

CONGESTION MANAGEMENT PROCESS (CMP)

Prepared by:



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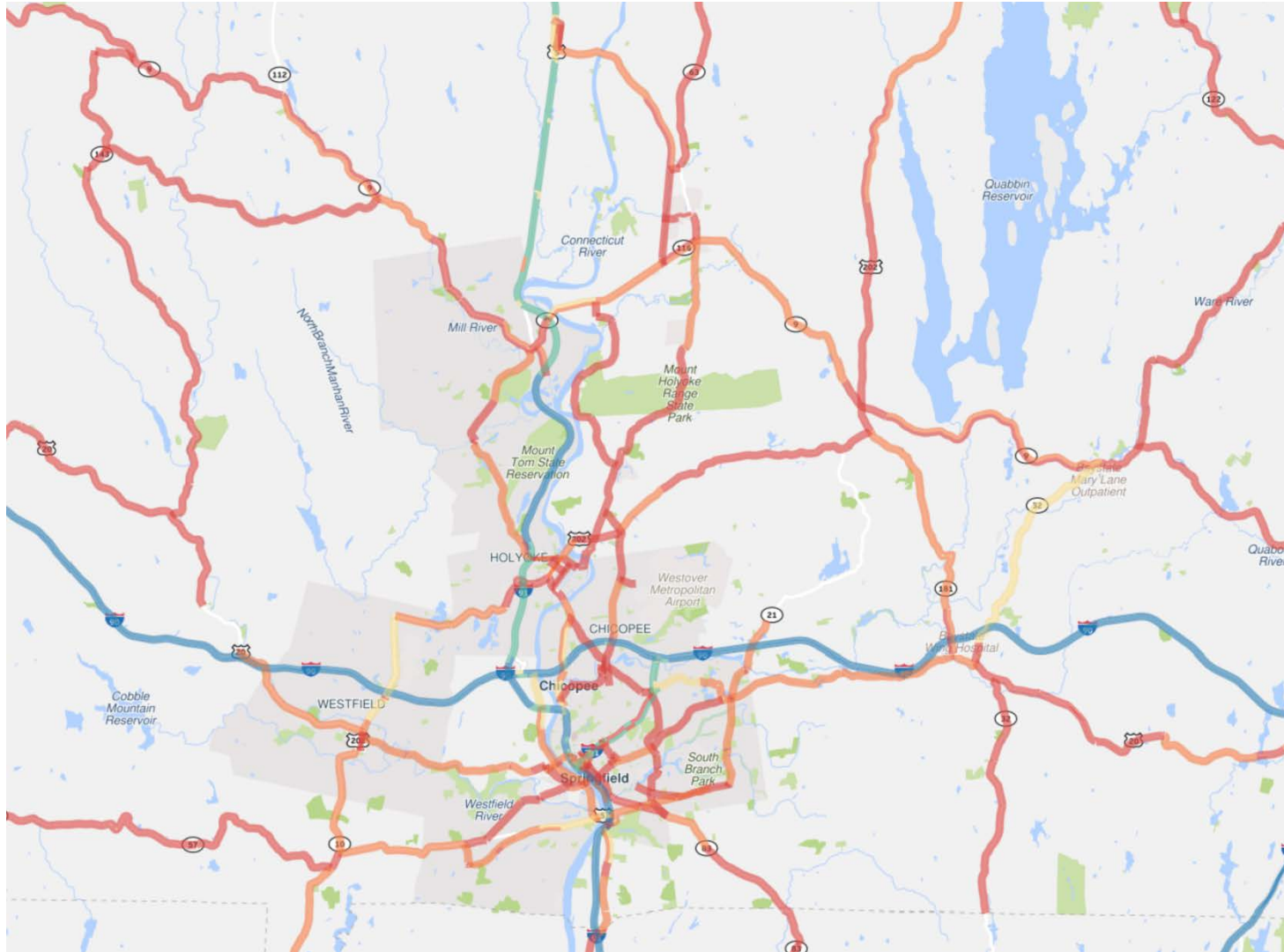
November 10, 2021

