





CHELSEA HARBOR/DOWNTOWN NORWICH MOBILITY STUDY

Transportation Advisory Committee Meeting #2

Existing Conditions Presentation

September 12, 2023







Meeting Agenda

- Introductions
 - In person & online
- Existing Conditions Presentation
 - Summary
 - Findings
 - Issues Observed
 - Public Engagement
- Discussion/Next Steps





Existing Conditions - Scope of Work



Task 3. Data Collection

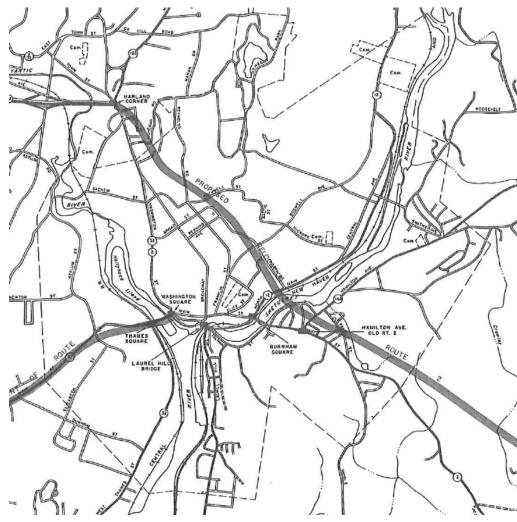
- 3.1 Transportation Data Collection
 - Turning Movement Counts from 12 intersections
 - Automatic Traffic Recorder Data from 9 locations
 - 5 years of Crash Data
 - Field Work/Reconaissance
 - Review local and regional Transportation Plans
 - Mapping
- 3.2 Land Use and Development Data
- 3.3 Pedestrians, Bicyclists, and Vulnerable Users



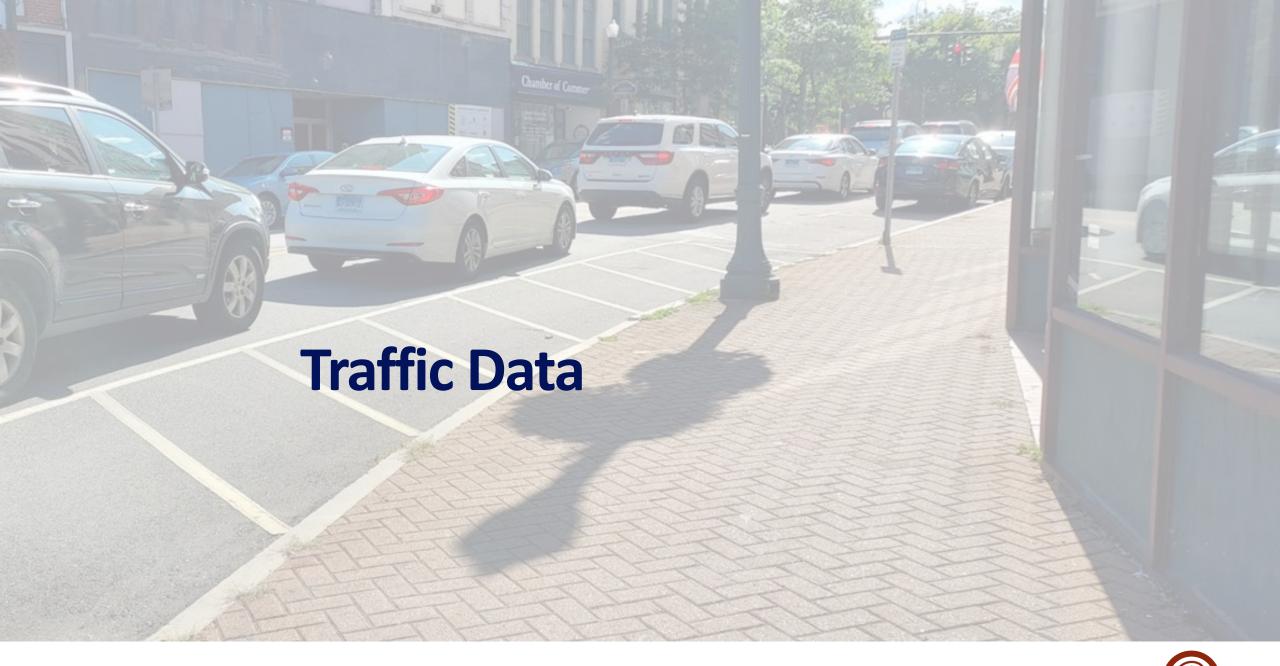


Norwich Transportation Context

- Mid-20th Century concern was getting through traffic quickly to beaches in Westerly, RI from Hartford
- Topography makes it difficult to route traffic around downtown Norwich
- Proposal to extend Route 2 highway north of downtown rejected
- TOPICS program of signals and one-way streets unpopular
- Other proposals to route traffic south of downtown never materialized
- Recent Complete Streets Policy, planning for other modes

