BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE **June 15, 2017**
TO **Boston Region Metropolitan Planning Organization**
FROM **Karl H. Quackenbush, Executive Director**
RE **Work Program for Union Point Redevelopment Modeling Support**

Action Required

Review and approval

Proposed Motion

That the Boston Region Metropolitan Planning Organization (MPO), upon the recommendation of the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning, vote to approve the work program for the Union Point Redevelopment Modeling Support project presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Agency and Other Client Transportation Planning Studies and Technical Analyses

CTPS Project Number

23328

Client

Southfield Redevelopment Authority (SRA)
Project Supervisor: Lyndsey Kruzer

CTPS Project Supervisors

Principal: Scott Peterson
Manager: Florence Ngai

Funding

SRA Contract # TBD

Impact on MPO Work

The MPO staff has sufficient resources to complete this work in a capable and timely manner. By undertaking this work, the MPO staff will neither delay the completion of nor reduce the quality of any work in the Unified Planning Work Program.

Background

The South Weymouth Naval Air Station, located in Weymouth, Abington, and Rockland, was closed in 1997 on the recommendation of the Base Realignment and Closure Commission. In 1998, the Massachusetts Legislature created the South Shore Tri-Town Development Corporation, which was subsequently reconstituted in 2014 as the Southfield Redevelopment Authority. The Southfield Redevelopment Authority is charged with reinforcing municipal control over the land use and redevelopment of the former base.

The 1,400 acre site was recently purchased by a development company, LStar, which has an ambitious redevelopment plan, known as Union Point, for eight million square feet of commercial development and approximately 4,000 housing units. The Union Point redevelopment plan was previously named Southfield. A Final Environmental Impact Report (FEIR) was filed and a Massachusetts Environmental Policy Act (MEPA) certificate was issued on July 18, 2007. LStar submitted a Notice of Project Change in the spring of 2017 and received feedback from the Massachusetts Executive Office of Energy and Environmental Affairs in May stating that further analysis of the transportation impacts would be required as significant transportation impacts associated with the new development are anticipated.

The site is immediately north of State Route 139 and approximately one mile south of State Route 3. State Routes 18 and 58 are to the east. An east-west parkway was constructed through the site as a result of a prior redevelopment effort. Much of the traffic generated from the site is expected to use State Route 3 via interchanges at State Route 18 and Derby Street in Hingham. Funds are programmed to widen State Route 18 in the near future and this improvement, along with other programmed improvements, will be represented in the Boston Region MPO's regional travel demand model.

The South Weymouth Station on the Kingston/Plymouth MBTA commuter rail line is immediately west of the site. There are 543 parking spaces at that station. Project proponents anticipate that proposed commercial and residential uses on the site will increase use of this station.

The proposed Union Point development is anticipated to occur in phases. The phases and their timing will be determined in consultation with the client, MassDOT, and key stakeholders. The Central Transportation Planning Staff (CTPS) will work with the project team—which consists of MassDOT and Howard Stein Hudson, as the primary consultant, with other sub-consultants—to define the appropriate study

area and acquire updated traffic counts for a selection of intersections in the study area. CTPS will produce forecasts of travel demand for the 2017 base year and two horizon years—2040 and an interim year between 2017 and 2040 to be determined by the project team.

Objectives

The objectives of this work program are as follows:

1. Provide MassDOT with traffic projections for the 2017 base year, 2040, and an interim year that will be determined by the project team. The forecasts will be for the morning (AM) peak travel period (6:00 AM – 9:00 AM) and evening (PM) peak travel period (3:00 PM to 6:00 PM). These outputs will be consistent with the projections developed for the MPO's Long-Range Transportation Plan (LRTP), *Charting Progress to 2040*.
2. Provide the client with an analysis of transit use and other traffic data to support its metrics calculations and alternatives analysis.

Work Description

The study area will consist of the immediate area surrounding the development site, roughly defined by State Routes 18, 139, and 3. The exact boundaries will be defined in cooperation with the project team after work has commenced.

CTPS will use the MPO's travel demand model and will incorporate land-use data that are consistent with the most recently adopted LRTP, *Charting Progress to 2040*. The specific land-use assumptions for the development phases will be reflected in the intermediate year and horizon year model assumptions, which will be developed in collaboration with MassDOT and the Metropolitan Area Planning Council (MAPC). MassDOT and MAPC will provide guidance on how to maintain control totals of population and employment. The salient features of the model are as follows:

- The geography covered by the model includes all of eastern Massachusetts, from just west of Interstate 495 to the Massachusetts coast, and between the Rhode Island and New Hampshire borders. It does not include Cape Cod or areas west of Worcester.
- The highway network representation is based on MassDOT's road inventory system as of spring 2012. All roads classified as collectors or higher are included in the network.
- There are 2,727 transportation analysis zones (TAZs) within the model area.
- The land use underlying the model is consistent with state control totals (established in July 2015 by MassDOT's Office of Transportation Planning).
- Vehicle types represented in the highway assignment are single-occupant autos; high-occupancy autos (two or more riders); and light, medium, and

heavy trucks. These truck definitions are consistent with the Transportation Research Board's *Quick Response Freight Forecasting Manual*.