Different Types of Data

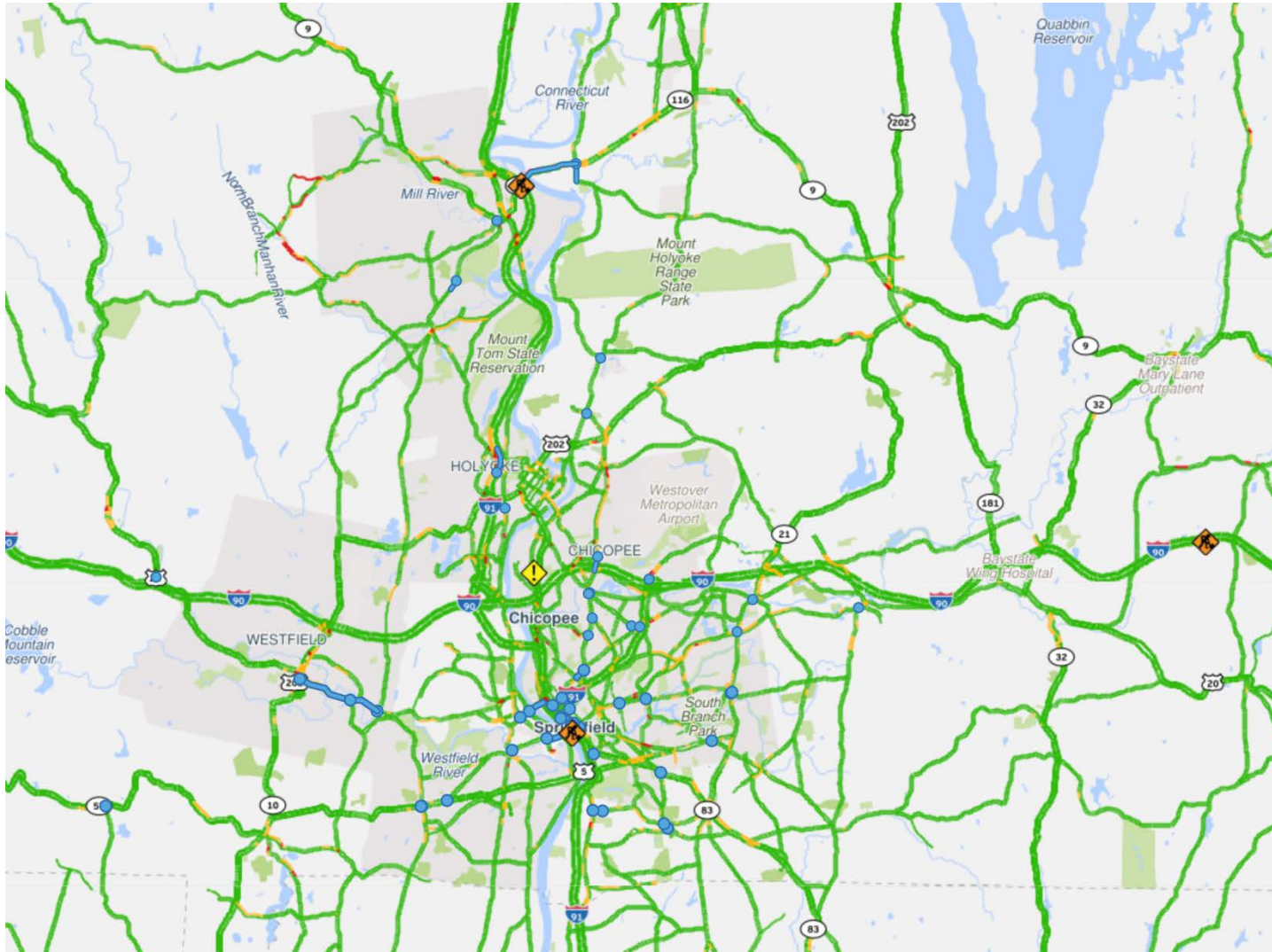
- Manually collected data - Archived
- National Performance Measure Research Data Set (NPMRDS) Data - New
- Regional Integrated Transportation Information System (RITIS) XD Data - New



