Statewide Strategic Transit Assessment Study

Phase 3 Results

August 13, 2019

Phase 3 Overview

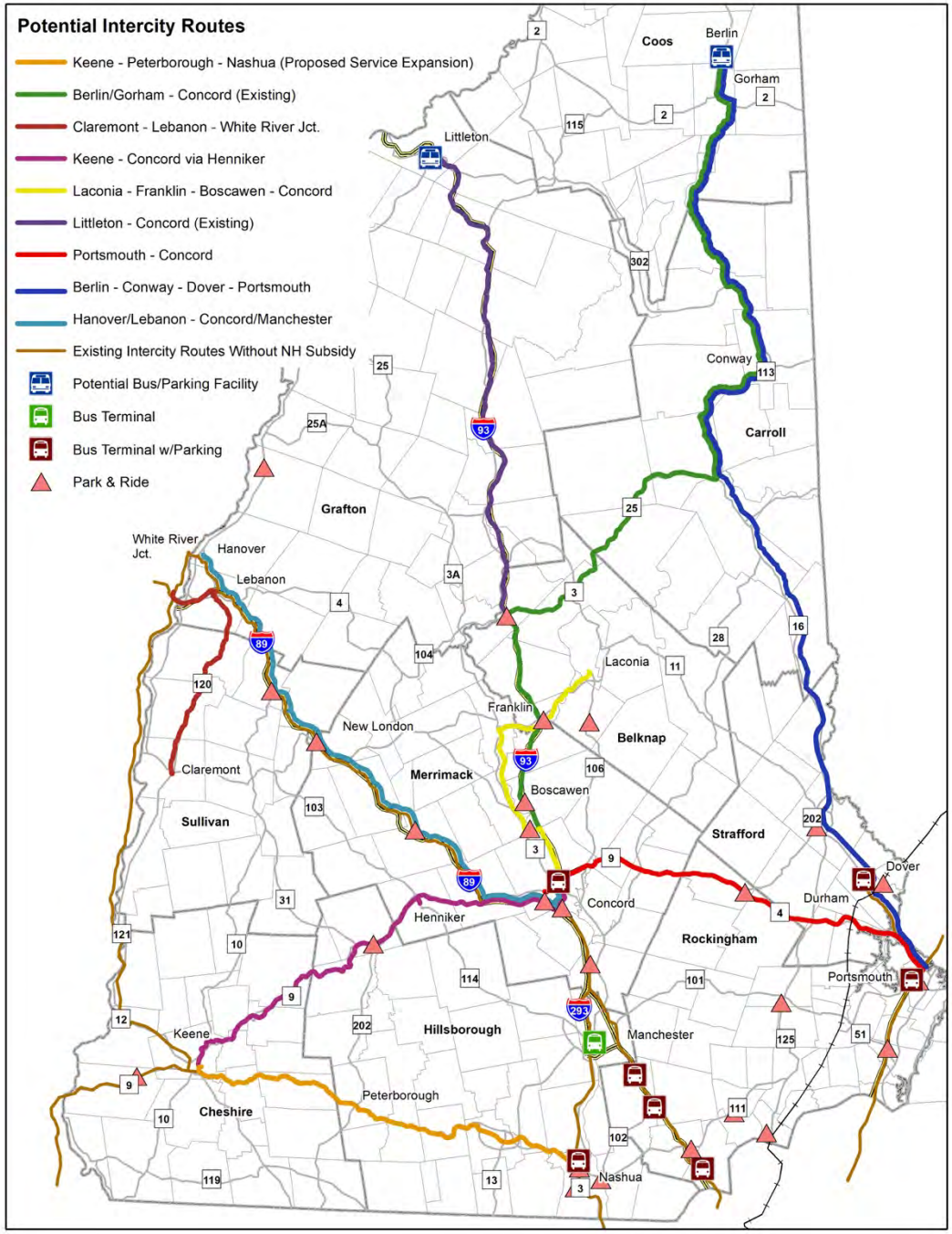
- Intercity Service
- Existing and Forecast Demand
  - Demographic and commuting patterns analysis
  - Identifying areas with unmet need
- Viability and Sustainability
  - Develop new bus services to address needs
    - Local routes
    - Commuter routes
  - Survey Results and Prioritization
- New Technology
- Peer analysis of NH providers

Potential Intercity Route Network

- Took expansive view of possible routes
  - Intra-state line-haul routes connecting larger cities
  - Access from rural areas to intercity network
  - Shorter feeder routes to primary hubs
  - Connecting to colleges/universities without current service
    - Lakes Region Community College (Laconia - 200 residential students)
    - Franklin Pierce University (Rindge - 1,000 res. Students without cars)
    - New England College (Henniker - 500 res. students without cars)
- Proposed two bus facilities at northern end of rural routes where no facilities exist now
  - Littleton
  - Berlin

New Hampshire DOT
Department of Transportation

Existing and Potential Intercity Routes and Facilities



Route Statistics

Route	One-way miles	Est. Travel Time	Est. Time to Boston
Littleton – Concord	90	2 hr. 5 min.	3 hr. 40 min.
Berlin – Concord	125	3 hr. 20 min.	5 hr.
N. Conway – Concord	90	2 hr. 15 min.	4 hr.
Laconia – Concord	34	1 hr. 10 min	2 hr. 20 min.
Claremont – Lebanon/WRJ	30	45 min.	3 hr.
Hanover – Concord	70	1 hr. 30 min.	n/a
Keene – Nashua	48	1 hr. 10 min.	3 hr.
Keene – Concord	55	1 hr. 20 min.	3 hr. 30 min.
Portsmouth – Concord	50	1 hr. 15 min.	n/a
Berlin – Dover	120	3 hr. 15 min.	4 hr. 45 min.

Cost and Ridership Estimates

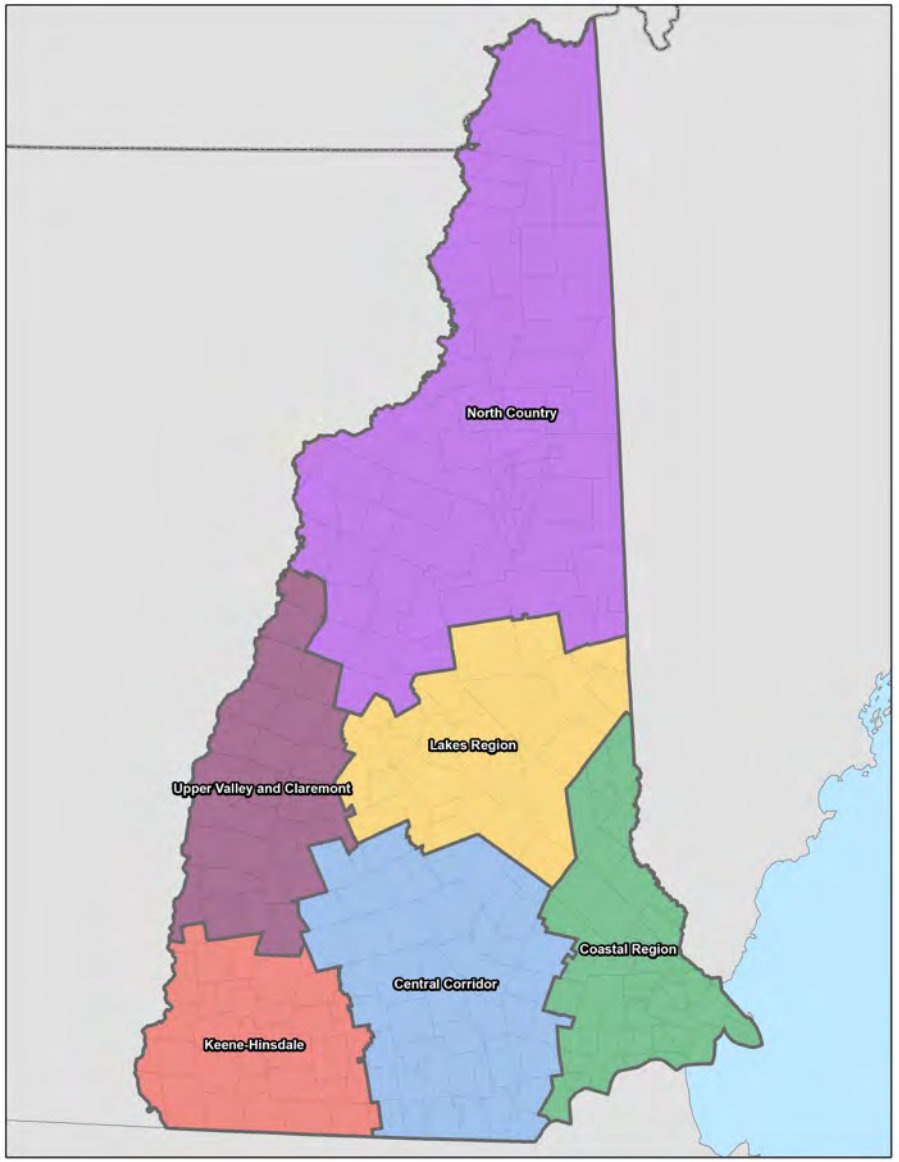
Route (One-way fare)	Annual Cost	Annual Ridership	Subsidy (30% FRR)
Laconia – Concord ($6)	$145,000	7,200	$102,000
Claremont – Lebanon/WRJ ($6)	$128,000	6,500	$89,000
Hanover – Concord ($10)	$450,000	14,000	$310,000
Keene – Nashua ($7)	$106,000	5,000	$71,000
Keene – Concord ($8)	$356,000	13,000	$252,000
Portsmouth – Concord ($8)	$308,000	11,500	$216,000
Berlin – Dover ($30)	$778,000	8,000	$538,000

Initial Priorities

- Tier 1
  - Littleton – Concord (existing)
  - Berlin – N. Conway – Concord (existing)
  - Laconia – Franklin – Concord (high need/college)
  - Keene – Nashua (high need/college)
- Tier 2
  - Keene – Concord (high need/college)
  - Claremont – Lebanon/WRJ (high need/inexpensive)
  - Hanover – Concord (large potential market)
- Tier 3
  - Portsmouth – Concord (more commuter oriented)
  - Berlin – N. Conway – Dover (high need, but expensive)

Analysis Regions

- Used RPC boundaries
- Combined CNHRPC, SNHPC and NRPC into Central Corridor
- Combined RPC and SRPC into Coastal Region



Key Measures

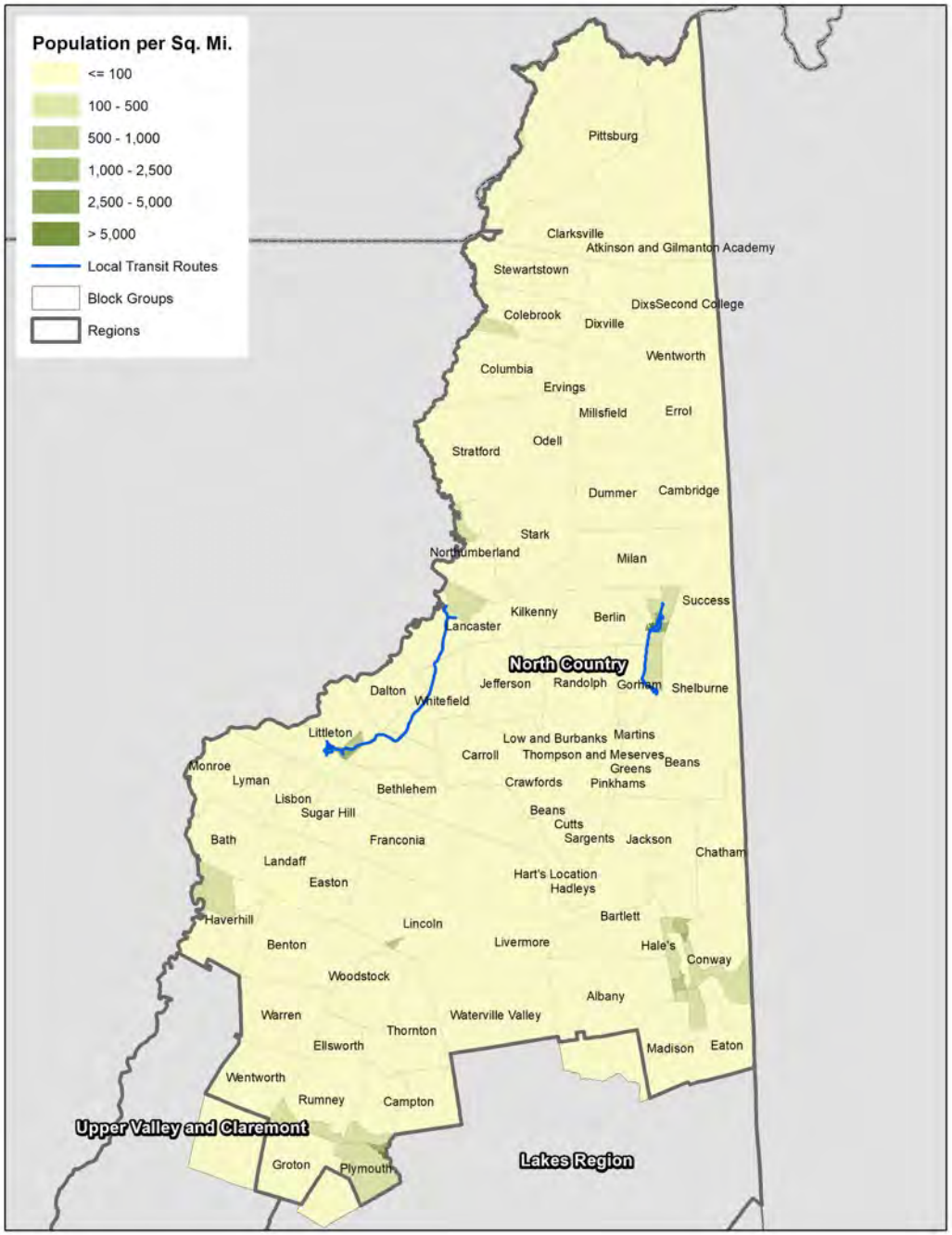
- Population density – population per square mile
- Employment density – jobs per square mile
- Transit propensity – index based on 4 characteristics
  - Population over age 80
  - People with a disability
  - People below the poverty line
  - Households with zero cars available

Transit Propensity

- For each indicator, classified census block groups into four categories
  - Low – at or below state average (0 points)
  - Medium – from state average to double (1 point)
  - High – from double to triple the state average (2 points)
  - Very High – more than triple the state average (3 points)
- Added points together to form composite measure
- Any block group in a very high category for at least one measure was considered at least "high" overall

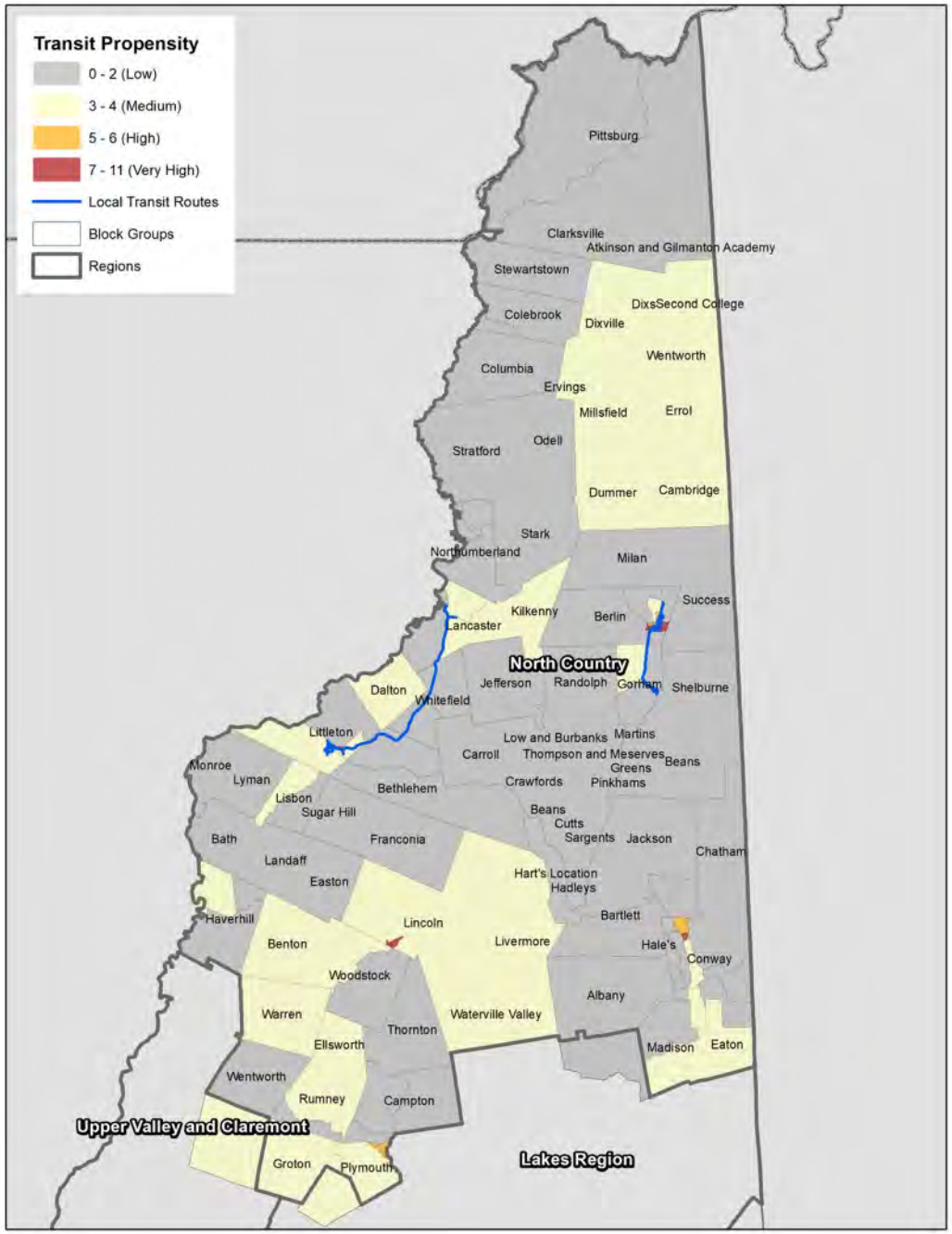
North Country

- Overwhelmingly rural
- Moderate density
  - Berlin/Gorham
  - Lancaster
  - Littleton
  - Plymouth
  - Conway



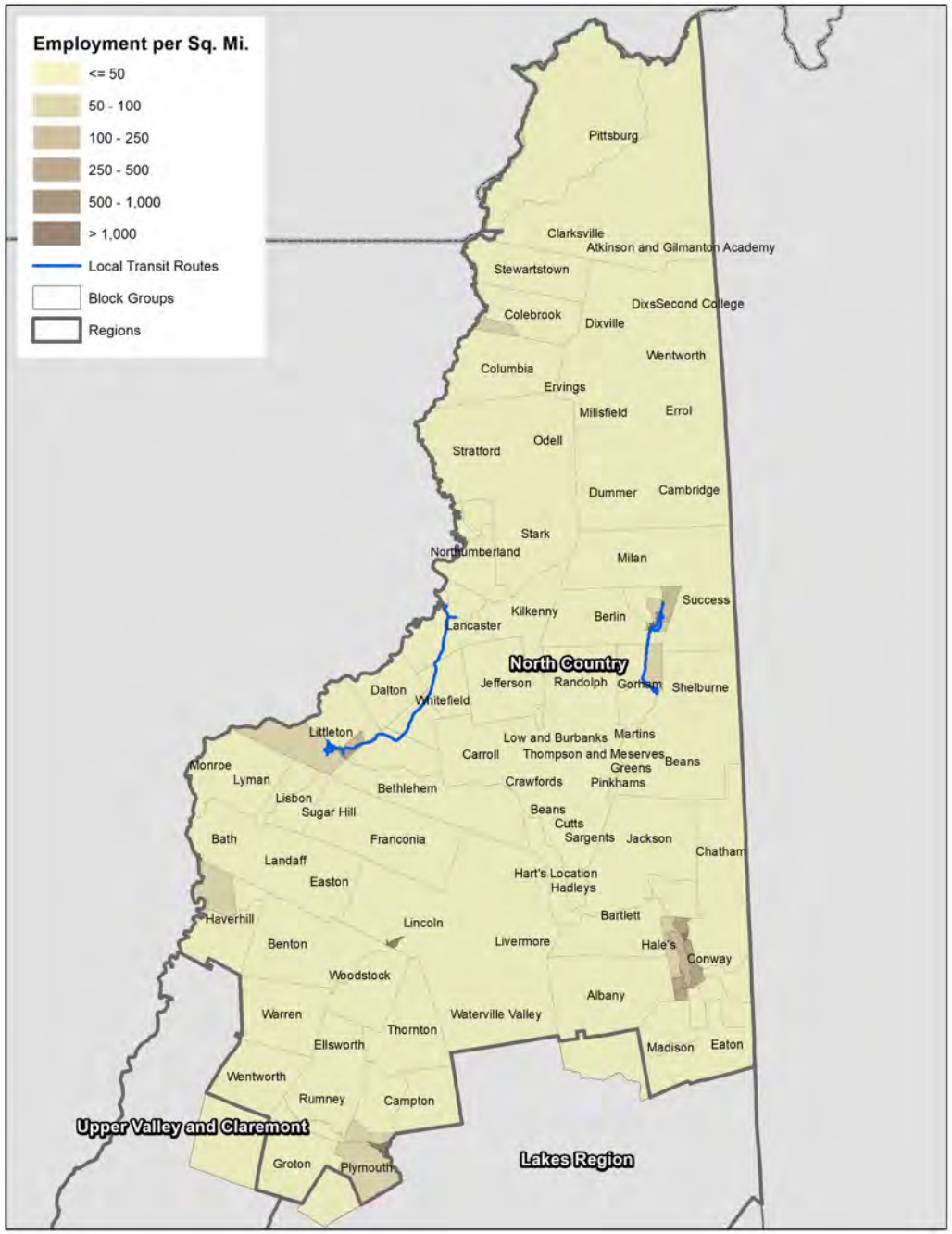
North Country

- High need block groups
  - Berlin
  - Lincoln
  - North Conway
  - Plymouth
- Medium need in large swaths of region



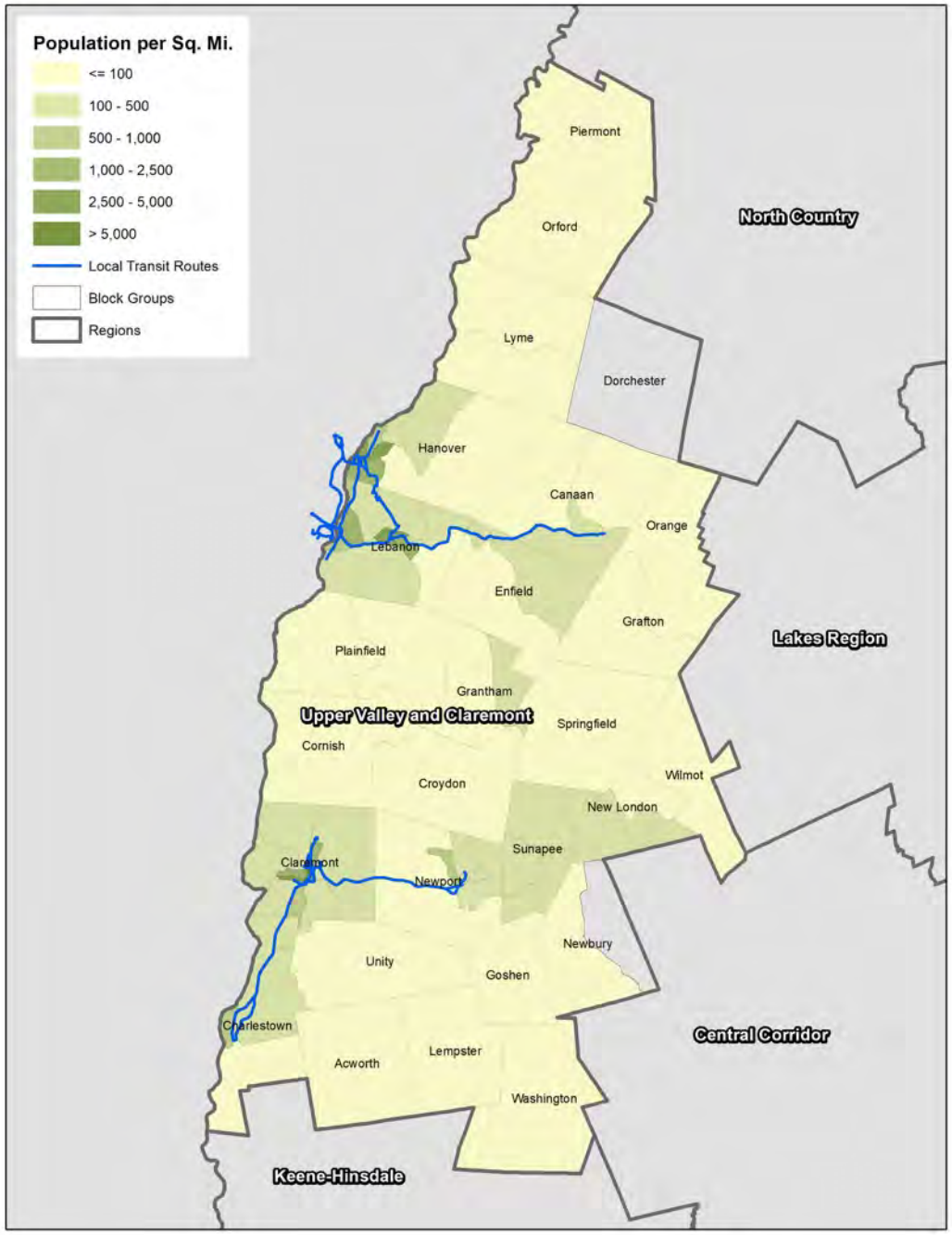
North Country

- Highest employment density
  - Conway
  - Plymouth
  - Berlin
  - Littleton
  - Lincoln (Loon Mtn)



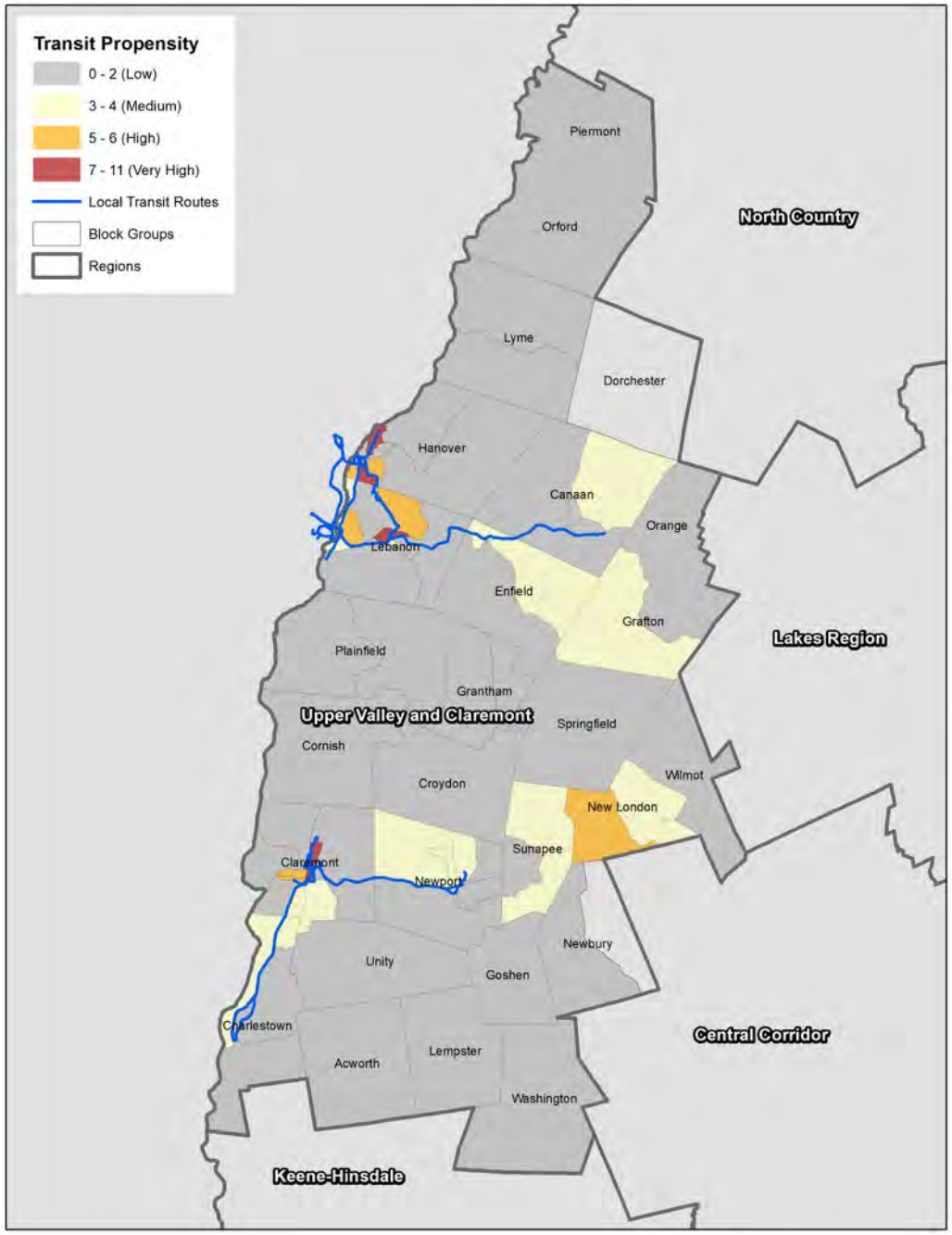
Upper Valley/ Claremont

- Highest density in Lebanon and southern Hanover as well as central Claremont
- Newport, Charlestown, New London, Canaan, Enfield have moderate density



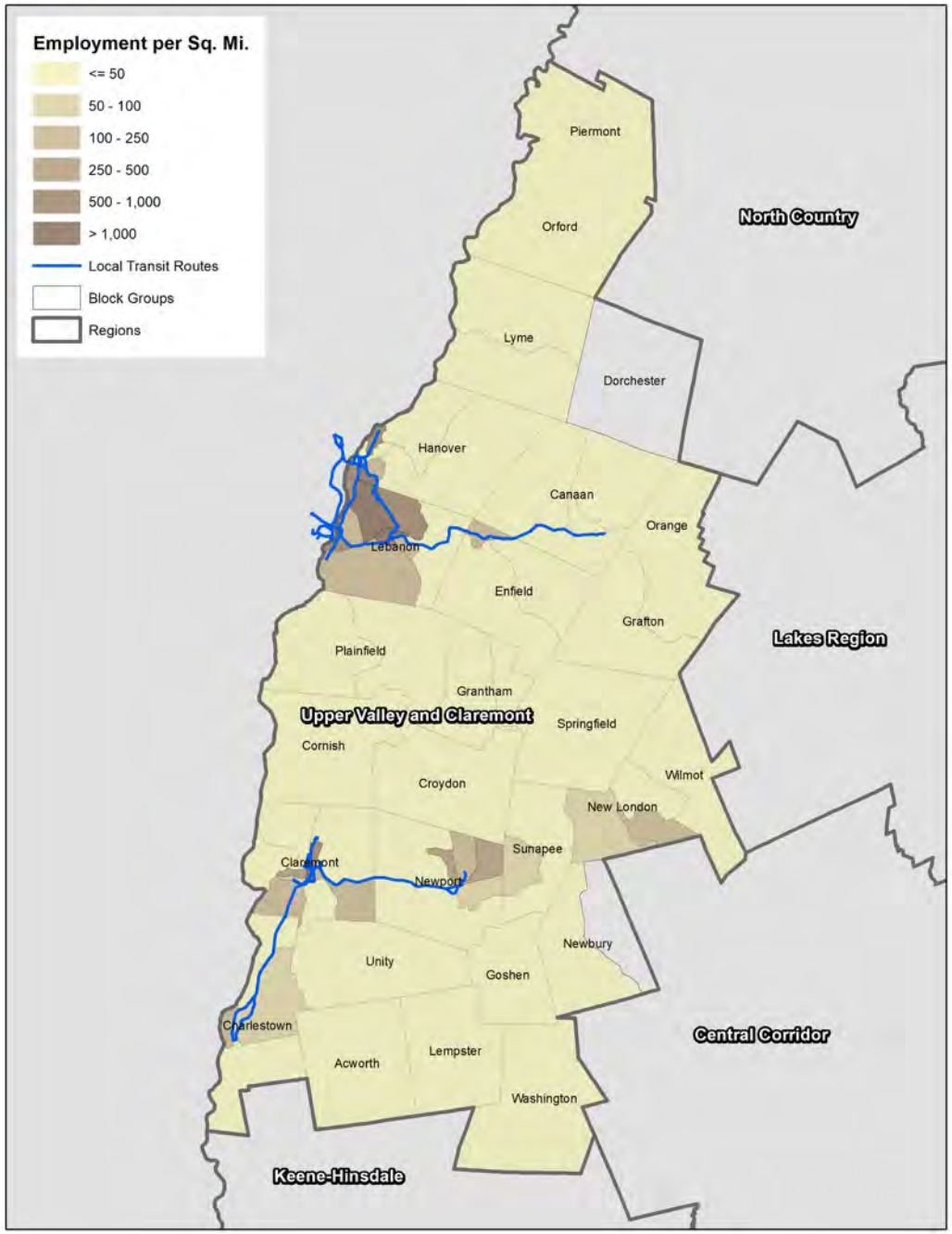
Upper Valley/ Claremont

- Very high needs in Hanover, Lebanon and Claremont
- High need in New London and other parts of Lebanon and Hanover



