

# **SOUTHWEST NH TRANSPORTATION ADVISORY COMMITTEE**

---

## **NH 12 North Corridor**

June 5, 2017

- This marks the sixth 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 NH 12 North Corridor.
- 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

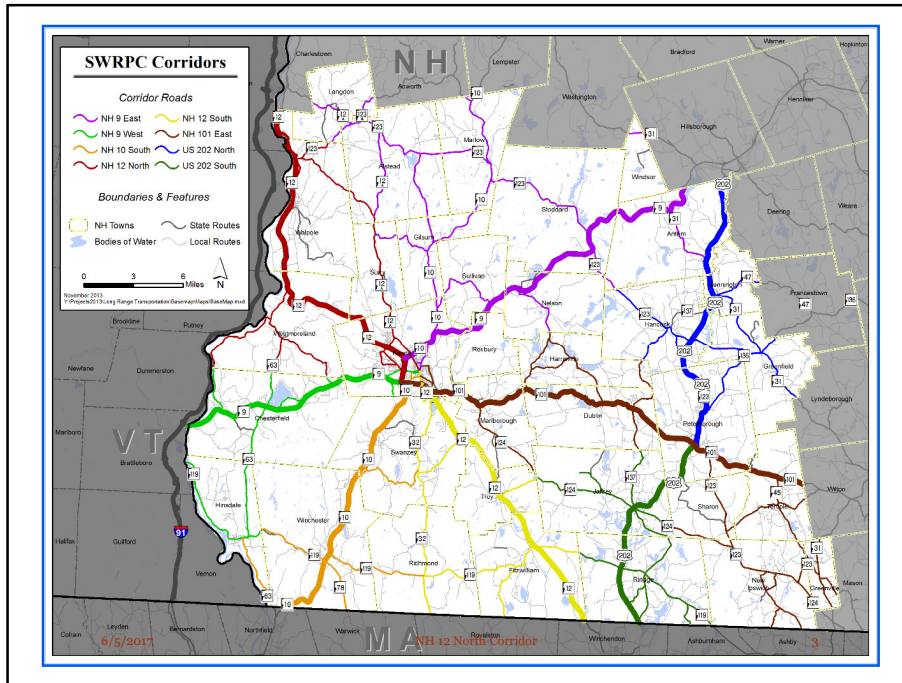
- Corridor Features and Location
- Population
- Commuting & Economy
- Housing & Land Use
- Travel & Vehicle Trends
- Performance Measures
- Challenges & Opportunities
- Past & Future Projects

6/5/2017

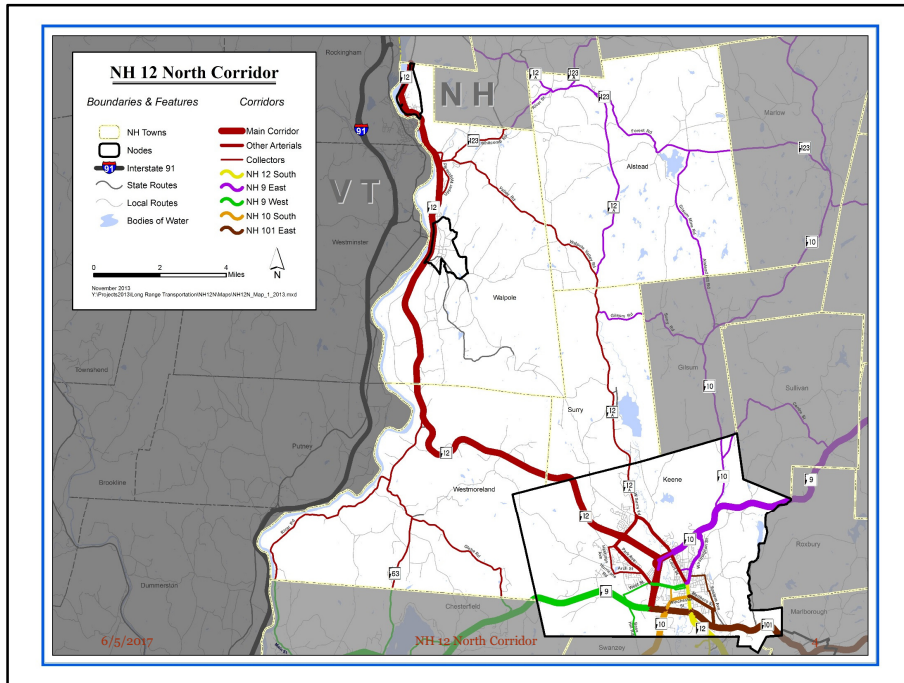
NH 12 North Corridor

2

- Today's presentation will begin with an orientation and description of the NH 12 North Corridor 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.

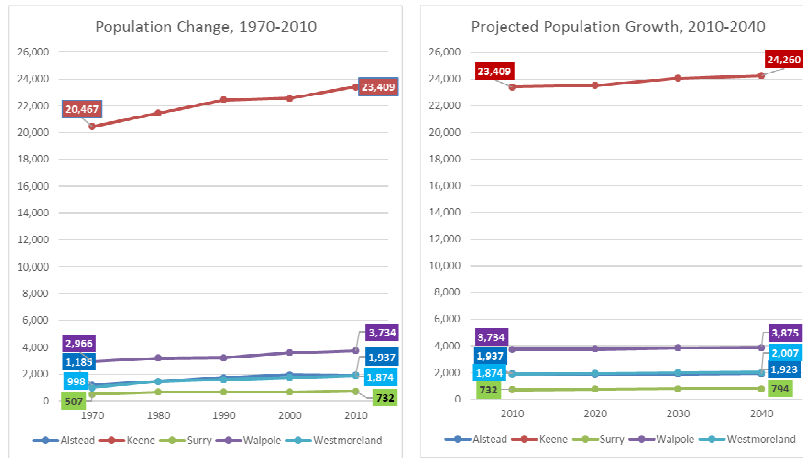


- This is a map of Southwest NH showing the eight corridors that were identified in *Southwest Connects*, with each Corridor represented by a different color.
- Corridors are based on data SWRPC collected recognizing direction of travel patterns, traffic volumes, federal highway classifications (federally 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.



- The Corridor we will be speaking about today is the NH 12 North Corridor. The NH 12 North Corridor is represented in dark red.
- In our region, the corridor extends north from the intersection of NH 10/12/101 in Keene to Walpole/Charlestown town line on NH 12. Towns that are recognized as part of the Corridor include Alstead, Walpole, Surry, Westmoreland and Keene.
- NH 12, Dwinell Street (NH 123) in Walpole, and Maple Ave, Park Ave and Court Street in Keene are all considered minor arterials by USDOT and NHDOT.
- Major collectors include NH 12A from Keene to Alstead, as well as Arch Street, Hurricane Rd and Hastings Ave in Keene, Route 63 in Westmoreland, and Arch Bridge Street and Vilas Bridge Road in Walpole.
- Several minor collectors are part of the corridor system including Walpole Valley Road in Alstead, Whitcomb Road (NH 123), Valley Road and Upper Walpole Road in Walpole, as well as River Road and Glebe Road in Westmoreland.
- 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 Keene, Walpole village and North Walpole village. Incidentally, Keene and Walpole have both taken major steps to improving walkability and bikeability by adopting complete streets policies.

## Population: Past & Projected



Source: US Census and NH Office of Energy and Planning

6/5/2017

NH 12 North Corridor

5

- I want to start by talking about population change on the Corridor.
- Populations within the towns range from a little over 700 people in Surry to 24,000 people in Keene.
- The chart on the left shows that there was minor growth for each of the towns over the 40 year period from 1970 to 2010.
- The chart on the right shows that demographers estimate each community will have slow growth rates over the next thirty years.

