

SOUTHWEST NH TRANSPORTATION ADVISORY COMMITTEE

NH 9 West Corridor

November 2, 2015

- This marks the third 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 9 West 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 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 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.

Presentation Outline

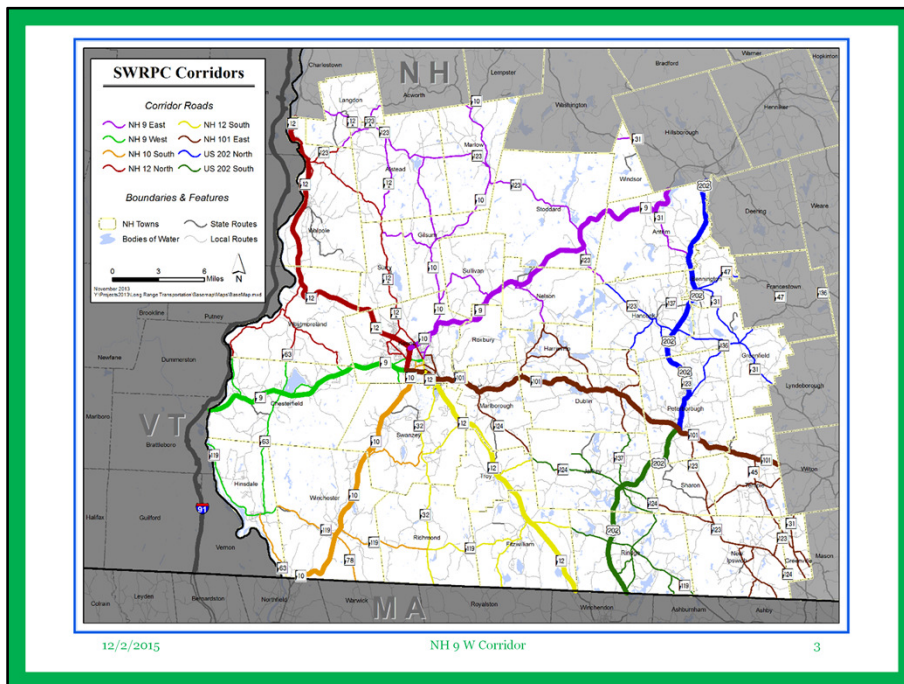
- Corridor Features and Location
- Population
- Travel & Vehicle Trends
- Commuting & Economy
- Housing & Land Use
- Performance Measures
- Challenges & Opportunities
- Past & Future Projects

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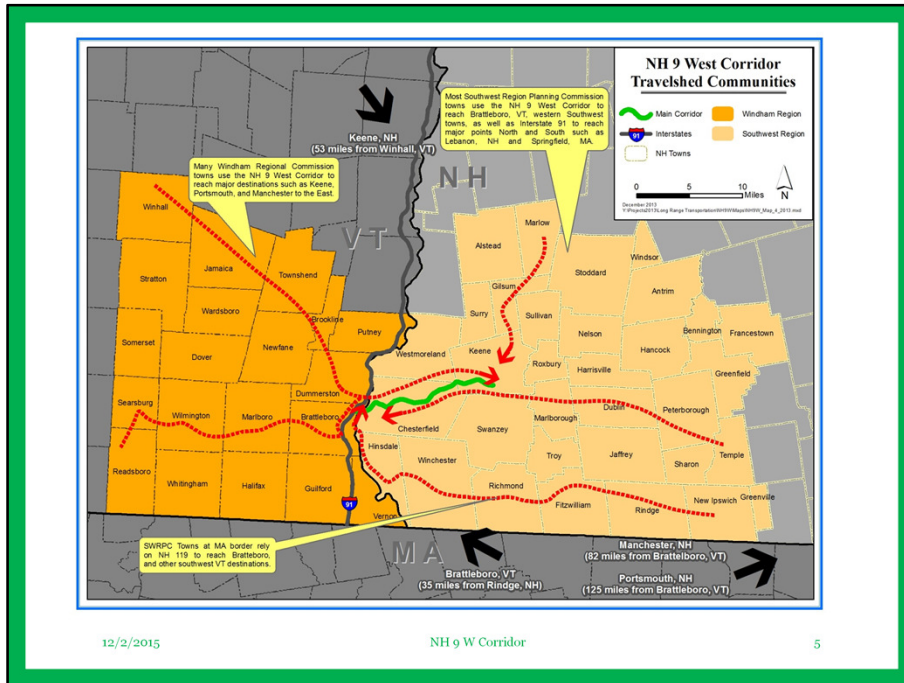
NH 9 W Corridor

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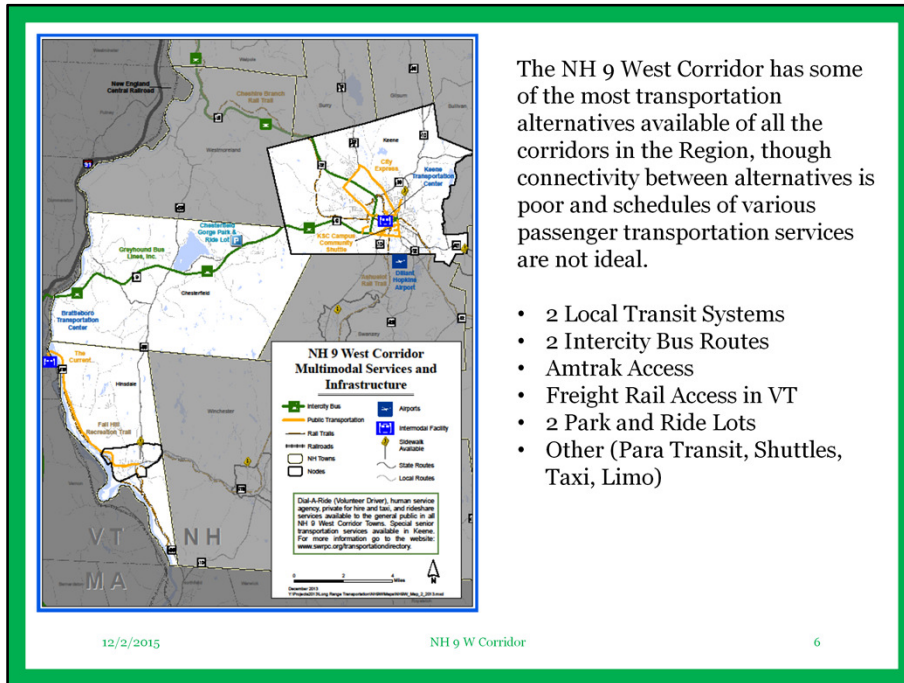
- Today's presentation will begin with an orientation and description of the NH 9 West Corridor including characteristics of the people that live there, how people travel along the corridor, economic characteristics of the corridor, and a description of housing activity and land use in the corridor system.
- 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*, 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. There are 14 nodes recognized in the Plan.