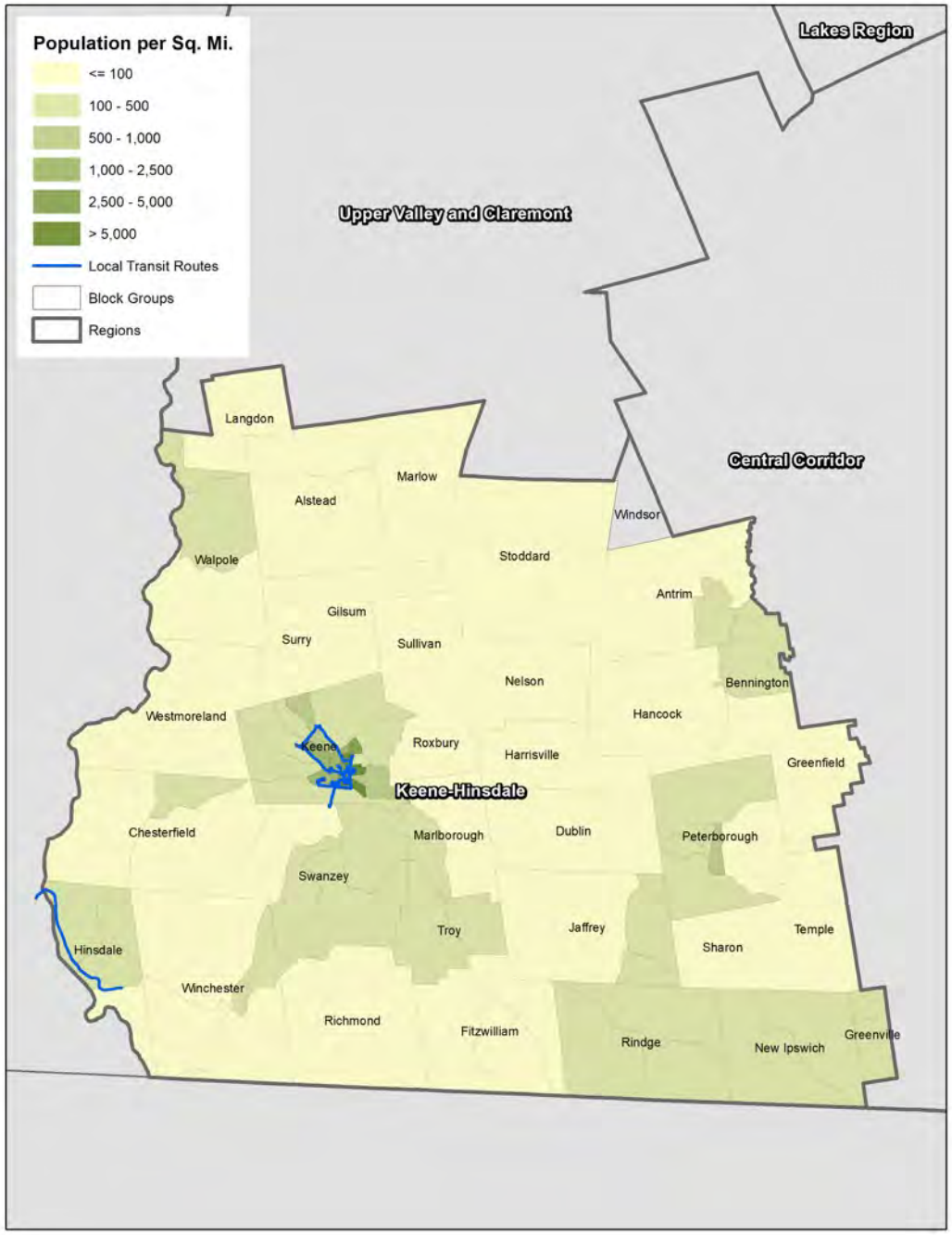
Upper Valley/ Claremont

- Lebanon and downtown Hanover clearly has the highest employment density
- Claremont-Newport and New London have moderate density



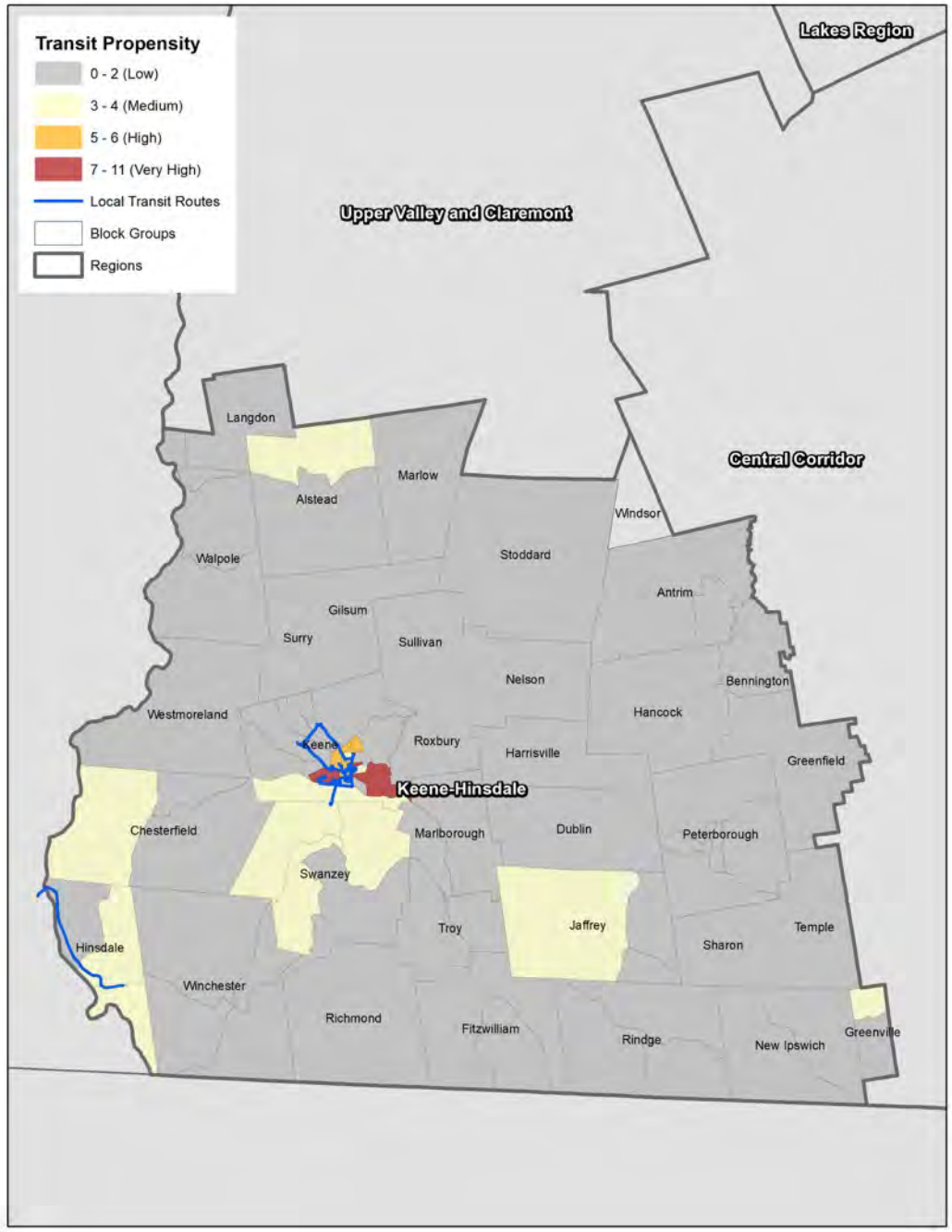
Keene-Hinsdale

- Very rural area overall
- Highest density in downtown Keene
- Low to moderate density at east edge of region



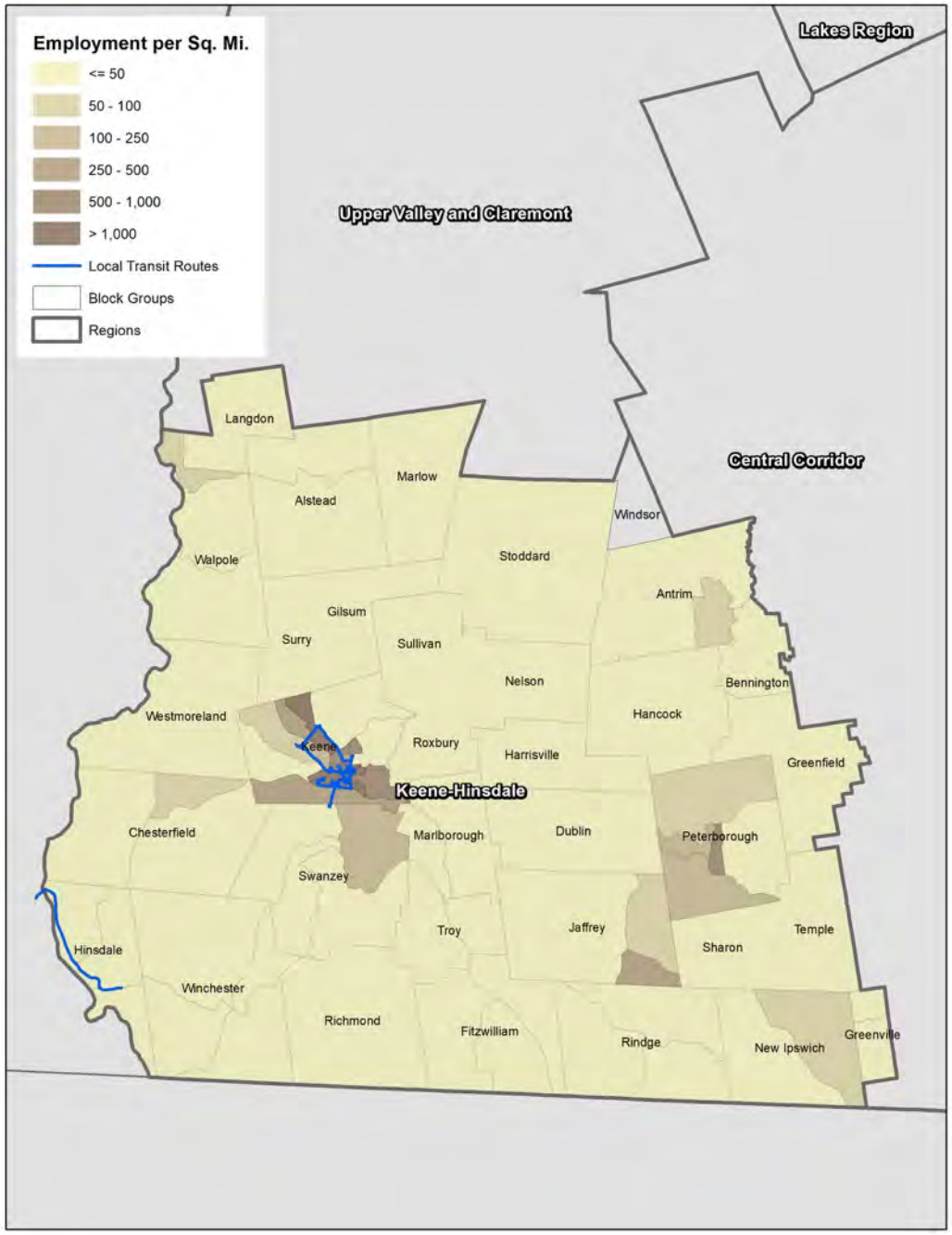
Keene-Hinsdale

- Only area of high need is in Keene
- Moderate need in Jaffrey, Swanzey and Hinsdale/Chesterfield



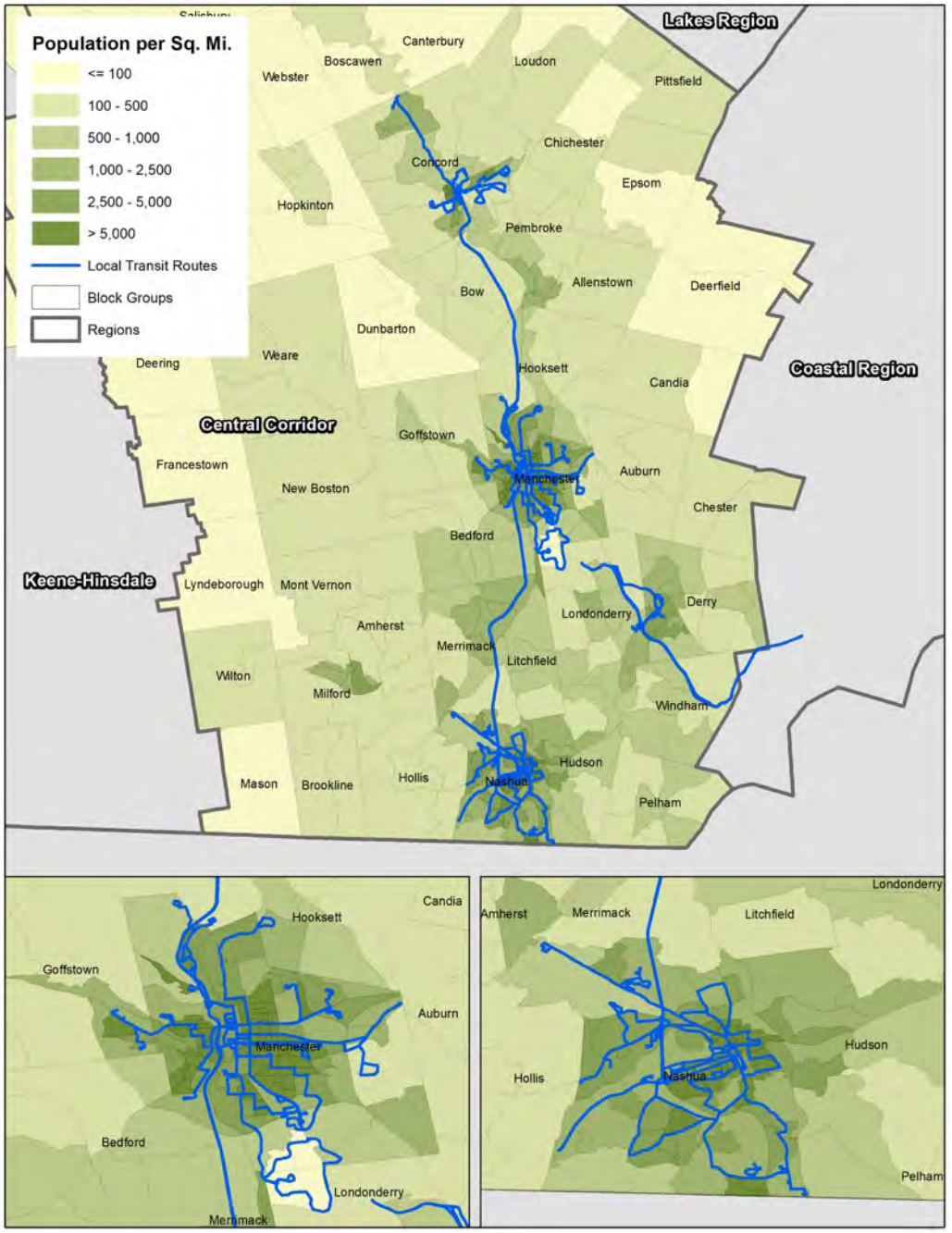
Keene-Hinsdale

- Employment density highest in Keene
- Peterborough and Jaffrey have moderate concentrations of jobs



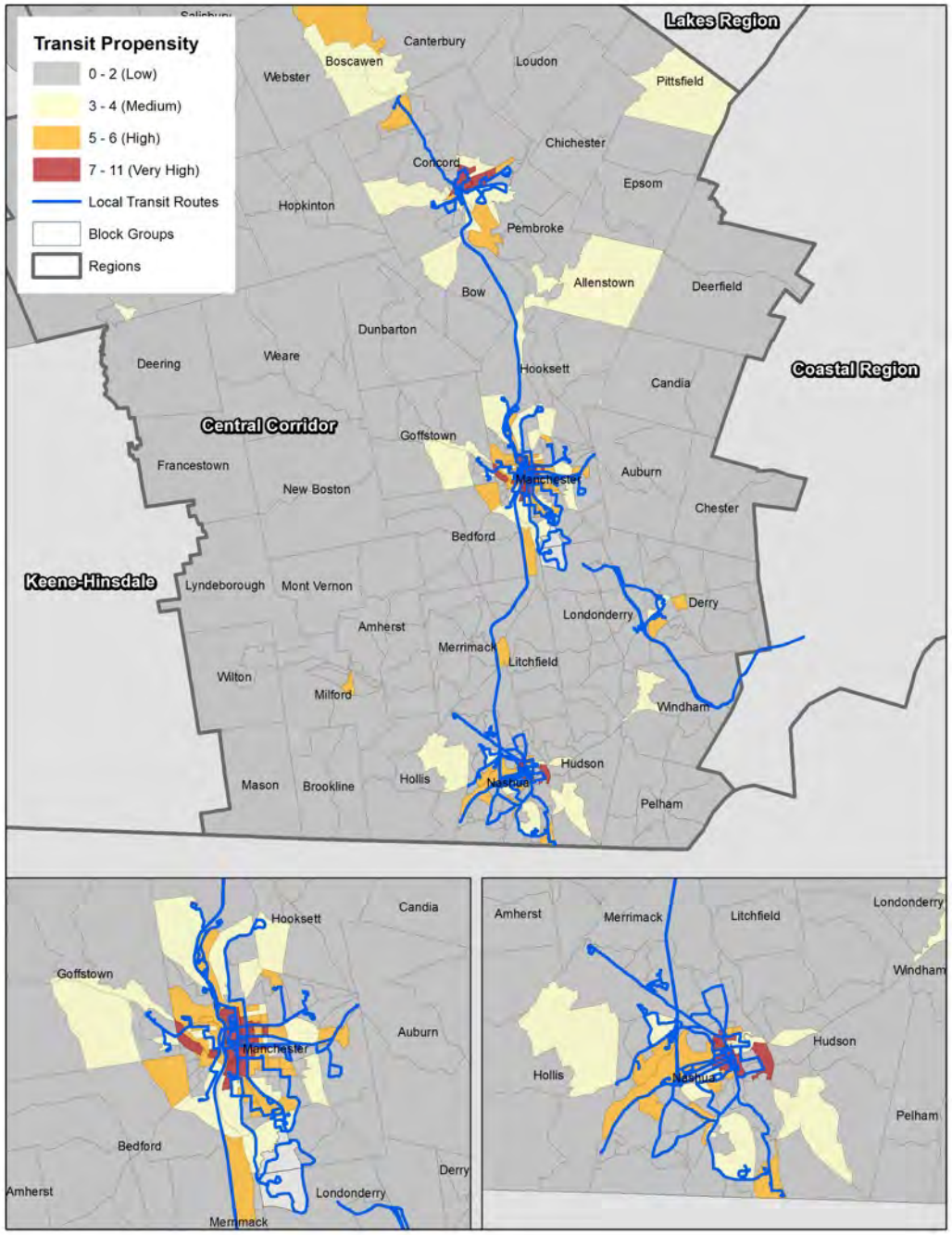
Central Corridor

- Areas of high residential density have thorough transit coverage in Nashua, Manchester and Concord
- Moderate density areas without bus service
  - Pembroke
  - Allenstown
  - Milford
  - Hudson



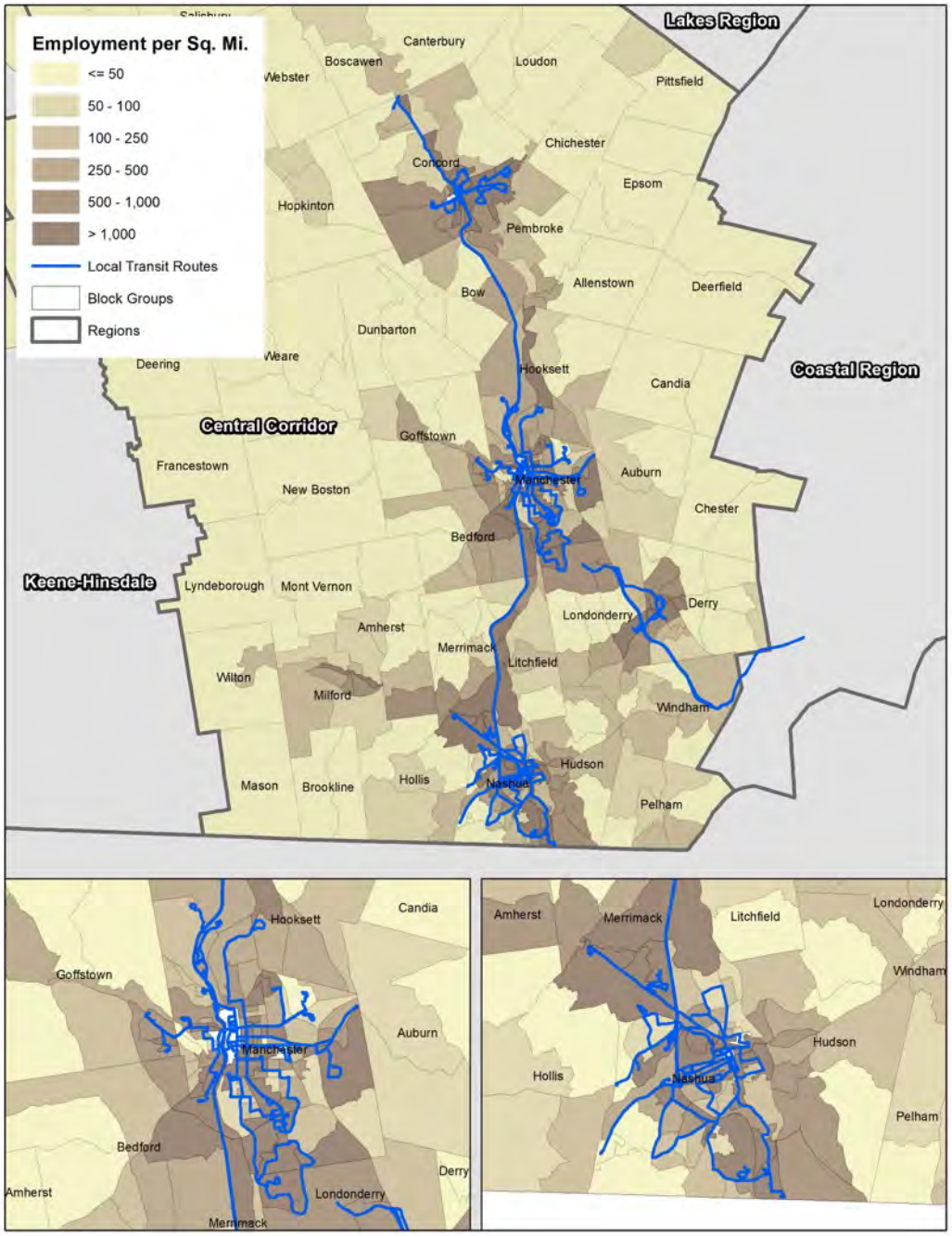
Central Corridor

- Very high propensity
  - Concord
  - Manchester
  - Nashua
- High propensity – unserved by bus routes
  - Milford
  - Derry
  - Pembroke
  - Boscawen
  - Merrimack



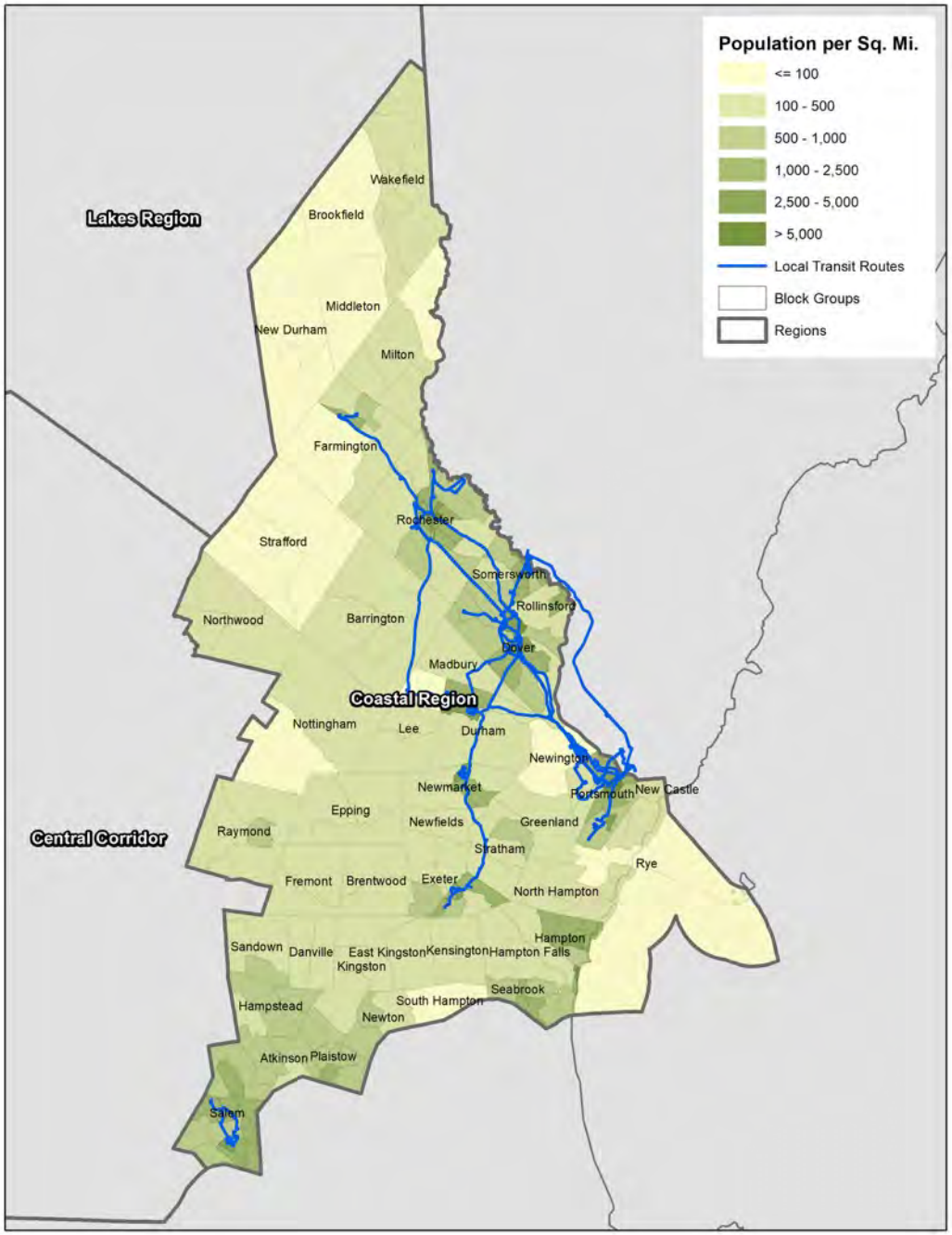
Central Corridor

- Employment density relatively high throughout central corridor
- Large cities dominate, but Milford, Amherst, Derry, Londonderry, Hudson and Bedford also have many jobs



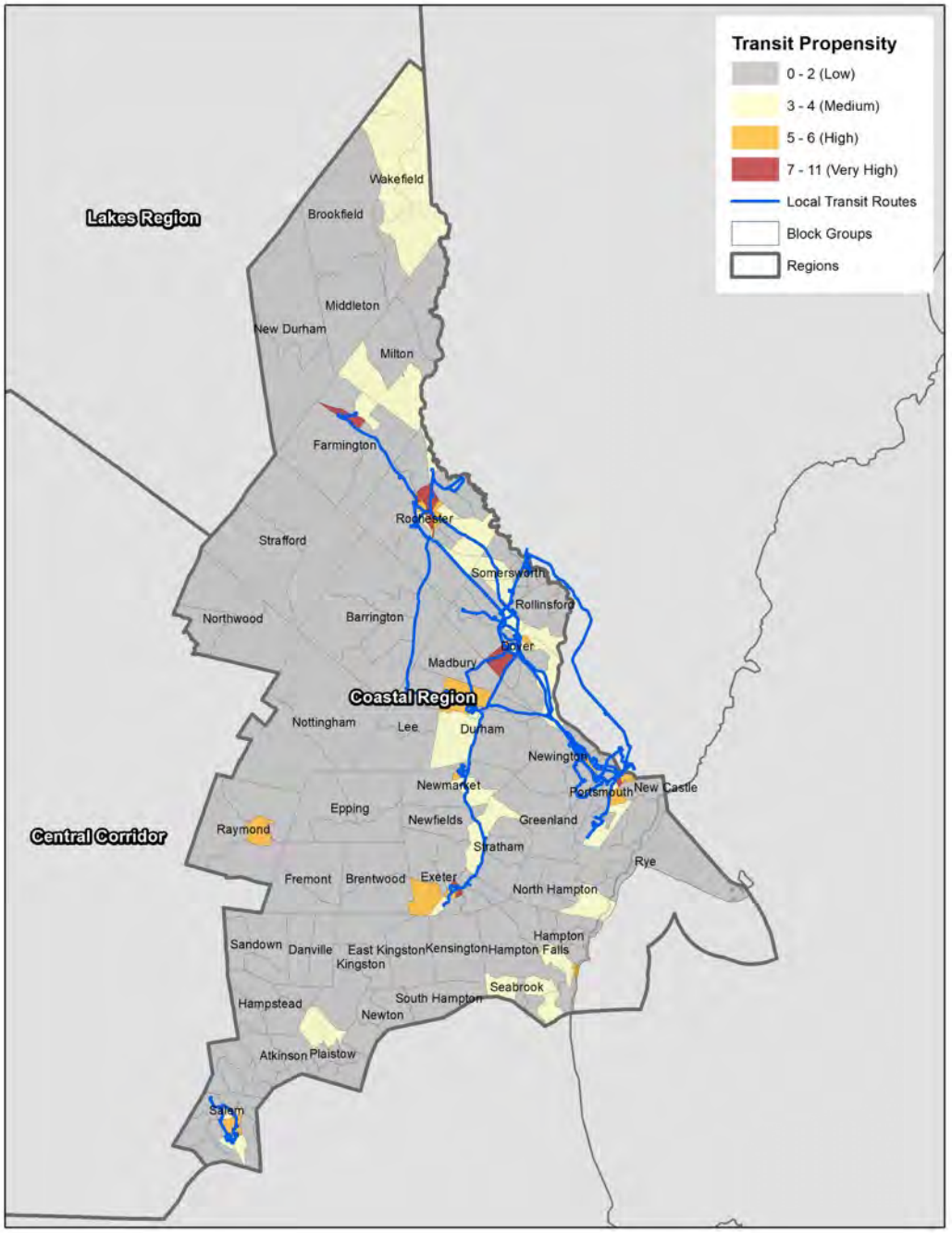
Coastal Region

- Part of urbanized area but not as dense as Central Corridor
- High density in some pockets, but moderate density across much of southern and eastern edges



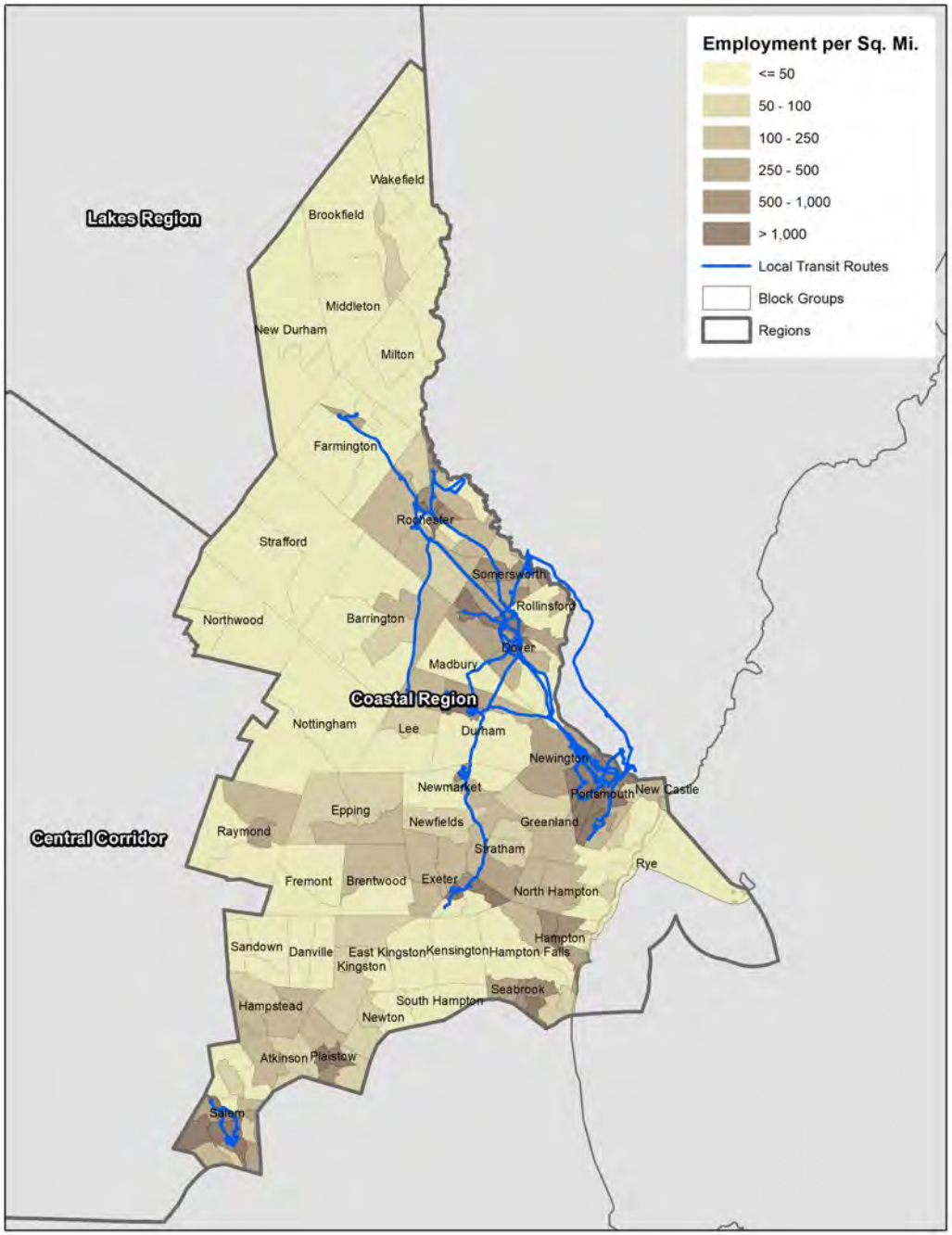
Coastal Region

- Very high propensity
  - Farmington
  - Rochester
  - Dover
  - Portsmouth
  - Exeter
- High propensity – unserved by bus routes
  - Raymond
  - Hampton
  - Exeter



