

Technical Memorandum

To: Matt Hodges – Dominionium
From: Jonah Finkelstein, PE
Date: September 20, 2019
Re: Trip Generation Memorandum – West Saint Paul Residential Development

Purpose of Report and Study Objectives

The purpose of this study is to determine the expected traffic generation for the proposed residential development site located south of Butler Avenue between Hall Avenue and Livingston Avenue in West Saint Paul, Minnesota. The new land use will consist of a 137-unit apartment complex and 232 senior building in place of the existing shopping center.

Conclusions

The trip generation and distribution of the proposed residential complex was reviewed. Using standard trip generation data, the expected trip generation for the proposed development is:

- 1,604 daily trips to and from the site
- 96 new AM peak hour trips (29 entering and 67 exiting)
- 121 new PM peak hour trips (70 entering and 51 exiting)

No significant operational impacts are anticipated for the surrounding roadways and intersections due to the trips generated from this proposed development.

Existing Site

The proposed site is currently vacant but was originally a big box department store. The development shares its parking lot with the strip mall to the south though these connections are proposed to be removed with the new development.

Based on available data sources, the following Average Daily Traffic (ADT) volumes are present on the surrounding roadways:

- 5,200 vehicles per day on Butler Avenue west of S Robert Street
- 8,300 vehicles per day on Butler Avenue east of S Robert Street
- 13,300 vehicles per day on S Robert Street north of Butler Avenue
- 18,400 vehicles per day on S Robert Street south of Butler Avenue

Trip Generation

The existing and future traffic forecasts for the site are based on the data and methods published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition*. The ITE manual compiles studies from across the country to provide a national average of traffic for various land uses. Spack Consulting also collects current average traffic volumes for various land uses in the Twin Cities regional area for use in our studies. Local data is considered more relevant than the ITE national data as it is generally newer and accounts for our area's specific characteristics and driving habits. Per the procedure in the *Trip Generation Manual*, local trip generation data is used when possible and supplemented with national ITE data when local data is not available.

Table 1 presents the trip generation for proposed land uses.

Table 1 – Raw Trip Generation Comparison

Source	Description (source)	Daily Trips		AM Peak Hour		PM Peak Hour	
		Entering	Exiting	Entering	Exiting	Entering	Exiting
ITE	Multifamily Housing (Mid-Rise) – 167-Units (ITE-221)	373	373	13	36	37	24
	Senior Adult Housing – Attached – 232-Units (ITE-252)	429	429	16	30	33	27
	TOTAL TRIP GENERATION	802	802	29	67	70	51
Local	Apartment	302	302	6	36	40	19
	Senior Adult Housing	393	393	26	16	24	32
	TOTAL TRIP GENERATION	695	695	32	52	64	51

As shown in Table 1, the local and ITE based peak hour trip generation results are similar. Therefore, based on recommended best practices, the trip generation forecasts based on local data are used in the analysis.

The proposed development change results in roughly 1,390 new daily trips, 84 new AM peak hour trips, and 115 pm peak hour trips when compared against the vacant lot.

To show the magnitude of change compared to the previous big box store land use the expected trip generation for the residential land use was compared against that of a department store. This comparison can be seen in Table 2.

Table 2 – Raw Trip Generation Comparison

Source	Description (source)	Daily Trips		AM Peak Hour		PM Peak Hour	
		Entering	Exiting	Entering	Exiting	Entering	Exiting
Proposed Land Use	TOTAL TRIP GENERATION (Local)	695	695	32	52	64	51
Existing Land Use	Big Box Store (Local)	2,358	2,358	99	77	184	192
Net Change in Trip Generation		-1663	-1663	-67	-25	-120	-141

As Table 2 shows, when compared to the previously existing big box store land use, the proposed residential land use is expected to generate less traffic including:

- 3,326 less daily trips
- 92 less AM peak hour trips
- 261 less PM peak hour trips

Trip Generation Distribution

To be able to see the impact of site trips on surrounding intersections, trips need to be distributed throughout the roadway network. A trip distribution pattern for the generated traffic going to and from the proposed development accounting for the major highway connections surrounding the development and likely travel patterns is as follows:

- 30% of the generated traffic to/from the north on S Robert Street
- 20% of the generated traffic to/from south on S Robert Street
- 35% of the generated traffic to/from east on Butler Avenue
- 15% of the generated traffic to/from west on Butler Avenue

Traffic generated by the site development was assigned to the area roadways per this distribution pattern.