## Population: Special Populations



Youth (Age 14 and under), 13%



Young Adults (Age 15-34), 35%



Middle Age (Age 35-64), 37%



Seniors (Age 65+), 16%



Low Income (At or under 150% of Poverty level), 20%



Single Parent Households, 27%

Source: American Community Survey 5 Year Estimates 2015

6/5/2017

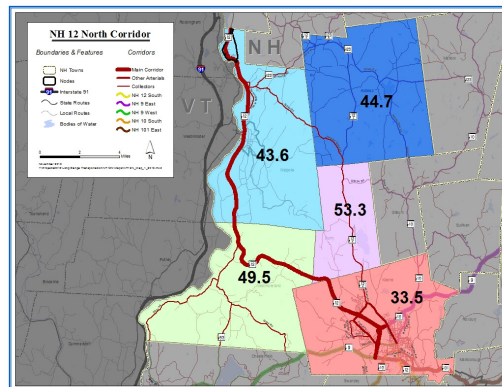
NH 12 North Corridor

6

- At the end of the day, who are we planning transportation for? People.
- On this slide, SWRPC shows segments of the population that live on the corridor, because different groups or people tend to have certain transportation needs or can be seen as representing a specific transportation market. Some groups don't drive, some have less resources such as money or time, and some have distinct lifestyles that separate them from others in terms of transportation preferences.
- 13% of the corridor population is made up of youth. The higher concentrations of youth are in Alstead (18%) and Walpole (17%) with a very high concentration of youth in North Walpole in particular (20%). This population cannot drive.
- The percentage of young adults is 35%. This is largely driven by the higher learning institutions based in Keene (39%). There is some evidence that "millennials" are less interested in owning a car, and more interested in having other transportation options.
- The percentage of middle age people is 37%. Keene's young adults population drives this number down somewhat. Alstead, Surry, Walpole and Westmoreland actually have middle age populations of 43% or more. This is a population that tends to demand high mobility and transportation flexibility.
- Today, seniors make up about 16% of the corridor population. Walpole Village in particular, has a high senior population at 33%. According to information from the National Household Travel Survey, 1 out of 5 US seniors 65 and over do not currently drive.

- One-fifth of the population is considered low income in the corridor. Part of this is because of the student population in Keene (Keene's low income population is 23%). Low income populations can be very sensitive to transportation expenses.
- More than a quarter of all families living in the corridor are headed by single parents. Higher proportions of single parent families can be found in Keene (30%) and Walpole (29%) with North Walpole Village constituting a high number of single parent families (48%). Single parent households tend to need a flexible transportation options to deal with time constraints.

## Median Age



Source: American Community Survey 5 Year Estimates 2015

6/5/2017

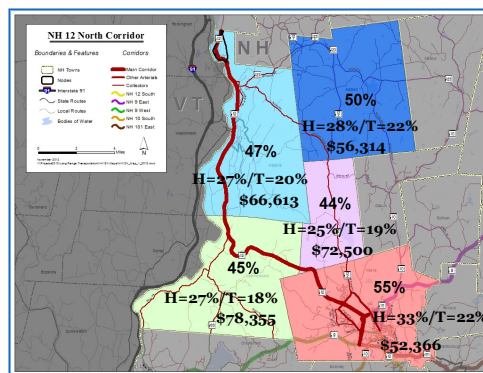
NH 12 North Corridor

7

- Half of the population living in Westmoreland and Surry are above the age of 50. Walpole and Alstead are not far behind.
- The college populations present in Keene bring its median age down.
- As a basis for comparison the median age in the United States is 37.6 and for NH it is 42.2.
- Experts believe that a significant percentage of retirees are expected to age in place in New Hampshire. This is also expected for the NH 12 North Corridor communities.



## Income as % of Housing + Transportation



Source: American Community Survey 5 Year Estimates 2014 and Center for Neighborhood Technology

6/5/2017

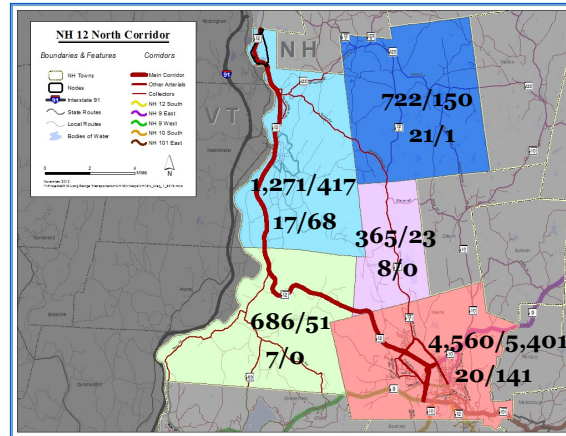
NH 12 North Corridor

8

- NH demographers and housing experts believe that NH will have a high rate of seniors wanting to age in place living out the rest of their lives in their own homes. As people begin to retire, this may cause a housing supply issue for new workers, if housing development doesn't keep up with job availability. While employers can try to attract more of a workforce from farther away, the more distant a workforce is, the more difficult it will be to retain that workforce.
- 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.
- This map shows that the median household is either near or above this standard.
- Beneath each H&T cost estimate, I've given a breakdown of the estimated median housing and transportation costs for each community on the NH 12 N Corridor.
- Of course, affordability is driven to a large degree by household income. Here are the

median household income figures for each community. Although housing and transportation are shown as 44% of a median Surry resident's housing and transportation, that is based on the median household having an annual income of \$72,500.

