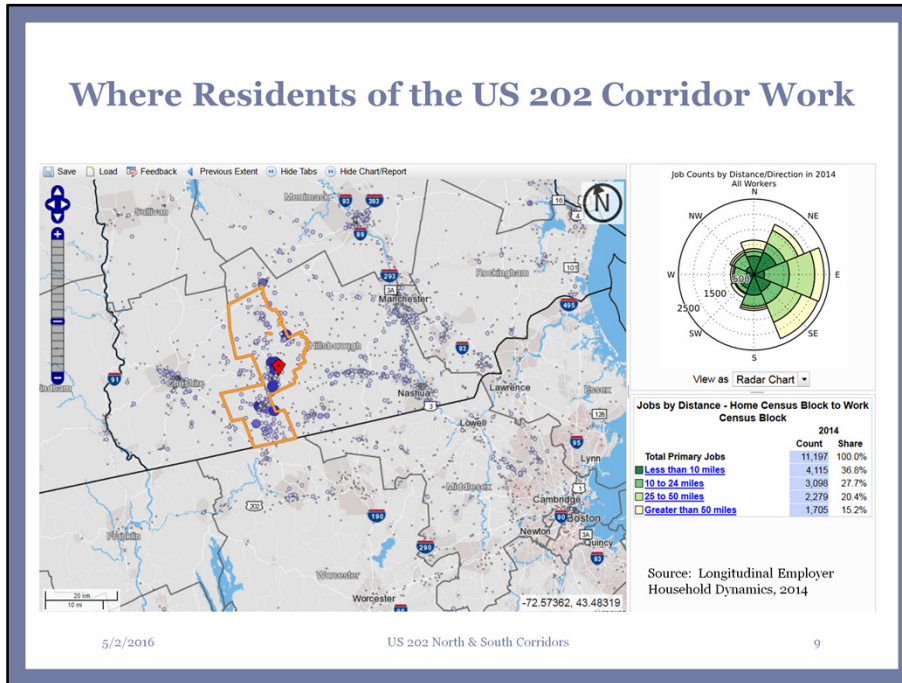
- Median annual income on the corridor varies widely ranging from about \$54,000 in Jaffrey to over \$80,000 in Hancock
- The Center for Neighborhood Technology, which is a think tank that has built models to understand the cost of transportation shows the proportion of income that a typical household spends on transportation. This methodology accounts for census data on vehicles and commuters per household, sample odometer readings, commuting data, and consumer expenditure survey data. The data shown on the map is calibrated to \$2.10 per gallon gas prices and based on ACS 2014 Census Median Incomes by town.
- Based on this data, it is estimated that half of each community's population spends at least 18 to 22% of their annual income on transportation alone.
- The cost of transportation is typically the second largest household expense...



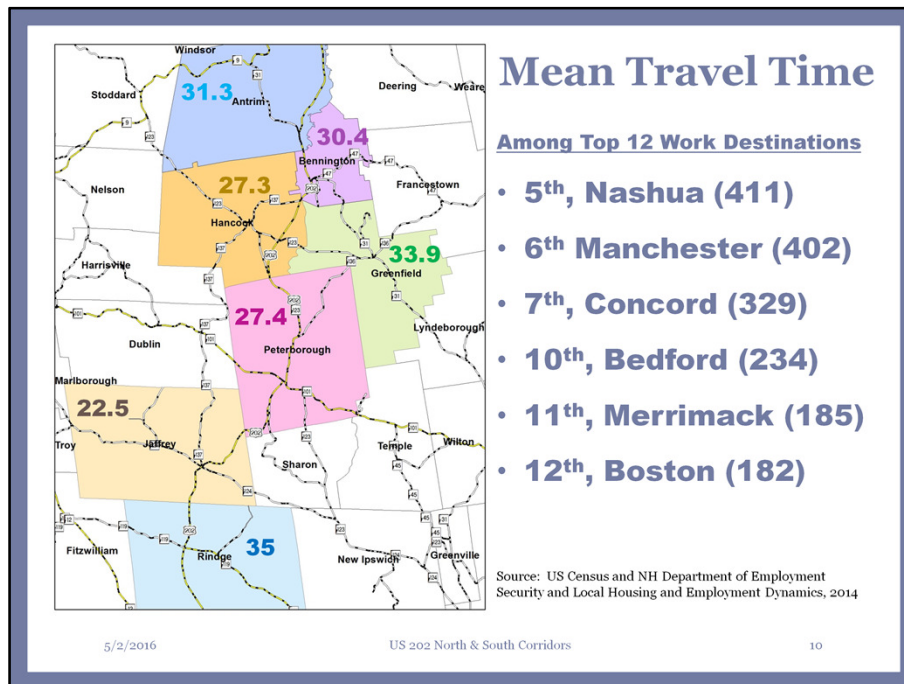


- The most expensive household expense is typically housing
- Housing experts usually say that if housing is 30% or more of annual household income, then it is not considered affordable because it consumes too much of household's budget to the detriment of other important household needs such as food, clothing, healthcare, education, etc.
- The 30% housing metric continues to be an important metric...however, many experts have updated their metric to account for the second most expensive expense category—transportation—because many people sacrifice inexpensive housing for more cars or longer commutes...in other words...more expensive transportation costs...This updated metric suggests that housing and transportation shouldn't be more than 45% of household income.
- On this map only one community--Jaffrey—exceeds this metric—but keep in mind that these are median numbers. In other words half of the households find housing and transportation more expensive than what is shown on the map.

## Where Residents of the US 202 Corridor Work

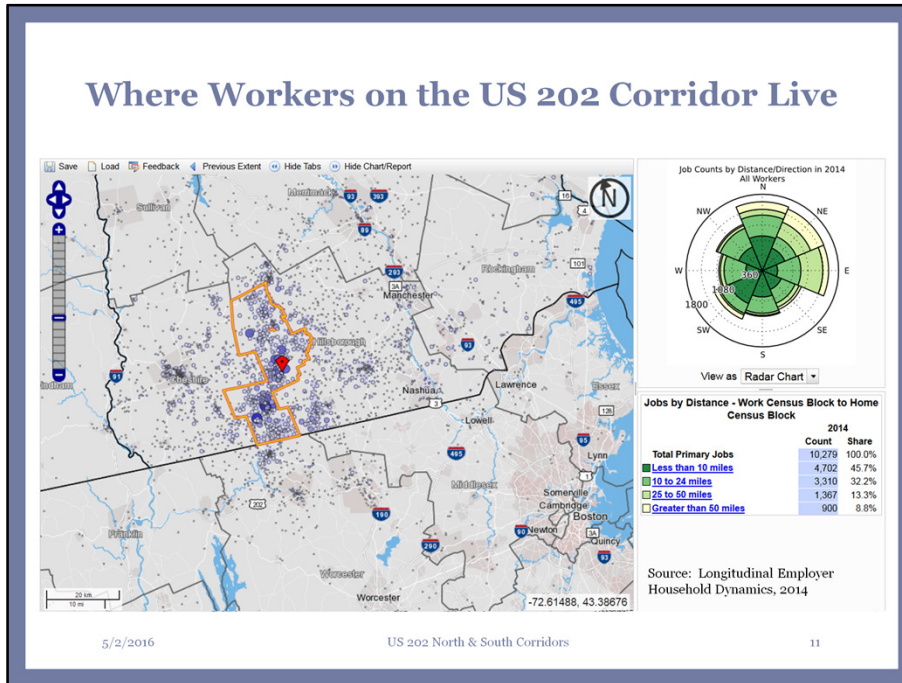


- Many of the services and shopping that the communities need can be found in the corridor area in nearby places like Peterborough and Rindge.
- Work commutes are mostly along the corridor as well—as noted by the concentration of blue dots on the corridor—but there are also many that commute far away to areas as far as Boston.
- As the radar graph shows in the upper right corner of the slide—most longer distance trips—25 miles or greater—are heading east.

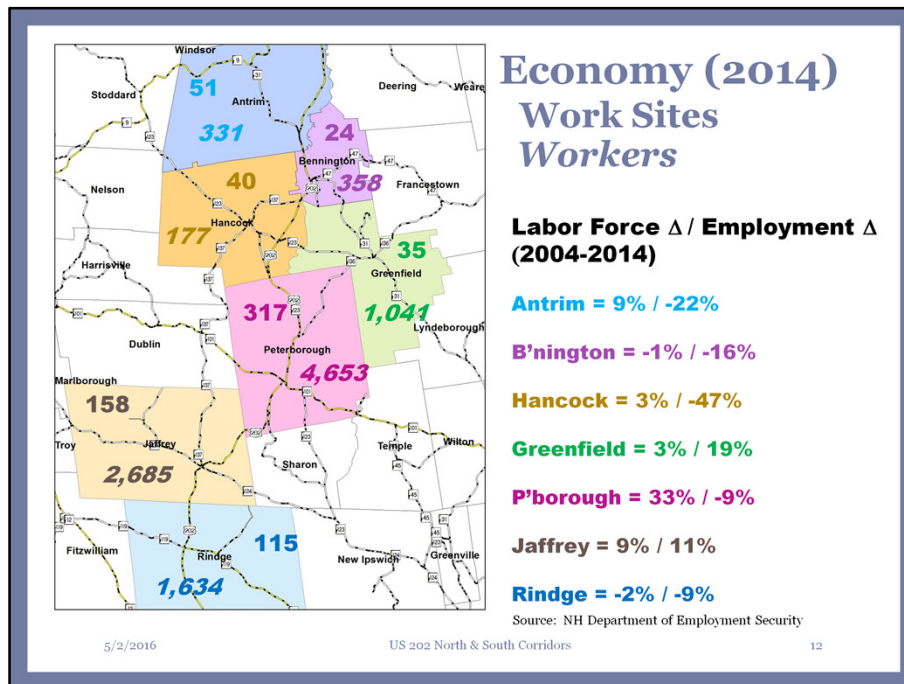


- According to the US Bureau of the Census, Antrim, Bennington, Greenfield and Rindge residents mean commute travel time is over a half hour one way.
- Jaffrey, Peterborough and Hancock have shorter commute times—Jaffrey and Peterborough have a higher proportion of available in-town jobs and Hancock has what appears to be a high proportion of home businesses, probably bringing the commute times down.
- On the right side of the slide, is a list of some of the top work destinations for the US Corridor communities. These types of destinations help bring the mean travel times up. Nashua is the 5<sup>th</sup> most popular work destination for the US 202 communities, Manchester is 6<sup>th</sup>, etc.
- The numbers in parentheses to the right represent the number of people residing on the corridor that work in those communities. In other words, 182 people residing on the US Corridor worked in Boston, MA in 2014.
- The commute destination data here does not include self-employed people or the military.

