

July 14, 2017

Mr. Andrew Port Planning Director City of Newburyport Office of Planning & Development 60 Pleasant Street P.O. Box 550 Newburyport, MA 01950

Re: Waterfront West Redevelopment – Review Transportation Impact Assessment Newburyport, Massachusetts

Dear Mr. Port:

On behalf of the Newburyport Planning Board, Tetra Tech (TT) has completed a peer review of the November 2016 *Transportation Impact Assessment* (TIA) prepared by Vanasse and Associates, Inc. (VAI) for the proposed Waterfront West Redevelopment project located along Merrimac Street in Newburyport, Massachusetts. The study evaluates the potential traffic impacts associated with the currently-proposed project which includes 200 residential condominium/townhouse units, 100 hotel rooms and approximately 20,000 square feet (sf) of retail/restaurant uses. The existing site structures will be removed or renovated to support the proposed uses and the existing marina, boat slips and moorings adjacent to the site will continue to be accessed through the site. Access to the site will continue to be provided along Merrimac Street via Tournament Wharf, McKay's Wharf and Brown's Wharf.

The proposed project is currently in the master planning stage and, as such, the site's build program (access, land uses, size) could change from the program presented in the TIA. Any changes to the site program from that presented in the TIA should be evaluated to determine if supplemental traffic review is warranted.

TT is in receipt of the following materials:

- A plan set (Plans) titled "Waterfront West, Newburyport, MA", dated March 10, 2017, prepared by RJO'Connell & Associates, Inc.
- A Traffic Impact Assessment (TIA) titled "Transportation Impact Assessment, Waterfront West Redevelopment Project, Merrimac Street, Newburyport, Massachusetts" dated November 2016, prepared by VAI.

The November 2016 TIA generally conforms with standard professional practices in the Commonwealth of Massachusetts for the preparation of traffic impact studies for projects of the size and nature of the proposed Waterfront West development. However, the Applicant should provide additional information on the items identified in this letter, as summarized on page 11, to provide a comprehensive review of the project's traffic-related impacts.

Project Study Area

 The TIA evaluated 9 intersections along Merrimac Street (at the Route 1 northbound off-ramp and southbound on-ramps, Market Street, McKay's Wharf, Titcomb Street, Brown's Wharf, Green Street, Newburyport Visitor Center Driveway and State Street). The study area also included the State Street/Liberty Street, Winter Street/Route 1 SB on-ramp and the Summer Street/Route 1 NB off-ramp intersections. All of the study intersections are unsignalized with the exception of the Merrimac Street/State Street intersection and the Merrimac Street/Green Street intersection which operate under traffic signal control when activated by pedestrians. The project is expected to generate a significant portion of its trips (up to 32 percent) beyond the study area presented in the TIA. Tetra Tech is aware that the City is studying an extensive network of intersections as part of their downtown traffic study. Therefore, Tetra Tech recommends that the Applicant address the trip generation and distribution comments outlined in this letter and re-evaluate the study area for appropriateness in consultation with the City's Planning and Development Department.

State Highway Access Permit

2. The TIA states that the project will require a Highway Access Permit from the Massachusetts Department of Transportation (MassDOT). The Applicant should confirm if the project will be required to go through the Massachusetts Environmental Policy Act (MEPA) review process. The Applicant should clarify the proposed parking supply and net increase in weekday daily traffic volume associated with the proposed project as this information would be used to determine if MEPA review thresholds are exceeded.

Study Analysis Time Periods

3. The study includes an impact analysis of the weekday morning (7am-9am), weekday evening (4pm-6pm) and Saturday midday (11am-2pm) peak periods. The time periods chosen for detailed analysis are appropriate for a mixed-use development with residential, retail/restaurant and hotel uses.

