

Hudson Townwide Traffic Study

Hudson Townwide Traffic Study 2022-2023 Summary

*Hudson Planning Board Meeting
July 12th 2023*

METROPOLITAN PLANNING ORGANIZATION



NRPC

Value yesterday. Enhance tomorrow. Plan today.

Hudson Townwide Traffic Study

Tonight's Discussion

- Project Purpose
- Scope of work
- Methodology
- Findings
 - LOS for Intersections
 - LOS for Road Segments
 - Problem Areas
- Conclusions

Hudson Townwide Traffic Study

Project Purpose

- Study the long-term impacts of planned and potential future development on the town's arterial highway network and potential spillover onto local streets
- Report on the existing (2022) road capacity (level of service) and forecast of future conditions in 2030 and 2045
- Funded by NRPC's Unified Planning Work Program (UPWP) under the Special Projects category

Hudson Townwide Traffic Study

Scope of Work

- Existing Conditions Analysis (23 intersections & 18 road segments)
 - Data Collection
 - Intersection & Road Segment Level of Service Analysis
- Future Conditions Analysis (2030 & 2045 scenarios)
- Existing & Future Conditions Mapping
- Other Considerations
 - Hudson Master Plan – 2020 update
 - Hudson Logistics Center and other foreseeable developments
 - Hudson Boulevard
 - Other local studies

Hudson Townwide Traffic Study

Methodology

- Data Collection
 - Automatic Traffic Recorder Counts (for road segments)
 - Turning Movement Counts (for intersections)
 - Hudson's GridSmart Traffic Detection System (for intersections)
- Existing Conditions Analysis
 - **Arterial/Road Segment Level of Service:** volume-to-capacity ratios (total volume/total capacity)
 - **Intersection Level of Service:** SYNCHRO software based on the Highway Capacity Manual (HCM) methodology
- Future Conditions Analysis
 - **TransCAD Regional Traffic Model:** Model run for 2030 & 2045; based on current regional land use growth projection & planned infrastructure projects.

Hudson Townwide Traffic Study

Findings – Intersection Level of Service (LOS)

- A qualitative measure used to relate the quality of motor vehicle traffic service.

LOS for Signalized Intersections

LOS	Intersection Delay (seconds)
A	≤10
B	10 to 20
C*	<i>20 to 35</i>
D	35 to 55
E	55 to 80
F	>80

LOS for Unsignalized/ Stop-Controlled Intersections

LOS	Intersection Delay (seconds)
A	≤10
B	10 to 15
C*	<i>15 to 25</i>
D	25 to 35
E	35 to 50
F	>50

Source: Highway Capacity Manual

*** LOS C is the target LOS for intersections**

Hudson Townwide Traffic Study

Findings – LOS for Intersections

#	Intersection	AM Peak			PM Peak		
		2022 LOS	2030 LOS	2045 LOS	2022 LOS	2030 LOS	2045 LOS
1	111-102-3A (Ferry & Chase)	F	F	F	F	F	F
2	Library St & Ferry St	C	C	C	C	D	C
3	Library St & Highland St	C	D	D	D	D	D
4	Burnham Rd & Central St	D	E	E	D	D	D
5	Central-Kimball-Greeley (Rt.111 & Greeley)	F	F	F	F	F	F
6	NH102 & Elm Ave	B	B	B	B	B	B
7	NH 102 & Page Rd#	A*	B	B	A*	B	B
8	Central St & Chase St	A*	A*	A*	A*	A*	A*
9	Central St & Library St	B	B	B	C	B	B
10	Lowell Rd & Central Rd	B	B	B	C	C	C
11	Lowell Rd & Pelham Rd	C	C	C	D	E	E
12	Lowell Rd & Executive Dr	C	C	D	B	C	C
13	Lowell Rd-Hampshire Dr-Oblate Dr	A	A	A	A	A	A
14	Lowell Rd & Wason Rd#	D	D	D	D	D	D
15	Lowell Rd & Sagamore Bridge Rd#	B	B	B	E	D	E
16	Lowell Rd & Walmart Blvd#	C	B	B	C	C	C
17	Lowell Rd & Rena Ave#	A	A	A	B	B	B
18	Lowell Rd/Dracut Rd/Steele Rd#	C	C	C	F	C	F
19	Dracut Rd & Sherburne Rd#	A*	B	B	F*	B	B
20	Kimball Hill Rd & Bush Hill Rd	A*	A*	A*	A*	A*	A*
21	Central St & Belknap Rd	A*	A*	A*	A*	A*	A*
22	Lowell Rd & Fox Hollow Dr	B	A	B	C	C	D
23	Lowell Rd & Birch St	A	A	A	B	B	B