## Where Workers on the US 202 Corridor Live



- Unlike the commuting map earlier that showed 36 percent of the population commuting 25 miles or more each way to work, people that work on the corridor are much more concentrated on or near the corridor communities (22%). Instead of commuting toward the Boston area, most are commuting from nearby places in NH.

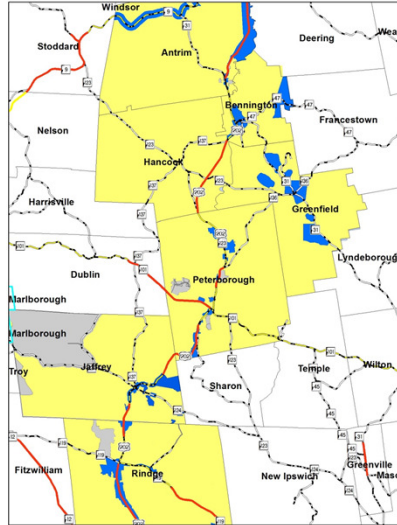


- This slide looks at some economic indicators to give a picture of the US 202 Corridor economy.
- In 2014, the most current data available, the southern end of the corridor has a higher proportion of work sites (regular font) and workers (italicized font) than the northern part of the corridor, however there are some large employers in the northern part—such as Crotched Mountain Rehabilitation in Greenfield and Monadnock Paper Mills in Bennington.
- On the right I am showing how each community's number of people in the labor force and jobs has changed from 2004 to 2014
- Each town has had very different economic experiences over the 11 year period
  - Only Peterborough experienced a boost in labor force—other towns have slow growth or lost labor force
  - For most US 202 corridor communities, it is likely that the local labor force will either grow slowly or recede as the labor force continues to age
  - Several towns lost jobs during this period—Hancock lost 47% of its jobs in the period. Greenfield and Jaffrey added jobs.

## Land Use

- Blue = Commercial/ Industrial Zoning or Commercial an Emphasis
- Yellow = Residential or Rural
- Grey = Other (Hospital zone, Mountain zone, College zone, etc)
- Red = Controlled Access Highway

Source: Towns and NHDOT



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- Over half of the US 202 Corridors are controlled access: 10.4 of 18.1 miles for the US 202 North Corridor and 8.8 of 13.7 miles for the US 202 South Corridor
- Controlled Access refers to highway in which through previous construction efforts, NHDOT has purchased access rights to land abutting the highway, so NHDOT has more authority to restrict driveway and entrance openings on those parts of the corridor. For example, if a landowner subdivides a property in the controlled access area, NHDOT has the ability to restrict access control so that the subdivided properties may enter the highway through a shared entrance or driveway.
- The controlled access parts of the highway are shown in red. Controlled access can be an important strategy for controlling certain high traffic generating land uses. Notice that NHDOT controls the entire commercially zoned area in northern US 202 in Antrim as well as the entire southern commercial area in Rindge.

# Housing

	Ratio of All Housing Units to Jobs	Housing Unit Vacancy (Not Including Seasonal Units)	Estimated Percent of Housing Units that are Seasonal Units	Housing Permits Issued 2010-2014			
				Single Family Units	Multi-family Units	Mobile Home Units	Total Units
Antrim	~3:1	6%	15%	13	0	0	13
Bennington	~2:1	9%	6%	0	0	0	0
Greenfield	<1:1	5%	6%	15	0	0	15
Hancock	~6:1	6%	11%	3	1	0	4
Jaffrey	<1:1	6%	6%	12	-7	-2	3
Peterborough	<1:1	6%	2%	-1	61	0	60
Rindge	~2:1	4%	15%	15	30	0	45
<b>Totals</b>				<b>57</b>	<b>85</b>	<b>-2</b>	<b>140</b>

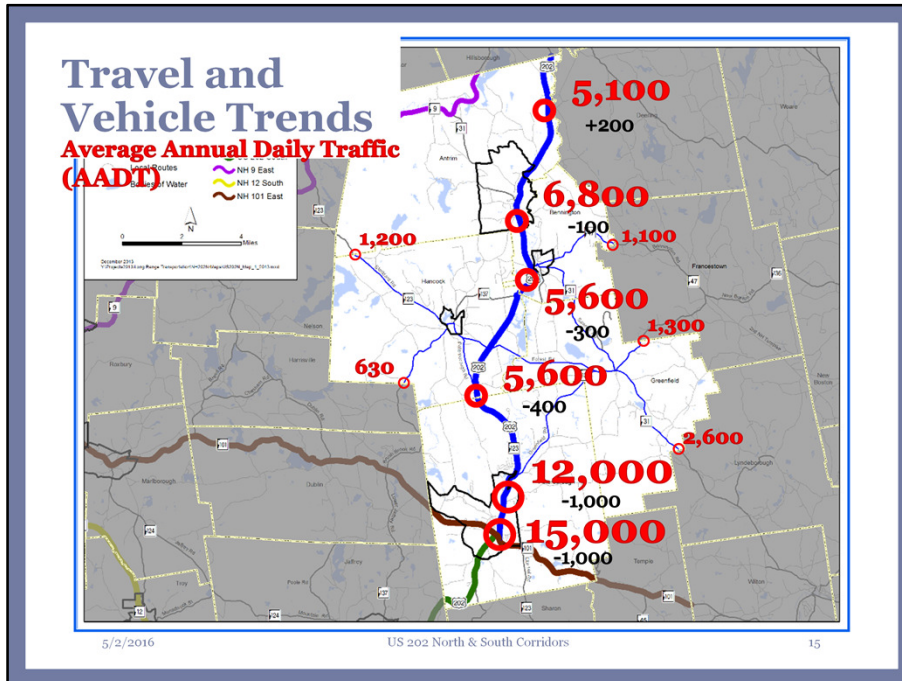
Source: NH Department of Employment Security and NH Office of Energy and Planning

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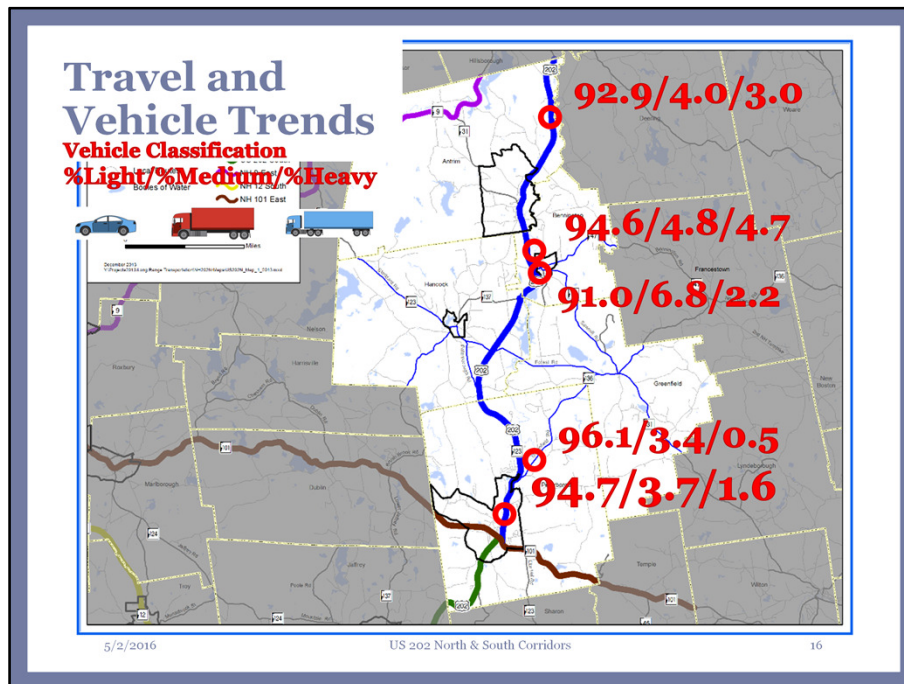
- Experts believe that a significant percentage of retirees are expected to age in place in New Hampshire. This is also expected for the US 202 Corridor communities.
- If that is the case, there is a question of where workers will be coming from to fill today's jobs. Unlike other parts of SW NH, many of the communities are not necessarily bedroom communities. The ratio of housing units to employment is relatively close. Only Hancock has a relatively high number of housing units to jobs. If residents stay in place, there is a possibility that there will not be a large supply of nearby housing to house local workers.
- Vacant housing rates—when accounting that much of the vacant housing is seasonal such as in Antrim, Hancock and Rindge--are low
- And building permit activity—with the exception of Peterborough and Rindge--has been relatively slow.
- If gas prices remain relatively high and vehicle transportation will remain the sole mode of choice—it may be a challenge to attract workers if the pace of building more housing in the area does not pick up.