Existing Traffic Volumes

- 4. The turning movement counts (TMCs) were generally conducted at the study intersections on Thursday, June 16, 2016 and Saturday, June 18, 2016 when schools were likely in session. The TMCs at the Merrimac Street/Brown's Wharf (Site Driveway) intersection were conducted on Saturday, August 27, 2016 and Tuesday, August 30, 2016. The 48-hour automatic traffic recorder (ATR) counts were conducted along Merrimac Street east of Market Street during the same week as the TMCs from Thursday through Saturday (June 16, 17 and 18). This is reasonable for a development of this type and size.
- 5. The intersection labeling in the TMC sheets provided in the Appendix does not match the labeling used in the TIA traffic volume graphics for two of the study intersections. Based on the traffic volumes presented in the TIA figures, Tetra Tech assumes that the TMC sheets labeled as the Merrimac Street/Site Driveway intersection apply to the intersection labeled as Merrimac Street/Brown's Wharf in the TIA figures (intersection to the west of Green Street). Similarly, Tetra Tech assumes that the TMC sheets labeled as the Merrimac Street/Brown's Wharf in the TIA figures (intersection to the west of Green Street). Similarly, Tetra Tech assumes that the TMC sheets labeled as the Merrimac Street/Brown's Wharf intersection apply to the intersection labeled as Merrimac. The Applicant should confirm these assumptions to ensure that the traffic count data for these two locations have been applied to the appropriate intersections in the TIA.
- 6. The 2016 Existing conditions traffic volumes are presented in Figures 5, 6 and 7 of the TIA for the weekday morning, weekday evening and Saturday midday peak hours, respectively, and finds that the traffic volumes are generally consistent with the TMC data sheets provided in the TIA. However, Tetra Tech notes some traffic imbalances that require further review by the Applicant (i.e., Merrimac Street westbound between Green Street and Brown's Wharf during the weekday morning peak hour).

Pedestrian and Bicycle Facilities

- 7. Tetra Tech generally agrees with the pedestrian accommodations described in Table 1 and Figure 4 of the TIA. It should be noted that, as of June 2017, crosswalks are currently provided across all approaches to the Pleasant Street/Green Street and Pleasant Street/State Street intersections.
- 8. The TIA states that the study area generally includes sufficient roadway widths to support shared bicycle-vehicle travel. However, the on-street parking along some segments of Merrimac Street

reduce the available travel widths. Additionally, improvements planned as part of the MVRTA Intermodal Facility along Merrimac Street in the vicinity of McKay's Wharf will result in lane widths along Merrimac Street that will be too narrow for shared travel. However, bike paths that separate bicycle travel from vehicle travel are provided in the area. Tetra Tech is aware of ongoing discussions between the Applicant and the City regarding the site's connection to the Clipper City Rail Trail. The Applicant should continue to work with the City to provide a safe connection for bicycle users between the site and adjacent bike paths.

Public Transportation

9. The TIA identifies two bus routes operated by the Merrimack Valley Regional Transit Authority (MVRTA) Bus Route 54 and Bus Route 53 (Summer Shuttle). Tetra Tech notes that, as of June 2017, the MVRTA continues to operate Route 54, but services via Route 53 no longer appear to be offered. Additionally, the MVRTA is proposing an intermodal facility to be located across from the Waterfront West site at the Merrimac Street/Titcomb Street intersection. Although the project will be in close proximity to existing and future local bus service, Tetra Tech generally agrees with the TIA that credit not be taken for transit services in the trip generation estimates.

Motor Vehicle Crash Data

10. The crash analysis has generally been prepared in accordance with industry standards and includes an evaluation of data from the MassDOT crash database for the study intersections for the five-year period between 2010 and 2014. However, the MassDOT crash data was not provided in the Appendix. It is recommended that the Applicant provide the crash data to Tetra Tech for review.

Study Time Horizon

11. The TIA utilized a seven-year planning horizon (2023 No-Build and 2023 Build conditions) which is consistent with MassDOT standards.