# Housing Supply & Growth



Source: NH Office of Energy and Planning and 2010 Census Summary File 1

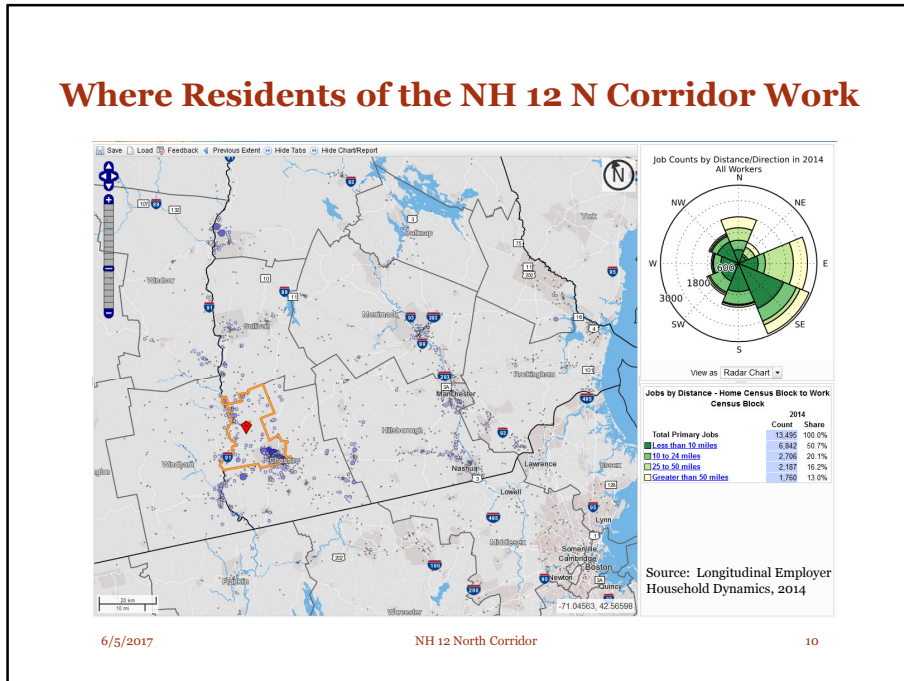
6/5/2017

NH 12 North Corridor

9

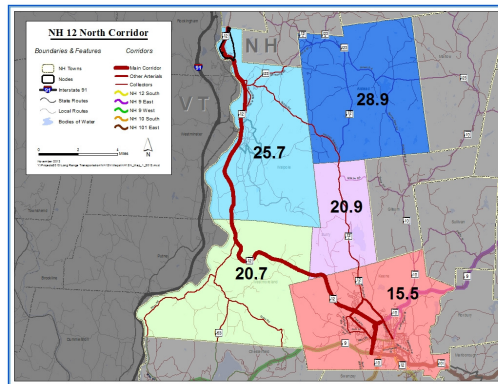
- In this slide, we are showing housing supply and growth.
- The top two numbers in each community represent the number of single family units/all other units (multifamily of mobile home units)
- The bottom two numbers in each community show the number of permits issued for single family units/all other units built in the period from 2010-2015.
- The data shows that the supply of multifamily units/mobile homes are much more a proportion of the housing stock in Keene and to a lesser extent Walpole. Similarly, there is a higher number of multifamily unit and mobile home development occurring in Keene and Walpole.

## Where Residents of the NH 12 N Corridor Work



- Most shopping or services on the Corridor are in Keene and Walpole.
- Where do residents living in the NH 12 communities work? This map shows that Keene is by far the most popular job destination employing over 40% of the corridor population. Smaller clusters are in Brattleboro, Walpole, Swanzey.
- As the radar graph shows in the upper right corner of the slide—most longer distance trips—25 miles or greater—which are heading east, southeast and north to places like Manchester, Nashua and Lebanon. These longer distance trips represent about 30% of all commuting trips.

# Mean Travel Time



## Commuting B'twn Corridor Towns

- **6,528 workers**

## Among Top 10 Work Destinations

- **2<sup>nd</sup>, Brattleboro (555)**
- **5<sup>th</sup> Lebanon (312)**
- **6<sup>th</sup>, Concord (297)**
- **8<sup>th</sup>, Nashua (243)**
- **9<sup>th</sup>, Manchester (229)**
- **10<sup>th</sup>, Hanover (206)**

Source: US Census and NH Department of Employment Security and Local Housing and Employment Dynamics, 2014

6/5/2017

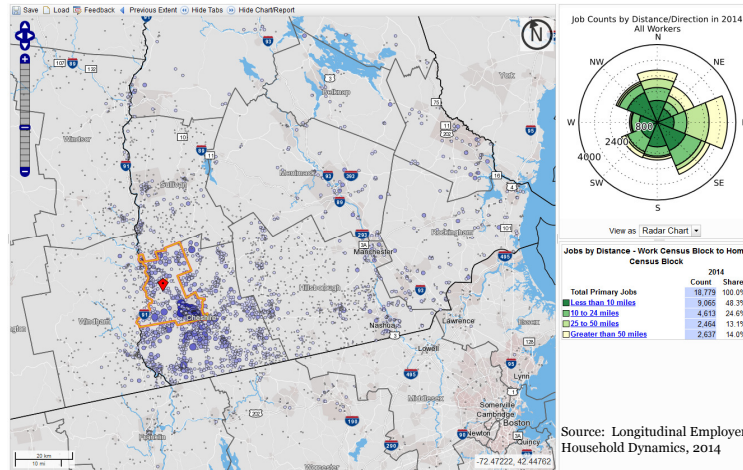
NH 12 North Corridor

11

- This chart provides another picture of work commuting for residents living in the NH 12 North communities.
- According to the US Bureau of the Census, the mean commute travel time for every community is less than a half hour one way.
- Keene has the shortest commute times—15.5 minutes—due to the high concentration of jobs near resident populations.
- On the right side of the slide, you can see that 6,528 people reside and work on the corridor. About 5,800 of those jobs are based in Keene! 6,258 people represents about 48% of the total workforce living on the corridor, so 52% of the workforce commutes outside of the corridor area.
- There is also 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. The eastern pull of long distance drives shown on the previous slide are largely due to a number of people commuting to Concord, Nashua and Manchester. The northern pull of long distance drives is due to a number of people that commute to Lebanon and Hanover.
- The numbers in parentheses to the right represent the number of people residing on the corridor that work in those communities. In other words, 555 people residing in the corridor communities worked in Brattleboro, VT in 2014.
- The commute destination data here does not include self-employed people or the

military.

## Where Workers on the NH 12 N Corridor Live



6/5/2017

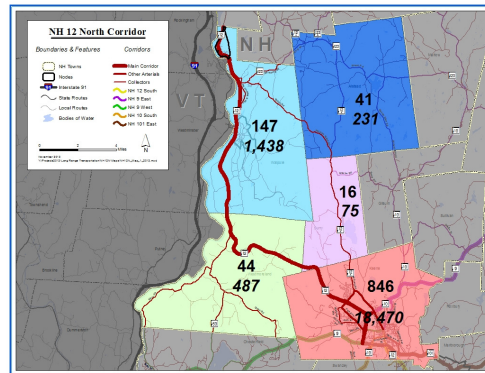
NH 12 North Corridor

12

- There are more jobs in the corridor communities than workers living in the corridor communities. The ratio is about 18,800 jobs to 13,500 workers. About 16,800 of these jobs are based in Keene.
- For employers located on the NH 12 Corridor, the draw for workers is fairly concentrated to people living in Cheshire County or just outside of Cheshire County. About 27% of the people working in the corridor area are commuting 25 miles or more to get to work.

## Economy (2015)

### Work Sites Workers



### Labor Force $\Delta$ / Employment $\Delta$ (2005-2015)

**Alstead = -60 / +49**

**Keene = -79 / -1,650**

**Surry = +78 / +15**

**Westmoreland = -11 / -186**

**Walpole = +371 / +148**

Source: NH Department of Employment Security

6/5/2017

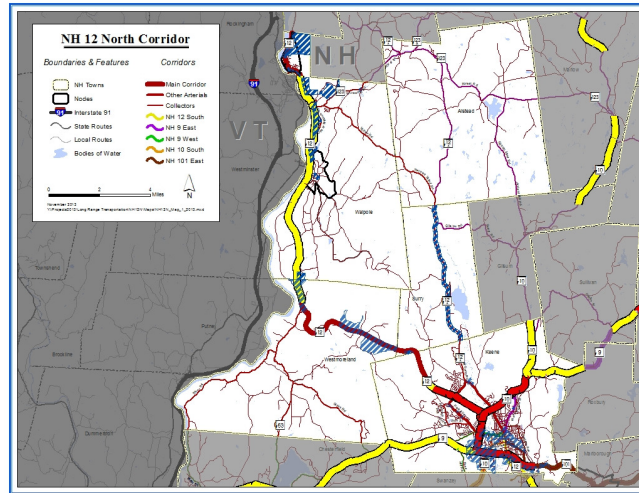
NH 12 North Corridor

13

- This slide looks at some economic indicators to give a picture of the NH 12 North Corridor economy.
- The numbers shown at the top of each community represent the number of work sites in each community tracked by the Department of Economic Security; The italics numbers shown at the bottom of each community represent the number of employed.
- On the right I am showing how each community's number of people in the labor force and jobs has changed from 2005 to 2015
- Each town has had very different economic experiences over the 11 year period
  - Walpole experienced both a boost in labor force and employment, Keene experienced a reduction in both.
  - For most NH 12 North corridor communities, it is likely that the local labor force will either grow slowly or recede as the labor force continues to age



## Land Use



Source: Towns and NHDOT  
6/5/2017

NH 12 North Corridor

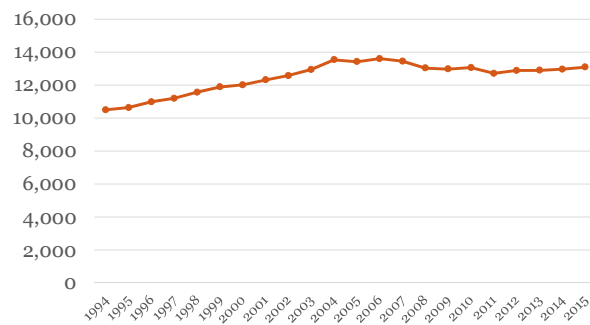
14

- About 10 miles of the corridor is controlled access (yellow) , 7 miles is limited access (red), and 9.5 miles is regular access.
- Surry, Westmoreland and Walpole have zoned much of their commercial development on NH 12.

