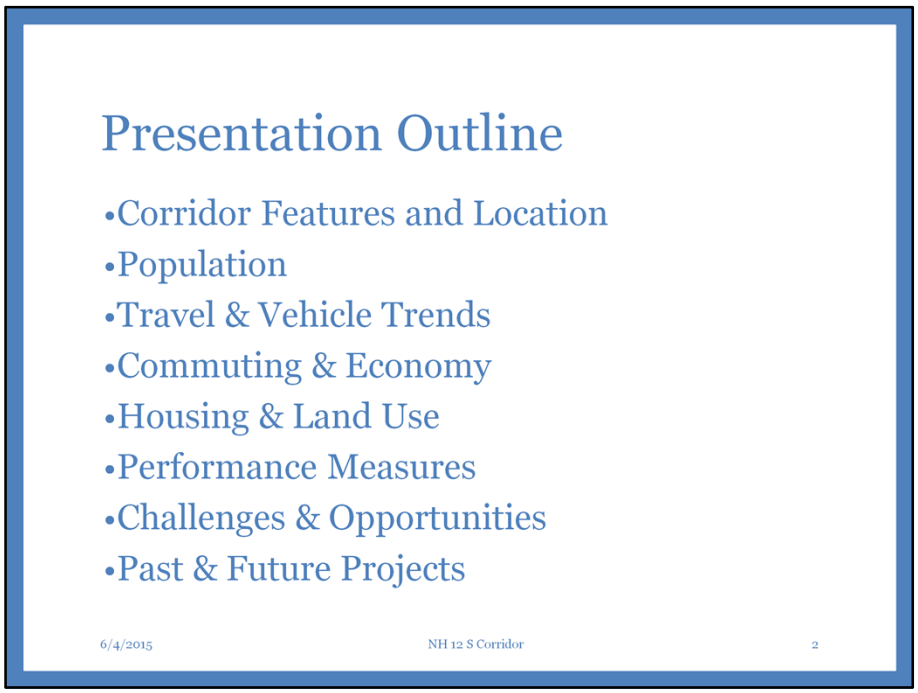
# SOUTHWEST NH TRANSPORTATION ADVISORY COMMITTEE

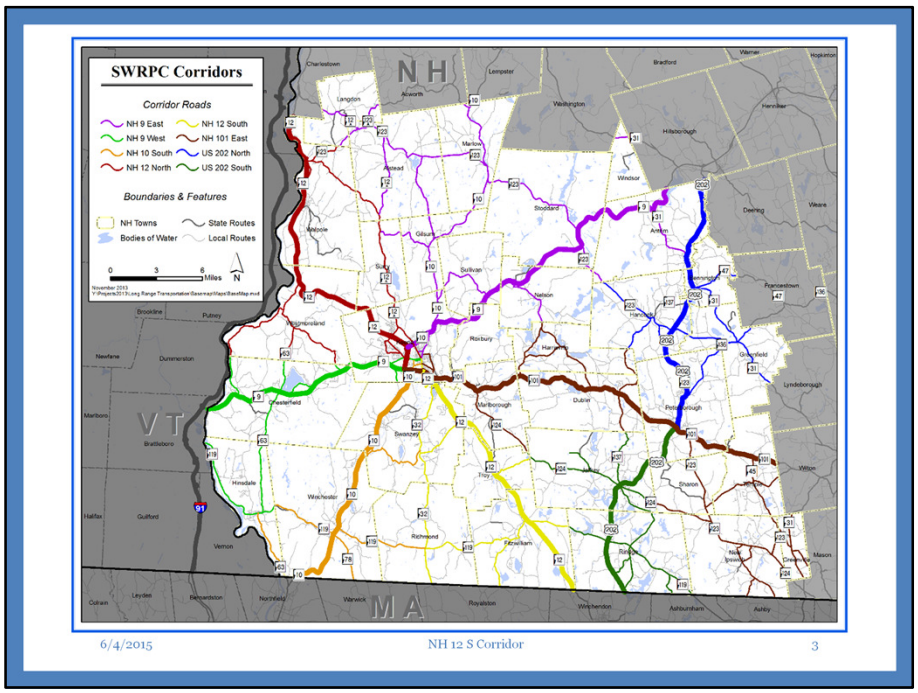
## NH 12 South Corridor

June 1, 2015

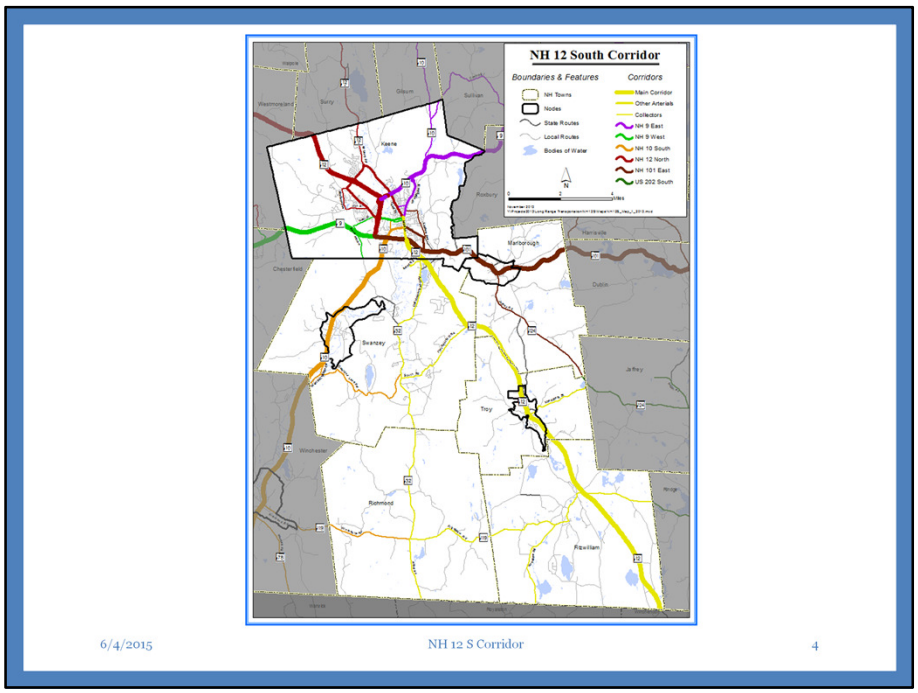
- This marks the second in a series of discussions we plan to hold on Corridors identified in *Southwest Connects*, the new Long Range Transportation Plan for Southwest New Hampshire. The meeting will feature the NH 12 South Corridor.
- As part of this series SWRPC staff has reached out to municipalities that are part of the Corridor 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 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 most 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.



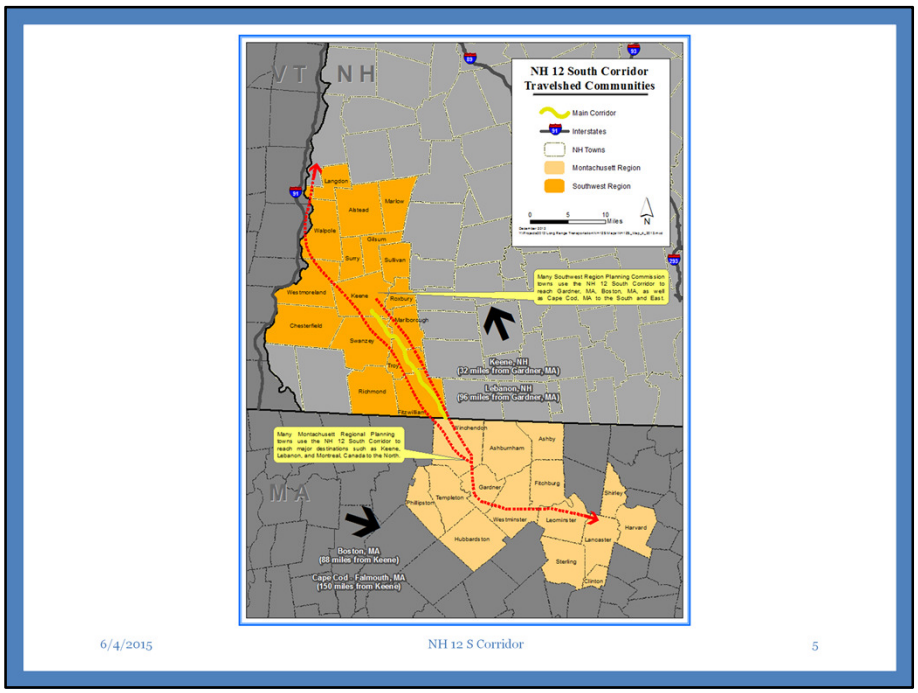

- Today's presentation will begin with an orientation and description of the NH 12 South Corridor including characteristics of the people that live there, how people travel along the corridor, economic characteristics of the corridor, and a description of housing activity and land use in the corridor 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. I encourage that questions and comments be made along the way as long as we work together to complete our discussion by 3 pm.
- As we go through this presentation, I have created a handout of *Southwest Connects* Goals and Objectives. Feel free to refer to them as we begin our discussion about the NH 12 South Corridor.