Future Traffic Growth

- 12. Based on the Applicant's discussion with City of Newburyport Office of Planning and Development, traffic associated with two specific projects in the area were used in the development of the 2023 No-Build traffic volumes: 1) Merrimac Ale House and 2) MVRTA Intermodal Parking Facility. Tetra Tech generally agrees with this methodology.
- 13. The trip generation calculations for the Merrimac Ale House project were not provided in the TIA Appendix. The trips associated with the restaurant project appear to be based on industry-standard trip rates published by the Institute of Transportation Engineers (ITE) published in *Trip Generation Manual, 9th Edition.* Tetra Tech reviewed the trip rates for Land Use Code 932 High-Turnover (Sit-Down) Restaurant applied to a 13,812 square-foot (sf) restaurant which matches the trip generation used in the TIA for the restaurant use for the weekday evening and Saturday midday peak hours. However, ITE also provides trips rates for LUC 932 based on the number of seats which results in a higher number of trips (approximately 40 to 45 peak hour trips) for a 442-seat restaurant when compared to using trip rates for 13,812 sf of restaurant space. However, this difference in trip generation is unlikely to significantly change the overall results of the analysis.
- 14. The trip distribution calculations for the Merrimac Ale House were not provided in the Appendix. However, the trip tracings were provided in the Appendix and assumed approximately 60 percent of trips along Merrimac Street will be generated to/from west of Green Street. Tetra Tech's review of existing peak hour travel patterns for the study area commercial driveways along the north side of Merrimac Street indicates approximately 70 to 75 percent of trips travel along Merrimac Street to/from the west of Tournament Wharf. Although the trip distribution patterns used differ slightly from the existing travel patterns for other commercial uses in the immediate area, adjusting the traffic volumes

to assume a slightly higher percentage of restaurant trips to/from the west of the Merrimac Ale House is unlikely to significantly change the overall results of the analysis.

15. A one percent per year growth rate was applied to the existing traffic volumes for seven years to estimate peak hour traffic volumes in the planning year 2023 based on the same MassDOT continuous count station data used to calculate the seasonal adjustment factors and discussion with the City of Newburyport Office of Planning and Development. Based on Tetra Tech's knowledge of historical traffic volumes in the area, the use of a 1 percent per year growth rate is reasonable and slightly higher than average.

Roadway Improvement Projects

- 16. The TIA indicates that two roadway improvement projects are proposed by others within the study area based on the Applicant's discussion with MassDOT and the City of Newburyport: 1) Route 1/Merrimac Street Intersection Improvements (MassDOT Project #608029) and 2) MVRTA Intermodal Facility Pedestrian Access Improvements.
- 17. Tetra Tech reached out to MassDOT and the Merrimack Valley Planning Commission (MVPC) in June 2017 to determine the status of the Route 1/Merrimac Street improvement project. Based on these discussions, the project does not currently have funding and, therefore, there is no established timeframe for the design or implementation of these improvements. It is our understanding that these improvements will likely include installation of traffic signals at both ramp intersections with Merrimac Street and pedestrian and bicycle improvements. The preliminary estimate available on the MassDOT project website for these improvements is listed at approximately \$2.2 to 2.4 million (design plus construction).

No-Build Traffic Volumes

18. Tetra Tech generally agrees with the methodology used in developing the 2023 No-Build traffic volumes presented in Figures 8 through 10 of the TIA which include the 2016 Existing traffic volumes grown by 1 percent per year plus traffic associated with the Merrimac Ale House and the MVRTA Intermodal facility. It should be noted that Figure 9 ("2016 Existing Weekday Evening Peak Hour Traffic Volumes") appears to be mislabeled as these volumes reflect the 2023 No-Build weekday evening peak hour traffic volumes.

Project-Generated Traffic

- 19. Traffic generated by the project was based on trip rates published in ITE's *Trip Generation* for Land Use Code (LUC) 230 Residential Condominium/Townhouse (applied to 200 units), LUC 310 Hotel (applied to 100 rooms), and LUC 820 Shopping Center (applied to 20,000 sf). The site program evaluated in the TIA is expected to generate approximately 3,696 daily trips on a weekday (159 vph during the morning peak hour and 330 vph during the afternoon peak hour). On a Saturday, the site is estimated to generate 4,648 daily trips (421 during the midday peak hour). Any future changes to the site's build program (land uses or sizes) should be evaluated to determine if supplemental traffic review is warranted.
- 20. The TIA utilized ITE trip generation data for LUC 820 (shopping centers) for the 20,000 sf of non-hotel commercial uses at the site which the TIA states will include retail and restaurant uses. Although the trip generation for specific uses, such as restaurants, would be estimated separately from general retail (shopping center) use utilizing more closely-related ITE land use codes (such as LUC 932 High-Turnover Sit-Down Restaurant), the TIA's trip generation estimates based on LUC 820 are conservative. Typically, trip generation estimates for shopping centers are based on ITE trip equations for large shopping centers and ITE trip rates for smaller shopping centers (except for during the weekday morning peak hour in which case ITE trip rates are generally used for any size