# Travel and Vehicle Trends

## New Hampshire

Vehicle Miles Traveled (Millions)

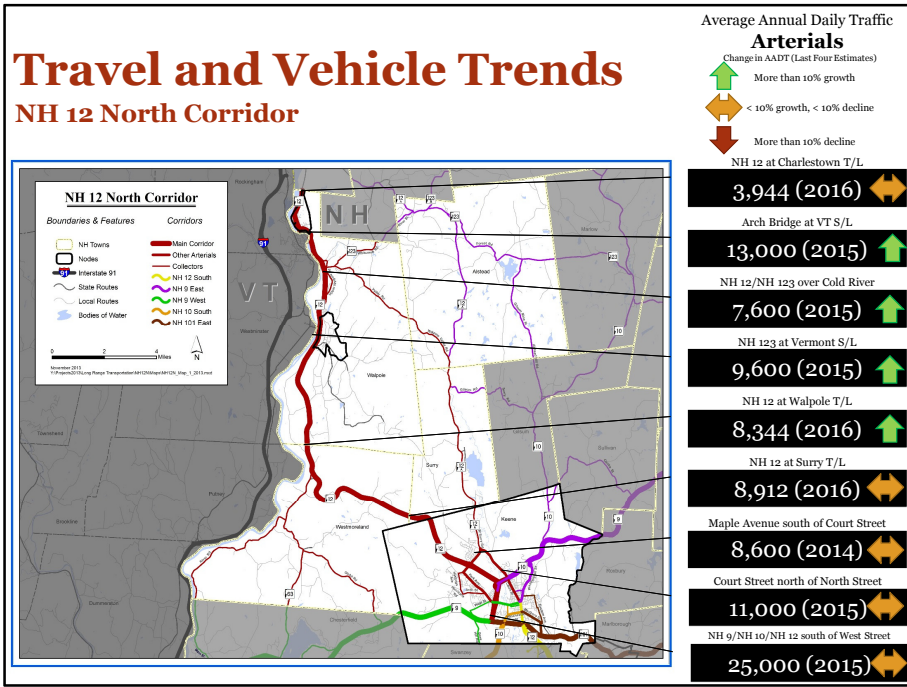


6/5/2017

NH 12 North Corridor

15

- The chart above depicts the amount of travel, or demand, on New Hampshire roads between 1994 and 2015 (as reported by the New Hampshire Department of Transportation to the Federal Highway Administration)
- The data above provides important context that approximates travel in Southwest NH.
- Specifically, the demand for travel peaked prior to the Great Recession, according to annualized estimates. Since that time travel has been relatively stagnant or in decline.
- Any return to pre-recession levels of growth, even in an improved economy would depend largely on an increase in workers, but as previous slides have shown, population is expected to be slow and many workers will be aging.

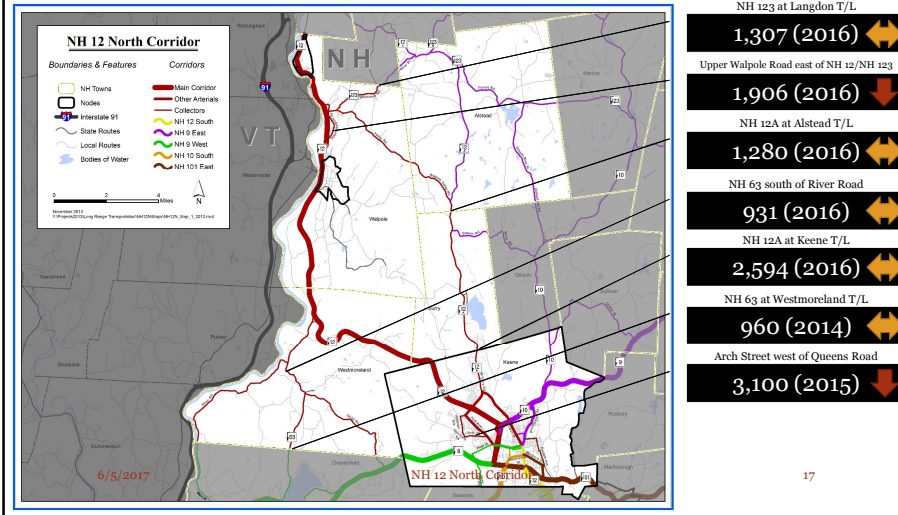


- Vehicle travel is monitored throughout the state through the federal Highway Performance Monitoring System. There are roughly 6,000 sites throughout the state that are sampled every three years, over 400 of which are located here in Southwest New Hampshire. The short term samples are then converted to average estimated traffic figures, or Average Annual Daily Traffic (AADT). That is, on average, the number of vehicles that travel a section of highway per day. Actual figures can vary at each site, sometimes significantly, based on the time of year. In most cases, observed figures are higher than the reported AADT during the summer, and lower during the winter. It should also be noted that estimates can sometimes be impacted by changes in regional travel as a result of detours and construction, sometimes located far from the monitored site.
- On the map above shows the NH 12 North Corridor. AADT volumes and year of estimate are listed below from north to south:
  - NH 12 (CHURCH ST) AT CHARLESTOWN TL in Walpole – 3,944 (2016), 3,700 (2013), 3,900 (2010), 4,000 (2007)
  - ARCH BRIDGE AT VERMONT SL – 13,000 (2015), 12,000 (2012), 6,500 (2003), 7,000 (2000)
  - NH 12/NH 123 OVER COLD RIVER – 7,600 (2015), 6,600 (2012), 6,500 (2009), 5,500 (2006)
  - NH 123 (DWINNELL ST) AT VERMONT SL - 9,600 (2015), 8,600 (2012), 5,900

- (2009), 4,900 (2006)
- NH 12 AT WALPOLE TL – 8,344 (2016), 7,200 (2013), 7,200 (2010), 6,900 (2007)
- NH 12A (WEST SURRY RD) AT KEENE TL - 2,594 (2016), 2,600 (2013), 2,500 (2010), 2,700 (2007)
- NH 12A (MAPLE AVE) SOUTH OF COURT ST – 8,600 (2014), 8,500 (2011), 9,500 (2008), 8,100 (2005)
- COURT ST NORTH OF NORTH ST – 11,000 (2015), 11,000 (2012), 9,800 (2010), 12,000 (2006)
- NH 9/NH 10/NH 12 (FRANKLIN PIERCE HWY) SOUTH OF WEST ST – 25,000 (2015), 24,000 (2012), 23,000 (2009), 23,000 (2006)
- Traffic volumes were the highest in Keene on the NH 12 North Corridor, where they relatively stable when considering the previous three estimates (above). Factors that may influence changes over this period include the Great Recession and changes to commercial development in this area.
- Traffic volumes at the northern extent of the corridor showed more dramatic changes, most likely due to the closure of the Vilas Bridge. NH 12 has also been the site of recent commercial development within the last ten years.

