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DEPARTMENT OF TRANSPORTATION
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# MEMORANDUM

**TO:** John Garcia, New Castle County Review Coordinator, DelDOT Planning

**FROM:** Claudy Joinville, Project Engineer C.J

**DATE:** October 28, 2014

**SUBJECT:** **Rite-Aid – Glasgow**
**Results of Traffic Operational Analysis Review**

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We have reviewed the traffic operational analysis (TOA) for the Rite-Aid pharmacy proposed in Glasgow, DE. The TOA was prepared by Traffic Planning and Design, Inc. (Consultant) and dated September 24, 2014. The analysis evaluates the traffic impacts of the proposed redevelopment, to be located on the southwest corner of the intersection of US Route 40 and Glasgow Avenue (New Castle Road 387A) in New Castle County. Currently, an existing Shell gas station is located at the site. This redevelopment would replace the gas station. The proposed redevelopment would consist of an 11,186 square foot pharmacy with drive-through windows. Two access points are proposed: one full access driveway along Glasgow Avenue and a rights-in / rights-out driveway along eastbound US Route 40. In addition, the proposed pharmacy would utilize the existing interconnection with the adjacent National Tire & Battery (NTB) store, west of the subject site.

The Consultant analyzed the site access along Glasgow Avenue as a full access driveway. However, due to the proximity of this entrance to the intersection of US Route 40 and Glasgow Avenue, DelDOT intends to prohibit the eastbound left-turn movement onto Glasgow Avenue. While a full access driveway shows no level of service (LOS) deficiencies, it would likely present unsafe conditions in the operation of this entrance, especially for left-turning vehicles.

DelDOT currently has two relevant projects in the study area. The first project is DelDOT's Hazard Elimination Program (HEP), formerly known as the Highway Safety Improvement Program (HSIP) which has a site at the intersection of US Route 40 and Glasgow Avenue. Reported in the 2011 HEP, Site V is the section of the US Route 40 corridor, which intersects Glasgow Avenue and extends from 0.02 miles east of Frenchtown Manor Road to 0.26 miles east of US Route 301. The HEP committee studied safety and operations at this intersection in great detail, and in the HEP Task I Report for this intersection, identified several issues of concern, along with recommendations for remedial improvements in the areas of signing, pavement markings, and signals.

In the HEP Task II Report, this intersection was studied more closely and recommendations for improvement were evaluated. Capacity and queueing analyses were completed and found that lane configuration and signal phasing modifications would be necessary on the eastbound approach of US Route 40 as well as the northbound and southbound approaches of Glasgow Avenue. The recommendations included the installation of split side-street phasing on the northbound and southbound Glasgow Avenue approaches to US Route 40. The northbound Glasgow Avenue approach to eastbound US Route 40 would be widened to provide two through lanes, a right-turn lane and bike lane, and the southbound Glasgow Avenue approach to westbound US Route 40 would be restriped to provide two through lanes and a right-turn lane. A channelizing island would be installed at the end of the right-turn lane on northbound Glasgow Avenue to discourage the creation of a third lane through driving on the shoulder along eastbound US Route 40.

Some of the improvements identified in the 2011 HEP, as mentioned above, were completed in 2013 as part of a paving and rehabilitation (P & R) project. More specifically, the improvements included the installation of the split side-street phasing on the northbound and southbound Glasgow Avenue approaches to US Route 40. Further, improvements to the southbound Glasgow Avenue approach to westbound US Route 40 were also completed as part of the P & R project.

The improvements associated with the HEP project, and which were not completed as part of the 2013 P & R project, have entered the design process with construction scheduled to begin in September 2015. The Consultant assumed these HEP improvements in the analysis of the future no-build and build cases for the intersection of US Route 40 and Glasgow Avenue as well as the two site entrances.

The second project involves the US Route 40 Corridor Twenty-Year Transportation Plan. Per this Plan, right-of-way dedication should be required from the subject site to establish a 17-foot minimum right-of-way from the edge of the existing outside travel lane and a 20-foot permanent easement outside that line. The developer would be responsible to construct a 10-foot shared-use path that would center in the 20-foot permanent easement. In addition, DelDOT's Traffic Section recommends that a "corner cut" right-of-way west of the northbound approach of Glasgow Avenue to eastbound US Route 40 be dedicated for the installation of traffic signal equipment including a pedestrian signal. The dimensions for the "corner cut" right-of-way would form an isosceles triangle with minimum 15-foot long legs along eastbound US Route 40 and northbound Glasgow Avenue.