shopping center). Since the size of the non-hotel commercial uses currently proposed at the site (20 ksf) is much smaller than the average size (greater than 300 ksf) of the developments on which the ITE data is based, use of the average trip rates (rather than the trip equations) to estimate the retail trip generation estimates would be appropriate. However, the TIA used the ITE trip equations which resulted in estimates that were generally much higher (sometimes by as much as 3 times) than the number of trips had the average ITE trip rates been used. Therefore, any additional trips for the currently-proposed restaurant use that would typically be estimated using ITE trip rates for LUC 932 rather than LUC 820 can be assumed to be accounted for in the conservative trip generation estimates provided in the TIA. Any change to the development program could warrant a re-evaluation of this methodology.

- 21. Tetra Tech generally agrees with the TIA that credit can be taken for trips shared among the proposed on-site uses using ITE internal trip capture rates. However, the source of some of these internal trip capture rates is not clear. The Applicant should ensure that current ITE internal trip capture rates are utilized and clarify the ITE source in which they are obtained.
- 22. The TIA took credit in the project trip generation for the existing traffic observed entering and exiting McKay's Wharf and Brown's Wharf at their intersections with Merrimac Street as shown in Table 6 of the TIA. However, the Brown's Wharf driveway is a shared driveway with other off-site uses. The Applicant should confirm if any observations were conducted on the count dates to determine if the traffic entering/exiting at this location were all generated by the site. If not, credit should not be taken for existing uses at the Merrimac Street/Brown's Wharf intersection and the Build volumes should be updated, as necessary. Additionally, the Applicant should confirm the source of the existing daily traffic volumes that are presented in Table 6 as this may impact MEPA review thresholds, if required.

Trip Distribution and Assignment

- 23. The TIA developed two general trip distribution patterns for the proposed uses on-site: 1) Residential (condominium/townhouse) and 2) Commercial (retail/restaurant/hotel uses) which are presented in Figures 11 and 12 of the TIA, respectively. Tetra Tech agrees with the use of two separate regional distribution patterns for the proposed commercial and residential site.
- 24. The residential trip distribution patterns were based on Journey to Work data published by the US Census. Although Tetra Tech agrees with the general methodology used in developing the residential trip distribution patterns, we disagree with the route assumptions for some of the communities in which Newburyport residents work. Namely, it is Tetra Tech's opinion that the portion of residents destined for Merrimac Street to the east and west of the study area would be lower than reported in the TIA and that a higher portion would use Route 1 to/from the south and Summer Street/Winter Street. It is recommended that the Applicant review the residential trip distribution calculations and revise, as necessary. Additionally, the Applicant should provide detailed calculations of how the local (site driveway) distributions were developed based on the locations of on-site residential parking.
- 25. The commercial trip distribution patterns shown in Figure 12 of the TIA were stated to be based on existing travel patterns in the study area. However, the TIA did not include calculations supporting the trip distribution patterns and Tetra Tech's preliminary review of existing volumes in the area indicates a potentially higher orientation of trips to/from the west of the site. It is recommended that the Applicant provide the supporting trip distribution patterns for the commercial component of the site to Tetra Tech for review. Additionally, the Applicant should provide detailed calculations of how the local (site driveway) distributions were developed based on the locations of on-site commercial parking.

26. The March 10, 2017 plan set appears to show a connection between the site and the Newburyport Visitor Center parking lot. However, no project trips were assigned to the Merrimac Street/Newburyport Visitor Center parking lot driveway intersection. The Applicant should confirm the connection, if any, between these two parcels. If a connection will be provided, the Applicant should consider the likelihood of site trips entering/exiting at this location via the Merrimac Street/Newburyport Visitor Center Driveway.