- Each Corridor is based in part on “travelsheds”. This is a map showing travelsheds associated with the NH 9 West 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 9 West, 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 9 West Corridor.
- For example, almost every town in the Southwest Region is likely to use NH 9 to get to major destinations in SE Vermont such as Brattleboro. For Southwest Region towns bordering Massachusetts, NH 119 is the main corridor for reaching Brattleboro, VT.



The NH 9 West Corridor has some of the most transportation alternatives available of all the corridors in the Region, though connectivity between alternatives is poor and schedules of various passenger transportation services are not ideal.

- 2 Local Transit Systems
- 2 Intercity Bus Routes
- Amtrak Access
- Freight Rail Access in VT
- 2 Park and Ride Lots
- Other (Para Transit, Shuttles, Taxi, Limo)

- 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.
- In addition to the highways previously mentioned, the NH 9 West Corridor has several other transportation services including:
 - Nearby access to a Vermont Amtrak station with 4 routes. A sample of current schedule information on the Amtrak is shown below.
 - 55, Mo-Fri – St Albans (8:58), Brattleboro (12:34), Springfield (14:50), NY, NY (18:45), Wash, DC (21:59)
 - 56, Mo-Fri – Wash, DC (8:10), NY, NY (11:33), Springfield (15:15), Brattleboro (17:10), St Albans (20:57)
 - 57, Sa-Su - St Albans (8:58), Brattleboro (12:34), Springfield (14:50), NY, NY (19:01), Wash, DC (22:25)
 - 54, Sa-Su – Wash, DC (7:30), NY, NY (11:30), Springfield (15:15), Brattleboro (17:10), St Albans (20:57)
 - 4 Intercity Greyhound Bus Service Routes that run on NH 9. A sample of current schedule information is shown below.
 - 2033, 7 days a week – White River Jct, VT (8:25), Keene (9:45), Brattleboro (10:20), Springfield (12:15), NY (15:30)
 - 2010 7 days a week – NY, NY (5:30), Springfield (9:40), Brattleboro

- (11:05), Keene (11:35), White River Jct (12:50)
 - 7960 Friday & Sunday – Brattleboro (15:15), Keene (15:50), Nashua (17:10), Boston (18:20)
 - 7961 Friday & Sunday – Boston (11:45), Nashua (12:50), Keene (14:10), Brattleboro (14:50)
- One 45 space park and ride facility in Chesterfield at the Granite Gorge State Park.
- One 25 space park and ride facility in Brattleboro operated and maintained by the Town on US 5 just north of the NH 9 roundabout
- Home Healthcare Hospice and Community Services operates its City Express/Campus Shuttle services, Monday thru Friday:
 - Bus #9 (Campus Shuttle) goes out to the Monadnock Marketplace every 30 minutes. First am stop is 7:38 and final stop is 19:08.
 - Bus #1 (Black Route/Clockwise Route) runs on Gilbo and West St starting at 8:00 and final stop is at 16:55.
 - Bus #5 (Red Route/Counter Clockwise Route) runs on Gilbo and West St starting at 8:00 and final stop is 15:54.
- Connecticut River Transit operates its Brattleboro Blue Line Route which connects downtown Hinsdale to Brattleboro. Weekday starts in Hinsdale at 6:10 am till 6:00 pm Monday thru Friday with 5 trips connecting to downtown Hinsdale. Weekend service goes from 9:20 am 4:55 with 4 stops to downtown Hinsdale. Service to Walmart is more frequent.
- There are several other services available in the area including a 7 day a week “Boston Connection” service offered by Thomas Transportation with connections from Keene’s bus station and airport to the MBTA Alewife Station and Logan Airport. Thomas Transportation offers this service up to 4 times a day depending on demand.

Population Projections

| Communities | 2010 | 2040 | Projected % Change in Population | Projected Total Population Change |
|--------------------|---------|---------|----------------------------------|-----------------------------------|
| Chesterfield | 3,604 | 3,661 | 1.6% | 57 |
| Hinsdale | 4,046 | 3,994 | -1.3% | -52 |
| Keene | 23,409 | 24,260 | 3.6% | 851 |
| NH 9 West Corridor | 31,059 | 31,915 | 2.8% | 856 |
| SWRPC Region | 102,313 | 108,168 | 5.7% | 5,855 |

Source: NH Office of Energy and Planning

- Low growth – a departure from previous decades
- NH 9 West communities estimated to account for 15% of regional growth for entire SWRPC Region though growth is really expected to come from Keene alone.