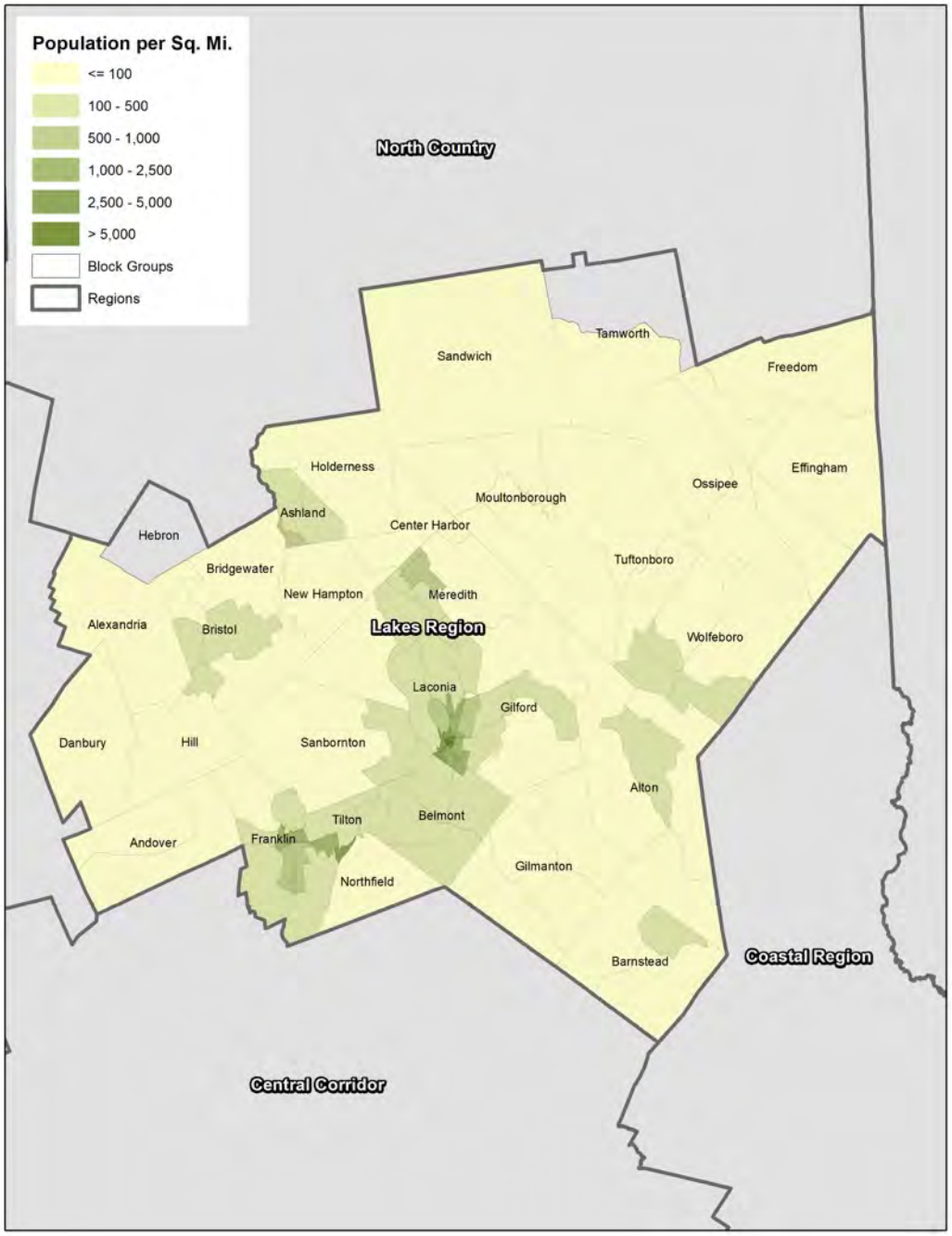
Coastal Region

- Employment density similar to residential – focused on southern and eastern edges
- Unserved areas
  - Plaistow
  - Seabrook
  - Hampton



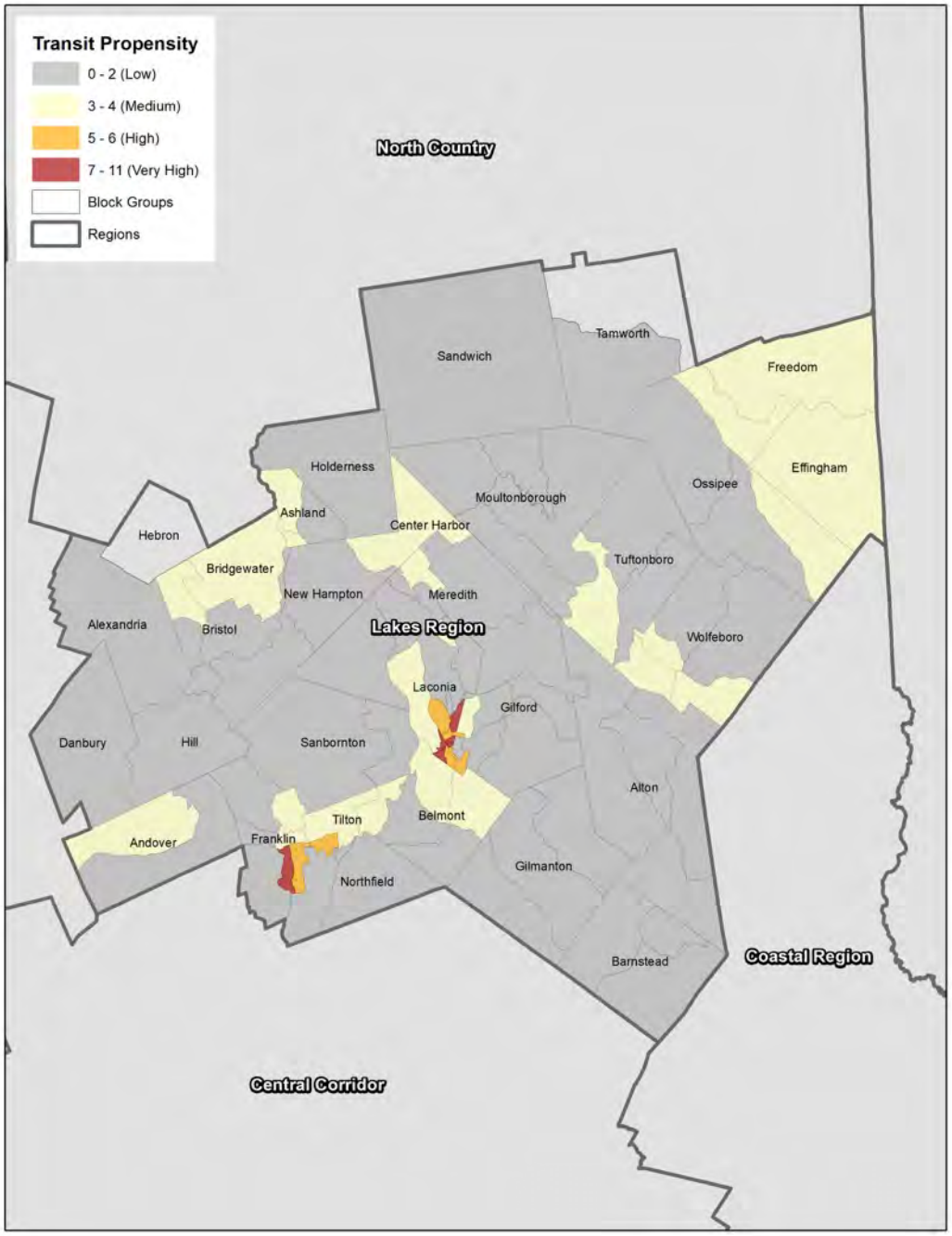
Lakes Region

- Currently no local bus services in Lakes Region
- Highest density in Laconia, Franklin and Tilton
- Moderate density in Meredith and Ashland
- Very rural in northeastern section of region



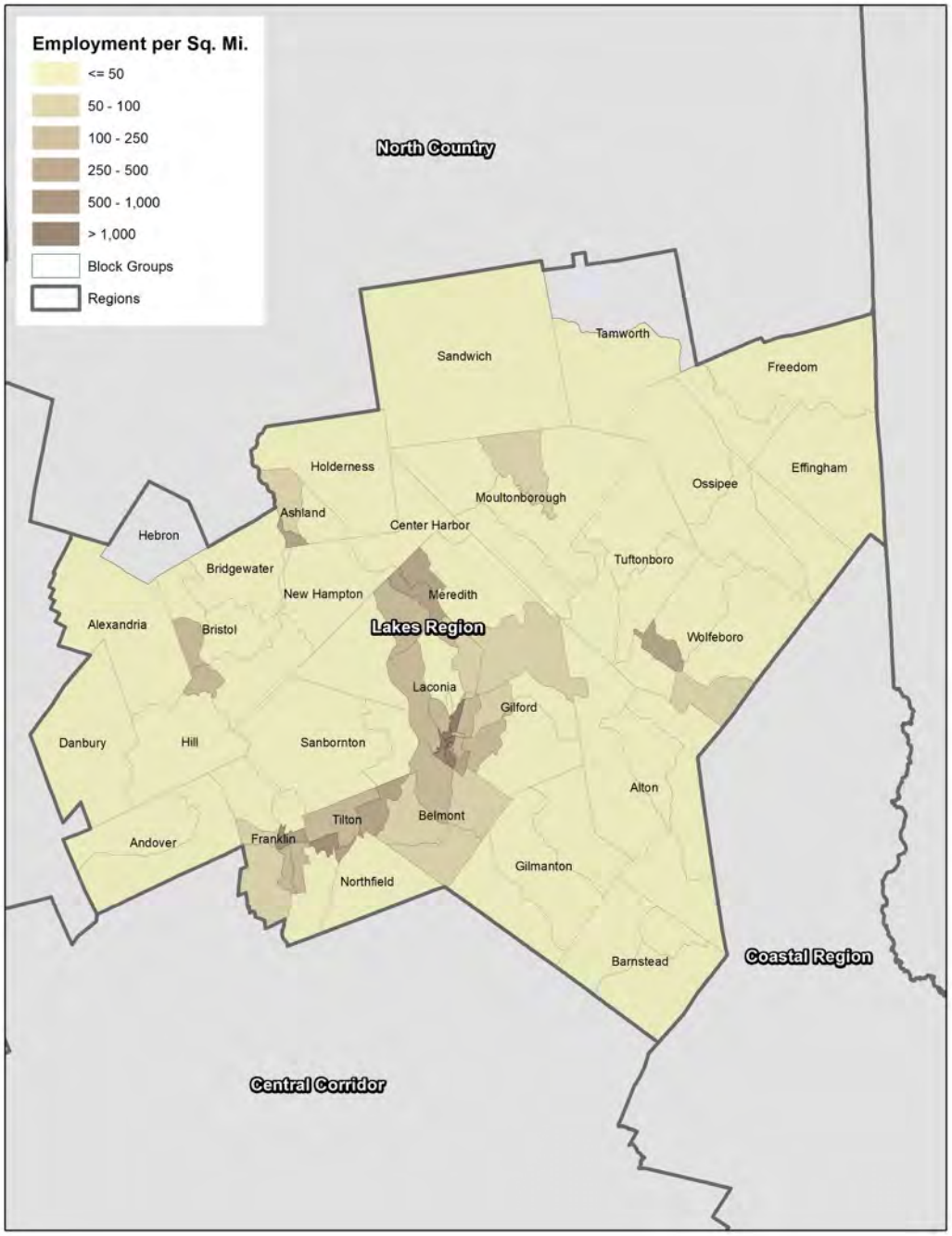
Lakes Region

- High/Very High propensity in Laconia and Franklin
- Moderate propensity near Lake Winnipesaukee and east of NH 16



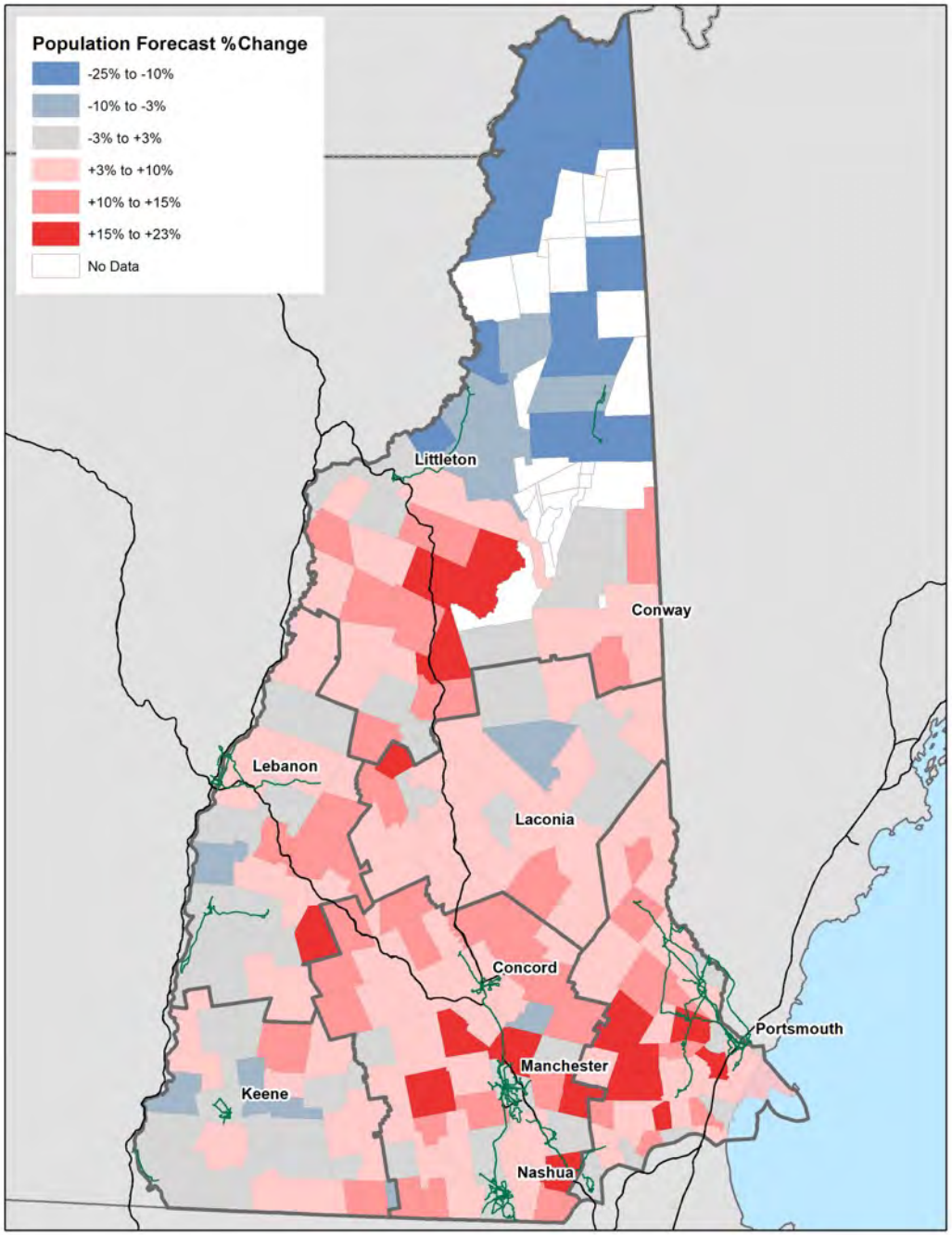
Lakes Region

- Most of the employment is in Meredith-Laconia-Tilton-Franklin corridor
- Some employment density in Wolfeboro



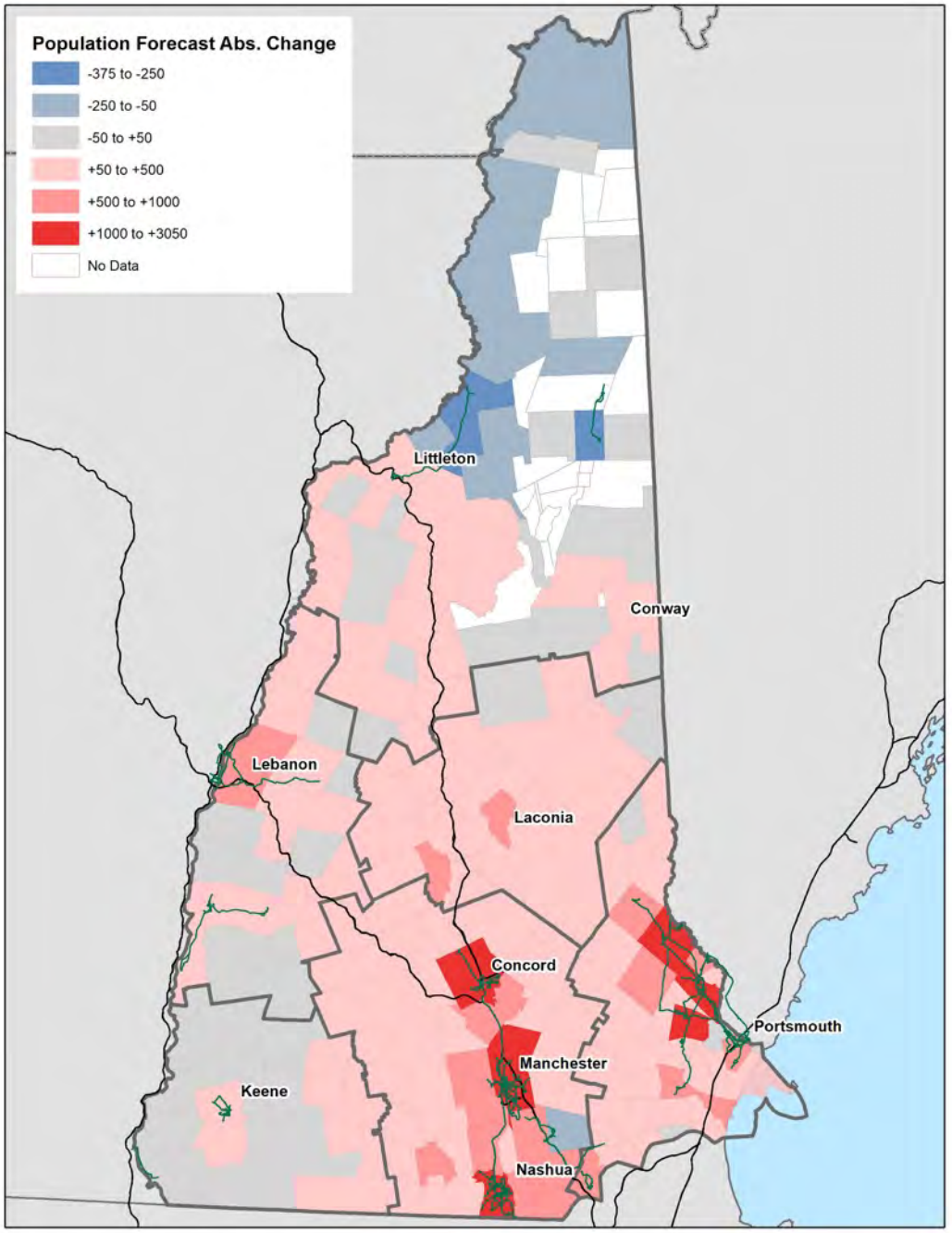
Population Forecast

- Percent change 2015 to 2030 forecast
- Based on NH Office of Strategic Initiatives projections
- Takes county-level estimates and allocates by municipality based on trends between 2000 and 2015
- Fastest growing communities not served by existing bus routes



Population Forecast

- Absolute change from 2015 to 2030
- Largest absolute growth in the larger cities and more populated areas
- Almost all in upper categories already served by transit; exceptions
  - Laconia
  - Franklin
  - Milford



What Does It All Mean?

- Many towns showed up as having moderate to high density in population and employment and/or high transit propensity, but no bus service
  - Conway
  - Plymouth
  - New London
  - Pembroke
  - Allenstown
  - Milford
  - Hudson
  - Merrimack
  - Raymond
  - Hampton
  - Exeter
  - Laconia
  - Franklin
  - Tilton

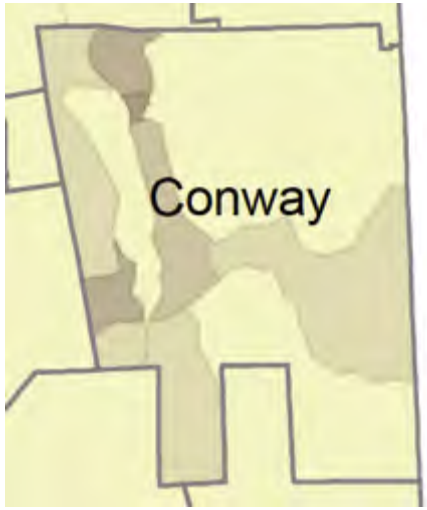
Possible Services

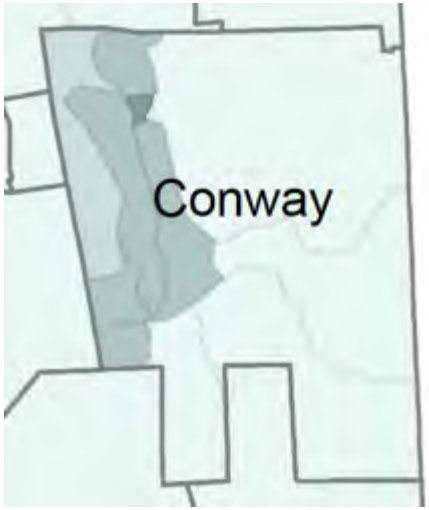
- Some of these locations have had fixed or flexible route service in the recent past that was discontinued due to poor ridership and lack of local support
  - Carroll County (Conway, Ossipee, Wolfeboro, etc.)
  - Winnipesaukee Transit System (Laconia-Tilton-Franklin)
  - Exeter (COAST route has been converted to on demand)
- Some are slated to see new intercity service in FY2020
  - Laconia
  - Franklin
  - Boscawen

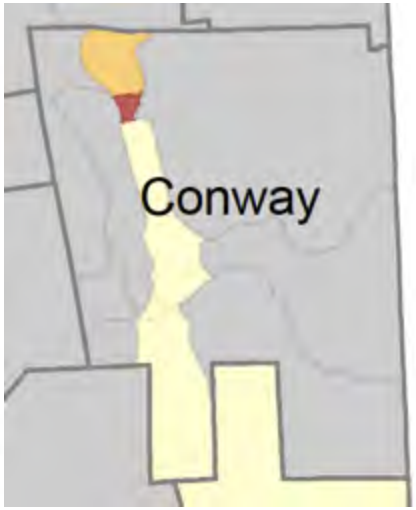
Assumptions for New Local Services

- For costing purposes, assumed a constant $75 per vehicle revenue hour for all local services
  - No specific operator assumed
- Made no assumptions about fare levels or revenue
- Most services could be operated as route deviation service with a 1/4-mile buffer; otherwise would require ADA complementary paratransit

Conway: Pop 9,018; Emp 7,282







Population per Sq. Mi.

- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,500
- > 2,500

Employment per Sq. Mi.

- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1,000 - 2,500
- > 2,500

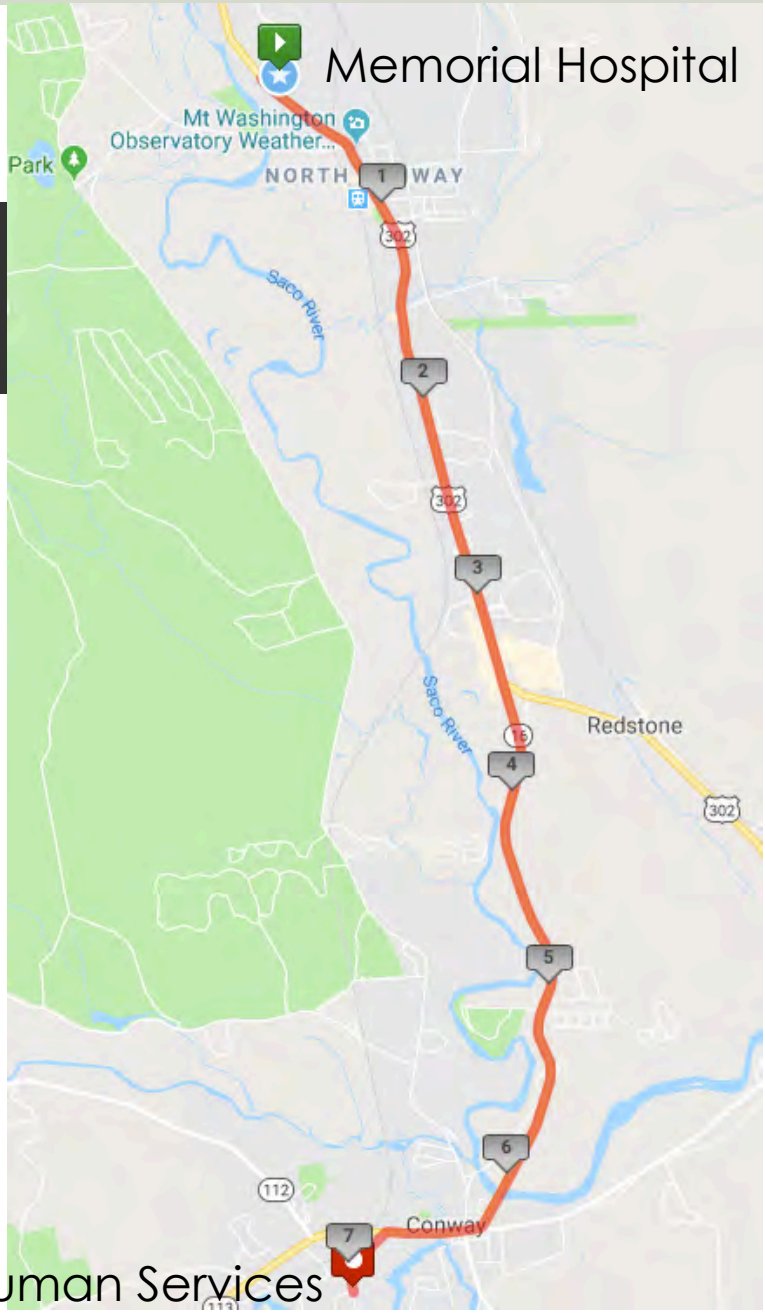
Overall Index Score

- 0 - 2 (Low)
- 3 - 4 (Medium)
- 5 - 6 (High)
- 7 - 11 (Very High)

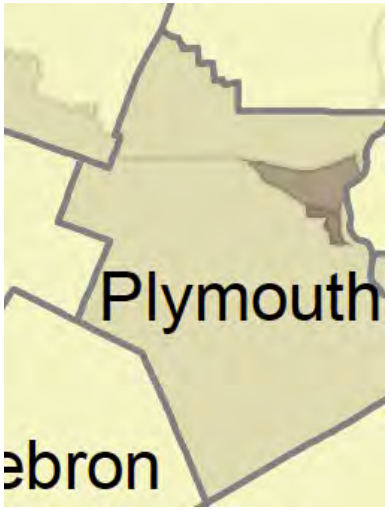
Conway Service

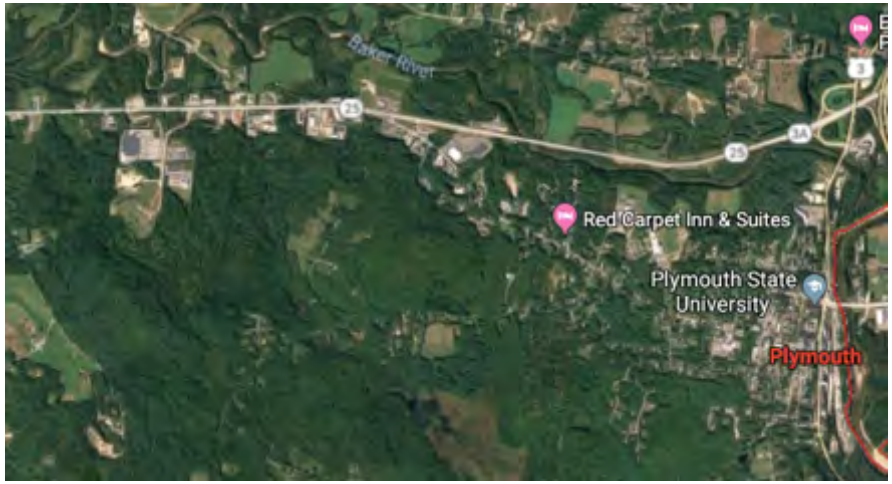
- Seasonal shuttle operating on White Mountain Highway (US 302)and NH 16 between Memorial Hospital and Health & Human Services
  - Two peak buses running at 30-minute headway
  - One bus midday and evening at 60-minute headway
  - Operate from 6:00 a.m. to 10:00 p.m. daily
  - Memorial Day through Labor Day (100 days)
  - Estimate of annual gross cost: $150,000

Conway Shuttle



Plymouth: Pop 6,659; Emp 4,099





Population per Sq. Mi.

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Employment per Sq. Mi.

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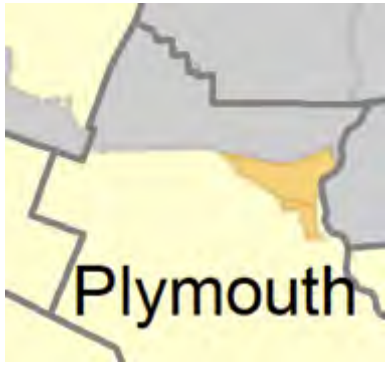

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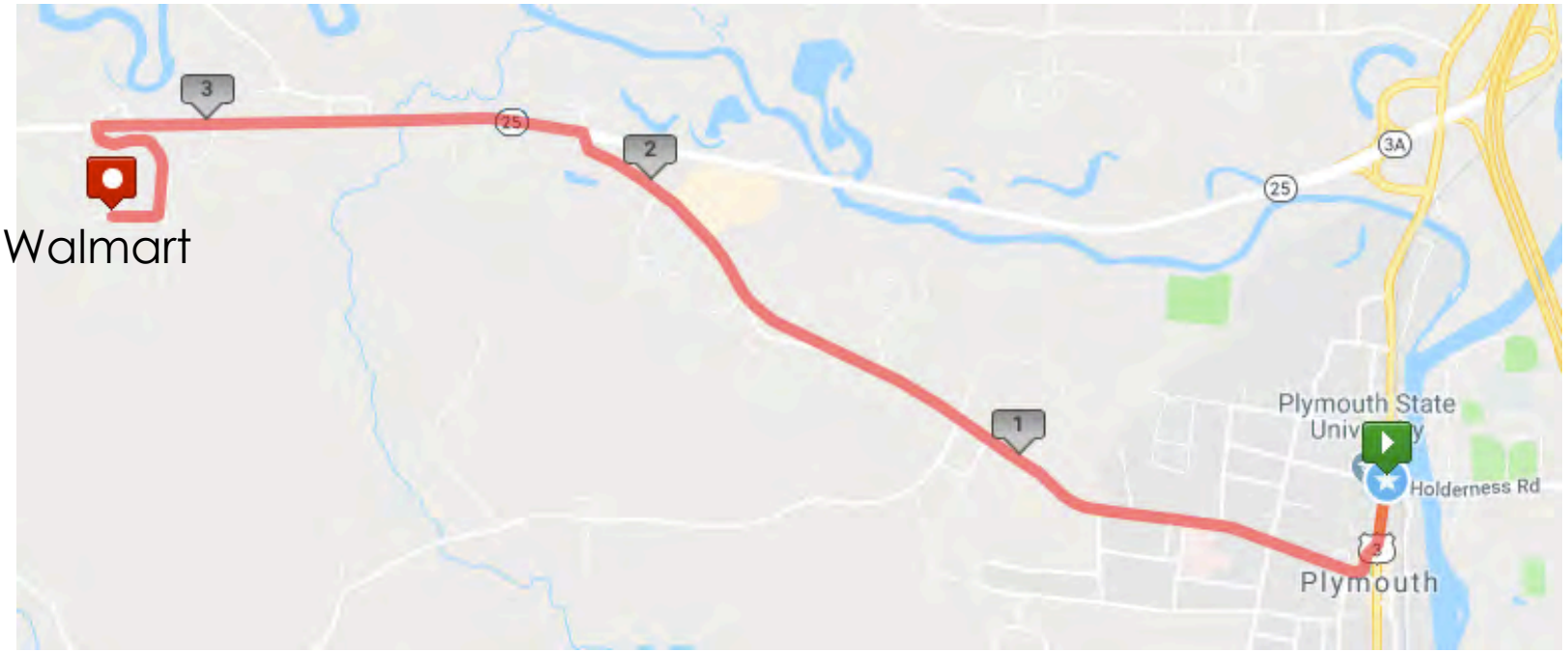
- 7 - 11 (Very High)

Plymouth Service

- Shuttle connecting retail and employment on NH 25 with PSU and residental development in town center via Highland Street (in partnership with PSU)
  - Western terminus: Walmart
  - Eastern terminus: Town Common/PSU
  - One bus operating at 40-minute headway
  - Operate 6:00 a.m. to 7:00 p.m. Mon-Fri
  - Estimate of annual gross cost: $250,000

Plymouth Shuttle



Pembroke/Allenstown: Pop 7,361

Population per Sq. Mi.

- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,500
- > 2,500

Employment per Sq. Mi.

- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1,000 - 2,500
- > 2,500

Overall Index Score

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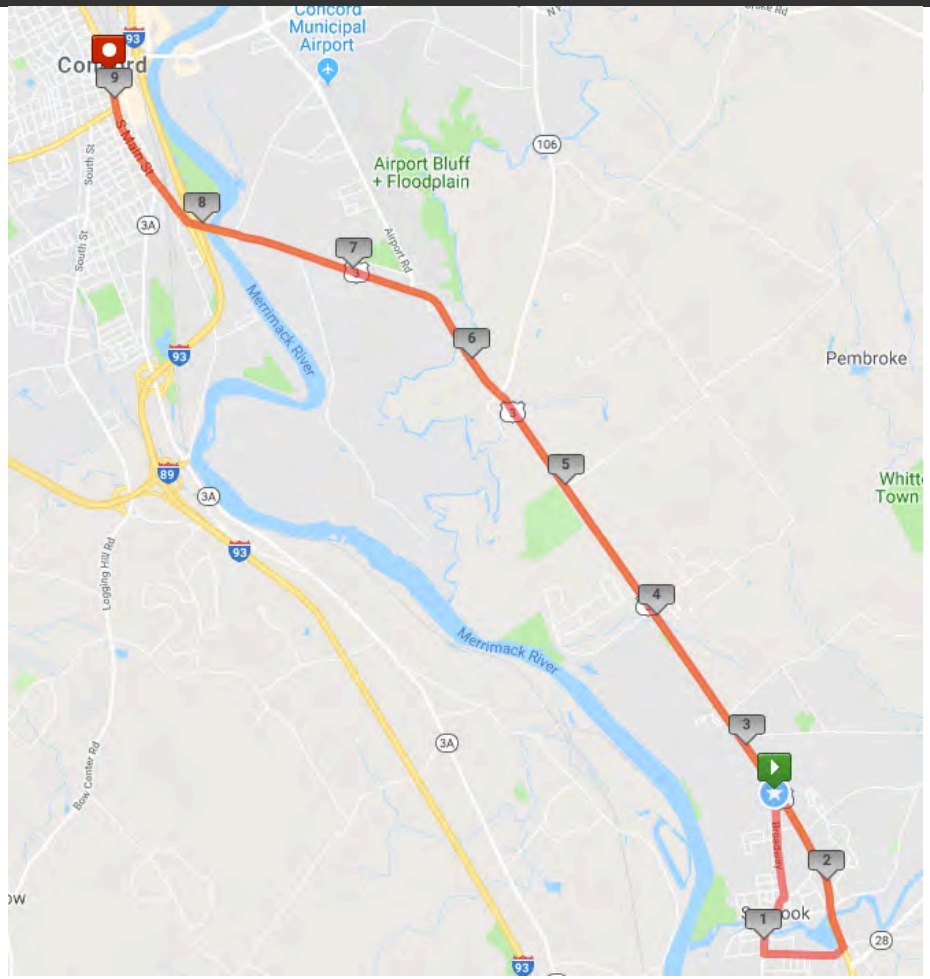
- 5 - 6 (High)
- 7 - 11 (Very High)

Suncook Service

- Local route connection to Concord (Eagle Square) via US 3
  - One bus at 60-minute headway
  - Operate 6:00 a.m. to 7:00 p.m. Mon-Fri
  - Estimate of annual gross cost: $250,000
- Could also consider local service from Concord to Manchester via US 3 (proposed in 2013 study)

Suncook – Concord Shuttle



Milford: Pop 15,206; Emp 6,239

Population per Sq. Mi.

- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,500
- > 2,500

Employment per Sq. Mi.

- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1,000 - 2,500
- > 2,500

Overall Index Score

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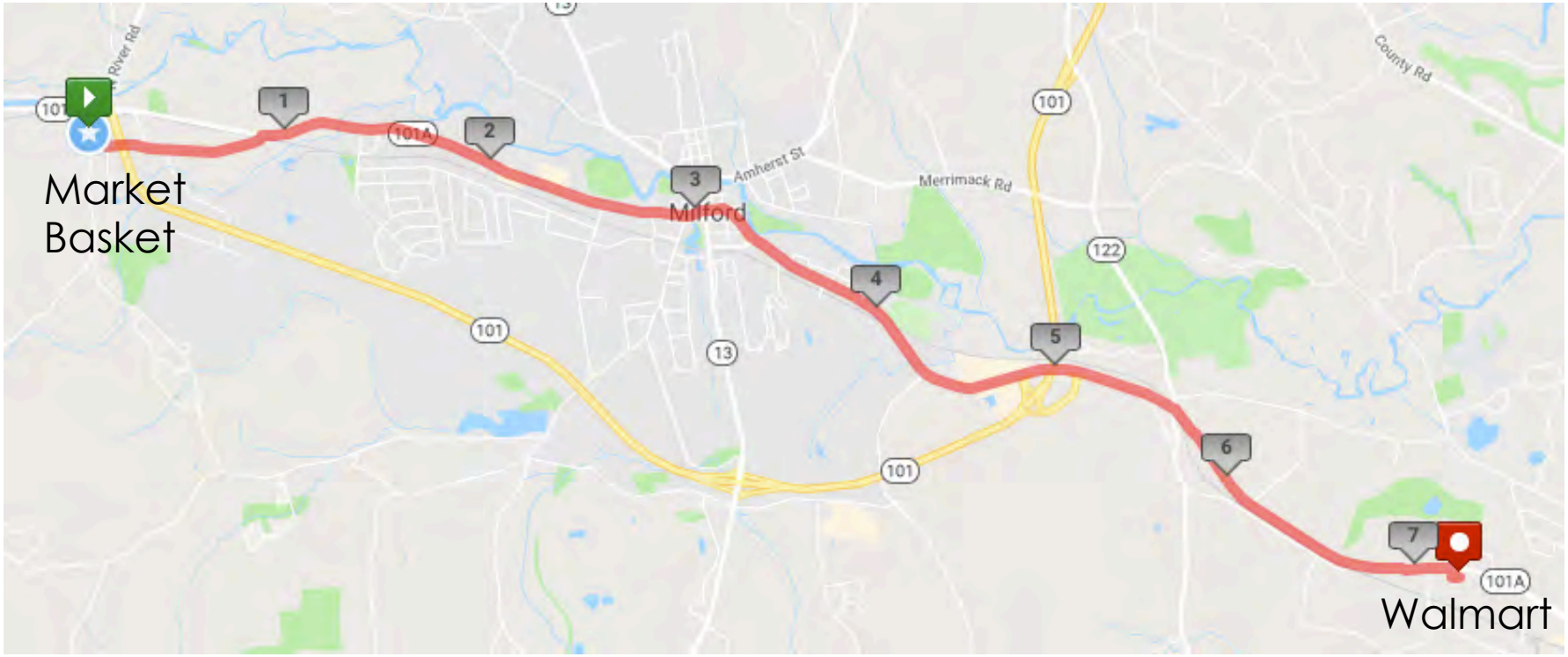
- 5 - 6 (High)
- 7 - 11 (Very High)

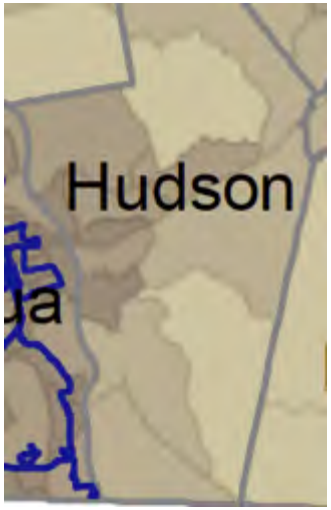
Milford Service

- Local shuttle operating between Market Basket and Walmart in Amherst (to connect to NTS)
  - One bus operating at 60-minute headway
  - Runs Tuesdays, Fridays and Saturdays from 9:00 a.m. to 6:00 p.m. to meet up with NTS Route 10/10A
  - Estimate of annual gross cost: $105,000
  - Would likely need to run as a fixed route with complementary paratransit service (possibly available with existing SVTC resources)

Milford Shuttle



Hudson: Pop 24,808; Emp 8,318



Population per Sq. Mi.

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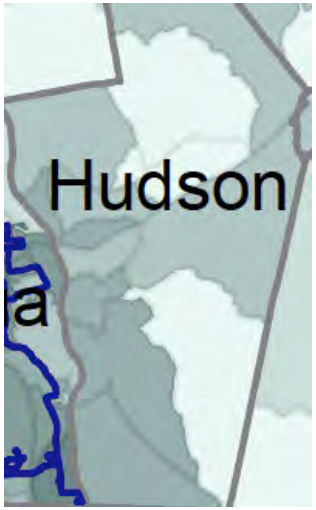

Employment per Sq. Mi.

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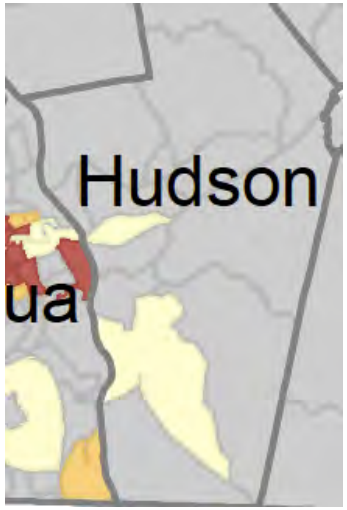

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- 7 - 11 (Very High)

Hudson Concepts

- Low transit propensity overall; mostly suburban-style development (only 117 households with no vehicles)
- Many Boston-bound commuters
- Local route to Nashua may be helpful to some
- Microtransit solution could help mobility in town
  - Technology-enabled shared ride service

Merrimack: Pop 25,580; Emp 14,177

Population per Sq. Mi.

- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,500
- > 2,500

Employment per Sq. Mi.

- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1,000 - 2,500
- > 2,500

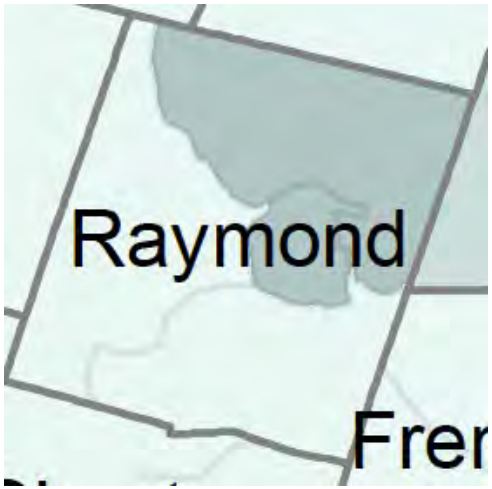
Overall Index Score

- 0 - 2 (Low)
- 3 - 4 (Medium)
- 5 - 6 (High)
- 7 - 11 (Very High)

Merrimack Concepts

- Low transit propensity overall; mostly suburban-style development (only 270 households with no vehicles)
- Block group including Horseshoe Pond has high transit propensity but only 834 people
- Local route to Nashua or Manchester may be helpful to some; many commuters to both cities
- Microtransit solution could help mobility in town

Raymond: Pop 10,257; Emp 2,847



Population per Sq. Mi.

- 0 - 100
- 100 - 250
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- 500 - 1,000
- 1,000 - 2,500
- > 2,500

Employment per Sq. Mi.

- 0 - 50
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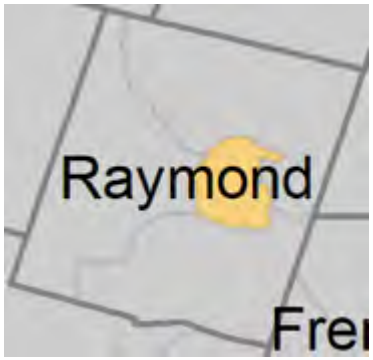


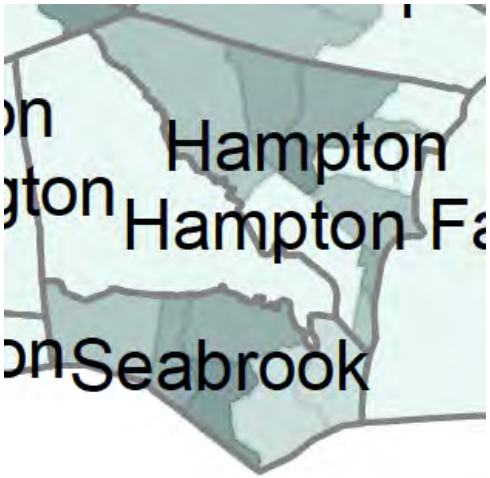
Overall Index Score

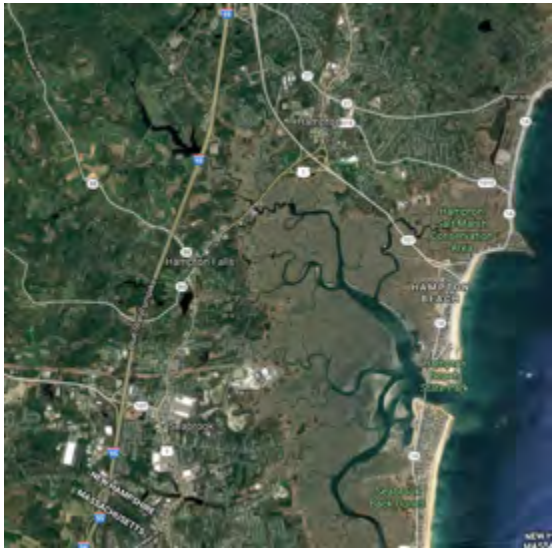
- 0 - 2 (Low)
- 3 - 4 (Medium)
- 5 - 6 (High)
- 7 - 11 (Very High)

Raymond Concepts

- Central section of town has higher-than-average incidence of poverty (246 individuals), but still low number of zero-vehicle households (only 17)
- Fixed-route service not an option here
- Shuttle to Walmart Distribution Center may help some, but it has huge parking lot and there are few people without cars

Hampton/Seabrook





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- > 2,500

Employment per Sq. Mi.

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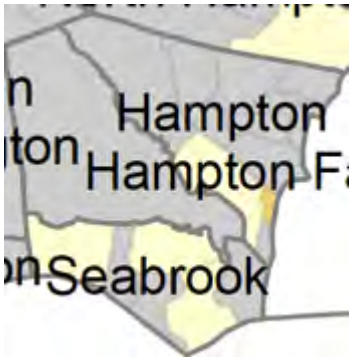

Overall Index Score

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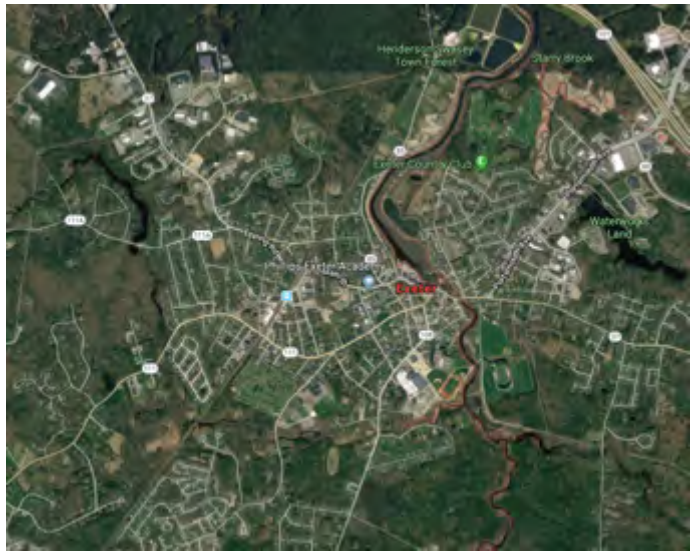
- 5 - 6 (High)
- 7 - 11 (Very High)

Hampton/Seabrook Concepts

- Combined population of nearly 24,000
- Mostly oriented to Boston commuting and beach vacations
- Suburban-style development
- Not close to existing COAST service
- Likely microtransit the only feasible option; could provide access to commercial areas on US 1

Exeter: Pop 14,562; Emp 8,981



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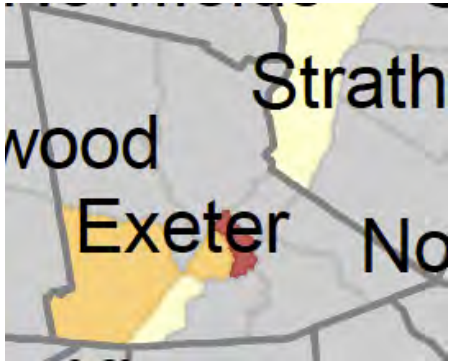

Overall Index Score

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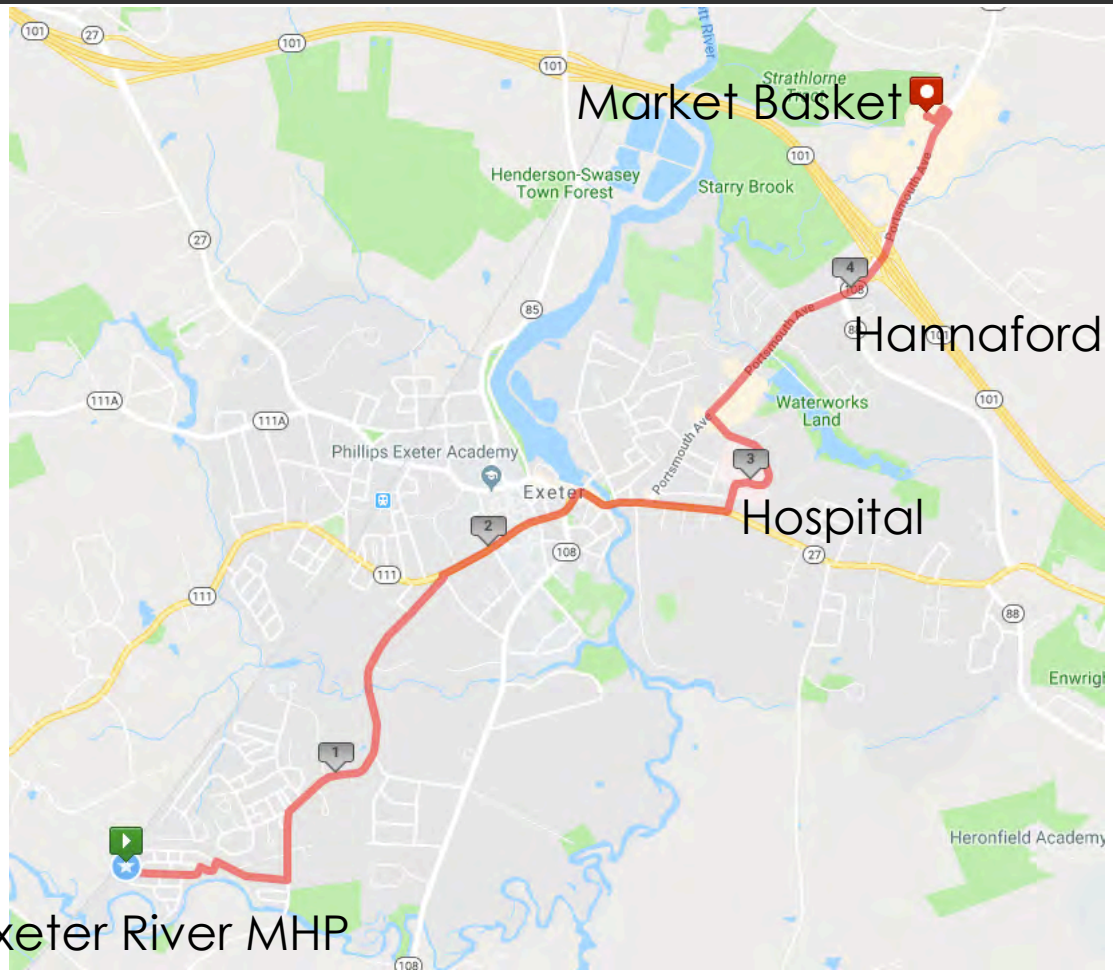
- 5 - 6 (High)
- 7 - 11 (Very High)

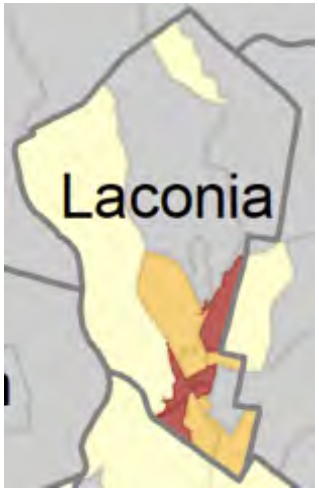
Exeter Concepts

- Possible substitute for current COAST deviated route Monday, Wednesday, Thursday and Saturday (connects to Stratham and Newmarket)
  - Shuttle route from Robinhood Drive through town and hospital to Hannaford and Market Basket in Stratham
  - One bus at 60-minute headway
  - Operate 6:00 a.m. to 7:00 p.m. Mon-Fri
  - Estimate of annual gross cost: $250,000

Exeter Shuttle



Laconia: Pop 16,171; Emp 8,826



Population per Sq. Mi.

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Employment per Sq. Mi.

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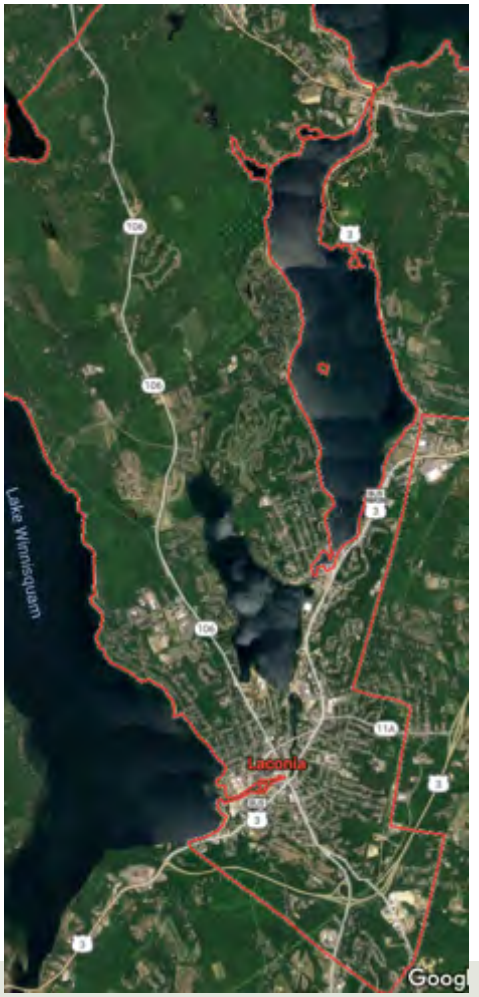
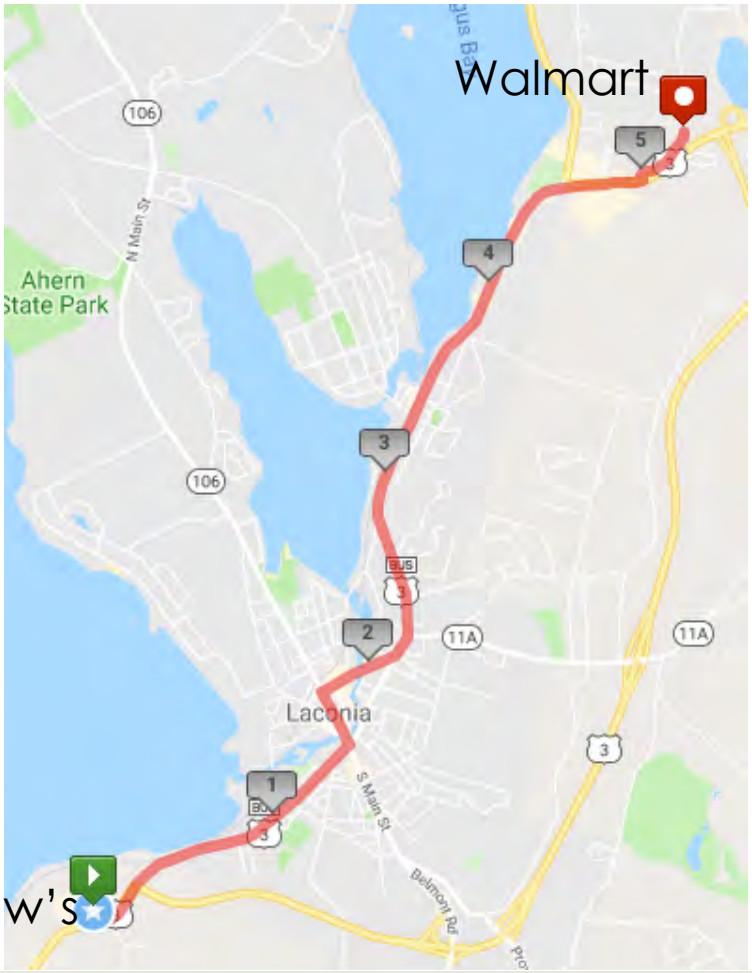


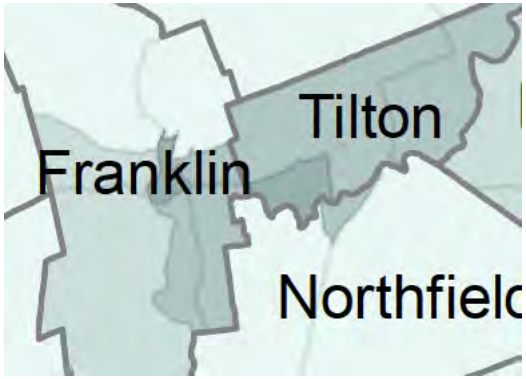
Laconia Service

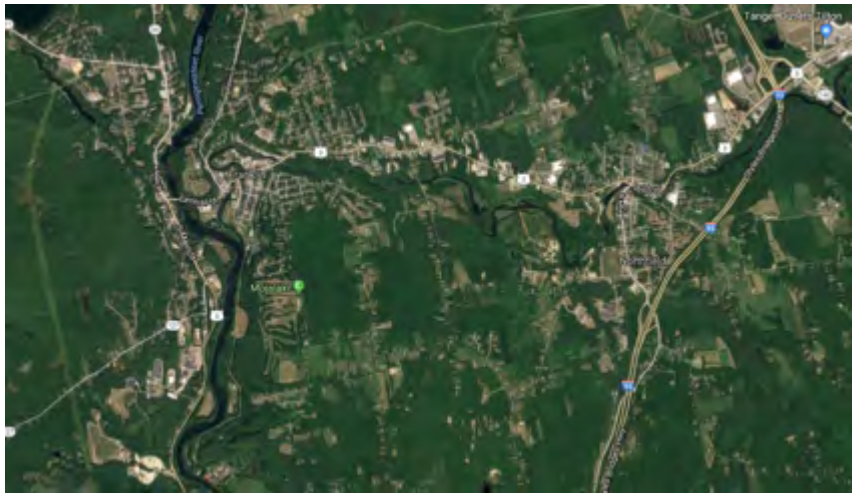
- WTS route discontinued in June 2017
  - Limited service (five trips per day)
  - Confusing and circuitous service pattern
  - Connected to Tilton and Franklin
- Local shuttle between Shaw's in Belmont and Walmart in Gilford via US 3 Business
  - Diverts through downtown Laconia via Main St and Church St.
  - One bus at 60-minute headway
  - Operate 6:00 a.m. to 7:00 p.m. Mon-Fri
  - Estimate of annual gross cost: $250,000

Laconia Shuttle



Franklin/Tilton: Pop 12,007; Emp 6,689





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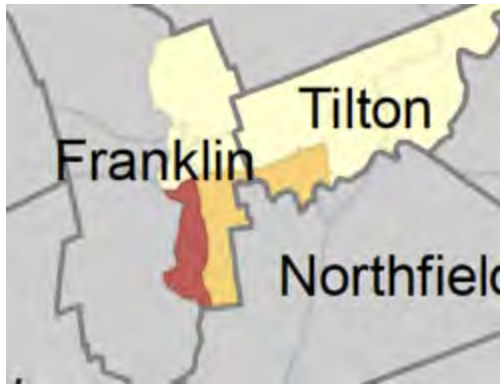

Overall Index Score

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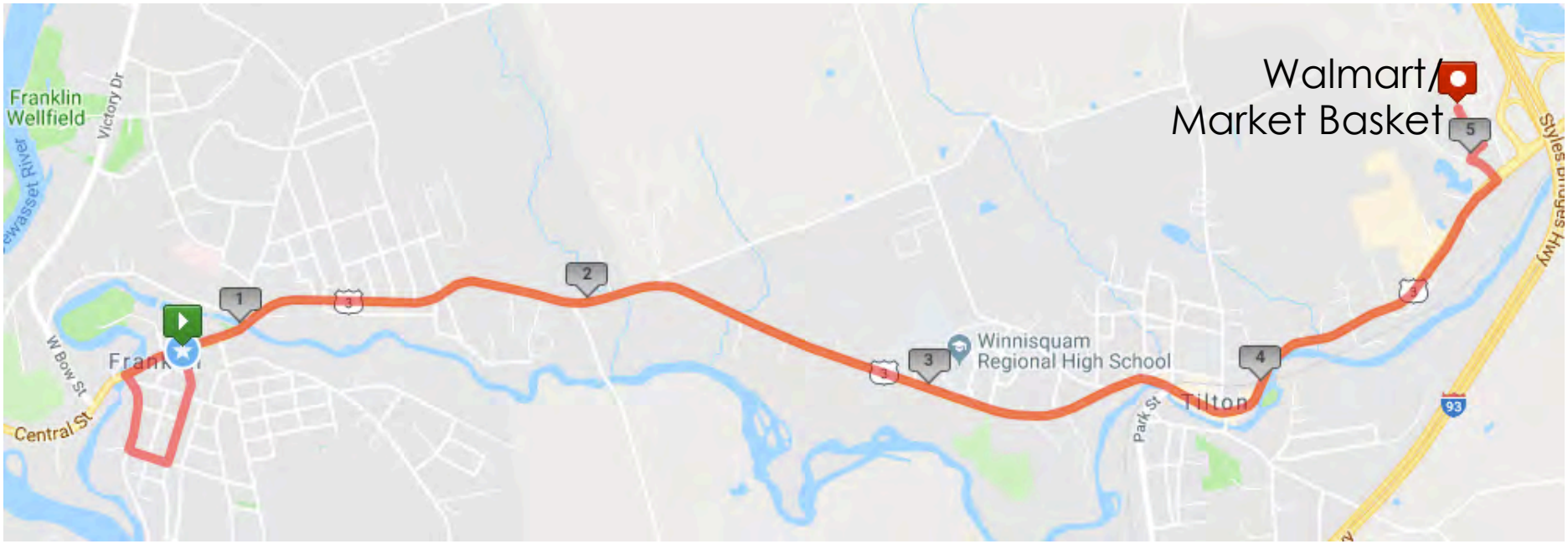
- 3 - 4 (Medium)
- 5 - 6 (High)
- 7 - 11 (Very High)

Franklin/Tilton Service

- Shuttle from center of Franklin to Tilton/Exit 20 retail area
  - One bus at 60-minute headway
  - Operate 6:00 a.m. to 7:00 p.m. Mon-Fri
  - Estimate of annual gross cost: $250,000

Franklin-Tilton Shuttle



Local Service Summary

Route	Headway	Days of Service	Annual Revenue Hrs	Annual Gross Cost*	Urban/ Rural
Conway	30/60	100	2,000	$150,000	Rural
Plymouth	40	255	3,315	$250,000	Rural
Suncook	60	255	3,315	$250,000	Urb/Rur
Milford	60	156	1,400	$105,000	Urban
Exeter	60	255	3,315	$250,000	Urban
Laconia	60	255	3,315	$250,000	Rural
Franklin/Tilton	60	255	3,315	$250,000	Rural
TOTAL				$1,505,000	

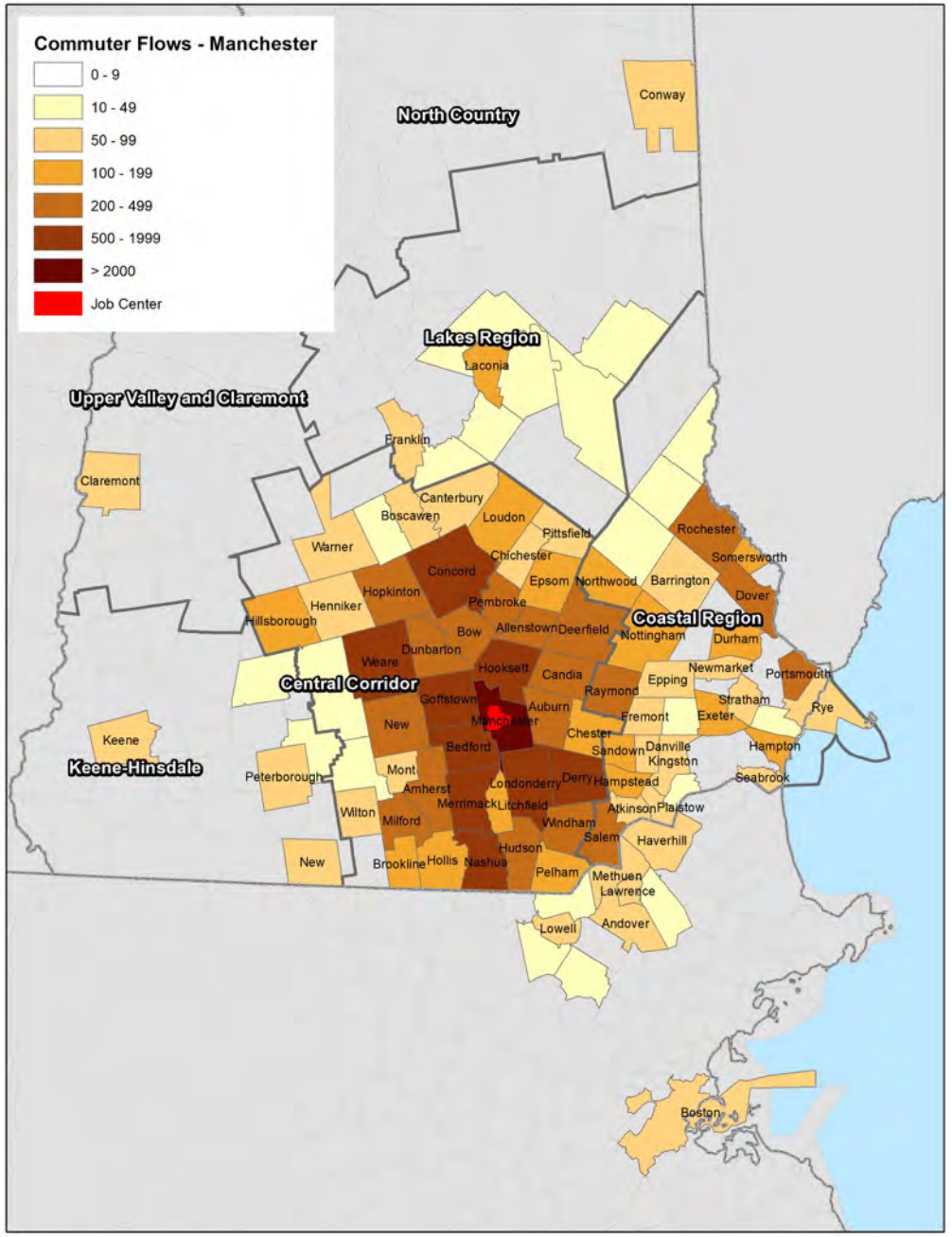
* Cost per revenue hour assumed at $75 for all services

