Shropshire Associates LLC

ESBE / SBE Certified

Traffic Engineering, Transportation Planning & Design

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Mr. Jon Barnhart, P.E. (via email jbarnhart@awponzio.com)
Arthur W. Ponzio Company & Associates, Inc.
400 North Dover Avenue
Atlantic City, NJ 08401

Re: **Traffic Engineering Evaluation**
Amherst Avenue Development Plan
City of Margate, Atlantic County, NJ
SA Project No. 20514

Dear Jon:

In response to your request, Shropshire Associates, LLC has completed a traffic engineering evaluation of the potential conversion of Amherst Avenue into a one-way street from Washington Avenue to Coolidge Avenue. Traffic count data along Amherst Avenue and the surrounding streets was analyzed for both existing conditions, and future conditions with one-way flow along Amherst Avenue in the westbound direction. Accident reports along Amherst Avenue and the surrounding streets were also analyzed. For the purpose of this study, Amherst Avenue is assumed to extend in an east-west direction.

Existing Conditions

A field reconnaissance was conducted to determine the features of the adjacent street network within the study area. Descriptions of the streets and intersections within the study area for this assessment are provided below.

- **Amherst Avenue** is a two-lane local street under the jurisdiction of the City of Margate. Amherst Avenue has a speed limit of 25 MPH and an approximate cartway width of 40' with 20' long perpendicular parking spaces to the north and on-street parallel parking to the south. The distance between Washington Avenue and Coolidge Avenue along Amherst Avenue is approximately 1,500'.

- **North Washington Avenue** is a two-lane local street under the jurisdiction of the City of Margate. Washington Avenue has a speed limit of 25 MPH and an approximate cartway width of 35'. Washington Avenue also provides parallel parking along both directions of the street.

- **North Adams Avenue** is a one-way southbound (SB) local street under the jurisdiction of the City of Margate. Adams Avenue has a speed limit of 25 MPH and an approximate cartway width of 25'. Adams Avenue also provides parallel parking along both directions of the street.

- **North Jefferson Avenue** is a one-way northbound (NB) local street under the jurisdiction of the City of Margate. Jefferson Avenue has a speed limit of 25 MPH and an approximate cartway width of 26'. Jefferson Avenue also provides parallel parking along both directions of the street.

- **North Madison Avenue** is a one-way southbound (SB) local street under the jurisdiction of the City of Margate. Madison Avenue has a speed limit of 25 MPH and an approximate cartway width of 25'. Madison Avenue also provides parallel parking along both directions of the street.

- **North Monroe Avenue** is a one-way local northbound (NB) street under the jurisdiction of the City of Margate. Monroe Avenue has a speed limit of 25 MPH and an approximate cartway width of 26'. Monroe Avenue also provides parallel parking along both directions of the street.

- **North Coolidge Avenue** is a two-lane local street under the jurisdiction of the City of Margate. Coolidge Avenue has a speed limit of 25 MPH and an approximate cartway width of 35'. Coolidge Avenue also provides parallel parking along both directions of the street.

- **Monmouth Avenue** is a one-way westbound (WB) local street under the jurisdiction of the City of Margate. Monmouth Avenue has a speed limit of 25 MPH and an approximate cartway width of 26'. Monmouth Avenue also provides parallel parking along both directions of the street. Monmouth Avenue currently pairs with Winchester Avenue which is one-way eastbound (EB).

- The only other public street within the study area is **Al Troiano Boulevard** (Massey Avenue) which extends for one block between Washington Avenue and Adams Avenue. The street is one land, one-way westbound with curb parking on both sides of the street.

- With the exception of the Washington Avenue/Monmouth Avenue intersection, all intersections in the study area are stop sign controlled with one lane on each approach. The **Washington Avenue/Monmouth Avenue intersection** is controlled by a two-phase traffic signal with one travel lane on each leg of the intersection.

Traffic Data

Traffic counts were conducted along Amherst Avenue between Washington Avenue and Jefferson Avenue during the Friday and Saturday peak traffic periods during the summer of 2018. The counts showed the following vehicle totals during the peak hour traffic conditions:

STREET	Friday AM Peak Hour	Friday PM Peak Hour	Saturday Peak Hour
Amherst Avenue	WB: 143 EB: 88	WB: 351 EB: 144	WB: 230 EB: 124
Washington Avenue	NB: 24 SB: 32	NB: 102 SB: 79	NB: 60 SB: 56
Adams Avenue	SB: 22	SB: 113	SB: 57
Jefferson Avenue	NB: 28	NB: 100	NB: 46

The following can be observed from the traffic counts:

- The highest volumes recorded were during the weekend evening peak hour.
- Each street in the study area is a low-speed, low volume local street.
- Amherst Avenue has a substantially higher westbound traffic volume during the critical peak hours than the eastbound traffic volume. As a result, a one-way westbound orientation of Amherst Avenue is justified by the current character of the traffic volumes.
- The northbound and southbound volumes on Washington Avenue, Adams Avenue and Jefferson Avenue are fairly balanced with Adams Avenue and Jefferson Avenue representing a one-way street pair.
- It is reasonable to assume that the one-way volumes along Madison Avenue and Monroe Avenue would be fairly consistent with the volumes on Adams Avenue and Jefferson Avenue, respectively.
- It is reasonable to assume that the two-way volume along Washington Avenue is consistent with, if not higher than, the volume along Coolidge Avenue.