Based on our review, we find that the intersection of US Route 40 and Glasgow Avenue would operate at level of service (LOS) D or better during the weekday morning and evening peak hours for both present and future conditions, and would meet the LOS criteria listed in Chapter 2 of the Standards and Regulation for Subdivision Streets and State Highway Access.

Should the developer choose to develop the property per the proposed land use listed above, we offer the following comments:

1) The developer will construct a 135-foot right-turn lane into the site entrance along Glasgow Avenue from the edge of the existing bike lane. This length is based on DelDOT's Standards and Regulation for Subdivision Streets and State Highway Access.

2) The developer will contribute to the HEP improvements at the intersection of US Route 40 and Glasgow Avenue. The improvements include widening northbound Glasgow Avenue to eastbound US Route 40 to provide an additional through lane and a bike lane. In addition, a channelizing island will be installed at the intersection of eastbound US Route 40 and Glasgow Avenue to discourage the creation of a third lane through driving on the shoulders along eastbound US Route 40.

3) The developer should provide a dedication of 17 feet towards right-of-way and an additional 20-foot permanent easement along the subject site frontage on eastbound US Route 40, as noted above.

4) The developer will provide a dedication of right-of-way west at the northeast corner of the subject site at the intersection of US Route 40 and Glasgow Avenue for the installation of traffic signal equipment including a pedestrian signal, as mentioned above. The dimensions for the right-of-way would form an isosceles triangle with minimum 15-foot long legs along eastbound US Route 40 and northbound Glasgow Avenue.

Please note that this analysis generally focuses on capacity and level of service issues. A Level of Service table for the existing and future cases is attached with this memorandum.

CJ:cjm
cc: Frank Montgomery, Traffic Planning & Design, Inc.
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Table 1
PEAK HOUR LEVELS OF SERVICE (LOS)
Rite-Aid Glasgow TOA
Prepared by Traffic Design and Planning, Inc.

| **Signalized Intersection**[1] | **LOS per TOA** | | **LOS per DelDOT**[2] | |
|---|---|---|---|---|
| US Route 40 / Glasgow Avenue | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| 2014 Existing | C (26.0) | C (31.0) | C (25.8) | D (36.4) |
| | | | | |
| 2016 without Rite-Aid – Glasgow | N/A | N/A | C (28.3) | D (49.3) |
| | | | | |
| 2016 without Rite-Aid – Glasgow *With HEP Improvements*[3] | C (28.5) | D (36.4) | C (27.4) | D (48.7) |
| | | | | |
| 2016 with Rite-Aid – Glasgow | N/A | N/A | C (28.9) | D (49.3) |
| | | | | |
| 2016 with Rite-Aid – Glasgow *With HEP Improvements*[3] | C (28.5) | D (36.4) | C (28.3) | D (48.9) |
| | | | | |
| 2016 with Rite-Aid – Glasgow *With Lefts-out on Glasgow Avenue Prohibited*[4] | N/A | N/A | C (28.9) | D (48.9) |
| | | | | |
| 2016 with Rite-Aid – Glasgow *With HEP Improvements*[3] *& Lefts-out on Glasgow Avenue Prohibited*[4] | N/A | N/A | C (28.1) | D (48.6) |
| | | | | |

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] DelDOT utilized HCS 2010 to analyze the intersection; the Consultant used Synchro 8. As a result, DelDOT's analysis shows level of service results that are different from TOA.
[3] The improvements identified in the 2011 Hazard Elimination Program for this intersection include reconfiguring the eastbound US Route 40 approach to Glasgow Avenue to provide an exclusive left-turn lane, two through lanes, and a right-turn lane. In addition, Glasgow Avenue would be widened to provide one additional northbound through lane and bike lane to eastbound US Route 40.
[4] With lefts-out prohibition at the entrance along Glasgow Avenue, eastbound left-turns at this entrance would utilize the rights-in / rights-out access along eastbound US Route 40 to head east toward the intersection of US Route 40 and Glasgow Avenue.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
Rite-Aid Glasgow TOA
Prepared by Traffic Design and Planning, Inc.