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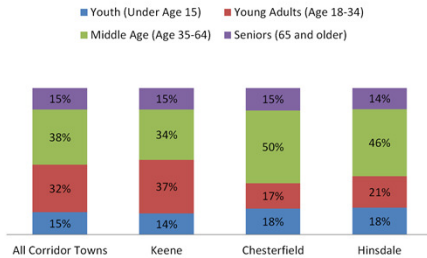
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- According to the NH Office of Energy and Planning, between 2010 and 2040 the Southwest Region is projected to grow just 5.7%. Contrast this to the previous thirty year period, 1980-2010 in which the region grew 29% (from 78,800 to 100,751). Between 2010-2040 NH 9 West Corridor towns are projected to grow even slower than the rest of the Region at 2.8%. During the previous thirty years, NH 9 grew by 12.4% (from 27,641 to 31,059).
- Hinsdale and Chesterfield are not projected to change very much over time. In fact, Hinsdale is projected to lose some of its population over time.

Population Sectors

A. Population By Age Groups



B. 65 and older population

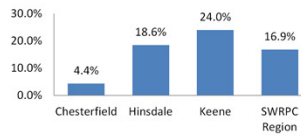
| Community | Residents 65+ in 2010 | Total Number of NEW 65+ Residents* | | | |
|--------------------|-----------------------|------------------------------------|-----------|-----------|-----------|
| | | 2011-2015 | 2011-2020 | 2011-2025 | 2011-2030 |
| Chesterfield | 552 | 294 | 641 | 999 | 1305 |
| Hinsdale | 584 | 283 | 594 | 951 | 1300 |
| Keene | 3439 | 1236 | 2605 | 4069 | 5614 |
| NH 9 West Corridor | 4575 | 1813 | 3840 | 6019 | 8219 |

*Numbers do not include the existing 2010 65+ population

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C. Low Income (150% or less of poverty level) ACS 09-13



| | 2014 Household Income and Automobile Expenses for Lowest 60% Earning Households in U.S. | | |
|--|---|-------------------|------------------|
| | Lowest 20% | Second Lowest 20% | Third Lowest 20% |
| Mean Household Income (before taxes) | \$10,308 | \$27,028 | \$47,056 |
| Mean Automobile Expenses | \$3,349 | \$5,447 | \$8,063 |
| Percent of Household Budget + Automobile | 32% | 20% | 17% |

Sources: US Census and Bureau of Labor Statistics

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- The slide provides some basic information about segments of population in the corridor area.
- “A” shows the entire population split up into four different age groups, “youth”, “young adults”, “middle age” and “seniors” live on the corridor. This information may be important when considering plans for transportation infrastructure and services. Youth represent a population that does not drive. Young adults represent what demographers are calling the “millennial” generation, which experts see as the first generation that expects multimodal transportation choices. According to AARP, 1 in 5 seniors 65 and older do not drive.
- Due to Keene’s academic institutions, its “young adult” population is much larger than Chesterfield and Hinsdale, whereas Chesterfield and Hinsdale have a much larger population of “middle-aged” residents.
- “B” shows how New Hampshire’s aging population will affect the three corridor towns. By 2020—only 5 years from now—both Chesterfield and Hinsdale are likely to more than double the senior population they had in 2010. By 2025, Keene is likely to double its senior population.
- “C” shows the percentage of low income people in each community. “Low income,” in this case, is defined by people having an income that is 150% or less

of poverty level. Keene and Hinsdale have a higher percentage of this population as compared to the regional population. Although Keene's figure includes students living in off campus housing, it does not include students living in on campus housing. Chesterfield has the lowest rate of people in poverty of any community in the Region.

- "Low income people" are roughly equivalent to people in the two lowest quintiles of income. The chart at the bottom right shows that low income households on average spend \$1 of every \$5 dollars of income on their household car(s).

Commuting and Economy

| | Chesterfield | Hinsdale | Keene |
|--|--------------|----------|--------|
| Residents working in own community | 554 | 511 | 8,801 |
| Residents working outside of community (Outflow) | 1,363 | 1,525 | 3,123 |
| Incoming Workers (Inflow) | 734 | 584 | 11,136 |

Chesterfield

- Top Worker Residences: Brattleboro (147), Hinsdale (103), Keene (63)
- Top Resident Workplaces: Keene (576), Brattleboro (373), Swanzey (112)...Hinsdale (13)

Hinsdale

- Top Worker Residences: Keene (204), Brattleboro (193), Winchester (79)...Chesterfield (13)
- Top Resident Workplaces: Brattleboro (675), Keene (202), Chesterfield (103), Vernon (102)

Keene

- Top Worker Residences: Swanzey (2,547), Marlboro (595), Winchester (589), Chesterfield (576)...Hinsdale (222), Brattleboro (186)
- Top Resident Workplaces: Swanzey (580), Brattleboro (235), Hinsdale (204)...Chesterfield (63)

Source: NH Department of Employment Security

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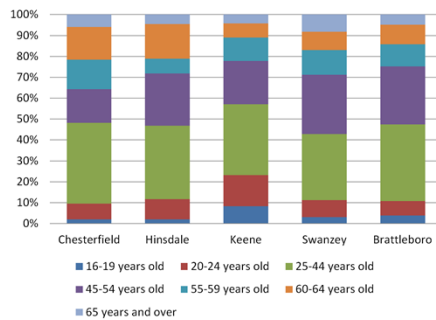
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- The table on this slide shows the number of residents working in their own community, versus the residents that work outside of the community versus the non-residents that come and work in the community.
- The bottom half of the slide shows the top worker residences and resident workplaces associated with each corridor community. You see that in addition to the corridor towns providing each other workers, other important communities that provide jobs or workers associated with this corridor are Swanzey, NH and Brattleboro, VT.

Commuting and Economy

Today, with the exception of Keene, more than 50% of workers in select communities are 45 and older. By 2030, they will be 65 and older.

