



FREIGHT & GOODS MOVEMENT STUDY

MAY 31, 2012



*Berkshire
Regional
Planning
Commission*

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I. PURPOSE

Effective freight transportation is integral to the Berkshires' economic growth, livability, and natural environment. It is increasingly important to integrate freight transportation priorities into planning and development so that the Berkshires' quality of life is improved and sustained. Freight transportation impacts a wide range of projects including intersection improvements, roadway reconstruction and rehabilitation, widening, and improvements for rail capacity expansion (e.g. increasing bridge clearance over railroads or widening tunnels.)

Understanding the kinds of services available for freight is important because goods move differently than people. Finished goods move to market. Materials processed towards finished goods have value added to them. Higher value goods typically move more quickly while unprocessed materials move more slowly. Value added is a key indicator of a region's industrial performance. Fast shipping uses trucks and air freight while slower shipping methods include ships, trains, and pipelines.

II. MEASURING FREIGHT

Freighters charge owners differently depending on timing and quantity for cargo delivery.

- **Less than Truck Load (LTL)** is the most popular and often the least expensive means of moving cargo because freighters can consolidate packed items, usually up to 8,000 pounds. Many carriers offer nationwide services that are reliable, predictable, but not guaranteed. The load is often repacked or moved to another truck in transit.
- **Partial Truck Loads (PTL)** are an economical way to move medium size loads and are partitioned. PTL's are booked by volume and the goods stay on the same truck from pick up to delivery.
- Freight is moved by **Truck Loads (TL)** if a shipment weighs more than 8,000 pounds or requires a larger volume. Sometimes TLs are used for medium size loads that the shipper does not want unloaded and reloaded as it would be with LTL. The truck that picks up the shipment is the same one that delivers it. TL doesn't mean that the truck is literally full, but it is dedicated to the single shipment.
- **Air Ride Truck Loads** provide a softer ride than standard freight trucks and are used for shipping delicate, high value cargo. Air ride services are more expensive and less frequent.
- **Blanket Wrap** or Van Moves are used when items are not boxed, crated, or packed. Blanket wraps are used when the shipper doesn't furnish packaging or the items are oddly shaped. These services are more expensive and take significantly more time over long distances than LTL.
- **Air Freight** is used for smaller shipments of valuable goods. Air freight can be cost competitive with LTL if the weight of the shipped items is dense. Air freight carriers charge based on size and weight of air shipments.
- **Expedited freight services** are more expensive and can be applied to any form of shipment. Expedited freight is not guaranteed for delivery on a certain day, but a window of delivery is provided.
- **Guaranteed Delivery** freight services provide a specific date of delivery and shipments are kept independent of other cargo. If the delivery is not at the right time, the shipper refunds the difference between standard shipping and guaranteed shipping.

III. WHO CARRIES FREIGHT?

Trucking companies and independent drivers work directly for their client, through freight carriers, and/or shipping agents. Many trucks are owned and operated by their drivers. Some cargo moves on regular routes or for only one consignment per run, while other cargo moves through different loading stations/shippers to various consignees. Sometimes cargo for one leg of the route is known when the cargo is loaded but trucks may have to wait at the destination for return cargo.

Typically the purchaser takes ownership of the freight as it leaves the seller's 'dock'. The new owner is responsible while the freight is in transit. Some operations, like Crane & Company, move materials from site to site. Many big companies (e.g. grocery store chains) operate internal trucking operations. Freight warehousing is virtually nonexistent in the Berkshires and is a reduced sector internationally because freight owners use shipping as a form of 'rolling' storage.



IV. FREIGHT DATA AND ANALYSIS

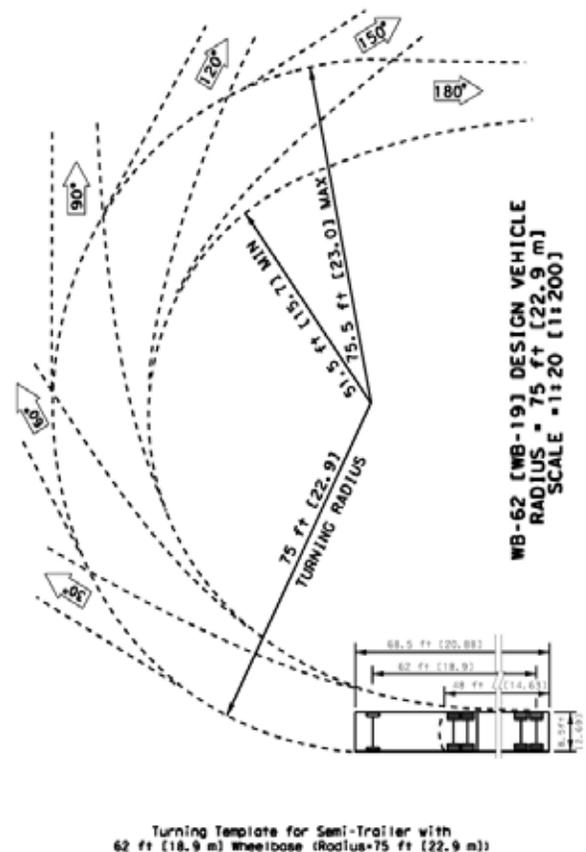
Freight data is difficult to gather because the vast majority of cargo is shipped by the private sector. Truck loads are not comparable because of the many different methods for shipping cargo. Many states have freight movement models, but they usually use commodity flow data (from the US Economic Census), not vehicles, in analysis. Some freight companies sell information about their shipments, but data is not extensive because the cargo owner takes possession of the goods as they ship and privacy is important