- Vehicle travel is monitored throughout the state through the federal Highway Performance Monitoring System. There are roughly 6,000 sites throughout the state that are sampled every three years. The short term samples are then converted to average estimated traffic figures, or Average Annual Daily Traffic (AADT). That is, on average, the number of weekday vehicles that travel a section of highway per day.
- On the map above, which shows the US 202 North Corridor only, the largest circles represent locations along the US 202 North main arterial and the smaller circles are locations off the main arterial (NH 123, NH 136, NH 31, and NH 137). Text in black indicates the recent change in estimated AADT. From north to south:
  - US 202 (CONTOOCOOK VALLEY RD) SOUTH OF REST AREA – 5,100 AADT in 2014, 5,000 in 2008
  - US 202 & NH 31 (CONTOOCOOK VALLEY RD) AT BENNINGTON TL – 6,800 AADT in 2014, 6,900 in 2008
  - US 202 SOUTH OF JCT NH 31 – 5,600 AADT in 2014, 5,300 in 2008
  - US 202/NH 123 (CONCORD ST) AT PETERBOROUGH TL – 5,600 AADT in 2015, 6,000 in 2009



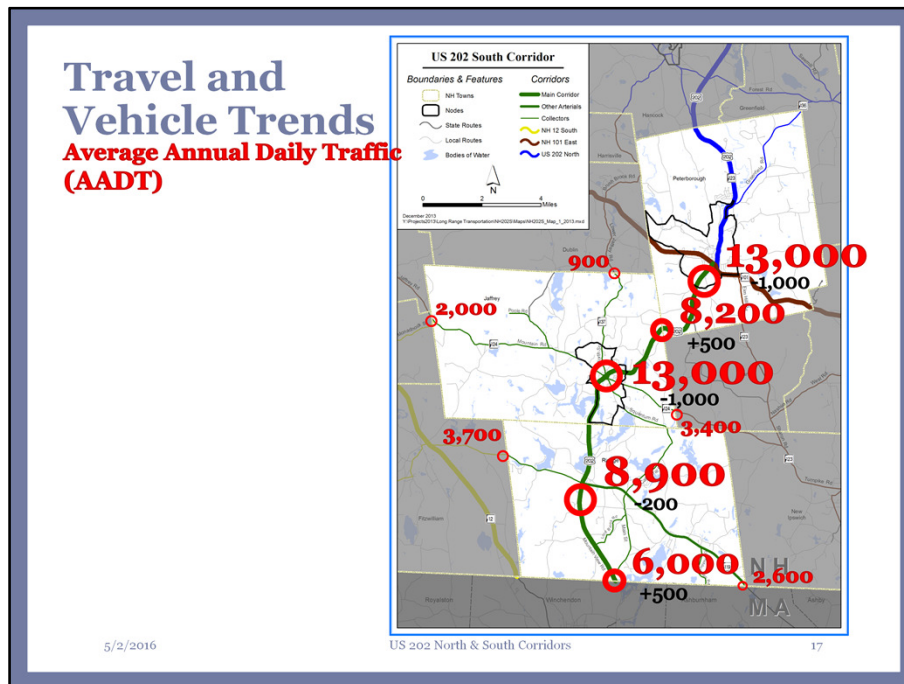
- US 202/NH 123 (CONCORD ST) SOUTH OF SAND HILL RD – 12,000 AADT in 2015, 13,000 in 2009
- US 202/NH 101 (WILTON RD) OVER CONTOOCOOK RIVER – 15,000 AADT in 2014, 14,000 in 2008
- Traffic volumes were the highest in Peterborough on the US 202 North routes. Traffic volume on US 202 decrease rapidly from a high of 12,000 vehicles per day north of NH 101 to 5,600 at the Hancock town line.
- In the short term, traffic volumes were observed to be relatively stable.



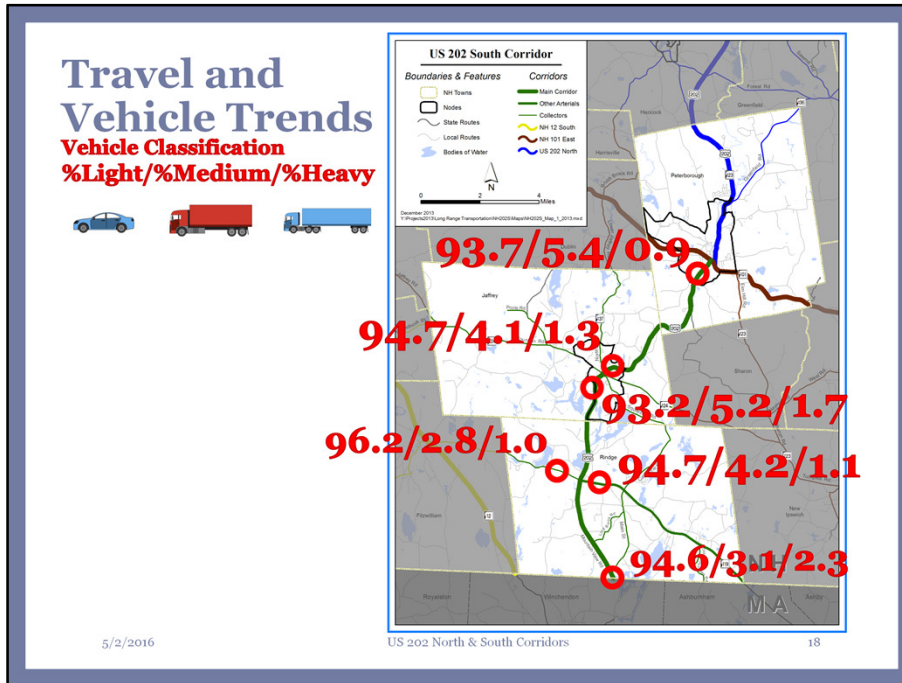
- A subset of these traffic sites were analyzed with respect to the classification of vehicles. Different schemes may be used to classify vehicles. One common way is to separate light duty, medium duty, and heavy duty vehicles. Light duty vehicles include passenger cars and trucks, medium duty vehicles include “single-unit” trucks, such as a box truck or interstate bus, and heavy duty vehicles include tractor trailer combinations of varying lengths and number of axles.
- The figures above depict the fraction of light, medium, and heavy duty vehicles as a percentage of total traffic (%light/%medium/%heavy) for the following sites (from north to south) on the US 202 North Corridor:
  - US 202 south of rest Area (Antrim)
  - Antrim Road east of US 202 (Bennington)
  - NH 31 east of US 202 (Bennington)
  - NH 136 east of US 202 (Peterborough)
  - US 202 north of NH 101 (Peterborough)
- Light-duty passenger vehicles dominate travel on this corridor. Compared to other corridors in the Southwest Region, US 202 North Corridor truck volumes are small. Much of the truck traffic is probably influenced by

Peterborough area industry and commerce. Collector roads, such as Antrim Road, which is used to access Monadnock Paper Mill in Bennington, carries a moderate amount of truck traffic as do other collector roads such as NH 136, a collector road to Greenfield which has some industry and services that attract truck traffic including American Steel Fabricators and Crotched Mountain Rehabilitation Center.

- Looking at US 202 only, the figures above translate to about 140 tractor trailers per day at the southern end of US 202 S and about 170 tractor trailers per day at the northern end. Please see page 120 of Southwest Connects for more information.

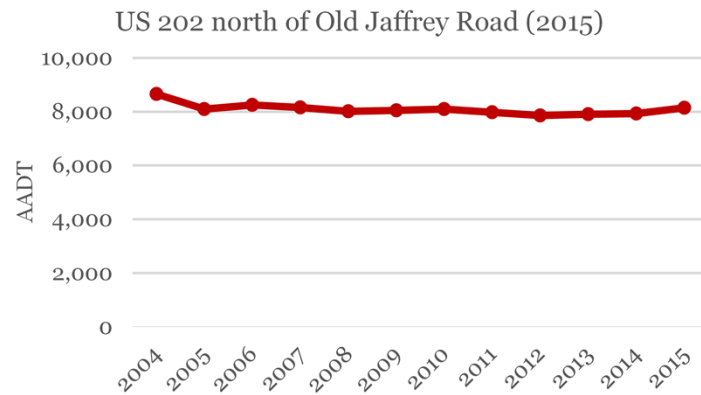


- Here are AADT numbers for the US 202 South Corridor.
- On the map above, the largest circles represent locations along the US 202 South main arterial and the smaller circles are locations off the main arterial (NH 137, NH 124, and NH 119). Text in black indicates the recent change in estimated AADT. From north to south:
  - US 202 (JAFFREY RD) SOUTH OF NH 101 – 13,000 AADT in 2015, 14,000 in 2009
  - US 202 (PETERBOROUGH ST) AT PETERBOROUGH TL – 8,200 AADT in 2015, 7,700 in 2009
  - US 202/NH 124 (MAIN ST) EAST OF NH 137 OVER CONTOOCOOK RIVER – 13,000 AADT in 2013, 13,000 in 2010
  - US 202 SOUTH OF NH 119 – 8,900 AADT in 2013, 9,100 in 2010
  - US 202 AT MASS SL – 6,000 AADT in 2013, 5,500 in 2010
- The US 202 South corridor generally is more heavily trafficked than the US 202 North corridor. Notably, it features two east-west collectors, NH 119 and NH 124.