Every 5 years, the number of existing workers entering retirement will increase significantly...



| | 2015 | by 2020 | by 2025 | by 2030 |
|--------------|------|---------|---------|---------|
| Chesterfield | 108 | 391 | 644 | 935 |
| Hinsdale | 91 | 421 | 563 | 1061 |
| Keene | 487 | 1254 | 2533 | 4903 |
| Swanzey | 323 | 670 | 1139 | 2260 |
| Brattleboro | 293 | 852 | 1483 | 3140 |

Source: US Census, ACS 2009-2013

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- On the left, a table provides a snapshot view of the age of workers associated with the corridor towns, as well as Swanzey and Brattleboro.
- Ignoring migration patterns (and assuming that the age demographic would remain constant), the table on the right shows how quickly the number of today's workers will turn 65 or older based on 5 year increments. For example, there are only 108 residents in Chesterfield who are 65 and older and working today. By 2020, the number of Chesterfield residents that are in today's workforce will expand to 391. By 2025, the number will expand to 644, and so on.

Housing and Land Use

Approximate Ratio of Housing Units to Jobs

- Chesterfield = ~2:1
- Hinsdale = ~3:1
- Keene = <1:1

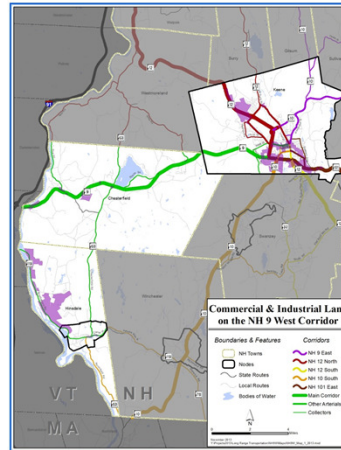
Source: US Census 2009-2013 ACS

| Community | Housing Units | Vacant Housing Units |
|--------------|---------------|----------------------|
| Chesterfield | 1595 | 4% |
| Hinsdale | 1905 | 6% |
| Keene | 9905 | 5% |
| Swanzey | 3059 | 7% |
| Brattleboro | 6147 | 5% |

Source: US Census 2009-2013 ACS

| Community | Residential Building Permits 2008-2012 |
|--------------|---|
| Chesterfield | 26 |
| Hinsdale | 39 |
| Keene | 266 |
| Swanzey | 90 |

Source: NH Office of Energy and Planning

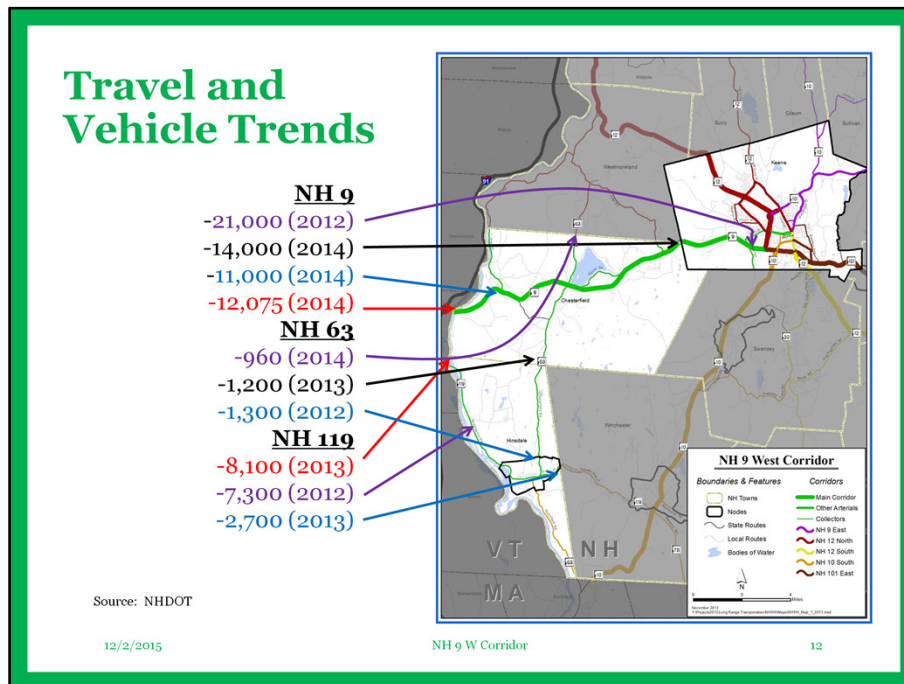


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- Experts believe that a significant percentage of retirees can be expected to age in place.
- If that is the case, there is a question of where workers will be coming from to fill today's jobs.
- Vacancy rates are low and building has been relatively stagnant.
- The map on the right shows areas that are currently zoned commercial or industrial in the three corridor communities. Notice the amount of land Chesterfield has made available for economic growth versus Hinsdale, although both are similarly positioned near I-91 and near similar labor markets.



NH 9

- Traffic on Route 9 is highest where local and regional traffic mix on NH 9 East of Ash Brook Road in Keene, although traffic has not grown in that location since the late 2000s.
- Freight counts on NH 9 were as follows: East of Ash Brook Road in Keene in 2012: 93.4% light duty, 3.2% medium duty, and 3.4% heavy duty (of 21,757 ADT). At the Vermont state line, light, medium and heavy duty vehicles were 93.8%, 2.2%, and 4.0% respectively. This translates into over 700 tractor trailers per day on a weekday in Keene and over 600 at the Vermont state line.

NH 63

- Traffic has been flat all along the NH 63 over the last decade.