The advent and growth of electronic shopping combined with more efficient and reliable logistics increased demand for freight services. From 1999 to 2009 the percent of electronic commerce sales in the retail sector increased sevenfold from 0.6% of total retail sales in 1999 to 4.1% in 2009. In manufacturing, e-commerce shipments increased from 18% of total manufacturing shipments in 2000, to 39% (\$2.2 trillion) in 2008.

V. WHERE DO TRUCKS LIKE TO TRAVEL?

Trucks travel a variety of ways. Trucks use atlases, GPS devices, or receive instructions from their company or the owner of the cargo. Some communities establish truck routes with signage and way-finding. Trucks vary in length and height. Heavier trucks use additional axles to redistribute weight and reduce damage to roadways. Some bridges are not designed or are not in a condition to handle truck traffic. These factors and others go into deciding what makes a good truck route along with the relationship between land use and transportation.

- **Bridge Under Clearance & Weight Restrictions-** The current preference for bridge clearance over roads is 16 ½' for new bridges and 14 ½' for existing bridges. Bridges that do not meet the standards are indicated as functionally obsolete on the Region's bridge map. If a bridge cannot support heavy vehicles, it is posted with weight restrictions.
- **National Functional Classification-** The Interstate highway system moves the most vehicles the longest distances between America's metropolitan areas. Trucks use arterial roads for longer trips and direct access to the heaviest industrial and commercial uses in the County. Collector roads generally handle shorter trips, while local roads handle the shortest freight movements and are not usually constructed for heavy trucks.
- **Turning Radii-** Berkshire roads that carry significant truck traffic should be able to accommodate the WB-62 design template vehicle. The outside wheel path of the WB-62 design vehicle requires a minimum of 45' from the radius of the turning arc.
- **Speeds-** Massachusetts sets speed limits through an 85% speed study conducted by MassDOT on state-maintained roadways or conducted by a community and approved by MassDOT on locally maintained roads. If a speed limit is not established, speeding can be enforced 20 mph in a school zone, 30 mph within 1/8 of a mile of thickly settled areas or business district, 40 mph on an undivided highway within 1/4 of a mile of a thickly settled or business district, and 50 mph on a divided highway within 1/4 of a mile of a thickly settled or business district.
- **Grades-** Speed differential on highways with steep grades contribute to safety and operational problems. Trucks and other heavy vehicles lose speed on steep, ascending grades and may be unable to reach full highway speed until they pass the crest of the hill. Vehicles behind them slow down, contributing to rear-end conflicts and risky passing maneuvers. Truck drivers may go down hills at slower speeds to maintain better control of their vehicles. A lack of passing lanes causes bottlenecks for faster moving vehicles.
- **Pavement Condition-** Pavement conditions degrade rapidly when heavy trucks use a road. Every time the weight of a vehicles doubles, it dies eight times the damage to pavement. Roads that carry a high volume of truck traffic should be kept in a condition that requires routine maintenance (as opposed to capital preventative maintenance or reconstruction) because of the potential for rapid degradation. Poor pavement conditions negatively affect fuel consumption (particularly for low speed truck movements) and increase vehicle maintenance costs.



