



Travel Demand Model Methodology

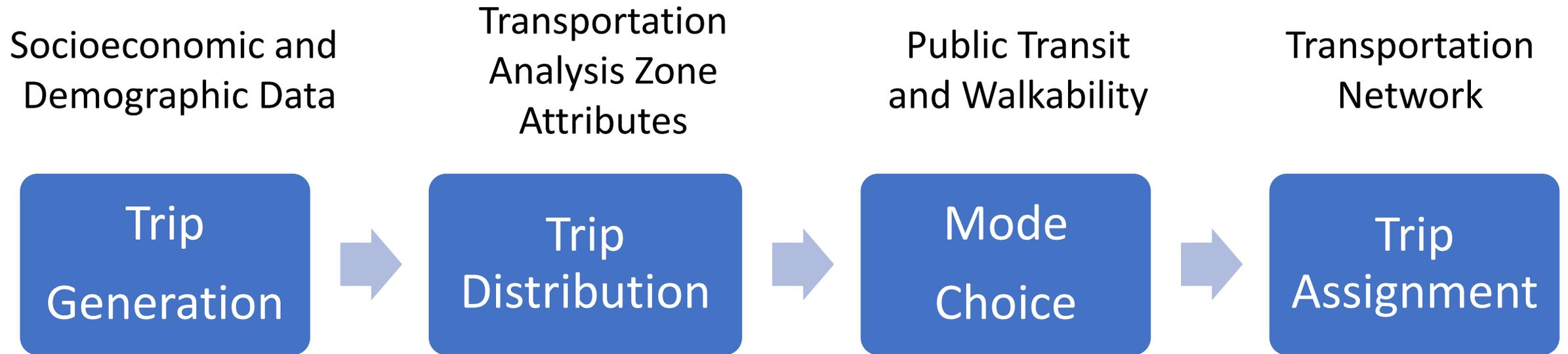
Christian Matthews

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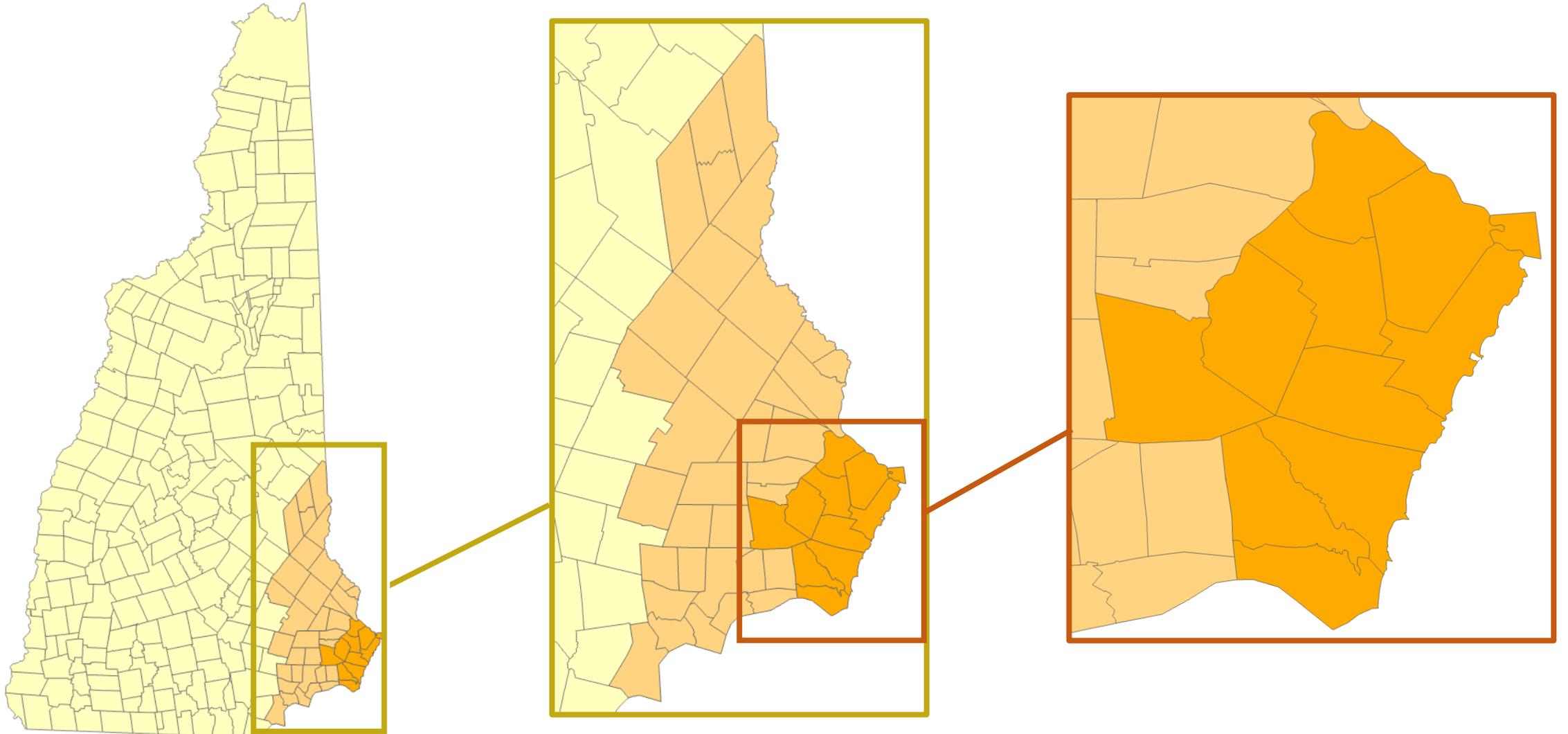
Agenda