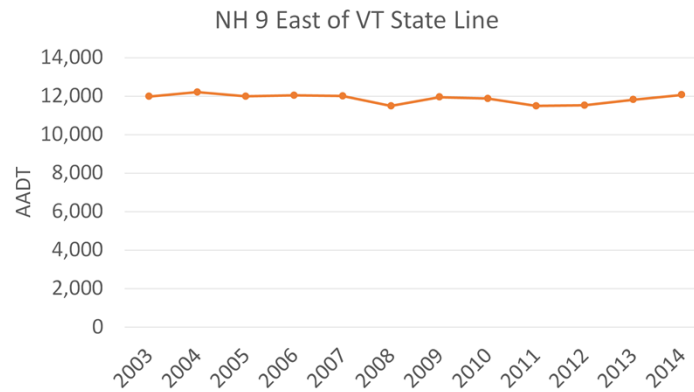
NH 119

- At the VT/NH line traffic jumped from 7,100 in 2007 to 9,700 in 2010, back down to 8,100 in 2013. The majority of traffic is light-duty passenger

vehicles (98.4%), only 0.6% of vehicles were tractor trailers, about 54 per day according to weekday figures from 2013.

- NH 119 on the west side of Hinsdale Village has seen some growth over time, while other parts of the route have remained relatively flat.

Travel and Vehicle Trends



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- Traffic on Route 9 at the NH/VT line has remained relatively flat. Traffic levels dipped slightly during the Great Recession and as of last year bounced back up to level last seen in 2007.

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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- Southwest Connects has tried to incorporate performance measures to understand different assets on each corridor. Some performance measures are borrowed from MAP-21, while others come from NH DOT's Balanced Scorecard.
- Some MAP-21 performance measures have not yet been finalized.
 - The proposed pavement and bridge condition performance measures are currently outside of their comment period.
 - 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 determine 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 (See Table 5: <https://www.federalregister.gov/articles/2015/01/05/2014-30085/national-performance-management-measures-assessing->

pavement-condition-for-the-national-highway#h-59)

- 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.
- Rail lines and airport runway conditions are not relevant to this corridor but are discussed in other sections of Southwest Connects.

Pavement

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 Proposed Rule

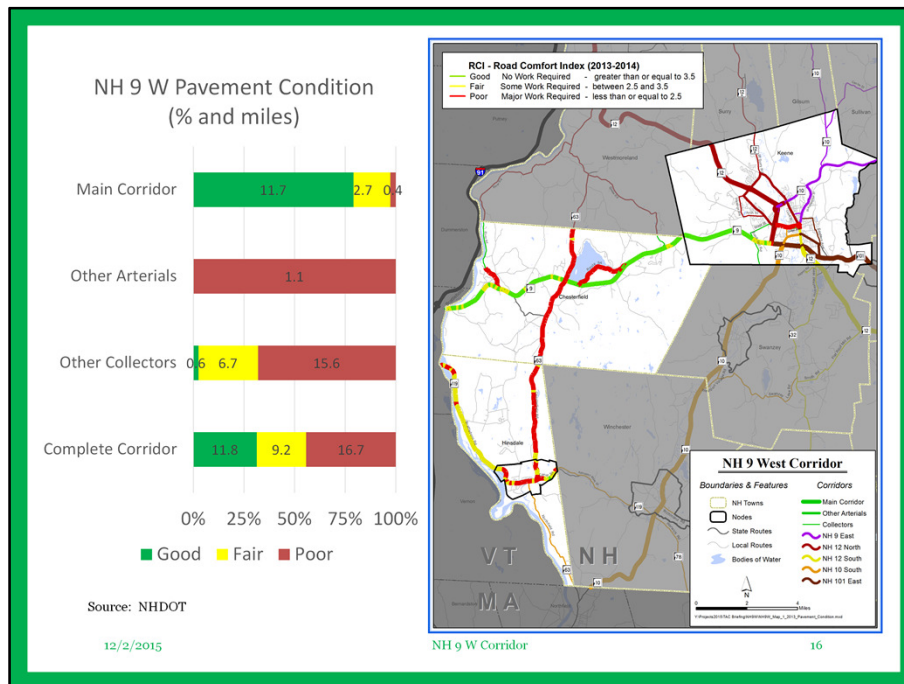
- Ride Comfort Index (International Roughness Index)
- Cracking Percent
- Rutting

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- NHDOT currently using a Road Comfort Index to measure its roads. However, USDOT is recommending a performance measure that also accounts for cracking and rutting. NHDOT has not gathered/analyzed the additional data yet.



- 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 1/10th of a mile increments in one direction. National Highway System mileage is surveyed every year. Unnumbered state highways (i.e. Glebe Rd, River Rd, etc.) 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 9 W corridor has approximately 31% of its pavement in good condition with another 24% in fair condition. The remaining fraction, about 45% is in poor condition.
- Many roads in NH were not constructed to support heavy truck loads and traffic volumes. As a result they can be more susceptible to a variety of distresses.
- The highest need for pavement reconstruction/rehabilitation is off Route 9, including Route 63, Route 9A, portions of Route 119, Brook Street in Chesterfield, and West Street

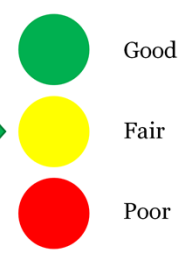
in Keene.