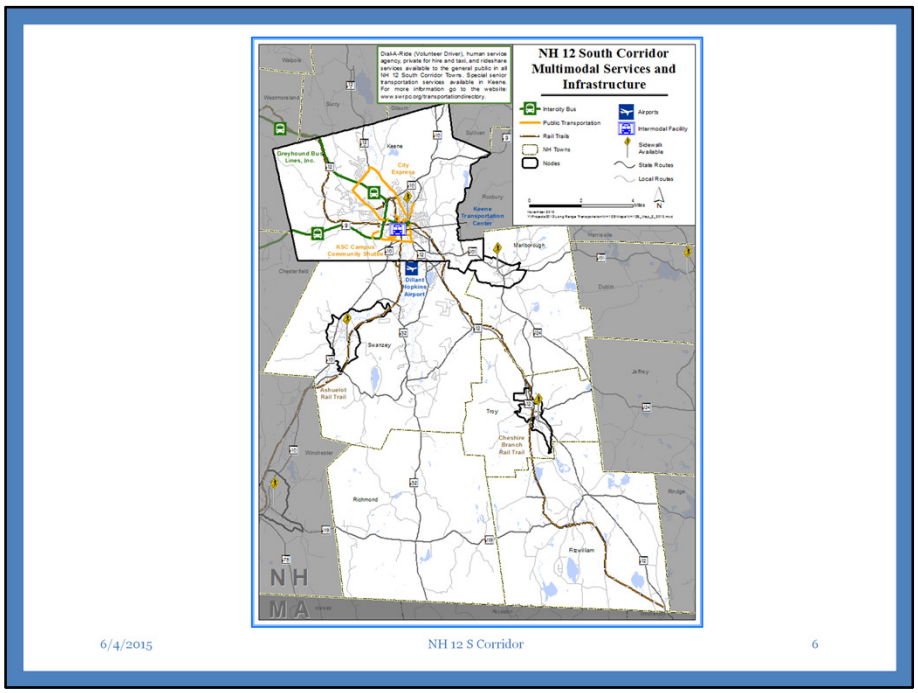

- This is a map of Southwest NH showing the eight corridors that were identified in *Southwest Connects*, each Corridor represented by a different color.
- Corridors are based on data SWRPC collected recognizing direction of travel patterns, traffic volumes, federal highway classifications (federally 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 as well as collector roads that link to the arterial roads. 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 Keene, which is linked with six corridors and Peterborough which is linked by three corridors. Some towns are identified as having nodal centers—downtowns or villages that transition the regional vehicle-based travel patterns to the local and shorter distance travel patterns that are often more pedestrian and bicycle scale. Nodes can be thought of as pearls on a necklace which represents the corridor. There are 14 nodes recognized in the Plan.




- As I said earlier, the Corridor we will be speaking about today is the NH 12 South Corridor.
- Its backbone is NH 12 in Keene at the intersection of NH 101 to NH 12 at the NH/MA State Line. (Although the Southwest Region jurisdiction stops at the NH/MA line, it makes sense to think of Route 12 extending all the way to MA-2 via MA-140 in Westminster, MA)
- It also includes parts of Routes NH 32 and NH 119 as well as Royalston Road in Fitzwilliam, Main St in Keene, Airport Road and Flat Roof Mill Road in Swanzey, and Monadnock Road in Surry.
- Towns that are recognized as part of this corridor are in alphabetical order Fitzwilliam, Keene, Marlborough, Richmond, Swanzey and Troy.




- Each Corridor is based in part on "travelsheds". This is a map showing travelsheds associated with the NH 12 South Corridor.
- The travelshed concept is derived from the watershed concept, showing the origin of where many trip origins and destinations in Southwest NH start to use NH 12 South, much like how stream networks converge into rivers. It is intended to show geographical areas that are connected with each other through Corridors.
- The arrows show directions of travel associated with different travelsheds. The travelsheds are different blocks of color of other regional districts that would be a likely origin or destination connected by the NH 12 South Corridor.
- For example, it is not unusual for a trip starting as far away as Walpole or Alstead to use NH 12 South to reach destinations in Eastern Massachusetts. It is not just a facility that is used by Keene, Swanzey, Troy and Fitzwilliam. For Southwest Region towns in the dark grey, it is less likely that they would use NH 12 South.




- 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.
- NH 12 South has very little to offer in this respect. Community transportation needs for people that don't drive would need to rely on family or neighbors or one of the volunteer driver services operating in the Region.

# Population Projections

| Communities | 2010 | 2040 | Projected % Change in Population | Projected Total Population Change |
|---|---|---|---|---|
| Fitzwilliam | 2,396 | 2,667 | 11.3% | 271 |
| Keene | 23,409 | 24,260 | 3.6% | 851 |
| Richmond | 2,063 | 2,116 | 2.5% | 53 |
| Swanzey | 7,230 | 7,677 | 6.2% | 447 |
| Troy | 2,145 | 2,338 | 9.0% | 193 |
| NH 12 South Corridor | 37,243 | 39,057 | 4.9% | 1,814 |
| SWRPC Region | 102,313 | 108,168 | 5.7% | 5,855 |

- Low growth – a departure from previous decades
- NH 12 South communities estimated to account for 31% of regional growth

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- Between 2010 and 2040 the Southwest Region is projected to grow just 5.7%. Contrast this to the previous thirty year period, 1980-2010 in which the region grew 30%. Between 2010-2040 NH 12 South Corridor towns are projected to grow even slower than the rest of the Region at 4.9%.

# Population

| | All Corridor Communities | Proportion of Corridor Population | Communities with Above Average proportion of Special Populations |
|---|---|---|---|
| Youth (Age 15 and Under) | 6,139 | 16% | Fitzwilliam (18%); Marlborough (17%); Richmond (22%); Swanzey (18%); Troy (21%); Troy Village (23%) |
| Young Adults (Age 16-34) | 11,804 | 31% | Keene (37%) |
| Middle Age (Age 35-64) | 14,874 | 39% | Fitzwilliam (48%); Marlborough (45%); Richmond (47%); Swanzey (46%); Troy (42%) |
| Seniors (65 and older) | 5,581 | 15% | Marlborough (17%) |
| Racial Minorities | 1,624 | 4% | Keene (5%) |
| Low Income (Population at or under 150% of Poverty Level) | 7,094 | 18% | Keene (22%) |
| Single Parent Households | 2,756 | 32% | Keene (36%); Troy Village (40%) |

- How is the transportation system serving different segments of our population?

