



## MEMO

**TO:** Steven Kleppin, Director of Planning and Zoning, City of Norwalk, CT  
**FROM:** Stewart Gordon, PE, PTOE and William Melendez, PE, PTOE, PTP  
**SUBJECT:** Traffic Engineering Peer Review of 10 Norden Place (Norden Park)  
**DATE:** November 23, 2020

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## GENERAL OVERVIEW

WSP has performed an independent engineering evaluation and review of the traffic impact and access study submitted to the City of Norwalk by Tighe & Bond on behalf of Benefore Properties for the proposed conversion of a 330,000 square foot portion of the existing building located on the eastern side of the building to accommodate a new warehouse and wholesale distribution use, to upgrade the existing loading docks, and adjacent parking and driveways to accommodate the new use. The building is located at 10 Norden Place in Norwalk, Connecticut. WSP's focus of this technical review was to assess the accuracy and content of the technical traffic engineering information presented to the City. It is WSP's objective that this engineering peer review will assist the City in making an informed judgement of the adequacy of this project design, and its mitigated impact on the overall operations and safety of the surrounding roadway network.

WSP' review of the transportation issues focused on three aspects of the application submittal:

- First, WSP reviewed the technical information presented in the reports and site plans and has compared them with general industry standards for accuracy, approach, and application. Where inconsistencies existed, or further clarification was needed, an initial review technical memorandum was prepared and submitted on October 13, 2020.
- Second, a thorough review of the conclusions and recommendations reached by the project team has been completed. If WSP was not able to reach the same conclusions and/or the analysis does not support a specific recommendation highlighted by the project team, the basis for the disagreement is presented for consideration by the City.
- Finally, WSP has offered findings and suggestions to help guide the process as it moves forward. These issues include specific conditions that the City may want to consider and/or highlight issues that are beyond the scope of the project design team to address but should be considered in the overall process.

## SUBMISSION MATERIALS

In conducting a traffic engineering review of the proposed project, WSP has reviewed the following materials:

- Traffic Impact Study, prepared by Tighe & Bond, dated June 1, 2020
- Tighe & Bond response to Traffic comments (from City of Norwalk, Connecticut Department of Transportation (CTDOT) Mobility & Parking, and East Norwalk Neighborhood Association, dated September 22, 2020



- Applicant response to Norwalk Zoning Commission Comments, dated October 1, 2020
- Applicant's response to WSP's Preliminary Review dated October 16, 2020.
- Applicant's Second Supplemental Materials dated October 28, 2020

## PROPOSED OPERATIONS

According to the existing land use, which encompasses Unit A1 and Unit A2 with a total of 635,460 square foot, the building is used as Manufacturing, Research and Development, and General Office. The applicant proposes to divide the existing building with Unit A2 being proposed to be used as Warehouse/Wholesale. The TIAS does not state the estimated number of employees, and the expected hours of operations, whether it would be a regular eight-hour work day or would consist of various shifts throughout a longer period of time. In the initial review, it was recommended that the applicant should discuss similar developments done by the applicant, including number of employees, hours of operation, employee and freight traffic logistics.

In the applicant's Second Supplemental Materials dated October 28, 2020 a Facilities Management and Operations Plan was provided stating that, although the expected tenant is unknown, and based on the square footage, the anticipated number of employees is 100. It was also stated that based on experience, the typical distribution for a business-to-business warehouse would be:

- 95% of the 100 anticipated employees will be on-site between the hours of 6 AM and 6 PM, Monday through Friday
- 90-95% of the proposed vehicle traffic will occur between the hours of 6 AM and 8 PM, Monday through Friday
- 90-95% of the proposed truck traffic will occur between the hours of 6 AM and 8 PM, Monday through Friday
- 5-10% of the proposed truck traffic will occur between the hours of 8 PM and 10 PM, Monday through Friday;
- 0-5% of the proposed truck traffic will occur between the hours of 10 PM and 6 AM, Monday through Friday

The applicant also provided three example of tenants that operate in the same sector as the expected tenant for Unit A2. The examples provided include from supply chain, logistics, inventory management and food packaging and processing.

**WSP finds the applicant's supplemental operational information and responses acceptable.**

## STUDY AREA

The study area for included in the traffic impact study involves three signalized intersections and two unsignalized intersections. The intersections included are:

1. Strawberry Hill Avenue and Beacon Street (signalized)
2. Strawberry Hill Avenue and Norden Place (signalized)
3. Norden Place and Northern Site Driveway (unsignalized)
4. Norden Place and Southern Site Driveway (modified driveway; unsignalized)
5. Triangle Street and Route 136/Winfield Street (signalized)



As part of the initial review, WSP recommended the addition of various intersections as part of the study area, mainly in terms of safety. The applicant provided responses and the addition of the following four intersections:

1. Strawberry Hill Avenue and County Street (signalized)
2. Strawberry Hill Avenue and King Street (unsignalized)
3. Strawberry Hill Avenue and Walter Avenue (signalized)
4. Strawberry Hill Avenue and William Street (unsignalized)

## SITE ACCESS, CIRCULATION & PARKING

Access to the existing Norden Place complex, which includes the study site Unit A2, will be provided by two ingress/egress driveways. The northern driveway will remain as existing with a single lane for ingress and a single lane for egress and will be used exclusively for passenger cars. The southern driveway will consolidate the existing two southerly driveways, with a single lane for ingress and two lanes for egress and will be used for both passenger cars and trucks. The provided plans do not address the necessary pavement markings and signage to guide trucks into the correct driveway and any necessary signs to circulate traffic within the site.

The supplemental materials indicated that the number of loading docks have been modified and that there will be a total of 19 loading docks. However, plan sheet A2 shows eight loading docks in the north side and eight loading docks in the south side. The applicant should identify the location of the remaining three loading docks.