2011 POSTED BRIDGES & NATIONAL FUNCTIONAL CLASSIFICATION SYSTEM

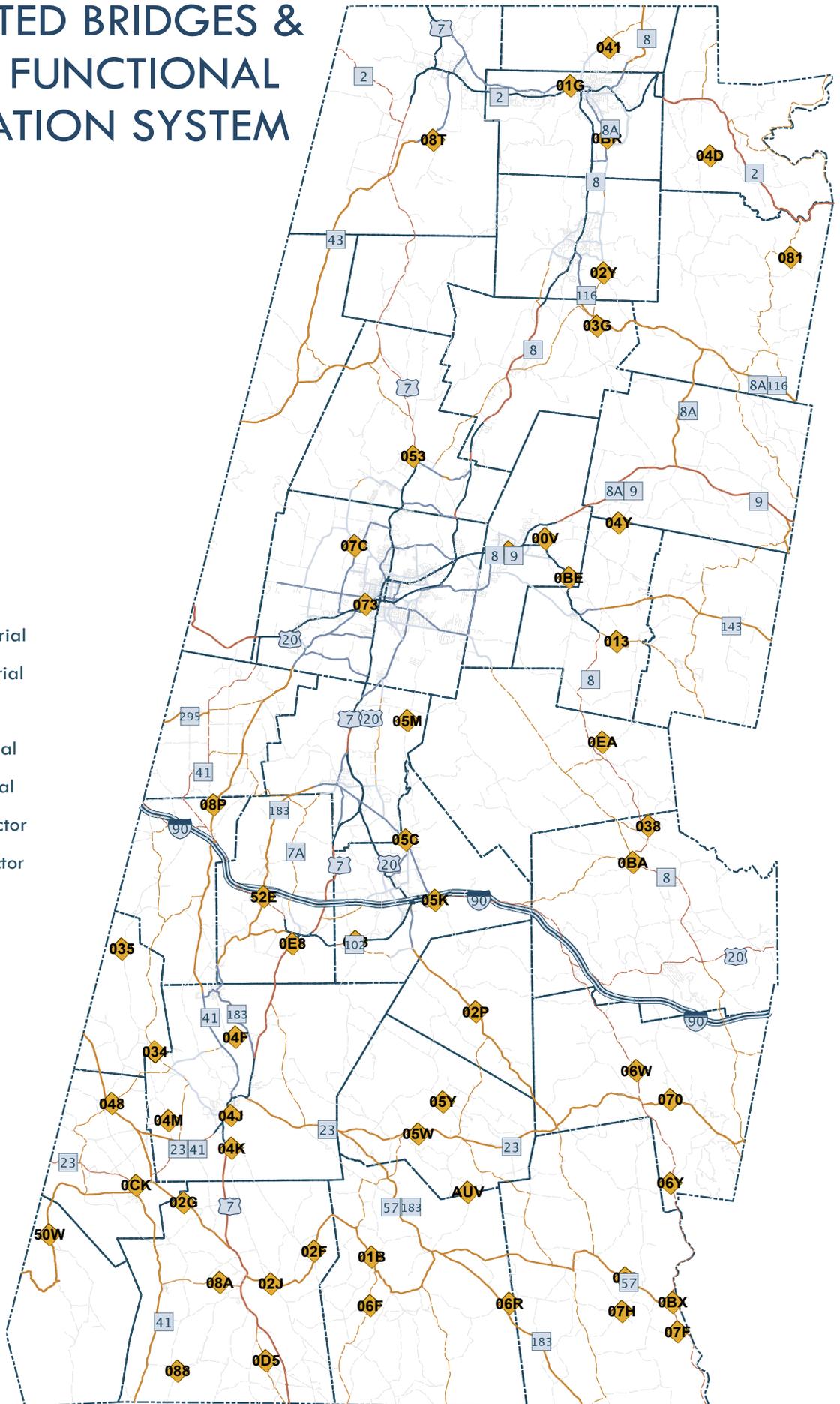
Legend

-  Interstate
-  Urban Major Arterial
-  Urban Minor Arterial
-  Urban Collector
-  Rural Major Arterial
-  Rural Minor Arterial
-  Rural Major Collector
-  Rural Minor Collector
-  Local
-  Local Boundaries