Bridges

| 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



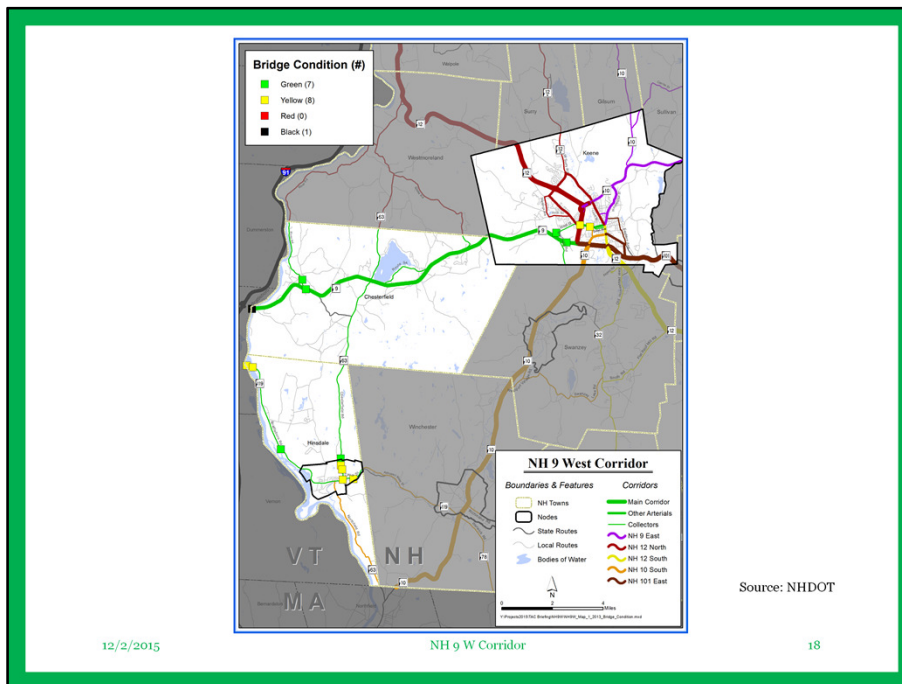
Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges
USDOT FHWA Report No. FHWA-PD-96-001

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- 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.

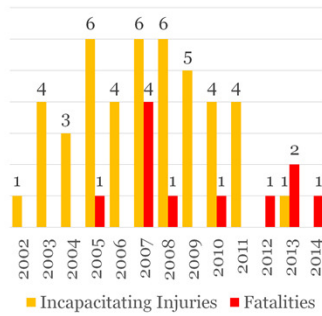


- There are 16 bridges throughout the corridor system. The map shows that none are in poor or “red-listed” condition.
- In Chesterfield, two bridges appear to be coincident. The current vehicle bridge, the United States Navy Seabees Bridge (040/096), was constructed in 2003. Immediately downstream, the Justice Harlan Stone Bridge (040/095), originally built in 1937 is used for only pedestrian and bicycle traffic.
- Two other state line bridges are important to traffic on the corridor. On route 119, the Anna Hunt Marsh Bridge (041/040) (westernmost) and Charles Dana Bridge (042/044) (easternmost) span the Connecticut River.
- The Anna Hunt Marsh Bridge was originally constructed in 1920 and was reconstructed in 1988. It has a National Bridge Inventory of Functionally Obsolete, but it is not on the red list. In Aug. 2014 the bridge received deck, superstructure, and substructure ratings of 7, 5, and 6, respectively.
- The Charles Dana Bridge was also originally constructed in 1920 and reconstructed in 1988. It was last inspected in Apr. 2013 and received ratings of 7, 5, and 6. This bridge is also functionally obsolete.
- Both bridges have an E-2 weight restriction which prohibits certain single unit and combination trucks from using this crossing.

Safety

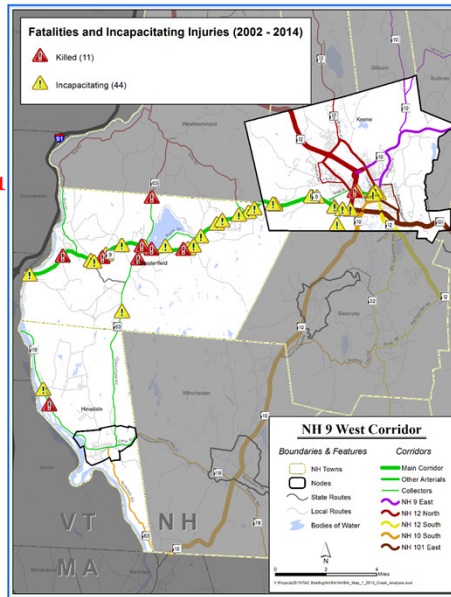
- Fatalities: From MAP 21
- Serious Injuries: From MAP 21

NH 9 W Corridor Injury Severity (2002 – 2014)



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Source: NHDOT

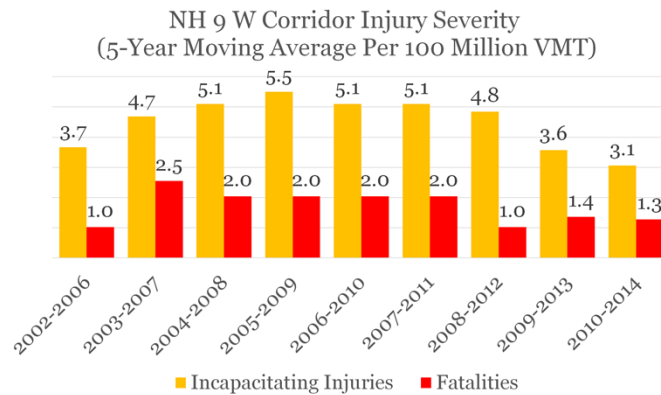


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- Here is a map showing fatality and serious injury crashes in the NH 9 West Corridor System for the period we have data available (2002 – 2014).
- Over that time period, there were a total of 11 fatalities and 44 incapacitating injuries on arterials, collectors, and at intersections along this system, the majority of which were in Chesterfield.