Based on plan sheet C1.00, the previously approved number of parking spaces is 1,944, with a net loss of 110 parking spaces. However, it is not clear if it means that the current number of parking spaces is 2,054. Based on the proposed development, the required number of parking spaces is 1,190 but the applicant is proposing 1,834 parking spaces, with an excess of 644 parking spaces. The City has expressed that some removal of the excess parking spaces shall be considered to promote sustainability with creation of green space. Additionally, the applicant should identify the required number of handicapped parking spaces, per City parking requirements and standards outlined by the Americans with Disabilities Act (ADA).

The TIAS evaluated the intersection sight distances at the existing site driveways with Norden Place according to the 2003 CTDOT Highway Design Manual (including the 2013 revisions). WSP confirmed that the sight lines meet the CTDOT guidelines.

**WSP considers the Site Plan and geometric modification appropriate. However, the applicant should address the signage require for site access and circulation, confirmation of the number of loading docks and evaluation of the necessary number of parking spaces.**

## EXISTING ROADWAY CONDITIONS

Sections 2.1 and 2.2 of the TIAS describes the existing roadway conditions in the study area. WSP has performed a field observation of the existing roadway conditions within the study area, and the findings are described in this section.

### Strawberry Hill Avenue

- The Connecticut Department of Transportation (CTDOT) classifies Strawberry Hill Avenue as a minor arterial.
- It is a 2-lane roadway with a posted speed limit of 25 mph.
- Between US 1 (Westport Avenue) and Fitch Street, Strawberry Hill Avenue has a bike lane in each direction.

- Between US 1 (Westport Avenue) and Fitch Street, there are pedestrian crosswalks crossing Strawberry Hill Avenue at the intersections with County Street (signalized), King Street, Walter Avenue (signalized), Tierney Street (signalized), Beacon Street (signalized), and Norden Place (signalized). Additionally, there is a midblock crossing between Alrowood Drive and Rome Street.
- Pedestrian Rectangular Rapid Flashing Beacons (RRFB) are installed at King Street and in the mid-block crossing between Alrowood Drive and Rome Street. The RRFB are pedestrian push-button actuated devices used in combination with pedestrian warning signs to provide high-visibility strobe-like warning to drivers when pedestrians are crossing the road.
- On-street parking is allowed on the east side of Strawberry Hill Avenue between US 1 and Beacon Street and on the west side of Strawberry Hill Avenue between Norden Place and Fitch Street.
- Given that three schools (Naramake Elementary School, Nathan Hale Middle School and Norwalk High School) are located on Strawberry Hill Avenue, pavement markings and signage are strategically located and includes pedestrian crossing signs, school ahead signs, and school ahead pavement markings.



*Strawberry Hill Avenue Pavement Markings depicting crosswalks, bike lanes, yield markings, and school warning markings*





*Strawberry Hill Avenue Signage depicting speed limit, bike lanes, school signs and pedestrian crossing signs*

**Norden Place**

- Norden Place is a local road maintained by the City of Norwalk.
- It is a two-lane roadway with a speed limit of 30 mph. A 25-mph advisory sign is located near the Northern Site Driveway.
- On-street parking is permitted; however, it is prohibited on the east side of Norden Place between the Northern Site Driveway and the Southern Site Driveway.
- Shared bike lanes are provided in both directions.
- Dedicated left turn lanes are provide for both the Northern and Southern Site Driveways.
- There are marked intersection crosswalks or mid-block crossing on Norden Place. There are wheelchair ramps and crosswalks are located at both the Northern Site and Southern Site Driveways.



*Norden Place Pavement Markings depicting shared bike lanes and crosswalks at both the Northern and Southern Site Driveways*



*Norden Place Signage depicting regulatory speed limit, advisory speed sign, no parking sign and intersection ahead sign*

## TRANSIT

The TIAS evaluates the bus service in the area and identified the Norwalk Transit District WHEELS Route 7 providing service within the study area. The TIAS indicates that the service along the study area is between 5:55 AM to 6:55 PM, Mondays through Saturday.

WSP has confirmed that the WHEELS Route 7 provides services in the study area. However, if expanding the study area to include the Strawberry Hill Avenue intersections, the hours of operation would be between 5:55 AM – 7:01 PM, Mondays through Saturday (at 7:01 PM the bus stops at the Norwalk High School). Additionally, there is a 2:15 PM “school tripper” at Norwalk High School, but it is also available to all public riders. The TIAS states that there is a bus stop within the site at Avalon/Norden Park. But there are also bus stops on Strawberry Hill Avenue in front of both the Nathan Hale Middle School and the Norwalk High School. Additionally, school buses run through the area before and after school session as well as parents picking up and dropping off students, which could potentially affect the operational conditions during the peak hours.

## TRUCK ACCESS ROUTES

The TIAS does not provide the expected truck access route to/from the site. On July 17<sup>th</sup>, 2020, the City requested a map showing the proposed truck routes, and the applicant provided the truck routes in the responses dated on September 22<sup>nd</sup>, 2020. The applicant describes three (3) truck routes: primary route, secondary route and tertiary routes. The applicant describes the pros and cons of each of the alternatives, in terms of vertical clearance restrictions and intersection geometric turning radius limitations.

WSP field verified the restrictions presented by the applicant in the responses as well as the Truck Access Route figure provided by the applicant. The applicant findings are summarized in the following table in addition to other observations identified by WSP that shall be evaluated by the applicant. It is important to note that based on the CTDOT’s Office of State Traffic Administration (OSTA), the CTDOT’s roadway functional classifications, and the CTDOT’s Traffic Monitoring Count Data, the roads identified as part of a truck routes already carry truck traffic, mainly single-unit trucks. According to the CTDOT’s Traffic Monitoring Count Data in year 2017 and 2020, US Route 1 carries approximately five percent single-unit trucks, Strawberry Hill Avenue carries approximately three percent single-unit trucks, East Avenue carries approximately six percent single-unit trucks, and Route 136 carries approximately three percent of single-unit trucks. The applicant provided the estimated number of trucks for each of the truck routes in their supplemental materials. The



following table summarizes the existing daily traffic, and existing percent of trucks on some of the main roads along the proposed truck routes and compares it against the added number of trucks.