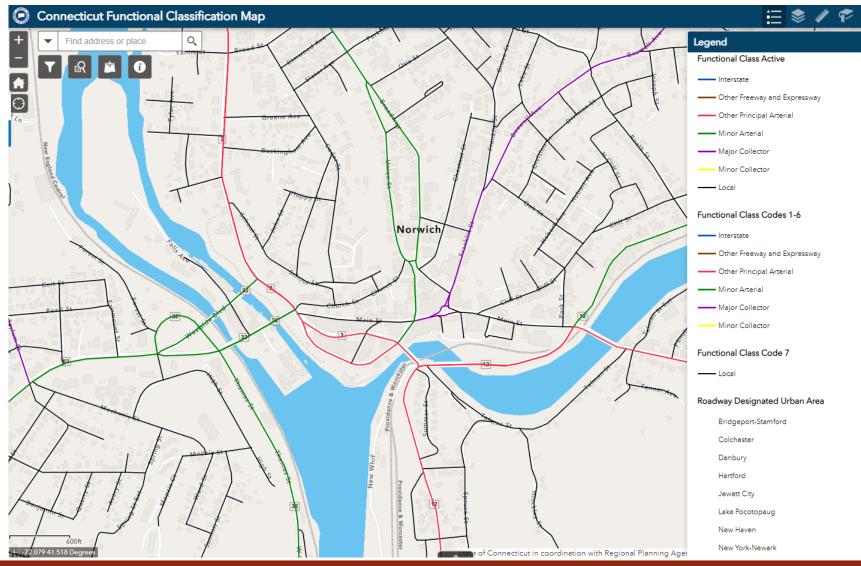








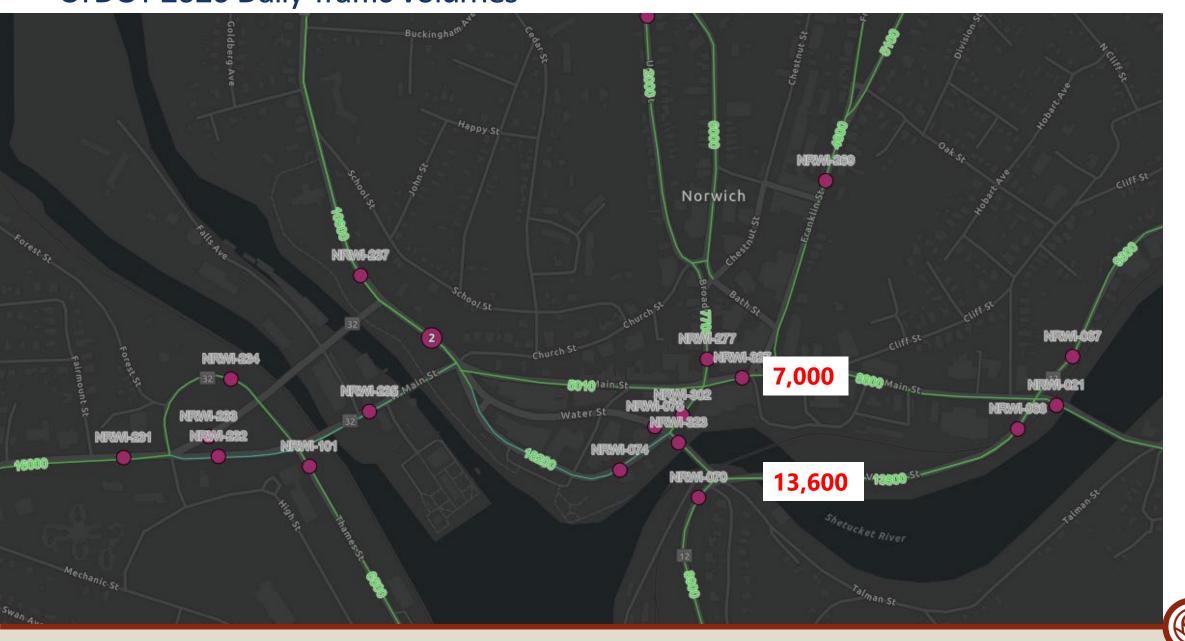
City Roadway System – State Highways



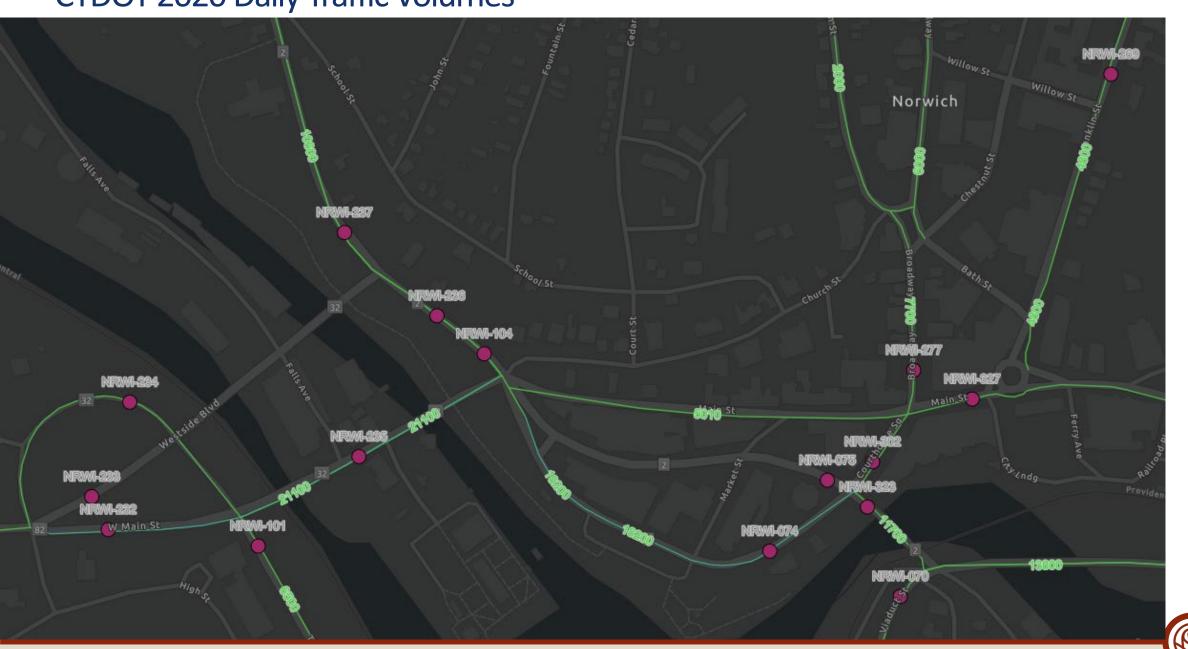
- Principal Arterials in Downtown
 - Route 2
 - Route 12
- Minor Arterial Route 82
- Major Collector Franklin
 Street
- All Others Locals



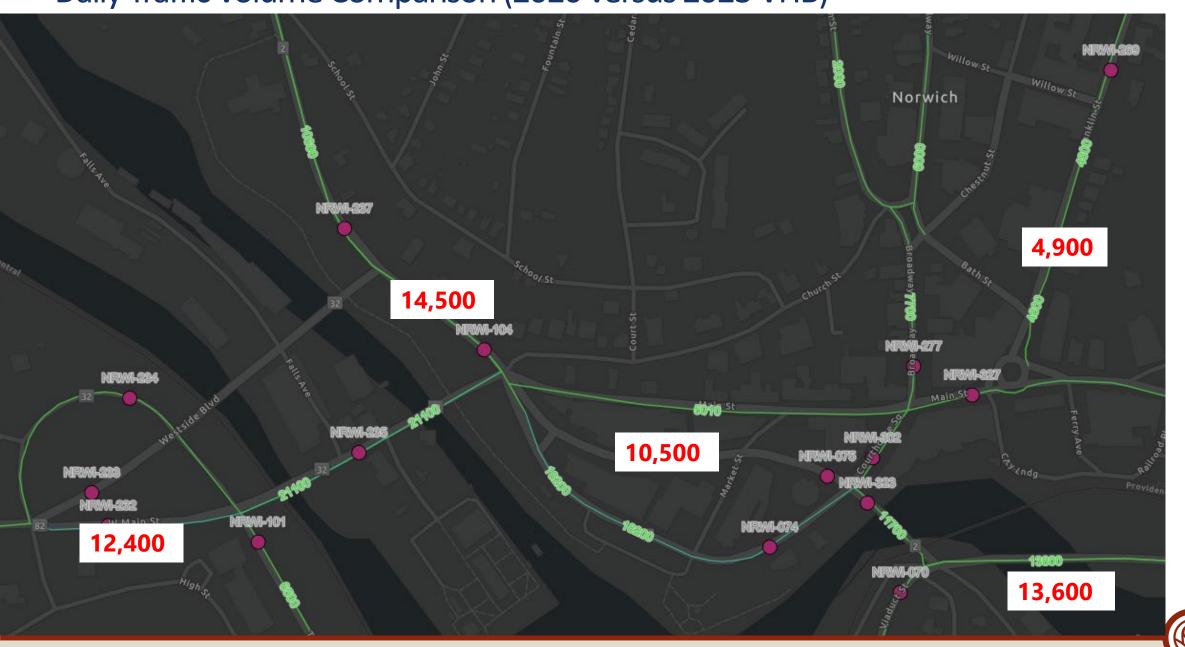
CTDOT 2020 Daily Traffic Volumes



CTDOT 2020 Daily Traffic Volumes



Daily Traffic Volume Comparison (2020 versus 2023 VHB)



Traffic Data Summary

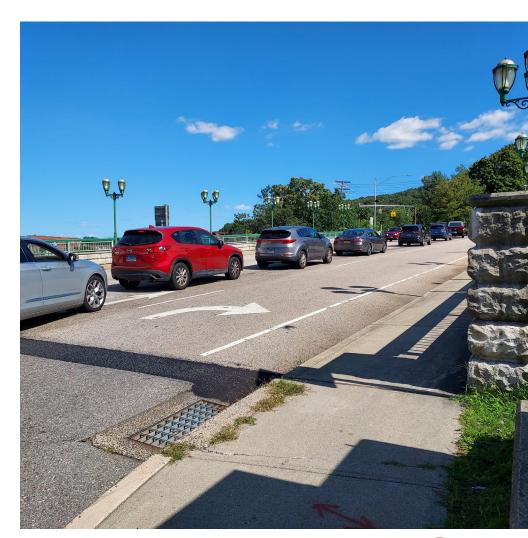
- 2023 Traffic Counts Similar to CTDOT ADT (Website)
- Higher Than CTDOT 2020 ADT
- 85th Speeds Not Unusually High
- June Traffic Counts Thursday Saturday Daily
 Volume Similar at Some Locations
- Non-traditional Peak Hours
 - Weekday Mid-Day Peaks
 - 3pm Afternoon Peak Hours
 - Highest of Day