NPMRDS Coverage



RITIS XD Coverage



RITIS Platform

Massive Data Downloader

3. Select one or more date ranges ⓘ

11/17/2020 - through - 11/17/2020

+ Add another date range

4. Select days of week

Sun Mon Tue Wed Thu Fri Sat

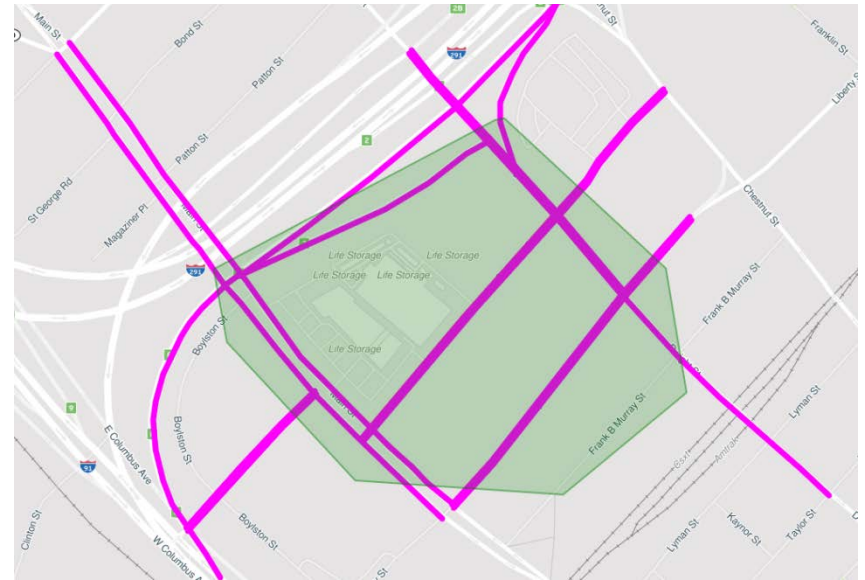
5. Select one or more times of day ⓘ

12:00 AM - to - 11:59 PM

+ Add another time of day

6. Select data sources and measures ?

- INRIX
- Speed
- Historic average speed
- Reference speed
- Travel time
- C-Value ⓘ
- Confidence score



7. Select units for travel time

- Seconds
- Minutes

8. Null record handling

- Include records with null values

9. Select averaging

- Don't Average
- 5 minutes
- 10 minutes
- 15 minutes
- 1 hour



Data Processing

The screenshot displays the Power BI Desktop interface. The top ribbon includes tabs for File, Home, Insert, Modeling, View, Help, Format, and Data / Drill. The Data / Drill tab is active, showing options like Get data, Excel, Power BI, SQL, Enter data, Dataverse, Recent sources, Transform data, Refresh, New visual, Text box, and More visuals.

The main area shows a data table with the following columns: xd, Weekend LOTTR, Evening LOTTR, Midday LOTTR1, AM LOTTR, and Average of confidence_score. The table contains 15 rows of data.

On the right side, the visualization pane is open, showing the Filters, Visualizations, and Fields sections. The Fields section lists several data sources: AM-no-weekends-2019, New-Midday-PM-2019, PM-weekday-2019, weekend-2019, and XD_Identification. The visualization pane also shows the Rows and Columns sections, with the following fields added:

- Rows: xd, zip, road-name
- Columns: Add data fields here
- Values: Weekend LOTTR, Evening LOTTR, Midday LOTTR1, AM LOTTR, Average of confidence_