Road	Average Annual Daily Traffic (Year 2020)	Single-Unit Truck (25-50 ft)		Articulated Truck (> 50 ft)		Existing Combined Truck Percent	Proposed Added Trucks (Combined Single Unit and Articulated)	
		Existing Daily Total	Existing Truck Percent	Existing Daily Total	Existing Truck Percent		Proposed Daily Total	Adjusted Truck Percent
US Route 1	16,800	889	5.29%	67	0.4%	5.69%	99	6.28%
Strawberry Hill Avenue	8,400	261	3.11%	3	0.04%	3.15%	99	4.32%
East Avenue	17,100	1098	6.42%	86	0.5%	6.92%	79	7.39%
Saugatuck Avenue (Route 136)	5,100	162	3.17%	4	0.07%	3.24%	10	3.45%
Washington Street (Route 136)	14,800	829	5.60%	21	0.14%	5.74%	10	5.81%
Van Zant Street (Route 136)	5,400	308	5.71%	15	0.27%	5.98%	10	6.17%

The applicant provided the estimated number of trucks for each truck route, however, a breakdown between single unit trucks and articulated trucks was not provided. Based on the existing conditions, there are around three articulated trucks on Strawberry Hill Avenue. If the estimated number of trucks traveling on Strawberry Hill Avenue is 99, the applicant should evaluate how many of those would be articulated trucks.

Although not part of any truck route, through truck traffic should be prohibited on the local streets of Beacon Street and Tierney Street as a short-cut between Strawberry Hill Avenue and East Avenue to reach I-95. The intersection sight distance is obscured at the Beacon Street and Sunset Hill Avenue intersection.





*Beacon St and Sunset Hill Ave intersection sight distance*

Truck Access Route	Description	Applicant's Identified Restrictions	WSP Identified Restrictions (in addition to applicant's)
Primary Route	To/From I-95: <ul style="list-style-type: none"> <li>• US Route 7</li> <li>• US Route 1</li> <li>• Strawberry Hill Avenue</li> <li>• Norden Place</li> </ul>	No horizontal or vertical restrictions identified.	The Strawberry Hill Avenue & Norden Place has a limited radius in the northeast corner of the intersection for articulated trucks.
Secondary Route	To/From I-95: <ul style="list-style-type: none"> <li>• East Avenue</li> <li>• Fitch Street</li> <li>• Strawberry Hill Avenue</li> <li>• Norden Place</li> </ul>	The East Avenue & Fitch Street intersection has limited radius in the northeast corner of the intersection.	No additional restrictions identified





Truck Access Route	Description	Applicant's Identified Restrictions	WSP Identified Restrictions (in addition to applicant's)
Tertiary Route (1)	To/From I-95: <ul style="list-style-type: none"> <li>West Avenue</li> <li>North Main Street</li> <li>Washington Street (Route 136)</li> <li>Fort Point Street</li> <li>Van Zant Street</li> <li>East Avenue</li> <li>Fitch Street</li> <li>Strawberry Hill Avenue</li> <li>Norden Place</li> </ul>	11'-2" vertical clearance restriction identified due to the railroad bridge overpass at the Washington Street & North Main Street intersection. 12'-2" vertical clearance restriction identified due to the railroad bridge overpass on East Avenue between Winfield Street and Fort Point Street.	Fort Point Street & Van Zant Street has a limited radius in the southwest corner of the intersection for articulated trucks. Van Zant Street & East Avenue has a limited radius in the northwest corner of the intersection for articulated trucks.
Tertiary Route (2)	To/From I-95: <ul style="list-style-type: none"> <li>Saugatuck Avenue (Route 136)</li> <li>Winfield Street (Route 136)</li> <li>Triangle Street</li> <li>Norden Place</li> </ul>	10'-11" vertical clearance restriction identified due to the railroad bridge overpass on Saugatuck Avenue (Route 136) between Ferry Lane W and Ferry Lane.	

## COLLISSION HISTORY & SAFETY ANALYSIS

As noted in the TIAS, crash data was collected from the Connecticut Crash Data Repository (CCRD) between February 2017 and February 2020 at the five (5) intersections. TIAS Section 2.5 and Table 3 summarizes their findings. Table 3 provides a summary of the crashes by type and severity on the study area. Appendix D provides the summary by intersection in terms of crash type and severity.

WSP spot checked the data provided in Table 3 against the backup data provided in Appendix D and found Table 3 reflects the data provided in Appendix D. Additionally, WSP spot checked the intersections of Strawberry Hill Avenue and Norden Place, and Triangle Street and Winfield Street and found that Table 3 and Appendix D are reflective of the data found in the CCDR. The TIAS states that the most frequent collision type was rear ends and all the crashes were Property Damage Only (PDO), with no injuries or fatalities reported.

The TIAS provided a narrative of the crash experience, however, no deficiencies were noted, and no safety improvements were identified as needed. Currently, both the Strawberry Hill Avenue and Beacon Street and the Strawberry Hill Avenue and Norden Place intersections are under reconstruction as part of the bridge rehabilitation which could improve traffic and safety operations at these two intersections.

The City's Mobility & Parking Department expressed concerns regarding the Triangle Street and Howard Avenue intersection sight distances, traffic volumes and crashes. The applicant responded and provided documentation. The applicant responded that due to the roadway curvature, on-street parking and vegetation, intersection sight distances are limited looking in both directions from Howard Avenue eastbound and looking left (south) from Howard Avenue



westbound. The applicant also responded that the recorded number of crashes at this intersection is minimal, with only two crashes recorded in the last 3.5 years. The applicant mentioned the installation of all-way stop control at the intersection as a potential mitigation. However, it is also stated that the intersection does not meet the Manual on Uniform Control Devices (MUTCD) guidance for all-way stop control. WSP verified the traffic volumes provided in the TIAS for the intersection and confirmed the crashes at the intersection. Therefore, WSP concurs that the all-way stop control is not warranted and that on-street parking restrictions and vegetation removal should be considered to increase the driver sight lines at the intersection.