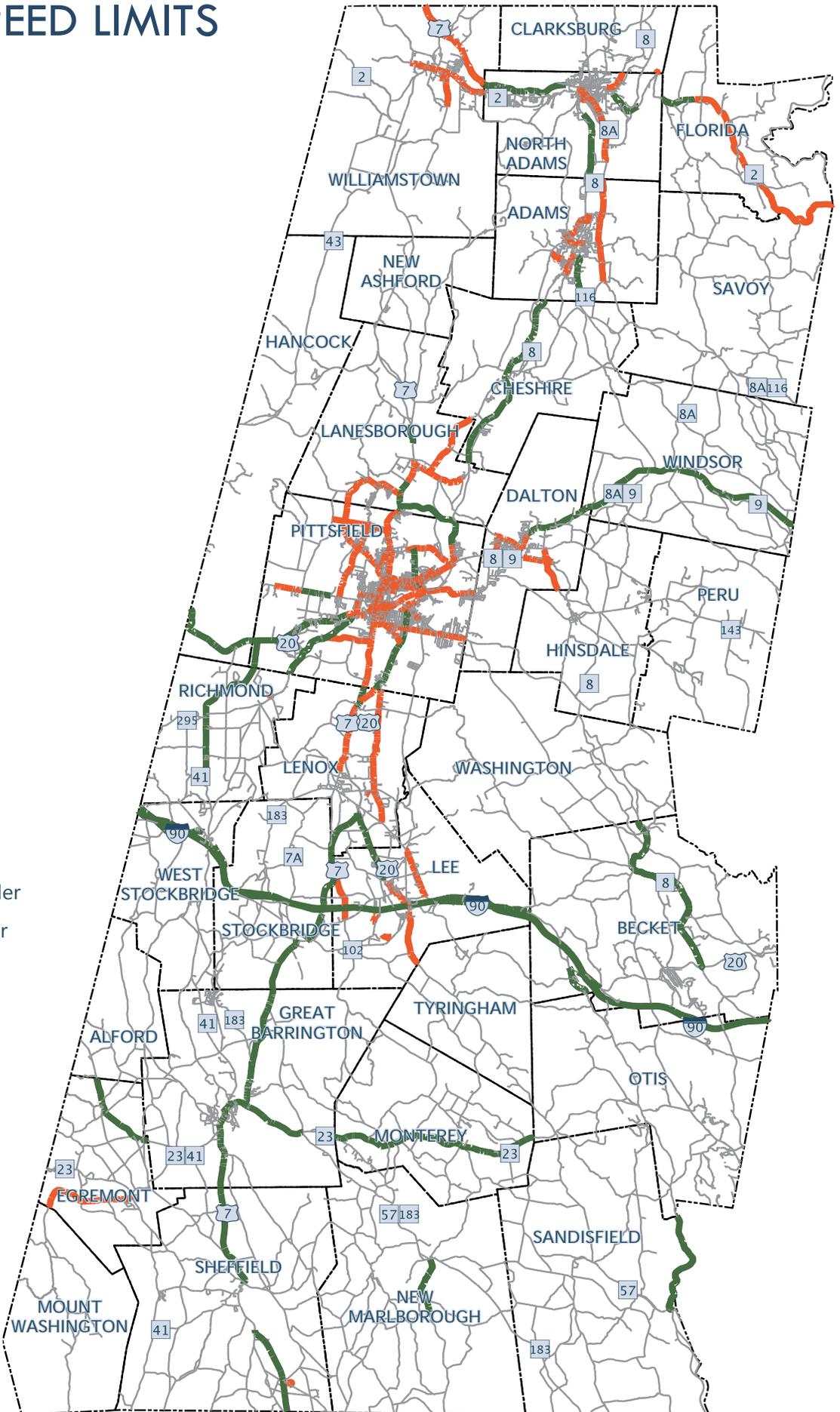


0 1.25 2.5 5 Miles

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POSTED SPEED LIMITS



Legend

-  No Posted Limit
-  35 MPH and Under
-  40 MPH and Over
-  Local Boundaries

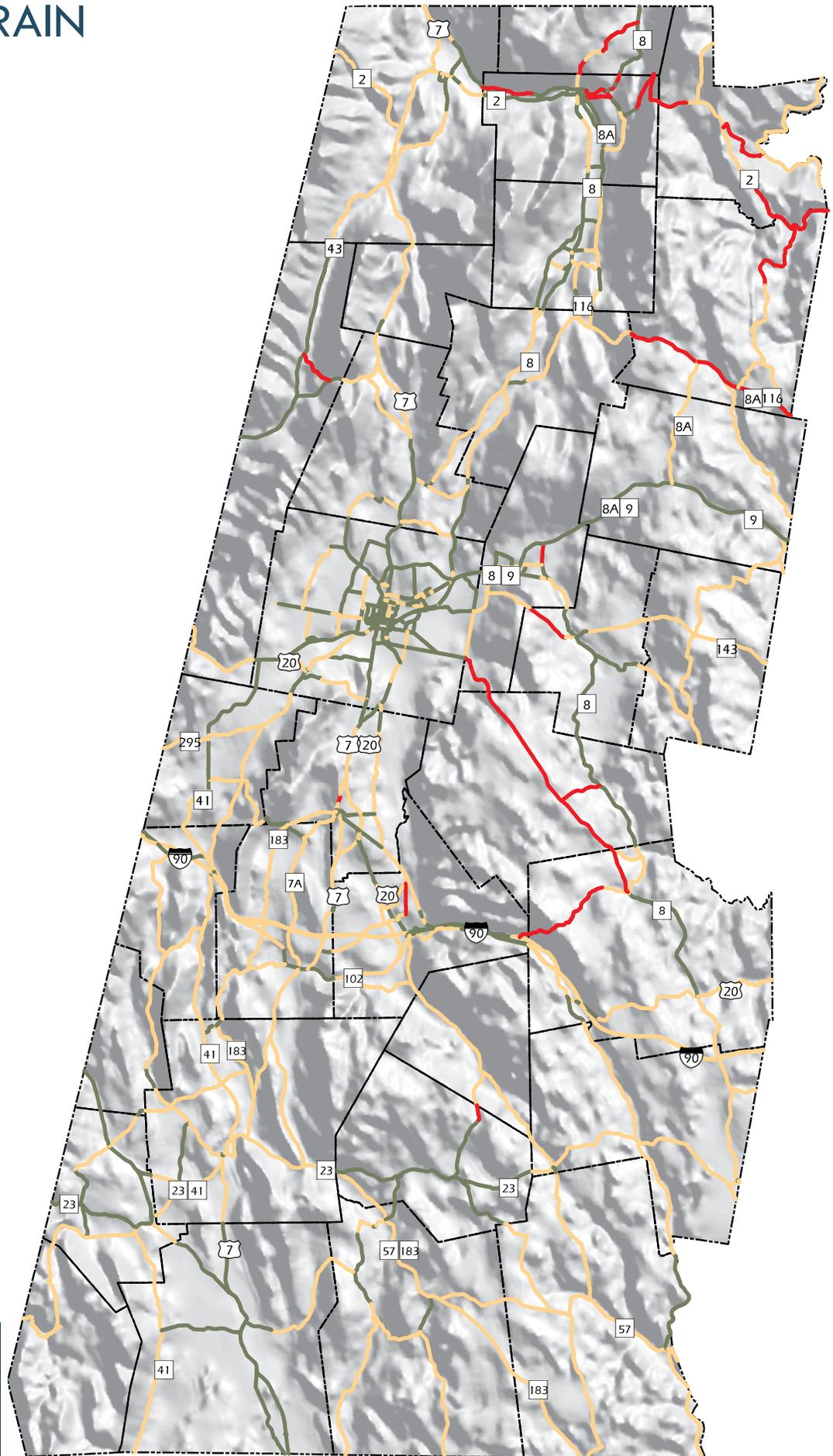


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ROAD TERRAIN



Legend

-  Level
-  Rolling
-  Mountainous
-  Local Boundaries



0 1.25 2.5 5 Miles



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2011 PAVEMENT CONDITIONS (PASER)