Commuting Patterns

- Looked at 16 largest employment centers in New Hampshire
  - Six of them with more than 15,000 jobs
- In most cases, focused on an employment zone within a city or town, rather than a town as a whole
  - Any potential transit service works better for a focused area with high density and limited parking
- Data source is 2015 LEHD from US Census

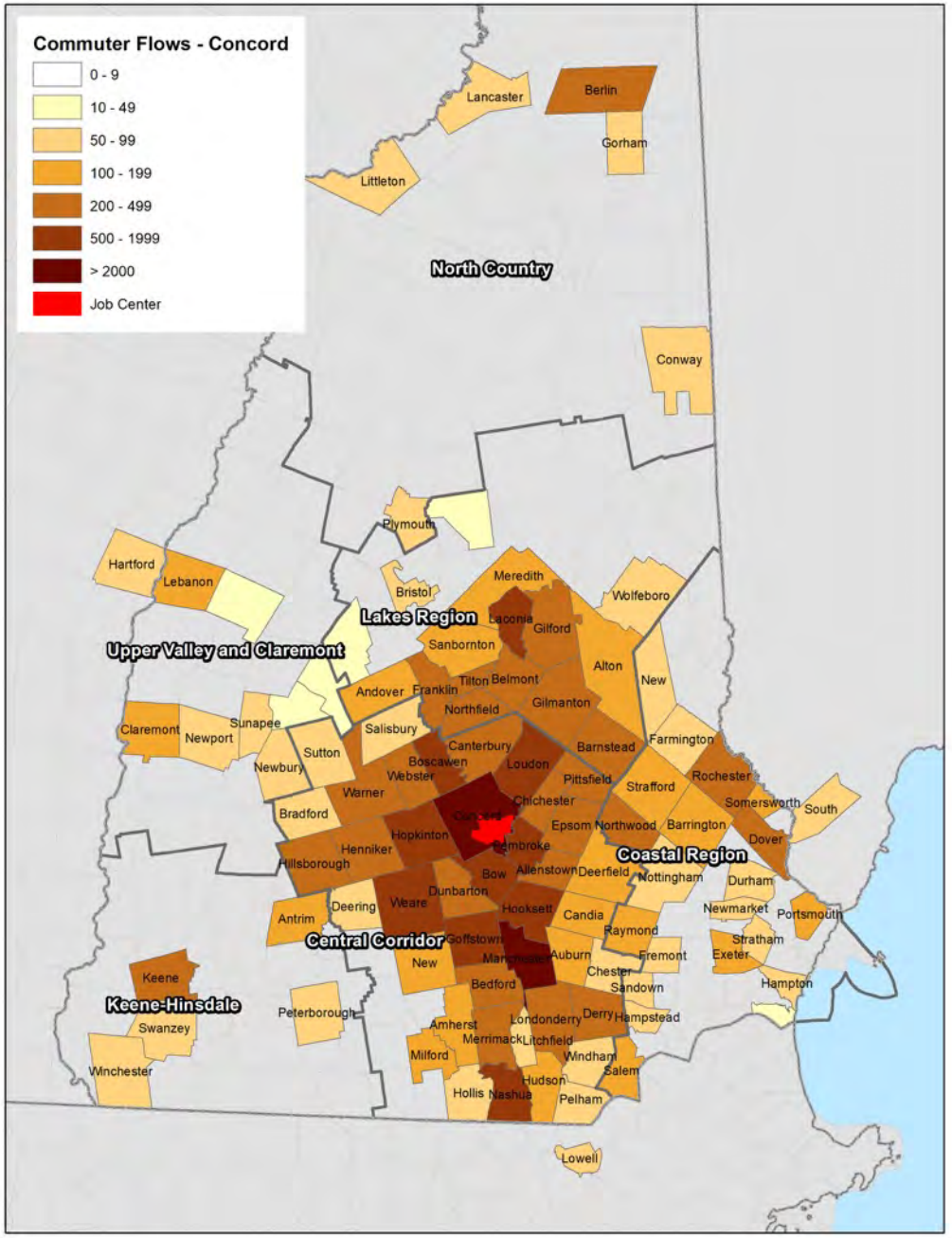
Downtown Manchester

- 37,860 jobs
- Adjacent suburbs provide many of the commuters
- US 3 and I-93 corridors evident; how to capture more of this market
- Contingent from NH 16 corridor crossing via NH 101



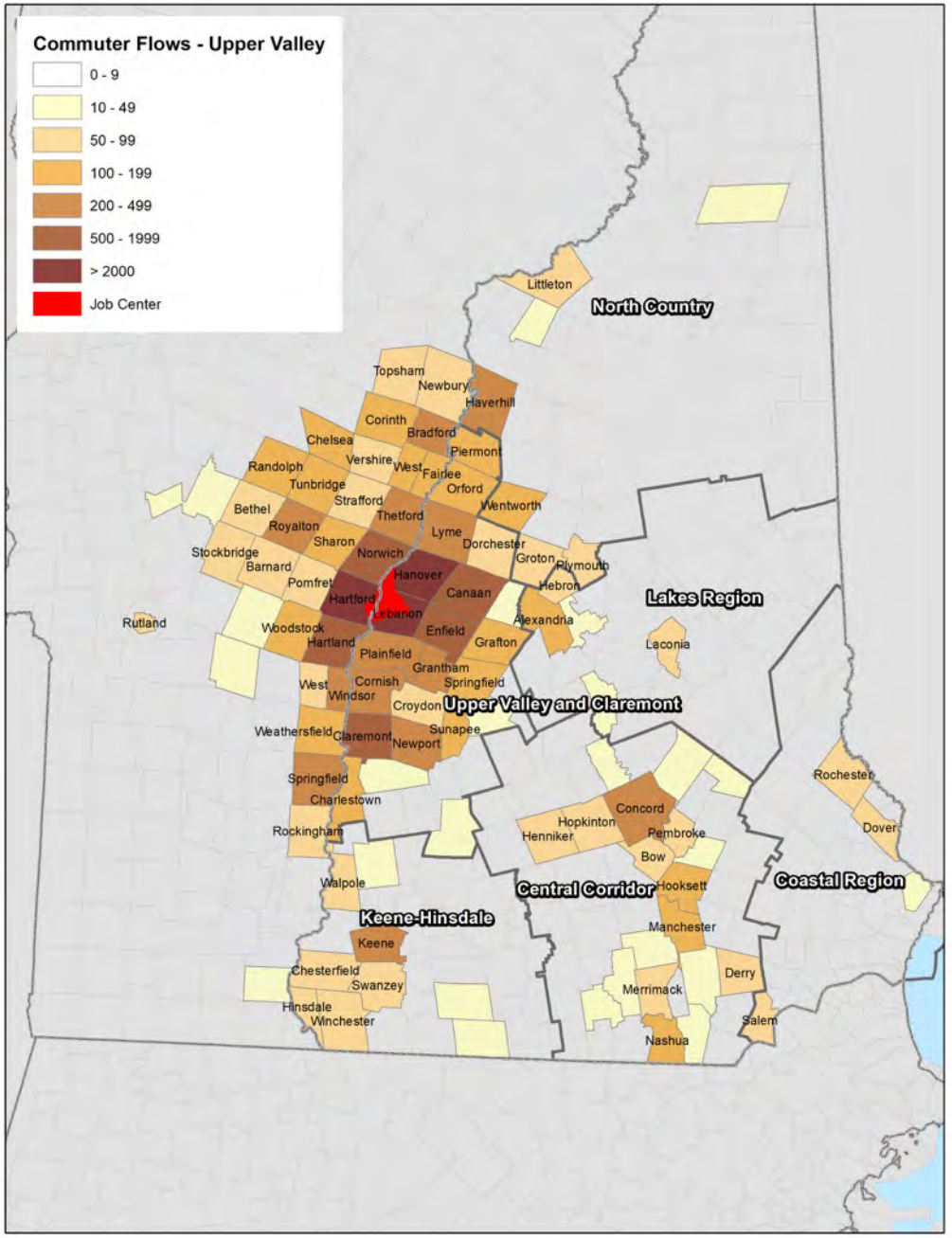
Downtown Concord

- 35,677 jobs
- Includes Loudon Rd and State complex on Hazen Drive, as well as Concord Hospital
- More spread out than Manchester pattern
  - 540 commuters each from Laconia and Nashua
  - 245 from Berlin (!) and 234 from Keene



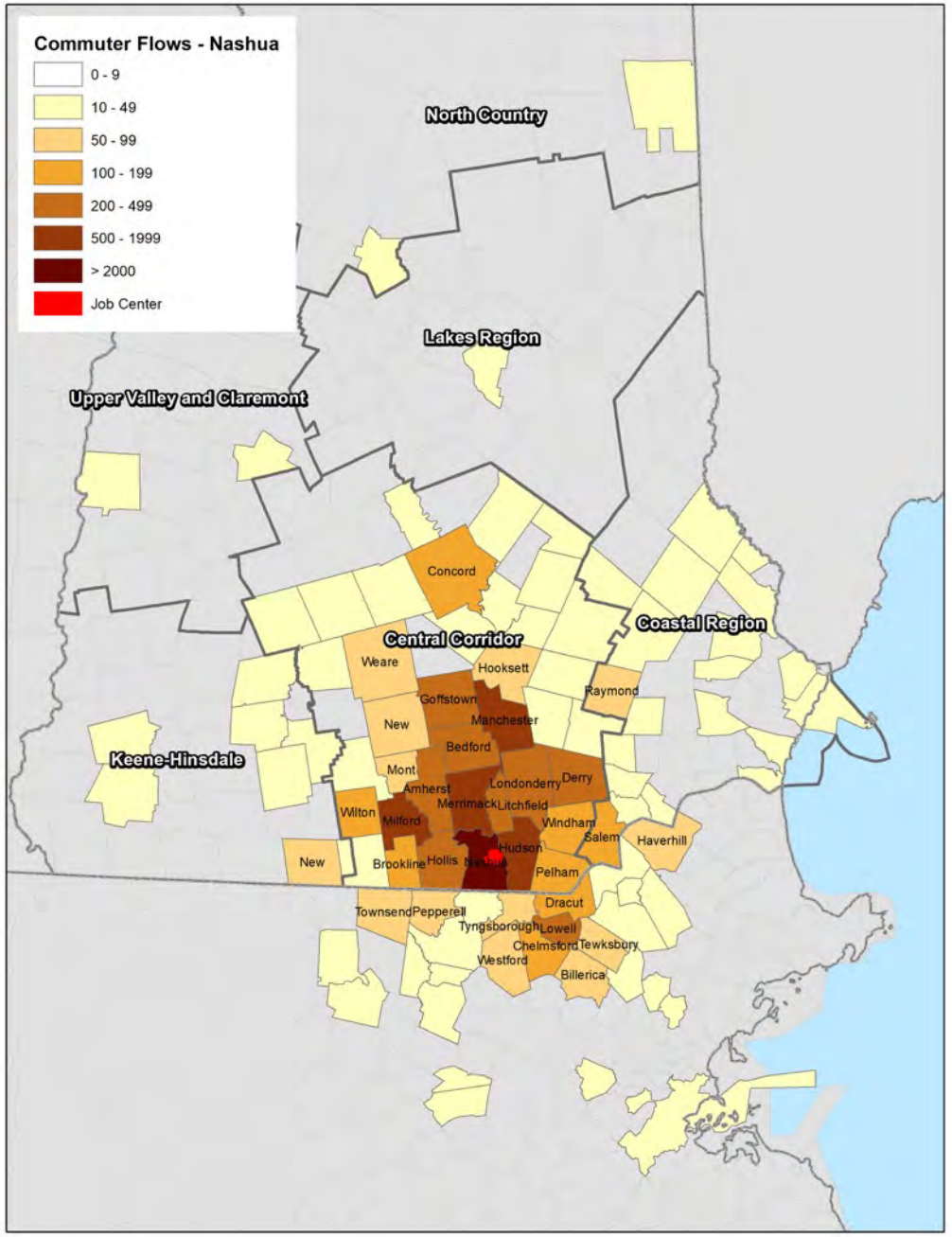
Upper Valley

- 29,984 jobs
- Large influx from Vermont
- I-91 corridor evident from north and south
- 903 commuters from Claremont
- 379 commuters from Concord
- 319 commuters from Keene



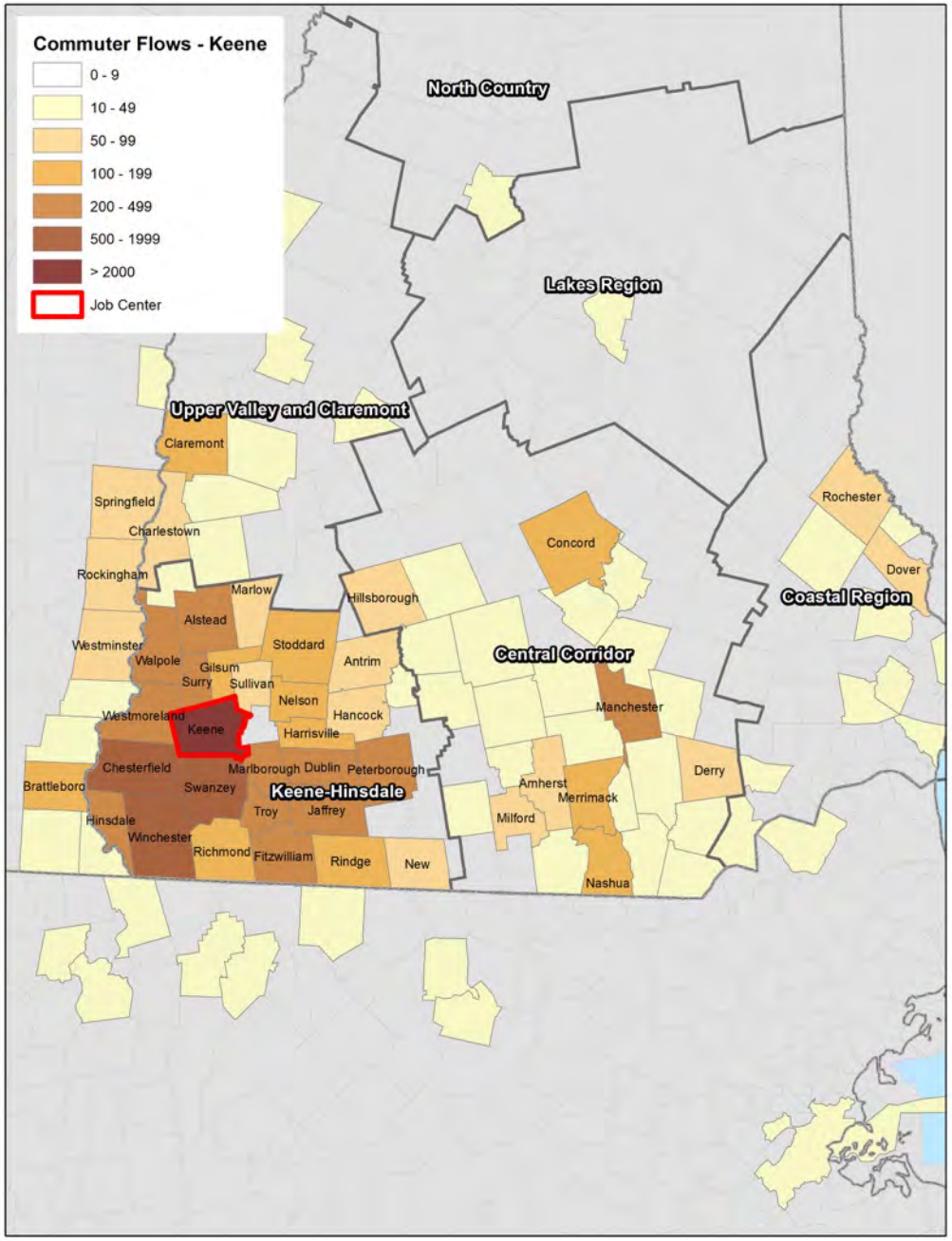
Downtown Nashua

- 17,201 jobs
- Downtown largest of at least four distinct job centers in the city (53,459 total)
- Overall pattern for downtown much more compact
- Manchester (874) and Milford (537) most important non-adjacent sources



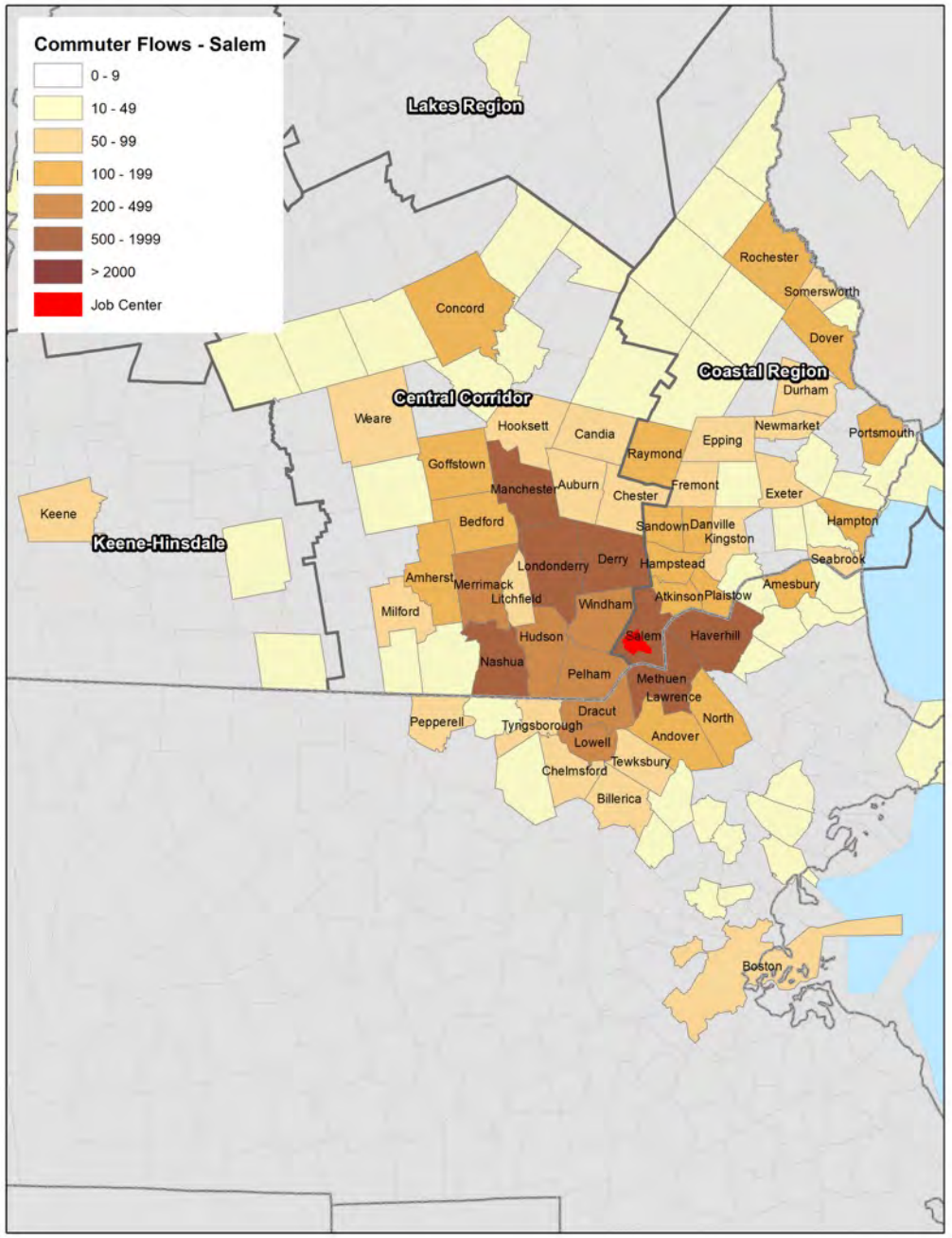
Keene

- 18,158 jobs (city-wide)
  - About 7,000 jobs in downtown area
- Largest flows coming from the south via NH 9, 10 and 32
- NH 12 and 101 also important corridors
- 234 coming from Manchester (92 headed to downtown Keene)



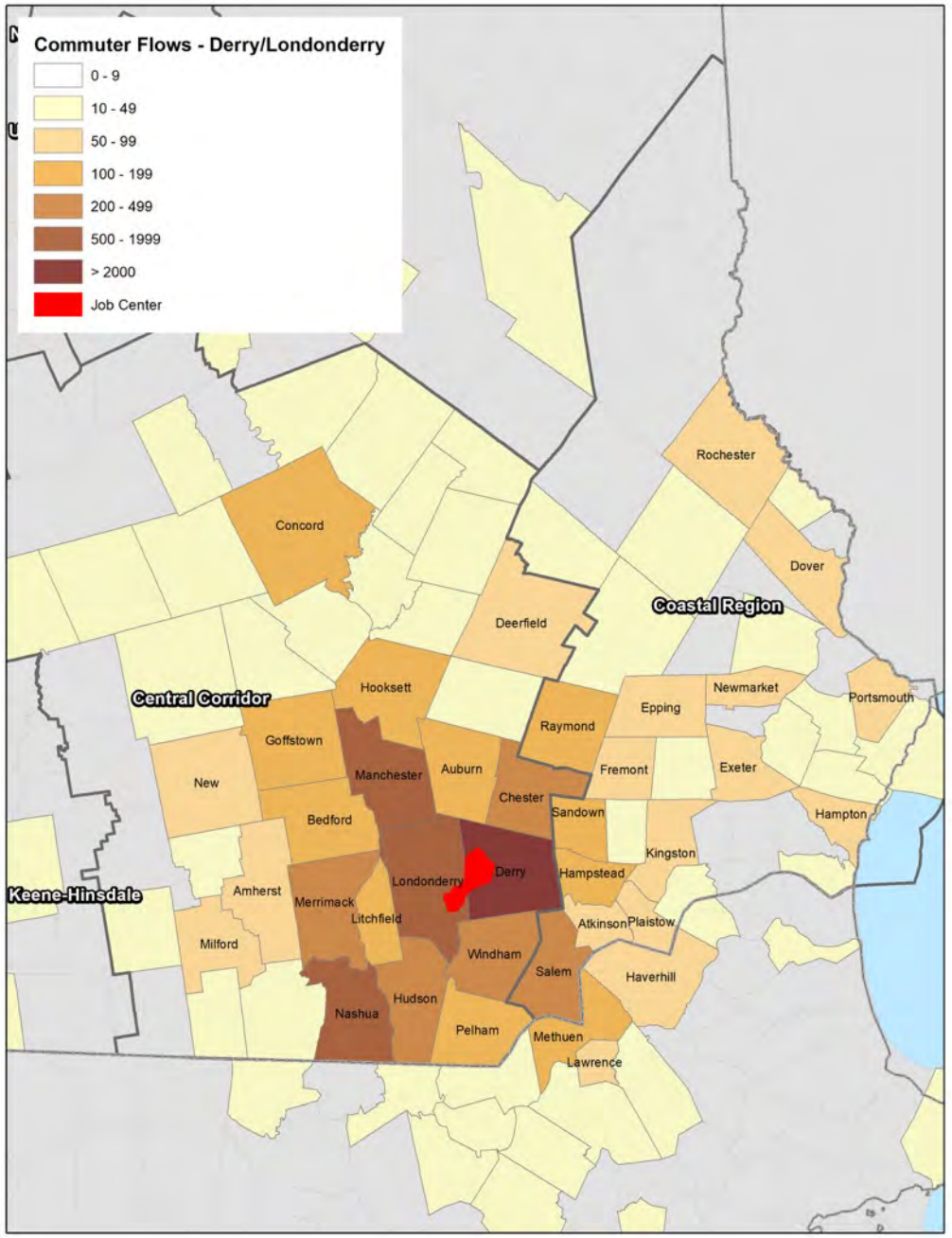
Downtown Salem

- 16,920 jobs
- Significant draw from Massachusetts border towns
- Manchester and Nashua each send around 1,000 workers
- Hundreds from Concord and NH 16 corridor



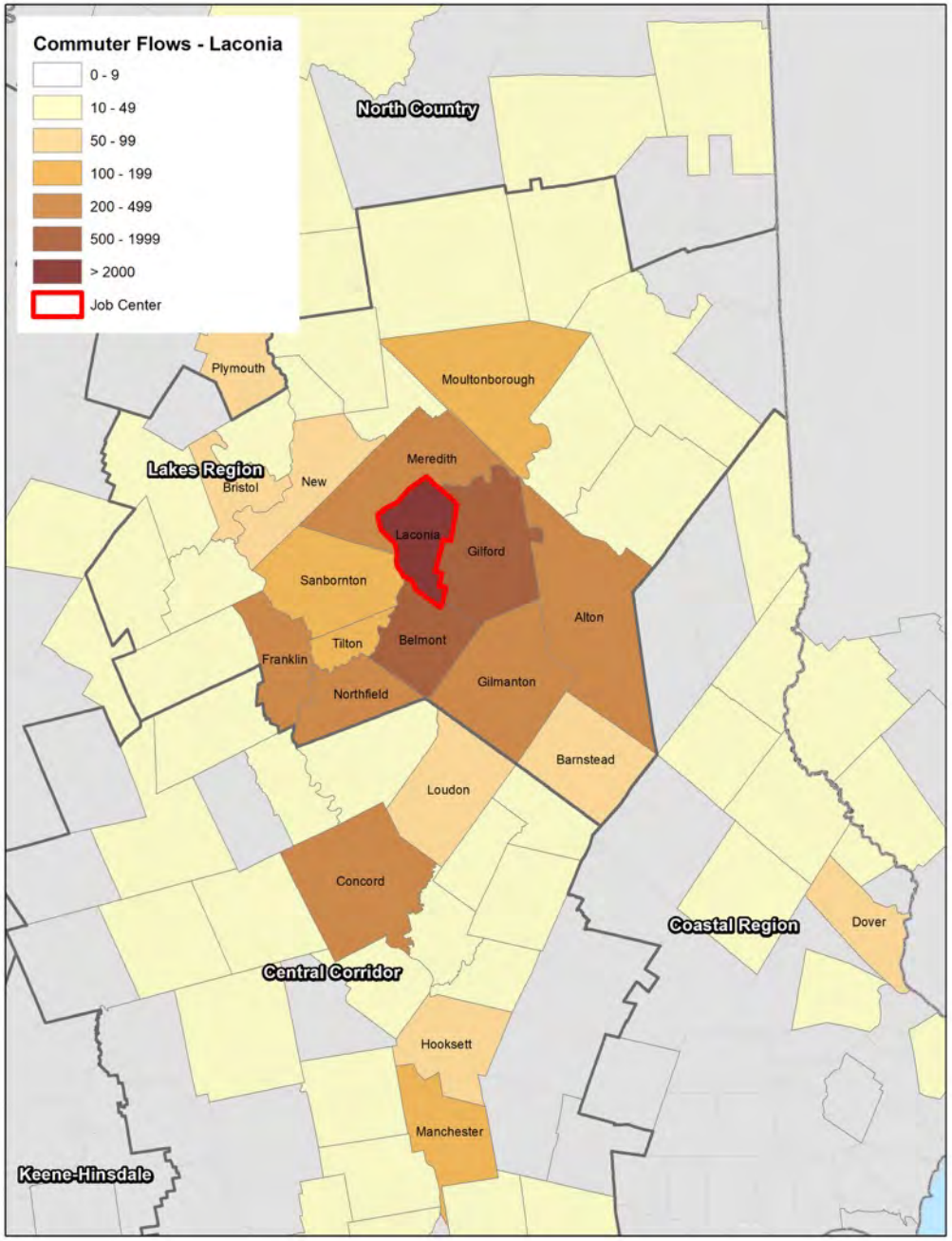
Derry-Londonderry

- 11,810 jobs
- More compact pattern due to smaller number of total jobs
- Manchester sends 1,385 workers
- Nashua sends 633



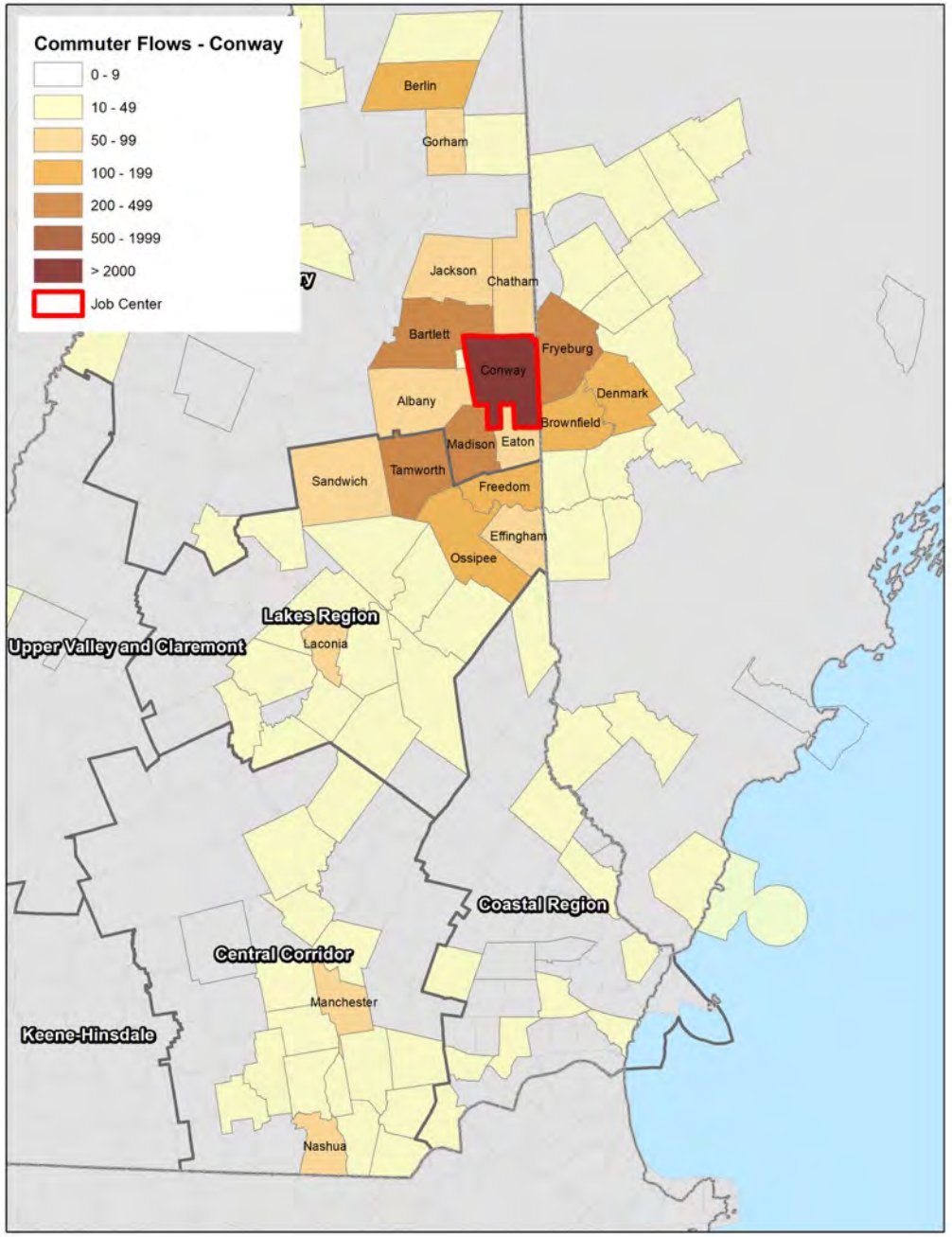
Laconia

- 9,238 jobs for town as a whole, most focused in downtown area
- 252 commuters from Concord and 286 from Franklin
- 108 travel from Manchester



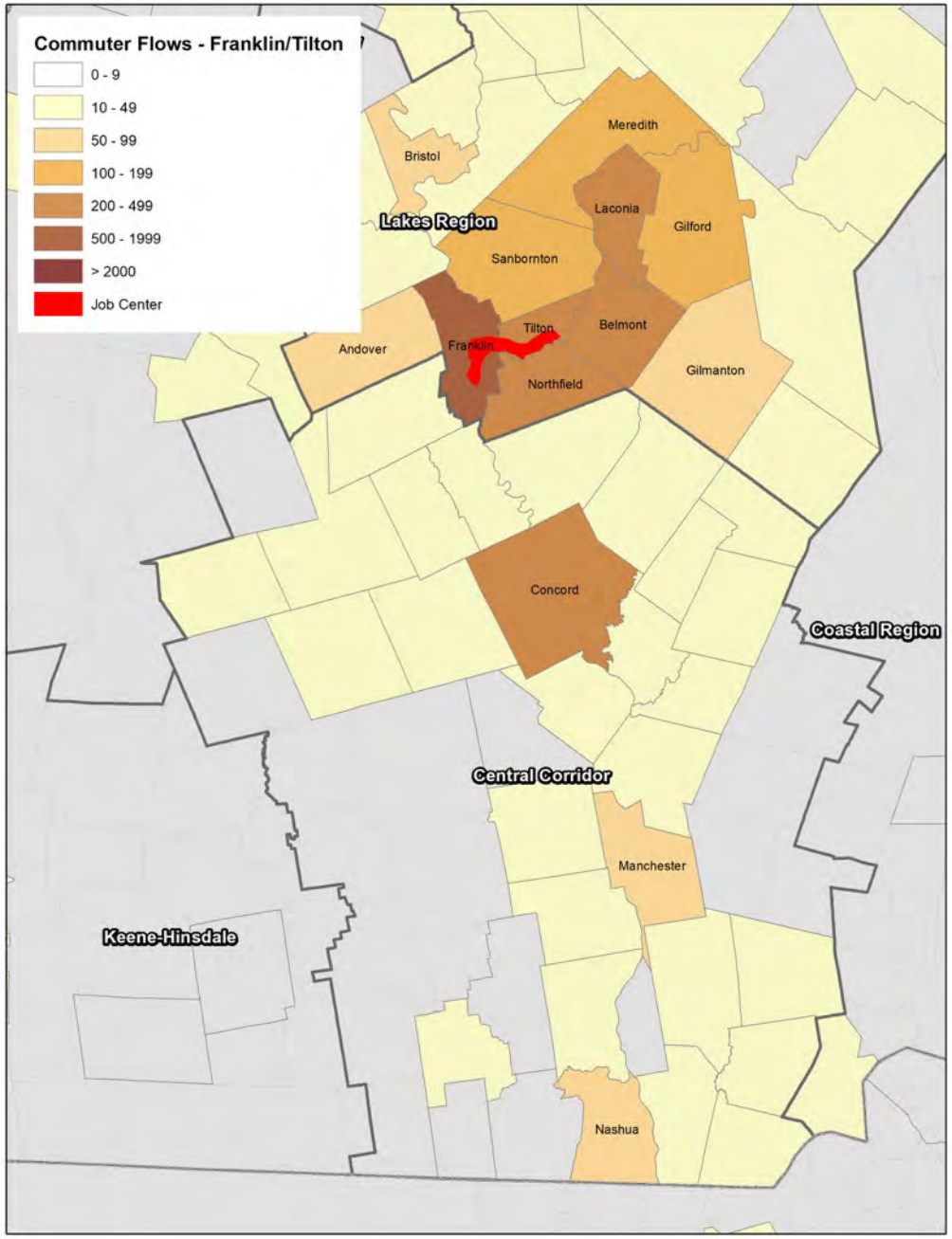
Conway

- 7,282 total jobs
- Largest job center in North Country
- Relatively compact pattern from neighboring towns in Maine and NH
- Over 100 from Berlin