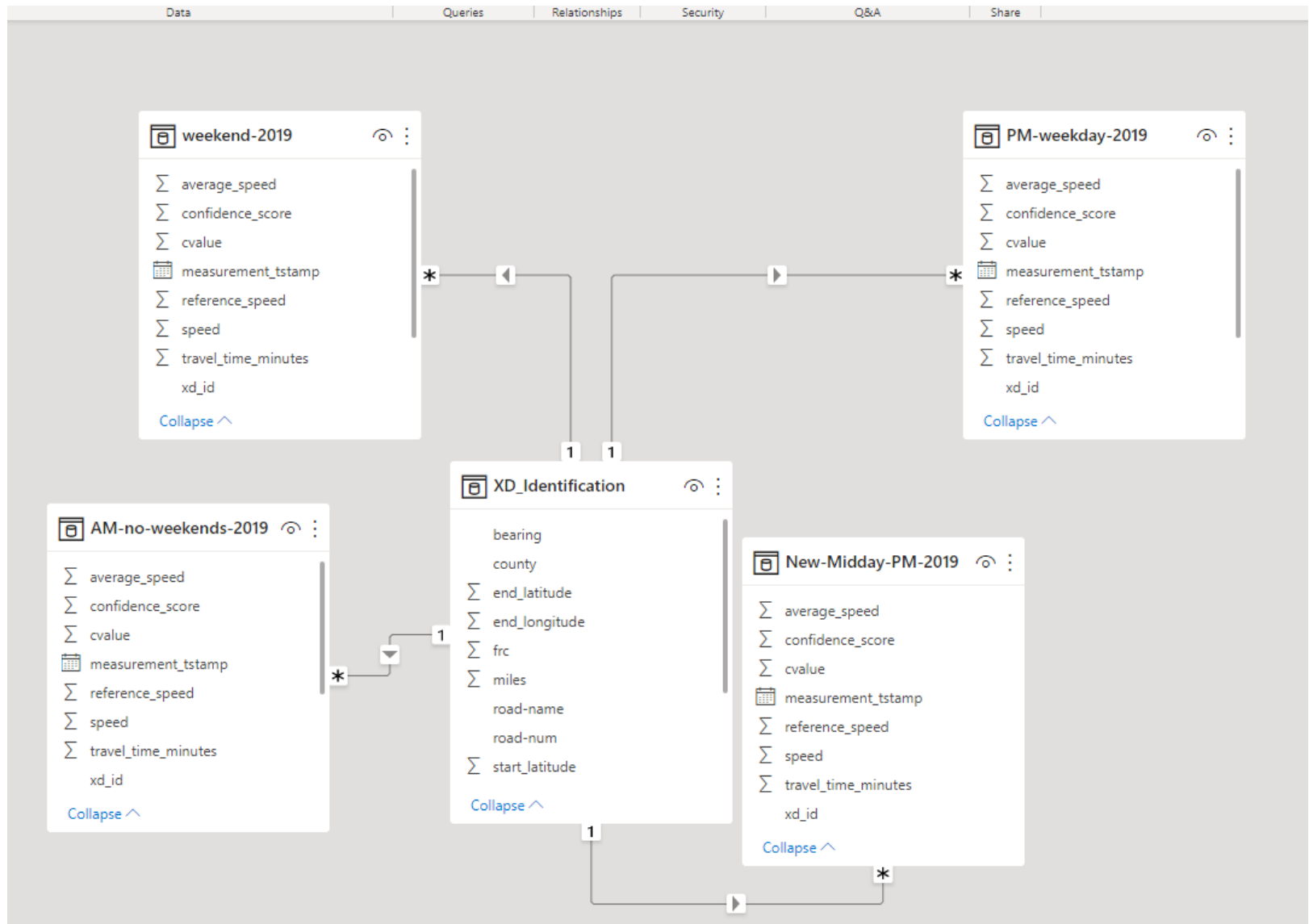
xd	Weekend LOTTR	Evening LOTTR	Midday LOTTR1	AM LOTTR	Average of confidence_score
440978381	1.40	1.33	1.33	1.33	29.98
440990745	1.26	1.21	1.24	1.26	
441016253	1.44	1.43	1.39	1.44	
441014817	1.38	1.34	1.33	1.33	
440975063	1.03	1.03	1.03	1.03	
440975065	1.04	1.04	1.03	1.03	
440975064	1.04	1.04	1.04	1.04	
441018183	1.06	1.06	1.04	1.04	
440985127	1.08	1.11	1.10	1.08	
440981212	1.22	1.61	1.44	1.39	
429058491	1.06	1.16	1.06	1.06	
429058604	1.70	1.76	1.57	1.50	
429058606	1.11	1.20	1.40	1.50	

Power BI Desktop connects multiple different sources of data for analysis. The application will create visuals such as graphs and maps.

<https://powerbi.microsoft.com/en-us/desktop/>



Data Processing



Measurement

LOTTR is based on the amount of time it takes to drive the length of a road segment. To compute it, we:

- 1 | Collect travel times (NPMRDS).
- 2 | Find the 50th pct. and 80th pct. times.
- 3 | Compute LOTTR = 80th/50th percentile.
- 4 | Repeat for 4 periods shown below.