# Travel and Vehicle Trends

## NH 12 North Corridor

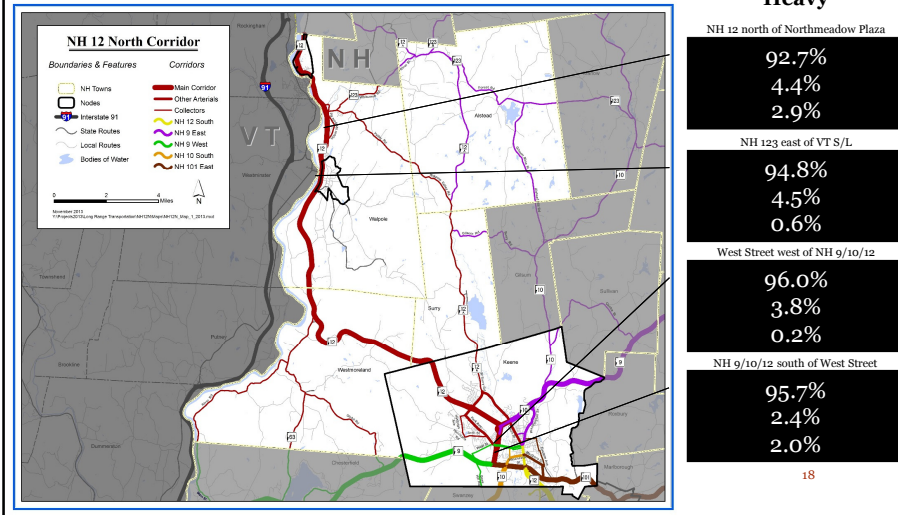


- The map above shows the NH 12 North Corridor. AADT volumes and year of estimate are listed below from north to south:
  - NH 123 (WHITCOMB RD) AT LANGDON TL - 1,307 (2016), 2,100 (2013), 2,000 (2010), 1,300 (2007)
  - UPPER WALPOLE RD EAST OF NH 12/NH 123 - 1,906 (2016), 2,000 (2013), 2,000 (2010), 2,200 (2004)
  - NH 12A AT ALSTEAD TL - 1,280 (2016), 1,200 (2013), 1,200 (2010), 1,300 (2007)
  - NH 63 SOUTH OF RIVER RD – 931 (2016), 780 (2013), 750 (2010), 860 (2007)
  - NH 12A (WEST SURRY RD) AT KEENE TL - 2,594 (2016), 2,600 (2013), 2,500 (2010), 2,700 (2007)
  - NH 63 AT WESTMORELAND TL - 960 (2014), 1,000 (2011), 950 (2008), 1,000 (2005)
  - ARCH ST WEST OF QUEENS RD – 3,100 (2015), 3,200 (2012), 3,200 (2009), 4,000 (2006)
- NH 12 North Collectors above appeared for the most part to experience stable traffic volumes, according to recent estimates. None experience notable growth (over 10%) between the first and last years' estimates.



# Travel and Vehicle Trends

## NH 12 North Corridor



- 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 buses, and heavy duty vehicles include tractor trailer combinations of varying lengths and number of axles.
- NH 12 north of Northmeadow Plaza demonstrated the highest proportion (not number) of tractor trailer trucks, 7.3% of all traffic or approximately 200 trucks per day. NH 123 east of the Vermont state line (which happens to be restricted by a difficult turning radius and clearance from a railroad bridge just east of US 5 in Vermont) and West Street in Keene were less likely to host trucks.
- The area of the NH 9/10/12 bypass, south of West Street, saw about 500 tractor trailers per day even though the proportion of trucks to total traffic was only 4.4%.

## Infrastructure Condition

### Pavement Condition

% Interstate Good, % Interstate Poor

% NHS Good, % NHS Poor

### Bridge Condition

# Good Condition, # Poor Condition

Deck Area in Good Condition, Deck Area in Poor Condition

6/5/2017

NH 12 North Corridor

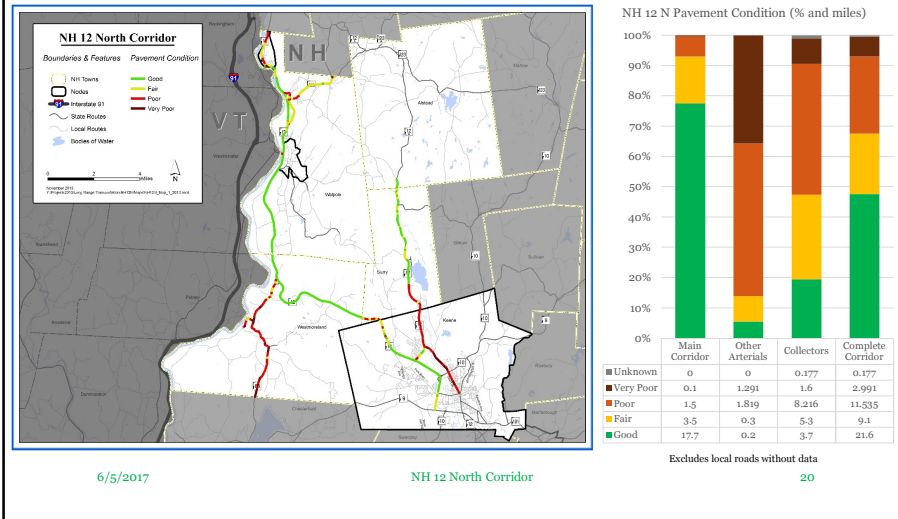
19

- *Southwest Connects*, the regional transportation plan for Southwest New Hampshire, incorporates performance measures to understand the states of different assets on each corridor. Some performance measures are borrowed from the federal MAP-21/FAST Act, while others come from NH DOT's Balanced Scorecard.
- Infrastructure condition—specifically pavement condition and bridge condition—are performance measures that are derived from the MAP-21/FAST Act.
- Although federal performance measures prescribe data collection on interstate and sometimes National Highway System (NHS) roads only, SWRPC has collected and will present comparable data (where available) for non-interstate and non-NHS portions of our transportation network.



# Pavement Condition

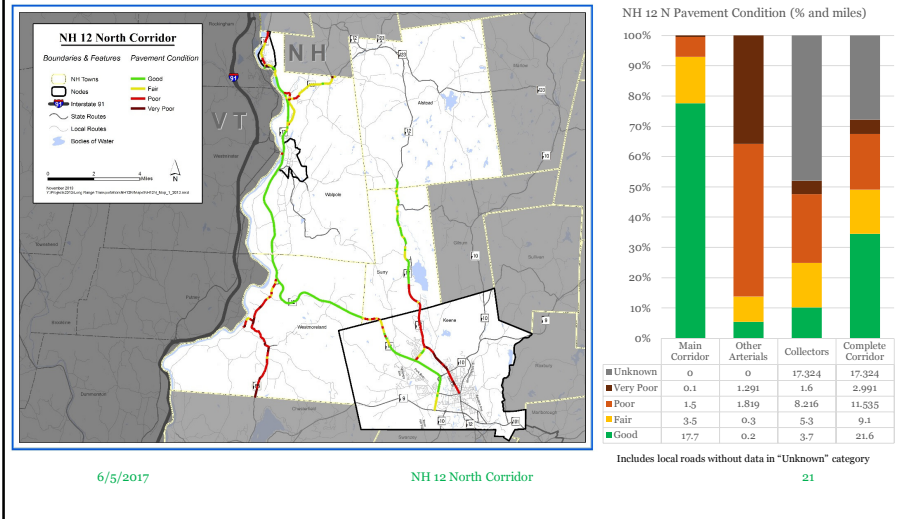
## Existing Conditions



- Today, pavement condition is recorded utilizing specialized sensors, which record pavement condition attributes in 1/10<sup>th</sup> of a mile increments in one direction of travel. National Highway System and Interstate mileage is surveyed every year. Other numbered routes and unnumbered state highways (like Upper Walpole Road) are surveyed every other year.
- 2015-2016 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.
- The predominant condition of the NH 12, the “Main Corridor” or principal arterial, is Good. However, arterials and collectors off NH 12 were much more likely to be in fair or worse condition.