Future Traffic Volumes – Build Condition

27. Tetra Tech has reviewed the 2023 Build traffic volumes which include the 2023 No-Build traffic volumes plus the project trips minus the existing trips observed entering/exiting Brown's Wharf and McKay's Wharf. As mentioned above under Project-Generated Traffic, the Applicant should confirm if any observations were conducted on the count dates to determine if the traffic entering/exiting at Brown's Wharf were all generated by the site. If not, credit should not be taken for existing uses at the Merrimac Street/Brown's Wharf intersection and the Build volumes should be updated, as necessary.

Traffic Operations Analysis

- 28. The TIA utilized the HCM 2010 methodology using Synchro version 8.0 software to conduct the capacity analyses which is consistent with industry standard methodology. The capacity analyses were generally prepared in accordance with industry standards, except where described below and generally used the traffic volumes presented in the TIA graphics. The analysis indicates that many of the turning movements exiting the minor street approaches to Merrimac Street for the Build conditions operate with relatively long delays (LOS E/F operations) during peak hours. In order to offset project-related impacts, the Applicant is proposing mitigation at the Merrimac Street intersections with the Route 1 ramps and Green Street/Newburyport Visitor Center Driveway as discussed under "Off-Site Mitigation."
- 29. The capacity analyses were generally conducted using peak hour factors (by approach) and heavy vehicle percentages (by movement) consistent with industry standards. However, they did not always match the turning movement count data. Tetra Tech recommends that the Applicant review the peak hour factors and heavy vehicle percentages used are appropriate for any future analyses conducted for this project.
- 30. The signalized intersection capacity analyses were conducted using lost time adjustments for some of the analysis conditions which are not typically used. Lost time adjustments are generally only used if sufficient data has been collected at an intersection supporting the use of an adjustment. Tetra Tech recommends that lost time adjustments not be applied when conducting any future analyses.
- 31. Capacity analyses for the Build with Mitigation conditions at the Route 1/Merrimac Street ramps and Merrimac Street/Green Street/Newburyport Visitor Center driveways were conducted. Tetra Tech has the following comments on these analyses:
 - a) The pedestrian calls are assumed to be zero. The Applicant should verify the appropriate number of pedestrian calls based on the count data.
 - b) Tetra Tech has reviewed the electronic Synchro files and notes significant congestion in the network under the Build (mitigated) conditions. It is recommended that the Applicant review the capacity analyses to address all comments in this letter and ensure that the proposed improvements can accommodate the additional traffic generated by the site.
- 32. The TIA analyzed the Merrimac Street/State Street intersection as a signalized intersection using the Percentile Delay Method utilizing the Synchro version 8.0 software. MassDOT standards indicate

that the level of service results should be reported using methodologies from the Highway Capacity Manual (HCM). The Applicant should discuss the use of the Percentile Delay Method instead of the HCM method for signalized intersections.

Sight Distance Evaluation

- 33. Both stopping and intersection sight distances were evaluated for the site driveways located on Merrimac Street which are existing intersections. The measured sight lines were compared to recommended sight distances published by AASHTO for the posted speed limit. This is appropriate since the measured 85th percentile travel speeds are less than the posted speed limit on Merrimac Street. However, the sight distance calculations were not provided in the TIA. It is recommended that the calculations be provided in order to provide a comprehensive review. Additionally, based on the results presented in Table 12 of the TIA, it appears that the required minimum SSD has not been adjusted for roadway grades. It is recommended that the Applicant ensure that the SSD calculations account for roadway grade consistent with AASHTO standards.
- 34. The TIA recommends that the proposed signs and landscaping within the intersection sight triangles for the ways serving the site be designed to not restrict sight lines. The TIA also recommends that snow windrows be removed once they exceed 2.5 feet in height within the sight triangles of the ways serving the site. Tetra Tech generally agrees with these recommendations.
- 35. The TIA used a driver position distance for ISD of 7-10 feet back from edge of roadway. AASHTO guidance indicates that 8 to 14.5 feet back from the edge of travel way should be used in ISD analyses.
- 36. It is recommended that the Applicant provide sight triangles and profiles for all three driveways to ensure that adequate sight distance can be provided assuming implementation of the Merrimac Street roadway improvement plan recently approved for the MVRTA's Intermodal Facility. If minimum AASHTO SSD and ISD criteria are not satisfied, mitigation should be proposed, where possible, to enhance sight lines. The Applicant may also consider alternative access locations where adequate sight lines can be achieved.
- 37. The TIA recommends that the City consider restricting on-street parking within 20 feet of the way serving the site to enhance sight lines. Tetra Tech generally agrees with this recommendation, but recommends that the Applicant prepare the sight triangles for each site driveway and work with the City to determine appropriate measures, if any, to enhance sight lines where AASHTO criteria is not met, including any removal of on-street parking spaces.