1. Review Model
2. Web Maps

How Does it Work?

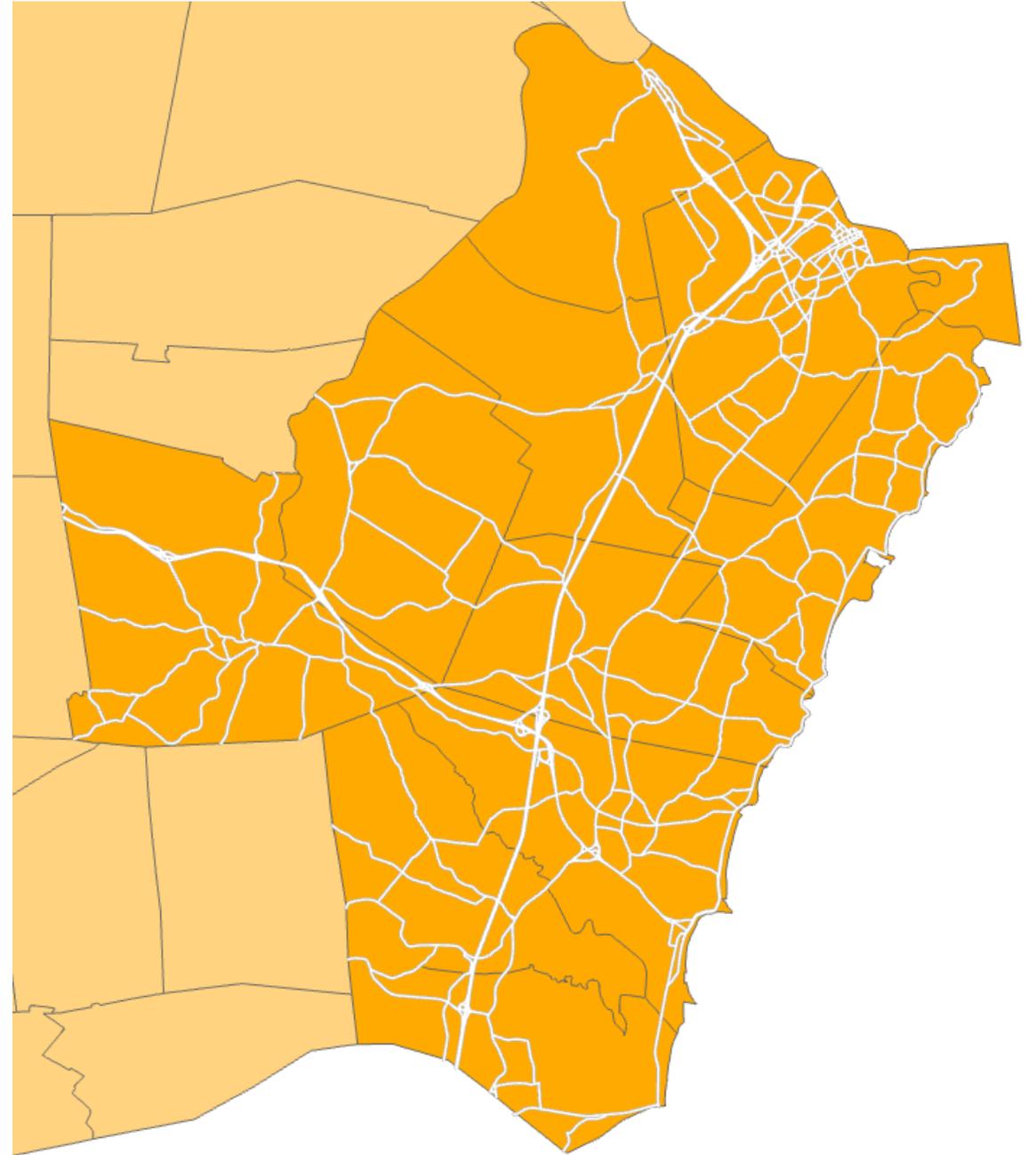


Model Area



Model Network

- High Capacity Ramp
- Interstate/Freeway
- Local***
- Low Capacity Ramp
- Major Collector
- Minor Arterial
- Minor Collector
- Principal Arterial



GIS -> Model

Data Sources

- Bridge Decks
- Scenarios
 - MHHW+1.0' Scenario
 - Model Network Affected 1'
 - MHHW+1'
 - MHHW+1.7' Scenario
 - MHHW+1.7'+6.8' 100 Year Flood Scenario
 - MHHW+4.0' Scenario
 - MHHW+4.0'+6.8' 100 Year Flood Scenario
 - MHHW+6.3' Scenario
 - MHHW+6.3'+6.8' 100 Year Flood Scenario
- Model Network
- STC Study Area
- Model Area

Display Manager

- TAZ_2015
- Node
- Network_SLR_1ft
- Node:1
- Node:2
- Network_2015:1
- 1.0' Affected Segments

RPC_Model.map - TAZ_2015

2216 2222 113 317 90 8014 8013 25 238 870 2422

Sea-Level Rise Impacts

Sea Level Rise Scenario	Estimated Impacted Road Miles
1.0'	0.5
1.7'	1.0
4.0'	15.7
6.3'	33.2***

Web Maps

- Sea Level Rise 1' - <https://rpc-nh.maps.arcgis.com/apps/mapviewer/index.html?webmap=96b39853cbde4672ba770a851916d88c>
- Sea Level Rise 1.7' - <https://rpc-nh.maps.arcgis.com/apps/mapviewer/index.html?webmap=1a3f435ffad84ced96e8d86d508dbac4>
- Sea Level Rise 4.0 - <https://rpc-nh.maps.arcgis.com/apps/mapviewer/index.html?webmap=de63560785f04f2dbdb2ed789fc53a57>



Prioritization Methodology

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Agenda

1. Site Selection Criteria
2. Draft Site List
3. Web Map

Site Selection Criteria

- Alternate Route Available
- Annual Average Daily Traffic
- Assessed Property Value/Area
- Distance to Emergency Facilities
- Distance to Non-Emergency Municipal Facilities
- Functional Class
- Social Vulnerability Index

Alternate Route Available

GIS is utilized to calculate the availability of alternate routes to get to/from each link under each scenario. If a link is inaccessible in a particular scenario it is considered that no alternate route is available.

Presence of Alternate Routes Scoring		
Alternate_Routes	Inundated Links	Score
No	20	5
Yes	105	0



Traffic Volume

The travel demand model calculates an estimated daily traffic volume for each direction on each included roadway. In some cases model data is supplemented with traffic volume count data from RPC and NHDOT.

Volume Scoring			
Min Volume	Max Volume	Inundated Links	Score
0	2,151	25	1
2,152	3,307	25	2
3,308	3,377	25	3
3,378	4,937	25	4
4,938	20,220	25	5



Assessed Property Value/Area

The assessed property value per acre of each parcel adjacent to inundated links is calculated as a proxy for population/businesses served which is only available in larger blocks.