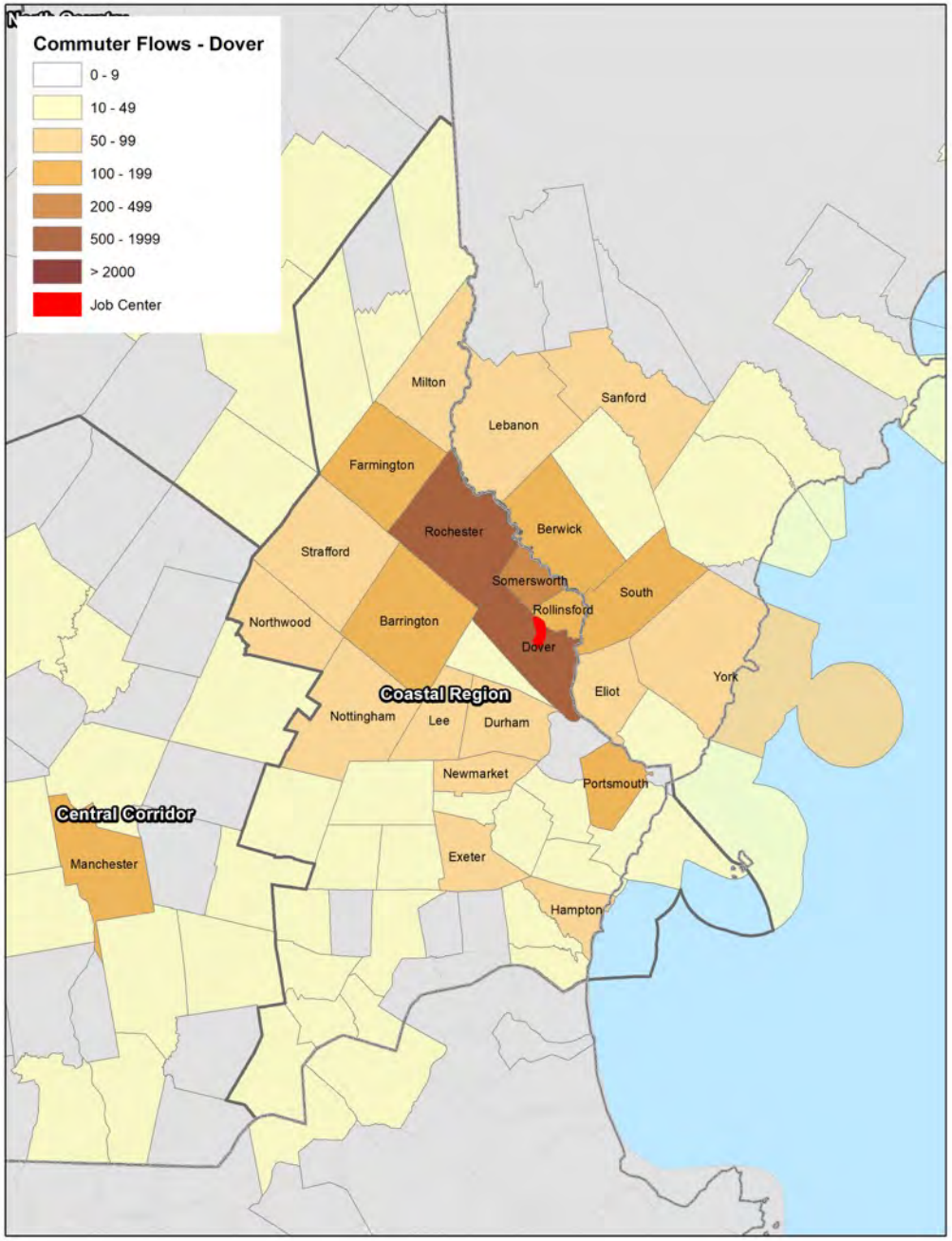
Franklin-Tilton

- 6,224 jobs in US 3 corridor including downtown Franklin and Exit 20 area of Tilton
- 449 commuters from Laconia
- 350 commuters from Concord



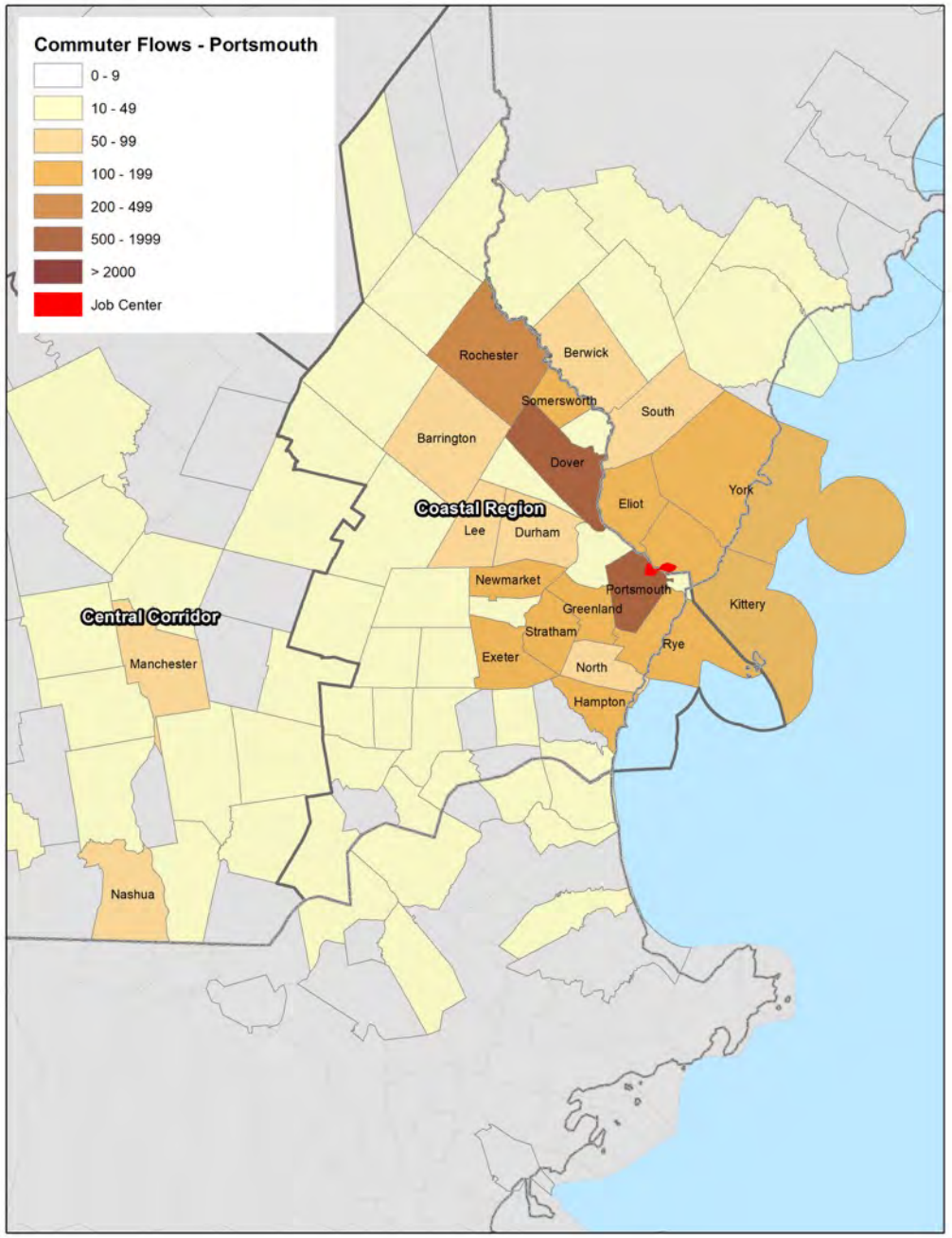
Downtown Dover

- 6,222 jobs
- Over 650 commuters from towns in Maine
- NH 16/108 an important corridor (already served by COAST Route 2)
- Manchester sends 124 workers



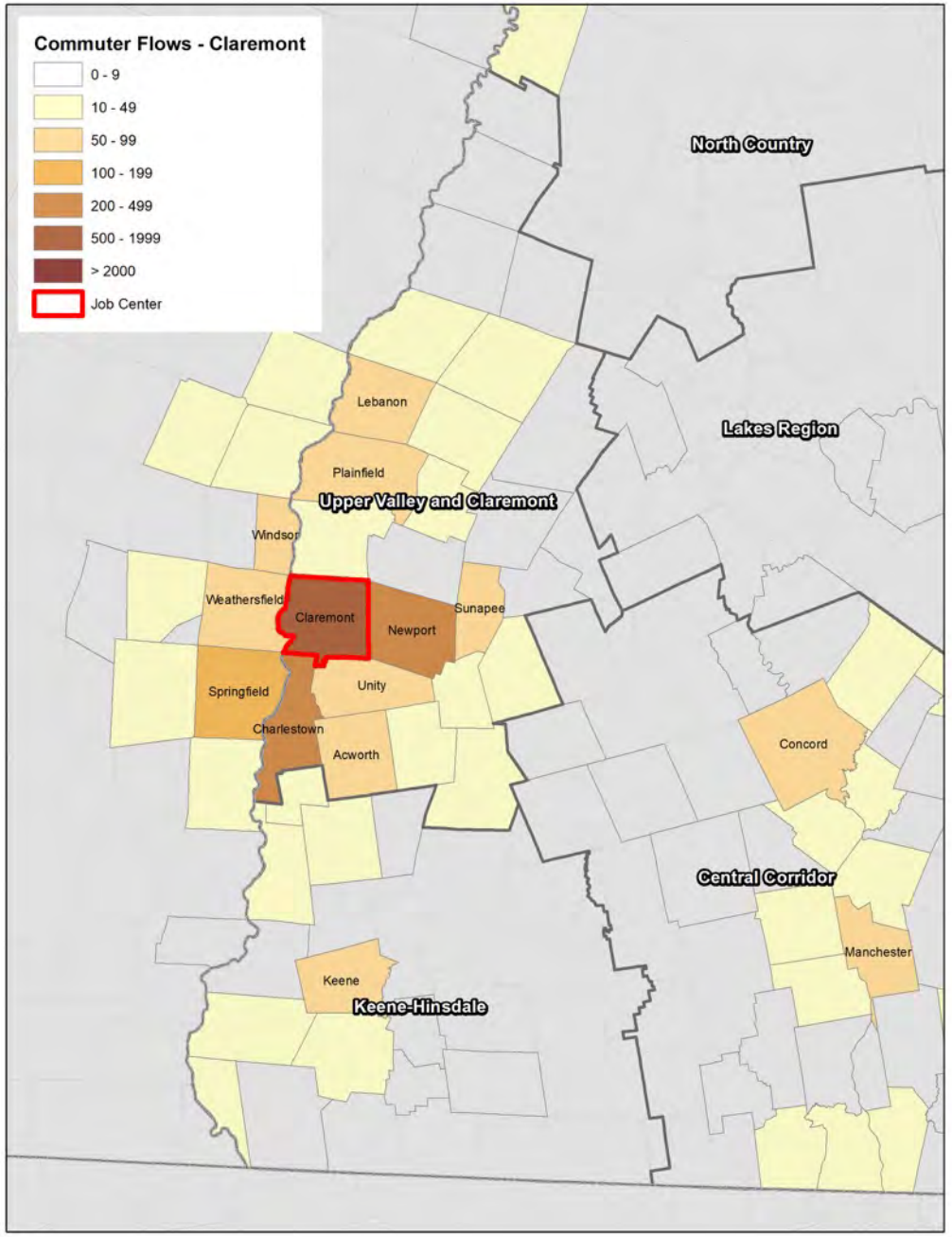
Portsmouth/ Shipyard

- 6,076 jobs
- NH 16 corridor important for commuting
- Only 785 commuters from Maine
- 365 communities send 9 or fewer "commuters" from all over New England and NY/NJ/PA, accounting for 13% of jobs



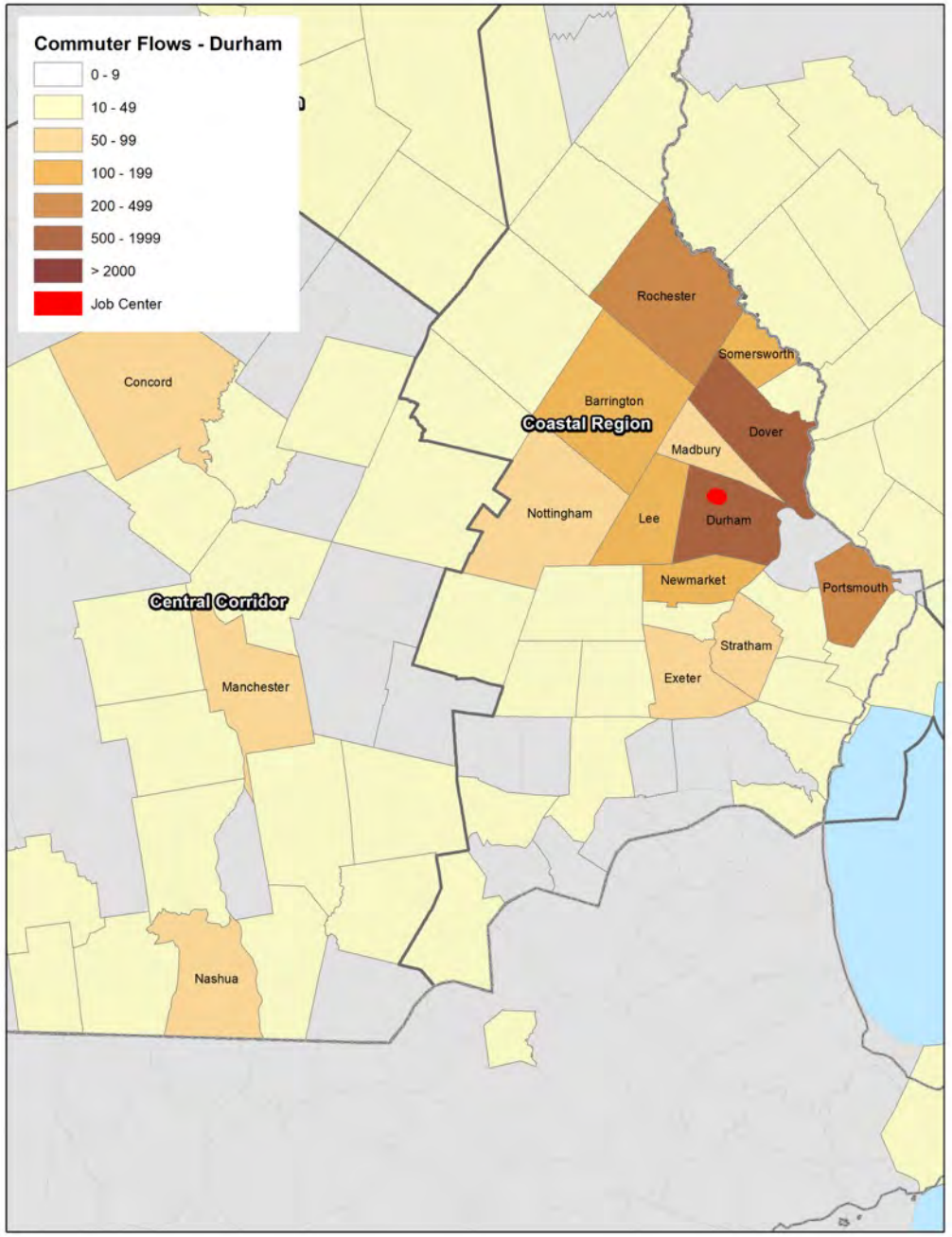
Claremont

- 5,277 jobs for town as a whole, but most employment is downtown
- Relatively tight cluster, but Keene, Manchester and Concord send more than 50 commuters each



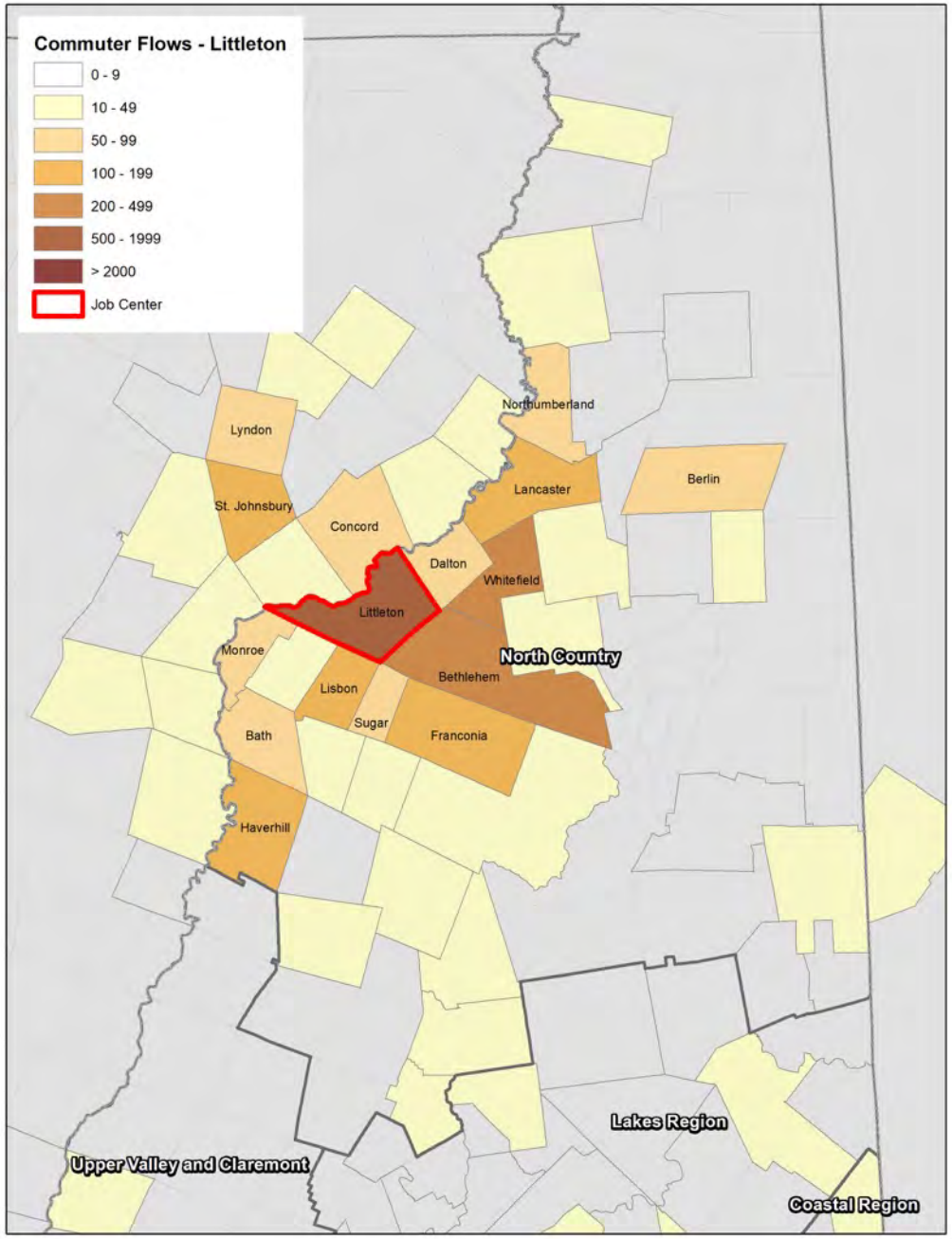
Durham – UNH and Downtown

- 5,191 jobs
- Great majority of commuters within a 15-mile radius
- UNH Wildcat Transit serves these corridors
- The three large cities each send over 50 commuters



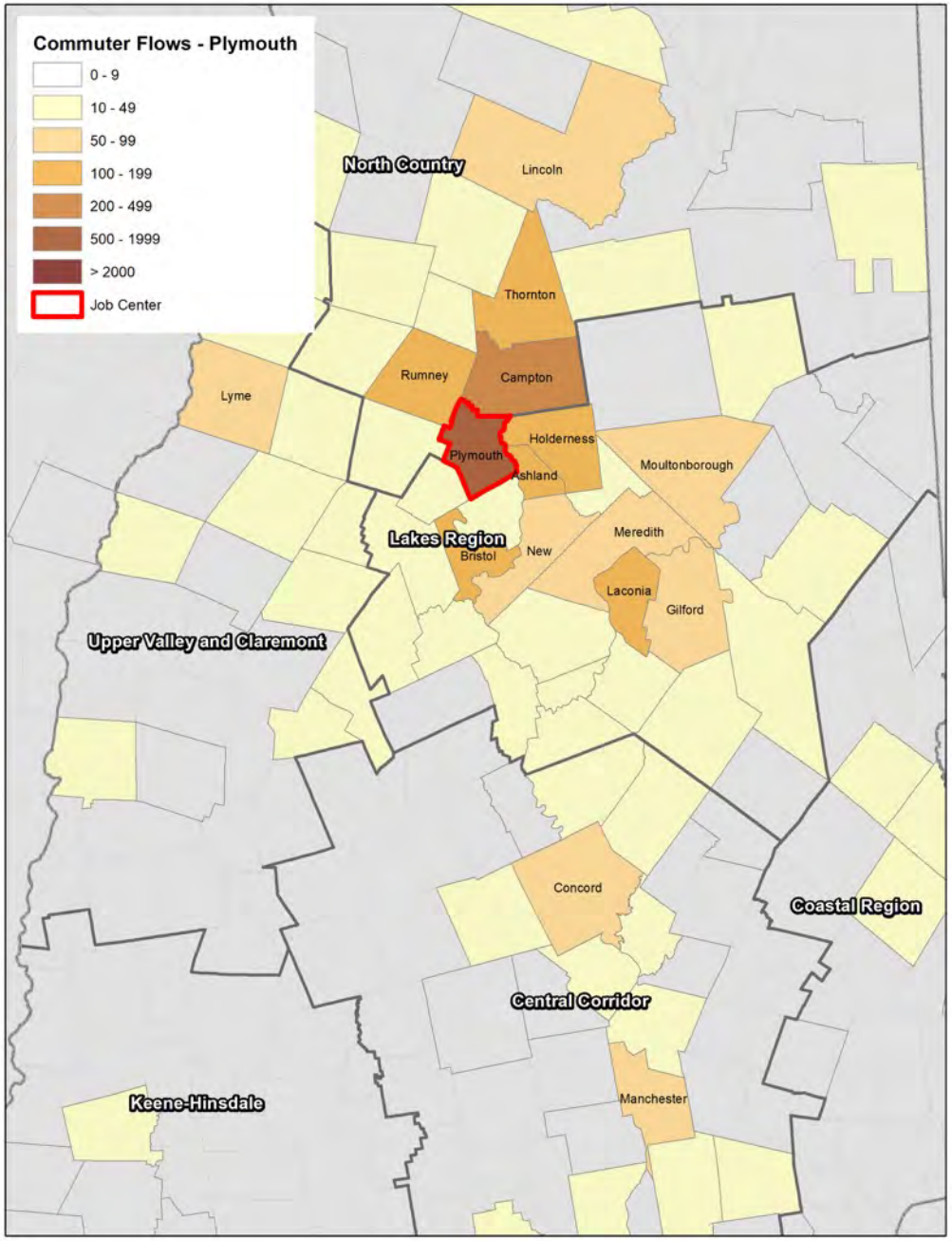
Littleton

- 4,419 jobs (town as a whole)
- Most jobs in downtown and along US 302 (plus hospital)
- Significant draw from Vermont



Plymouth

- 4,099 jobs (town as a whole)
- Plymouth State University a draw from Concord and Manchester



Numerous Commuter Links

- Manchester east-west
  - Weare, Goffstown
  - Portsmouth-Dover-Roch
  - Derry-Londonderry
- Concord
  - Keene
  - Laconia
  - Rochester-Dover
- Claremont to Upper Valley
- Nashua from Milford, Manchester and Lowell
- Keene from Manchester, Peterborough, Claremont
- Salem from Nashua and Manchester
- Laconia from Concord, Franklin and reverse
- Littleton from south and east

Commuter/Regional Needs

- Longer trips within New Hampshire very difficult to accomplish in most corridors
  - Intercity service makes few stops; not structured for intra-state travel
  - Example: cannot use Dartmouth Coach to travel from Upper Valley to Concord or Manchester, even though passes through
- Only a few existing commuter/regional routes
  - Manchester – Concord
  - Manchester – Nashua
  - Canaan – Lebanon
  - Rochester – Kittery (and similar COAST services)

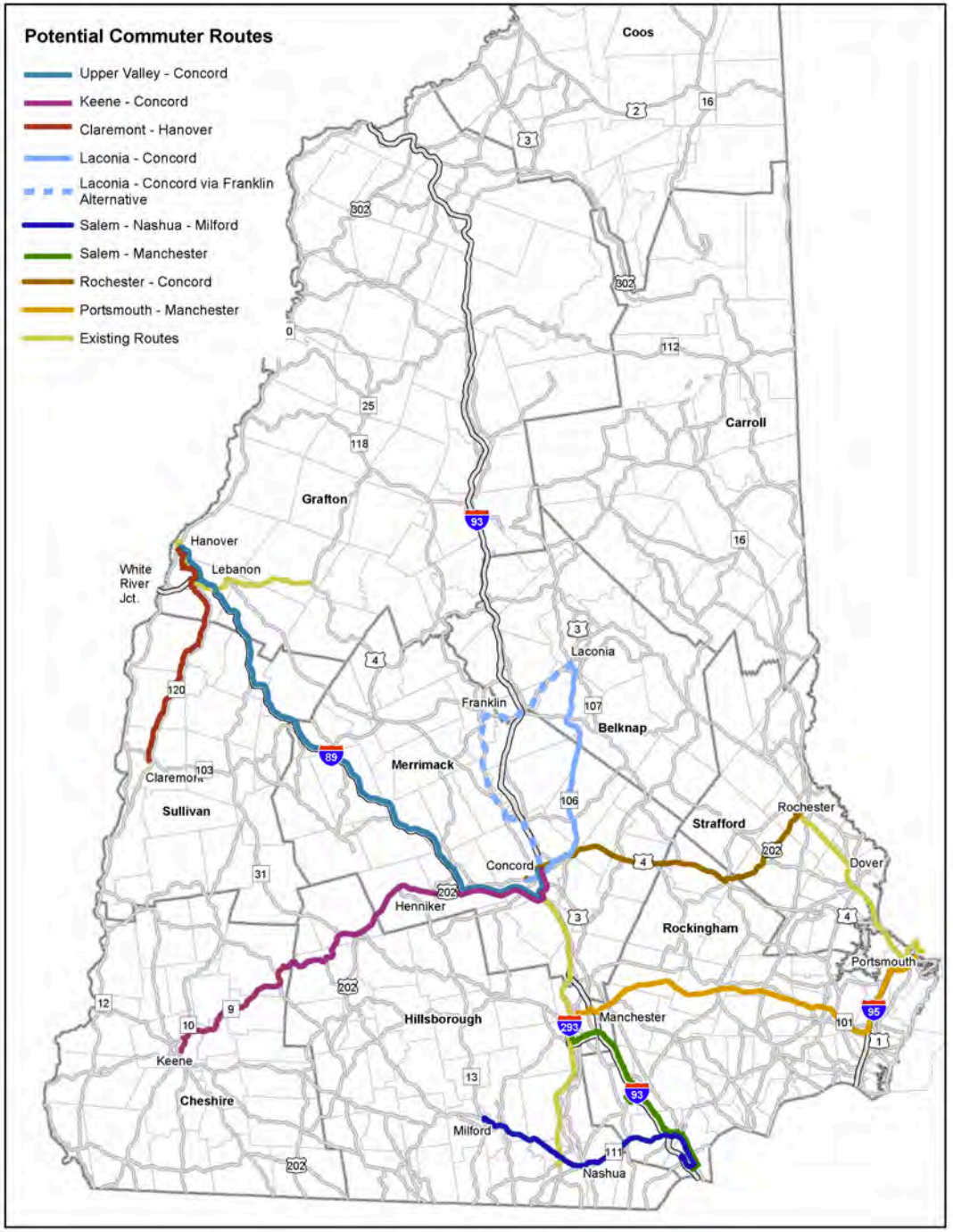
Potential Commuter Routes

- Keene – Concord
- Claremont – Hanover
- Hanover – Concord
- Laconia – Concord
- Rochester – Concord
- Portsmouth – Manchester
- Salem-Windham-Londonderry – Manchester
- Salem – Nashua – Milford

New Hampshire DOT
Department of Transportation

Potential Commuter Network

- Links together most important employment centers in southern half of the state
- North Country linked via intercity routes



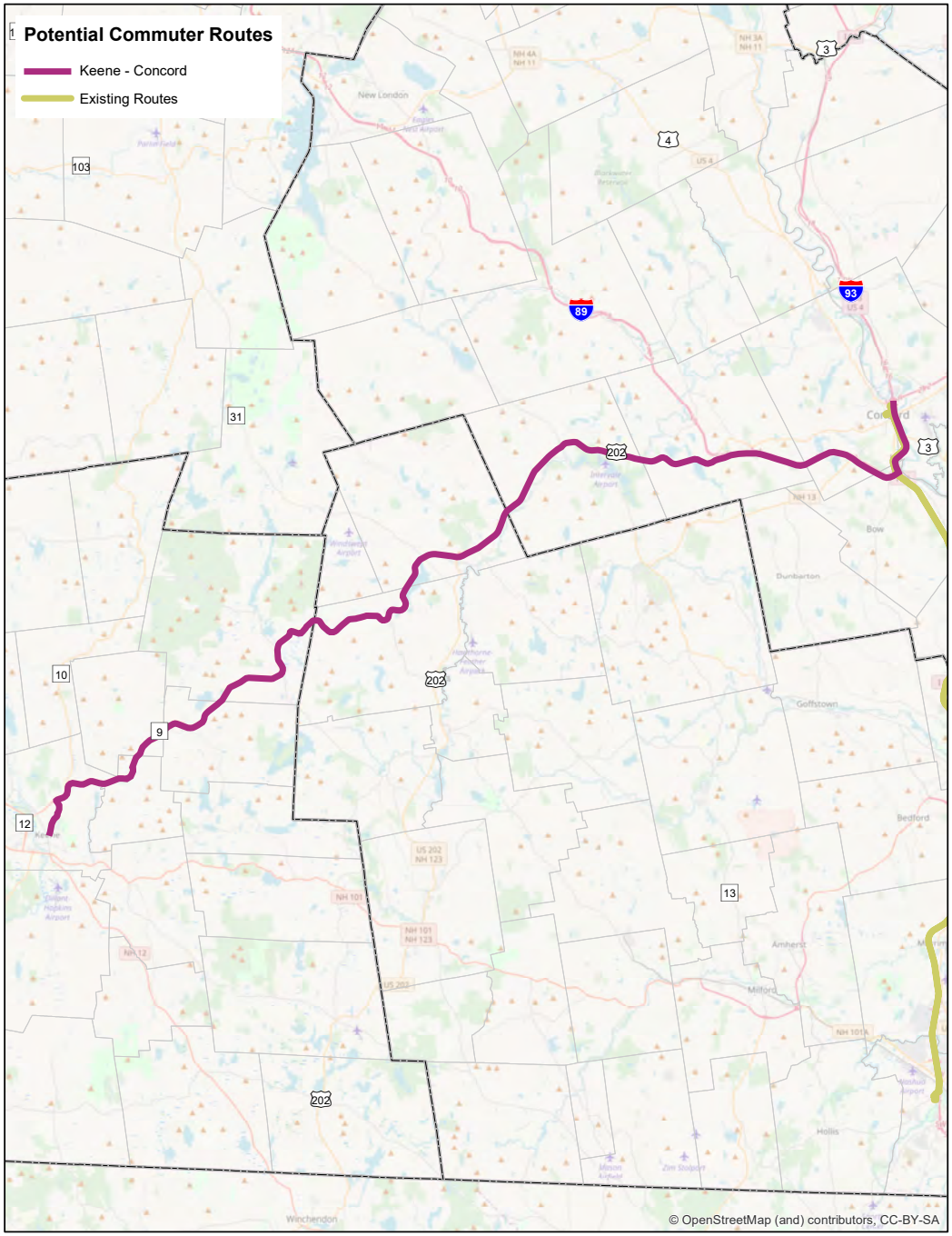
Assumptions

- Four round-trips per weekday (2 AM, 2 PM)
  - Two buses needed for each route
  - Each bus runs one round-trip per peak period
- Cost is average of $125 per vehicle revenue hour (VRH) and $4 per vehicle revenue mile (VRM)
  - Evens out effects of traffic congestion and road types
  - No assumptions for fare levels yet
- Ridership is 4% of peak direction market and 1% of reverse peak
  - Also included 1% of some neighboring communities if Park & Ride lot is present
  - Based on experience with Vermont commuter routes