Intersection Impact Analysis

Using the trip generation and trip distribution, new trips for the proposed land use plan were routed through the following intersections:

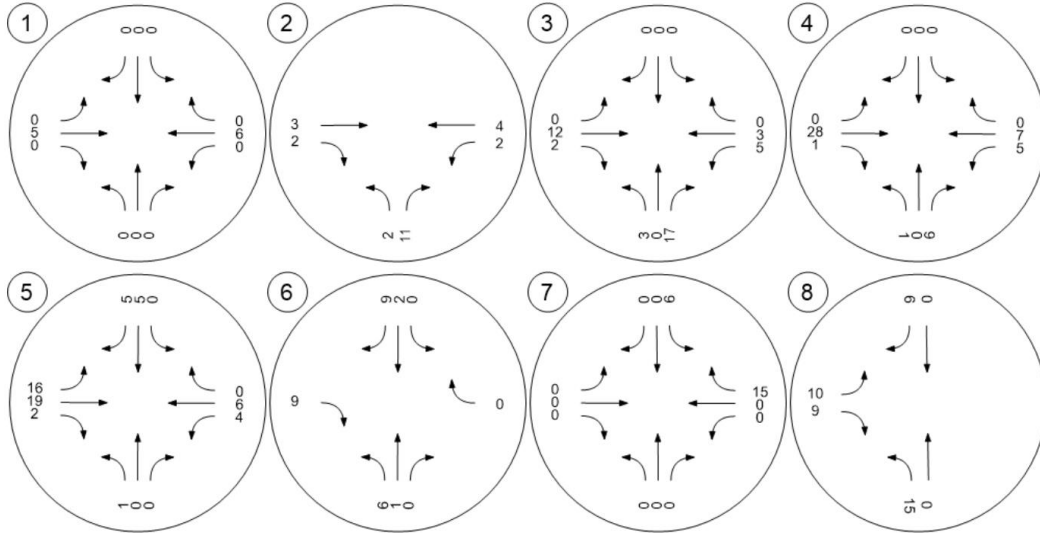
- Butler Avenue & Hall Avenue
- Butler Avenue & Western Site Access
- Butler Avenue & Eastern Site Access
- Butler Avenue & Livingston Avenue
- S Robert Street & Butler Avenue
- S Robert Street Orme Avenue
- Livingston Avenue & Orme Avenue
- Livingston Avenue & Site Access

Figure 1, below, present the routing of the new trips, associated with the residential development, through the study area.

