

February 7, 2020

City of Spokane
Attn: Inga Note, P.E.
Senior Traffic Planning Engineer
808 W. Spokane Falls Boulevard
Spokane, WA 99201

Re: Trip Generation & Distribution Letter for the **Health Science & Innovation Building**
840 E. Spokane Falls Boulevard
Spokane, Washington

Dear Inga,

DCI Engineers understands that as part of the SEPA application process, the City of Spokane requires a trip generation and distribution letter to understand the possible traffic impacts for the proposed Health Science & Innovation Building to be constructed at 840 E. Spokane Falls Boulevard. A vicinity map of the site location is included in Appendix I.

Project Description

The proposed project includes the development of a 1.5-acre property located north of the Spokane River at the southwest corner E. Spokane Falls Boulevard and Hamilton Street. The property is currently a McKinstry warehouse building. The existing McKinstry warehouse building is approximately 35,000 square feet in size. The existing structures and paved surface parking lot will be demolished and removed for the proposed development. The south parking lot and McKinstry office building at 850 E. Spokane Falls Boulevard will remain. The project proposes a 4-story building with administrative area, classrooms, lab and research/simulation space plus parking for up to 44 vehicles in a single level garage on the main floor. The building will total approximately 88,391 square feet. Further description of the proposed building can be found in the Project Information section below. See Appendix III for the proposed project site plan.

Trip Generation Summary:

The number of trips generated by the existing site was estimated using information found in the 10th Edition of ITE's *Trip Generation Manual*. The *Trip Generation Manual* was used to calculate the estimated total number of existing trips entering and exiting the site during the AM and PM peak hours based on building square footage. The land use for the existing site is *150 – Warehousing*. The methodology described in the *Trip Generation Handbook* was used to determine whether to use the fitted curve or the average rate for each scenario. For all instances of the existing site, the fitted curve was used. The proposed trips were estimated based on the number of students and faculty/staff that will be utilizing the building after construction is complete. Pass-by trips and internal capture were determined to be negligible. Due to the nature of the project and the site's proximity to downtown and Gonzaga University campus, trip generation calculations considered pedestrian (walking, transit, and biking) trips to and from the site to get a more accurate representation of the vehicular trips generated by the site. The total net trips (difference between existing trips and proposed trips) was then calculated for the project. The corresponding charts from the ITE Manual and the trip calculations are

included in Appendix II. The following is a summary of the estimated trip generation (existing and proposed) for the project.

Trip Generation (Existing)

Land Use 150 – Warehousing

- Weekday, Peak Hour of Adjacent Street Traffic, One hour between 7-9 AM
 - Average vehicle trip ends vs. 1000 s.f. of gross floor area (35.0)
 - Fitted Curve – **30 Trips**
 - 77% IN, 23 trips
 - 23% OUT, 7 trips
- Weekday, Peak Hour of Adjacent Street Traffic, One hour between 4-6 PM
 - Average vehicle trip ends vs. 1000 s.f. of gross floor area (35.0)
 - Fitted Curve – **32 Trips**
 - 27% IN, 9 trips
 - 73% OUT, 23 trips

Project Information

The trip generation manual does not contain a land use that accurately fits the proposed project. Land uses 540 and 550 are related but do not have a sufficient sample size to accurately represent the newly proposed Health Science & Innovation Building.

In order to get a more representative number of total trip generation with the addition of the new Health Science & Innovation Building, we have used the project information provided to us and made a conservative estimate of the number of vehicular and pedestrian trips to and from the project site.

The UW Medical School portion of the building is anticipated to have 5th and 6th year students with a maximum of 80 students per class along with a total of 65 faculty/staff. It is assumed that 100% of users will arrive within the AM Peak Hour for the UW Medical School portion of the building, however, only 50% are expected to exit during the PM Peak Hour due to users leaving during different hours of the day. Users of this portion of the building will be staying for most of the morning which means they will be primarily entering trips in the AM Peak Hour and begin exiting after the AM Peak Hour and into the PM Peak Hour. Of these users, it is assumed that most of them (90%) will be coming from off-campus and would be vehicular trips while the rest will be pedestrian trips. For your information, the 6th year students are on campus for the first 6 months of the year and the latter 6 months are spent in off-site clinical studies.

The Gonzaga portion of the building will have (3) 25-person classrooms, (2) 50-person classrooms, and (6-7) 10-12 person classrooms along with a total of 14 faculty/staff. It is assumed that that the Gonzaga occupied portion of the building will have a typical occupancy of 90% during the AM Peak Hour and 20% in the PM Peak Hour when classes are less common. Users of this portion of the building will likely be attending shorter classes and could be expected to both enter and exit the building within an hour. It is also assumed that most of these users (90%) will be coming from campus and will be pedestrian trips, while the remainder (10%) will be vehicular trips.