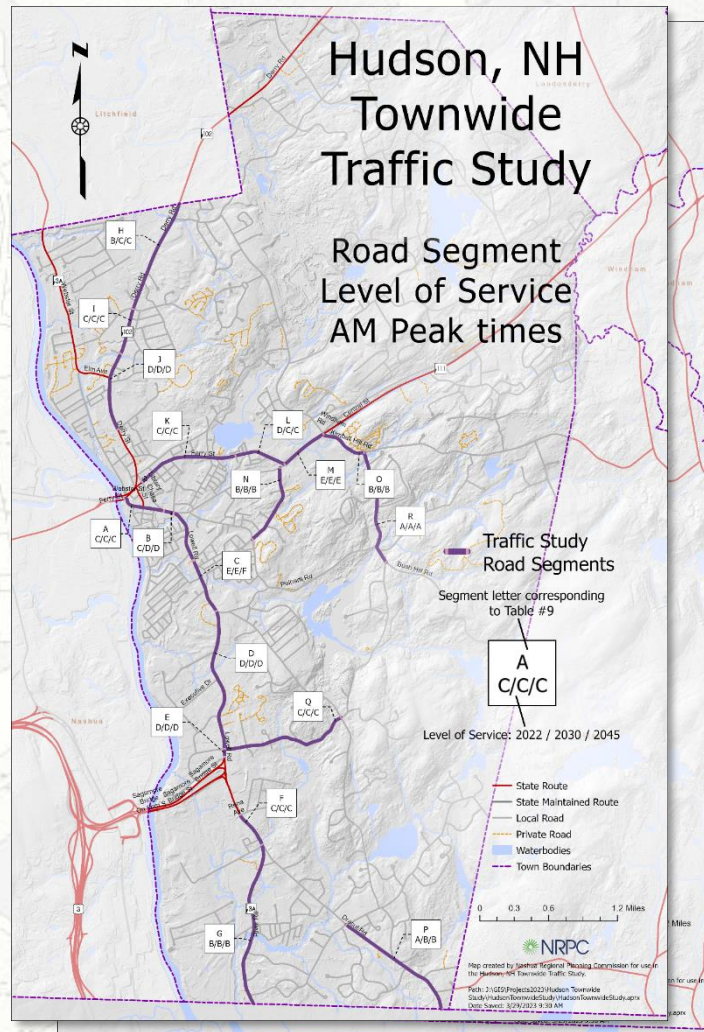
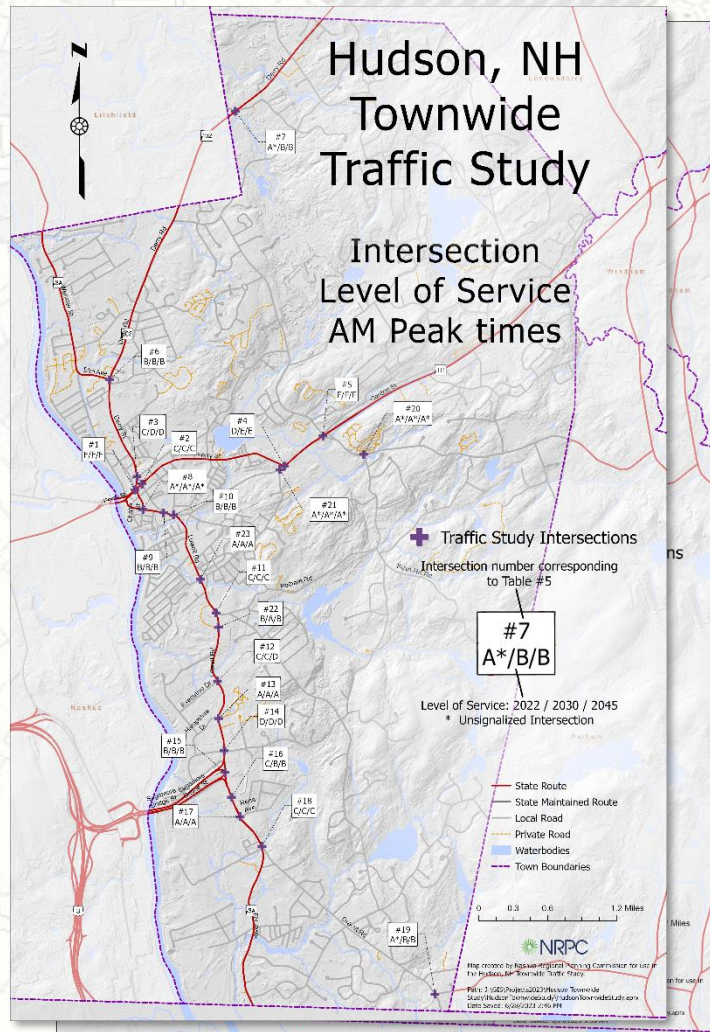
* Unsignalized intersection in various configurations.

