



E - Transportation Narrative



Transportation

This current transportation evaluation builds upon the prior extensive transportation analyses¹ conducted for the Planned Unit Development Preliminary Master Plan (PUD-PMP) for the XMBLY development located at 5 Middlesex Avenue in Somerville, Massachusetts.

This section provides an evaluation of the new Block 23 development for WP East Acquisitions, LLC, which will include approximately 329 new residential apartment units and approximately 4,100 square feet (sf) of supporting street-front retail/restaurant space (the "Project"). Approximately 2,250 sf of retail/active space also will be located at the southwest corner of the Grand Union Boulevard/Road L intersection. The specific potential traffic impacts associated with this current development project, as described in the following section, is also evaluated as part of this current assessment. The Project name is now Alta XMBLY and addressed as 290 Revolution Drive.

Proposed Alta XMBLY Development Program

The Alta XMBLY development will be constructed within an approximately 71,935 sf (1.65 acre) parcel of land within the planned XMBLY development in Somerville, Massachusetts (the "Site"). This initial XMBLY development will occur within Alta XMBLY, which is bound by Grand Union Boulevard to the east, the planned Road K to the west, and the planned Road L and Revolution Drive to the north and south, respectively. A total of 329 residential units are proposed within the planned eight-story Alta XMBLY building, along with 4,140 sf of street-level retail/restaurant use. As noted earlier, approximately 2,250 sf of retail/active space also will be located at the southwest corner of the Grand Union Boulevard/Road L intersection. The parking needs for this parcel will be accommodated by 199 structured parking spaces within the new Alta XMBLY building footprint. This parking will be designated for use by residents only, with parking for the retail/restaurant uses being provided on-street along Road K, and other nearby roadways where public parking is available. The proposed Site parking supply falls below the 342-space supply required by the City of Somerville Zoning Ordinance, but still will meet the anticipated functional needs of the

▼
¹ XMBLY PUD-PMP, Traffic Impact and Access Study, VHB (Watertown, Massachusetts) March 2018.



proposed Project. A waiver from this parking requirement is being requested in conjunction with this submittal.

The proposed development for Alta XMBLY is consistent with the recently approved PUD-PMP for the overall XMBLY development. The anticipated trip generation associated with this proposed development is discussed in detail later in this evaluation.

Vehicular Access and Circulation

The Project Site is bound by Grand Union Boulevard and Revolution Drive to the east and south, and the newly proposed Road K and Road L to the west and north, respectively. With the Site being bound by these existing and planned roadways, there will be multiple options for automobile traffic entering and exiting the overall Project site. The planned Road K will connect to Foley Street to the north, and to Revolution Drive to the south. Road K will intersect Foley Street opposite the K-Mart Driveway on the opposite side of the roadway, and this location will continue to function as a full-access unsignalized intersection. Road K will continue to the south through the Site where it will intersect Revolution Drive opposite the existing Home Depot driveway. To enhance access at this location, a new eastbound left-turn lane will be constructed within the existing Revolution Drive median to accommodate entering left-turns into the Project Site. This intersection will continue to operate as a full-access four-way, unsignalized intersection. At its approximate midpoint, Road K will be intersected by Road L, which will continue to the east to its terminus with Grand Union Boulevard.

To avoid traffic conflicts on Grand Union Boulevard, turning movements to and from Road L will be limited to right-turns only. Road L will provide access and egress for the Project's 199-space residential parking garage, and Site residents also can use Road K to travel to and from the garage.

Pedestrian/Bicycle Accommodations

As part of the planned multi-modal environment of XMBLY there will be ample pedestrian accommodations in place surrounding Alta XMBLY. Grand Union Boulevard already features 8-foot wide sidewalks along both sides of the roadway, with crosswalks provided at Foley Street to the north, and Revolution Drive to the south. Push-button actuated exclusive pedestrian phases are provided at both intersections.

A 10.5-foot minimum-width sidewalk will be constructed along the northerly Site frontage along Road L, with street furniture provided and tree pits at the wider mid-block segment. A variable-width sidewalk will be constructed along the Site's Road K



frontage along with street furniture, trees and other amenities. A 12+foot wide sidewalk also will be provided along the northerly side of Revolution Drive, including street trees. The segment of Road K between Road L and Revolution Drive is being designed as a “festival street”, which may be shut down for automobile traffic for special events. This segment will be designed with the roadway being raised to be flush with the sidewalks to help promote the desired multi-modal environment. Bollards will be provided along the roadway edge between the on-street parking and sidewalk area for added pedestrian protection.