Per 100 Million VMT (2010-2014)



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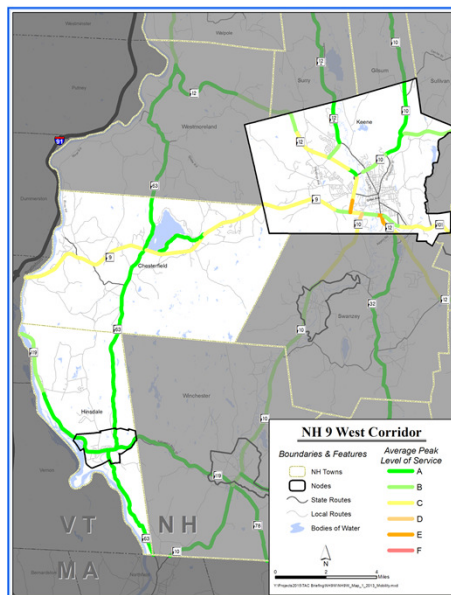
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- Since the MAP-21 performance measure is based on a 5 year rolling average, SWRPC gathered historical data to show changes in fatalities and incapacitating injuries.
- The rolling average of serious injuries and fatalities is useful because it reduces “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.
- 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.

Mobility

- FHWA Proposed Rule not yet available.
- Balanced Scorecard utilizes Level of Service



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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.

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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- 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.
- 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.
- There are approximately 40 parking spaces at the Chesterfield Gorge Park and Ride of NH 9.
- As was described above, transit routes include NH 9 and West Street in Keene, NH 9 in Chesterfield and NH 119 in Hinsdale.

| | Examples | Locations Where Accessible |
|----------------------------|---|-------------------------------|
| Pedestrian | Sidewalks | Keene, Hinsdale |
| | Cheshire Branch Rail Trail/Fort Hill Branch Trail | Keene/Hinsdale |
| Bicycle | Cheshire Branch Rail Trail/Fort Hill Branch Trail | Keene/Hinsdale |
| | 4 foot Shoulders on NH 9 W Corridor Backbone | Keene, Chesterfield |
| Fixed Route Bus | City Express, Keene State College Shuttle, The Current Blue Route | Keene, Hinsdale |
| Demand Response Bus | Para Express, Friendly Bus | Keene |
| Volunteer Drivers | American Red Cross | Keene, Chesterfield, Hinsdale |
| Carpooling Program | Contoocook Valley Trans. Co. | Keene, Chesterfield, Hinsdale |
| Intercity Bus | Greyhound Bus Lines Thomas Transportation | Keene |
| Railroad Freight | | |
| Railroad Passenger | No Example Available | |
| Railroad Excursion | | |
| Airport | No Example Available | |

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- Keene has approximately 65 miles of sidewalks. Those located on West Street are notable to this corridor system. Hinsdale has about 2.06 miles of sidewalk located in the village area.
- Cyclists utilize Cheshire Rail Trail and Fort Hill Branch Rail Trail as well as highways that are part of the State’s recommended bicycle routes maps (including NH 9, 63, and 119. In addition, the corridor is part of the Connecticut River Byway (NH 63 only).

Regional Transportation Challenges

- Poor Infrastructure (eg. Hinsdale-Brattleboro Bridge, NH 63)
- Some transportation services, but disconnected—not a “system”. How to adequately serve future population?
- Access to I-91 via NH 9 and NH 119 requires coordination with Vermont
- Regional dialogue on transportation improvements needed on shared infrastructure (eg. Base Hill Road)

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- What are the current and upcoming challenges associated with the NH 9 West Corridor. Based on feedback SWRPC has received thus far these challenges are:
- Poor infrastructure. The Town of Hinsdale in particular is disproportionately affected by poor road conditions in NH 63 and a very old bridge connecting to Brattleboro. There are other areas that need attention as well but these two areas by far are in need of attention.
- Although the NH 9 West Corridor has park and ride lots, transit and even intercity bus services, none of these are connected. When the towns’ population ages, how will people get around. AARP found that 1 in 5 seniors today do not drive. I
- The NH 9 West Corridor’s regional significance is that it connects to Interstate 91. But NH doesn’t have a direct connection to the interstate without going through Vermont first. Ongoing coordination with Vermont and Brattleboro will be important. NH will want to keep apprised of Vermont’s plans in the Brattleboro area.
- Finally, NH 9 is a shared resource. Some towns in or near the Corridor have expressed concerns that they have not been included in discussions about projects in the Route 9 area. Projects on NH 9 should include invitations to a broader range of stakeholders.

Regional Transportation Opportunities

- Harnessing economic development opportunities thru I-91
- Vermont infrastructure and transportation services
- New England Central Railroad
- Knowledge Corridor

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- What are the current and upcoming opportunities associated with the NH 9 West Corridor? Opportunities might include:
- Continuing to assess economic growth opportunities by using the corridor as a connection to I-91. This is especially true for the three corridor communities: Chesterfield, Hinsdale and Keene.
- Another opportunity would be to piggyback on nearby Vermont improvements to transportation. This might include expanding from Vermont's more robust transit services, its work on I-91 or its recent track, bridge and underpass upgrades to railroad infrastructure on the New England Central Railroad (NECR).
- A third opportunity is to look at short line rail connection from the New England Central Railroad (NECR) in Hinsdale. The NECR approaches Hinsdale on the east side of the Connecticut River in northern Northfield, MA before it crosses the river and then continues its northward trajectory in Vermont. There is about 2 miles of farmland in Northfield and Hinsdale separating the bridge crossing to where the old Fort Hill Branch rail road exists today, which is owned by NH DOT.
- Finally, there is the possibility of building on the branding success of the Knowledge Corridor. The Knowledge Corridor is term for the area comprising north-central Connecticut up to Northampton and Amherst, MA area to connect the many institutions of higher learning with business expansion. The I-91 Corridor serves as the Knowledge Corridor's backbone.

Recent Projects (2010 - Present)

- Chesterfield-Troy-Swanzey 22552 – Paving in District 4
- Chesterfield 13597 – NH 63 safety improvements along Spofford Lake (2015)
- NH 63 emergency repairs
- Hinsdale bus service (The Current)

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- Here are some recent investments that have been made by NHDOT on the NH 9 W Corridor since 2010.