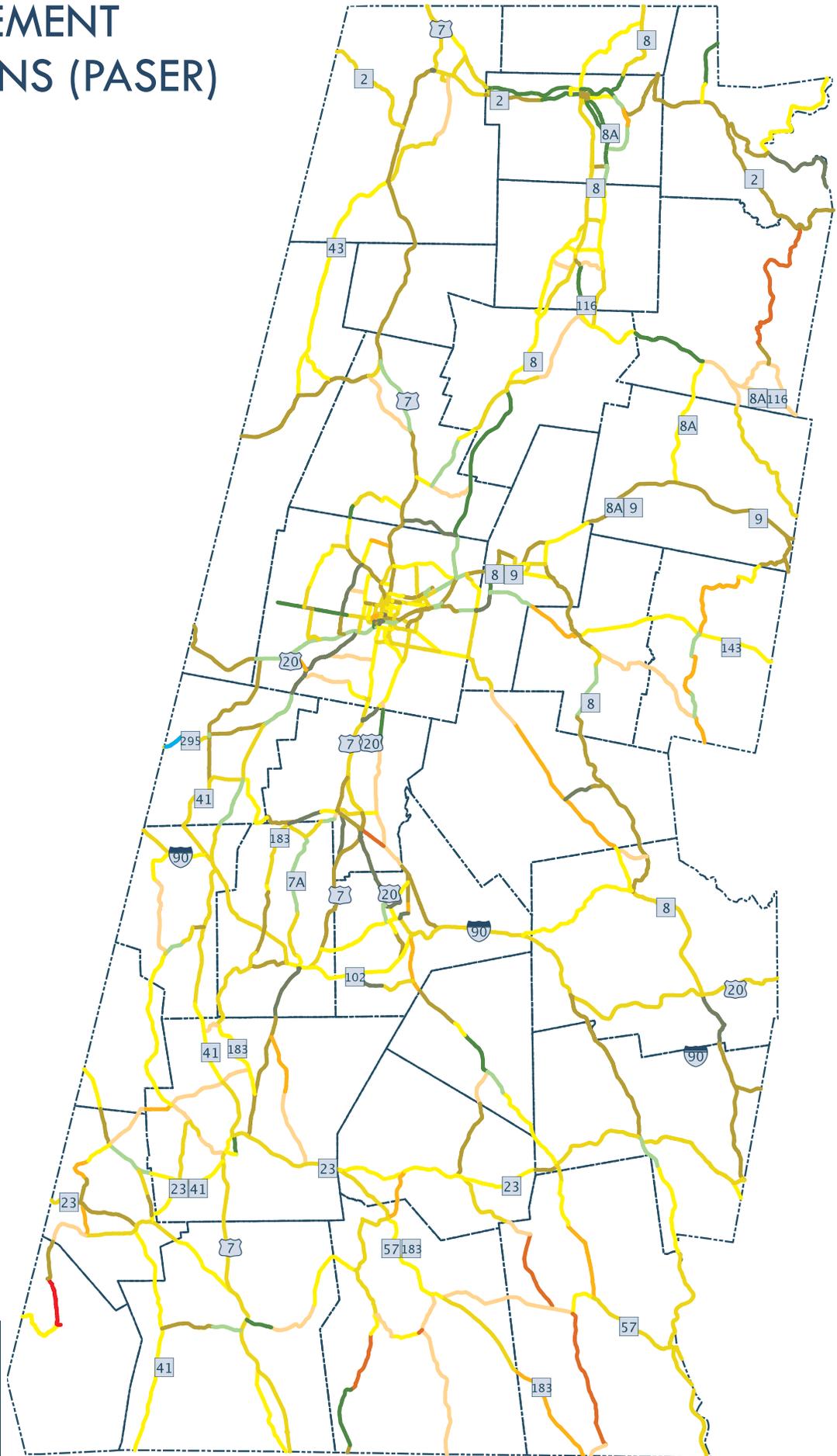
Legend

-  10- Excellent
-  9- Excellent
-  8- Very Good
-  7- Good
-  6- Fair
-  5- Fair
-  4- Poor
-  3- Very Poor
-  2- Very Poor
-  1- Failed
-  Uncollected
-  Local Boundaries



0 1.25 2.5 5 Miles

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DEVELOPING A FREIGHT QUESTIONNAIRE

In 2000, the Oregon Department of Transportation commissioned a study of their freight survey practices as well as those of 34 other places in the US and Australia. The majority of surveys they found focused on identifying truck trips, however, half the surveys asked respondents to indicate where there were problems or impediments to freight logistics.