Parking

38. The March 10, 2017 plan set does not provide a summary of all of the proposed on-site parking. The Applicant should summarize the proposed parking supply and compare it to existing and proposed City standards.

Emergency/Fire Access

- 39. The TIA recommends that the access ways to the site be at least 24-feet wide for two-way traffic flow and 20-feet wide for one-way traffic flow and that fire lanes be a minimum of 20-feet wide and constructed with a surface material that can support emergency vehicles to ensure adequate fire truck access consistent with NFPA®1. Tetra Tech generally agrees that the application of this guidance is reasonable.
- 40. Plan FT-1 provides an AutoTurn analysis of a 41-foot long ladder truck. Review of Plan FT-1 indicates that the ladder truck can generally maneuver in and around the site adequately with the following exceptions:

- c) The Applicant should confirm the design vehicle used in the AutoTurn analysis with the Newburyport Fire Department.
- d) The plan indicates that access to Building 2 may require the ladder truck to reverse direction when exiting.
- e) The shortest path for an emergency vehicle entering the site via Tournament Wharf to Building 2 would be to use the aisle between Buildings 2 and 7. The Applicant should provide an AutoTurn analysis of the emergency vehicle making a right-turn maneuver entering the parking lot adjacent to Building 2.
- f) The Applicant should provide an AutoTurn analysis of an emergency vehicle making a leftturn from the aisle south of Building 4 onto McKay's Wharf.
- g) Building 8 appears to have limited emergency vehicle access and the current plan only shows an emergency vehicle driving past the south side of Building 8. The Applicant should confirm emergency access to Building 8 and work with the Fire Department, as necessary, to determine if additional access is required. If an emergency vehicle is expected to enter the area to the right of Building 8, the Applicant should provide an AutoTurn analysis of an emergency vehicle entering and exiting this area.
- h) The Applicant should conduct an AutoTurn analysis of an emergency vehicle accessing Building 6.
- i) The Applicant should confirm if emergency vehicles will be able to maneuver between the aisle between Buildings 3, 4 and 8. If so, the Applicant should conduct an AutoTurn analysis to ensure that all maneuvers to/from this internal intersection are accommodated.
- j) There are several areas of Plan FT-1 where the emergency vehicle appears to conflict with proposed parking spaces or islands. Such points of conflict include, but are not limited to, the parallel parking in the southwest corner of Buildings 1 and 5, the parking aisle north of Building 3 and the island north of Building 7. The Applicant should ensure that all islands are either mountable or redesigned to accommodate emergency vehicle access and remove any parking spaces that would conflict with the path of emergency vehicles.
- k) The Applicant should review the grades of the driveways serving the site to ensure that adequate emergency access will be provided.
- 41. The AutoTurn analyses provided in plan FT-1 only show an emergency vehicle entering from the west. The Applicant should conduct AutoTurn analyses of emergency vehicles entering the site driveways (including Brown's Wharf via Merrimac Street) from the east. Similarly, the Applicant should ensure that emergency vehicles can exit the site to the west along Merrimac Street.
- 42. The Applicant should review the site plan with the Fire Department to ensure the City is satisfied with the emergency vehicle accommodations.

School Bus Pick-Up/Drop-Off

43. Tetra Tech agrees with the TIA that the Applicant should discuss possible bus pick-up/drop-off locations with City Officials including the School Department. The anticipated location(s) of any bus stops should have adequate sight lines for vehicles driving behind or opposing the school bus to see the bus's flashing lights.

Roadway Configuration & Signage

44. The Applicant should consider the feasibility of improving the site access between the existing Brown's Wharf parcels to ensure safe and efficient intersection operations into and out of the site at this location. An alternative to consider is restricting access at this location to emergency access only or removing the access to the site.