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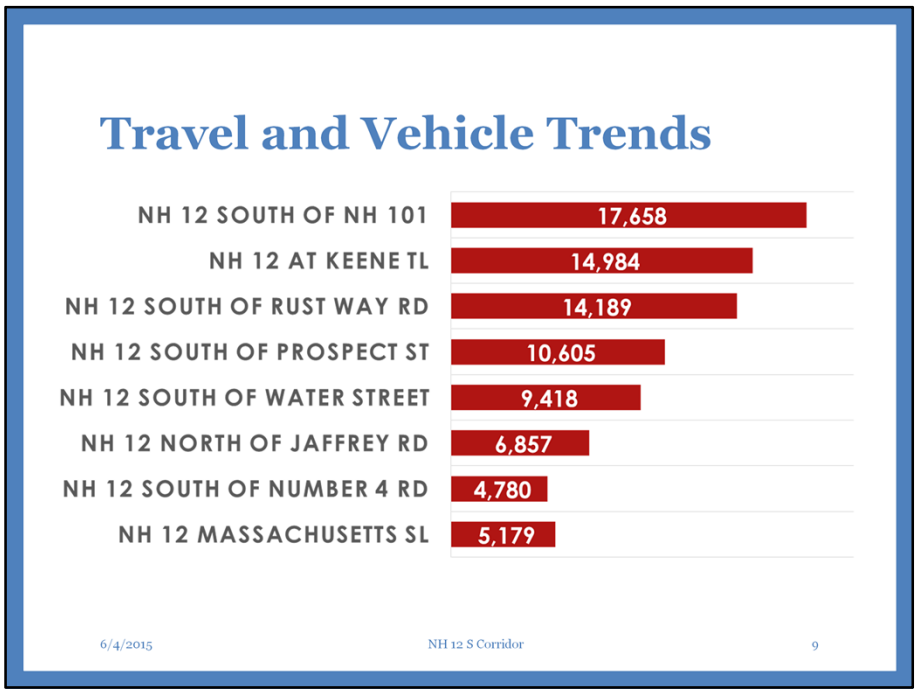
- The total population of NH 12 South Corridor communities was 37,243 as of 2010.
- This chart is meant to show subsets of that population. Generally speaking these segments of population tend to have different transportation needs.
- Youth, age 15 and under, represent a subset of the population that does not drive. These are individuals that depend on other drivers for the most part in the Corridor, because there is a lack of other options to travel independently and many destinations are beyond a walkable or bike-able distance.
- Existing trends suggest that young adults—often called "Millennials"--are less likely to want to own a car today. The highest proportion of this group exist in Keene, where a more urban environment may be able to allow for this lifestyle.
- Middle age—people ages 35-64—represent a large proportion of families and the labor force. These folks often need flexibility in transportation to make trips for work, shopping, recreation, daycare, school, etc.
- Seniors drive less than younger age cohorts, and they create a demand for transit, demand response, volunteer driver, and other services to meet their needs when they can no longer safely drive.
- Here is a good place to point out one of the Goals in *Southwest Connects*: "Goal

3: The transport system will provide people of all ages and abilities timely access to goods, services, recreation, entertainment and companionship." Ask yourself, are there projects or strategies that would allow this corridor to better meet this goal?




- This graphic indicates the travel volume averaged out over 7 days from South to North.
- As expected, most of the traffic gets heavier the closer to Keene you get.
- Traffic has not grown appreciably:
    - Traffic grew 17,000 to 18,000 at NH 12 South of Martell Court from 1990 to 2012
- The proportion of trucks in this data showed about 4 percent of the traffic at the Massachusetts State Line representing tractor trailer trucks to about 2 percent at the Swanzey/Keene TL.

# Commuting and Economy

NH Communities with 50 or more employees commuting to NH 12 communities and many likely using NH 12 South Corridor

| Employee Origin | Number | Employee Destination |
|---|---|---|
| Swanzey | 1,314 | Keene |
| Keene | 315 | Swanzey |
| Troy | 289 | Keene |
| Fitzwilliam | 230 | Keene |
| Rindge | 168 | Keene |
| Richmond | 114 | Keene |
| Fitzwilliam | 67 | Swanzey |
| Chesterfield | 61 | Swanzey |
| Troy | 53 | Swanzey |

Jobs and Employers in Communities on NH 12 South Corridor

| Community | Total Jobs | Total Work Sites |
|---|---|---|
| Keene | 18,442 | 842 |
| Swanzey | 2,235 | 149 |
| Marlborough | 423 | 59 |
| Troy | 228 | 27 |
| Fitzwilliam | 258 | 46 |
| Richmond | 70 | 15 |

- Largely "bedroom communities" to Keene
- Large proportion of commuters coming from inside Corridor itself, not Massachusetts . South of Keene, not seeing lots of commuters from northern parts of Cheshire County.

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- The table on the left shows that Keene is an important destination for most of the communities on the NH 12 South Corridor including Fitzwilliam, Richmond, Swanzey and Troy.
- The tables on the left also shows that there is limited use of the corridor for other commuting trips for communities outside of the corridor. For example, there are no significant trips coming from Massachusetts or trips from other parts of NH or Vermont using NH 12 to reach towns on the NH 12 South Corridor.
- Keene dwarves other NH 12 South communities in the number of jobs and employers that it hosts, although Swanzey's job and employer base continues to grow.

# Housing and Land Use

| | Housing Cost | Transportation Cost | Together | Total |
|---|---|---|---|---|
| Fitzwilliam | 26-27% | 26-27% | 52-54% | $29,152-$30,274 |
| Keene | 20-35% | 18-25% | 38-60% | $21,303-$33,638 |
| Marlborough | 26% | 25-27% | 51-53% | $29,152-$29,153 |
| Richmond | 27% | 28% | 55% | $30,834 |
| Swanzey | 24-28% | 25-27% | 49-54% | $27,471-$30,274 |
| Troy | 26-27% | 25-26% | 51-53% | $28,592-$29,713 |

- Results for a median income family with 2 commuters, 4 people
- Median income = $56,062
- Adjusted for housing and transportation costs

Sources include Consumer Expenditure Survey, Census American Community Survey data at Census Block Group level, Longitudinal Employment –Household Dynamics Data, Origin-Destination Employment Statistics data.
http://www.locationaffordability.info/lai.aspx

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- The final column is a tool that looks at household travel patterns based on availability of transportation, gas prices, predominant insurance costs, typical transportation expenditures, commuting patterns, and average household trip data. Here we can see the higher cost of transportation for housholds living in a bedroom community.

## Performance Measures

- Improve asset condition
- Improve safety
- Improve mobility
- Improve multimodal accessibility

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- *Southwest Connects* has a number of performance measures that it uses to monitor the effectiveness of the transportation system. We borrow performance measures currently being established through the federal MAP 21 transportation bill, as well as measures adopted by NHDOT and the Monadnock Region Transportation Management Association (www.monadnockTMA.org).
- MAP-21 national goals include safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability, and reduced projected delivery delays. So far MAP-21 has released proposed performance measures for safety and infrastructure condition only.
- In this section we will review USDOT MAP-21 performance targets and measures, they are a key part of federal transportation funding because they define a performance and outcome-based program that all states are required to implement.
- Southwest Connects reports on some of these metrics to increase understanding of how our region compares to state and national targets.
- We will highlight a few of these measures today. Some measures in the plan are not applicable for this corridor. For example, there is no park and ride facility, which would meet the goals of improving mobility or multimodal accessibility.

## Improve Asset Conditions:

- Pavement Condition: NHDOT Balanced Scorecard
- Bridge Condition: From MAP-21 Proposed Rule
- Red List Bridges: From NHDOT Balanced Scorecard
- Rail Lines Capable of Speeds of 40 MPH: From NHDOT Balanced Scorecard
- Airport Runway Surface Conditions: From NHDOT Balanced Scorecard
- Remaining Useful Life of Transit Buses: From NHDOT Balanced Scorecard

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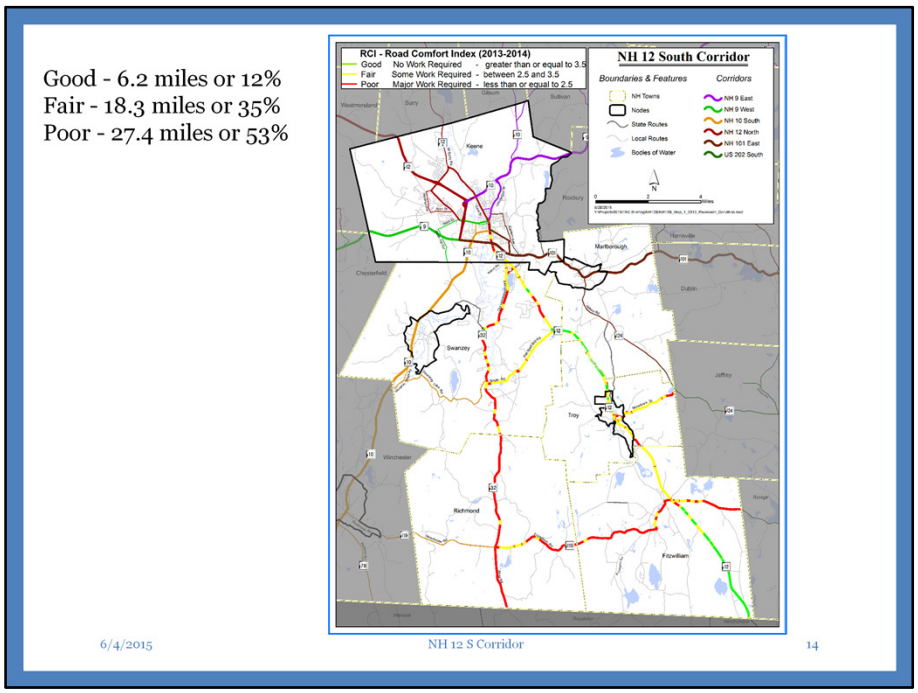
- As stated before, some MAP-21 performance measures have not yet been finalized.
- The proposed pavement and bridge condition performance measures are currently within their comment period (Ending April 6, 2015).
- The four *proposed* measures to assess pavement condition are: (1) Percentage of pavements on the Interstate System in Good condition; (2) Percentage of pavements on the Interstate System in Poor condition; (3) Percentage of pavements on the NHS (excluding the Interstate System) in Good condition; and (4) a Percentage of pavements on the NHS (excluding the Interstate System) in Poor condition. The IRI or International Roughness Index, Cracking Percent, and Rutting determines if a segment is in Good, Fair, or Poor condition. For example, IRI: For non-urbanized areas, Less than 95 = Good, 95-170 = Fair, Greater than 170 = Poor. The remaining two measures are assigned good, fair, or poor values. If all three are good, the segment is good. If two or more are poor, it is rated poor.
- Bridge condition is monitored through the National Bridge Inventory and there are two bridge performance measures under MAP-21: percentage of NHS bridges in good condition and percentage of NHS bridges in poor condition. The ratings of Good, Fair, and Poor are assigned based on the deck, superstructure,