# Pavement Condition

## Existing Conditions



- The following graph depicts the pavement condition of the corridor when taking into account mileage on the corridor that was not surveyed (such as certain City roads, River Road in Westmoreland, etc.)
- When considering these routes, the corridor may in fact be in worse condition, between 30% and 40% in good condition.

# Pavement Condition

## Upcoming Resurfacing Projects

### 17402 - Keene

Route: NH 9/NH 12 with exits  
Length: 5.9 miles  
Limits: From West Street to Forge Street  
Strategy: Preservation

### 18422 - Walpole

Route: NH 12  
Length: 2.8 miles  
Limits: From south of Main Street to north of Vilas Bridge Road  
Strategy: Preservation

### 18427 - Walpole

Route: NH 12  
Length: 5.7 miles  
Limits: From north of NH 63 in Westmoreland to south of Main Street in Walpole  
Strategy: Preservation (Crack Seal)

### 18431 - Westmoreland

Route: Depot Road  
Length: 0.3 miles  
Limits: From NH 63 to NH 12  
Strategy: Roughness

### 18402 - Chesterfield

Route: NH 63  
Length: 2.2 miles  
Limits: From NH 9 in Chesterfield to NH 12 in Westmoreland  
Strategy: Roughness

### 18415 - Charlestown

Route: NH 12  
Length: 2.2 miles  
Limits: From Main Street in Walpole to north of the north end of Langdon Road in Charlestown  
Strategy: Light Capital Paving

### 18416 - Surry

Route: NH 12  
Length: 0.8 miles  
Limits: From Forge Street in Keene to Surry/Westmoreland town line  
Strategy: Light Capital Paving

### 19411 - Alstead

Route: NH 12A/NH 123  
Length: 2.2 miles  
Limits: From NH 12A in Alstead (Alstead Center Road) to NH 12 in Walpole  
Strategy: Light Capital Paving

- Upcoming resurfacing projects taking place throughout the corridor, according to New Hampshire Department of Transportation, are listed above.
- The first two-digits of each project represent the anticipated calendar year. More information is available via the Bureau of Planning and Community Assistance webpage: <https://www.nh.gov/dot/org/projectdevelopment/planning/amps/facts-figures.htm>
- As a reminder, the Department has a paving strategy which takes into account the priority, or tier, of a route, as well as the cost of a given treatment.

# Bridge Condition

## Methods

Code	Description
9	Excellent Condition
8	Very Good Condition
7	Good Condition
6	Satisfactory Condition
5	Fair Condition
4	Poor Condition
3	Serious Condition
2	Critical Condition
1	"Imminent" Failure Condition
0	Failed Condition

1. Deck  
2. Superstructure  
3. Substructure

Good  
Fair  
Poor

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

6/5/2017

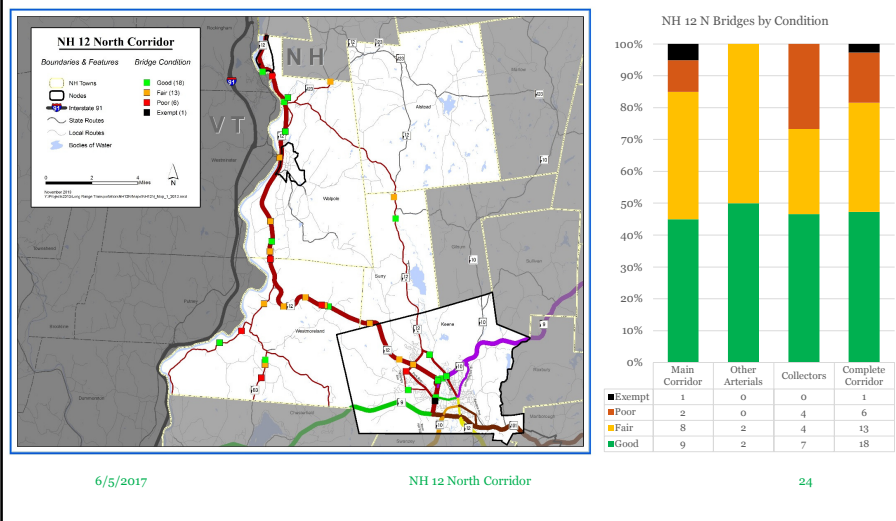
NH 12 North Corridor

23

- Bridge inspection data is available once per year (April) from the Department of Transportation. This can make results somewhat of a lagging indicator, depending on the time of inspection and scheduled maintenance, reconstruction, or replacement.
- 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.
- 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.

# Bridge Condition

## Existing Conditions

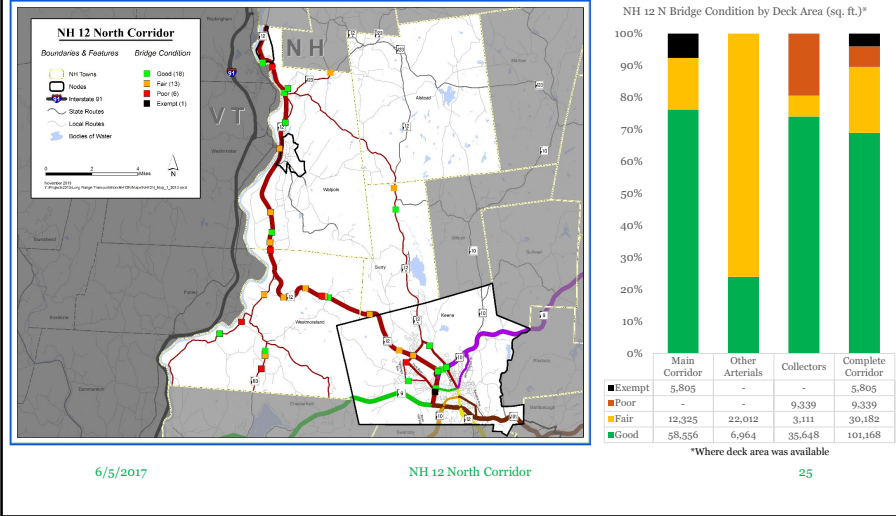


- There are 38 bridges located on highways of the NH 12 N Corridor system (either according to the State: 10ft. span, or federal: 20 ft. span, definition). The map pictured shows that 6 are “red-list” bridges.
- Four of the red-list bridges (with at least one major element in poor condition) are state-owned including:
  - Walpole 062/052: Vilas Bridge over the Connecticut River. The bridge was originally constructed in 1930, reconstructed in 1974, and closed in 2009.
  - Westmoreland 113/163: The culvert location is on NH 12 near the Walpole town line. It was originally constructed in 1960 and currently has a planned project associated with it for replacement/repair (Westmoreland 40520)
  - Westmoreland 159/125: The culvert location is on NH 12 over Mill Brook (near S. village Road). It was originally constructed in 1941 and currently has a planned project associated with it for replacement/repair (Westmoreland 41250)
  - Westmoreland 109/061: NH 63 over Partridge Brook. The bridge was originally constructed in 1935 and was reconstructed in 1978. A planned project associated with it for replacement/repair is Westmoreland 41394.
- Two of the red-list bridges are municipally-owned:
  - Westmoreland 089/100 carries River Road over Partridge Brook. All three elements were found to be in poor condition. It was originally constructed in 1937.