- Here are vehicle classification numbers for the US 202 South Corridor.
- The figures above depict the fraction of light, medium, and heavy duty vehicles as a percentage of total traffic (%light/%medium/%heavy) for the following sites (from north to south):
  - US 202 south of NH 101 (Peterborough)
  - US 202 north of NH 124 (Jaffrey)
  - US 202 south of NH 124 (Jaffrey)
  - NH 119 east of US 202 (Rindge)
  - NH 119 west of US 202 (Rindge)
  - US 202 at Massachusetts state line (Rindge)
- The US 202 South Corridor, which links Peterborough to Massachusetts, also has minimal traffic, carrying about 120 daily truck trips a day between the two states. The US 202 South Corridor has several significant collector roads including NH 124 East, NH 119 West and NH 119 East. NH 124 East is an important route for local industry such as Millipore and Teleflex Medical.

## Travel and Vehicle Trends



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- As mentioned earlier, vehicle travel is monitored throughout the state per the Highway Performance Monitoring System. Certain information is collected via short-term studies, as seen in the preceding slides. In addition to these locations, NH DOT maintains roughly 60 sites throughout the state that are continuously monitored. Continuously monitored sites are helpful in understanding recent trends in traffic more clearly than short term studies because they operate each day of the year. There is one such device located on the US 202 S corridor.
- Traffic on US 202 near the Rindge town line has been relatively stable over the last 10+ years.

## Asset Condition

- Pavement Condition
- Bridge Condition
- Red List Bridges
- Rail Lines Capable of Speeds of 40 MPH
- Airport Runway Surface Conditions
- Remaining Useful Life of Transit Buses

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- *Southwest Connects*, the regional transportation plan, incorporates performance measures to understand the states of different assets on each corridor. Some performance measures are borrowed from MAP-21, while others come from NH DOT's Balanced Scorecard.
- Under the Balanced Scorecard, any bridge with a major structural element in poor condition is a red list bridge. Every bridge is inspected at least once every two years, state-owned red-listed bridges are inspected twice per year, and municipal red-listed bridges are inspected at least once per year.

Improve Asset Conditions

## Pavement Condition

### NHDOT Balanced Scorecard

#### Road Comfort Index

— Good	No Work Required	- greater than or equal to 3.5
— Fair	Some Work Required	- between 2.5 and 3.5
— Poor	Major Work Required	- less than or equal to 2.5

### MAP21 Performance Requirements

- Measures: % Interstate Good, % Interstate Poor  
% NHS Good, % NHS Poor
- Calculation: Ride Comfort Index (International Roughness Index)  
Cracking Percent  
Rutting

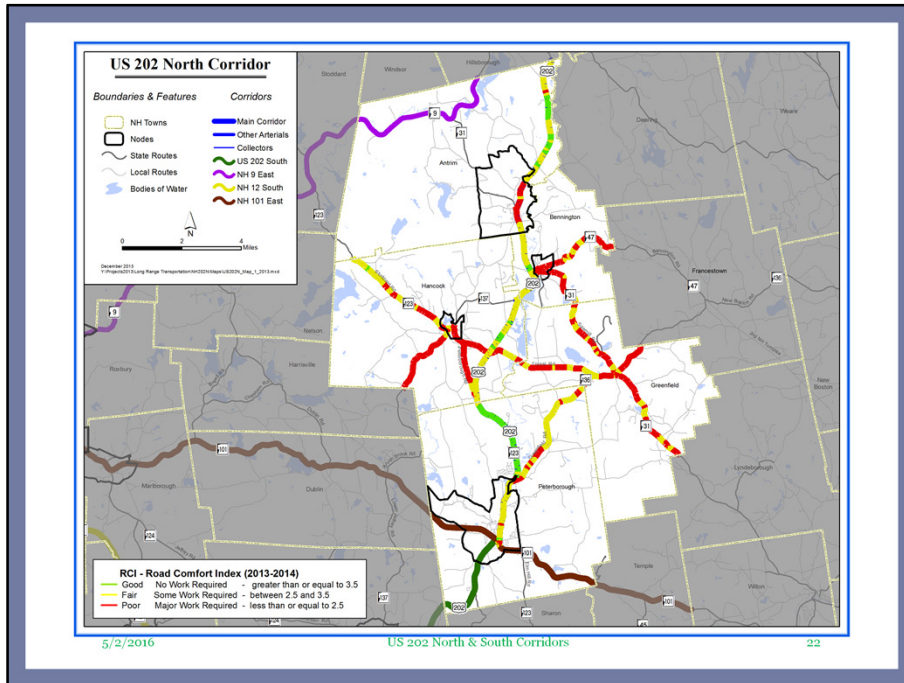
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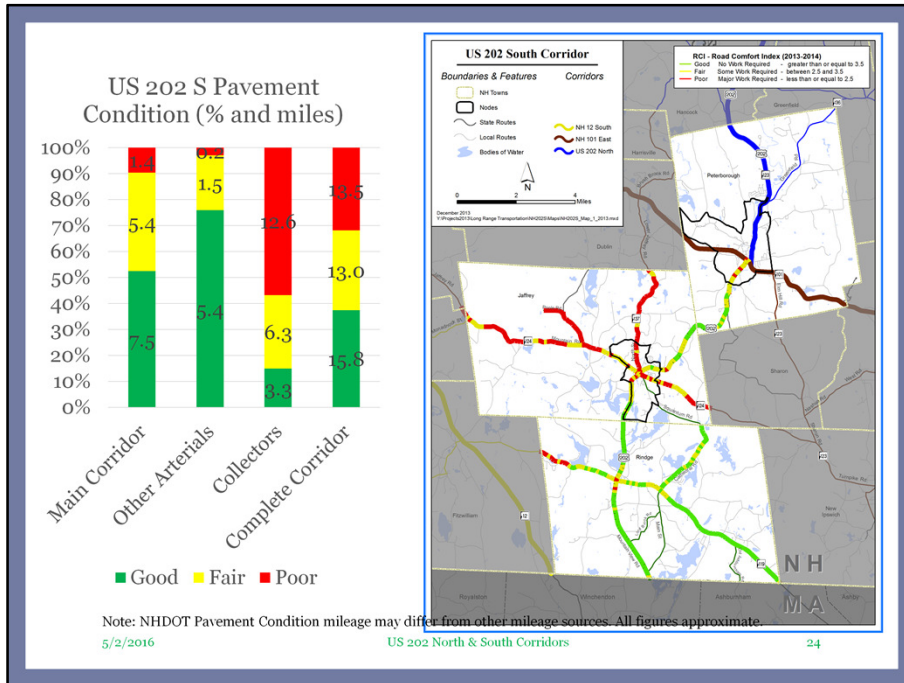
- NHDOT is currently using a Road Comfort Index to measure its roads. MAP-21, superseded by the FAST Act, introduced a new rule that will require that the State also incorporate rutting and cracking into their calculations of pavement condition. SWRPC expects to have access to this additional information in the future.
- The condition measures proposed are listed on the slide above: percentage of interstate pavements in good and in poor condition, and the percentage of non-interstate National Highway System pavements in good and in poor condition. Although not all corridors included National Highway System mileage, SWRPC continues to provide information for all surveyed portions of each corridor including non-National Highway System arterials as well as collectors. US 202, the subject of this presentation, is actually not part of the National Highway System.
- For a map of National Highway System routes in New Hampshire, visit [http://www.fhwa.dot.gov/planning/national\\_highway\\_system/nhs\\_maps/new\\_hampshire/nh\\_newhampshire.pdf](http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/new_hampshire/nh_newhampshire.pdf). There are no National Highway System routes on either the US 202 North or South corridors.
- Today, SWRPC continues to provide information on the percentage of pavements in good, fair, and poor condition, as provided by the most recent data from NH DOT (2013-2014).



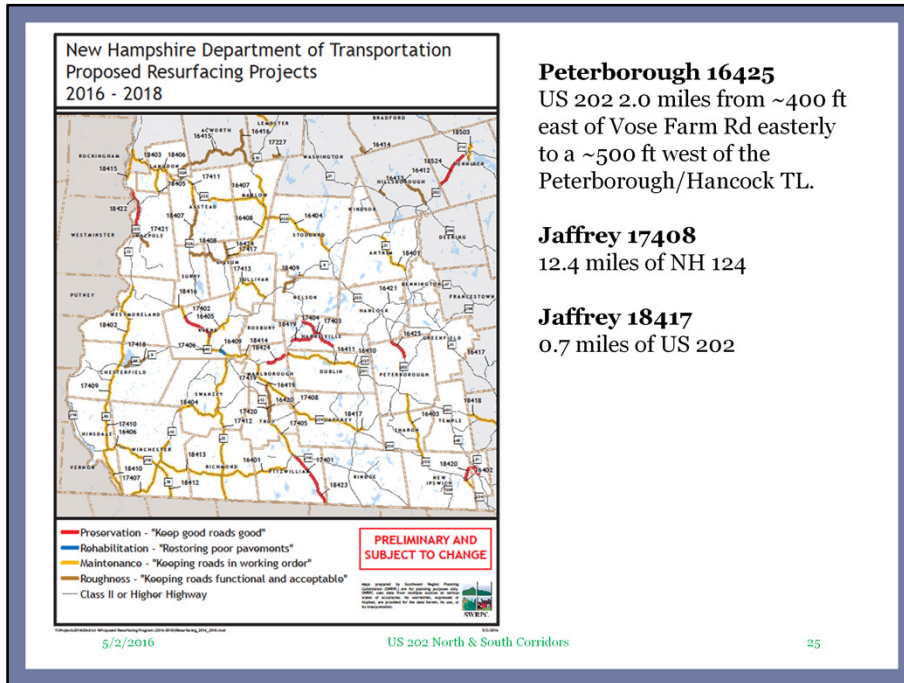


- Under the FHWA proposed rule, NH will establish a statewide target for pavement and bridge condition measures.
- Currently pavement condition is recorded under contract with Pathways, utilizing specialized sensors, which record pavement condition attributes in 1/10<sup>th</sup> of a mile increments in one direction. National Highway System mileage is surveyed every year. Unnumbered state highways ( i.e. Cathedral Road in Rindge) are surveyed every other year.
- 2013-2014 NH DOT data displayed in the current slide is based on Ride Comfort Index (RCI) only (0-5 scale): Good is > 3.5, 2.5 – 3.5 is fair, < 2.5 is poor. RCI is based on the International Roughness Index (IRI), one of three measures to be utilized as part of MAP-21 performance measure proposed rule-making. The other two were cracking and rutting.