		111 1 5	0.1	_
Thu -Jun-23	Fri 09-Jun-23	Week Day	Sat 10-Jun-23	Sun 11-Jun-23
31	22	Average 26	45	40
6	12	9	18	24
16	6	11	16	21
19	17	18	8	10
	21		24	16
22		22		
73	80	76	44	34
130	134	132	54	34
229	204	216	83	94
213	207	210	140	116
204	205	204	172	173
169	194	182	208	201
171	226	198	211	195
192	223	208	228	200
151	222	186	233	201
218	194	206	251	189
189	214	202	234	184
201	245	223	205	182
238	245	242	274	169
159	314	161	241	137
130	211	159	221	129
124	181	136	159	102
76	115	88	103	80
61	83	67	90	72
53	76	58	80	43
3075	3651	3240	3342	2646



Observations: Traffic

- Typical Route 2 through traffic
- Higher speeds along Chelsea Harbor and Water Street due to wider roadways
- Signals Causing Congestion at Key Intersections
- Queuing observed:
 - Water St & Chelsea Harbor Dr/Courthouse Sq, going eastbound on Route 2
 - Main St & Courthouse Sq/Broadway, going westbound, backing up into roundabout





Intersection Capacity Analyses

- Turning Movement Traffic Counts
- Developed Traffic Model From Aerials
- Synchro Model for Three Peak Periods
- Extensive Modeling with Signal Timings

- CTDOT Closed Loop, City TBC/TC
- Roadway Geometries, Storage Lanes
- Signal Timing and Phasing
- Calibrated From Existing Observations





Traffic Analyses – Signalized Intersections

Table 6 Signalized Intersection Capacity Analysis Summary – Existing Conditions

	Mov't		Morn	ing Pea	k Hour			Midda	ay Peak	Hour			Eveni	ng Pea	k Hour	
Location	i MOV t	v/c¹	Del ²	LOS ³	Q50 ⁴	Q95 ⁵	v/c	Del	LOS	Q50	Q95	v/c	Del	LOS	Q50	Q95
Route 82 at	EB T/R	0.40	16	В	77	203	0.44	17	В	94	279	0.58	20	С	132	#362
West Side Blvd. &	WBL	0.43	48	D	50	91	0.26	44	D	31	69	0.52	44	D	64	100
N. Thames St/	WBT	0.30	7	Α	42	180	0.31	8	Α	45	207	0.47	9	Α	76	270
N. High St.	WB R	0.15	7	Α	0	31	0.09	6	Α	0	31	0.13	7	Α	0	21
	NB L/T/R	0.04	43	D	0	0	0.04	43	D	0	0	0.06	42	D	0	17
	SB L/T/R	0.21	44	D	14	46	0.03	43	D	0	0	0.13	42	D	10	23
	Overall	0.33	15	В			0.33	15	В			0.44	17	В		
Route 82 at	EB L/T	0.24	9	Α	36	119	0.32	10	Α	48	170	0.46	15	В	60	222
N. Thames St /	EB R	0.05	11	В	0	30	0.04	13	В	0	30	0.06	20	В	0	m34
Thames St.	NBT	0.10	33	C	20	38	0.15	36	D	25	50	0.13	32	C	28	53
	NB R	0.17	34	C	0	39	0.15	36	D	0	52	0.14	32	C	0	53
	SB L	0.09	33	C	12	29	0.06	35	D	7	18	0.05	31	C	7	16
	SB T	0.66	42	D	124	178	0.62	43	D	103	128	0.70	42	D	146	146
	Overall	0.32	23	C			0.36	21	C			0.47	23	C		
Route 2 at	SE T/R	0.62	31	C	94	152	0.46	28	C	64	114	0.51	29	C	66	105
West Side Blvd.	NW L	0.34	12	В	63	177	0.39	13	В	77	212	0.49	14	В	104	#278
	NW T	0.31	4	Α	0	148	0.30	4	Α	0	146	0.38	4	Α	0	191
	Overall	0.40	18	В			0.39	16	В			0.47	17	В		



Traffic Analyses – Signalized Intersections

Table 6 Signalized Intersection Capacity Analysis Summary – Existing Conditions

	Mov't		Morn	ing Pea	k Hour			Midda	ay Peak	Hour			Eveni	ng Pea	k Hour	
Location	IVIOV C	v/c¹	Del ²	LOS ³	Q50 ⁴	Q95 ⁵	v/c	Del	LOS	Q50	Q95	v/c	Del	LOS	Q50	Q95
Route 2 (Water St)	WB L/R	0.49	32	С	20	61	0.51	32	С	28	90	0.74	51	D	33	#112
at Route 82 &	WB R	0.53	33	C	21	65	0.53	33	C	28	94	0.79	62	Е	35	#126
Church St. &	NB T/R	0.60	21	С	86	215	0.60	22	С	92	212	0.69	26	С	99	#257
Main St.	SB L/T	0.54	21	С	65	134	0.33	20	С	43	115	0.33	22	C	40	114
	NE L	0.32	20	С	41	140	0.30	21	C	43	131	0.46	26	C	61	192
	NE T/R	0.45	23	C	45	#208	0.74	32	C	102	#377	0.70	34	C	86	#367
	NE R	0.20	19	В	0	70	0.28	20	C	0	71	0.27	23	C	0	86
	Overall	0.49	22	C			0.60	24	C			0.61	29	C		
Chelsea Harbor Dr.	EB L/T/R	0.18	1	Α	21	34	0.22	2	Α	29	47	0.23	2	Α	33	53
at Market Street	NB T/R	0.12	37	D	5	26	0.12	36	D	5	30	0.10	36	D	5	26
	SB L/T	0.26	38	D	10	32	0.38	39	D	16	41	0.41	39	D	18	45
	Overall	0.19	3	Α			0.23	4	Α			0.25	4	Α		
Route 2 (Water St)	NW T/R	0.33	7	Α	27	184	0.35	8	Α	32	170	0.39	9	Α	43	207
at Courthouse Sq.	NE L/T	0.22	22	C	10	42	0.29	22	C	16	60	0.44	22	C	32	87
& Chelsea Harbor	NE R	0.42	4	Α	0	30	0.45	4	Α	0	41	0.60	5	Α	0	21
	Overall	0.39	8	Α			0.42	8	Α			0.56	9	Α		



Table 6 Signalized Intersection Capacity Analysis Summary – Existing Conditions (Continued)

	Mov't		Morn	ing Pea	k Hour			Midda	y Peak	Hour			Evenir	ng Pea	k Hour	
Location	IVIOV t	v/c¹	Del ²	LOS ³	Q50 ⁴	Q95 ⁵	v/c	Del	LOS	Q50	Q95	v/c	Del	LOS	Q50	Q95
Main St at	WBT	0.39	17	В	115	183	0.39	17	В	120	218	0.43	18	В	132	#276
Broadway &	NB L	0.01	34	C	0	0	0.01	34	C	0	0	0.02	34	C	0	0
Courthouse Sq.	NB R	0.11	8	Α	0	34	0.13	8	Α	0	36	0.20	9	Α	0	30
	SB L	0.49	31	C	60	99	0.48	33	C	59	99	0.49	32	C	67	113
	SB R	0.40	31	C	43	77	0.48	33	C	54	92	0.55	33	C	68	116
	Overall	0.32	20	В			0.32	19	В			0.37	20	В		
Route 2 at	WBL	1.06	100	F	~188	#305	0.82	47	D	117	#192	0.83	49	D	122	#240
Viaduct Rd./	WBR	0.55	18	В	58	108	0.63	20	В	70	127	0.56	18	В	62	#136
Laurel Hill Rd/	NB L/T/R	0.42	43	D	5	11	0.49	41	D	11	16	0.61	67	Е	7	19
Summer St/	SE L/T	1.01	79	Е	150	#411	>1.20	>120	F	226	#647	>1.20	>120	F	307	#758
Talman St	SE R	0.41	16	В	51	150	0.20	13	В	24	91	0.29	14	В	36	125
	NW L/T/R	0.42	41	D	10	8	0.30	42	D	3	13	0.52	49	D	6	10
	NE L/R	>1.20	>120	F	~191	#213	0.89	56	E	89	#162	>1.20	>120	F	~155	#247
	Overall	1.07	104	F			1.00	82	F			1.20	>120	F		
												l				
Franklin St at	WB L/R	0.50	31	C	7	42	0.44	29	C	15	47	0.44	31	C	14	57
Boswell St	NBT	0.20	18	В	15	65	0.28	23	C	24	86	0.32	22	C	35	118
/Oak St	NB R	0.14	6	Α	8	59	0.20	8	Α	30	109	0.30	9	Α	49	160
	SB L	0.21	24	C	5	33	0.29	27	C	9	44	0.32	27	C	11	49
	SB T	0.17	12	В	10	70	0.15	16	В	14	60	0.14	13	В	15	63
	SW L/R	0.48	19	В	29	116	0.32	18	В	38	111	0.46	22	C	49	141
	Overall	0.33	16	В			0.29	17	В			0.36	17	В		
Route 2 at	EB L	0.16	29	С	12	43	0.22	29	С	18	65	0.43	29	С	27	86
Route 12	EB T/R	0.61	39	D	97	200	0.61	39	D	94	#231	0.71	43	D	121	#325
(Viaduct Rd &	WBL	0.86	44	D	128	#315	0.76	34	C	110	#291	0.94	61	Е	130	#374
N. Main St)	WB T/R	0.64	34	C	149	#392	0.66	36	D	138	#406	0.90	57	Е	211	#574
	NB L/T/R	0.96	69	Ε	196	#587	>1.20	>120	F	~384	#816	>1.20	>120	F	~373	#872
	SB L	0.40	22	С	35	115	0.37	22	С	26	98	0.36	23	С	29	86
	SB T/R	0.60	22	C	154	416	0.45	19	В	104	320	0.52	21	C	138	324
	Overall	0.86	40	D			0.94	89	F			0.99	78	E		