- 45. The Applicant should confirm if the site driveway aisles labeled as fire truck lanes will be limited to emergency vehicle travel only. If so, proper signage and pavement markings should be provided.
- 46. The Applicant should consider the feasibility of restricting some of the travel aisles to one-way movements and converting some of the surface parking to parallel parking as some of the emergency maneuvers through the site are very tight.
- 47. The Applicant should consider installing Stop bars and Stop signs at the on-site internal intersections.
- 48. The TIA recommends that Stop-sign control and Stop line pavement markings should be implemented for vehicles exiting the site. Tetra Tech generally agrees with this recommendation at the site access points with Merrimac Street (Tournament Wharf and McKay's Wharf) and the site access to Brown's Wharf and the rear parking lot serving the Newburyport Visitor's Center. Additionally, Tetra Tech recommends that the Applicant work with the owner of the Brown's Wharf driveway to implement a Stop sign and Stop line pavement markings at its intersection to Merrimac Street.
- 49. Should a central mailing system be implemented, the Applicant should consider a curb bump out or designated parking space for the mail delivery vehicles and motorists picking up/dropping off mail.
- 50. The Applicant should consider the feasibility of relocating or restricting access at McKay's Wharf. McKay's Wharf is separated from the exit-only driveway serving the adjacent Horton's Yard property to the east via an approximate 4-foot wide brick wall and ensure that the McKay's Wharf driveway conforms to current City standards.

Pedestrian and Bicycle Access

- 51. The March 10, 2017 plan set provides a pedestrian and bicycle circulation plan (Plan C-4) which shows pedestrian circulation through parts of the site, but not the entire site and it does not show details of pedestrian accommodations (sidewalks, crosswalks, etc.). Tetra tech generally agrees with the TIA that sidewalks should be provided connecting the on-site buildings and amenities to the existing sidewalk system on Merrimac Street. The Applicant should provide a more detailed plan of proposed pedestrian and bicycle accommodations to ensure that safe pedestrian and bicycle access is provided, especially as they relate to connections with existing facilities. Also, as mentioned previously, the Applicant should continue to work with the City on the proposed site connection to the Clipper City Rail Trail.
- 52. Tetra Tech generally agrees with the TIA that that the driveways be constructed so that they are flush with adjacent sidewalks or, when this cannot be achieved, that wheelchair ramps that are compliant with the American Disabilities Act (ADA) be implemented. Tetra Tech recommends that the Applicant review any areas where on-site roadway grades, including the site driveways, consist of grades that exceed ADA standards and discuss the feasibility of providing ADA-compliant grades or alternative travel paths that satisfy ADA standards.
- 53. Crosswalks should be provided where sidewalks end on one side of the site roadways and begin on the opposite side of the street. The Applicant should ensure that all sidewalks begin and end at internal intersections wherever possible to ensure that midblock crossings are avoided.

Transportation Demand Management Program (TDM)

54. The TIA states that the project will implement a TDM program at the site to encourage alternative modes of transportation including the posting of public transit information, distribution of welcome packets to new residents and employees detailing alternative modes of transportation at the site,

emergency ride home program through MassRIDES, pedestrian accommodations, connection to the Clipper City Rail Trail, construction of a central mailing system within each building and secure bicycle parking. Tetra Tech notes that the proposed TDM program is reasonable for this type and size project.

Legal Rights of Access over Private Ways

55. The Applicant should confirm the jurisdiction of all access roadways connecting to the site to determine which roadways are private ways. Any connection to a private way should be addressed with the City and owners of any privately-maintained roads. Additionally, the plans show that the access to the adjacent Michael's Harborside property, Newburyport Visitor Center, Brown's Wharf and access to the Clipper City Rail Trail via Tournament Wharf are proposed to remain. Any shared access agreements should be reviewed to ensure that access to these adjacent uses will be maintained as proposed.