It was also considered that not all users would be entering or exiting during the AM and PM peak hours. One user could represent multiple trips within the peak hour if they both enter and exit within the hour. Conversely, if a user entered prior to the peak hour or exited after the peak hour, that trip would not be counted as a peak hour trip. For example, there is a total capacity of 259 students and 14 faculty/staff for the Gonzaga occupied portion of the building during the AM Peak Hour. Of the possible 259 students and 14 faculty/staff, it is assumed that there will be a building occupancy of 90% at this time. Therefore, it is anticipated that there will be 233 students and 13 faculty/staff.

Combined that gives a total building occupancy in the AM Peak Hour of 246 people. This number represents the total number of people in the building within the AM Peak hour, however, we can assume that 90% of the 246 occupants (221) will be entering the new Health Science & Innovation building during the AM Peak Hour. This same methodology was applied to all situations for entering and exiting trips during the AM and PM Peak Hour for both the University of Washington and Gonzaga University occupied portions of the building. See below for a table depicting the assumed percentages.

Trip Generation (New)

<u>UW Total New Trips (160 Students) (65 Faculty/Staff)</u>								
Peak Hour	Occupancy	Occupying Students	Occupying Faculty/Staff	Total Occupying Users	% of Users Entering During Peak Hours	Entering Trips	% of Users Exiting During Peak Hours	Exiting Trips
AM	100%	160	65	225	90%	203	5%	12
PM	50%	80	33	113	5%	6	90%	102

<u>GU Total New Trips (259 Students) (14 Faculty/Staff)</u>								
Peak Hour	Occupancy	Occupying Students	Occupying Faculty/Staff	Total Occupying Users	% of Users Entering During Peak Hours	Entering Trips	% of Users Exiting During Peak Hours	Exiting Trips
AM	90%	233	13	246	90%	221	80%	197
PM	20%	52	3	55	20%	11	90%	50

<u>UW Peak Hour Trips</u>			
	Total Trips	Vehicular Trips (90%)	Pedestrian Trips (10%)
AM Peak	215	194	21
<i>Entering:</i>	203	183	20
<i>Exiting:</i>	12	11	1
PM Peak	108	97	11
<i>Entering:</i>	6	5	1
<i>Exiting:</i>	102	92	10

GU Peak Hour Trips			
	Total Trips	Vehicular Trips (10%)	Pedestrian Trips (90%)
AM Peak	418	42	376
<i>Entering:</i>	221	22	199
<i>Exiting:</i>	197	20	177
PM Peak	61	6	55
<i>Entering:</i>	11	1	10
<i>Exiting:</i>	50	5	45

Summary

Total Net Peak Hour Trips						
	Existing Vehicular Trips	Existing Pedestrian Trips	New Vehicular Trips	New Pedestrian Trips	Net Vehicular Trips	Net Pedestrian Trips
AM Peak	30	0	236	397	206	397
<i>Entering:</i>	23	0	205	219	182	219
<i>Exiting:</i>	7	0	31	178	24	178
PM Peak	32	0	103	66	71	66
<i>Entering:</i>	9	0	6	11	(3)	11
<i>Exiting:</i>	23	0	97	55	74	55

Trip Distribution Summary

Vehicular trips for this project site will enter and exit the site solely through the driveway to the site along E. Spokane Falls Boulevard. From E. Spokane Falls Boulevard, trips to the site will travel east or west to their desired location. A trip distribution for the project has been included in Appendix IV.

The table below describes the vehicular movements at the boundary of the analysis extents, the potential destinations/originations associated with that movement, and the anticipated percentage of trips that would be associated with that movement. It is assumed that these percentages will be consistent across both the AM and PM peak hours.

Roadway (Direction)	Origination/Destination	Anticipated Percentage
Trent Ave. (East)	Residential/Industrial	10%
Spokane Falls Blvd. (West)	Downtown Spokane/ Commercial	15%
Hamilton St. (North)	Residential/Commercial	25%
I-90 (East)	Spokane Valley	15%
I-90 (West)	Downtown Spokane/South Hill	20%
2 nd / 3 rd Avenue (West)	Commercial	15%

Trip distribution for pedestrians is expected to consist almost entirely of Gonzaga University students and staff.

The table below describes the pedestrian movements at the boundary of the analysis extents, the potential destinations/originations associated with that movement, and the anticipated percentage of trips that would be associated with that movement. It is assumed that these percentages will be consistent across both the AM and PM peak hours.