The study also identified lessons learned from the other surveys. Notably, freight logistics are more complex than industry outsiders realize and there are different considerations for manufacturers, distributors, and carriers. Methods of shipping change rapidly. Private businesses don't readily participate so the survey should be concise. The survey should not be complex. Identifying the right respondent is important. A survey should focus on transportation bottlenecks and how they affect individual businesses. Include issues with non-recurring congestion. Understand that access and level of service are equally important.

Oregon's study suggested a list of questions BRPC used to construct a survey:

- One questionnaire verses separate questionnaires for shippers, carriers, and/or others?
- Survey transportation managers, drivers, or both?
- Directly contact the drivers or contact them through management?
- Focus on trucks only or consider other modes of freight including rail and air?
- Use open-ended questions or a structured list of problems?
- Ask the respondents to rank problems or just list problems?
- Ask about problems and practices for both inbound and outbound freight?
- Use written/self completing questionnaire or personal interview?
- Cold or prearranged participation?

BRPC staff worked through the list of questions and determined the following approach:

- One questionnaire that identifies company, company size, freight type, frequency, purpose, and vehicle fleet.
- BRPC would contact companies directly and allow them to decide who responds.
- Ask if rail freight is used and if BRPC can follow up with additional questions. The Berkshire's airports do not move a measurable amount of freight.
- The questions will be structured except for two open ended questions- one about specific problem areas and another about cost/expenses incurred because of the Berkshire's lack of access.
- Respondents will pick from a list of road problems and select the most important one(s).
- The survey does not distinguish from inbound and outbound freight.
- BRPC will deliver short paper surveys and issue an electronic survey with instructions. Staff can assist respondents with completing the survey or technical issues.
- The principal respondents selected will be contacted personally. We also will publicize the survey and transportation planning through press releases and newsletter articles.

The Berkshire Chamber of Commerce sent a web link to the freight and goods movement survey to Berkshire businesses via several e-newsletters. BRPC Staff followed up with many individual companies via e-mail and telephone in order to increase the response rate.

SURVEY RESULT SUMMARY

The respondents ranged from small businesses to some of the Region's industrial heavyweights. They were split between manufacturers and retailers/wholesalers. No big-box retailers responded to the survey. More of the respondents contract their shipping to private carriers than operate their own fleet. 2/3 of the respondents ship goods out daily while 60% receive shipments daily. The companies were evenly divided between partial and full truckloads of freight. Not surprisingly, much of the truck traffic is from Region's core industries like plastics extrusion and paper.

- 80% of the respondents agreed or strongly agreed that deteriorating pavement/potholes and narrow bridges and intersections were regional problems.
- The majority of respondents agreed or strongly agreed that traffic congestion and improper traffic signal timing were problems for moving freight and goods.
- A minority of respondents indicated that under-height bridges, snow and ice removal, and weight restricted bridges were problematic.
- The majority of respondents had no opinion, disagreed, or strongly disagreed that traffic crashes, pedestrian & cyclists, weight restricted bridges, steep grades, snow and ice removal, and the lack of marked truck routes were regional problems affecting truck logistics.

Respondents indicated a few logistics bottlenecks, most notably US 7/20 and 8/9 through Pittsfield. All but one respondent agreed that the lack of access to convenient and direct trucking routes makes it harder to ship freight and goods in the Berkshires. Only one respondent uses rail to move freight.

DETAILED SURVEY RESULTS

Questions 1-5 were contact information questions.

#6. How many employees does your company have in Berkshire County?

Answer Options	Response Percent	Response Count
1-25	54.5%	6
26-100	18.2%	2
101-250	0.0%	0
251+	27.3%	3

#7. Which of the following best describes your company?

Answer Options	Response Percent	Response Count
Manufacturer	63.6%	7
Distributor	0.0%	0
Retailer/Wholesaler	36.4%	4

#8 Does your company have its own vehicle fleet for moving freight and goods?

Answer Options	Response Percent	Response Count
Yes	45.5%	5
No	54.5%	6

If yes, please tell us how many and what size vehicles you use:

- 1 tractor and 120 trailers
- We have our own truck but also contract out larger loads to Scotty's Trucking in Adams
- 25 power unit. 7 class 8 tractors 4 straight trucks over 45K GCW Pickups and cars
- one E-150

#9 How often do you ship over-the-road freight and goods?

Answer Options	Response Percent	Response Count
Daily	77.8%	7
Several times a week	11.1%	1
Weekly	11.1%	1

- 3-10 trucks Daily
- Until business increases, several times per year. Some customers prefer to pick up.

#10 Do you ship full or partial truckloads of freight and goods?

Answer Options	Response Percent	Response Count
Full Truckloads	50.0%	5
Partial Truckloads	50.0%	5

- Most loads are between 5,000# and 20,000#
- Mainly partial, but occasionally full
- We ship mostly parcel- UPS/FEDEX/USPS
- Both
- Mostly single items, wt 250 # ~ crates

#11 What are the principal freight and goods you ship?

- Precast concrete
- Steel building parts, beams columns clips, panel and trim
- Molded plastic parts
- Cosmetics and associated products
- Defense Materials
- Solar hot water collectors
- Signs
- Heating oil

#12. How often do you receive over-the-road freight and goods?