Blue LOS indicates an improvement in LOS and Red LOS indicates a decline in LOS

Improvement made to the intersection in 2030 and 2045

Hudson Townwide Traffic Study

Findings – Maps



METROPOLITAN PLANNING ORGANIZATION



Value yesterday. Enhance tomorrow. Plan today

Hudson Townwide Traffic Study

Findings – Road Segment Level of Service (LOS)

- A qualitative measure used to relate the quality of motor vehicle traffic service.

Single-Lane Arterials Uninterrupted Flow

LOS	Ave Speed = 50		Ave Speed = 40		Ave Speed = 30	
	V/C	VPL/Hr	V/C	VPL/Hr	V/C	VPL/Hr
A	0.30	480	0.30	420	0.30	360
B	0.40	640	0.40	560	0.40	480
C	0.60	960	0.60	840	0.60	720
D	0.80	1280	0.80	1120	0.80	960
E	1.00	1600	1.00	1400	1.00	1200
F	>1	>1600	>1	>1400	>1	>1200

Signalized Arterials

LOS	<2 signal int/mi.		2-4 signal int/mi.		>4 signal int/mi.	
	V/C	VPL/Hr	V/C	VPL/Hr	V/C	VPL/Hr
A
B	0.40	420	0.40	360
C	0.60	630	0.60	540	0.60	450
D	0.80	840	0.80	720	0.80	600
E	1.00	1050	1.00	900	1.00	750
F	>1	>1050	>1	>900	>1	>750