Traffic Analyses – Signalized Intersections

- Problem Intersections LOS
- LOS E/F Conditions
 - Notorious Viaduct Road Intersection
 - Too Many Approaches
 - Route 2 at Route 12/Nmain
 - LOS E/F and Queues
- All Others Operate Favorably



Traffic Analyses – Stop Sign Controls

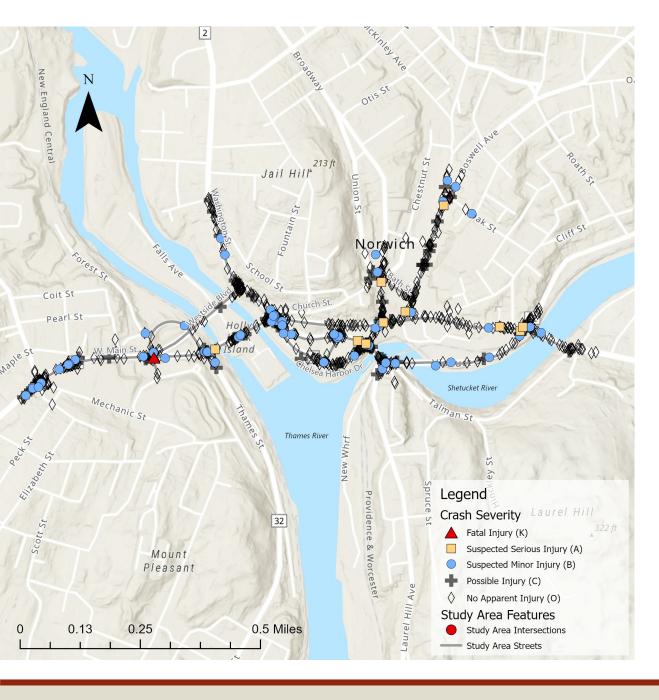
Table 7 Unsignalized Intersection Capacity Analysis Summary – Existing Conditions

		Moi	rning f	Peak H	our	Mid	dday P	eak Ho	ur	Evening Peak Hour				
Location	Mov't	v/c¹	Del²	LOS ³	Q95 ⁴	v/c	Del	LOS	Q95	v/c	Del	LOS	Q95	
		•	•											
Bath St at	WB T/R	0.06	8	Α	0.2	0.06	8	Α	0.2	0.06	8	Α	0.2	
Chestnut St	NW L	0.17	7	Α	0.6	0.14	7	Α	0.5	0.14	7	Α	0.5	
	NW T	0.06	8	Α	0.2	0.06	8	Α	0.2	0.06	8	Α	0.2	
Chestnut St at	WB L	0.1	8	Α	0.3	0.09	8	Α	0.3	0.09	8	Α	0.3	
Broadway	SB T	0.07	6	Α	0.2	0.1	6	Α	0.4	0.1	6	Α	0.4	
Main St at	EB L/T	0.32	6	Α	1	0.27	5	Α	1	0.38	7	Α	2	
Franklin St	WB T/R	0.34	6	Α	1	0.39	7	Α	2	0.40	7	Α	2	
	SB L/R	0.20	5	Α	1	0.12	4	Α	0	0.19	5	Α	1	









All Study Area Crashes

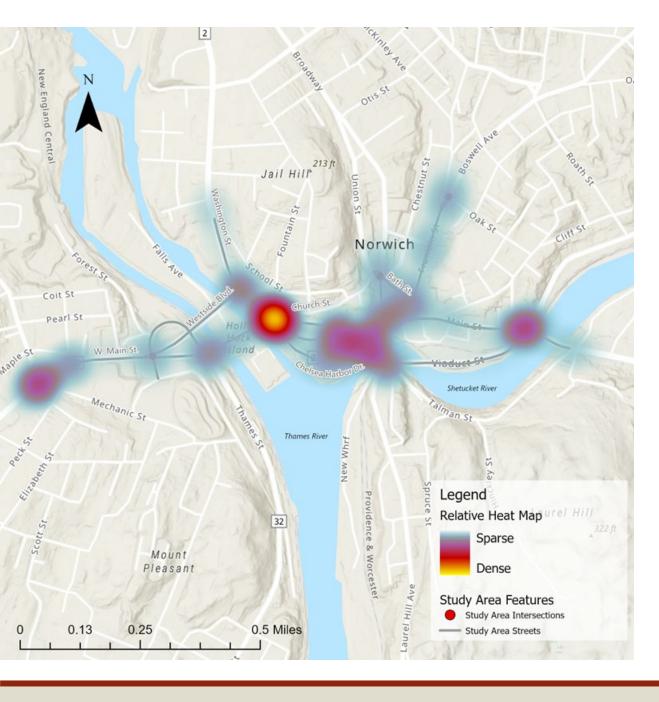
- For the 2018-2022 period, 938 crashes
- 17% were injury crashes
- Most common crash types were front to rear (rear-end) at 43%, sideswipe same direction at 20%, and angle crashes at 18%
- December accounts for highest proportion of crashes by month (10%)
- Friday accounts for highest proportion of crashes by day of the week (17%)



Manner of Collision Summary

	Crash Severity	Number of Crashes	Percent of Total						
	Fatal Injury(K)	1	0%]					
	Suspected Serious Injury (A)	10	1%						
Ī	Suspected Minor Injury (B)	72	8%						
İ	Possible Injury (C)	77	8%	1					
	No Apparent Injury (O)	778	83%	1					
	Total	938	100%			_	_		
	KAB Crashes			K	Α	В	С	0	Total
		83	9%						
	Fusikha Dana	404	43%			25	40	339	404
ŀ	Front to Rear	183				4	2	177	183
	Sidoswino Samo Direction	103	20%			4		111	103
ŀ	Sideswipe, Same Direction	166			3	21	19	123	166
sion	Angle	100	18%		3	21	19	123	100
Manner of Collision	Sideswipe, Opposite Direction	23	2%			2	3	18	23
er of	Other	21	2%			3	2	16	21
ann	Front to Front	14	1%	1		1	2	10	14
≥	Rear to Side	6	1%					6	6
Ī	Rear to Rear	1	0%					1	1
ſ	Unknown	14	1%					14	14
	Not Applicable*	106	11%		7	16	9	74	106