Answer Options	Response Percent	Response Count
Daily	55.6%	5
Several times a week	44.4%	4
Weekly	0.0%	0
Comment:	1	1

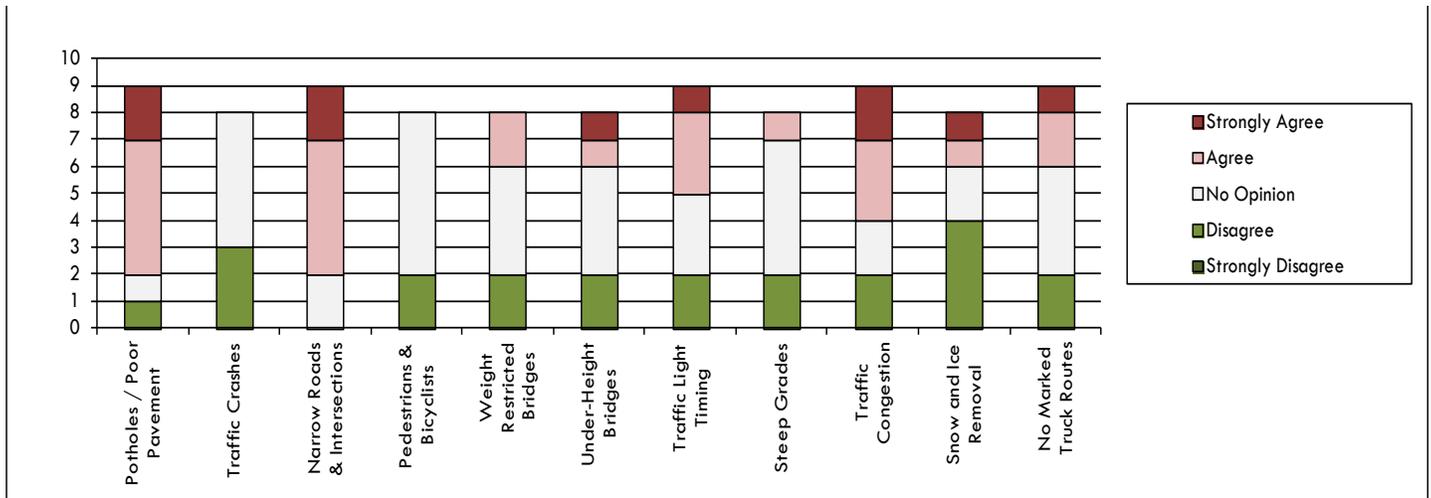
#13. Do you receive full or partial truckloads of freight and goods?

Answer Options	Response Percent	Response Count
Full Truckloads	70.0%	7
Partial Truckloads	30.0%	3

14 What are the principal freight and goods you receive?

- Paper
- Aggregate, cement
- Raw steel and accessories for steel buildings, doors, windows screws, etc
- Raw materials
- Resins, boxes
- Cosmetics and associated products
- Solar hot water collectors
- Supplies - steel, components, etc
- Heating oil

#15: The following are problems for moving freight and goods in Berkshire County.



- Access to major highways.
- One bridge is not passable since the tropical storm. The next best route has poorer pavement and is not maintained during winter.
- Whether it's pick-up or drop off, many companies do not come here daily, so when we ship or receive that is a concern regarding sending or getting our shipments

#16. Are there specific roads or intersections that are problems for trucks?

If yes, what about the road(s) or intersection(s) is a problem and do you have any suggestions for fixing it?

- Route 20 traffic, lights, intersections. Coming from north 7 to 20 west South St. intersection is very difficult for any large truck.
- Route 7/20 thru Lee and 8/9 thru Pittsfield
- South Street bridge in Dalton. Make it accessible for 13' 6" trucks and trailers.
- The green bridge that crosses the Housatonic in Great Barrington on Rt.. 7- there are big back -ups here in the summer- in both directions. A roundabout should be considered for the signaled intersection that is about a mile north of the bridge. Also- the bridge should be widened so trucks can make the corner when they are turning right to go over the bridge heading north.
- Rt. 9 (Merrill Rd.)

#17. Does the lack of access to convenient and direct trucking routes make it harder to ship freight and goods in the Berkshires?