Accident Data

The Margate City Police Department collected crash data in the portion of Amherst Avenue between Washington Avenue and Coolidge Avenue for the past four years. It was found that from 2016 to 2019, nine accidents occurred along northbound Amherst Avenue. Five accidents involve vehicles being struck by vehicles backing out of the parking spaces along Amherst Avenue. There were also two same direction side-swipe accidents that occurred along this portion of eastbound Amherst Avenue. The remaining two-accidents occurred at stop-controlled intersections along Amherst Avenue where vehicles on the side streets did not obey the stop sign.

Evaluation of Converting a Section of Amherst Avenue to a One-Way Street

As described above, the streets within the study area are a mixture of one-way and two-way traffic flows. The purpose of the conversion would relate to improved management of traffic patterns and reducing conflicts. Generally, motorist and pedestrians are concerned about safety and mobility. Area businesses and property owners would have concerns over accessibility and economic impact. In order to evaluate the conversion of a two-way street to a one-way flow, the evaluation criteria suggested by the traffic engineering industry include safety, speed, functional street pairs, impacts on other streets, local access, driving distance increases, driver confusion and cost. Each of the evaluation criteria are addressed in the following sections.

Safety: The conversion of a two-way street to a one-way street inherently increases safety by reducing the number and severity of crashes through eliminating head-on crashes. One-way streets can simplify crossings for pedestrians, who must look for traffic in only one direction. Studies have shown that conversion of two-way streets to one-way generally reduces pedestrian crashes. Vehicle conflict points are also reduced with one-way flow through the reduction of permitted turning movements. In addition, the accident experience along Amherst

Avenue would suggest that a one-way flow would improve overall traffic safety through eliminating a direction of flow for the backing maneuvers of parked vehicles along the waterfront. In general, one-way streets work well in heavily congested traffic areas or in central business districts. The congestion related to Amherst Avenue is tied to pedestrian activity and parking maneuvers along the street not a lack of street capacity. From a safety standpoint, a properly designed one-way flow along Amherst Avenue within the study area should provide improvement.

Speed: Two-way streets will tend to generate slower speeds due to "side-friction," especially on residential streets without a striped center line. Although Amherst Avenue has no centerline stripe, it does have a mix of commercial, recreational and residential uses and is a low speed street. To address the speed of traffic if the street is converted to one-way, design changes should be made to minimize the westbound lane width which may include traffic calming techniques such as curb extensions and turning radius reductions. Substantial “side-friction” will remain with the angled parking along the waterfront, parallel parking along the south side of the street and the presences of six cross streets within the 1,500’ section of Amherst Avenue.

Functional Street Pairs: One-way streets operate best in pairs or a one-way couplet, optimally separated by a block to no more than one-quarter mile. Currently, Monmouth Avenue would function as the one-way pair to Amherst Avenue. Monmouth Avenue is one-way eastbound within the study area and also serves as a one-way pair to Winchester Avenue which is one-way westbound in the study area. The effectiveness of Monmouth Avenue as a one-way pair for Amherst Avenue is related to the following discussion on the impacts to other streets. It should be noted that the one block section of Al Troiano Boulevard may be more effective as a one-way eastbound street if Amherst Avenue is converted to a one-way westbound flow.

Impacts on Other Streets: In order to consider impacts on other streets, the elimination of the eastbound traffic flow on Amherst Avenue would redirect approximately 150 vehicles to other area streets. The standard one-way capacity for a one lane, 25 MPH street is over 1,200 vehicles per hour. If Monmouth Avenue currently experiences the same eastbound critical peak hour volume as the westbound volume on Amherst Avenue of 351 vehicles, there is more than sufficient capacity along Monmouth Avenue to accommodate the added 150 vehicles if all were redirected from eastbound Amherst Avenue to eastbound Monmouth Avenue. However, it is reasonable to assume that some of the 150 eastbound Amherst Avenue vehicles are destined for the commercial, recreational and residential uses along Amherst Avenue within the study area. This local traffic would circulate from Monmouth Avenue to the northbound travel paths of Washington Avenue, Jefferson Avenue and Monroe Avenue to then traverse on Amherst Avenue westbound. As the current critical peak hour volumes on the northbound streets are approximately 100 vehicles, there is more than sufficient street capacity to accommodate the redirected traffic volumes from the conversion of Amherst Avenue to one-way westbound within the study area.