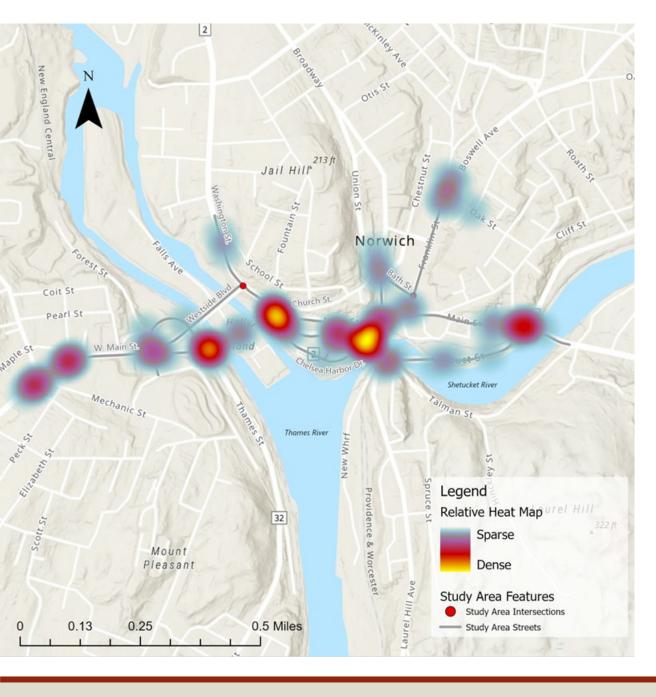
KABCO Heatmap

Map shows density of crashes at study intersections for all crash severities.

- K = fatality
- A = Suspected Serious Injury
- B = Suspected Minor Injury
- C = Possible Injury
- O = No apparent injury

Highest crash density at Washington Square





KAB Heatmap

Map shows density of crashes at study intersections for highest crash severities.

- K = fatality
- A = Suspected Serious Injury
- B = Suspected Minor Injury

High severities at Washington Square, Water St/Chelsea Harbor Dr, W. Main St/Thames St, and Main Street/Viaduct Rd

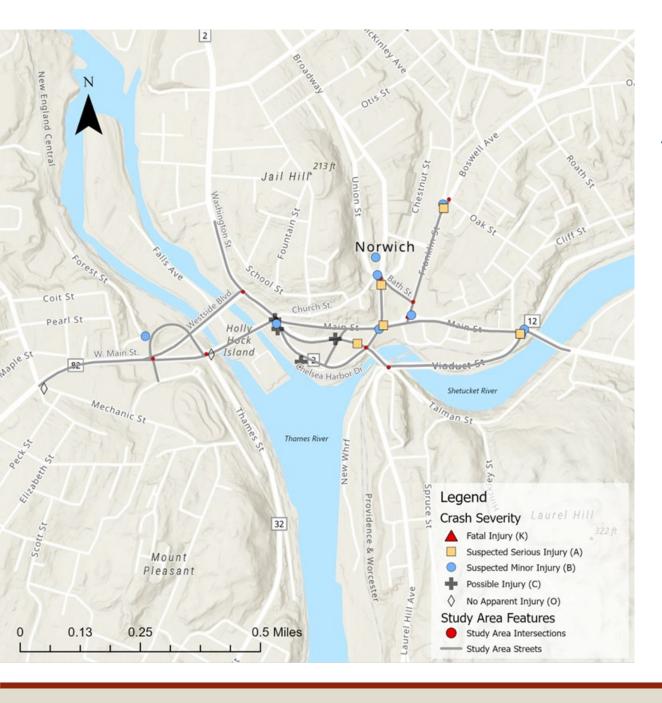


Key Intersection Crash Summary

Intersection	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Apparent Injury (O)	Total
W. Main St. and N. Thames St.	1		2	1	10	14
(westbound)						
W. Main St. and N. Thames St.		1	6	3	9	19
(eastbound)						
Washington St. and Westside					24	24
Blvd.						
Washington St. and Main St.			6	8	82	96
Chelsea Harbor Dr./Courthouse		1	7	8	15	31
Sq. and Water St.						
Water St. and Viaduct St.			2	2	15	19
Viaduct St. and Main St.		2	3	3	30	38
Main St. and Franklin St.		1	1		9	11
Franklin St. and Bath St.					8	8
Main St. and			3	1	7	11
Broadway/Courthouse Sq.						
Broadway and Union			1	1	4	6
St./Chestnut St.						
Franklin St. and Boswell St.		1		1	12	14
TOTAL	1	6	31	28	225	291*

^{*291} of the 408 total intersection crashes occurred at the twelve key intersections. Intersection crashes are identified as directed in the 2022-2026 Connecticut Strategic Highway Safety Plan. The other intersections with the highest crashes – making up 70% of the remaining crashes – were Market St/Water St (32), W. Main St/Asylum St (39) and Franklin St/Willow St (11).





Pedestrian Crashes

There were 20 pedestrian crashes in the 2018-2022 period.

- 70% of pedestrian involved crashes resulted in a KAB level injury level (most severe)
- Pedestrians account for nearly 17% of all KAB level injuries despite having commute to work mode share of only 2.4% and represent only 2% of total crashes
- Most pedestrian crashes happened in lowlight conditions (70%)



Pedestrian Crashes at Key Intersections

Key Intersections	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Apparent Injury (O)	Total
W. Main St. and N. Thames St. (westbound)						0
W. Main St. and N. Thames St. (eastbound)					1	1
Washington St. and Westside Blvd.						0
Washington St. and Main St.			1	2		3
Chelsea Harbor Dr./Courthouse Sq. and Water St.		1				1
Water St. and Viaduct St.						0
Viaduct St. and Main St.		1	2			3
Main St. and Franklin St.			1			1
Franklin St. and Bath St.						0
Main St. and Broadway/Courthouse Sq.		1	1			2
Broadway and Union St./Chestnut St.		1	1			2
Franklin St. and Boswell St.		1	1			2
Crashes not at a key intersection			2	2	1	5
TOTAL	0	5	9	4	2	20



Jail Hill Norwich Coit St Church St Pearl St Mechanic St Thames River Legend Crash Severity Suspected Serious Injury (A) Mount Suspected Minor Injury (B) Pleasant Possible Injury (C) No Apparent Injury (O) Study Area Features 0.5 Miles 0.13 0.25 —— Study Area Streets

Bicycle Crashes

4 bicycle crashes occurred in the 2018-2022 period.

- Minor Injuries at three locations:
 - W. Main St. and N. Thames St.
 - Washington St. and Main St.
 - W. Main St. and Ann St.
- 1 No Injury crash at W. Main St. and American Way

All four bicycle crashes occurred in daylight



Emphasis Area Crash Summary

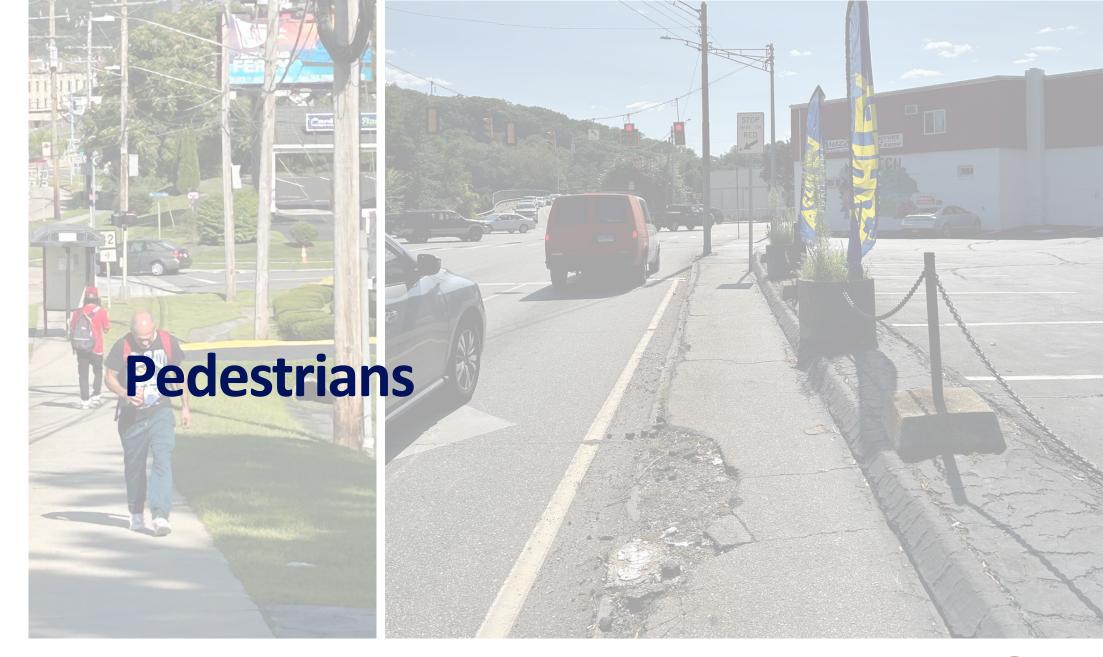
Emphasis Area	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Apparent Injury (O)	Total
Roadway Departure	1	2	10	12	90	115
Intersection	1	6	43	40	318	408
Impaired Driving			3	4	25	32
Aggressive Driver			26	34	274	334
Unrestrained Occupants		1	1	3	34	39
Motorcycle*		1	10	3	8	22
Distracted Driving			6	10	35	51
Pedestrians		5	9	4	2	20
Bicyclists**				3	1	4
Young Drivers (15-20)***			18	27	130	175
Older Drivers (65+)***	1	2	20	21	148	192