- Keene 090/101 is a large culvert carrying Maple Avenue traffic over Black Brook. It was originally constructed in 1961 and is in serious condition.

# Bridge Condition

## Existing Conditions



- The federal performance measures related to bridge not only account for the number of bridges in good or poor condition, but also the amount of bridge deck area in good and poor condition. Calculating the condition based on deck area provides another way to visualize the condition of bridges throughout the corridor.

# Safety Performance

## Fatalities

Measures: Fatalities according to Fatal Accident Reporting System

Calculation: 5-year average of fatalities per 100 million vehicles miles

## Serious Injuries

Measures: Serious injuries according to NH DOT

Calculation: 5-year average of serious injuries per 100 million vehicle miles

6/5/2017

NH 12 North Corridor

26

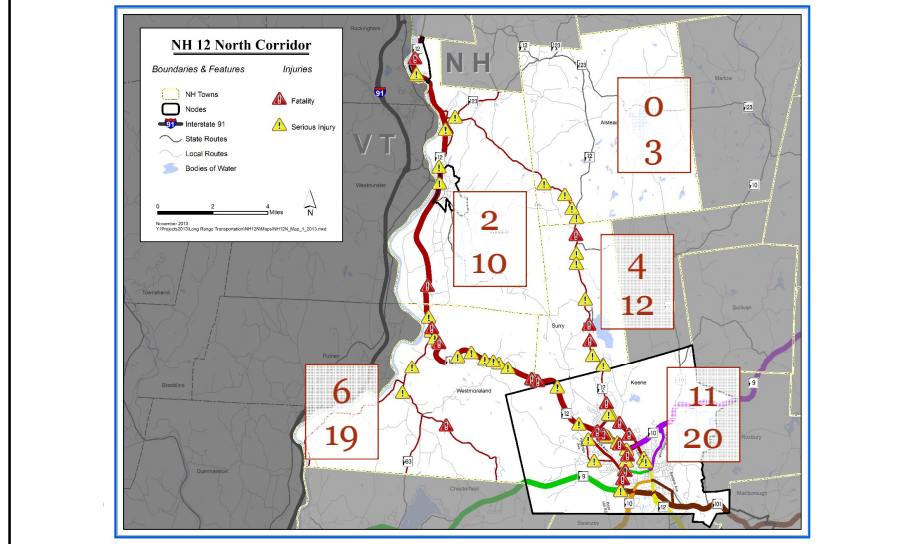
- Like infrastructure, safety can also be monitored using performance measures.
- Currently, the FHWA requires States to measure safety by tracking fatalities and serious injuries, currently recorded with every crash report. The rates are then normalized relative to the amount of travel (statewide) over a 5-year period.



# Safety Performance

Fatalities and Serious Injuries (2002-2014)

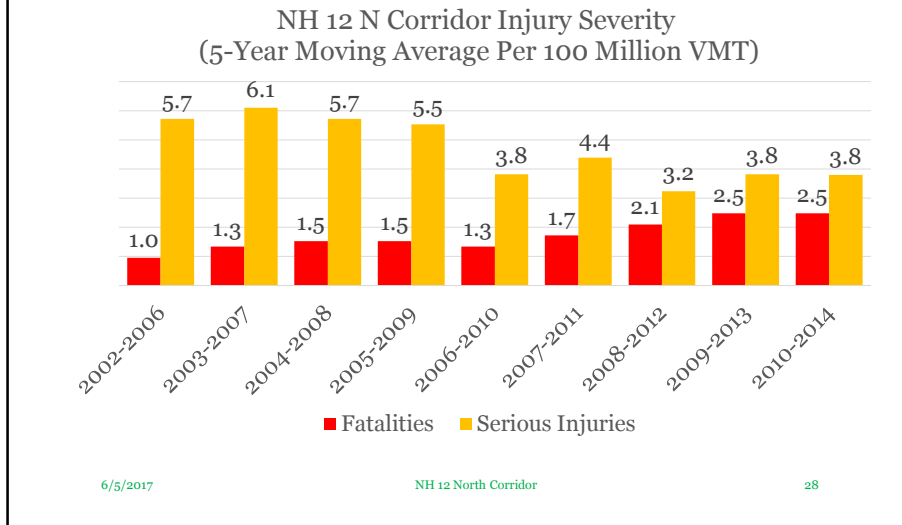
Fatalities  
Serious Injuries



- Here is a map showing fatality and serious injury crashes on the NH 12 N Corridor for the period we have data available (2002 – 2014).
  - Westmoreland: 6 fatalities, 19 serious injuries
  - Walpole: 2 fatalities, 10 serious injuries
  - Alstead: 0 fatalities, 3 serious injuries
  - Surry: 4 fatalities, 12 serious injuries
  - Keene: 11 fatalities, 20 serious injuries
- Over that time period, there were a total of 23 fatalities and 65 serious injuries on the NH 12 N Corridor.
- The number of these occurrences is the first “ingredient” to the performance measure.
- Since the MAP-21/FAST Act 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. NH DOT 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.
- 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.

# Safety Performance

## Fatalities and Serious Injuries (2002-2014)



- The rate used in this chart (fatalities and injuries per 100 million annual vehicle miles traveled over a 5-year period) is consistent with proposed MAP-21 rulemaking.
- In absolute terms, NH 12 N accounted for approximately 3.80 incapacitating injuries per 100 million vehicle miles travelled per year, and 2.48 fatalities per 100 million vehicles miles travelled per year according to 2010 to 2014 crash data and traffic volume data.

# Mobility

## Level of Service

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

Where

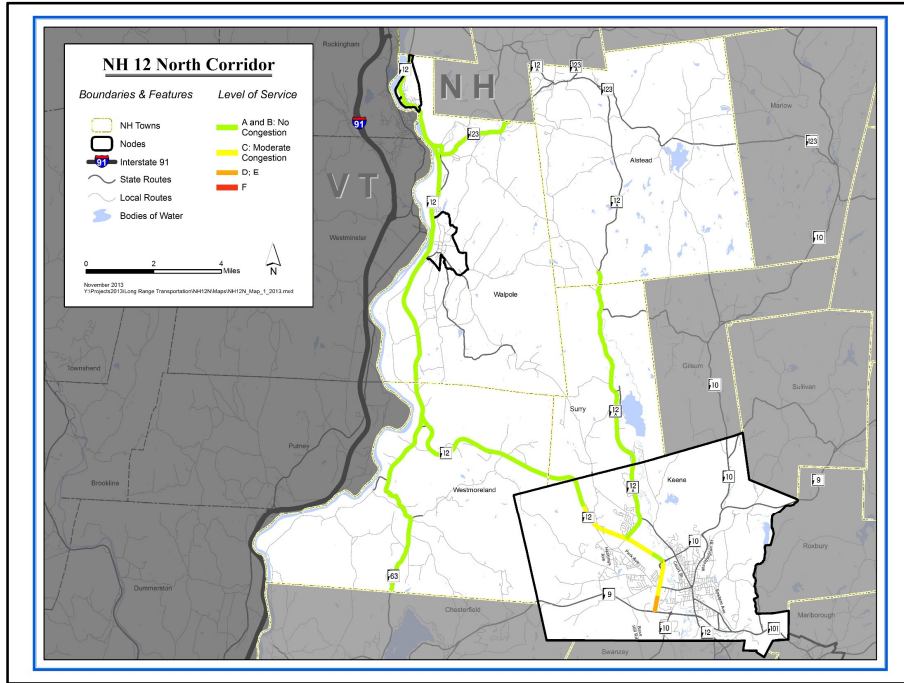
*AADT* Average Annual Daily Traffic  
*K* Percent of AADT occurring during peak hour  
*D* Directional distribution during peak hour  
*L* Total number of lanes per direction  
*F* Maximum flow rate