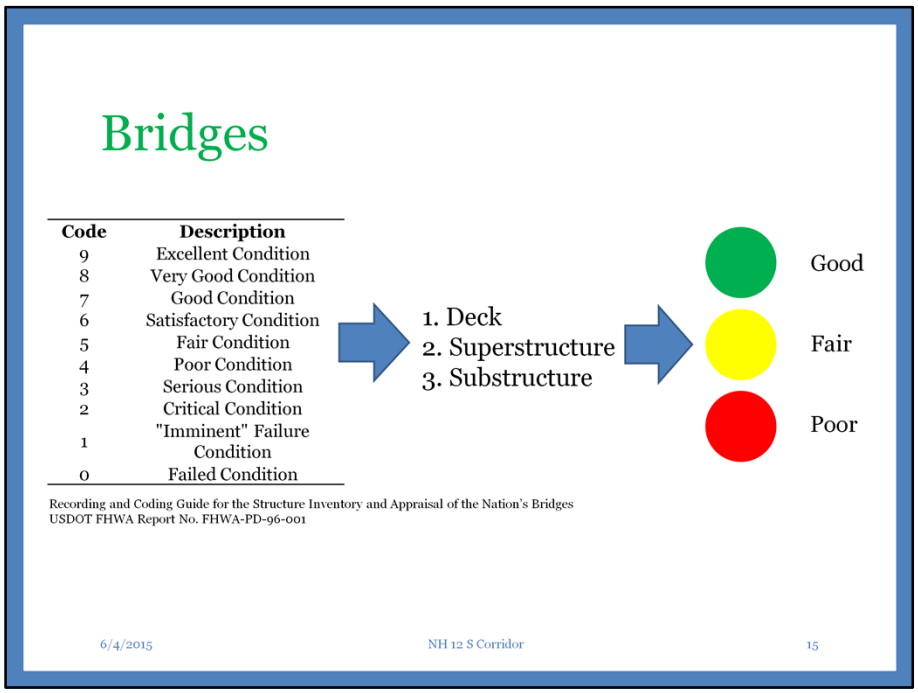
substructure, and culvert ratings from the NBI.

- 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.

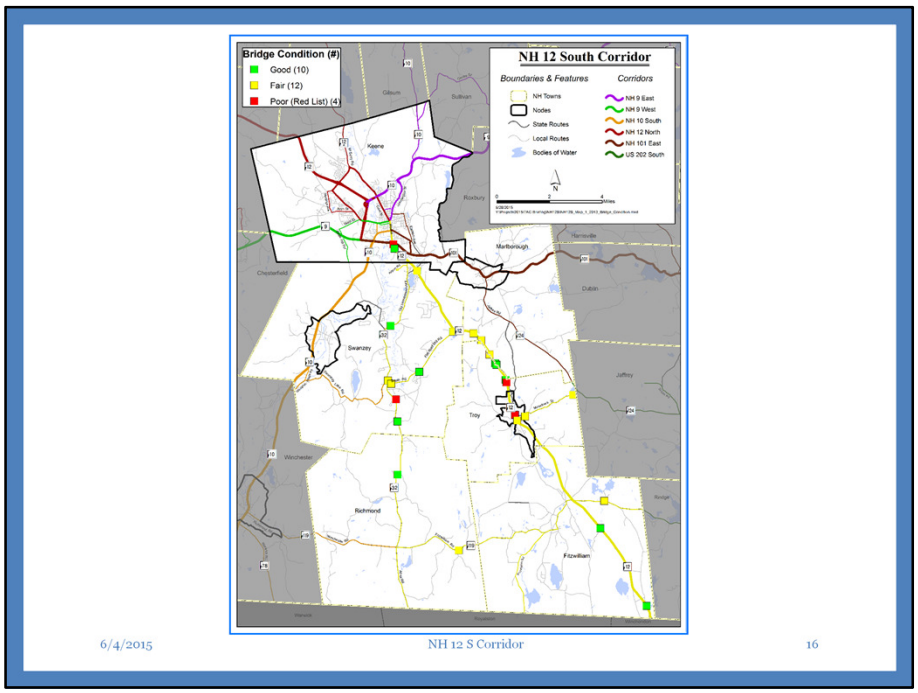



- Under the FHWA proposed rule, NH will establish a statewide target for pavement and bridge condition measures. The minimum level per FHWA is that no more than 5% of lane miles on the Interstate System may be in poor condition. NHDOT may establish additional targets, but they have not been determined at this time.
- Currently pavement condition is recorded under contract with Pathways, utilizing specialized sensors, which record pavement condition attributes in 1/10$^{th}$ of a mile increments in one direction. National Highway System mileage is surveyed every year. Unnumbered state highways ( ie. Monadnock Street, Marlborough Road, Flat Roof Mill Road.) is surveyed every other year.
- 2013-2014 NHDOT 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 under the MAP-21 performance measure proposed rule-making. The other two were cracking and rutting.
- NHDOT is currently reviewing 2013-2014 data to calibrate the detection of cracking.
- As a whole, the entire NH 12 South Corridor System has approximately 47% of mileage in fair or good condition. Only 12% is in good condition. However, current data do not reflect recent resurfacing projects that include Monadnock Street, Flat Roof Mill Road, and Route 12 in Swanzey.
- The highest need for pavement reconstruction/rehabilitation is off Route 12, including

Route 32 and Route 119.