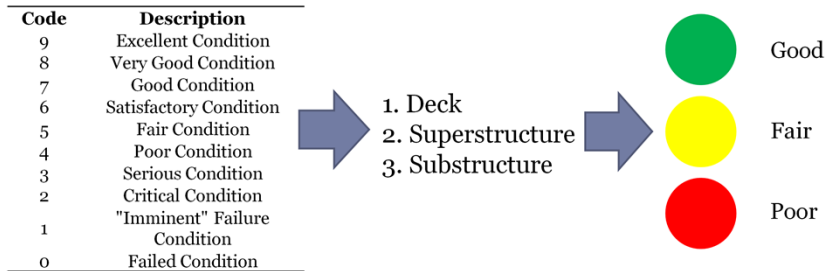


- As a whole, the entire US 202 South corridor was in a better state of repair, when considering the recent 2013-2014 data. Approximately 37.3% of its pavements were calculated to be in good condition with another 30.7% in fair condition. The remaining fraction, about 31.9% were in poor condition.
- The highest need for pavement reconstruction/rehabilitation is off US 202, including NH 124 and NH 137 in particular.
- The chart above depicts both the percentage and approximately mileage of US 202 S routes in good, fair, and poor condition.
- NH 124 west of its intersection with US 202 to NH 101 in Marlborough is currently scheduled for the 2017 construction/paving season, approximately 12.4 miles in total.



- The map above depicts resurfacing projects scheduled in our region from 2016-2018 by NH DOT. One project is located on the US 202 N corridor (16425) and two projects are located on the US 202 S corridor. For more information about NH DOT's paving program, visit <https://www.nh.gov/dot/org/projectdevelopment/planning/amps/facts-figures.htm>.

Improve Asset Conditions  
**Bridge Condition**



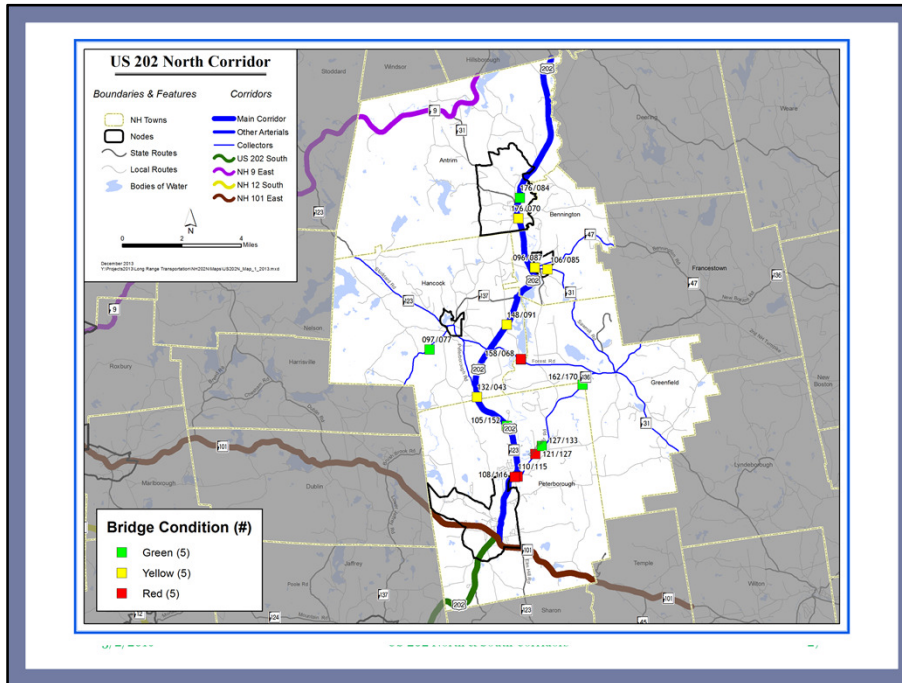
Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges  
 USDOT FHWA Report No. FHWA-PD-96-001

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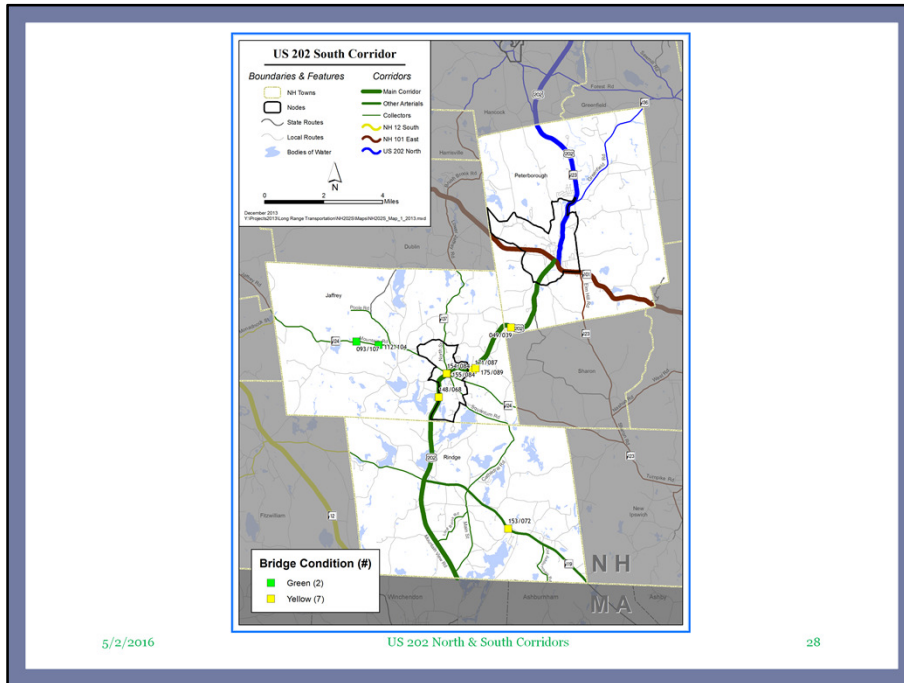
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- Bridge inspection data is available once per year (April) from the Department of Transportation. Figures may be somewhat of a lagging indicator, depending on the time of inspection and scheduled maintenance.
- Under MAP-21 performance measures, which rely on the National Bridge Inventory (NBI), the deck, superstructure, and substructure of each bridge are rated on a scale from 0-9. If all 3 are 7 or higher, the bridge is in good (green) condition. If 1 item is 4 or less, the bridge is in poor (red) condition. For a Culvert, which only has one rating in the NBI, 7 or higher is good, 5 or 6 is fair, and 4 or lower is poor.
- In general, a "structurally deficient" bridge is one with a condition rating of 4 or less in the Deck, Superstructure, Substructure, or Culvert categories and an appraisal rating of 2 or less in the Structural Condition or Waterway Adequacy National Bridge Inventory categories.



- There are 15 bridges located directly on highways of the US 202 N corridor system. The map shows that 5, or 1/3 are in “red-listed” condition.
- In Hancock, County Bridge, located at the town line with Greenfield over the Contoocook River is on the State Redlist. Although all three criteria of the bridge are rated in fair condition or better, it is considered structurally deficient. The original bridge was constructed in 1937. It carries fewer than 1,000 vehicles per day of traffic and was last inspected in October of 2015. The bridge has a posted weight limit of 8 tons.
- Peterborough has the majority of Redlist bridges:
  - On NH 136, 121/127 over Bogle Brook was first constructed in 1901 and was last rebuilt in 1980. The bridge substructure was rated in poor condition. The bridge carries approximately 2,900 vehicles per day and is posted E2. Also on NH 136, 110/115 is a culvert on the State Redlist.
  - On US 202/NH 123, 108/116 received poor ratings for both the deck and substructure. The superstructure received a fair rating. This bridge was first constructed in 1942, was last rebuilt in 1974, and carries approximately 6,900 vehicles per day over the Contoocook River.
  - Not depicted on the map above is 092/089, a municipal red list bridge on Main Street over the Contoocook River, which carries approximately 12,000 vehicles daily. Both the deck and superstructure were last rated 3 (serious condition) and it was built in 1940. Also not depicted on the map above is 087/077, US 202/NH

101 over the Contoocook River. This bridge carries approximately 15,000 vehicles per day over the Contoocook River. The deck of the bridge was rated in poor condition in October of 2015. It was first constructed in 1958.