Grand Union Boulevard currently features striped bicycle lanes on both sides of the roadway. The newly proposed Road K is being designed with single travel lanes in both directions along with parking along both sides of the street for most of its length. Space also is available within the Road K cross-section for 5-foot wide bike lanes on both sides of the direction. With the planned multi-modal setting, the festival-street configuration of Road K, and other factors, bicyclists should be able to readily ride within the flow of automobile traffic if desired due to the expected low speeds.

The Somerville Zoning Ordinance requires 111 bicycle parking spaces for the proposed Alta XMBLY development, and this requirement will be satisfied within the proposed parking garage.

Loading

The loading needs for Alta XMBLY are planned to be accommodated by two time-restricted loading spaces provided along the easterly side of Road K just south of Road L. The loading spaces will be located at the northerly end of the eight-foot wide parallel parking spaces planned along the Site’s Road K frontage. During the times of day when the spaces are not designated for loading activity, these spaces will be available for regular automobile parking. These two spaces have been located in close proximity to the building’s south lobby and move-in entrances to minimize the amount of time required for loading. In conjunction with this submittal, a waiver is being requested for relief from the required 12-foot by 20-foot loading space dimensions, as the two loading spaces will be 8-foot wide by 20-feet and 22-feet, respectively. From a functional perspective, these loading spaces should readily accommodate the anticipated Site demand. Individual tenant use of the loading spaces will be for supply deliveries and should be in the former of smaller trucks as opposed to longer trailer trucks. Most retail/restaurant deliveries should occur in the weekday morning hours. Regardless, as part of the overall Site management, deliveries being made to Alta XMBLY will be scheduled to help minimize any shared loading conflicts.



Sight Distance Evaluation

Sight distance measurements and analyses were performed in conformance with guidelines of the American Association of State Highway and Transportation Officials (AASHTO)² for the proposed Alta XMBLY Site driveway on Road K.

Stopping sight distance (SSD) is the distance required for a vehicle traveling along a roadway to perceive, react, and come to a complete stop before colliding with an object in the path of travel. SSD is measured along each major approach to unsignalized intersections to determine if vehicles can safely exit from a minor street or driveway approach. In this respect, SSD can be considered as the minimum visibility criterion for the safe operation of an unsignalized intersection.

Intersection sight distance (ISD) is based on the time required for perception, reaction, and completion of the desired critical exiting maneuver (a right-turn for both of the site driveways) once the driver on a minor street approach (or a driveway) decides to execute the maneuver. In this context, ISD is a desirable visibility criterion for the safe operation of an unsignalized intersection.

The required SSD and ISD for the proposed Alta XMBLY driveway were calculated using AASHTO guidelines. Table 1 summarizes the available and required sight distances.

**Table 1
Sight Distance Analysis Summary**

Driveway	Stopping Sight Distance			Intersection Sight Distance		
	Traveling	Required*	Measured	Looking	Desired	Measured
Alta XMBLY Road L	Eastbound	80 feet	100 feet ¹	Right	170'	110 feet ¹
	Westbound	80 feet	110 feet ¹	Left	170'	100 feet ¹

* Calculated sight distance based on 15 mph design speed.

¹ Clear sight lines are available between the proposed Alta XMBLY driveway and Grand Union Boulevard and Road K intersections to the east and west, respectively.

As can be seen in Table 1, the measured stopping sight distances for the proposed Alta XMBLY driveway satisfy AASHTO requirements for the expected 15 mph travel speeds along this short, Road L segment connecting Road K to Grand Union Boulevard. While the available intersection sight distance technically falls below the desirable ISD levels, exiting driveway traffic from the garage has clear lines of sight

² [A Policy on the Geometric Design of Highways and Streets](#); American Association of State Highway and Transportation Officials; Washington, D.C.; 2011.



looking to the east and west. While these measured sight lines fall below the desirable AASHTO levels, these are actually the measured distances from the driveway to both roadways intersecting Road L. Due to the 90-degree angle of these intersecting roadways, traffic turning from these streets will be doing so at even lower speeds so that adequate sight lines still will be available. With the proposed new building being set back sufficiently from the roadway edge, there are no physical obstructions which will impede the driver's sight lines from the Alta XMBLY driveway.

Trip Generation Summary

The trip generation analysis presented during the PUD-PMP approval process was a complex in nature due to transit use, travel by pedestrians and bicyclists, and potential trip sharing with nearby uses. Trip generation for Alta XMBLY was calculated for this assessment using the same Institute of Transportation Engineers (ITE)³ based methodology used in the transportation analysis during the PUD-PMP approval process.