^{*}Motorcycle involved crashes resulted in the second highest proportion of KAB level injuries. 50% of motorcycle crashes resulted in a KAB injury.



^{**} Bicyclists are not listed as a core emphasis area for Connecticut but are included due to their relevance to this project. All bicycle crashes occurred in daylight.

^{***}Young drivers and older drivers are not core emphasis areas in the Connecticut Strategic Highway Safety Plan but are considered Additional Safety Areas.

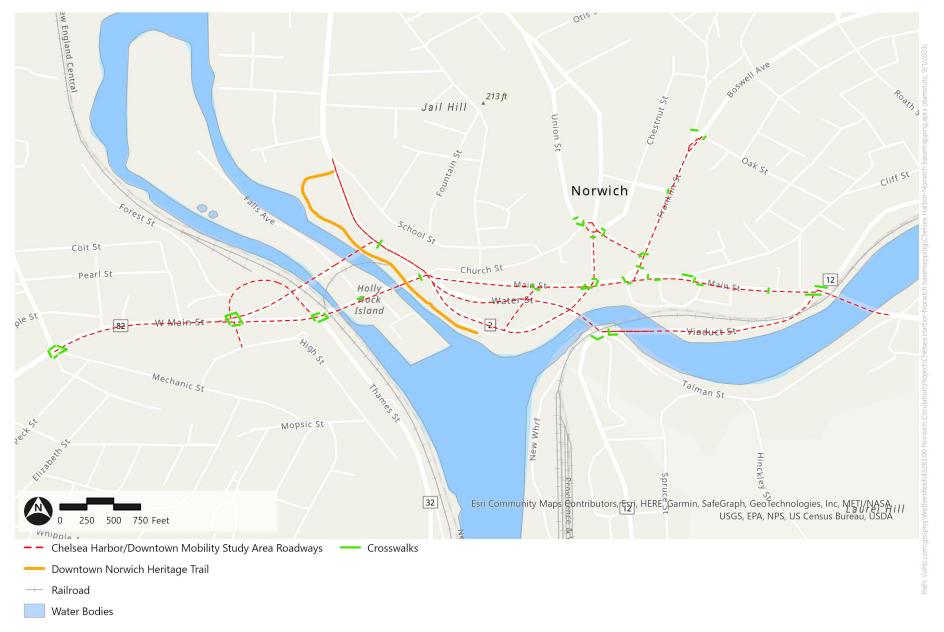




Crosswalks Study Area Roadways

Chelsea Harbor/Downtown Norwich Mobility Study | Norwich, CT



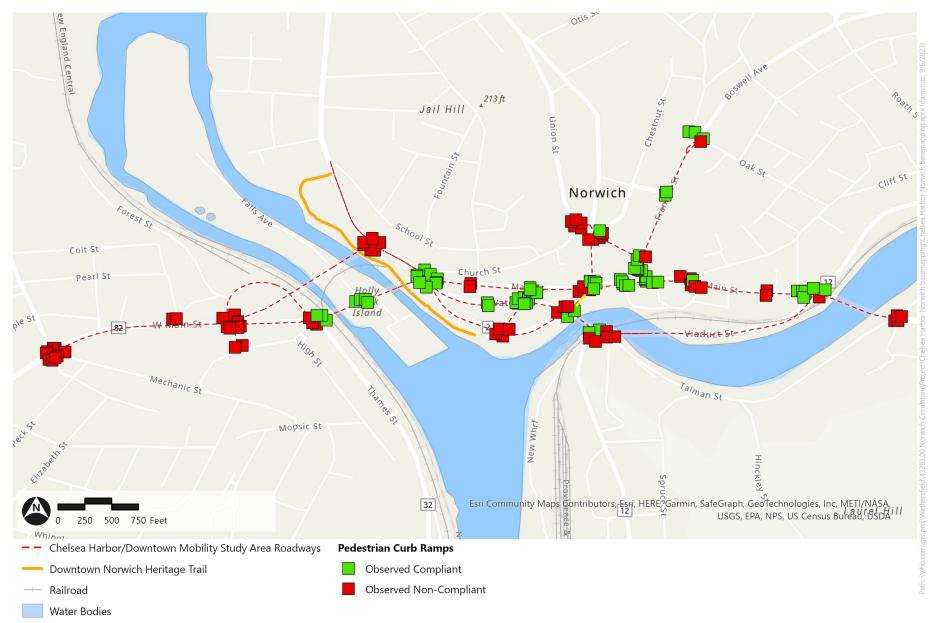




Curb Ramps Along Study Area Roadways

Chelsea Harbor/Downtown Norwich Mobility Study | Norwich, CT











Observations: Public Transit

- Google Map and GIS data do not appear to align with on-the-ground experience
- Lack of signage for bus stops bus shelters lack route information
- When present, signage affixed to other signs and posts, hard to notice
- Some bus stops in conflict with on-street parking spaces – not dedicated for bus stop