- There are fewer bridges located on the US 202 South Corridor, and they are in better condition. As of the most recent available date from NH DOT, none were assessed to be in poor condition. However, a number of structures have one or more attributes rated a 5 (fair), approaching poor condition:
  - 171/087 US202 over CONTOOCCOOK RIVER
  - 155/084 US202,NH124 over CONTOOCCOOK RIVER
  - 148/068 US202 over MOUNTAIN BROOK
  - 153/072 NH119 over CONVERSEVILLE BROOK



## Improve Safety

- Fatalities: From MAP 21
- Serious Injuries: From MAP 21

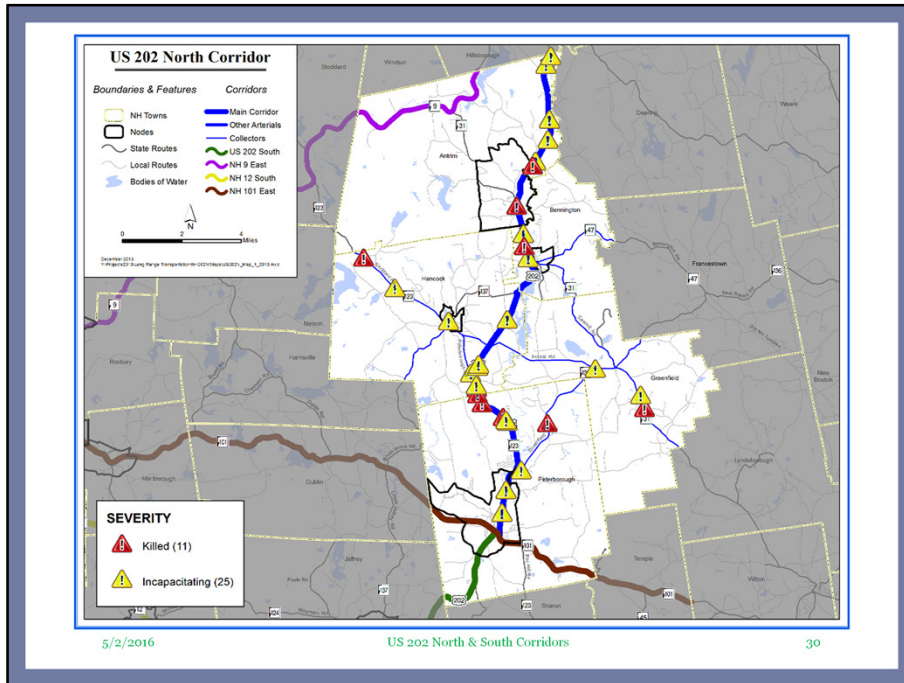
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Source: NHDOT

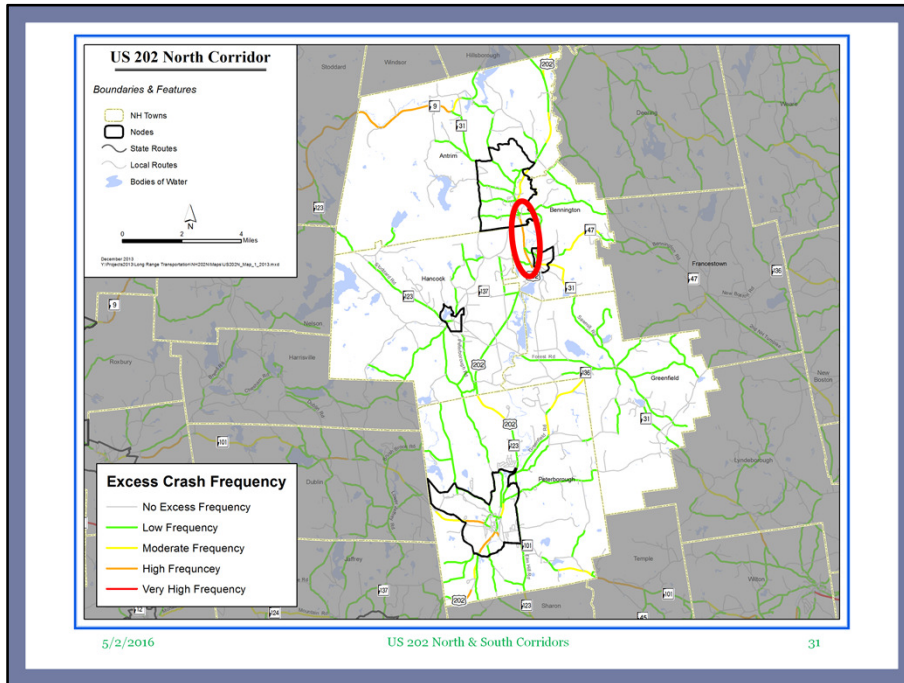
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- Safety is also measured by performance measures.
- Currently, the FHWA measures safety by tracking fatalities and serious injuries, measures that are recorded with every accident report on US highways.

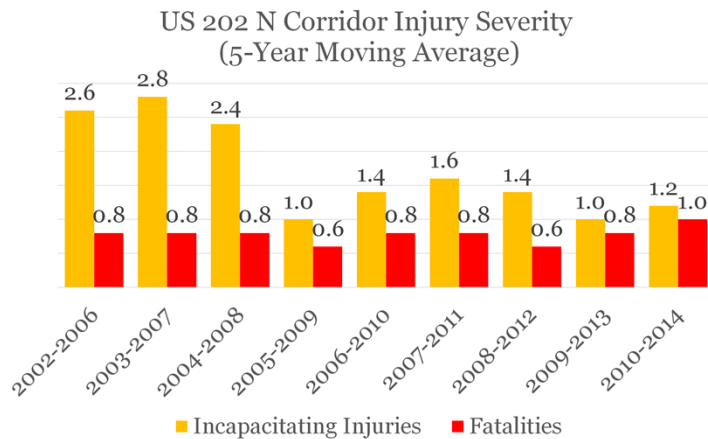


- Here is a map showing fatality and serious injury crashes in the US 202 North Corridor System for the period we have data available (2002 – 2014).
- Over that time period, there were a total of 11 fatalities and 25 incapacitating injuries on US 202 and its collectors.



- NH DOT utilizes a predictive model in accordance with the Highway Safety Manual to examine the performance of highway segments (not intersections). One segment, located on US 202 in Bennington is in the top 5% worst performing in the State based on the frequency of injuries.

## Per 100 Million VMT

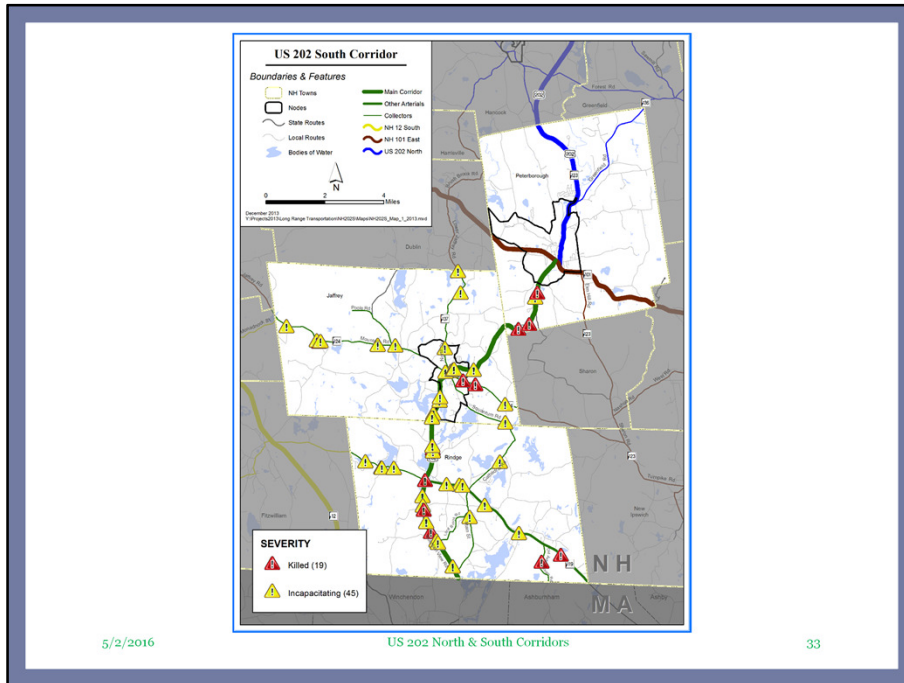


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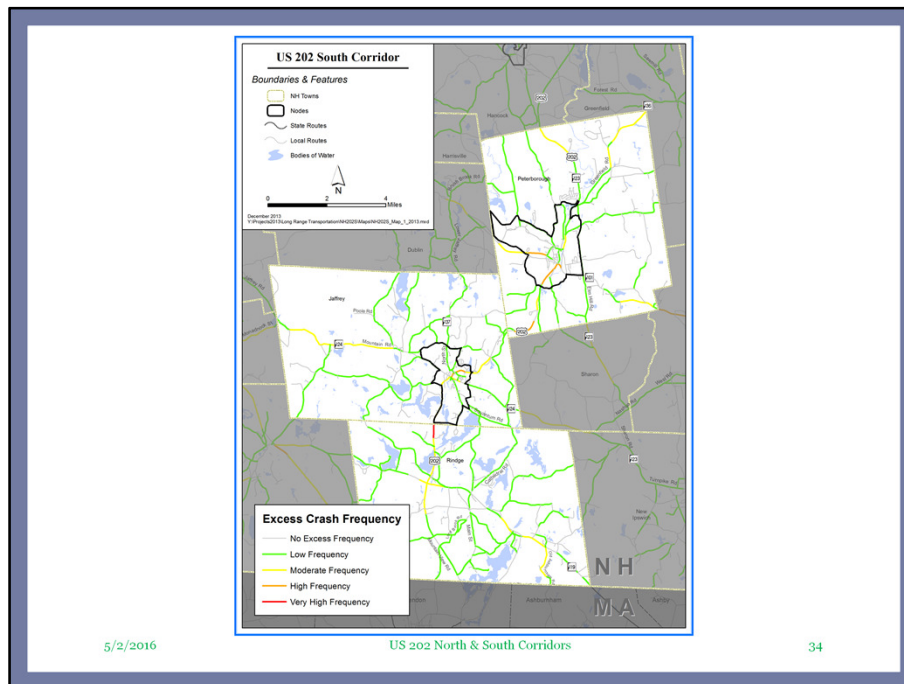
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- Since the MAP-21 performance measure is based on a 5 year rolling average, SWRPC gathered historical data to show changes in fatalities and incapacitating injuries.
- The rolling average of serious injuries and fatalities is useful because it reduces “spikes” that may happen from year to year. NHDOT currently supports this effort through a target of zero deaths and to reduce the five-year average fatalities and serious injuries statewide 50 percent by 2030.
- In absolute terms, US 202 North accounted for approximately 1.8 incapacitating injuries per year, and 1.4 fatalities per year between 2010 and 2014.
- Adjusting the fatality and serious injury rates based on the amount of travel on each corridor allows SWRPC to make comparisons between corridor systems. When comparing safety performance between an arterial and a less busy collector, it also takes away the bias from the principal arterial carrying the majority of annual daily traffic.
- The rate, per 100 million annual vehicle miles traveled over a 5-year period, is consistent with proposed MAP-21 rulemaking.
- Recorded traffic volumes were used to estimate the annual traffic in vehicle miles traveled or VMT.