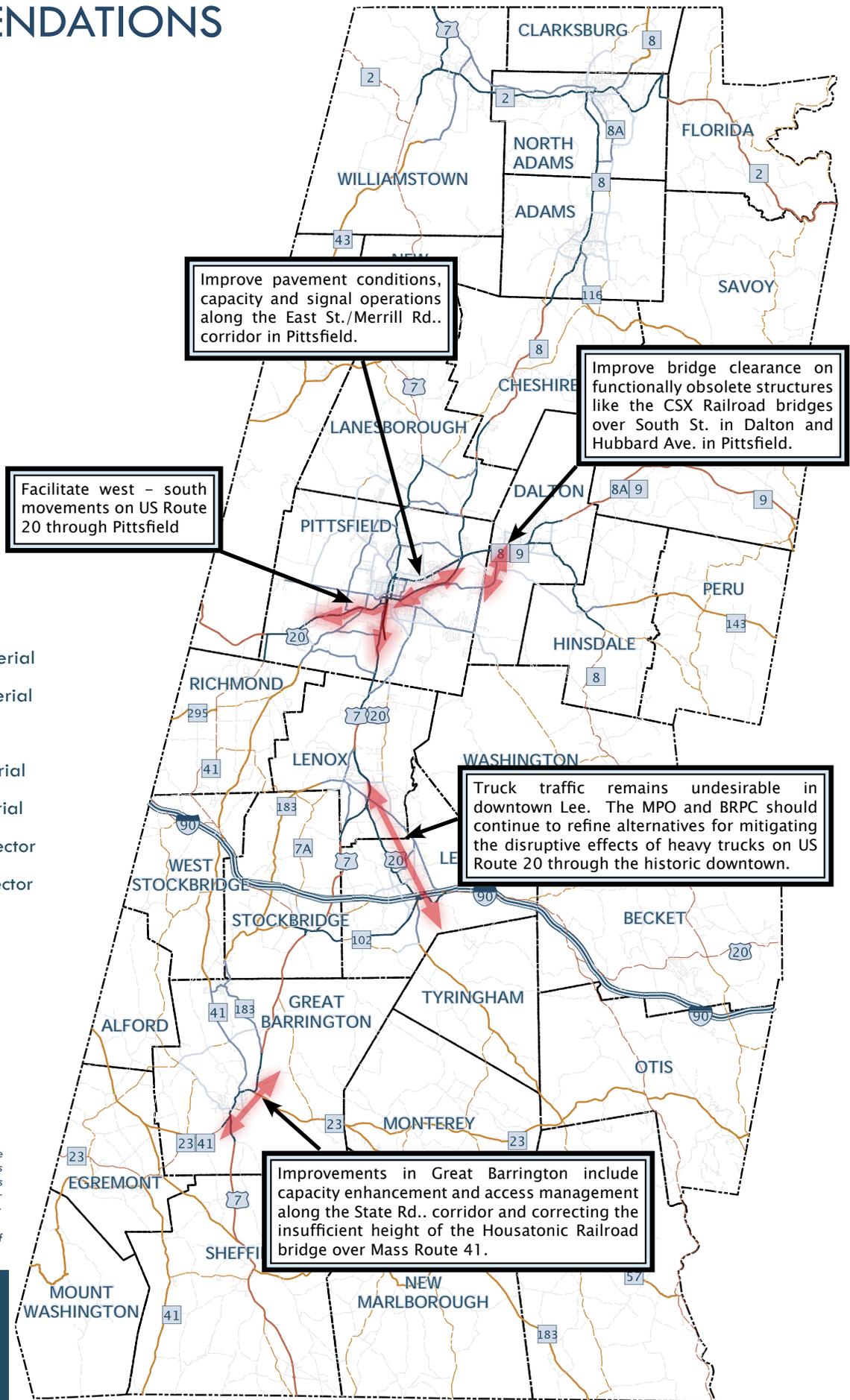
- While it does not impact our fleet directly as we are 90% local, the additional time and wear and tear on a vehicle to get to the turnpike or thruway has to be additional expense to the fleets that deliver and pick up here in Dalton.
- I am sure that our freight rates are calculated upon the distance and time it takes trucks to move around the county.
- About 10% more than our Holyoke plant.
- Need a bypass

RECOMMENDATIONS

BRPC investigated the state-of-the practice for freight logistics, gathered information about current conditions affecting freight in the Berkshires, and asked local freighters for suggestions to improve the system. The most significant obstacle for moving freight in the region remains the lack of a north-south limited access route that connects the Region's population and economic centers. New roads that bypass the Berkshires' downtowns lack funding and would dramatically impact the natural environment - two significant obstacles. The data about our roads and the input from stakeholders provide important steps so the Berkshire's MPO can improve the transportation network for freight logistics.

- The poor condition of the Region's pavement is a significant concern for freight shippers and receivers. The MPO should prioritize projects on major shipping routes (arterials) or adjacent to employment centers.
- The substandard design and operations of existing intersections often delays trucks traveling through the Region. Once a project is funded in the Transportation Improvement Program (TIP), execution of the project development process should rectify poor operations.
- Although there are few severely congested roads in the Berkshires, the MPO should monitor bottlenecks and chokepoints for opportunities to improve capacity and safety during project development.
- Communities and MassDOT can provide highly visible signage for suggested truck routes to direct freight traffic along locally-preferred corridors.
- Snow and ice removal remains integral to efficient freight movements. The Region should continue to coordinate responses to severe and inclement weather.
- Signal timing should include higher than average percentages of truck traffic on arterial corridors. All-red and amber signal phases should anticipate the greater time needed for trucks to stop.
- Industrial expansion and new developments should coincide with existing infrastructure capacity, including the transportation network.
- Installing passing lanes where needed is a long-term solution for reducing traffic and improving safety on steep hills.
- BRPC should gather and analyze data like speeds and the % of truck traffic to assist in future freight planning.

RECOMMENDATIONS



Legend

- Interstate
- Urban Major Arterial
- Urban Minor Arterial
- Urban Collector
- Rural Major Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Local
- Local Boundaries



0 1.25 2.5 5 Miles

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