Level of Travel Time Reliability (LOTTR) <small>(Single Segment, Interstate Highway System)</small>		
Monday – Friday	6am – 10am	LOTTR = $\frac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = 1.54
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during all of the time periods		Segment is not reliable

5 | If all are below 1.50, the segment is "reliable".

6 | The statewide metric is the % of person-miles traveled that are "reliable".

Note: for 2017, the data provider and computation methodology changed in NPMRDS for non-Interstate NHS. To account for this, we transpose the previously-established trend to pass through the 2017 data point.



Measurement

- Level of Travel Time Reliability (LOTTR) – PM3

$$\frac{\text{80th Percentile Travel Time}_i}{\text{50th Percentile Travel Time}_i}$$

6 a.m. – 10 a.m., weekdays
10 a.m. – 4 p.m., weekdays
4 p.m. – 8 p.m., weekdays
6 a.m. – 8 p.m., weekends

LOTTR is based on the amount of time it takes to drive the length of a road segment.



Road Segment Highest LOTTR Values

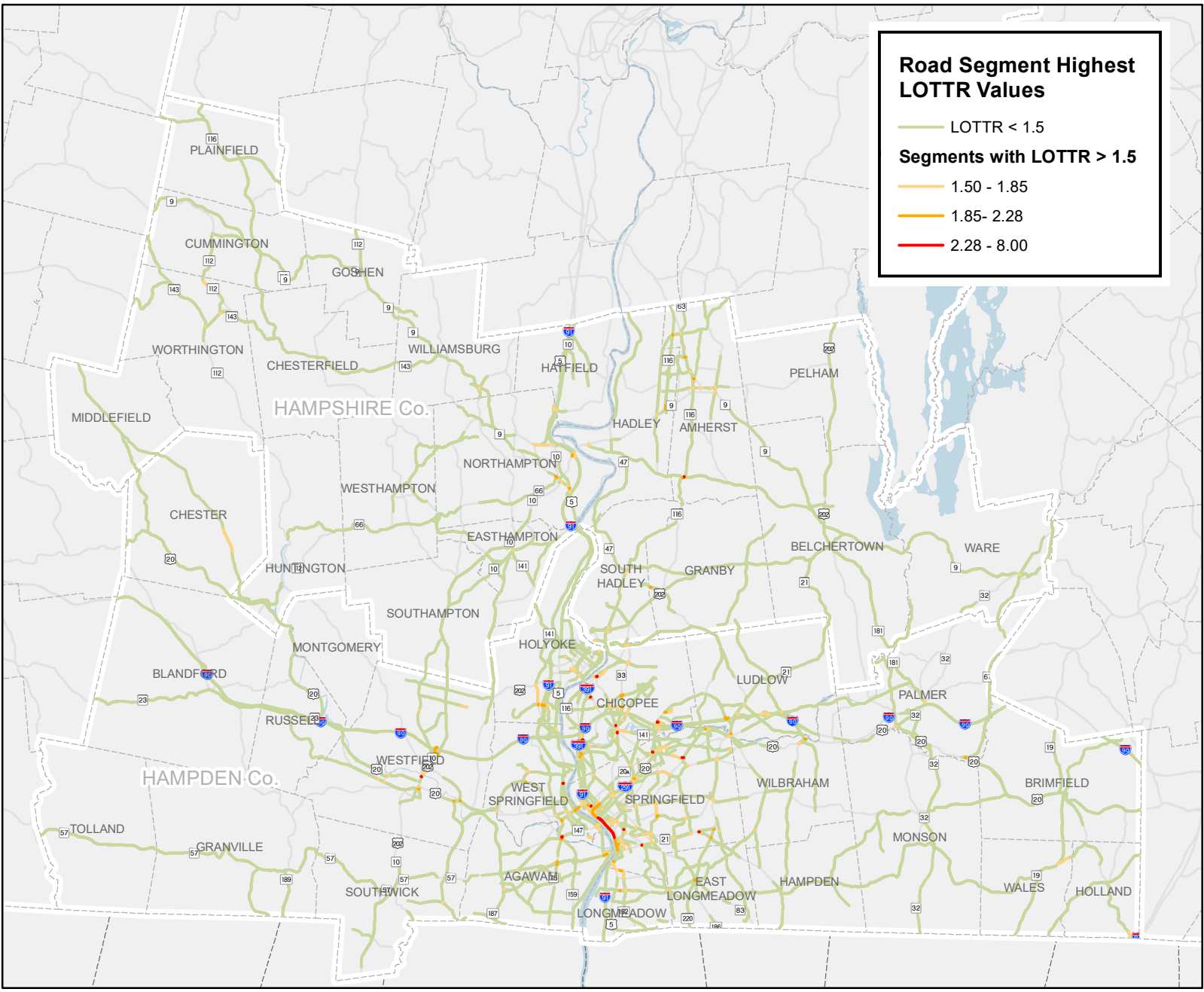
— LOTTR < 1.5

Segments with LOTTR > 1.5

— 1.50 - 1.85

— 1.85 - 2.28

— 2.28 - 8.00



Draft List of Segments with LOTTR 1.5 and Higher

Municipality	Road	Location	HIGHEST_LOTTR
Springfield	BICENTENNIAL HWY	at Allen Street	8
Springfield	BELMONT AVE	at Sumner Ave	6.666666667
Springfield	Pine Street Connector	at Maple Street	5.6
Chicopee	I-90 Exit 51 of Ramp	at I-291 (Right Left turn Lane)	2.875