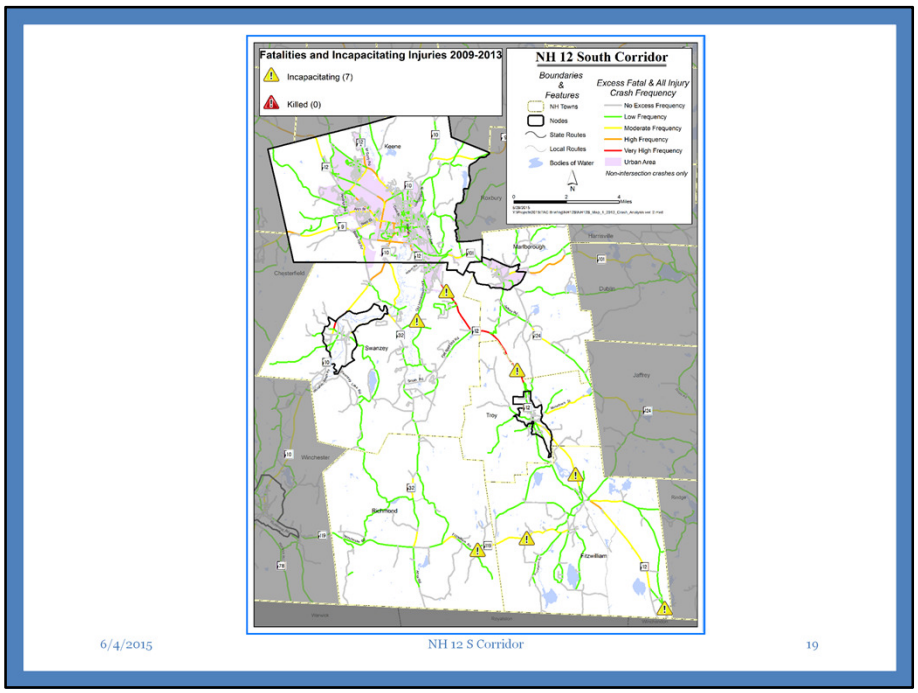

- Bridge inspection data is available once per year (April) from the Department of Transportation. Figures may be somewhat of a lagging indicator, depending on the time of inspection and scheduled maintenance.
- Under MAP-21 performance measures, which rely on the National Bridge Inventory, the deck, 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.
- 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 26 bridges throughout the corridor system. The map shows that four are in poor or "red-listed" condition. Three of these bridges are on the backbone corridor, Route 12 and 1 is on a secondary numbered route, Route 32.
- Swanzey 27692 scheduled for replacement in 2023 ($1.762 Million). The bridge was originally constructed in 1921. The deck, superstructure and substructure are all rated in poor condition (4).
- One redlist bridge, located in Keene, over Beaver Brook (137/059), is locally-owned and is scheduled for replacement. That project is programed for replacement as part of the City Bridge Rehabilitation and Replacement CIP Program and is eligible for funding as part of New Hampshire Department of Transportation (NHDOT) Municipal Bridge Program which includes 80% State and 20% City participation (NHDOT Project #26505). The bridge is currently rated in condition 4 (Poor). It is inspected as a culvert, so there are not separate deck, superstructure, and substructure ratings. The project is scheduled for construction in 2016.
- In Troy, two bridges are redlisted. 089/114, over the South Branch of the Ashuelot River, has deck, superstructure, and substructure ratings of 4, 4, and 5, respectively. In was originally constructed in 1941. The second bridge, over the abandoned railroad grade, 096/091, is redlisted due to the deck being in poor condition (4), the superstructure and substructure were rated 6 and 5 respectively. This bridge was built in 1957.

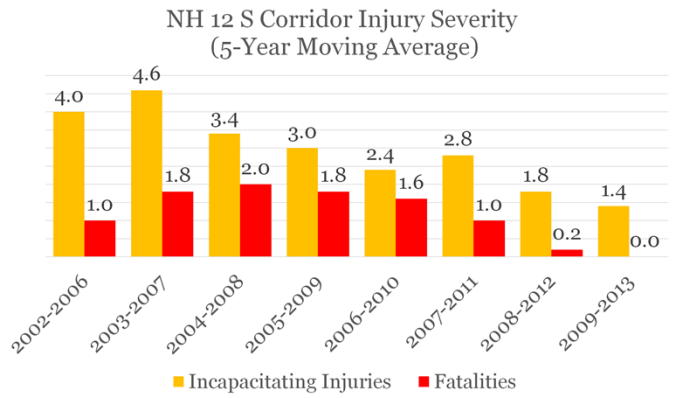

- The Runway 2/20 Rehabilitation Project was completed in 2014. Milling of the paved surface has been completed. The paving of the runway has been completed. Construction of a new taxilane east of the terminal ramp is also complete. This taxilane will provide access to hangar development sites, as outlined in the Airport Master Plan. Both Runway 14/32 and Runway 2/20 are now open.

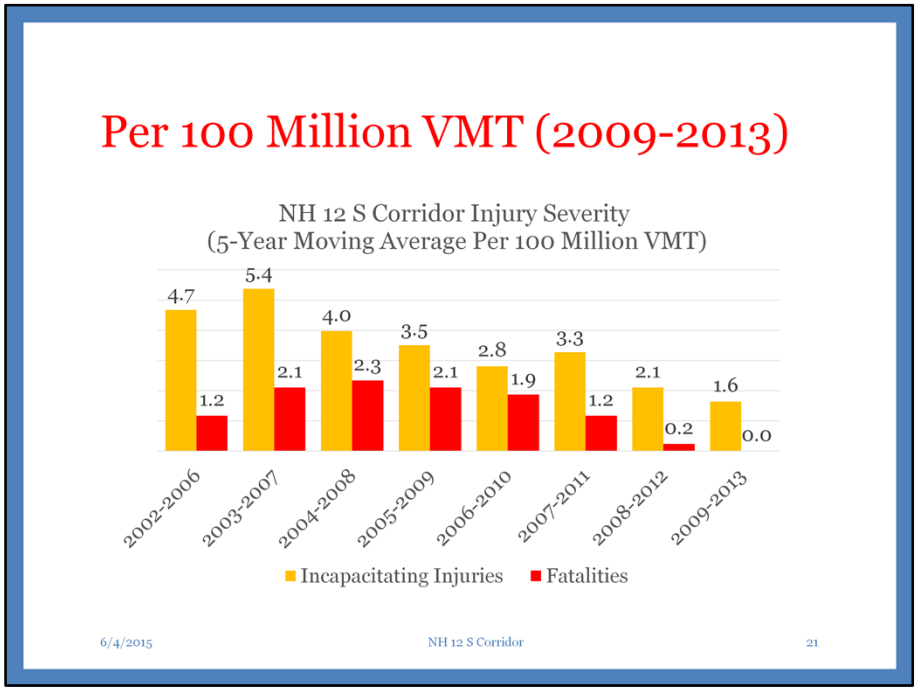

- MAP-21's safety performance measures are aimed at reducing traffic fatalities and serious injuries on all public roads, including local roads.
- NHDOT is required to assess series injuries and fatalities per vehicle miles traveled.
- Safety data is collected through the NH Department of Safety and every occupant involved with a collision is assigned an injury status at the scene. The highest severity status is a "fatal injury" (at scene or within 30 days of injury), followed by "suspected serious injury/incapacitating injury" (laceration, broken extremity, burns, unconsciousness, paralysis, etc.)
- MAP 21 safety performance measures are proposed as a 5-year rolling average rate for fatalities and serious injuries. They are normalized by examining the number of fatality and serious injuries per by 100 million VMT, so that lower volume roads can be compared with higher volume highways.
- Under the proposed rule, New Hampshire will be required to set annual targets based on the calendar year. Targets have not been set yet.
- NOTE: SWRPC has made available a handout titled: "NH 12 S Corridor System – Crash Summary (2002-2013)" to review crashes on the corridor with fatalities or incapacitating injuries. On the following sides, you will learn how the trend in these crashes has changed over time.



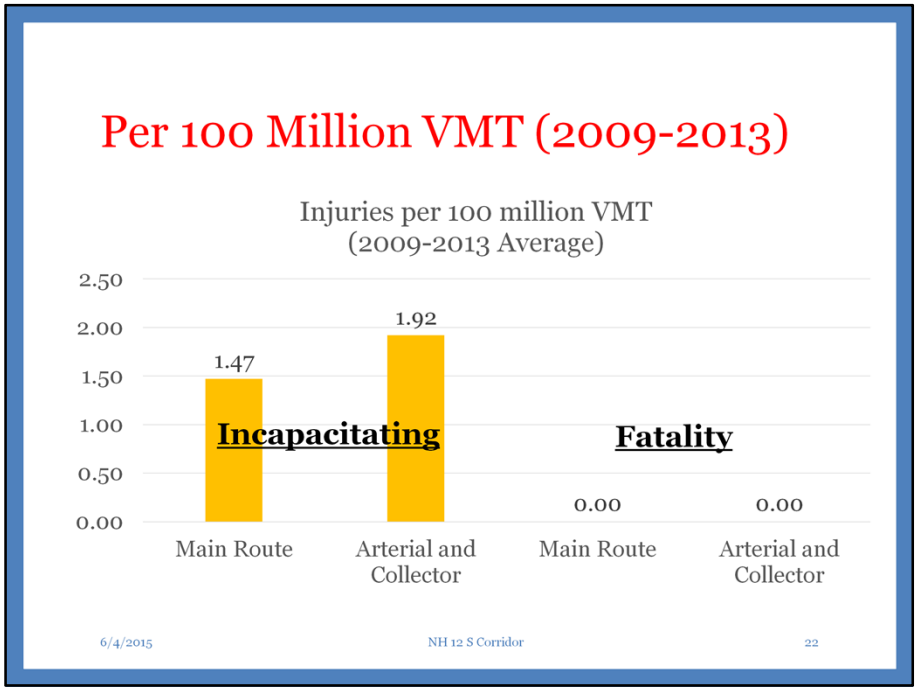

- Here is a map showing fatality and serious injury crashes in the NH 12 South Corridor System in the most recent 5 year period of complete crash data (2009-2013).
- Over the 2009-2013 time period, there were a total of 0 fatalities and 7 incapacitating injuries on the NH 12 South Corridor.
- Each road is colored to indicate its relative long term safety performance. The rating is based on a highway segments long term crash frequency as it compares to the long term crash frequency of similar site types (rural 2-lane highway, urban 2-lane divided highway, etc.) and traffic volumes. For each of comparison, highway segments outside of the NH 12 S corridor system are displayed.
- Excess crash frequency is calculated using both fatalities and all injuries according to the AASHTO Highway Safety Manual, and includes 10 or more years of crash information obtained from the Department of Safety.