The TIAS evaluated the crashes at the five (5) intersections. Based on the WSP's initial review, it was recommended to include other intersections along Strawberry Hill Avenue, which is designated as the primary truck route. Areas of concern on Strawberry Hill Avenue that was recommended to be documented per the following:

- There are three schools in the area; evaluate the intersection/driveways to see if there are any safety concerns and/or crash patterns.
- Given that there are bike lanes on Strawberry Hill Avenue in both directions, an evaluation should be performed to determine if there have been any crashes involving bicyclists.
- The sight distance for vehicles exiting Catalpa Street and the vehicles approaching from northbound Strawberry Hill Avenue may be a concern. Further engineering evaluation may be warranted if there are any crash patterns at this intersection.



Aerial view of Strawberry Hill Ave and Catalpa St intersection

The applicant provided responses and additional collision history information between January 2017 and July 2020 for the following intersections/segments along Strawberry Hill Avenue:

- Strawberry Hill Avenue and County Street (signalized)
- Strawberry Hill Avenue and Middle School South Driveway
- Strawberry Hill Avenue and William Street (signalized)
- Strawberry Hill Avenue and Middle School North Driveway



- Strawberry Hill Avenue and King Street
- Strawberry Hill Avenue and Tierney Street
- Strawberry Hill Avenue and High School South Driveway
- Strawberry Hill Avenue South of High School
- Strawberry Hill Avenue along High School Frontage
- Strawberry Hill Avenue and Catalpa Street

Based on the applicant's responses and information provided, the following was noted:

- No fatalities or major injuries were recorded
- No crashes involving bicyclists were recorded
- A pedestrian collision occurred near the Norwalk High School on November 21, 2017 at 4:52 PM; WSP further investigated this collision and found that it involved a 14-year-old female crossing the road.
- While WSP was investigating the above collision, it was noted that another pedestrian collision occurred on Strawberry Hill Avenue near Dairy Farm Road. This collision occurred on January 18, 2017 at 3:05 PM and involved an 11-year-old female that, according to the record, she was coming from school. The child suffered minor injury.
- A snowplow struck a hydrant near the King Street intersection; it was recorded as a truck collision
- Three crashes involved buses; one where a car rear-ended the bus, one where a bus struck a utility pole, and one unknown

**Based on the crash data collected by the applicant, and the investigations performed by WSP along Strawberry Hill Avenue, WSP concurs that there are no significant or notable patterns of collisions.**

## TRAFFIC COUNT DATA

As noted in the TIAS, traffic data was collected in April 2019 during two peak periods: weekday morning (7:00 AM to 9:00 AM), and weekday afternoon (4:00 PM to 6:00 PM). These time periods are appropriate for the traffic impact analysis based on typical roadway peak hours of operation for the proposed Unit A2 warehouse/wholesale conversion, and the data collected is sufficient for the scope of this project. The collected traffic data included vehicular, pedestrian, and truck volumes. Based on the traffic count data, the morning peak hour occurred from 7:15 AM to 8:15 AM and the weekday afternoon peak hour occurred from 5:00 PM to 6:00 PM. WSP confirmed the peak hour volumes based on the traffic count data provided in Appendix A. The 2019 Existing peak hour volumes were illustrated on the TIAS Figure 3 and Figure 4 for the weekday morning peak and the weekday afternoon peak, respectively.

As part of the applicant responses to the traffic comments dated on September 22, 2020, the applicant also provided traffic count data (2018) from CTDOT for both the Strawberry Hill Avenue and Beacon Street and the Strawberry Hill Avenue and Norden Place intersections. These data provide pedestrian, bike, and truck information which is essential and should be considered when analyzing the traffic operations at signalized intersections as frequency of pedestrian calls can directly impact vehicle delay and vehicle queues.

Based on WSP's initial review, it was noted that the TIAS collected traffic volume data in April 2019 and does not expressly address how April counts compare to a yearly average traffic volume. Both Connecticut Department of Transportation (CTDOT) and Norwalk Transportation Impact & Access Study (TIAS) guidelines refer to seasonal adjustments to traffic



volumes not counted during peak months. The applicant provided responses and supporting documentation indicating that weekdays in April seasonal adjustment factors were below 1.0. Therefore, no seasonal adjustments were applied. **Correspondence between the applicant and the CTDOT Bureau of Policy and Planning were provided by the applicant confirming CTDOT's acceptance of the traffic volumes.**

## **FUTURE (BACKGROUND) TRAFFIC IMPACTS**

WSP reviewed the future (background) traffic conditions as provided in the TIAS. The 2022 Background traffic volumes were developed by applying a 0.6 percent yearly general growth rate to the Existing 2019 traffic volumes. The growth rate was estimated based upon consultation with CTDOT Bureau of Policy Planning. Supporting documentation is provided in Appendix A of the TIAS.

**WSP has reviewed and considers the growth rate appropriate for development of future design hour volumes.**

The resulted 2022 Background Conditions are presented on Figures 5 and 6 of the TIAS. WSP confirmed that the 2019 Existing traffic volumes were increased by 0.6 percent annual growth rate for three years, and that the 2022 Background traffic volumes shown on Figures 5 and 6 were correctly calculated. The applicant should confirm with the City's Planning and Zoning Department regarding any other approved development projects in the study area that need to be included in the 2022 Background traffic volumes.

The growth rate was applied to the existing volumes to the projected horizon year of 2022, when the proposed Unit A2 is scheduled to be completed and occupied. Currently, Unit A1 is vacant and could be occupied anytime for its intended use (Manufacturing, General Office, Research & Development). During the initial review, WSP recommended that the trips that would be generated by Unit A1 also be incorporated in the background (no-build) traffic analysis. This would provide the worst-case scenario for determining total traffic impacts on study roadways and intersections. The applicant concurred and updated the traffic volumes, to include traffic that would be generated by Unit A1, to establish the 2022 Background Conditions.