Alta XMBLY Trip Generation Summary

The unadjusted trip generation estimates for the current Alta XMBLY development proposal are summarized in Table 2 for the proposed residential and retail/restaurant uses.



3 [Trip Generation Manual; Tenth Edition; Institute of Transportation Engineers; Washington, D.C.; 2017.](#)



Table 2
Alta XMBLY Trip Generation –
Total Unadjusted Trips

Time Period	Apartments: 329 units ¹ +	Retail/Restaurant: 4,140 sf ²	= Total
Weekday Daily (vpd)	1,790	156	1,946
Weekday Morning Peak (vph)			
Enter	29	2	31
<u>Exit</u>	<u>81</u>	<u>2</u>	<u>83</u>
Total	110	4	114
Weekday Evening Peak (vph)			
Enter	85	8	93
<u>Exit</u>	<u>54</u>	<u>8</u>	<u>62</u>
Total	139	16	155
Saturday Daily (vpd)	1,418	192	1,610
Saturday Midday Peak (vph)			
Enter	71	10	81
<u>Exit</u>	<u>74</u>	<u>9</u>	<u>83</u>
Total	145	19	164

vpd Vehicles per day
vph Vehicles per hour

1 Source: Trip Generation Manual, Tenth Edition; Institute of Transportation Engineers; Washington, D.C.; 2017. Based on ITE LUC 221 (Mid-Rise Residential), based on 329 units.

2 Based on ITE LUC 820 (Shopping Center), assumes 4,140 sf of retail/restaurant space.

The trip generation estimates summarized in Table 2 are the raw, unadjusted trips that could be generated by the proposed uses without any consideration for transit use, travel by bicycles and pedestrians, shared trips and other factors inherent within the mixed-use context of the surrounding area. Ultimately, considerable internal trip-sharing between Alta XMBLY and surrounding uses within the XMBLY site (and other nearby developments) is expected. The exact amount of trip sharing is largely depending on the amount and type of surrounding uses, both of which will be continually changing as XMBLY and the surrounding Assembly Square area continues its growth. As such, varying levels of trip sharing also expect through various time of day and on weekends.

The amount of automobile traffic generated by Alta XMBLY should be limited due to the availability of public transportation. The PUD-PMP transportation analysis for the overall XMBLY development assumed that only 43-percent of residents would be



travelling by automobile to and from the Site, but that 80-percent of the retail traffic would be in the form of automobile trips. This conservative approach was taken to help avoid any potential off-site traffic impacts from being understated. However, for this analysis, the City of Somerville's maximum desired auto mode split of 50-percent was utilized. With ample transit opportunities, and the surrounding multi-modal environment, travel by means other than automobile is now a viable option to the point where the 50-percent goal ultimately should be attainable.

Furthermore, retail uses typically attract a significant percentage of their customers in the form of "pass-by" trips consisting of vehicles already on the adjacent roadway that are attracted to a retail use when passing the Site. The primary destination of this traffic is elsewhere and the primary trip will be resumed following a stop at the proposed development. As with the PUD-PMP analysis, ITE-documented pass-by rates of 34- and 26-percent were utilized during the respective weekday evening and Saturday midday peak hours, with a 25-percent pass-by rate being used during all other time periods studied.

These factors, combined with the internal trip sharing with other nearby uses, will reduce the amount of vehicle traffic associated with the new Alta XMBLY development. Once these factors have been appropriately considered, the resulting vehicular traffic on the surrounding roadways can be estimated. Table 3 summarizes the Alta XMBLY trip generation considering internal shared trips and mode splits.



Table 3
Alta XMBLY Trip Generation –
Net New Vehicle Trips

Time Period	Total Unadjusted ¹	- Shared/Transit/ Bike/Pedestrian ²	= Total Net
Weekday Daily (vpd)	1,946	1,168	778
Weekday Morning Peak (vph)			
Enter	31	19	12
Exit	<u>83</u>	<u>50</u>	33
Total	114	69	45
Weekday Evening Peak (vph)			
Enter	93	59	34
Exit	<u>62</u>	<u>39</u>	23
Total	155	98	57
Saturday Daily (vpd)	1,610	1,002	608
Saturday Midday Peak (vph)			
Enter	81	52	29
Exit	<u>83</u>	<u>53</u>	30
Total	164	105	59

vpd Vehicles per day

vph Vehicles per hour

1 Source: Table 2.

2 Source: Adjustments to trip generation based on methodology outlined in [Trip Generation Manual; Tenth Edition](#); Institute of Transportation Engineers; Washington, D.C.; 2017.