# 5-Year Rolling Average

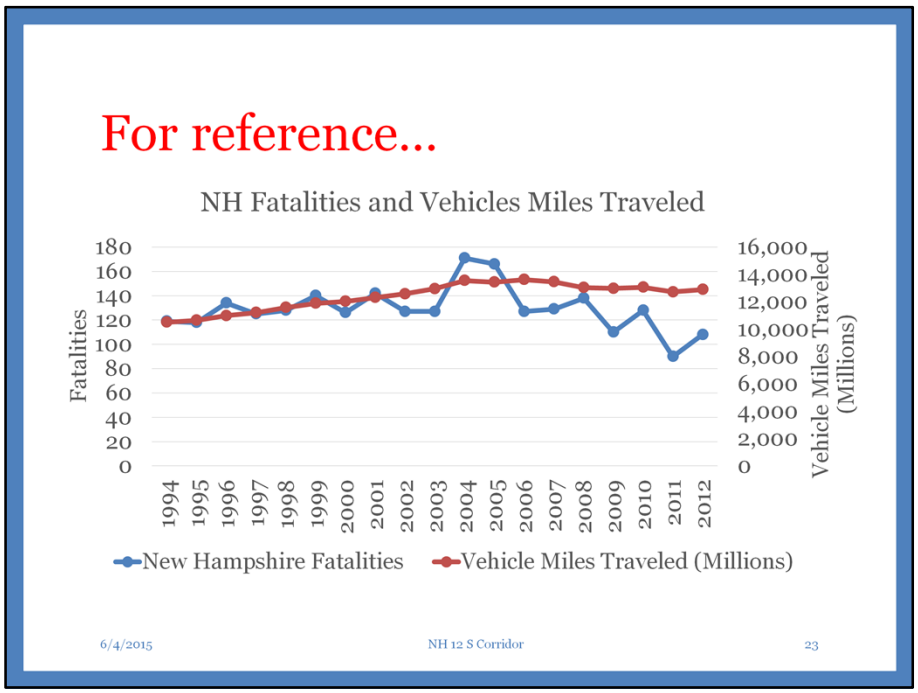




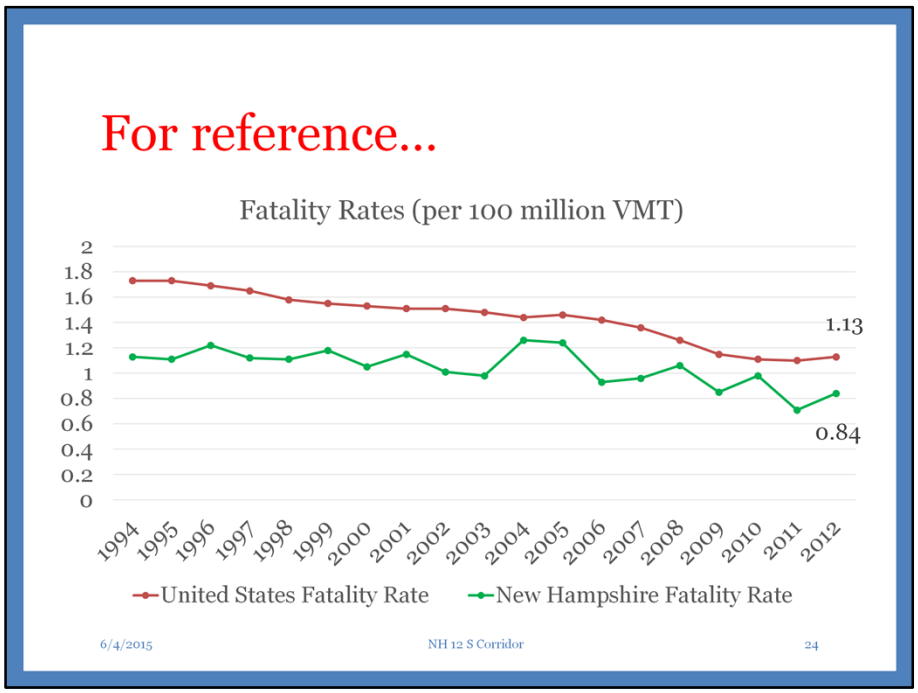

- Since the MAP-21 performance measure is based on a 5 year rolling average, SWRPC gathered historical data to show changes in fatalities and incapacitating injuries.
- The rolling average of serious injuries and fatalities is useful because it reduces "spikes" that may happen from year to year. NHDOT 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.
- Adjusting the fatality and serious injury rates takes away some of 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.



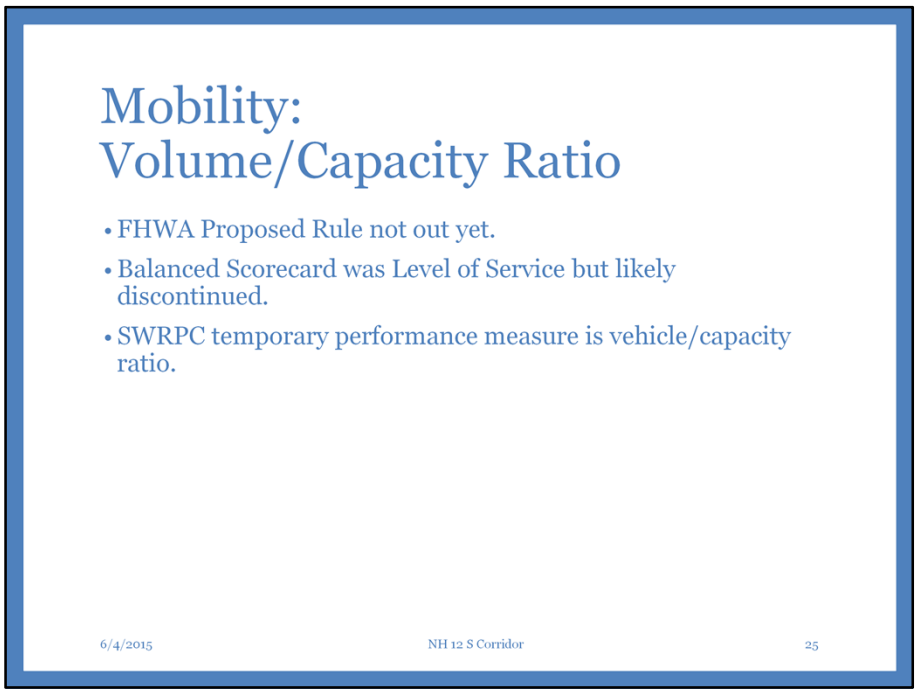

- In this slide, the principal arterial or "main route" is separated from the minor arterials and collectors that make up the NH9E corridor system.
- Adjusting the fatality and serious injury rates takes away some of the bias from the principal arterial carrying the majority of annual daily traffic.
- 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.
- In this analysis, fatality rates per vehicle mile traveled were higher off of the backbone corridor (ie. NH 12 itself has performed slightly better than the arterials and collectors that connect to NH 12, including RT 119 and RT 32).




- To provide a means of comparison, statistics are provided over this and the following slide. The rolling 5-year average of the NH 12 S corridor is consistent with the state trend.
- In New Hampshire, highway fatalities are in decline, in part due to safety improvements (both highway and vehicle) but also total travel, which has decreased since 2006.
- It should be noted that fatalities are not inherently tied to total vehicle miles traveled and that vehicle miles traveled vary from year to year. Between 1994 and 2004, fatalities appeared to be closely related to miles driven. Since then, especially after 2006, statewide travel has stagnated or decreased. Total fatalities have also declined.




- New Hampshire has a lower highway fatality rate than the nation (0.84 fatalities per million vehicles miles travelled per year in 2012)




- 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. For example, a rural lane of highway has a capacity of roughly 1,400 vehicles per hour.