Roadway (Direction)	Origination/Destination	Anticipated Percentage
Hamilton St. (North)	Residential	10%
Cincinnati St. (North)	Campus/Residential	40%
Spokane River Campus Path to north side of Spokane Falls Blvd. (Cross at Cincinnati St.)	Campus	20%
Spokane River Campus Path crosses under Spokane Falls Blvd. bridge	Campus	30%

If you have any questions, please don't hesitate to contact me.

Sincerely,
DCI Engineers Inc.

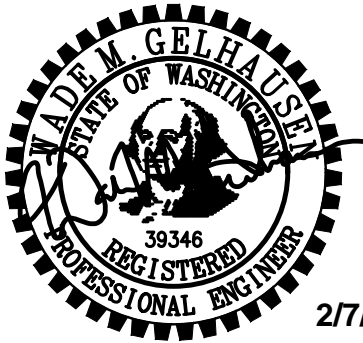


Wade Gelhausen, P.E.
Associate Principal



Sam Shastany, E.I.T.
Project Engineer

- Appendix I: Vicinity Map
- Appendix II: Calculations/ITE Manual (AM & PM Peak Hour)
- Appendix III: Site Plan
- Appendix IV: Trip Distribution



2/7/2020

Appendix I

Vicinity Map



Appendix II

Land Use: 150

Warehousing

Description

A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas. High-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related uses.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the 13 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:30 a.m. and 12:30 p.m. and 3:00 and 4:00 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas.

Source Numbers

184, 331, 406, 411, 443, 579, 583, 596, 598, 611, 619, 642, 752, 869, 875, 876, 914, 940

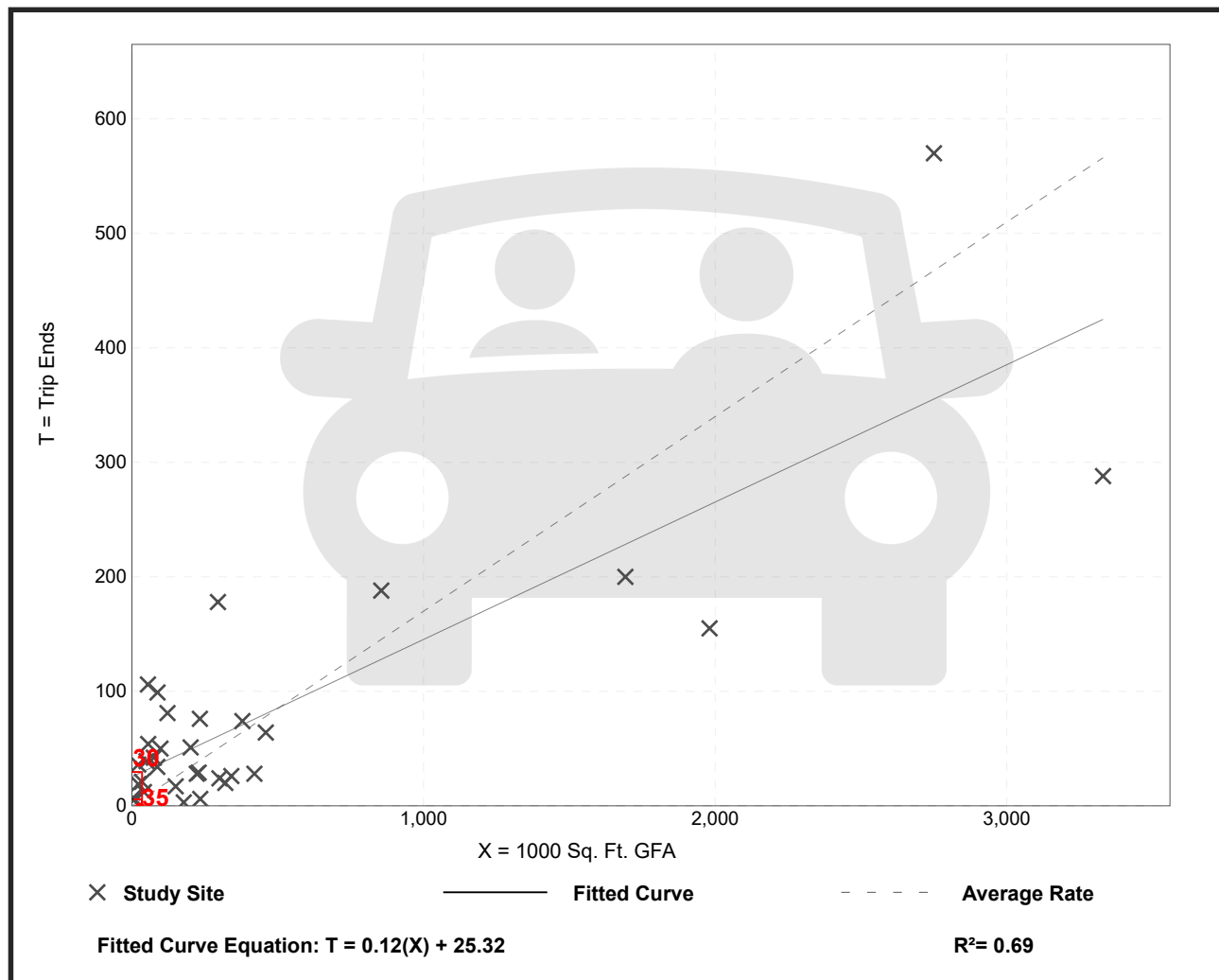
Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 34
 Avg. 1000 Sq. Ft. GFA: 451
 Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.20