6/5/2017

NH 12 North Corridor

29

- Another key performance measure that MAP-21 and NHDOT are concerned with is mobility, or the 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 for road segments (excluding intersections) during the peak hour of demand.
- The highest modeled rates of peak hour congestion occurred in the vicinity of the NH 9/10/12.

## Multimodal Accessibility

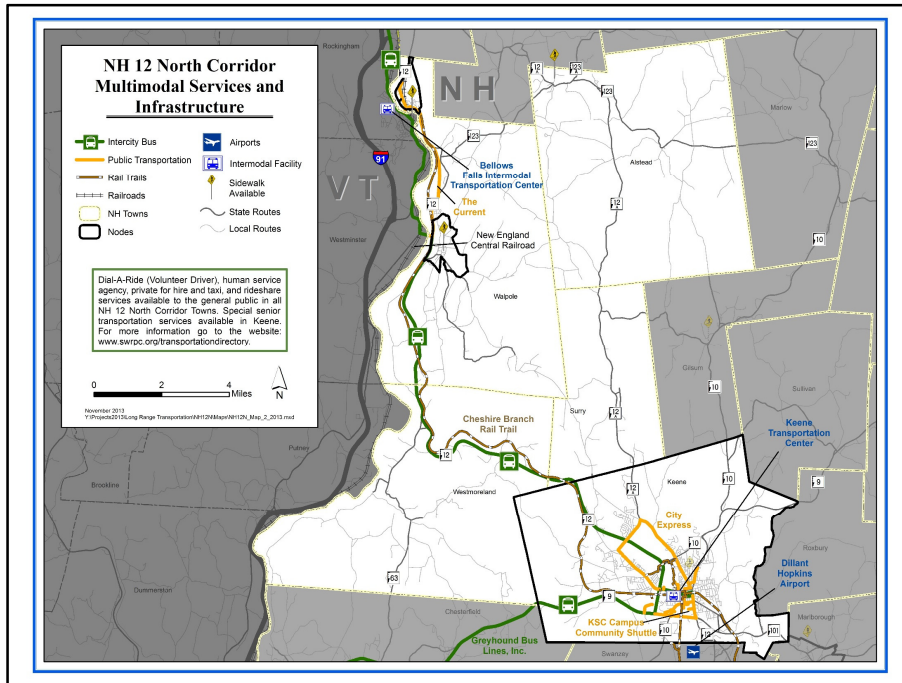
- Sidewalks: From Monadnock Alliance for Sustainable Transportation (MAST)
- Bikeways: From MAST
- # of Park and Ride Lot Spaces: From MAST
- Public Transit Routes: From MAST
- Intercity Bus Routes: From MAST

6/5/2017

NH 12 North Corridor

31

- 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.
- More information is available in *Southwest Connects*.



- For each corridor, the *Southwest Connects* depicts 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.
- The NH 12 N corridor includes:
  - A daily north and south Greyhound intercity bus routes from White River Junction, VT to Springfield, MA with a stop in Bellows Falls, VT and Keene;
  - A local weekday transit service operated by Connecticut River Transit that connects Bellows Falls and Walpole called the Bellows Falls In-Town Route;
  - A local weekday transit service operated by Home Healthcare Hospice and Community Services called the City Express;
  - Sidewalk infrastructure in Keene, Walpole and a very small segment of sidewalk in Alstead.
  - The Cheshire Branch Rail Trail which connects Keene to Walpole. The large portion of the trail has been improved in Keene. Other parts of the trail are in good condition, however there are some areas in Walpole where the trail is overgrown or in poor repair.
- There are two intermodal transportation areas associated with the NH 12 Corridor. Connections between the bike trail, intercity bus and local transit are available on Gilbo Ave in Keene. In Bellows Falls, a short walk from North Walpole, people can catch a ride on the Vermonter Amtrak service, connect to intercity bus and local transit.

## **Regional Transportation Challenges – Opportunities?**

- Cooperation/Coordination with Vermont re: Vilas Bridge
- Major flooding damage to NH 12, NH 123 and NH 63 as well as Cheshire Rail Trail--does more need to be done?
- New England Central Railroad—Improve connections?
- North Walpole Village—working fine, or need to plan for future?
- Retail growth in Walpole—losing prime ag land?

6/5/2017

NH 12 North Corridor

33

- SWRPC is aware of some transportation challenges associated with the NH 10 Corridor.
- The following list of challenges and opportunities have been collected by SWRPC staff from various sources.

## Past Projects

- Gilsum-Surry 24094 – River Road Storm Damage 6/28/13
- Keene – NH 9/10/12 Bridge Rehabilitation over West Street
- Keene 28737 – Traffic calming improvements to Pako Avenue area (SRTS Project)
- Walpole 24781 – Railroad bridge repair, rain storm 7/2/13
- Walpole 24096 – County Road Storm Damage 6/28/13
- Westmoreland 24107 – River Road Storm Damage 7/2/13
- Westmoreland 15867 – NH 12 Pavement and Bridge Rehab from S. Village Rd north 3.6 mi to north of junction of NH 63
- Westmoreland 24761 – Railroad bridge granite arch repair, rain storm 7/2/13
- Westmoreland 40520 – NH 12 over Aldrich Brook (113-163)- Bridge repair

6/5/2017

NH 12 North Corridor

34

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



## Future Programmed Projects

- Keene 40439 – Park Ave/Ami Brown Road Pedestrian and Bicycle Improvements (TAP Project)
- Surry-Keene 29667 – Pavement Rehabilitation on NH 12A from Court Street in Keene northerly 2.9 miles to Park Street in Surry
- Surry 41213 – NH 12A repair 9'x9' concrete box culvert
- Westmoreland 41394 – NH 63 over Branch Partridge Brook (109/061)-Replace deck, install riprap
- Westmoreland 41250 – NH 12 over Mill Brook (159/125)- Repair Arch and install riprap
- Walpole-Westminster, VT 40070 – NH 123 Rehabilitation of bridge over Connecticut River (132/062)
- Walpole-Charlestown 14747 – From N. Walpole Reconstruct to NH 12A in Charlestown, add shoulders, improve drainage

6/5/2017

NH 12 North Corridor

35

- Several projects are scheduled in the near term in communities along the corridor.

## Other Future Projects?

### Alstead

•?

### Keene

• Complete Streets Policy Implementation?

### Surry

•?

### Walpole

• Vilas Bridge Rehabilitation?

### Westmoreland

•?

### Regional

• Transit Service?

6/5/2017

NH 12 North Corridor

36

- 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

---

6/5/2017

NH 12 North Corridor

37

- We hope this has provided some useful information for thinking about the NH 12 North 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*