- The primary times of day for analysis are the AM and PM peak periods. The model is designed to simulate a typical Wednesday in May, which is considered to approximate an average annual weekday.

The processes for developing the traffic-volume forecasts are as follows:

1. Validate the model to observed weekday travel patterns and volumes during the AM and PM peak periods. The validation will focus on the study area, not on the entire modeled region. The model will be adjusted, if necessary.
2. Develop the land-use scenario for the model for the horizon years based on the anticipated phased development plans. (The land-use data will be consistent with that used in the LRTP.)
3. Develop the transportation networks for the horizon years. The networks will reflect planned transportation projects in the LRTP.
4. Develop a subarea area model for the study area.
5. Develop traffic forecasts under no-build and build conditions for each forecast year or phase.
6. Develop a mitigation scenario for each forecast year in consultation with the project team.

The tasks associated with completing this work are detailed below.

Task 1 Define Study Area and Collect Transportation Data

CTPS will work with the project team to identify the study area and the locations for which observed traffic data will be available.

Weekday traffic data are required for validating and adjusting the Boston Region MPO's model. The project team will provide CTPS with observed traffic data as well as base-year balanced count data. The balanced counts should be consistent from intersection to intersection and balanced by vehicle type within the study area. The data will include AM and PM turning movement counts and Automatic Traffic Recorder (ATR) counts. If the turning movement count data do not cover a full three-hour period, CTPS will expand the data to reflect the peak-period traffic. In addition, CTPS will exploit the INRIX dataset for travel-time data and tap into other data, such as geometry data, provided by MassDOT or the project team. Transit data will be examined for all public transportation modes in the study area.

Products of Task 1

- A list of roadway locations and intersections, which will be the focus of the study

- A map of the study area
- Maps and figures that show the AM and PM peak period traffic data

Task 2 Review Land-Use Assumptions

Construction of the full-build development scenario at Union Point will constitute a substantial intensification of the land use on the site, more than the existing background growth projected for the site by regional planners. With this additional, and not necessarily anticipated, amount of development on the site, it will be necessary to review the land-use assumptions for the TAZs comprising the actual development site and also for the TAZs that surround Union Point in Weymouth, Rockland, and Abington.

The methodology proposed would link the development to the land-use assumptions in the LRTP. After examining these land-use assumptions, any deficiency in households or employment data for the Union Point redevelopment site would be supplemented with anticipated growth in the surrounding communities of Weymouth, Rockland, and Abington where feasible. MassDOT's control totals of population and employment for the MPO area would be maintained. Any proposed development in excess of the development that will be represented in the model will need to be considered in an additional Notice of Project Change or a supplement to this work at the appropriate time.

The actual full-build development scenario will be considered as a land use scenario and will be evaluated with the 2040 transportation networks as one of the eight alternatives.

Product of Task 2

- Two future-year land-use scenarios that are consistent with the proposed development on the site and regional growth projections
- One full-build land-use scenario that is unconstrained to the MassDOT's control totals

Task 3 Validate Base-Year Model

CTPS will use the most current and calibrated regional model set available for incorporating the land-use assumptions from the LRTP. This model has been used extensively to study other major projects in the region such as the Lower Mystic Project. This task focuses on validating the AM and PM model results in the study area, with particular attention paid to the count locations identified and the transit ridership at the West Weymouth Station of the Kingston/Plymouth commuter rail line under Task 1. CTPS will adjust the model if needed.

Product of Task 3

A validated base-year transportation network for the study area

Task 4 Perform No-Build and Build Alternatives Analysis

CTPS will model up to eight alternatives for each of the horizon years. The alternatives will include the no-build, build scenarios for testing highway mitigation measures and/or transit improvements, and the full-build land-use scenario. It must be noted that the full-build land-use scenario does not reflect the state's latest adopted planning assumptions. The model run result can be used for assessing impacts, but any associated analysis results are not suitable for updating any environmental document.

The no-build alternative will be modeled first, followed by the build alternatives and the build scenarios with mitigation measures and/or transit improvements. This order of modeling alternatives will be followed for each development phase. For any alternative that combines highway and transit improvements, it is highly recommended that individual improvements shall be evaluated separately in individual model runs. Improvements that are deemed to be effective will then be packaged into a single alternative.

The regional model will be used for high-level assessments at the regional level, for evaluating transit impacts, and for establishing the travel demand input to the subarea model (see Task 5).

Products of Task 4

- Excel files showing the volumes at the intersections identified in Task 1 for each of the modeled alternatives
- Tabular transit summaries for the study area

Task 5 Develop Subarea Models for Base Year and Horizon Years

CTPS will develop a subarea model, which is a highway assignment module focused on the study area. The subarea model area will include the development site as well as its immediate surroundings. The area will be large enough to capture potential trip diversions resulting from the new development and mitigation measures. Roadway geometry data collected under Task 1 will be used to verify the network. TAZs will be reserved as place holders for implemented developments in the horizon years. TAZs in the immediate area will be refined for better assignment results. The subarea network will be detailed enough to provide sufficient traffic data for performing a level-of-service analysis; however, the network will not include minor roads or driveways.