New Hampshire DOT
Department of Transportation

Keene – Concord

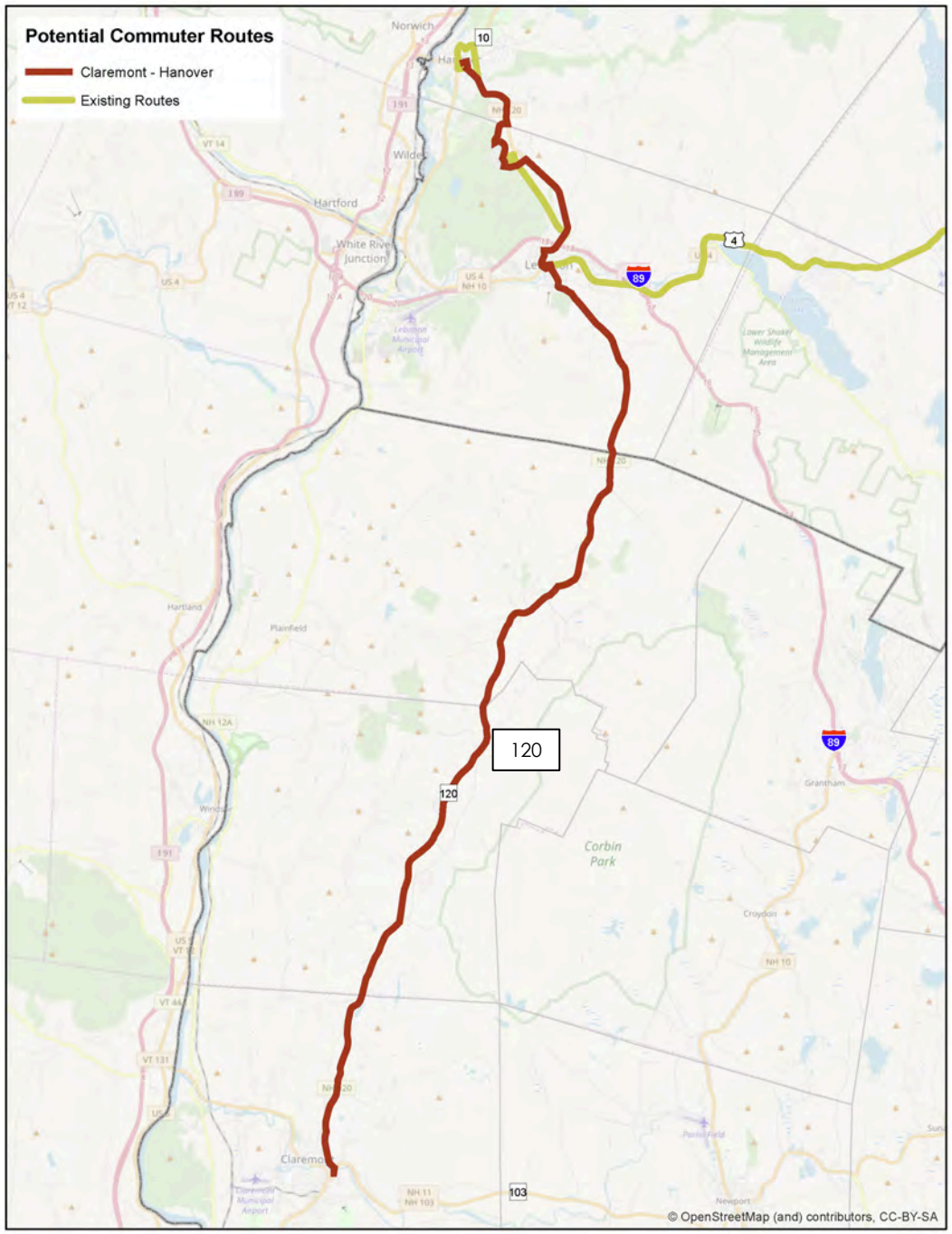
- Starts at Transportation Center in Keene
- Could stop in one or more towns along the way
- Terminates in downtown Concord (could extend to Concord Hospital)
- 55 miles
- Commuting
  - Keene: 234
  - Hillsborough: 324
  - Henniker: 328
  - Conc.→Keene: 120



New Hampshire DOT
Department of Transportation

Claremont – Upper Valley

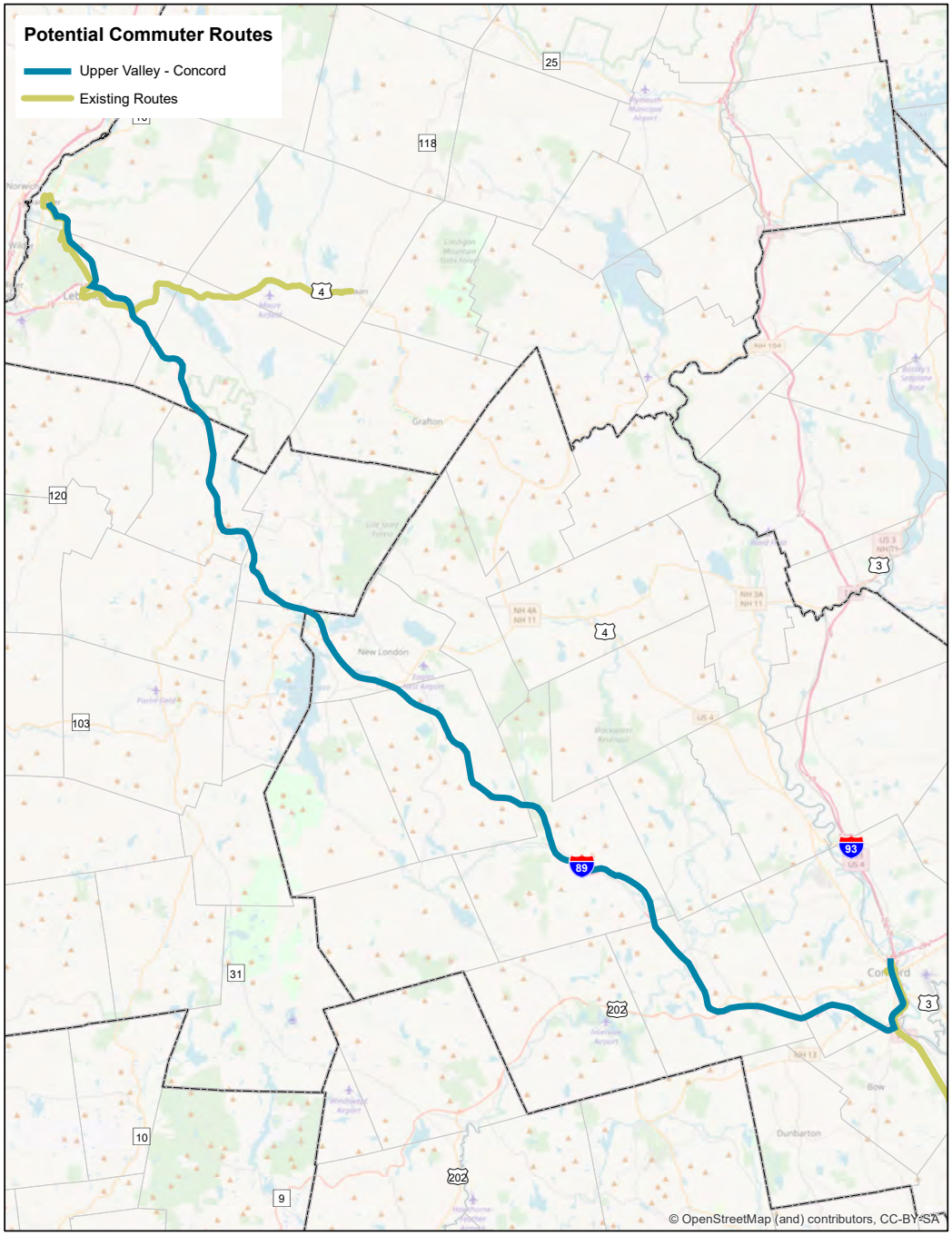
- Operates on NH 120 into Lebanon
- Could terminate at Lebanon City Hall or continue to DHMC and Hanover (as shown)
- 29.6 miles
- Commuting to UV
  - Claremont: 903
  - Plainfield: 366



New Hampshire DOT
Department of Transportation

Upper Valley – Concord

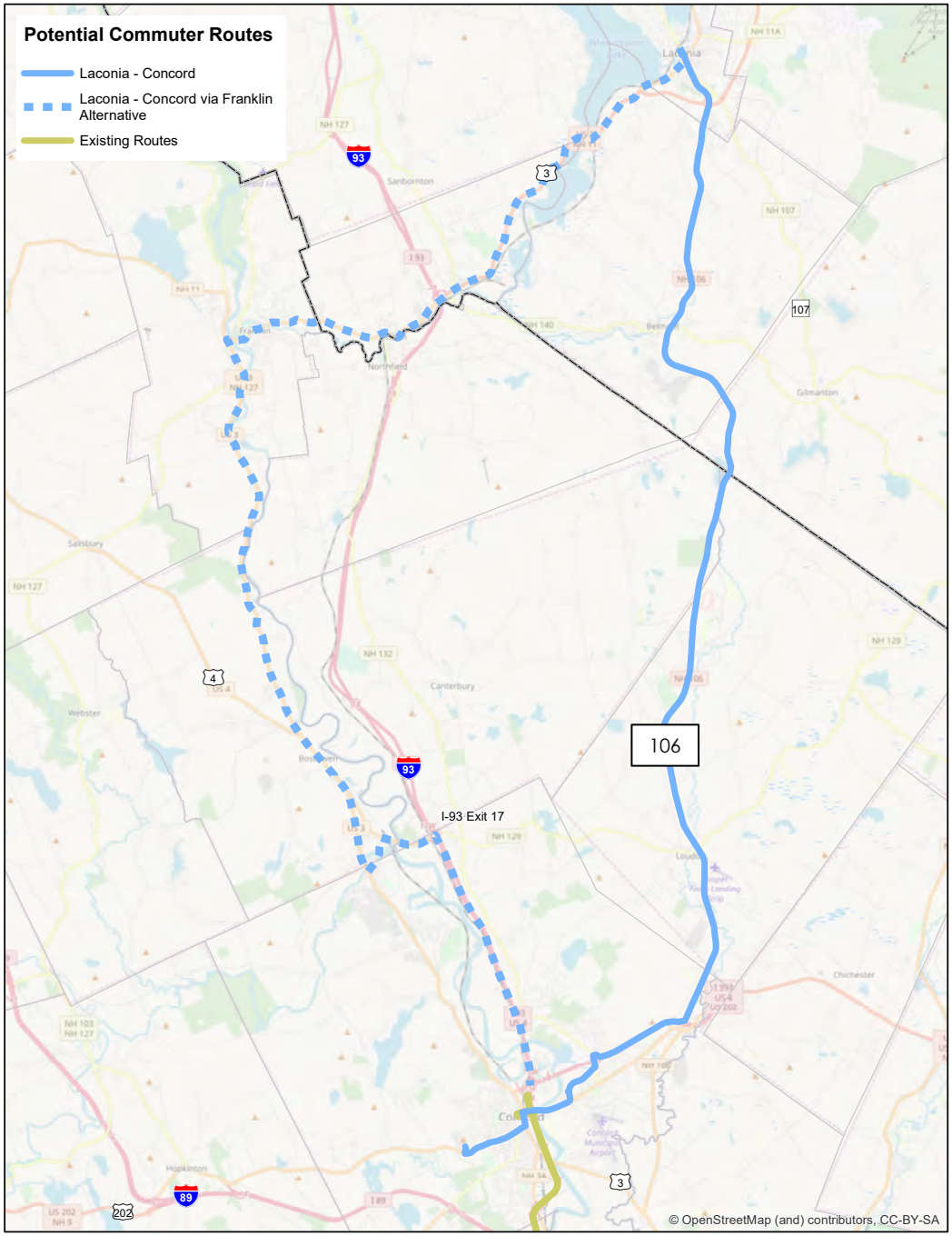
- Starts in downtown Hanover
- Serves DHMC campus
- Could stop at one or more P&R along I-89
- Terminates in downtown Concord
- 69.5 miles
- Could serve both Upper Valley and Concord commuting markets, plus longer distance trips between the two areas



New Hampshire DOT
Department of Transportation

Laconia – Concord

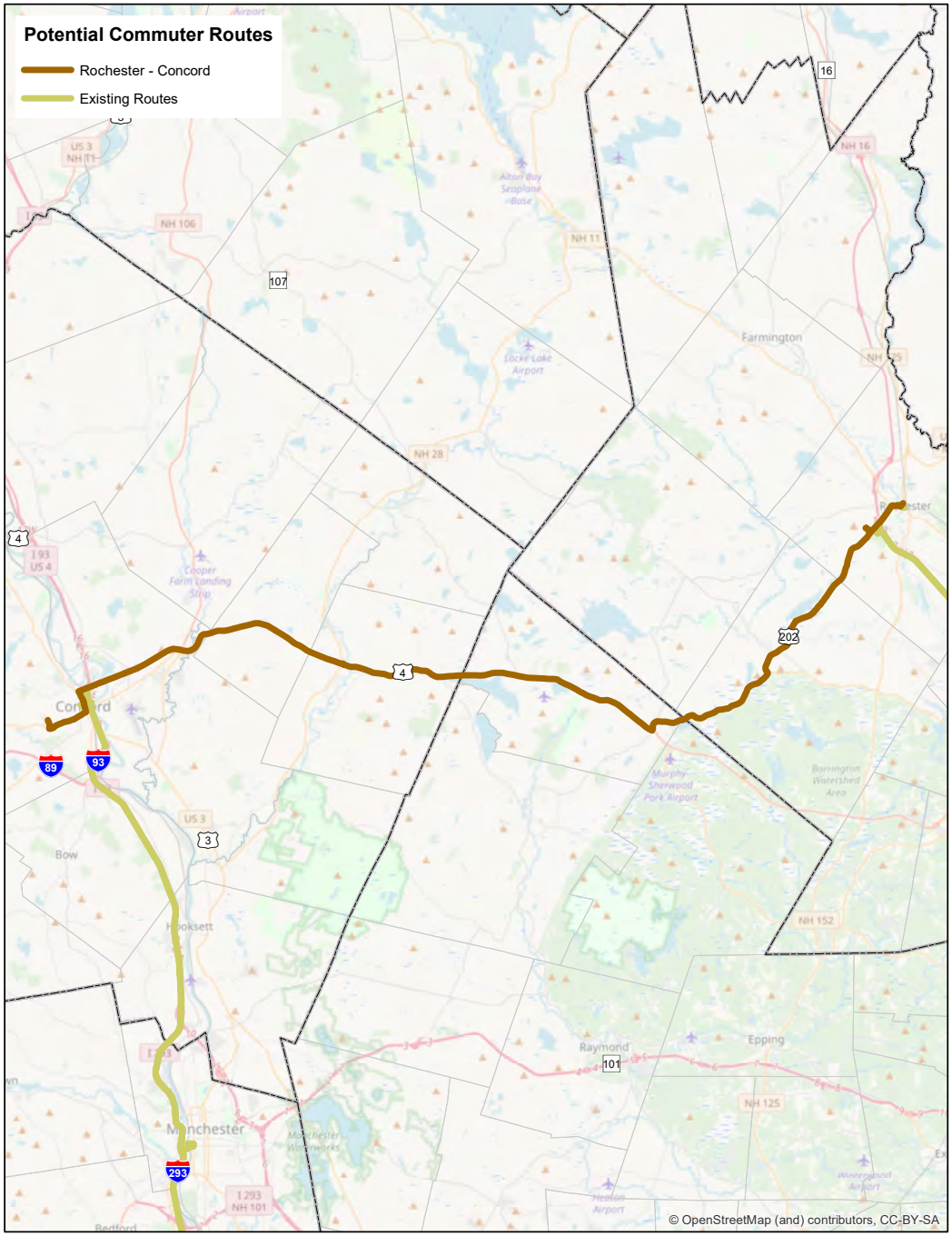
- Direct route via NH 106
- Alternative via US 3 similar to proposed intercity route
  - Tilton, Franklin and County Complex in Boscawen
- Terminates in downtown Concord
- 28.2 mi. (dir.)/33.7 mi. (alt)
- Commuters
  - Laconia→Conc.: 540
  - Franklin→Conc.: 483
  - Conc.→Laconia: 252



New Hampshire DOT
Department of Transportation

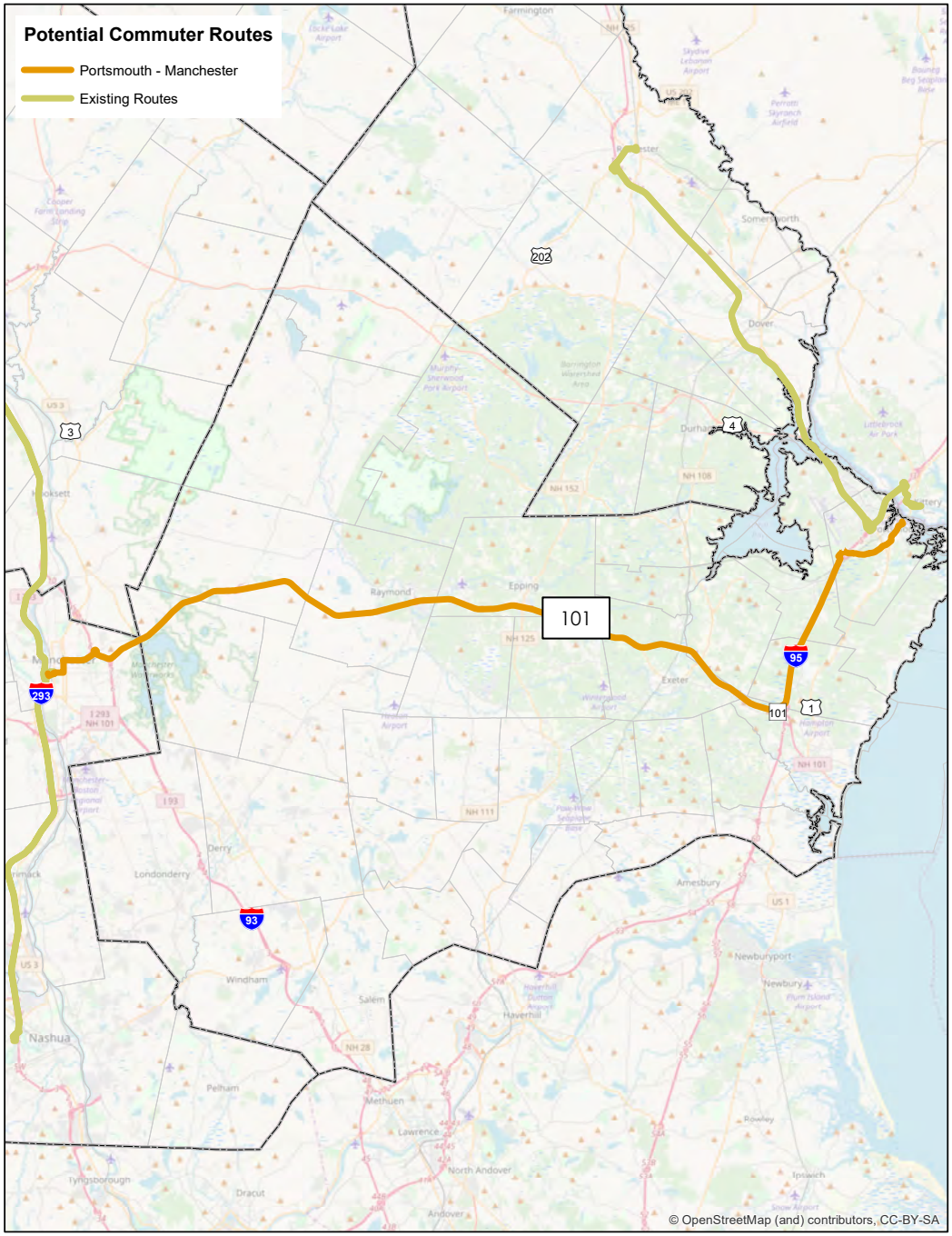
Rochester – Concord

- Starts in downtown Rochester
- Stops at Rochester P & R
- Serves downtown Concord
- Terminates at Concord Hospital
- 37.4 miles
- Commuters to Concord
  - Rochester: 402
  - Epsom: 496
  - Northwood: 253



Portsmouth – Manchester

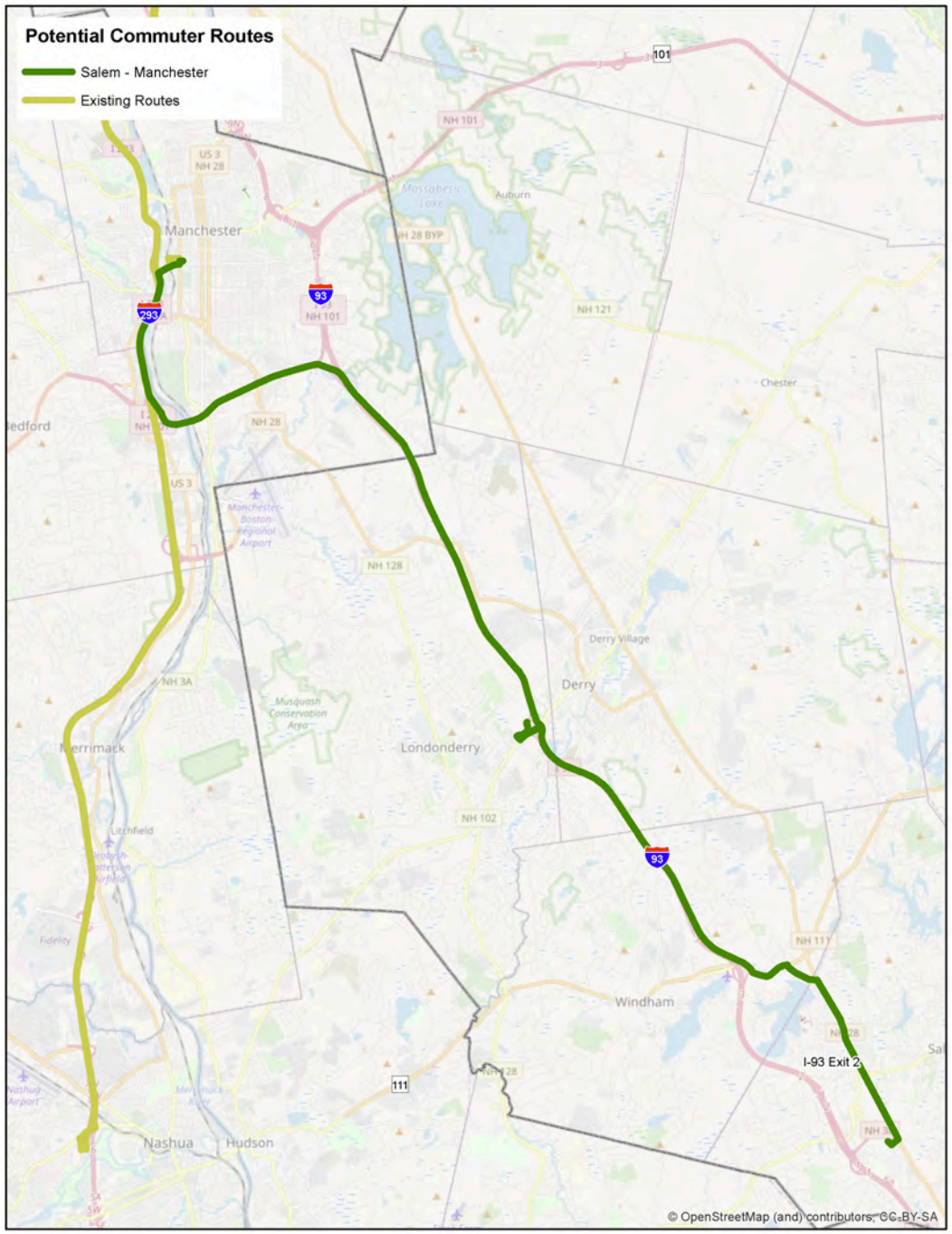
- Starts downtown Portsmouth
- Serves Portsmouth Transportation Center
- Possible stops in Hampton, Epping, Raymond
- Terminates at UNH in Manchester
- 45.8 miles
- Commuters to DT Manch.
  - Portsmouth: 203
  - Hampton: 146
  - Raymond: 323



New Hampshire DOT
Department of Transportation

Salem – Londonderry – Manchester

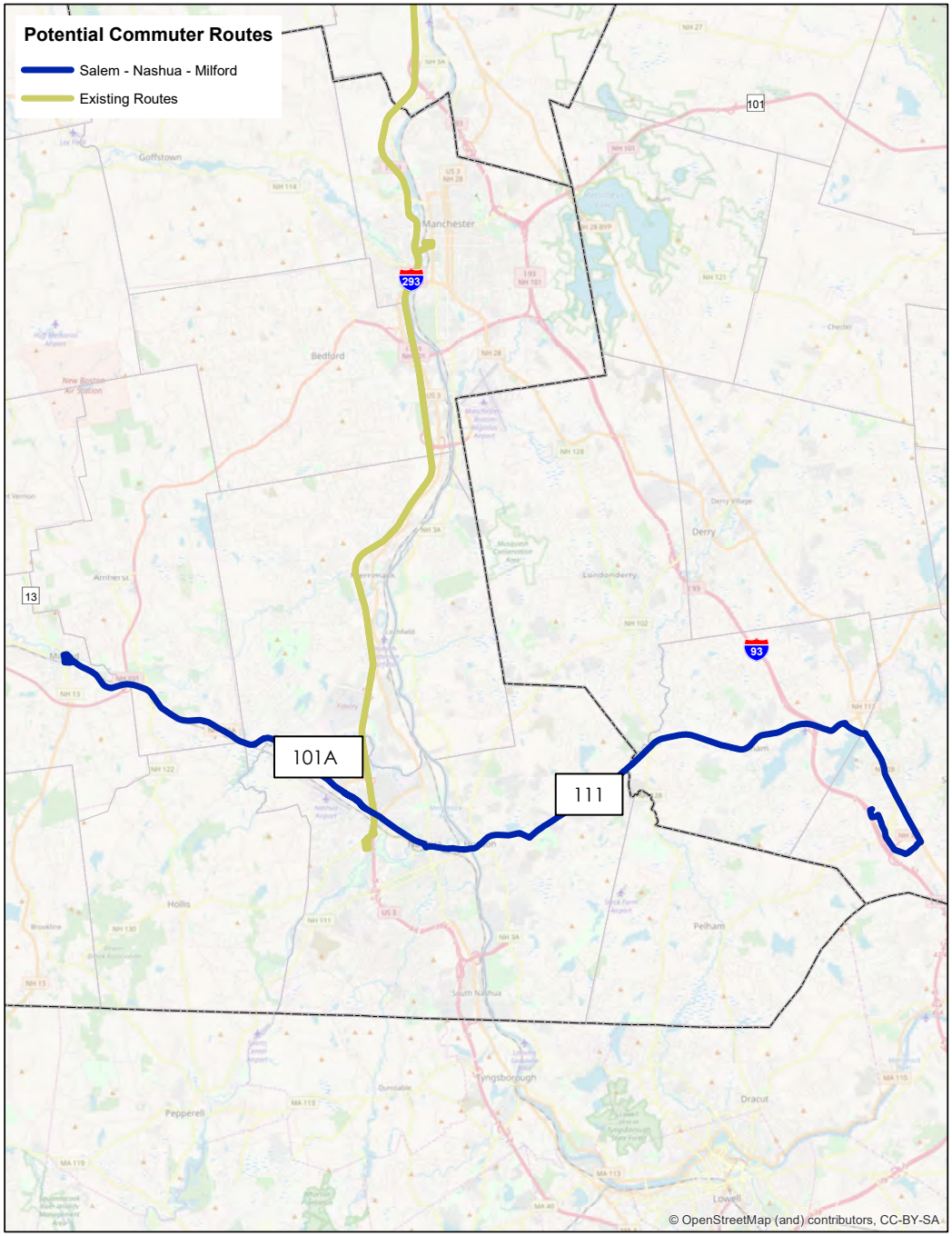
- Starts at Tuscan Village
- Serves Exit 3 Bus Terminal
- Serves Londonderry P&R
- Express to Veterans Park in Manchester
- 26.5 miles
- Commuters
  - Salem→Manch: 367
  - Lond.→Manch: 1,093
  - Lond.→Salem: 503
  - Manch.→Salem: 973



New Hampshire DOT
Department of Transportation

Salem – Nashua – Milford

- Starts at Exit 2 Bus Terminal
- Serves apartments along Cluff Crossing Rd and retail/jobs along S. Broadway (NH 28) in Salem
- Through-routed to Milford via primary employment corridor in Nashua
- 29.5 miles
- Commuters
  - Milford→Nashua: 537
  - Salem→Nashua: 164
  - Nashua→Salem: 1,011



Commuter Routes Summary

Route	Miles	Run Time	Annual Cost	Annual Riders	Cost/ Rider
Keene-Concord	53	80	$386,000	19,000	$21
Claremont-Hanover	28	68	$260,000	26,000	$10
Hanover-Concord	70	95	$485,000	34,000	$14
Laconia-Concord	29	55	$234,000	12,000	$19
Rochester-Concord	37	75	$312,000	23,000	$13
Portsmouth-Manchester	47	75	$349,000	26,000	$13
Salem-Londonderry-Manchester	26	50	$211,000	42,000	$5
Salem-Nashua-Milford	30	85	$301,000	19,000	$15
TOTALS			$2,538,000	201,000	$13

Operations

- No particular operator assumed for any of the routes
  - Could be contracted to private entity or run by transit providers
- Several routes connect two provider regions
  - Joint operations by the providers could result in the most efficient operation (little/no deadheading)
  - Mix of urban and rural funding could be tricky but not impossible
  - Four commuter routes in VT operated jointly
- Vehicle types unspecified as yet – could vary by route

Viability and Sustainability

- Conditions for local routes to be successful
  - High degree of local support, including matching funds
  - High gasoline prices
  - Safe bus stops and walkable environment
- Conditions for commuter routes to be successful
  - Limited parking/expensive parking at destination
  - High gasoline prices
  - Longer distances (more than 10 miles)
  - High density of jobs in a walkable environment
  - Very convenient transit connections to extend reach

Results of Survey

- 988 responses overall (3 from out of state)
- Over 200 cities and towns represented
- Top five response towns
  - Nashua – 74
  - Concord – 68
  - Manchester – 65
  - Dover – 40
  - Keene - 19

Planning Commission	Responses	2016 Population	Response Rate
NCC	134	89,082	0.15%
CNHRPC	169	129,386	0.13%
LRPC	122	113,208	0.11%
UVLSRPC	70	89,476	0.08%
SRPC	100	149,848	0.07%
NRPC	128	207,903	0.06%
SWRPC	60	100,518	0.06%
SNHPC	141	256,538	0.06%
RPC	56	191,544	0.03%

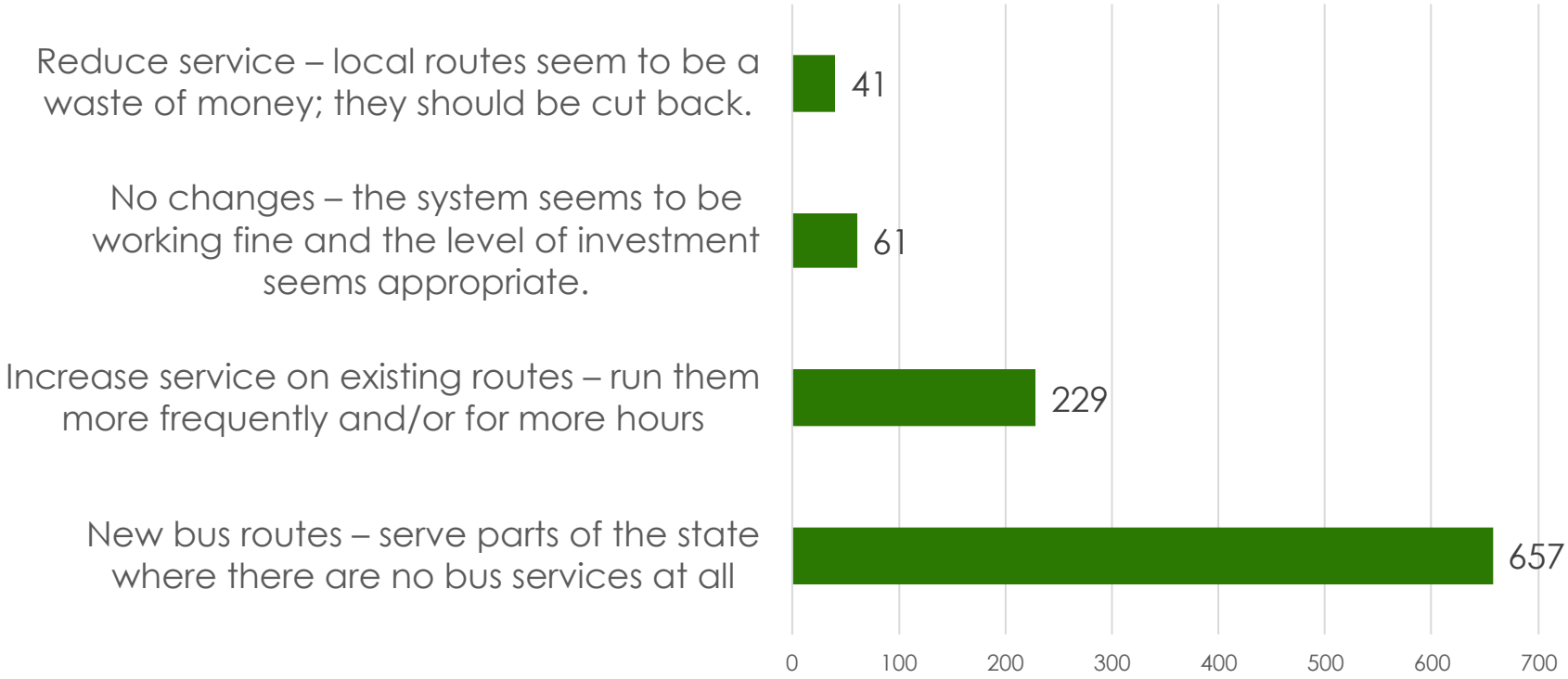
Profile of Respondents

- Mostly working age (26 to 64): 76%
  - Rest mostly 65-79 (18%)
- Mostly employed full time: 65%
  - Retired next at 15%
- Almost all have a motor vehicle available: 92%
- Most never use public transit in NH: 58%
  - 5% are frequent users, 11% use it once a month, 24% use it once a year or so