Land Value Scoring			
Min Value	Max Value	Inundated Links	Score
\$0	\$233,957	25	1
\$233,958	\$877,933	25	2
\$877,934	\$1,510,487	25	3
\$1,510,488	\$3,313,868	25	4
\$3,313,869	\$6,701,743	25	5



Distance to Emergency Facility

This criterion uses the data collected as part of the RPC Hazard Mitigation Plans to identify the location of emergency services facilities. Network Analyst is utilized to calculate the shortest path between each link and the nearest emergency services facility.

Distance to Emergency Services Scoring			
Min Distance	Max Distance	Inundated Links	Score
0	0.271	25	5
0.272	0.51	25	4
0.52	1.58	25	3
1.59	2.46	25	2
2.47	4.2	25	1



Distance to Community Facilities

Network Analyst is utilized to calculate the shortest path between each link and the nearest community facility (schools, libraries, beach, recreation) as derived from other projects.



Distance to Community Facilities

Min Distance	Max Distance	Inundated Links	Score
0	0.23	25	5
0.231	0.39	25	4
0.391	0.54	25	3
0.541	0.77	25	2
0.771	1.59	25	1

Functional Class

The functional classification is a grouping of streets and roadways (both state and community owned and maintained) into sets according to the role the particular highway plays in serving travel on the system as defined by the Federal DOT and implemented by State DOTs and communities.

Functional Classification Scoring		
Functional Class	Inundated Model Links	Score
Interstate/Freeway	0	
Principal Arterial	12	5
Minor Arterial	66	4
Major Collector	46	3
Minor Collector	0	
High Capacity Ramp	0	
Low Capacity Ramp	1	2
Local	0	
Total	125	

Social Vulnerability Index (SVI)

SVI is an aggregate value that indicates magnitude of presence of socially vulnerable populations such as elderly, young children, disabled, and those in poverty. Higher SVI values indicate a more vulnerable population, lower indicate less vulnerable.

Social Vulnerability Index Scoring			
Min Index Value	Max Index Value	Inundated Links	Score
0	0.0756	23	1
0.7561	0.1821	40	2
0.18211	0.268	10	3
0.2681	0.543	11	4
0.5431	0.7973	41	5

Criteria Weighting

Draft Criteria Weights	
Criterion	Weight
Functional Classification	15%
Average Daily Volume (AADT)	10%
Distance to Emergency Services	15%
Alternate Route Availability	15%
Social Vulnerability Index (SVI)	15%
Distance to Community Facilities	15%
Average Land Value per Acre	15%

SLRGroup	Town	Roads
1	PORTSMOUTH	State St
2	PORTSMOUTH	Marcy St
3	PORTSMOUTH	Junkins Ave, Parrott Ave
4	PORTSMOUTH, NEW CASTLE	Marcy St, Newcastle Ave, Portsmouth Ave
5	NEW CASTLE	Wentworth Rd
6	RYE	Wentworth Rd
7	RYE	Wentworth Rd
8	RYE	Ocean Blvd, Pioneer Rd
9	RYE	Ocean Blvd
10	RYE	Marsh Rd, Parsons Rd
11	RYE	Ocean Blvd, Wallis Rd
12	RYE	Brackett Rd
13	RYE	Locke Rd, Ocean Blvd
14	HAMPTON, NORTH HAMPTON	Ocean Blvd, Ocean Blvd
15	HAMPTON	Cusack Rd
16	HAMPTON	High St
17	HAMPTON	NH 1A SB On ramp, Ocean Blvd, Ocean Blvd to Winnacunnet, Winnacunnet Rd
18	HAMPTON	Brown Ave, Church St, Glade Path, Highland Ave, Nh Rt 101
19	HAMPTON	Ashworth Ave
20	SEABROOK	Route 286
21	SEABROOK	South Main St
22	HAMPTON	Lafayette Rd
23	EXETER	Water St
24	STRATHAM	Squamscott Rd

Web Maps

- Group Rankings - <https://rpc-nh.maps.arcgis.com/apps/mapviewer/index.html?webmap=f3e75b9eb083423e8c29f1130611bfe4>