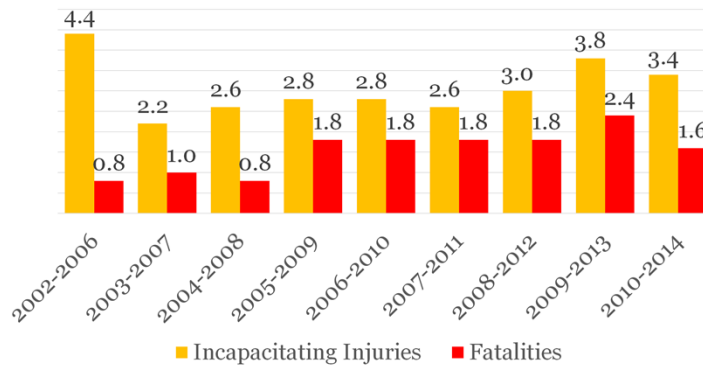
- Here is a map showing fatality and serious injury crashes in the US 202 South Corridor System for the period we have data available (2002 – 2014).
- Over that time period, there were a total of 19 fatalities and 45 incapacitating injuries on arterials, collectors, and at intersections along this system.



- NH DOT utilizes a predictive model in accordance with the American Association of State Highway and Transportation Officials Highway Safety Manual to examine the performance of highway segments (not intersections). Three segments were in the top 5% worst performing in the State based on the frequency of injuries including Wilton Road in Peterborough, Mountain Road in Jaffrey, and Forristall Road in Rindge. None of these segments were located on the US 202 South Corridor system.
- In addition to examining and rating highway segments, NH DOT also tabulates a list of the top 100 worst performing interstections. The list is calculated using a similar methodology as the one used to examine highway segment (based on the American Association of State Highway and Transportation Officials Highway Safety Manual). Prescott Road at its intersection with NH 124 (Turnpike Road) was the only intersection located in either the US 202 North or US 202 South corridors.

## Per 100 Million VMT

US 202 S Corridor Injury Severity  
(5-Year Moving Average)



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- In absolute terms, US 202 South accounted for approximately 4.6 incapacitating injuries per year, and 2.2 fatalities per year between 2010 and 2014, significantly more than on US 202 North. After accounting for the increased traffic volumes on the US 202 South corridor compared to the US 202 North corridor, the injury and fatality rates were still considerably higher. Further, the historical rolling average appears to be stable or trending upwards.

# Improve Mobility

Level of Service

$$\frac{v}{c} = \frac{AADT \times K \times D}{L \times F}$$

Where

*AADT* Average Annual Daily Traffic  
*K* Percent of AADT occurring during peak hour  
*D* Directional distribution during peak hour  
*L* Total number of lanes per direction  
*F* Maximum flow rate

**\* Based on 2011 data**

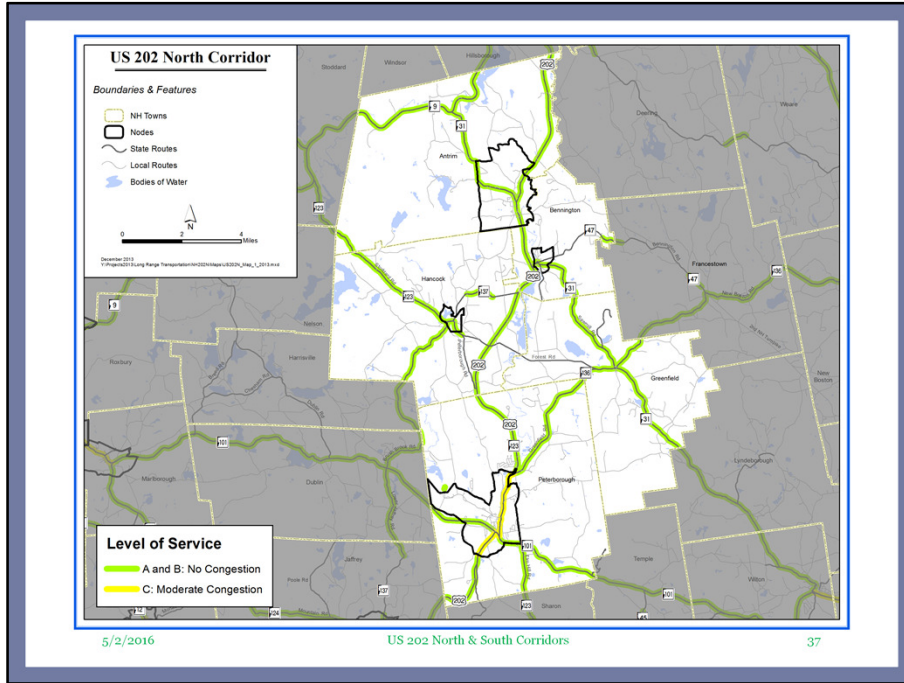
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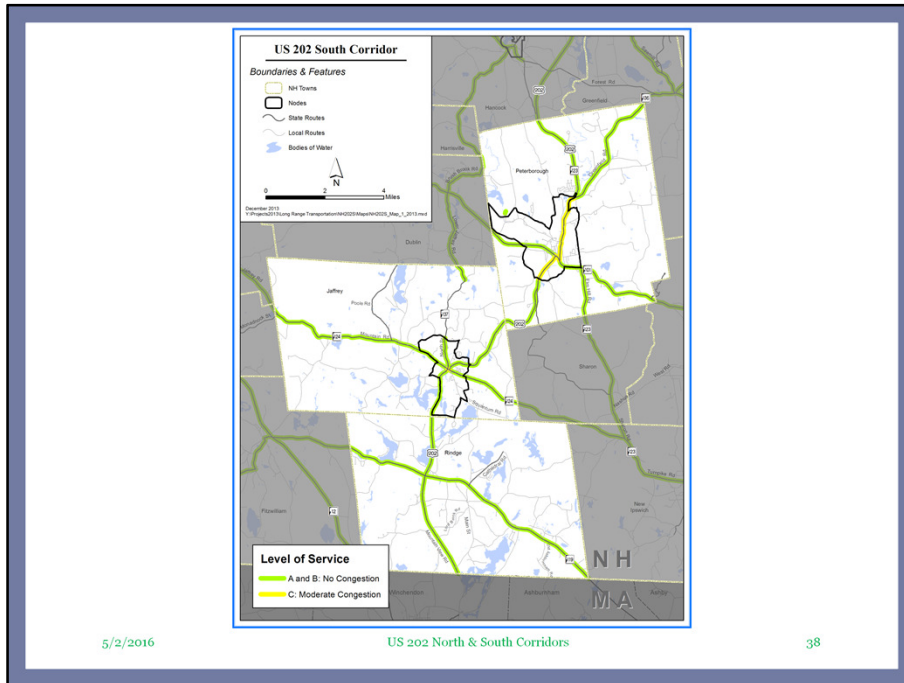
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- Another performance measure that MAP-21 and NHDOT are concerned with is “mobility.” Mobility refers to relative ease of travel. Measuring delay, either directly or indirectly, is one a common way transportation planners evaluate mobility. Nationally, MAP-21 has the stated goal of congestion reduction on the National Highway System.
- MAP-21 has not finalized its performance measure regarding mobility at this time. NHDOT is currently reassessing the best way to measure mobility.
- Since the status of mobility measures are in flux, SWRPC has temporarily used volume/capacity ratio and level of service (LOS) as a temporary way to measure mobility. A highway’s volume to capacity ratio determines its LOS by comparing the peak hourly rate of flow in vehicles per hour, to the capacity of that road.
- The map utilizes the average peak hour of the average peak month. The results factor in the number of lanes, the theoretical maximum flow per lane, as well as directional distribution. A indicates no congestion. B and C indicates moderate congestion.
- In the future, NH DOT will provide actual travel times per road segment for improved measurement of delay.





- The above map depicts level of service during the peak hour of demand during the day. On the US 202 North Corridor--outside of the intersection of US 202 and NH 101--most segments experience relatively little congestion.



- The above map depicts level of service during the peak hour of demand during the day. On the US 202 South Corridor--Outside of the intersection of US 202 and NH 124--most segments experience relatively little congestion.