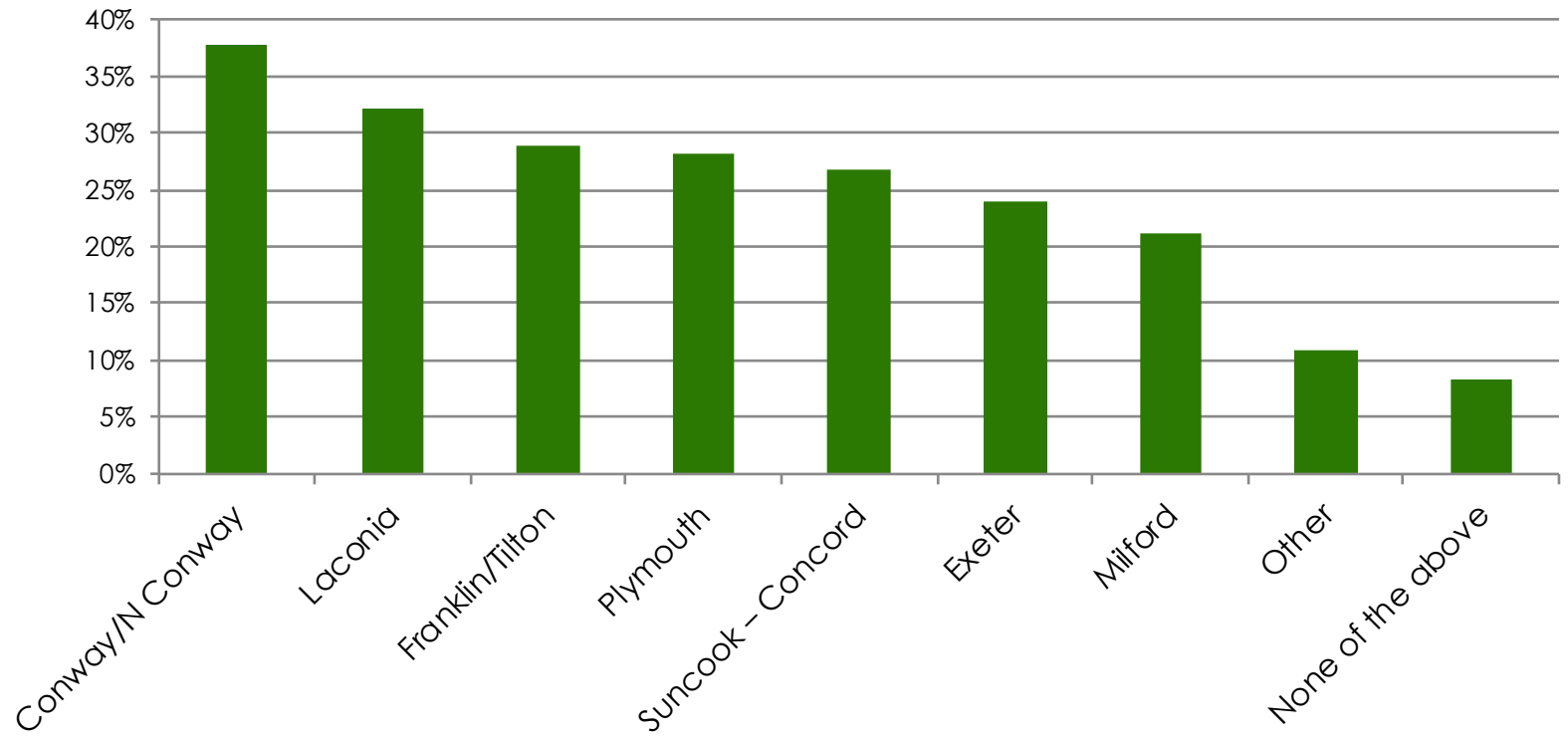
Policy Preferences

- Five operational policy choices were ranked as follows: (lower number is better on a scale from 1 to 5)
  - Basic mobility – 1.98
  - Access to employment – 2.24
  - Support economic development – 3.35
  - Maximize efficiency – 3.48
  - Attract millennials and choice riders – 3.94
- Four capital investment choices were ranked as follows:
  - More passenger facilities – 2.33
  - New buses and vans – 2.40
  - Better pedestrian access – 2.56
  - More technology – 2.70

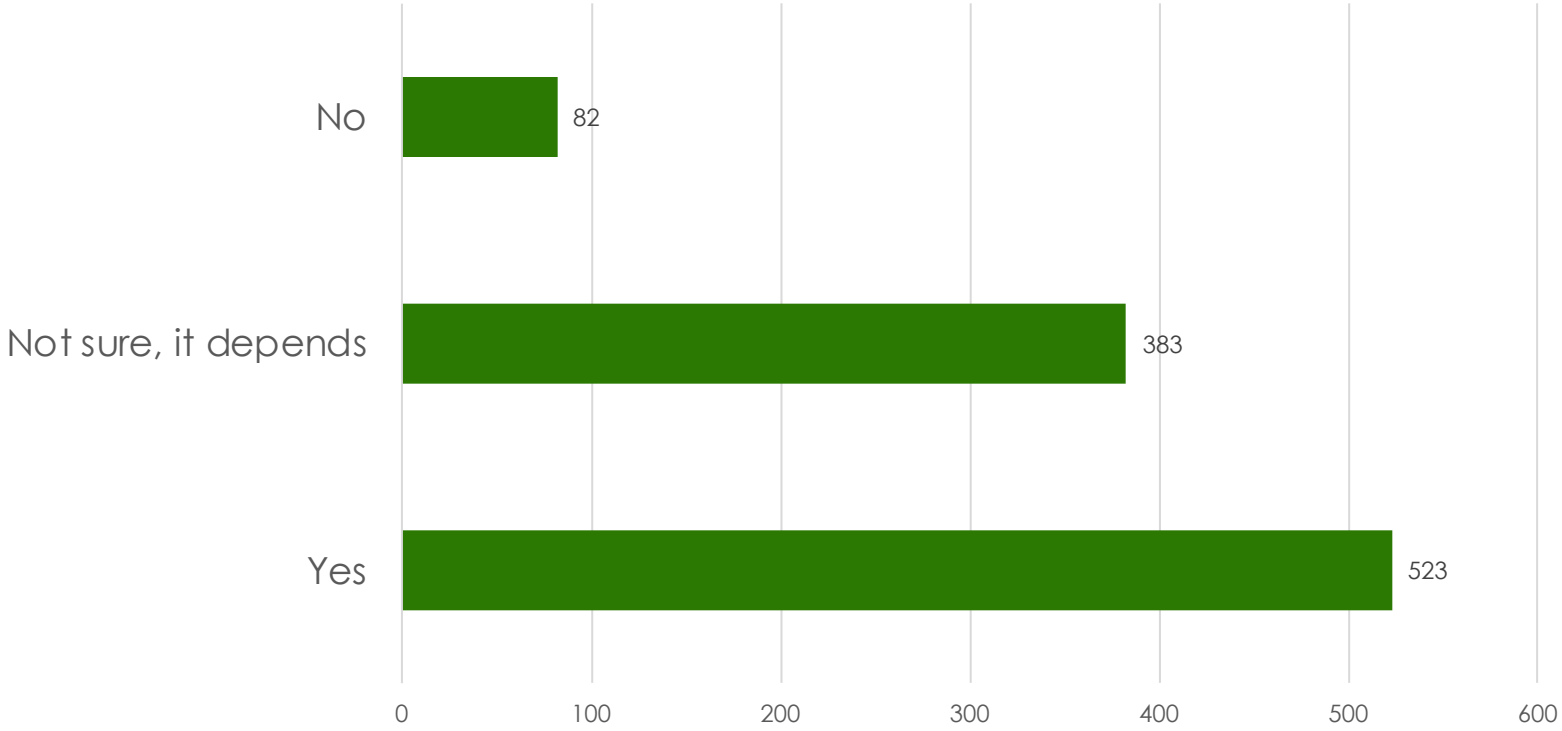
Overall Level of Local Service



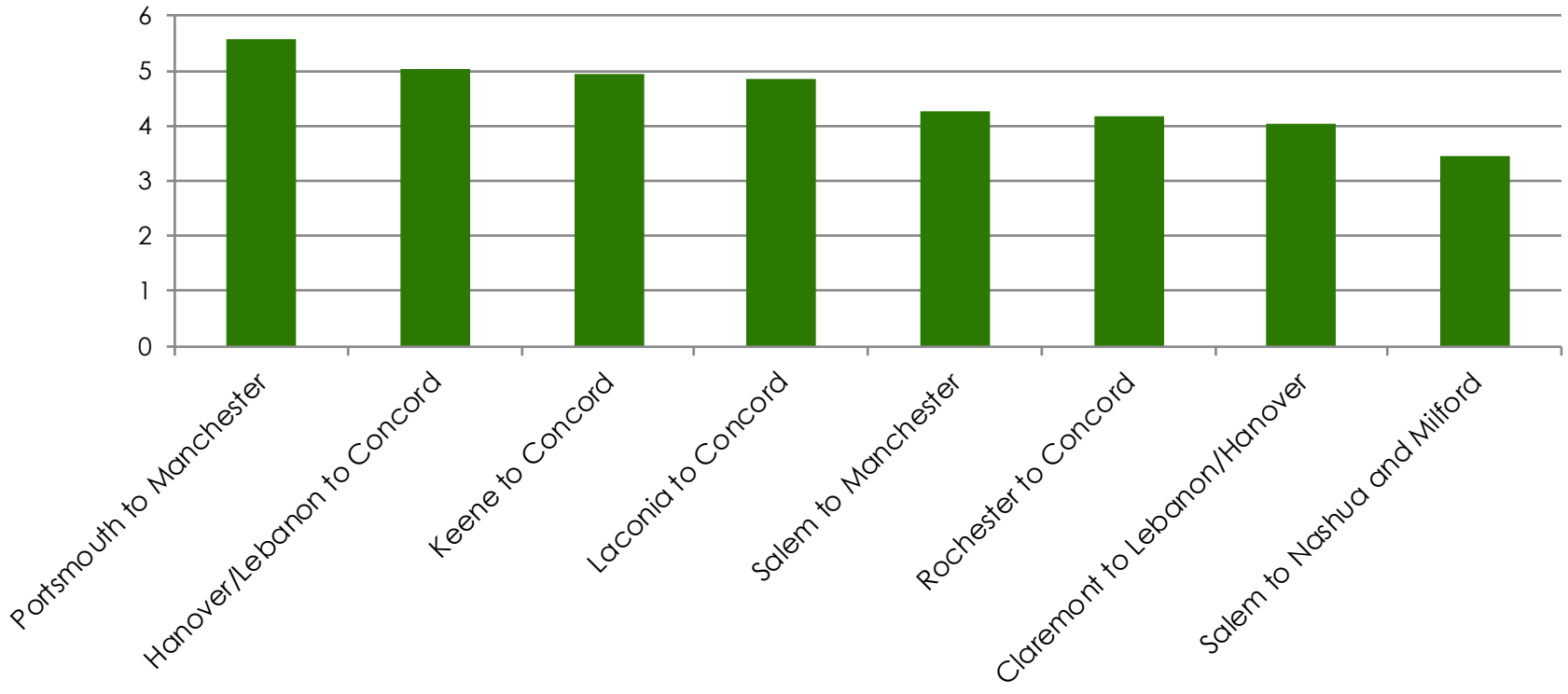
Local Route Preferences



Support for Commuter Routes



Commuter Route Ranking*



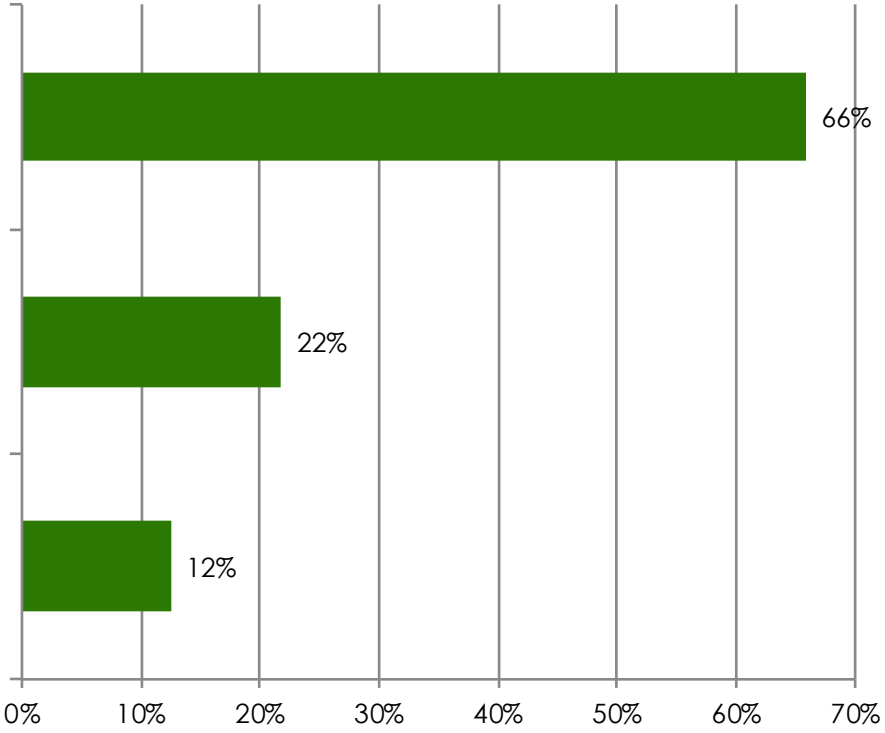
*Higher score is better

Role for Public Transit in NH

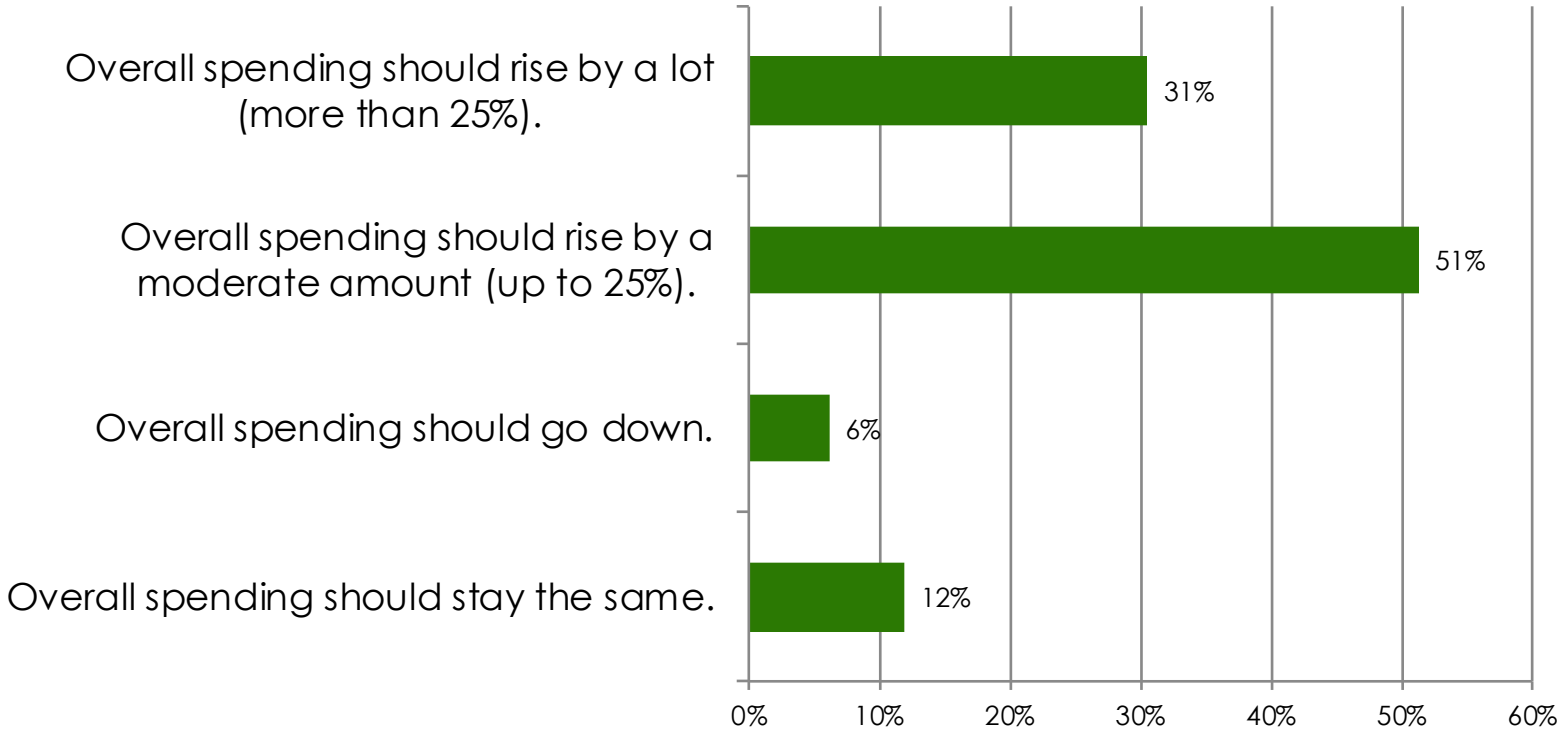
It should be a viable transportation option for people all over NH, even people living in rural communities.

It should be a viable transportation option for parts of the state so people in urbanized areas can choose to live without owning a car.

It should mainly be a social service so that people who cannot drive can take care of basic necessities.



Public Spending on Transit



Comments

- Many comments about need for more service in the North Country, both local and commuter
- Many comments about expanding service in places that already have transit: Nashua, Keene, Portsmouth, Littleton, etc.
- Many requests for east-west connections across state
- Many mentions of rail service

Priorities for Local Service

- Focus on areas with no current bus routes
- Tiers based on quantified need and public preferences
- Future funding should not exclude expansions of existing systems

Proposed Local Route Tiers

- Tier 1
  - Conway
  - Laconia
- Tier 2
  - Milford
  - Franklin/Tilton
  - Suncook (to Concord and/or Manchester)
- Tier 3
  - Plymouth
  - Exeter

Priorities for Commuter Service

- Complement intercity routes
- Promote east-west connections
- Link local transit systems together

Proposed Commuter Route Tiers

- Tier 1
  - Salem-Londonderry-Manchester (coordinated with Tuscan Village and Woodmont Commons developments)
  - Claremont-Lebanon-Hanover
- Tier 2
  - Portsmouth-Manchester
  - Hanover-Concord
  - Rochester-Concord
- Tier 3
  - Laconia-Concord*
  - Keene-Concord*
  - Salem-Nashua-Milford

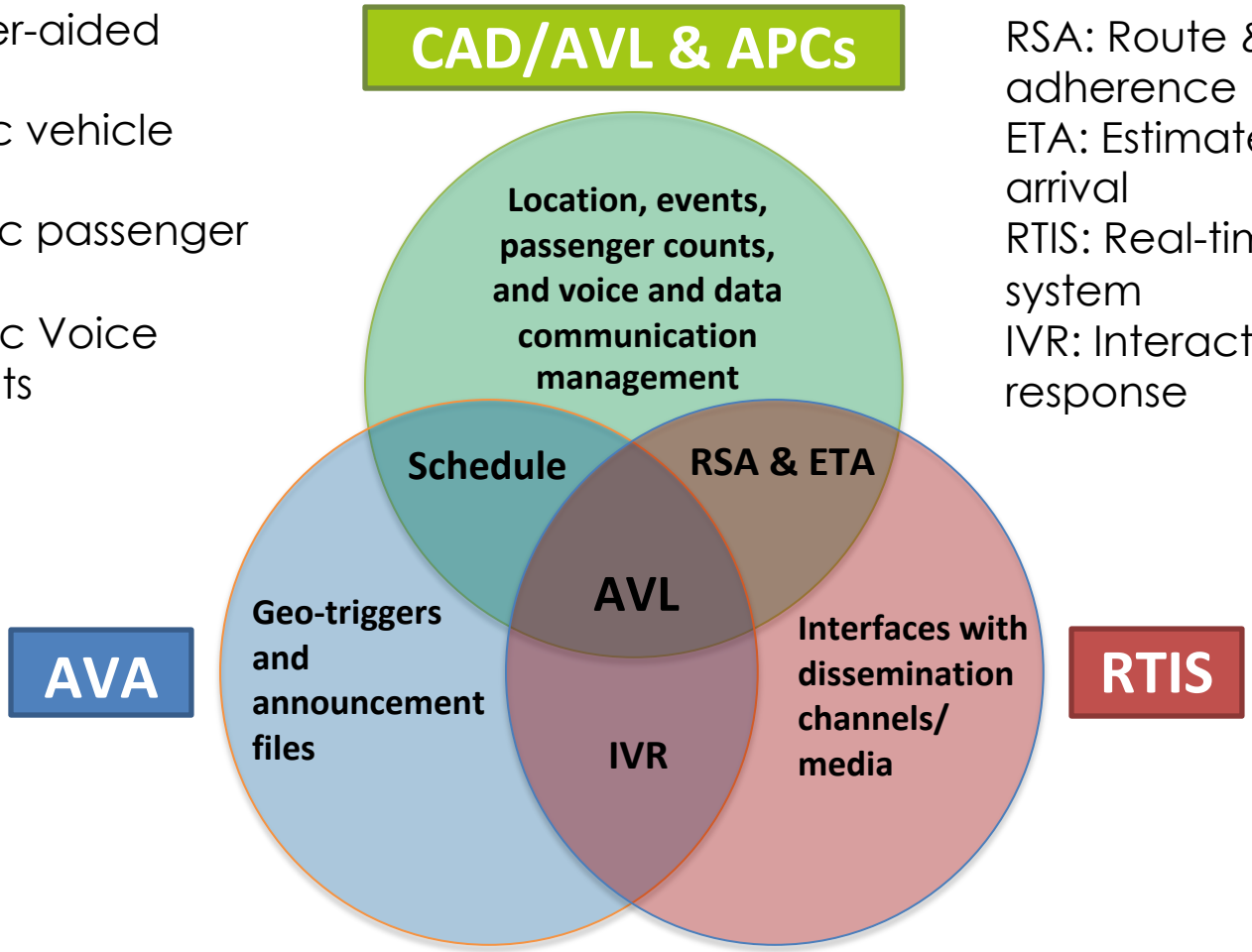
*Move to higher tier if intercity route not implemented

Transit Technology "Menu"

- Fleet Operations and Management
- Traveler Information
- Safety and Security
- Automated Fare Payment
- Maintenance
- Other

Core Technology Dependencies

CAD: Computer-aided dispatch
AVL: Automatic vehicle location
APC: Automatic passenger counter
AVA: Automatic Voice Announcements



RSA: Route & schedule adherence
ETA: Estimated time of arrival
RTIS: Real-time information system
IVR: Interactive voice response

Tier 1 Technologies

- Communications technologies*
- Automatic vehicle location (AVL)
- Computer-aided dispatch (CAD)
- On-board automated voice announcements (AVA)
- En-route/wayside traveler information, including real-time arrival/departure information in a variety of dissemination media
- Technology integration*
- Third-party smartphone applications (included in traveler info. cost)
- Open data for third-party application development*

*unit cost not available

Tier 2 Technologies

- Automatic passenger counters (APCs)
- Scheduling (fixed-route and paratransit) systems
- Mobile (on-board and exterior) and fixed video surveillance
- Covert emergency alarm and covert live audio monitoring
- On-board digital video recorders
- Geographic information system (GIS) application*
- Service coordination facilitated by technology (includes paratransit CAD/AVL)

*unit cost not available

Tier 3 Technologies

- Vehicle component monitoring (VCM)
- G-force monitoring (EDRS)
- Maintenance software to schedule and track scheduled and unscheduled maintenance activities, and manage parts inventory
- On-board Internet access for passengers*
- 511, 311 and 211 systems, and Google Transit*

*unit cost not available

Later Tiers

- Tier 4
  - Automated fare media (e.g., magnetic stripe cards, contact smartcards, contactless smartcards and smartphone-based payment methods)
  - Automated fareboxes and faregates
  - Ticket vending machines
- Tier 5
  - Transfer connection protection (TCP)
  - Transit signal priority (TSP)
  - Data management and reporting*
- Tier 6
  - Intelligent vehicle technologies (e.g., collision warning)*
  - Lane control technologies*

*unit cost not available

Recommendations Overview

- Only Tiers 1 to 3 expected by 2029
- Draft implementation agenda and timeline for each provider to reach minimum recommended level of technology (Tier 3)
- Cost estimates for capital and operations & maintenance prepared by year

Tier 1 Recommendations by Provider

- Covers implementation timeframe through 2023
- Capital costs estimated in 2019 dollars
- Operating and maintenance costs assumed to begin in year after deployment, also in 2019 dollars
- Costs not estimated for items with no available unit costs

Advance Transit

- Tier 1 elements already deployed
  - Communications system
  - AVL
  - Real-time information
  - Third-party smartphone applications
- Tier 1 elements recommended (2022)
  - Automated vehicle announcements
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Note: TSP (Tier 5) is also recommended for AT by 2021 for one intersection.
Capital: $72K to $162K
O&M: $7K to $16K

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$118,000	$211,000	$20,000	$31,200

COAST

- Tier 1 elements already deployed
  - Communications system
  - Computer-aided Dispatch (CAD)/AVL
  - Real-time information
  - Third-party smartphone applications
  - AVA
- Tier 1 elements recommended (2022)
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Manchester Transit Authority

- Tier 1 elements already deployed
  - Communications system
  - AVL
  - AVA
- Tier 1 elements recommended (2022)
  - CAD
  - Traveler information
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$395,750	$1,012,250	$101,148	$201,445

Sullivan County Transit

- Tier 1 elements already deployed - None
- Tier 1 elements recommended (2023)
  - Communications technology
  - AVL
  - CAD
  - AVA
  - Traveler information
  - Third-party smartphone applications
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$564,000	$1,282,000	$122,355	$232,468

Tri-County CAP Transit

- Tier 1 elements already deployed - None
- Tier 1 elements recommended (2023)
  - Communications technology
  - AVL
  - CAD
  - AVA
  - Traveler information
  - Third-party smartphone applications
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$666,000	$1,506,000	$126,938	$242,183

VNA-HCS

- Tier 1 elements already deployed - None
- Tier 1 elements recommended (2023)
  - Communications technology
  - AVL
  - CAD
  - AVA
  - Traveler information
  - Third-party smartphone applications
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$585,000	$1,326,000	$123,265	$234,425

Nashua Transit System

- Tier 1 elements already deployed
  - Limited AVL
  - AVA
- Tier 1 elements recommended (2023)
  - AVL
  - CAD
  - Traveler information
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$528,000	$1,226,000	$105,675	$207,595

CART

- Tier 1 elements already deployed - None
- Tier 1 elements recommended (2023)
  - Communications technology
  - AVL
  - CAD
  - AVA
  - Traveler information
  - Third-party smartphone applications
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$585,000	$1,326,000	$123,265	$234,425

CAT

- Tier 1 elements already deployed
  - Communications system
- Tier 1 elements recommended (2023)
  - AVL
  - CAD
  - AVA
  - Traveler information
  - Third-party smartphone applications
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$518,000	$1,184,000	$120,080	$227,880

UNH Wildcat Transit

- Tier 1 elements already deployed
  - Communications system
  - CAD/AVL
  - Real time information
  - Third-party smartphone applications
- Tier 1 elements recommended (2022)
  - AVA
  - Open data (cost not estimated)
  - Technology integration (cost not estimated)

Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
$152,000	$269,000	$21,200	$33,200

Statewide Cost Estimates

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$224,000	$431,000	$0	$0
2022	2,144,750	4,959,250	28,163	48,900
2023	2,366,250	5,119,750	498,331	951,445
2024	0	0	967,002	1,809,044
2025	1,517,750	3,139,250	967,002	1,809,044
2026	264,000	506,000	1,386,524	2,386,433
2027	302,500	570,500	1,483,850	2,533,334
2028	546,000	1,236,000	1,582,551	2,682,610
2029	1,671,000	3,938,000	1,704,889	2,894,060
2030	N/A	N/A	2,072,054	3,530,410

Next Steps - Technology

- Flesh out technology strategy and integration plan for each agency
- Consider economies of statewide or multi-regional procurement for some technologies
- Begin research on funding possibilities, including private/foundation sources

Peer Analysis

- Compared amount of service provided to that in other areas similar in terms of population and geographic area
- Used National Transit Database data from FY2017
  - Developed separate sets of peers for each urban operator
  - Grouped rural operators into two sets
- Focused on bus mode; set aside stats on demand response service and other modes
- VOMS=vehicles operated in maximum service
- VRH=vehicle revenue hours (WD=average weekday)

Nashua – 17 peer systems

Item	Nashua	Peer Avg.
Service Area	32 sq. mi.	35 sq. mi
Population	86,933	89,207
Bus VOMS	9	21
Bus WD VRH	113	215
Annual VRH	32,981	62,284
Ann. Op. Exp.	$1.86 m	$4.99m

Yakima Transit	WA
Greater Roanoke Transit Company	VA
Mid Mon Valley Transit Authority	PA
ART (Asheville Redefines Transit)	NC
Kenosha Transit	WI
St. Cloud Metropolitan Transit Commission	MN
Gary Public Transportation Corporation	IN
Decatur Public Transit System	IL
Eau Claire Transit	WI
Bloomington Public Transportation Corp.	IN
City of Plymouth	MN
Beaumont Municipal Transit System	TX
Iowa City Transit	IA
City of Lawrence	KS
Cache Valley Transit District	UT
City of Scottsdale - Scottsdale Trolley	AZ
City of Turlock	CA

COAST – 20 peer systems

Item	COAST	Peer Avg.
Service Area	368 sq. mi.	351 sq. mi
Population	166,975	171,654
Bus VOMS	14	29
Bus WD VRH	154	276
Annual VRH	41,941	81,237
Ann. Op. Exp.	$3.82 m	$7.05 m

Berkshire Regional Transit Authority	MA
Southeast Area Transit	CT
Cape Cod Regional Transit Authority	MA
Tompkins Consolidated Area Transit	NY
Beaver County Transit Authority	PA
County Commissioners of Charles County, MD	MD
County of Lebanon Transit Authority	PA
Chattanooga Area Regional Transportation Auth.	TN
Cape Fear Public Transportation Authority	NC
Chatham Area Transit Authority	GA
Indian River County	FL
Portage Area Regional Transportation Authority	OH
Bay Metropolitan Transit Authority	MI
Laketran	OH
Madison County Transit District	IL
Medina County Public Transit	OH
Delaware County Transit Board	OH
Transit Joint Powers Authority for Merced County	CA
Butte County Association of Governments	CA
Imperial County Transportation Commission	CA

Manchester – 19 peer systems

Item	MTA	Peer Avg.
Service Area	63 sq. mi.	63 sq. mi
Population	135,366	124,996
Bus VOMS	13	22
Annual VRH*	48,529	60,719
Ann. Op. Exp.	$3.29 m	$5.55 m

*MTA is a reduced reporter and does not report weekday VRH

Greater Portland Transit District	ME
UNH - University Transportation Services	NH
City of Huntsville	AL
Macon-Bibb County Transit Authority	GA
Town of Cary	NC
Bay County Transportation Planning Org.	FL
City of Murfreesboro	TN
Duluth Transit Authority	MN
South Bend Public Transportation Corporation	IN
Springfield Mass Transit District	IL
Wichita Falls Transit System	TX
Las Cruces Area Transit	NM
City of Tyler	TX
Sioux City Transit System	IA
Topeka Metropolitan Transit Authority	KS
City of Columbia	MO
Transfort	CO
Mesa County	CO
Solano County Transit	CA

CART – 9 peer systems

Item	CART	Peer Avg.
Service Area	172 sq. mi.	187 sq. mi
Population	112,897	110,873
Bus VOMS	8	22
Annual VRH*	6,912	33,467
Ann. Op. Exp.	$539,811	$2,494,992

Cape May County Fare Free Transportation	NJ
Shenango Valley Shuttle Service	PA
Fredericksburg Regional Transit	VA
Tuscaloosa County Parking and Transit Auth.	AL
Douglas County Rideshare	GA
Lake Erie Transit	MI
Cleveland Area Rapid Transit	OK
River Parishes Transit Authority	LA
Peoria Transit	AZ

*CART is a reduced reporter and does not report weekday VRH

Larger Rural Systems – 10 peers

Item	Peer Avg.	AT	TCC	SCST
Service Area	28 sq. mi	45 sq. mi.	45 sq. mi.	36 sq. mi.
Population	30,670	30,000	15,000	20,000
Bus VOMS	12	18	4	6
Annual VRH	15,011	43,068	5,782	4,127
Ann. Op. Exp.	$927,124	$3,698,664	$276,066	$254,981

Asotin County PTBA	WA
Weirton Transit Corporation	WV
Bristol Tennessee Transit System	TN
Goldsboro-Wayne Transportation Auth.	NC
Municipality of Barceloneta	PR

Liberty Transit	GA
Citrus County Transit	FL
Wausau Area Transit System	WI
Michigan City Transit	IN
Intracity Transit	AR

Smaller Rural Systems – 10 peers

Item	Peer Avg.	VNA-HCS	CAT
Service Area	13 sq. mi	8 sq. mi.	18 sq. mi.
Population	25,120	20,000	30,000
Bus VOMS	7	3	6
Annual VRH	11,280	7,184	8,294
Ann. Op. Exp.	$822,186	$455,659	$833,769

City of Kingston Citibus	NY
East Windsor Township	NJ
Watertown CitiBus	NY
Bristol Virginia Transit	VA
City of Winchester	VA

Anderson Transit Authority	SC
City of Beloit Transit System	WI
Twin Cities Area Transportation Authority	MI
Steel Valley Regional Transit Authority	OH
Southeast Missouri State University	MO

Peer Analysis Takeaways

- Most NH urban systems operate about half the amount of service that their peers do
  - MTA somewhat more than half, CART only about a fifth
- Among rural systems:
  - AT operates well more than the peers: three times the hours, four times the expense, even without any weekend service
  - TCC and SCT operate about a third of the service that peers do
  - Keene service is about 2/3 of the peer service (but has smaller service area and lower population)
  - CAT operates 3/4 of the hours, but has higher total operating cost than the peers

Survey Respondent Support

- Though not a statistically-valid sample, survey respondents represent reasonable cross-section of NH
- Even though 58% of respondents never use public transit and another 24% use it once a year or so, more than 80% of respondents support increased funding for public transit, with 31% supporting a major increase
- There is broad support for expanding access to public transit across all of New Hampshire and improving existing services as well

Timeline

- Additional public outreach in September
- Documentation in August/September
- Completion of project in the Fall