Public Transit Along Study Area Roadways

Chelsea Harbor/Downtown Norwich Mobility Study | Norwich, CT



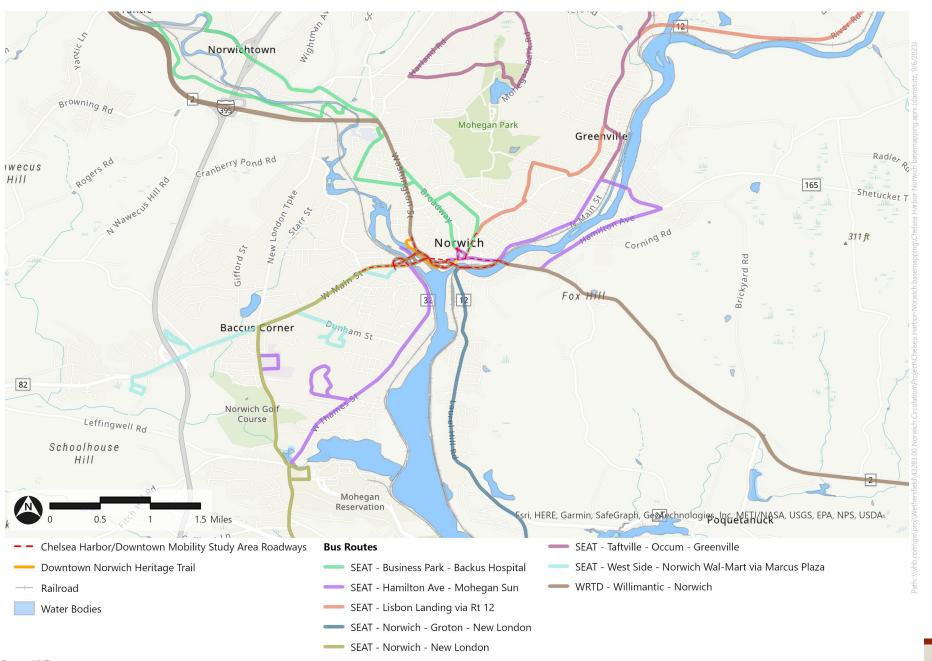




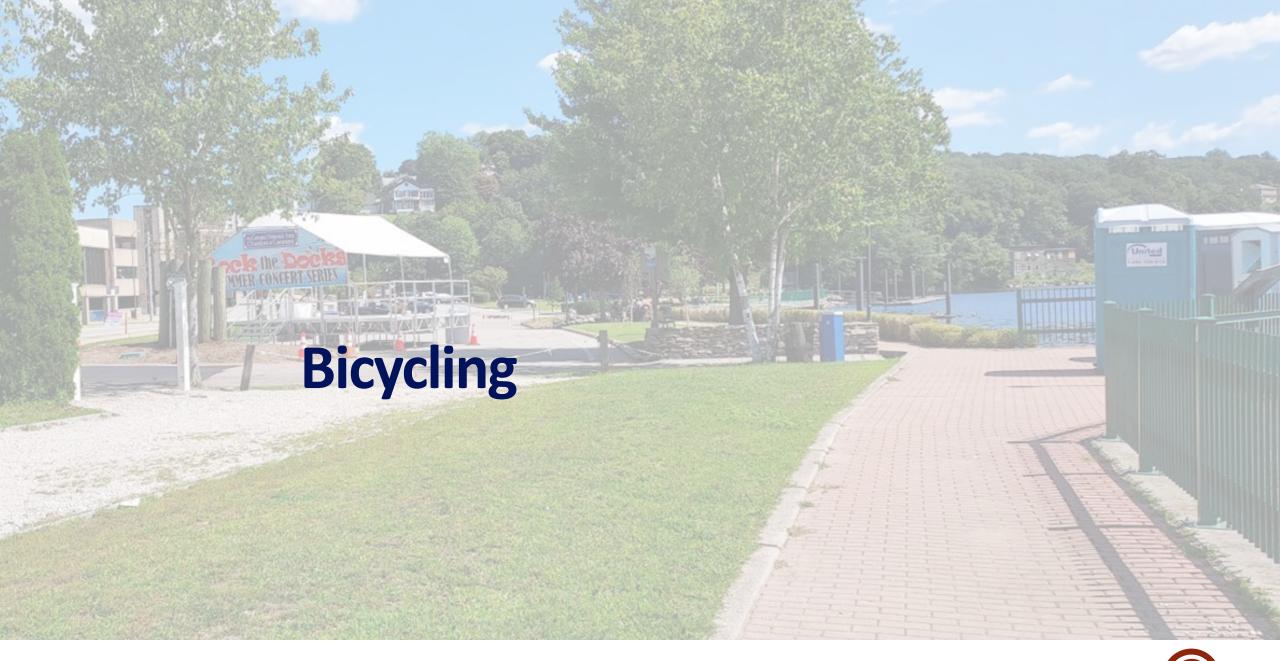
Public Transit in the Norwich Region

Chelsea Harbor/Downtown Norwich Mobility Study | Norwich, CT











Observations: Bicycling

- No bicycle lanes or bike pavement markings observed
- A handful of bike racks near the library
- Few people observed bicycling, except near Howard T. Brown Park
- Heritage Walk Trail only off-road facility with limited connectivity, but oriented to pedestrians





Bicycling Along Study Area Roadways

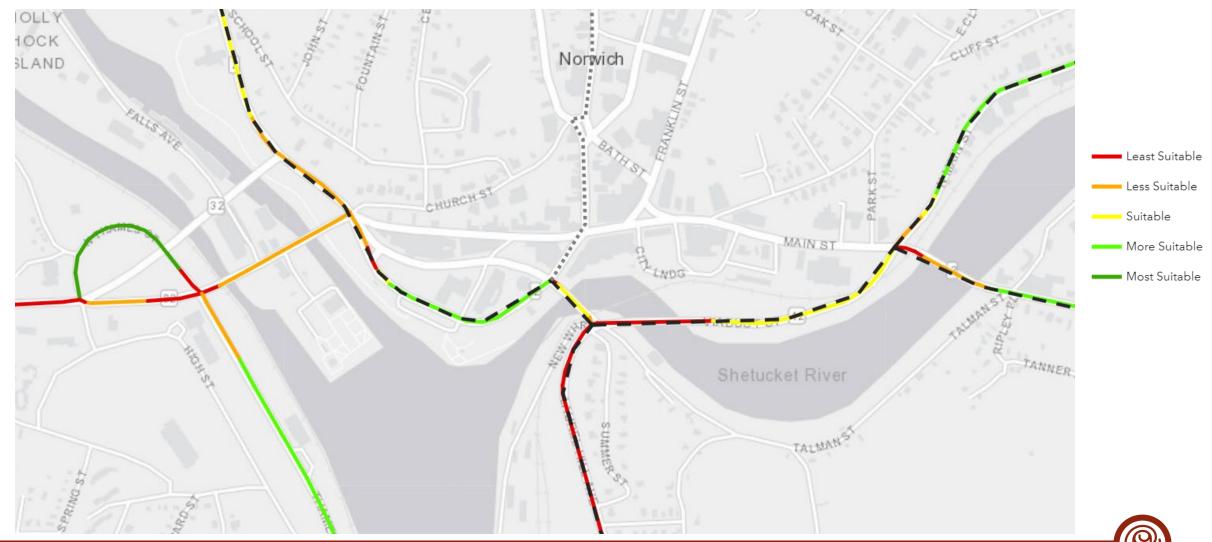
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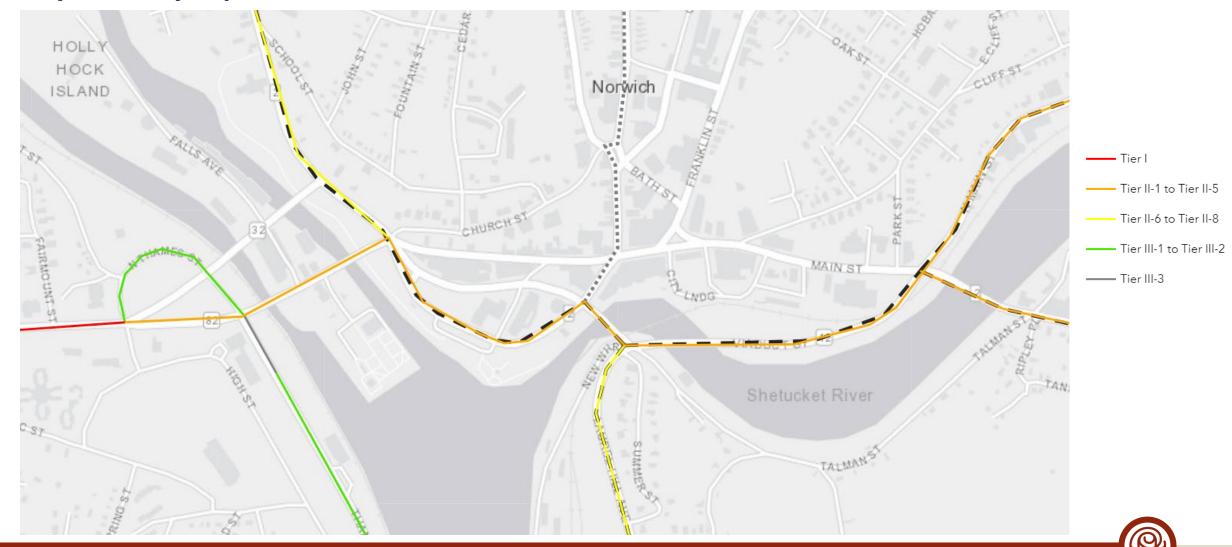