## Improve Multimodal Accessibility

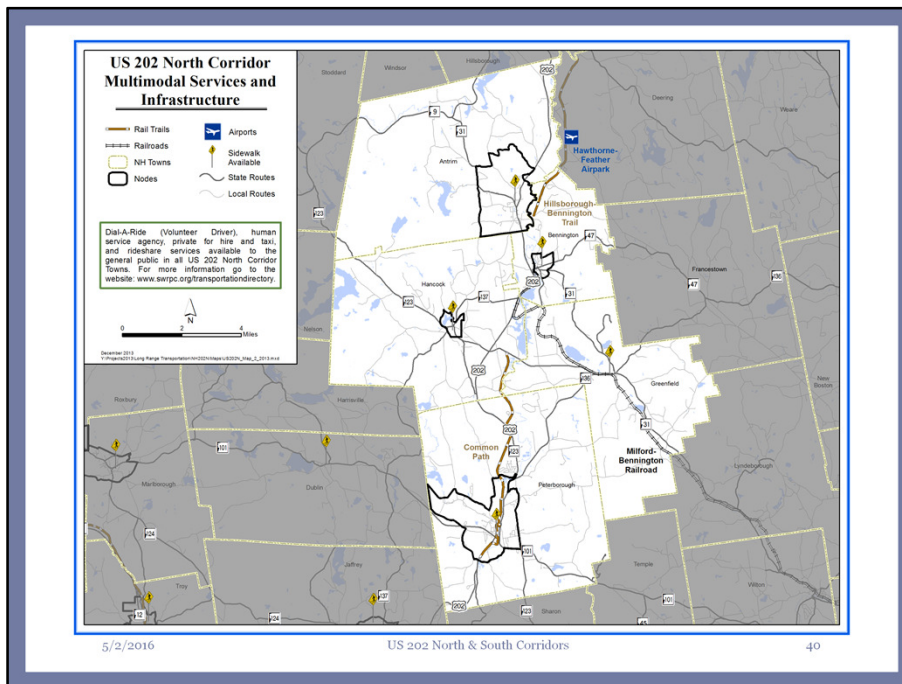
- Sidewalks: From Monadnock Alliance for Sustainable Transportation (MAST)
- Bikeways: From MAST
- # of Park and Ride Lot Spaces: From MAST
- Public Transit Routes: From MAST
- Intercity Bus Routes: From MAST

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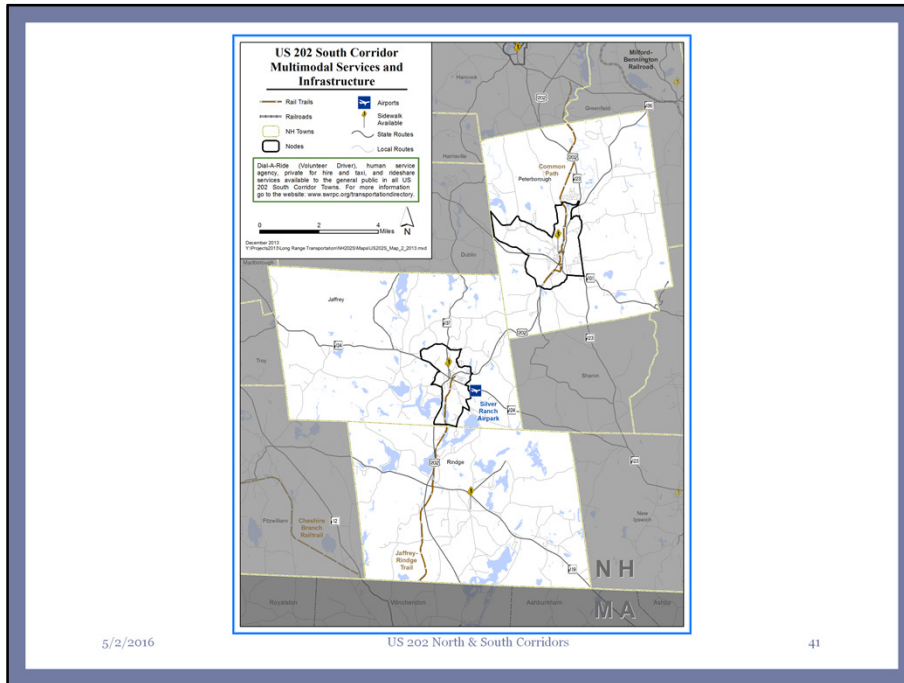
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- Multimodal accessibility is not a performance measure that is yet being used by MAP-21. NHDOT's Balanced Scorecard has some measures but they are in a state of research and development. As a result, the Southwest Connects Plan, decided to use multimodal measures that are currently being measured by the Monadnock Alliance for Sustainable Transportation in its Action Plan. This plan looks at mileage of sidewalks, bikeways, # of park and ride lot spaces, mileage of public transit routes and mileage of intercity bus routes over time.



- For each corridor, the Plan shows available multimodal services and infrastructure. These are things like intercity bus services, public transportation, rail trails, railroads, airports, intermodal facilities, nodal centers with sidewalks, etc.
- Antrim, Bennington, Hancock, Greenfield and Peterborough each have sidewalk infrastructure, though there is more infrastructure in Antrim, Bennington and Peterborough. Hancock, has an interesting stone dust/dirt sidewalks which fit in well with the small downtown area.
- The Milford Bennington Railroad is an active railroad owned by the State which snakes through Greenfield Hancock and Bennington. It has been used most recently as a rail to transport gravel and was used for a time for excursions to Greenfield State Park.
- Further up the rail turns into trail into Hillsborough as the Hillsborough-Bennington Trail.
- The Common Path is an important multi-use trail along the US 202 North Corridor.
- There is no local transit available in this area, but there are some services such as the volunteer driver program run by Contocook Valley Transportation Company.
- An intercity bus route runs through Peterborough (but does not stop) along NH 101 that stops in Brattleboro, VT, Keene, Nashua and Boston, MA on Fridays and Sundays.
- For more information on multimodal services and infrastructure on the US 202 North Corridor, see page 123 of *Southwest Connects*.



- For the US 202 South Corridor, Peterborough and Jaffrey both have good sidewalk networks. There are some sidewalks in Rindge.
- The Jaffrey Rindge trail provides good connectivity between the two towns. This was part of a former railroad that extended into Peterborough. Unfortunately the connection from Jaffrey to Peterborough is not connected anymore.
- There is no regular local transit available in this area, but there are some services such as the volunteer driver program run by Contoocook Valley Transportation Company. In addition the Monadnock Adult Day Care Center runs a bus to destinations along the corridor including shopping in Rindge.
- For more information on multimodal services and infrastructure on the US 202 South Corridor, see page 134 of *Southwest Connects*.

## Regional Transportation Challenges

- Downtown Jaffrey – Balancing Accessibility and Mobility
- Mobility-Accessibility for Non-Drivers
- Passing Opportunities?

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- SWRPC is aware of some transportation challenges associated with the US 202 Corridor. These include:
  - The need to balance vehicle/truck mobility on US 202 while improving walkability/bikeability/parking in downtown Jaffrey
  - Improving what there are for transit options for non-drivers such as the elderly, disabled, youth.
  - US 202 may need to examine vehicle passing opportunities

## Regional Transportation Opportunities

- Milford-Bennington Railroad?
- Rail Trail Connectivity?
- Improve Walkability in Antrim, Jaffrey, Peterborough?
- Synergies with Franklin Pierce University?

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- There may be opportunities for the US 202 to upgrade its personal and freight transportation options including the
  - Milford-Bennington Railroad which has upgraded track that passes through Greenfield, Hancock and part of Bennington
  - There are some important gaps in the rail trail—should Jaffrey and Peterborough explore a way to connect their rail trail-common path systems?
  - Several town centers are located on the US 202 corridor including Antrim, Jaffrey and Peterborough. There may be opportunities to improve walkability for the local population.
  - Are there opportunities to work with FPU to improve intercity bus transit for regional residents?

## Future Programmed Projects

- Antrim 14942 – Craig Road bridge replacement (Red List)
- Antrim 29468 – West Street over Great Brook bridge replacement
- Bennington 29486 – South Bennington Road over Russell Brook bridge rehab or replacement
- Jaffrey 16307 – Reconfigure “dog-leg” intersection of US 202, NH 124, and NH 137
- Peterborough 14772A – Reconstruct US 202 at Main Street intersection and retaining wall
- Peterborough 14933 – Main Street bridge replacement over Contoocook River (Red List)

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- Several projects are scheduled in the near term in communities along the corridor.
- For more information about these projects contact SWRPC.



## Future Programmed Projects

- Peterborough Peterborough 15879 - Bridge Replacement and Widening, US 202 & NH 101 over Contoocook River (Red List)
- Peterborough 27712 - Bridge replacement of bridge carrying US 202 and NH 123 over Contoocook River (108/116)
- 40082 - NH136 over Boglie Brook (121/127) - Repair extension toe walls
- Statewide 40595 – Repair State-owned railroad bridges
- Bennington 16030 – Reconstruct roadside in village area

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- Here are some other future programmed projects...

## Future Projects?

### Antrim

- Downtown walkability/bikeability?

### Bennington

- US 202 safety performance improvements?
- Railroad Bridge over Antrim Road?

### Greenfield

- NH 136 and RR crossing?

### Hancock

- ?

### Peterborough

- Access Management on US 202 S of NH 101?
- US 202/NH 101 Roundabout?

### Jaffrey

- Downtown walkability/bikeability/parking?

### Rindge

- US 202 safety performance improvements?

### Regional

- Park and Ride Lot?
- Investment in Demand Response Transit?
- Jaffrey/Peterborough Rail Trail Connection?

- Over the years, SWRPC has been approached with other project ideas. Here is a list.
- SWRPC encourages you to contact their office to talk about your project ideas. Should they be in the Ten Year Plan or are there funding programs that can help make them reality and address the Corridor community's transportation needs?

# ADDITIONAL DISCUSSION

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- We hope this has provided some useful information for thinking about the US 202 Corridor System.
- Our hope is that data and analysis will provide an opportunity for the SWRPC TAC, NHDOT, municipal officials, and state legislators to work together to develop consensus on projects or initiatives that will continue to address the corridor's greatest challenges and opportunities.
- We look forward to hearing your thoughts. Contact J. B. Mack at 357-0557.
- For further reading visit [www.swrpc.org/regionalplan](http://www.swrpc.org/regionalplan) to read *Southwest Connects*