Off-Site Mitigation

- 56. The Applicant has proposed off-site mitigation at two critical areas within the study area along Merrimac Street at 1) the Route 1 ramps and 2) Green Street/Newburyport Visitor Center Driveway. Tetra Tech generally agrees that mitigation is warranted at these locations.
- 57. Merrimac Street/Route 1 ramp intersections:
 - a) The Applicant is proposing to prepare the design plans at this location, assuming traffic signal implementation, including MassDOT 100 Percent Design/Project Specifications & Estimate (PS&E). The Applicant is also proposing to assist in the preparation of grant applications to obtain construction funding (by others) for these improvements. The Applicant should address the current lack of funding for this project.
 - b) The Applicant should provide concept plans that detail the proposed geometry and traffic signal equipment necessary to support the improvements and provide a cost estimate for the proposed modifications.
 - c) As mentioned previously, Tetra Tech has reviewed the electronic Synchro files and notes significant congestion in the network under the Build (mitigated) conditions assuming signalization at the ramps. It is recommended that the Applicant review the capacity analyses to address all comments in this letter and ensure that the proposed improvements can accommodate the additional traffic generated by the site.
 - d) The Applicant should consider the feasibility of alternative (unsignalized) improvements at the Merrimac Street/Route 1 ramp intersections, such as a roundabout, that address traffic safety and flow and minimize delays. If alternative improvements are feasible, concept plans and cost estimates should be provided.
- 58. Merrimac Street/Green Street/Newburyport Visitor Center Driveway Intersection:
 - a) The Applicant is proposing to implement improvements at this location to mitigate project-related impacts including implementation of traffic signalization for all roadway users (it is currently operating under traffic signal control only upon pedestrian push-button actuation). The Applicant should provide concept plans that detail the proposed geometry and traffic signal equipment necessary to support the improvements and provide a cost estimate for the proposed modifications.
 - b) Tetra Tech is aware that the City is currently evaluating potential traffic circulation modifications in the downtown area including the conversion of Green Street from one-way (northbound) vehicle

flow to two-way traffic flow from High Street to Merrimac Street. The Applicant should work with the City to determine the appropriate project mitigation at this location.

In summary, the TIA generally conforms to industry standards. However, the Applicant should provide additional information on the items identified in this letter to provide a comprehensive review of the project's traffic-related impacts. The most significant items to address include:

- Confirm the need for a Massachusetts Department of Transportation (MassDOT) Access Permit and determine if review is required through the Massachusetts Environmental Policy Act (MEPA) office.
- Confirm the appropriate peak hour turning movements were used at the Merrimac Street intersections with Brown's Wharf and the Newburyport Visitor Center driveway.
- Describe how the trip generation by the existing site uses was determined.
- Provide the source of the internal trip capture rates used in estimating the project's trip generation.
- Provide supporting calculations for the regional commercial trip distribution patterns used in the TIA
 and detailed calculations of the residential and commercial trip distribution at the driveways serving
 the site based on the locations of on-site parking.
- Provide a summary of the proposed on-site parking supply and compare to existing and proposed City standards.
- Review the feasibility of relocating the McKay's Wharf driveway further west and eliminating the use of the Brown's Wharf driveway.
- Explain the use of the Percentile Delay Method instead of the Highway Capacity Manual (HCM) which is the method recommended by MassDOT.
- The Build (with project and mitigation) condition capacity analyses for the Merrimac Street intersections with the Route 1 ramps, Green Street and the Newburyport Visitor Center driveway should be updated to address comments herein including, but not limited to, volumes, peak hour factors, signal settings, and intersection layout and ensure that all proposed mitigation can adequately accommodate the proposed project traffic increases.
- Review the available sight distances at the driveways serving the site with the City to determine removal of obstructions (such as on-street parking) within the sight triangles to enhance sight lines.
- Prepare additional AutoTurn analyses to ensure that emergency vehicles can adequately access and maneuver through the site subject to review by the Newburyport Fire Department.
- Prepare concept plans and cost estimates for all proposed off-site mitigation and review the feasibility of alternative improvements.
- Address the lack of current available construction funding for the future roadway improvements at the Route 1 northbound and southbound ramps.

These comments are offered as guides for use during the City's review. If you have any questions or comments, please feel free to contact us at (508) 786-2200.

Very truly yours,

Country & Jones

Courtney E. Jones, P.E. Senior Project Engineer

P:\165975\143-165975-17001\DOCS\REPORTS\REVIEWLTR_WATERFRONT WEST_07.14.2017_FINAL.DOCX