As shown in Table 3, once transit use, internal shared trips, and travel to and from the Project Site by biking and walking are properly considered, the resulting trip generation ranges from 45 to 59 new peak hour trips. As with other developments in the area, Alta XMBLY should experience notable transit ridership as the new Orange Line Station is conveniently located roughly 1,000 feet to the east of the proposed building. Alta XMBLY traffic is expected to follow the same general travel patterns to and from the site as that summarized in the PUD-PMP transportation analysis. Once these trips have been distributed onto the surrounding roadway network this level of additional traffic should not have a notable impact on the operation of the surrounding roadways or intersections.



Traffic Mitigation Overview

The PUD-PMP transportation analysis identified several transportation-related improvements both within the Assembly Square District and in the surrounding area. These improvements have been identified to address potential traffic impacts associated with the overall XMLBLY development and, as such, will be able to accommodate the lesser traffic from the Alta XMBLY development.

The traffic study analysis indicates that depending on the nature of a given Project use, approximately 15- to 35-percent of the Project traffic will be passing through the Mystic Avenue/Broadway/Lombardi Street interchange at the southwesterly end of the Assembly Square district. This interchange was reconstructed with significant signal enhancements as part of the initial nearby Assembly Square redevelopment project. However, to help mitigation any potential traffic impacts resulting from this Project, the Proponent is proposing to install an adaptive traffic signal system including the following four locations:

- Mystic Avenue (Route 38) at I-93 Southbound Off-Ramp U-Turn
- Mystic Avenue (Route 38) at Grand Union Boulevard / Lombardi Way
- Lombardi Way at I-93 Southbound Off-Ramp
- Broadway at Lombardi Way / Mt. Vernon Street

Each of these four locations is currently signalized, and interconnected, so that they all are operating in a coordinated manner under peak-period conditions. However, installing the updated adaptive signal equipment will allow these four signals to operate in a far more flexible, adaptive manner responding to actual traffic conditions continuously on a cycle-by-cycle basis. Adaptive signal control is a relatively new design entity, but it has been found to be very effective, and far more responsive than just relying on predetermined signal timing programs. This new system will help to minimize Project impacts while helping to address existing deficiencies in this area.

TDM Plan

Transportation Demand Management (TDM) measures are most often directed at commuter travel and implemented at office sites. However, due to the mixed-use and transit-orientated nature of the Proposed Project, there also are opportunities to bring TDM programs to the Proposed Project's other land uses, including the residential housing retail shops, restaurants, and active uses.



The Proponent is committed to becoming an active member of the Assembly Square Transportation Management Association. An overall on-site TDM coordinator will be designated to oversee all TDM programs for each building of the Proposed Project, and the Project site in its entirety. The person(s) in this role will coordinate with other organizations within Assembly Square to help promote a reduced reliance on single-occupant motor-vehicle travel to the Project site.

General TDM measures to be implemented as part of this Project will involve promoting transit use and facilitating bicycle and pedestrian travel both through site amenities and ongoing practices and programs. These will include providing bicycle racks and amenities and also may involve providing a new Blue Bikes bike-share station within the Project Site. The mixed-use nature of the site by itself also effectively will function as a TDM measure. Specifically, with the variety of uses proposed both within the Project site and in place in the surrounding area, the need to travel off-site by automobile for dining or shopping opportunities will be minimize. With the mixture of residences and office/lab uses it is possible that some residents may specifically choose to work on site due to it also being their place of employment, further reducing the need for vehicular travel.

Conclusion

The proposed Alta XMBLY development will involve the construction of approximately 329 new residential apartment units and 4,140 sf of supporting ground-floor retail/restaurant space. Trip generation for this development was estimated using the same ITE-based methodology utilized for PUD-PMP transportation analysis for the overall XMBLY development. The resulting trip generation is expected to range from 42 to 59 total peak hour trips on the surrounding roadway network. Once these trips have been distributed onto the surrounding roadway network this level of additional traffic should not have a notable impact on the operation of the surrounding roadways or intersections. The trip generation associated with Alta XMBLY falls within the previously estimated levels for this area, so there should not be any changes in the anticipated impacts which were considered in the PUD-PMP transportation analysis. Accordingly, further detailed traffic analyses should not be necessary for this currently proposed development.