**WSP reviewed the traffic forecasting volumes shown on the supplemental TIAS Figures 12 through 23 and considers the volumes to be reasonable and acceptable. However, the applicant should confirm with the City regarding any other approved development in the area.**

## **SITE VEHICLE TRIP GENERATION**

The TIAS developed the vehicle trips using rates published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> Edition, 2017. The TIAS used Land Use Code 150 (Warehousing) to estimate the vehicle trips. The resulted vehicle trip trips are provided in Table 4 of the TIAS. WSP verified that the trip generation was calculated based on the building square footage using Lane Use Code 150 (Warehousing) and using the fitted curve methodology for both the AM and PM peak hours.

A comparison between the estimated vehicle trips generated by the proposed Warehouse/Wholesale conversion against the current permitted uses such as Manufacturing, General Office, and Research & Development was provided in Table 5 of the TIAS. The TIAS stated the use of Land Use 140 (Manufacturing), Lane Use 710 (General Office Building), and Land Use 760 (Research and Development Center) to calculate the trip generation by these uses. It was noted that the trip generation rate for some land uses was calculated based on the "Average Rate" when both the "Average Rate" and the fitted curve equation were provided. In those instances, the fitted curve equation should be used.

As documented in the TIAS and verified by WSP, the total trips generated by converting the building into a Warehouse/Wholesale, and the total trips generated by the building based on its currently permitted uses are as follow:





Total Trips Generation		
Lane Use	Weekday Morning	Weekday Afternoon
Warehouse/Wholesale Distribution (Proposed Land Use)	65	67
Manufacturing (Existing Approved Land Use)	205	221
General Office Building (Existing Approved Land Use)	383	379
Research and Development Center (Existing Approved Land Use)	139	162

WSP agrees with the use of the land use codes and confirmed the values entered in Table 5. However, the applicant should calculate the trip generation rates based on the fitted curve equation, when provided.

## SITE TRUCK TRIP GENERATION

The TIAS indicates that the truck trips generated by the proposed Warehouse/Wholesale conversion would be seven truck trips in the weekday morning and ten truck trips in the weekday afternoon. Additionally, on July 17<sup>th</sup>, 2020, the City requested the applicant to provide a comparison of the truck trips generated by the proposed Warehouse/Wholesale conversion against the current permitted uses such as Manufacturing, Research & Development, and General Office. The applicant provided Table 5 in the responses dated on September 22<sup>nd</sup>, 2020. The truck trips provided by the TIAS and the applicant responses are:

Site Truck Trip Generation provided by Applicant			
Lane Use	Weekday Morning	Weekday Afternoon	Weekday
Warehouse /Wholesale Distribution (Proposed Land Use)	7	10	198
Manufacturing (Existing Approved Land Use)	10	10	155
General Office Building (Existing Approved Land Use)	3	3	40
Research and Development Center (Existing Approved Land Use)	N/A	N/A	N/A

Utilizing the ITE Trip Generation Manual, 10<sup>th</sup> Edition Supplement, WPS was able to confirm the truck trips that would be generated by the proposed Warehouse/Wholesale land use as well as the truck trips that would be generated with the existing approved land uses.

Although the ITE Trip Generation Manual states that the truck trips during the morning and afternoon peak hours for the proposed Warehouse/Wholesale use for Unit A2, would be 7 and 10, respectively, if it operates on a 24-hour schedule, the 198 weekday truck trips would produce an average of 16 truck trips per hour. If the hours of operation are less, then the average truck trips per hour would be higher. According to the applicant's supplemental materials, 90-95% of the proposed truck traffic will occur between the hours of 6AM and 8PM, which would produce an average of 13 truck trips per hour in the 14-hour period. This number could be higher during non-peak hours if the morning and afternoon peak hours only produce 7 and 10 truck trips. To this end, WSP evaluated the Truck Trip Time-of-Day Distributions from ITE



Trip Generation Supplement, Appendix D. The following table shows the trip distribution by time of day for the proposed land use and the existing approved land uses.

Hourly Distribution of Truck Trips by Land Use							
Time Period	Warehouse / Wholesale Distribution		Manufacturing (Existing Land Use)		General Office Building (Existing Land)		
	Percentage	Total	Percentage	Total	Percentage	Total	
12AM – 1AM	0.3%	1	0.5%	1	0.0%	0	
1AM – 2AM	0.2%	0	0.6%	1	0.0%	0	
2AM – 3AM	1.3%	3	0.7%	1	0.0%	0	
3AM – 4AM	1.3%	3	1.4%	2	0.0%	0	
4AM – 5AM	2.4%	5	0.7%	1	0.0%	0	
5AM – 6AM	3.5%	7	0.0%	0	0.0%	0	
6AM – 7AM	4.4%	9	3.8%	6	0.0%	0	
7AM – 8AM	5.3%	10	4.2%	7	4.4%	2	AM Peak
8AM – 9AM	5.5%	11	7.8%	12	2.9%	1	
9AM – 10AM	9.9%	20	9.9%	15	8.8%	4	
10AM – 11AM	9.7%	19	11.0%	17	13.2%	5	
11AM – 12PM	11.2%	21	9.2%	14	20.6%	8	Proposed Max
12PM – 1PM	6.8%	13	8.2%	13	19.1%	7	
1PM – 2PM	8.0%	16	7.7%	12	8.8%	4	
2PM – 3PM	6.1%	12	6.9%	11	13.2%	5	
3PM – 4PM	9.3%	18	9.4%	15	4.4%	2	
4PM – 5PM	6.9%	14	5.2%	8	2.9%	1	
5PM – 6PM	3.9%	8	3.8%	6	1.5%	1	PM Peak
6PM – 7PM	0.9%	2	2.2%	3	0.0%	0	
7PM – 8PM	0.6%	1	1.5%	2	0.0%	0	
8PM – 9PM	1.6%	3	1.6%	2	0.0%	0	
9PM – 10PM	0.8%	2	1.2%	2	0.0%	0	
10PM – 11PM	0.0%	0	1.0%	2	0.0%	0	
11PM – 12AM	0.2%	0	1.2%	2	0.0%	0	
Total	100%	198	100%	155	0.0%	40	