Local Access: In general, two-way streets provide better local access and better mobility for bicyclists. To minimize the impact on visitors to local businesses, residences and recreation uses, advance signing for the use of Monmouth Avenue for eastbound traffic destine for the six-block section of Amherst Avenue is recommended.

Driving Distance Increases: The conversion to a one-way street will increase travel distances of motorists resulting from the need to circumnavigate multiple streets to reach destinations along Amherst Avenue. The distance between the centerline of Amherst Avenue and the centerline of Monmouth Avenue is 450'. The distance between centerlines of each of the six north-south streets in the study area is 300'. Therefore, the maximum distance to circumnavigate a full block is 1,500'. At 25 MPH with a maximum of two stop signs, the maximum travel time to circumnavigate a full block is estimated at 75 seconds. An example of the maximum circumnavigation travel path would be the following:

- A motorist approaching Coolidge Avenue from eastbound Amherst Avenue would be redirected to turn right onto southbound Coolidge Avenue
- The motorist would proceed to Monmouth Avenue and turn left onto eastbound Monmouth Avenue
- The motorist would proceed eastbound to Monroe Avenue to turn left to northbound Monroe Avenue
- The motorist would proceed northbound to Amherst Avenue and turn right to westbound Amherst Avenue

Based on the short distances between the streets, the potential maximum diversion time is not considered significant. It should be noted that emergency vehicle access must also be considered in the one-way street conversion.

Driver Confusion: One-way streets can create some driver confusion, especially for non-local motorists. Specifically, intersections involving one-way streets may be more confusing for some roadway users. Proper signing, striping and sight distances are essential to minimizing driver confusion. The implementation of any conversion must be properly communicated to the area property owners and the driving public to ensure an effective transition.

Cost: With the potential one-way conversion, no modification will be required to any traffic signals which will substantially reduce overall conversion costs. The conversion costs will be limited to revised striping, revised signing and any traffic calming measures deemed necessary to minimize the travel speed along Amherst Avenue within the study area.

Design Considerations

The following are a variety of design considerations regarding the conversion of Amherst Avenue to one-way westbound in the study area:

- Traffic calming measures will be required to effectively narrow the street to minimize travel speed in the study area. Measures can include curb extensions at intersections, raised crosswalks, edge striping and speed regulation signs.
- The conversion of Al Troiano Boulevard between Adams Avenue and Washington Avenue to one-way eastbound may complement the one-way westbound section of Amherst Avenue.

- Transition signing and striping is required at the intersection of Amherst Avenue and Coolidge Avenue where Amherst Avenue eastbound is restricted.

- Revised signing and striping at northbound Jefferson Avenue and Monroe Avenue to restrict right-turn movements onto Amherst Avenue.

- Advance signing should be provided along Monmouth Avenue and Amherst Avenue to the west of the study area to appropriately alert visitors to the study area of the most efficient travel path to access the businesses, residences and recreational uses in the study area.

- Angled parking along the waterfront should be considered to emphasize the one-way westbound flow of Amherst Avenue within the study area.

- A challenging component of the design will be the provision of a bicycle path within the study area that conforms to the one-way flow and is compatible with the on-street parking. It is recommended that any bicycle lane be incorporated into the northern side of Amherst Avenue to minimize conflicts with vehicular traffic. Although the northern side of Amherst Avenue contains angled parking, the higher-level vehicle/bicycle conflict areas will be the two-way to one-way transition area at Washington Avenue and the one-way to two-way transition area at Coolidge Avenue. Providing the bicycle lane along the northern side of Amherst Avenue eliminates any bicyclist from crossing the 351 one-way westbound vehicular movements during the critical peak hour. The westbound through movements along a one-way Amherst Avenue will always be a greater volume at a higher speed than the parking maneuvers from the angled parking spaces. Therefore, a northern side bicycle lane will have fewer conflict points than a southern side bicycle lane along the one-way section of Amherst Avenue.

- Appropriate sight distance at the intersections is critical.

Conclusions

Based on the character of the streets and pedestrian oriented uses in the study area of Amherst Avenue, there is a compelling safety basis to convert Amherst Avenue from the current two-way flow to a one-way flow in the westbound direction. With angled parking currently being provided along Amherst Avenue, potential conflict points would be eliminated. Monmouth Avenue, which is just east of Amherst Avenue, is currently one-way flowing in the eastbound direction. Westbound Monmouth Avenue would “pair” with eastbound Amherst Avenue within the study area. It is essential to provide an appropriate design of the one-way section of Amherst Avenue to minimize travel speed.

If you have any questions, please do not hesitate to call us.

Sincerely,
Shropshire Associates LLC

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