Westfield	Elm St (route 202) SB - Connector	Route 202 NB to Meadow St	2.8
Springfield	PLAINFIELD ST	Left onto Main street	2.8
Springfield	I-91 S	Exit 6 to Exit 4	2.786516854
Chicopee	I-391 Exit 4	Left onto Crattan Street	2.764705882
West Springfield	RIVER ST	at Memorial Ave	2.7
Chicopee	BUCKLEY BLVD	at Prospect Street	2.583333333
Holyoke	I-91 Exit 17	SB at Route 141	2.555555556
Springfield	COTTAGE ST	at Berkshire Ave	2.527272727
Chicopee	I-391 Exit 3	Left onto Chicopee Street	2.5
Chicopee	I-90 Exit 51 of Ramp	at I-291 (Left, Left turn Lane)	2.5
Chicopee	BROADWAY ST	at East Street	2.461538462
West Springfield	River Steet	at Memorial Ave	2.442857143
Amherst	West Street Southbound Left turn	Bay Road	2.4
Springfield	I-91 S	Sb between Exit 7 and 6	2.355555556
Chicopee	MONTGOMERY ST	at Memorial Drive	2.336842105
Chicopee	PROSPECT ST	at Buckley Blvd	2.333333333
Springfield	I-291 Exit 5	Left at Page Blvd	2.333333333
West Springfield	ELM ST	at Riverdale Road	2.285714286
West Springfield	ELM ST	at Riverdale Road	2.25
Longmeadow	FOREST GLEN RD - WB	at Route 5	2.238095238
Springfield	I-291 SB	S/O Exit 2A	2.235294118
Springfield	I-291 SB	S/O Exit 2A	2.231707317
Chicopee	I-90 On Ramp	Memorial drive WB	2.222222222
Holyoke	I91 Exit 15 Off Ramp	Left at Lower Westfield Rd	2.210526316
West Springfield	RIVER ST	Left turn at Park St	2.181818182
Agawam	RT-159 Main Street NB	at Suffield St	2.166666667
Westfield	LITTLE RIVER RD	at E. Main Street	2.111111111
Chicopee	Granby Road (Rotary)	at memorial Drive to Westover Road	2.083333333