CTDOT Active Transportation Plan Bicycle Suitability Map



CTDOT Active Transportation Plan Bicycle Facility Implementation Tiers

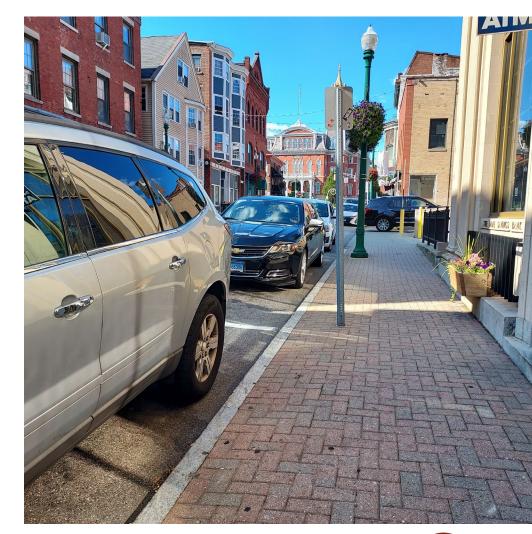






Observations: Parking

- Wide array of parking regulations and restrictions focused on directly adjacent land uses
- Time-limited on-street parking may change in a single block (e.g., 2-hour parking from 7 am – 4 pm and 8 am – 6 pm)
- Main Street, Broadway, Courthouse Square with heavy parking occupancy
- Off-street garages and parking lots underutlized

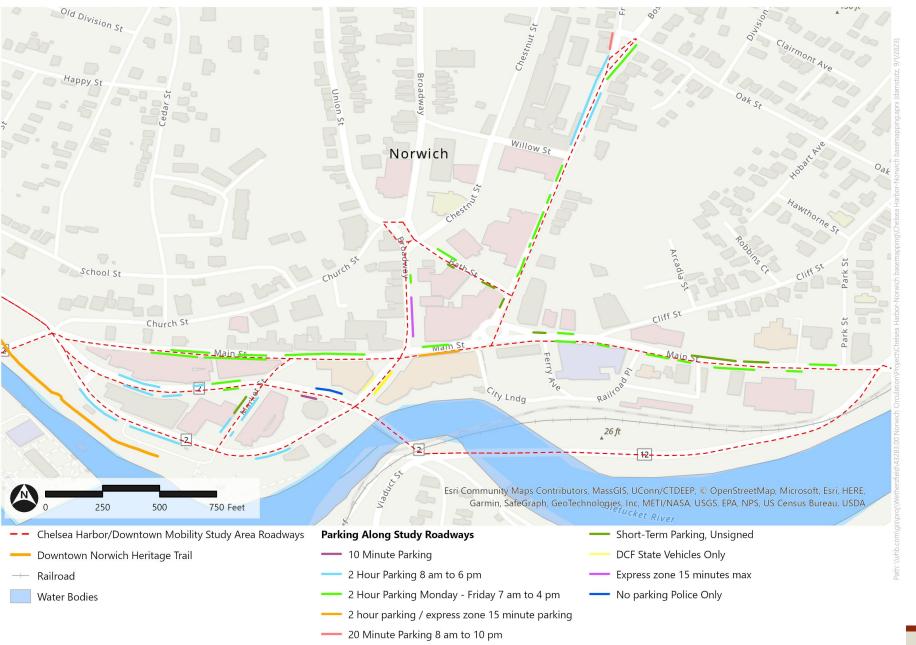




Parking Along Study Area Roadways

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Public Survey

Public Survey is now available!

https://www.surveymonkey.com/r/MFBKFVB

Or https://tinyurl.com/norwichstudy

Spanish version: https://www.surveymonkey.com/r/F3L5BPX

Survey is on study website through end of September.

10 people have taken the survey so far.

Sample comments:

- More events
- Safety is an issue
- More bike lanes
- Unappealing or Unsafe:
 - Washington Square
 - Franklin Roundabout
 - Lack of sidewalks

Chelsea Harbor and Downtown Norwich Mobility Study Public Survey

This public survey is being conducted on behalf of the Southeastern Connecticut Council of Governments (SCCOG) and the City of Norwich for the Chelsea Harbor/Downtown Norwich Mobility Study. The Study is a key component in the City of Norwich's efforts to provide streets that are safe and accessible for all users, including pedestrians, bicyclists, motorists, and transit users of all ages and abilities. The Study goals include improvements to livability, mobility, access to essential services, safe routes to the waterfront and Howard T. Brown Park, the Intermodal Transportation Center, the Norwich Marina and other downtown destinations. This will be accomplished through expanded bicycle facilities, sidewalk network improvements, and the reconfiguration of multi-lane, high-speed through streets that currently exist as a barrier between downtown proper and the City's waterfront area, East, and West Side neighborhoods. The Study will develop alternatives to the current configuration and traffic flows of the study area with the above goals in mind.





Rock the Docks Event

- Wednesday August 23, 6-8 pm
- Howard T. Brown Park
- Interacted with ~30+ individuals
- Anecdotal Summary from speaking to crowd:
 - Many people from surrounding region
 - Many don't come to downtown often except for events
 - People expressed concern over safety in downtown
 - Limited engagement for completing the survey because most people came to listen to the music





Rock the Docks Map Comment Summary

Safety at Intersections

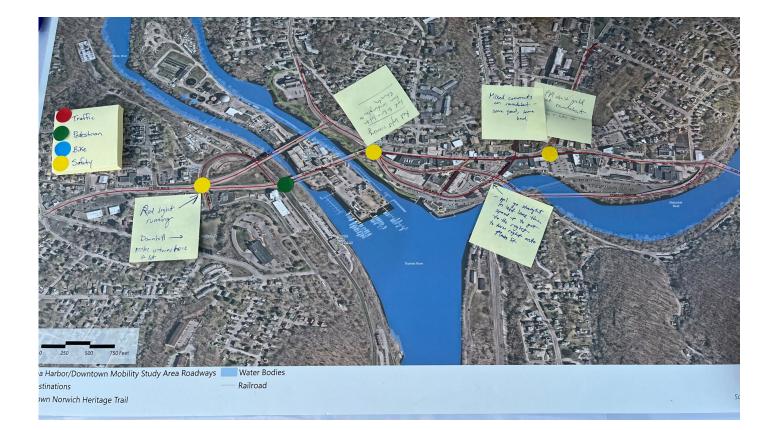
- 82 and Asylum
 - Red light running
 - U-Turns
- Route 82 and Washington Street
- Route 2 and Route 12
 - Lane jockeying

Franklin square Roundabout

Back up at roundabout due to signal

Pedestrian Safety

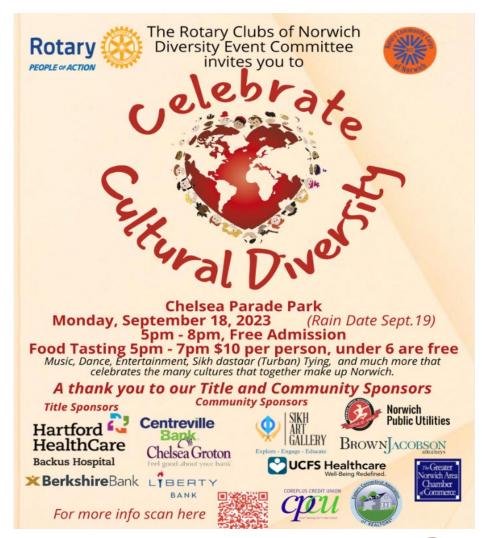
❖ Route 82 over the Yantic River





2023 Celebrate Cultural Diversity Schedule Main Event

- September 18, 2023
- Event Table
- VHB and VN will participate in the event and continue to share information about the study and collect comments





Missing Information

- Local GIS Data, including land use, ROW and property delineation mapping
- Development pipeline information and planned developments locations/addresses
- CTDOT ADA GIS Inventory Map
- Construction plan as-builts for Route 82 roadway and bridge plans
- Recent parking study of downtown







https://downtownnorwichmobilitystudy.com/











Transportation Advisory Committee Existing Conditions Presentation