| **Unsignalized Intersection** [1] **Two-Way Stop Control (T-intersection)** | **LOS per TOA** | | **LOS per DelDOT**[2] | |
|---|---|---|---|---|
| US Route 40 & Site Entrance | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| 2016 with Rite-Aid Glasgow (Case 3) | | | | |
| Northbound Site Entrance | N/A | N/A | B (12.9) | C (17.0) |
| | | | | |
| 2016 with Rite-Aid Glasgow (Case 3) *With HEP Improvements*[3] | | | | |
| Northbound Site Entrance | C (16.0) | C (23.8) | B (12.0) | C (17.0) |
| | | | | |
| 2016 with Rite-Aid Glasgow (Case 3) *With Lefts-out on Glasgow Avenue Prohibited*[4] | | | | |
| Northbound Site Entrance | N/A | N/A | B (13.0) | C (17.8) |
| | | | | |
| 2016 with Rite-Aid Glasgow (Case 3) *With HEP Improvements*[3] *& With Lefts-out on Glasgow Avenue Prohibited*[4] | | | | |
| Northbound Site Entrance | N/A | N/A | B (13.0) | C (17.8) |

[1] For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[2] DelDOT utilized HCS 2010 to analyze the intersection; the Consultant used Synchro 8. As a result, DelDOT's analysis shows level of service results that are different from TOA.
[3] The improvements identified in the 2011 Hazard Elimination Program for this intersection include reconfiguring the eastbound US Route 40 approach to Glasgow Avenue to provide an exclusive left-turn lane, two through lanes, and a right-turn lane. In addition, Glasgow Avenue would be widened to provide one additional northbound through lane and bike lane to eastbound US Route 40.
[4] With lefts-out prohibition at the entrance along Glasgow Avenue, eastbound left-turns at this entrance would utilize the rights-in / rights-out access along eastbound US Route 40 to head east toward the intersection of US Route 40 and Glasgow Avenue.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
Rite-Aid Glasgow TOA
Prepared by Traffic Design and Planning, Inc.

| **Unsignalized Intersection [1] Two-Way Stop Control (T-intersection)** | **LOS per TOA** | | **LOS per DelDOT[2]** | |
|---|---|---|---|---|
| Glasgow Avenue & Site Entrance | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| 2016 with Rite-Aid Glasgow (Case 3) | | | | |
| Eastbound Site Entrance | N/A | N/A | B (13.9) | C (22.9) |
| Northbound Glasgow Avenue - Left | N/A | N/A | A (8.3) | A (9.3) |
| | | | | |
| 2016 with Rite-Aid Glasgow (Case 3) *With HEP Improvements*[3] | | | | |
| Eastbound Site Entrance | B (13.1) | C (20.4) | B (12.3) | C (17.7) |
| Northbound Glasgow Avenue - Left | A (8.4) | A (9.6) | A (8.3) | A (9.3) |
| | | | | |
| 2016 with Rite-Aid Glasgow (Case 3) *With HEP Improvements*[3] *& With Lefts-out on Glasgow Avenue Prohibited*[4] | | | | |
| Eastbound Site Entrance | N/A | N/A | A (9.4) | B (10.7) |
| Northbound Glasgow Avenue - Left | N/A | N/A | A (8.3) | A (9.6) |

[1] For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[2] DelDOT utilized HCS 2010 to analyze the intersection; the Consultant used Synchro 8. As a result, DelDOT's analysis shows level of service results that are different from those in TOA.
[3] The improvements identified in the 2011 Hazard Elimination Program for this intersection include reconfiguring the eastbound US Route 40 approach to Glasgow Avenue to provide an exclusive left-turn lane, two through lanes, and a right-turn lane. In addition, Glasgow Avenue would be widened to provide one additional northbound through lane and bike lane to eastbound US Route 40.
[4] With lefts-out prohibition at the entrance along Glasgow Avenue, eastbound left-turns at this entrance would utilize the rights-in / rights-out access along eastbound US Route 40 to head east toward the intersection of US Route 40 and Glasgow Avenue.