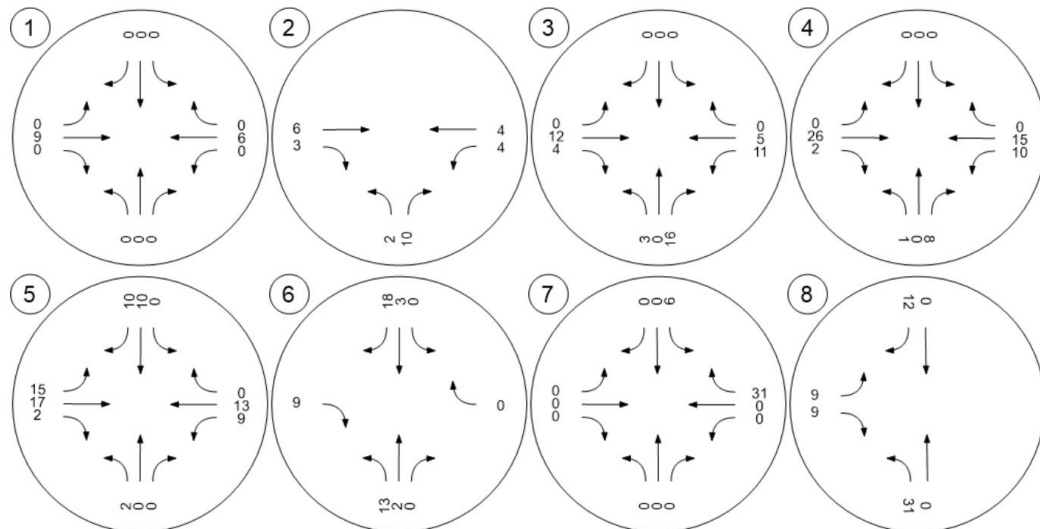
Figure 1 – Peak Hour Site Trips with Current Land Use Scenario



AM Peak Hour



PM Peak Hour



As seen in Figure 1, the highest hourly volume increase for any intersection movement due to the site traffic is 31 vehicles. This occurs at the westbound right turn at Livingston Avenue & Orme Avenue and the northbound left turn at Livingston Avenue & Site Access in the evening peak hour. This magnitude of new trips equates to an increase of roughly one vehicle every two minutes for that movement.

The West Saint Paul Planning Commission raised congestion concerns about the S Robert S & Orme Avenue intersection. At this intersection, the following volume increases are forecasted:

- Northbound left turn; six vehicles in the AM peak hour and 13 vehicles in the PM peak hour
- Southbound right turn; nine vehicles in the AM peak hour and 18 vehicles in the PM peak hour
- Eastbound right turn; nine vehicles in each of the peak hours

This magnitude of new trips at one intersection does not raise any significant impact concerns and is not expected to significantly change overall traffic flow or operations.

Site Plan Review

The proposed site plan was reviewed for traffic-related concerns. The following conditions are noted:

- Sidewalk Connections
 - Provide sidewalk extensions to the existing sidewalk along Butler Avenue.
 - Remove the internal crosswalks to the south of the development as they do not align with any receiving pedestrian infrastructure.
 - Construct a sidewalk along the west side of Livingston Avenue with connections to Butler Avenue and Orme Avenue. This will provide safe pedestrian connections to the south.
 - Provide a boulevard between Butler Avenue and the proposed sidewalk to allow room for snow storage and signage. This will also match the existing northern sidewalk configuration.
 - If mobility between buildings is expected to be high, additional crossing should be provided near the north and south end of each building.
- Site Access and
 - One new site access is proposed on Butler Avenue near Gorman Avenue. This access should line up with Gorman Avenue and limit the offset distance. As currently shown, the left turn movements between Gorman Avenue and the driveway overlap, creating travel path conflict concerns.
- Internal Routing and Operations
 - The offset stagger of the north-south aisles will help reduce speeds within the parking area. However, the staggers should be designed to ensure they allow safe passing of vehicles travelling in each direction to not create a bottleneck and that trucks can safely maneuver through the parking aisles.

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- Safe loading and unloading zones should be provided for tenants in a location that does not obstruct overall traffic flow on site.
 - A designated trash pick-up and delivery area is not shown on the site plan. These locations should be placed such they do not block routing through the site.
 - Service vehicles, such as trash pick-up and deliveries should be scheduled outside of peak hours to help reduce the overall peak hour vehicle demand of the site.
 - Bicycle Infrastructure:
 - Bicycle parking, in a well-lit area near the main accesses of each building, should be provided for guests.
 - Long term bicycle storage should be provided for tenants inside of each development. This facility should provide basic bicycle maintenance tools such as a tire pump for basic maintenance needs.

Attachments

- A. Site Plan