A – No Congestion, operations constrained by road geometry (V/C < 0.6)
B – Free flow, similar travel speeds as LOS A, but less freedom to maneuver
C – Travel speed and ability to maneuver further reduced
D – Travel speed further reduced
E – Near capacity
F – "Forced or breakdown flow"

| Town | Location | Peak Weekday PM | Year | Lanes | Capacity | V/C ratio | LOS |
|---|---|---|---|---|---|---|---|
| Keene | NH 12 S of Martell Ct | 1,830 | 2011 | 2 | 2800 | 0.65 | C |
| Keene | NH 12 @ Swanzey TL | 1,678 | 2011 | 2 | 2800 | 0.60 | C |
| Swanzey | NH 12 S of Rust Way | 1,315 | 2013 | 2 | 2800 | 0.47 | B |
| Marlborough | NH 12 @ Troy TL | 819 | 2012 | 2 | 2800 | 0.29 | A |
| Fitzwilliam | NH 12 @ Troy TL | 694 | 2013 | 2 | 2800 | 0.25 | A |
| Fitzwilliam | NH 12 over Scott Brook | 404 | 2013 | 2 | 2800 | 0.14 | A |
| Fitzwilliam | NH 12 @ Massachusetts SL | 425 | 2013 | 2 | 2800 | 0.15 | A |

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- Vehicle density is primary performance measure for level of service. A section of highway with certain physical attributes has a set capacity of vehicles over a given period of time. A volume to capacity ratio looks at the observed volume and the capacity of a given section to assign a letter grade that describes the flow of traffic.
- Using these measures, the corridor does not experience significant degradation in traffic flow, even during peak hours.
- NHDOT continues to research new ways of analyzing level of service and travel time through the National Performance Management Research Data Set (NPMRDS), which utilizes actual travel times recorded through the use of personal navigation aids like GPS units.

## Signalized Intersection

| Location | Period | Level of Service |
|---|---|---|
| NH 12 at Main Street and NH 101 in Keene | A.M. Peak<br>P.M. Peak | D<br>E |

## Definitions

| Level of Service | Signalized Intersection | Two Way Stop Controlled |
|---|---|---|
| A | Up to 10 sec./vehicle | Up to 10 sec./vehicle |
| B | 10-20 sec./vehicle | 10-15 sec./vehicle |
| C | 20-35 sec./vehicle | 15-25 sec./vehicle |
| D | 35-55 sec./vehicle | 25-35 sec./vehicle |
| E | 55-80 sec./vehicle | 35-50 sec./vehicle |
| F | More than 80 sec./vehicle | More than 50 sec./vehicle |

## Unsignalized Intersections

| Location | Period | Movement | Level of Service |
|---|---|---|---|
| NH 12 at NH 32 (Old Homestead Highway)* | A.M. Peak | NB Left<br>EB Left & Right | A<br>F |
| | P.M. Peak | NB Left<br>EB Left & Right | B<br>F |
| NH 12 at Swanzey Factory Road (if roundabout was not installed) | A.M. Peak | NB<br>SB<br>WB<br>EB | A<br>A<br>D<br>C |
| | P.M. Peak | NB<br>SB<br>WB<br>EB | A<br>A<br>E<br>C |
| NH 12 at Flat Roof Mill Road* | A.M. Peak | NB Left<br>EB Left & Right | A<br>C |
| | P.M. Peak | NB Left<br>EB Left & Right | A<br>C |
| NH 12 at Marlborough Road* | A.M. Peak | SB Left & Through<br>WB Left & Right | A<br>C |
| | P.M. Peak | SB Left & Through<br>WB Left & Right | A<br>C |
| NH 12 at NH 119 | A.M. Peak | NB Left<br>SB Left<br>WB<br>EB | A<br>A<br>B<br>B |
| | P.M. Peak | NB Left<br>SB Left<br>WB<br>EB | A<br>A<br>B<br>B |

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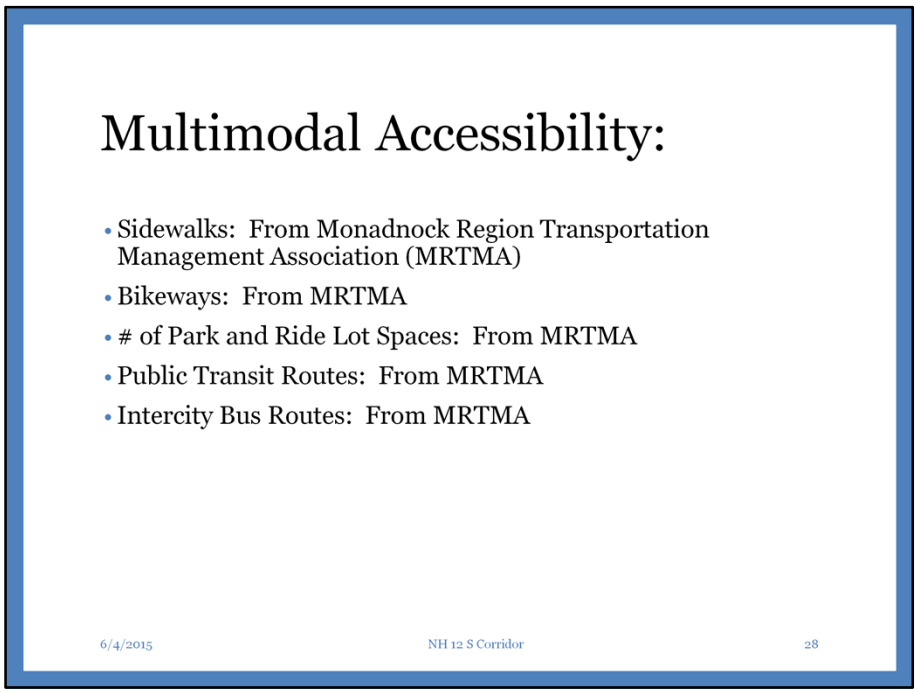
- The Main Street/101/12 signalized intersection was modeled by SWRPC following morning and evening turning movement studies and obtaining signal phasing information from NHDOT Bureau of Traffic
- LOS A represents the best operating conditions and LOS F represents the worst operating conditions. In intersection level of service studies, this is determined by the seconds of delay experienced by vehicles traveling through the intersection.
- It is important to note that a level of service of F does NOT mean an intersection is over capacity, longer delays are typical at signal with long cycle lengths.




- 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 Region Transportation Management Association 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.
- In terms of bikeways, the plan looks at highways on the corridor that have paved shoulders greater than 4 feet on one side, as well as improved multi-use trails and roadways with bikelanes or sharrows.

| | Examples | Locations Where Accessible |
|---|---|---|
| **Pedestrian** | Sidewalks | Keene, Swanzey, Troy Village |
| | Cheshire Branch Rail Trail | Fitzwilliam, Keene, Swanzey, Marlborough, Troy, Troy Village |
| **Bicycle** | Cheshire Branch Rail Trail | Fitzwilliam, Keene, Swanzey, Marlborough, Troy, Troy Village |
| | 4 foot Shoulders on NH 12 S Corridor Backbone | Fitzwilliam, ~2.7 Troy, Marlborough, Swanzey, ~.7 mi in Keene |
| **Fixed Route Bus** | City Express, Keene State College Shuttle | Keene |
| **Demand Response Bus** | Para Express, Friendly Bus | Keene |
| **Volunteer Drivers** | American Red Cross | |
| **Carpooling Program** | Contoocook Valley Trans. Co. | |
| **Intercity Bus** | No Example Available | Not Available |
| **Railroad Freight** | No Example Available | Not Available |
| **Railroad Passenger** | | |
| **Railroad Excursion** | | |
| **Airport** | Dillant-Hopkins Airport | Swanzey |

## Shoulder Width

- Consideration for shoulder, edge line, and centerline rumble strips
- Improve bicycle accommodation
- Space for emergency storage of disabled vehicles
- Area to avoid crashes
- Space for emergency and enforcement operations
- Improved sight lines through horizontal curves
- Driver comfort