Based on the table, the proposed Warehouse/Wholesale land use would generate a total of 174 truck trips (entering/exiting) between the hours of operation from 6AM and 8PM. During the morning peak hour (7:15AM-8:15AM), there would be ten truck trips, while in the afternoon peak hour there would be eight truck trips. The maximum truck trips would occur between 11AM and 12PM with 21 truck trips. There would be more than ten truck trips between 7AM and 5PM, with approximately 154 truck trips in that timeframe. However, if it kept as the existing/approved Manufacturing land use, the time period with more than ten truck trips range between 8AM and 4PM, with 109 truck trips. The supplemental material states that the 90-95% of the proposed truck traffic that will occur between 6AM and 8PM translates to approximately 90-95 trucks. However, based on the ITE Trip Generation Supplement, Appendix D, and as stated above, there would be 174 truck trips between 6AM and 8PM.

**The applicant should re-evaluate the expected truck trips given that the provided truck trips do not match the estimates from the ITE Trip Generation Supplement. Additionally, the applicant should consider restricting the trucks leaving the site during the morning and afternoon school arrival and departure peak hours. This would involve coordination with the City and the School Administration on the three schools located on Strawberry Hill Avenue to determine the school hours and when the school are picking up and dropping off students.**



Although it is expected that by 2022 the COVID-19 pandemic would be over, there has been more e-commerce delivery activities in the past few months. This means more warehouse/distribution center square footage is being used to support e-commerce and for e-commerce buildings it may mean more intensive use (in trips per square foot) than noted in ITE Trip Generation documentations, due to shorter inventory dwell/faster turn times. In the initial review, WSP expressed concerns regarding e-commerce. In the Supplemental Materials, the applicant stated that because 10 Norden Place is proposing a business-to-business and not a business-to-consumer/last mile delivery facility, e-commerce industry will not have impact on the proposed facility.

## SITE TRIP DISTRIBUTION

The TIAS indicates that the traffic entering and existing Unit A2 was based on existing traffic patterns within the study area, previous traffic studies for the site, and the roadway layout but there is no supporting documentation. The trip distribution is shown in Figure 7 of the TIAS and it is applied to both passenger cars and trucks. WSP back checked that the percentages shown in Figure 7 are properly distributed across all the intersections. However, in the initial review, WSP recommended that the applicant should expand the discussion regarding how the trip distribution was determined and whether the vehicles and trucks need to be assigned with same or different trip distribution patterns. For this matter, the applicant responded that the passenger vehicle trip distribution was based on the existing traffic patterns. The applicant also stated that the truck distribution was developed based on the truck access routes. Separate trip distributions were provided by the applicant for both passenger vehicles and for trucks.

WSP verified that the passenger vehicle trip distributions provided in supplemental October 28, 2020 documents, Figure 12 were correctly applied to the trip generations and the resulted site generated passenger vehicles shown in Figure 13 and Figure 14 are an accurate representation. Likewise, the truck trip distribution provided in Figure 15 were correctly applied to the trip generations and the resulted site generated truck traffic shown in Figure 16 and Figure 17 are an accurate representation. WSP also verified that the 2022 Background Traffic Volumes (with Unit A1) from Figure 10 and Figure 11 and the 2022 Site Generated volumes (both passenger vehicle and trucks) were combined to create the 2022 Combined volumes, as shown in Figures 22 and 23.

**WSP concurs with the applicant's trip distribution methodology.**

## CONSTRUCTION PLAN/PHASING

During the initial review, WSP recommended the applicant to provide input on the construction plan and construction phasing should the site not be fully completed in 2022 and anything that may impact traffic circulation/operations. The applicant stated that the site improvements to accommodate truck circulation will be performed concurrently with the building improvements and that it will be fully completed by 2022. The applicant also stated that the operational analysis includes the additional background traffic from Unit A1 and the results shows adequate traffic operations, however as noted below in Capacity Analysis review, operational analysis shall be updated. Additionally, in the Supplemental Materials, the applicant provided revised plans including the construction sequence.

**WSP concurs with the applicant's response with the exception of the operational analysis as noted below in the Capacity Analysis review.**

## POTENTIAL ACCESS FROM I-95

Providing direct access from I-95 requires the preparation of an Interstate Break-in Access Justification Report in accordance with Federal Highway Administration (FHWA) guidelines. The report must be approved by CTDOT, FHWA regional office and FHWA in Washington, D.C. Although it is a lengthy review and approval process, in the initial review, WSP recommended that the applicant evaluate the feasibility of providing direct access from I-95.



The applicant agrees that it will be a lengthy process which would also need the approval of the Southwestern Metropolitan Planning Organization (SMPO) and the project would have to be adopted into the region's Transportation Improvement Plan (TIP). If the City desires to pursue the I-95 access, the applicant suggested that the City coordinate with the SMPO to determine if the area would benefit from the I-95 access.