Hudson Townwide Traffic Study

Findings – LOS for Road Segments

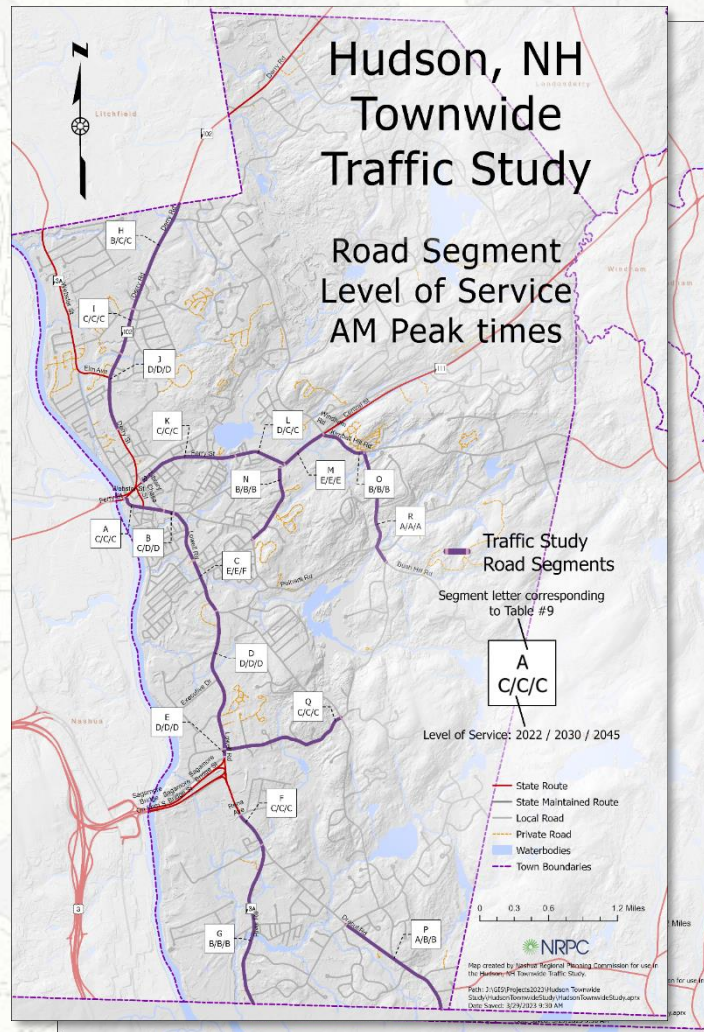
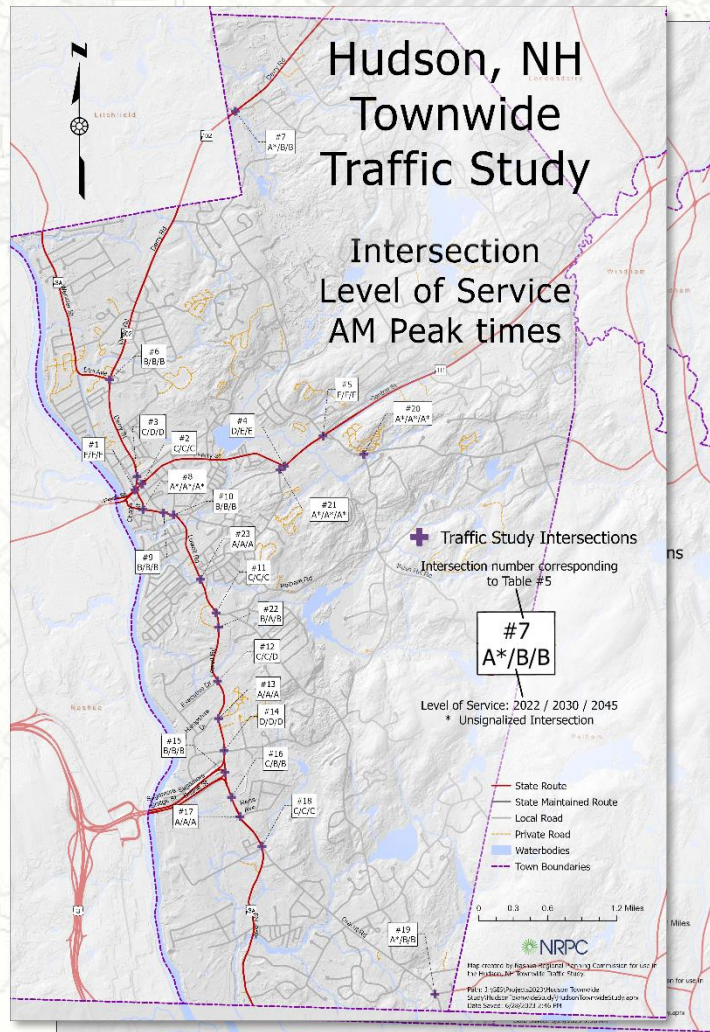
#	Segment	AM Peak						PM Peak					
		2022		2030		2045		2022		20330		2045	
		V/C	LOS	V/C	V/C	LOS	V/C	V/C	LOS	V/C	LOS	LOS	V/C
A	NH 3A (Central St) west of Library St	0.4	C	0.5	C	0.5	C	0.6	D	0.7	D	0.7	D
B	NH 3A (Central St) east of Library St	0.5	C	0.6	D	0.6	D	0.7	D	0.8	D	0.8	E
C	Lowell Rd south of Central St	0.9	E	1.0	E	1.0	F	1.1	F	1.2	F	1.3	F
D	Lowell Rd south of Pelham Rd	0.7	D	0.7	D	0.7	D	0.8	D	0.9	D	0.9	E
E	Lowell Rd south of Wason Rd#	0.6	D	0.7	D	0.8	D	0.8	E	1.0	E	1.0	F
F	Lowell Rd south of Rena Ave#	0.5	C	0.5	C	0.5	C	0.7	D	0.6	D	0.7	D
G	River Rd at Mass State Line	0.2	B	0.3	B	0.3	B	0.3	B	0.4	B	0.4	C
H	NH 102 at Litchfield Town Line#	0.3	B	0.5	C	0.5	C	0.4	B	0.6	C	0.6	C
I	NH 102 north of Easy St	0.5	C	0.5	C	0.6	C	0.7	D	0.7	D	0.7	D
J	NH 102/3A north of Ledge Rd	0.7	D	0.7	D	0.7	D	0.9	E	0.9	E	0.9	E
K	NH 111 (Ferry St) east of Library St	0.4	C	0.5	C	0.5	C	0.5	C	0.5	C	0.5	C
L	NH 111 (Burnham Rd) north of Central St	0.5	D	0.5	C	0.5	C	0.6	D	0.6	D	0.6	C
M	NH 111 (Central St) west of Kimball Hill Rd	0.8	E	0.9	E	0.9	E	0.9	E	1.0	F	1.0	F
N	Belknap Rd south of Central St	0.2	B	0.2	B	0.2	B	0.2	B	0.3	B	0.3	B
O	Kimball Hill Rd south of NH 111	0.3	B	0.4	B	0.4	B	0.4	B	0.4	C	0.4	C
P	Dracut Rd at Mass State Line#	0.2	A	0.2	B	0.2	B	0.3	B	0.4	C	0.4	C
Q	Wason Rd east of NH 3A	0.4	C	0.4	C	0.4	C	1.0	E	1.0	E	1.0	F
R	Bush Hill Rd north of Wason Rd	0.2	A	0.2	A	0.2	A	0.3	A	0.4	B	0.4	B