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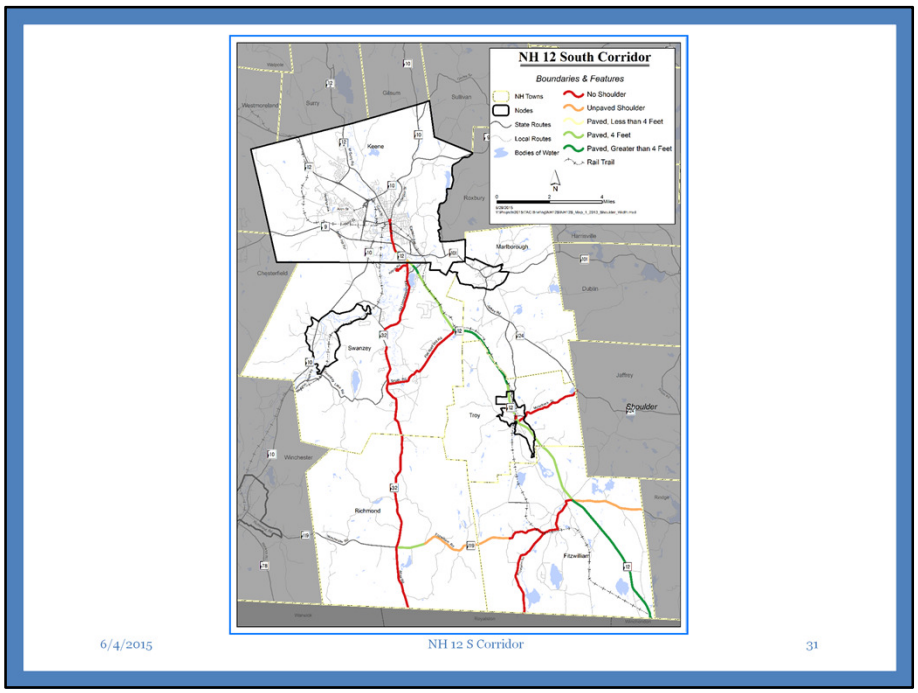
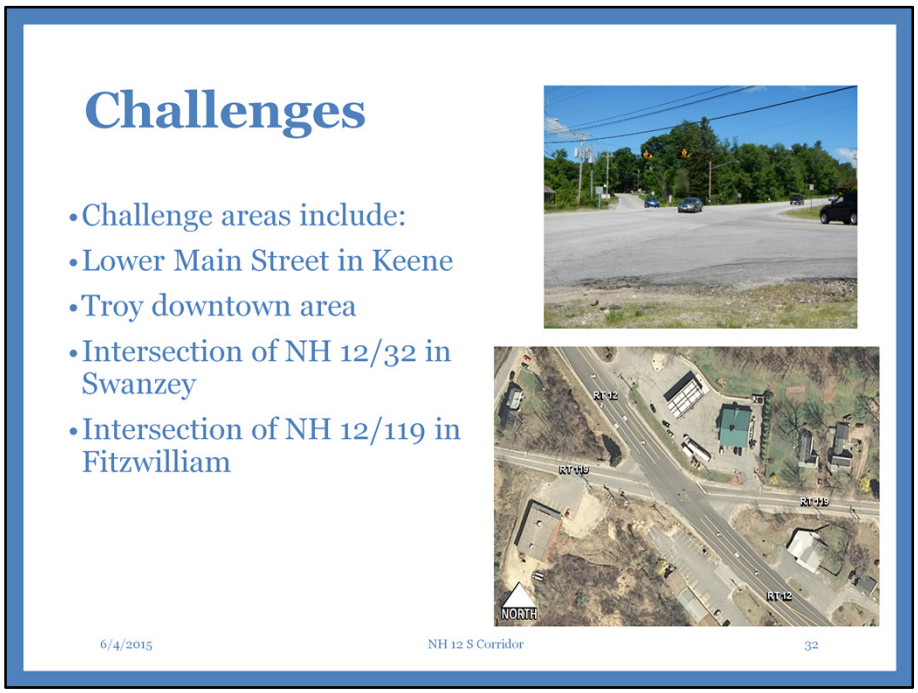
- Shoulder width is an important consideration for all users, and especially so for cyclists (they are legally allowed to operating within the traveled lane, but separation from vehicular traffic is preferred)
- The following map depicts common shoulder widths throughout the corridor network.




- This map depicts areas of the corridor system without a shoulder (red), with an unpaved shoulder of any width (orange), with a paved shoulder less than 4 feet (yellow), with a paved shoulder of exactly 4 feet (light green), and with a paved shoulder greater than 4 feet (dark green).
- The backbone corridor has a shoulder for almost it's full extent. Of the areas with a shoulder, it is most commonly paved, at 4 feet in width.
- Other arterial and collector sections are very different. The majority have no shoulder whatsoever.
- Both the Ashuelot and Cheshire Rail Trail are in proximity to the corridor. They trails are both oriented North-South and do not currently have safe crossings across the Bypass System/NH 101. The condition of the trails in some areas reduces their usability to pedestrians, cyclists, and others.




The first two bullets show the two nodal centers on this corridor (lower downtown Keene and downtown Troy). There are several locations on the corridor where towns, SWRPC, NHDOT and landowners will need to coordinate local, regional and state interests. In particular, the areas that need special attention include Lower Main Street in Keene, the intersection of NH 32, the Cheshire Fairgrounds/TIF District in Swanzey, downtown Troy and the intersection of NH 119 and NH 12 in Fitzwilliam.


1. The NH 12 South Corridor hosts the only public airport in the Southwest Region at Dillant-Hopkins Airport located in Swanzey, which is only a short distance off NH 12. This airport caters mostly to business and recreational aviation needs. It has capacity to accommodate additional air traffic and promote more regional economic development activity.
2. There is an opportunity to develop a Park and Ride near the north end of corridor area to serve NH 12 drivers heading south to MA 2, Boston, etc. as well as users of NH 9, NH 101 and NH 10.
3.The extension of Safford Drive from NH 32 to connect to NH 12 South near the Cheshire County Fairgrounds with construction nearly completed. They are also designating the area as an Industrial Park Zone.

4.The construction of the roundabout at the intersection of NH12/Lake Street/Swanzey Factory Road- construction to be completed by 2015

5. There is an opportunity to establish safe access to accommodate potential future needs by applying access management strategies for new development.
6. Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects, including broadband.

7. The Cheshire Branch Rail Trail is in fair to good shape through most of the corridor area. Spot trail improvements, regional cooperation and marketing could improve recreation and economic development opportunities for area towns.

The NH 12 South Corridor connects the western part of the Southwest Region with destinations in Massachusetts and beyond via the limited access highways MA 2, I-495 and I-95. Maintaining open communications with stakeholders across the state line will benefit commuters.

## Recent Projects (2010-Current)

- Chesterfield/Troy-Swanzey/Tamworth-Ossipee 22552 – Resurfacing of Route 12
- Keene 16075 - NH 101 / NH 12 / Main Street intersection, upgrade signal equipment, pavement markings and signs
- Swanzey - The extension of Safford Drive from NH 32 and designation of the area as an Industrial Park Zone.
- District 4 Resurfacing 29219 – Flat Roof Mill Road and Monadnock Street
- Troy 21197 – Troy Elementary School Sidewalks (South St.)
- Troy 15537 – Reconstruct sidewalks near Troy Common, Mill Street, South Street
- Swanzey 15697 - Safety improvements at the intersection of NH 12 and Lake Street

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- Here are some recent investments that have been made by NHDOT on the NH 12 South Corridor since 2010.

## Future Projects (Programmed)

- Keene 26505 – Bridge Replacement, NH 12 over Beaver Brook, 137/059 (Red List)
- Swanzey 27692 - Bridge Replacement, bridge carrying NH 32 over Martin Brook, 149/072 (Red List)

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- Fitzwilliam 16211 - http://www.nh.gov/dot/projects/fitzwilliam16211/
- Swanzey 27692 scheduled for 2023
- Keene SBG airport projects were unfunded at the time of writing. They appear as follows in Southwest Connects.
    - 8070 Keene-Swanzey, Dillant-Hopkins Airport: Expansion - apron & hangar improvements, NHDOT Recommendation 2020-2024 $2.020 Million
    - 8071 Keene-Swanzey, Dillant-Hopkins Airport: Modernization - taxiway improvements, NHDOT Recommendation 2022-2024 $4.234 Million
    - 8072 Keene-Swanzey, Dillant-Hopkins Airport: Preservation - runway reconstruction and hazard beacon rehabilitation, master planning, SRE purchase, NHDOT Recommendation 2015-2018 $2.881 Million

# Future Projects?

- Fitzwilliam 16211 - Intersection Safety Improvement Project through HSIP
- Richmond Trail Project (Four Corner Area)
- Richmond Shoulder Improvement Project (Four Corners Area)
- Route 12 South Corridor Study Recommendations (including: Park and Ride Lot, Rail Trail Improvements, Complete Streets, Intersection Safety)


- We hope this has provided some useful information for thinking about the NH 12 South 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 NH 9 greatest challenges and opportunities.
- We look forward to hearing your thoughts.
- For further reading visit www.swrpc.org/regionalplan to read *Southwest Connects* and ask Commission Staff to be notified when the *Route 12 South Corridor Study* is released.