## CAPACITY ANALYSIS

The TIAS conducted capacity analysis at each of the five study intersections in accordance with the Highway Capacity Manual (HCM), published by the Transportation Research Board using Trafficware Synchro Studio 10, computer traffic analysis software that is acceptable. Based on the capacity analysis, WSP has the following comments:

- The analysis includes the proper volume and geometric configuration for each condition, however, the lane widths do not match the signing and pavement marking plans.
- Both the Strawberry Hill Avenue and Beacon Street intersection and the Strawberry Hill Avenue and Norden Place intersection are currently under rehabilitation as part of the Strawberry Hill Avenue Bridge Rehabilitation Project. This project is expected to be completed by the end of 2020 and will include optimized signal timings while the lane configuration will remain the same. The TIAS states that the signal timings for the 2022 Background and Combined conditions will use the optimized signal plans from the rehabilitation project. However, the southbound Strawberry Hill Avenue approach at Beacon Street has a LOS E during the morning peak, which is not acceptable.
- Supporting documentation regarding the signal timing for the 2019 Existing Conditions for the Strawberry Hill Avenue and Beacon Street intersection and the Strawberry Hill Avenue and Norden Place intersection are not provided in the TIAS.
- Supporting documentation regarding the signal timing for the Triangle Street and Winfield Street (Route 136) are not provided in the TIAS.
- At traffic signal intersections analyzed, traffic signal controller operations do not utilize Volume-Density Control, therefore, the minimum gap and vehicle extension values shall be the same.
- Pedestrian calls should be modeled in the Synchro analysis to evaluate the operations of each of intersection when pedestrian actuation occurs. Without the pedestrian calls modeled in Synchro, the exclusive pedestrian phase is skipped every cycle. The improvements at both the Strawberry Hill Avenue and Beacon Street intersection and the Strawberry Hill Avenue and Norden Place intersection will include an exclusive pedestrian phase. Based on the traffic counts, pedestrian counts at the Beacon Street intersection range between two and 11 pedestrians crossing the road during the peak hour, while at the Norden Place intersection it ranges between one and ten. The Triangle Street and Route 136/Winfield Street intersection the pedestrian counts range between two and six during the peak hours.
- Conflicting bicycle volume should be modeled in the Synchro analysis to evaluate the operations of each intersection.
- Both Strawberry Hill Avenue and Beacon Street should be modeled as 25 mph.
- The truck percentage were kept the same between the 2019 Existing Conditions and the 2022 Combined Conditions. This value should be evaluated for the 2022 Combined Conditions based on the truck trips generated by the site.
- The results presented in Tables 1 and 2 and described in the text are representative of the Synchro outputs in Appendix C.





WSP evaluated the Strawberry Hill Avenue and the intersections with Beacon Street and Norden Place using the appropriate lane widths, pedestrian calls, and truck percentages during the AM Peak hour. The traffic operations changed, and the southbound Strawberry Hill Avenue at Beacon Street resulted in a LOS F. Attached is a copy of the evaluation. **The applicant should re-evaluate signal timings at these two intersections.**

## CONCLUSIONS & RECOMMENDATIONS

In summary, WSP has found that the TIAs and subsequent responses to comment letters follow the standards steps of a Traffic Impact Study. WPS considers that TIAs and subsequent documentation were prepared in a professional manner consistent with transportation industry standard and applications regarding crash evaluation, trip generation, trip distribution, and traffic analysis.

In general, WSP's remaining concerns include the following:

- Site Access/Circulation – The applicant should provide the necessary pavement markings and signage to access the site and for site circulation.
- Site Parking – The applicant should evaluate the necessary parking spaces. There is an excess of 644 spaces between the parking spaces needed and the parking spaces provided. There should be an evaluation of removing the excess parking spaces to promote sustainability by creating a green space. Also, the applicant should provide the necessary handicapped parking spaces, per ADA parking standards.
- Loading Docks – The supplemental materials indicated that the number of loading docks have been modified and that there will be a total of 19 loading docks. However, plan sheet A2 shows eight loading docks in the north side and eight loading docks in the south side. The applicant should identify the location of the remaining three loading docks.
- Articulated Trucks – The applicant provided the estimated number of trucks for each truck route, however, a breakdown between single unit trucks and articulated trucks was not provided. Based on the existing conditions, there are around three articulated trucks on Strawberry Hill Avenue. If the estimated number of trucks traveling on Strawberry Hill Avenue is 99, the applicant should evaluate how many of those would be articulated trucks.
- Truck Trip Generation – The supplemental material states that the 90-95 percent of the proposed truck traffic that will occur between 6AM and 8PM translates to approximately 90-95 trucks. However, based on the ITE Trip Generation Supplement, Appendix D, there would be 174 truck trips between 6AM and 8PM. The applicant should re-evaluate the expected truck trips given that the provided truck trips do not match the estimates from the ITE Trip Generation Supplement. The applicant should evaluate the impacts of restricting the trucks leaving the site during the morning and afternoon school arrival and departure peak hours.
- Traffic Analysis – The southbound Strawberry Hill Avenue approach at Beacon Street would operate at a LOS E in the 2022 Background and Combined conditions during the AM Peak hour, which is not acceptable per the City's Transportation Management Plan, TIAS Guidelines. Additionally, the applicant shall provide supporting documentation of existing traffic signal timings and re-evaluate the traffic operation analysis with the correct lane widths, with the appropriate truck percentages and applying the number of pedestrian calls at each signalized intersection.
- I-95 Potential Access – The applicant, in coordination with the City, should provide the necessary evaluation and steps required for the FHWA application of a potential access to the site from I-95 that would lessen the traffic impacts on the surrounding City roadway network.