Future Programmed Projects

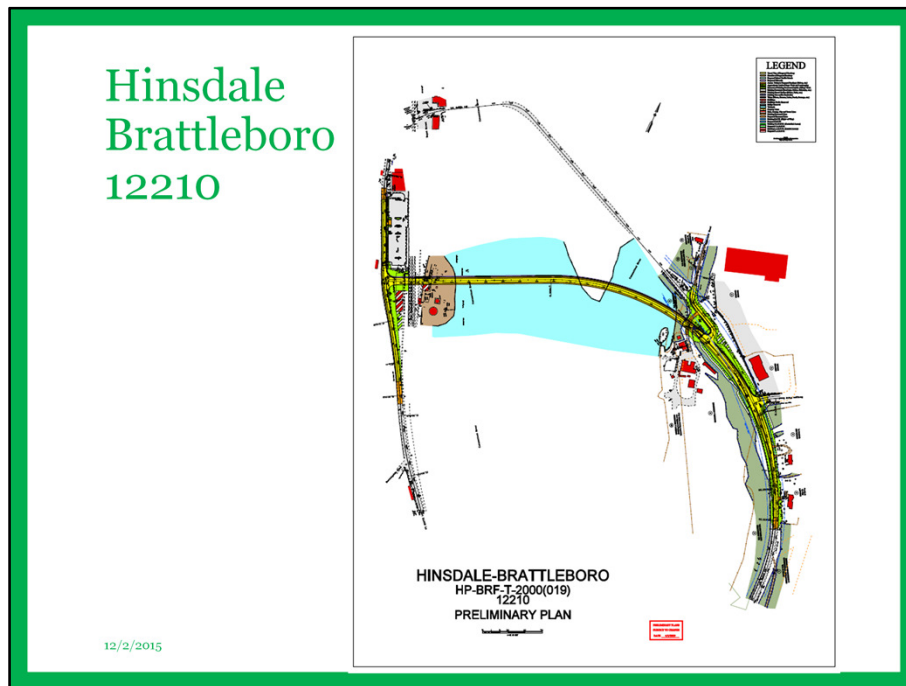
- Statewide 28513 – Installation of centerline and shoulder rumble strips on NH 9
- Keene 26765 – Roundabout at the intersection of NH Route 9 and Base Hill Road
- Hinsdale-Brattleboro 12210 – Reconstruction of the bridges over the Connecticut River (Design)
- Keene-Swanzey 40100 – Wetland mitigation for Keene and Swanzey projects (Planning)

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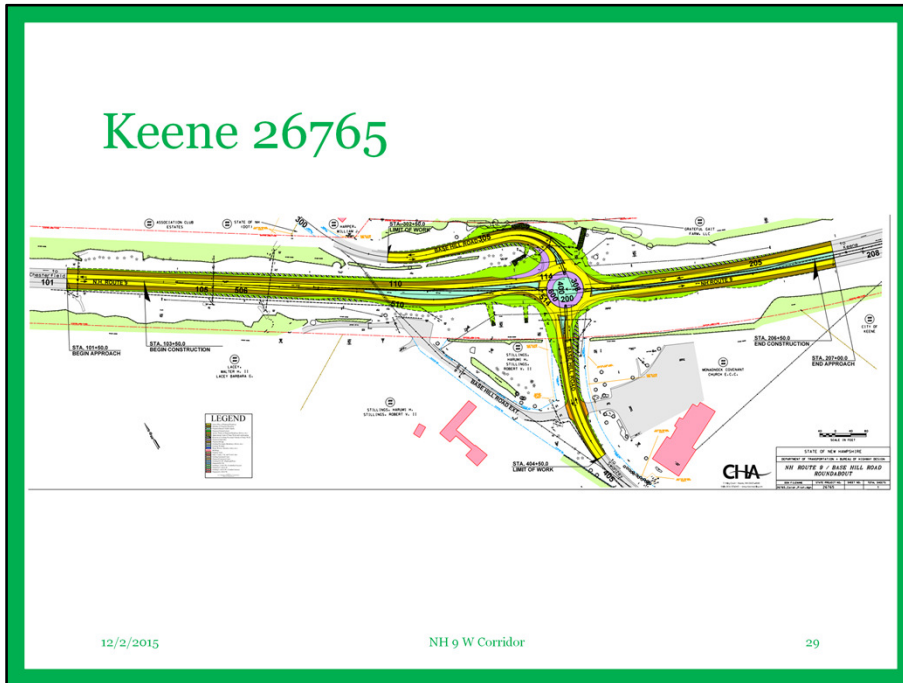
27

- And here are projects that have been programmed for future construction.



- Here is a preliminary engineering drawing of Hinsdale-Brattleboro bridge project, also known as project 12210.

Keene 26765



- And here is a preliminary engineering drawing of a proposed roundabout on NH 9 at the intersection of Base Hill Road.

Future Projects?

Chesterfield

- NH 9/NH 63 Intersection improvements?
- Justice Harlan Stone “Bridge of Flowers”?

Hinsdale

- Hinsdale Sidewalk improvement on NH 119?
- Vision for unused bridges at Connecticut River crossing?
- Fort Hill Branch Short Line?

Keene

- Gilbo Ave Intermodal Transportation Center?
- West Street improvements?
- T intersection improvements at NH 9 & NH 9/10/12?
- Base Hill Road improvements?

Regional

- Keene to Brattleboro (w/ Hinsdale/Winchester) Transit Service?

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- Over the years, SWRPC has been approached with other project ideas. These project ideas are listed by town unless they are regional in scope. Contact SWRPC to learn more.

ADDITIONAL DISCUSSION

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- We hope this has provided some useful information for thinking about the NH 9 West 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.
- For further reading visit www.swrpc.org/regionalplan to read *Southwest Connects*