Draft List of Segments with LOTTR 1.5 and Higher

Ludlow	Holyoke Str	at Cross Street	2.05555556
Chicopee	I-90 Exit 49	EB at Memorial Drive	2.0375
West Springfield	MEMORIAL AVE - SB	at River Street	2
Agawam	RT-147 / Springfield St EB	at Suffield St	2
Agawam	RT-147 / Springfield St EB	at Suffield St	2
Chicopee	WEST ST - SB	N/O Center Street	2
Granby	PLEASANT ST SB	at Marylou Lane	2
Granby	PLEASANT ST EB	at Marylou Lane	2
Chicopee	PROSPECT ST WB	at Yelle Street	2
West Springfield	AMOSTOWN RD NB	S/O Dewey St	2
Springfield	LONGHILL ST NB	at Edgeland St	2
Amherst	N. Pleasant St rotary	S/O Governors Dr	2
Amherst	N PLEASANT ST	N/O Governors Dr	2
Amherst	N PLEASANT ST	N/O Eastman	2
Amherst	Bay Road (Rounabout)	SB at west Street	2
Agawam	RT-75 S	at Rt 57 WB off ramp	2
Springfield	at I-91 exit 1 off ramp		2
Chicopee	I-90 Exit 51 of Ramp	at I-291 SB	2
Chicopee	I-90 Exit 51 of Ramp	at I-291 SB	2
Amherst	RT-116 NB	at Route 63	2
Westfield	Court St EB	at Broad Street	2
Chicopee	CHICOPEE ST SB	N/O Grattan Street	2
Amherst	E. Pleasant Street (Roundabout)	at Triangle Street	2
Springfield	ALLEN ST WB	at Bicentennial Hwy	2
Amherst	E. Pleasant Street (Roundabout)	S/O Triangle Street	2
Longmeadow	BLISS RD WB	E/O Longmeadow street	2
Springfield	COOLEY ST NB	at Bicentennial Hwy	2
East Longmeadow	RT-220 SB	S/O Route 83	2
Northampton	Route 9	At I-91 SB on Ramp	2
Springfield	PLAINFIELD ST EB	at I-91 NB on Ramp	2
Hadley	RT-116 NB	N/O Route 9	2
Agawam	Route 75 NB	at Route 57 WB on Ramp	2
West Springfield	Northe End Rotary EB	at Northend Bridge	2
Chicopee	Westover Road (Rotary)	at Memorial Drive NB	2

Draft List of Segments with LOTTR 1.5 and Higher

Northampton	WEST ST	at Route 9 NB	2
Chicopee	Grattan Street WB	at I-391 on Ramp SB	2
Chicopee	Westover Rotary SB	at Granby Road	2
Chicopee	I-391 NB Exit 2	at Central Street SB	2
Northampton	Route 5 Rotary	S/O Conz Street	2
Springfield	NORTH END BRG WB	E/O Northe Edn Rotary	1.975903614
Westfield	RT-10/202 Sb	at I-90 Exit 41	1.957446809
Ludlow	CROSS ST WB	at Holyoke Stret	1.954545455
Westfield	RT-10	at I-90 Exit 41	1.952380952
Springfield	MYRTLE ST SB	at Route 141	1.9375
Springfield	I-91 SB	N/O Exit 7	1.9375
Springfield	I-91 SB	N/O Southend Bridge	1.93220339
East Longmeadow	MAPLE ST EB	at Shaker Road	1.928571429
Chicopee	BLANAN DR Wb	at Burnett Road	1.925925926
Chicopee	WEST ST SB	at Center Street	1.923076923
East Longmeadow	SHAKER RD NB (Rotary)	at Maple Street	1.916666667
Holyoke	HOMESTEAD AVE SB	at Lower Westfield Road	1.916666667
Springfield	I-291 Exit 4 Off Ramp	at St. James Ave	1.911764706
Agawam	RT-57 EB Off Ramp	South End Bridge	1.909090909
Springfield	COOLEY ST SB	at Allen Street	1.909090909
Wilbraham	COTTAGE AVE EB	at Boston Road	1.904761905
Northampton	BRIDGE ST EB	At I-91 SB on Ramp	1.9
Ludlow	EAST ST WB	at Central Street	1.875
Holyoke	I-91 SB On Ramp	from Lower Westfield Road WB	1.875
Springfield	Island Pond Connector EB	at Roosevelt Ave	1.875
Westfield	I-90 Exit 41 Off Ramp WB	over I-90	1.870967742
Westfield	UNION ST EB	at Route 20	1.857142857
West Springfield	RIVER ST SB	at Park Street	1.857142857
Palmer	PARK ST WB	at Route 20	1.857142857
Palmer	LAWRENCE ST		1.847272727
Springfield			1.846153846
Springfield	RIFLE ST		1.842105263
Agawam			1.842105263
Chicopee	CABOT ST		1.833333333

Where are we going?

- Fine tune calculations and streamline process – Power BI
- Update CMP Report and Top Bottleneck List
- Deeper Dive into TOP Bottleneck List
- Freight Congestion Analysis