Blue LOS indicates an improvement in LOS and Red LOS indicates a decline in LOS

Improvement made to the intersection in 2030 and 2045

Hudson Townwide Traffic Study

Findings – Maps



METROPOLITAN PLANNING ORGANIZATION



Value yesterday. Enhance tomorrow. Plan today

Hudson Townwide Traffic Study

Conclusions

- LOS C is the target LOS for most intersections and roadways
- There are areas in Hudson where the intersection and road segment LOS is currently below LOS C or will be in the future
- Problematic intersections/segments & possible mitigation strategies
 - Examples...

Hudson Townwide Traffic Study

Conclusions – Intersection Example

- Ferry St/Chase St (NH111/NH102/NH3A)
 - LOS F, all analysis years, AM & PM
- Mitigation Strategies
 - Further optimization of traffic signal timing for future traffic patterns
 - Coordinate with the City of Nashua to optimize traffic flow on the Taylor Falls Bridge
 - Reconfigure the intersections to improve traffic flow
 - Update GridSmart system to accommodate intersections with more than 4 legs.

Hudson Townwide Traffic Study

Conclusions – Road Segment Example

- Lowell Road south of Central Street (b/t Central St & Pelham Rd)
 - LOS E (2022, 2030) LOS F (2045) AM Peak Periods
 - LOS F (2022, 2030 & 2045) PM Peak Periods
- Mitigation Strategies
 - TDM measures that reduce traffic volume in general
 - Explore potential alternative corridors such as the Hudson Boulevard concept

Hudson Townwide Traffic Study

Discussion

Matt Waitkins - AICP

Nashua RPC
MPO Coordinator

(603) 417-6566 Work
mattw@nashuarpc.org

30 Temple St
Suite 310
Nashua, NH 03060