**ATTACHMENT**  
**SYNCHRO ANALYSIS AM PEAK HOUR**

Lanes, Volumes, Timings  
 3: Strawberry Hill Ave & Beacon St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	30	99	160	503	644	142	
Future Volume (vph)	30	99	160	503	644	142	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	15	15	11	10	11	11	Modification
Storage Length (ft)	0	0	85			0	
Storage Lanes	1	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Fr <sub>t</sub>	0.896				0.976		
Fl <sub>t</sub> Protected	0.989		0.950				
Satd. Flow (prot)	1798	0	1678	1705	1707	0	
Fl <sub>t</sub> Permitted	0.989		0.155				
Satd. Flow (perm)	1798	0	274	1705	1707	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	116				11		
Link Speed (mph)	25			25	25		
Link Distance (ft)	684			316	679		
Travel Time (s)	18.7			8.6	18.5		
Peak Hour Factor	0.85	0.85	0.83	0.83	0.94	0.94	
Heavy Vehicles (%)	3%	3%	4%	4%	5%	5%	Modification
Adj. Flow (vph)	35	116	193	606	685	151	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	151	0	193	606	836	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	15			11	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	0.88	0.88	1.04	1.09	1.04	1.04	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	2	2		
Detector Template	Left		Left	Thru	Thru		
Leading Detector (ft)	20		20	100	100		
Trailing Detector (ft)	0		0	0	0		
Detector 1 Position(ft)	0		0	0	0		
Detector 1 Size(ft)	20		20	6	6		
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		
Detector 2 Position(ft)				94	94		
Detector 2 Size(ft)				6	6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Prot		D.P+P	NA	NA		

### Lanes, Volumes, Timings

#### 3: Strawberry Hill Ave & Beacon St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Protected Phases	4		1	1 2	2		3
Permitted Phases			2				
Detector Phase	4		1	1 2	2		
Switch Phase							
Minimum Initial (s)	7.0		5.0		15.0		5.0
Minimum Split (s)	20.0		12.0		22.5		26.0
Total Split (s)	24.1		16.0		30.1		26.0
Total Split (%)	25.1%		16.6%		31.3%		27%
Maximum Green (s)	20.0		12.0		25.0		22.0
Yellow Time (s)	2.6		3.0		3.6		4.0
All-Red Time (s)	1.5		1.0		1.5		0.0
Lost Time Adjust (s)	0.0		0.0		0.0		
Total Lost Time (s)	4.1		4.0		5.1		
Lead/Lag	Lag		Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes		Yes
Vehicle Extension (s)	3.0		2.0		6.0		3.0
Recall Mode	None		Min		None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							3
Act Effct Green (s)	8.7		39.4	43.5	25.8		
Actuated g/C Ratio	0.14		0.61	0.68	0.40		
v/c Ratio	0.44		0.44	0.53	1.21		
Control Delay	14.1		18.6	9.8	129.3		
Queue Delay	0.2		0.0	0.7	0.1		
Total Delay	14.4		18.6	10.5	129.4		
LOS	B		B	B	F		
Approach Delay	14.4			12.5	129.4		
Approach LOS	B			B	F		

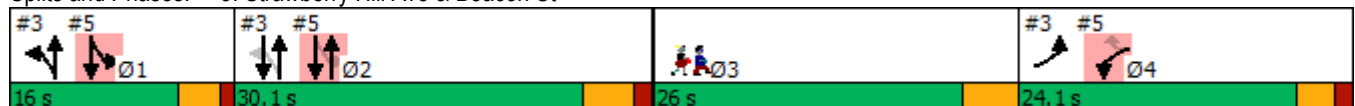
Modification

Southbound  
Strawberry Hill  
Avenue operations

#### Intersection Summary












Area Type: Other  
 Cycle Length: 96.2  
 Actuated Cycle Length: 64.3  
 Natural Cycle: 125  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 67.3  
 Intersection Capacity Utilization 70.1%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service C

#### Splits and Phases: 3: Strawberry Hill Ave & Beacon St





Lanes, Volumes, Timings  
5: Strawberry Hill Ave & Norden Place

							Ø3
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (vph)	57	226	437	129	174	569	
Future Volume (vph)	57	226	437	129	174	569	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	11	11	10	Modification
Storage Length (ft)	130	0		0	90		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.969				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1736	1553	1711	0	1662	1689	
Flt Permitted	0.950				0.155		
Satd. Flow (perm)	1736	1553	1711	0	271	1689	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		254	15				
Link Speed (mph)	30		25			25	
Link Distance (ft)	1069		781			316	
Travel Time (s)	24.3		21.3			8.6	
Peak Hour Factor	0.89	0.89	0.86	0.86	0.91	0.91	
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%	Modification
Adj. Flow (vph)	64	254	508	150	191	625	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	64	254	658	0	191	625	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			11	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.04	1.04	1.04	1.09	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2		1	2	
Detector Template	Left	Right	Thru		Left	Thru	
Leading Detector (ft)	20	20	100		20	100	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA		D.P+P	NA	

# Lanes, Volumes, Timings

## 5: Strawberry Hill Ave & Norden Place



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Protected Phases	4		2		1	1 2	3
Permitted Phases		4			2		
Detector Phase	4	4	2		1	1 2	
Switch Phase							
Minimum Initial (s)	7.0	7.0	15.0		5.0		5.0
Minimum Split (s)	20.0	20.0	22.5		12.0		26.0
Total Split (s)	24.1	24.1	30.1		16.0		26.0
Total Split (%)	25.1%	25.1%	31.3%		16.6%		27%
Maximum Green (s)	20.0	20.0	25.0		12.0		22.0
Yellow Time (s)	2.6	2.6	3.6		3.0		4.0
All-Red Time (s)	1.5	1.5	1.5		1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	4.1	4.1	5.1		4.0		
Lead/Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0	6.0		2.0		3.0
Recall Mode	None	None	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							3
Act Effct Green (s)	8.7	8.7	25.8		39.4	43.5	
Actuated g/C Ratio	0.14	0.14	0.40		0.61	0.68	
v/c Ratio	0.27	0.59	0.95		0.44	0.55	
Control Delay	30.2	10.8	45.7		20.3	11.7	
Queue Delay	0.0	0.3	0.2		0.0	1.0	
Total Delay	30.2	11.0	45.9		20.3	12.7	
LOS	C	B	D		C	B	
Approach Delay	14.9		45.9			14.5	
Approach LOS	B		D			B	

Modification

### Intersection Summary

Area Type: Other  
 Cycle Length: 96.2  
 Actuated Cycle Length: 64.3  
 Natural Cycle: 125  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 26.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 57.3%  
 ICU Level of Service B  
 Analysis Period (min) 15

### Splits and Phases: 5: Strawberry Hill Ave & Norden Place