The input trip tables will be extracted from the regional model and disaggregated. The base-year subarea model will be calibrated using the traffic data collected under Task 1. CTPS will adjust the trip table, if needed. Any adjustment to the trip table will be carried to the future years.

Product of Task 5

- AM and PM base-year and future-year subarea models

Task 6 Perform No-Build and Build Alternative Analysis Using the Subarea Model

CTPS will develop subarea models for future-year traffic projections. Future land use at the site will be estimated based on proposed site development plans, and links will be added to the model to reflect major internal circulation roads. CTPS will coordinate with the consultant team for incorporating the internal circulation roads. Resulting traffic volumes at selected locations will be provided to the project team for further traffic analyses. CTPS will also develop adjustment factors based on MassDOT traffic data for computing Saturday traffic volumes.

Product of Task 6

Future-year traffic data to be provided to project teams for further traffic analyses

Task 7 Conduct a Transit Analysis

CTPS will examine transit use in the study area and conduct a crowding analysis for the Plymouth/Kingston commuter rail line. The analysis will identify the trains operating during the peak period that have volume-to-capacity ratios that exceed MBTA service standards, and calculate the volume of passengers and standees at the peak point along the route.

Product of Task 7

Tabular summaries of the crowding analysis

Task 8 Project Coordination

CTPS will work with the project team to verify demographics and the infrastructure project mix for the interim and forecast years. The consultant will provide traffic counts. CTPS will attend coordination meetings as directed by MassDOT. CTPS may also help prepare presentation materials for these and other meetings as directed by MassDOT.

Product of Task 8

Coordination with the project team, attendance at meetings, and other assistance as needed

Task 9 Documentation

CTPS will produce a technical memorandum documenting all of the model methodology, assumptions, results, and analysis findings. The memorandum will be provided to MassDOT and the project team.

Product of Task 9

A technical memorandum documenting the project

Estimated Schedule

It is estimated that this project will be completed in eight months after work commences. The proposed schedule, by task, is shown in Exhibit 1.

Estimated Cost

The total cost of this project is estimated to be $245,200. This includes the cost of 81.0 person-weeks of staff time, overhead at the rate of 102.7 percent, printing, travel, equipment, consultants, and other direct costs. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/BD/SAP/fn

Exhibit 1
ESTIMATED SCHEDULE
Union Point Redevelopment Modeling Support

Task	Month 1	2	3	4	5	6	7	8	9
1. Define Study Area and Collect Transportation Data									
2. Review Land-Use Assumptions	A								
3. Validate Base-Year Model		B							
4. Perform No-Build and Build Alternatives Analysis									
5. Develop Subarea Models for Base Year and Horizon Years			C						
6. Perform No-Build and Build Alternative Analysis Using the Subarea Model									
7. Conduct a Transit Analysis									
8. Project Coordination									
9. Documentation									D

Products/Milestones

- A: Demographics
- B: Calibrated and Validated Base-Year Model
- C: Subarea model
- D: Final analysis and documentation

Exhibit 2
ESTIMATED COST
Union Point Redevelopment Modeling Support

Direct Salary and Overhead								**$245,000**
Task	Person-Weeks					Direct Salary	Overhead (102.70%)	Total Cost
	M-1	P-5	P-4	P-3	Total			
1. Define Study Area and Collect Transportation Data	0.5	0.0	1.0	3.5	5.0	$6,431	$6,604	$13,035
2. Review Land-Use Assumptions	1.0	1.5	1.5	1.0	5.0	$7,819	$8,030	$15,850
3. Validate Base-Year Model	1.0	0.0	2.5	1.5	5.0	$6,981	$7,169	$14,150
4. Perform No-Build and Build Alternatives Analysis	1.0	4.0	4.0	4.5	13.5	$20,025	$20,565	$40,590
5. Develop Subarea Models for Base Year and Horizon Years	2.5	5.5	10.0	5.5	23.5	$34,840	$35,781	$70,621
6. Perform No-Build and Build Alternative Analysis Using the Subarea Model	0.5	3.0	3.0	2.5	9.0	$13,523	$13,888	$27,412
7. Conduct a Transit Analysis	0.5	0.0	3.0	1.0	4.5	$6,176	$6,343	$12,519
8. Project Coordination	3.0	1.5	4.0	0.0	8.5	$13,627	$13,995	$27,622
9. Documentation	1.0	3.0	3.0	0.0	7.0	$11,446	$11,755	$23,202
Total	11.0	18.5	32.0	19.5	81.0	$120,868	$124,132	$245,000

Other Direct Costs	**$200**
Travel	$200

TOTAL COST	**$245,200**

Funding
SRA Contract