Data Plot and Equation



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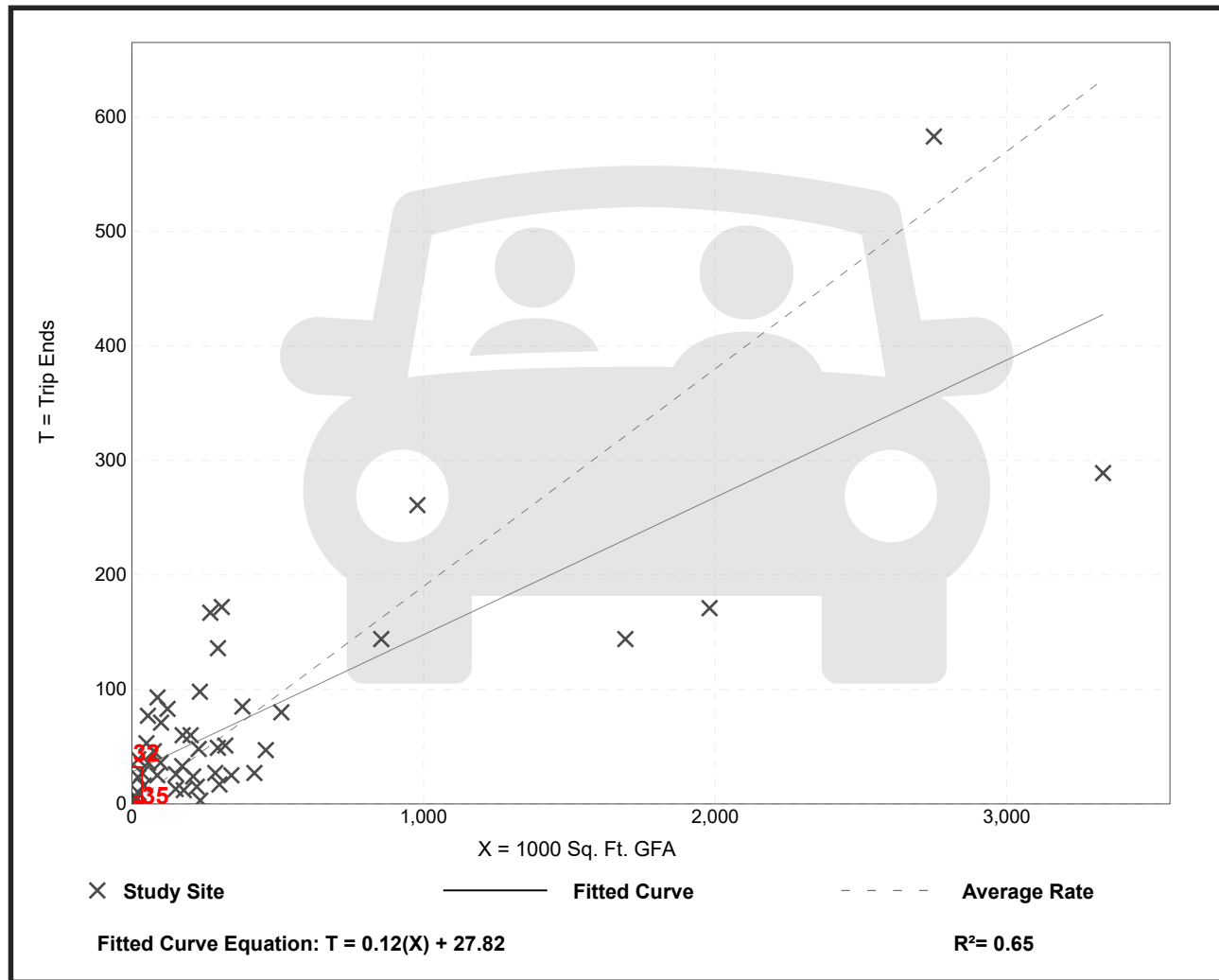
Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 47
 Avg. 1000 Sq. Ft. GFA: 400
 Directional Distribution: 27% entering, 73% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.19	0.01 - 1.80	0.18

Data Plot and Equation



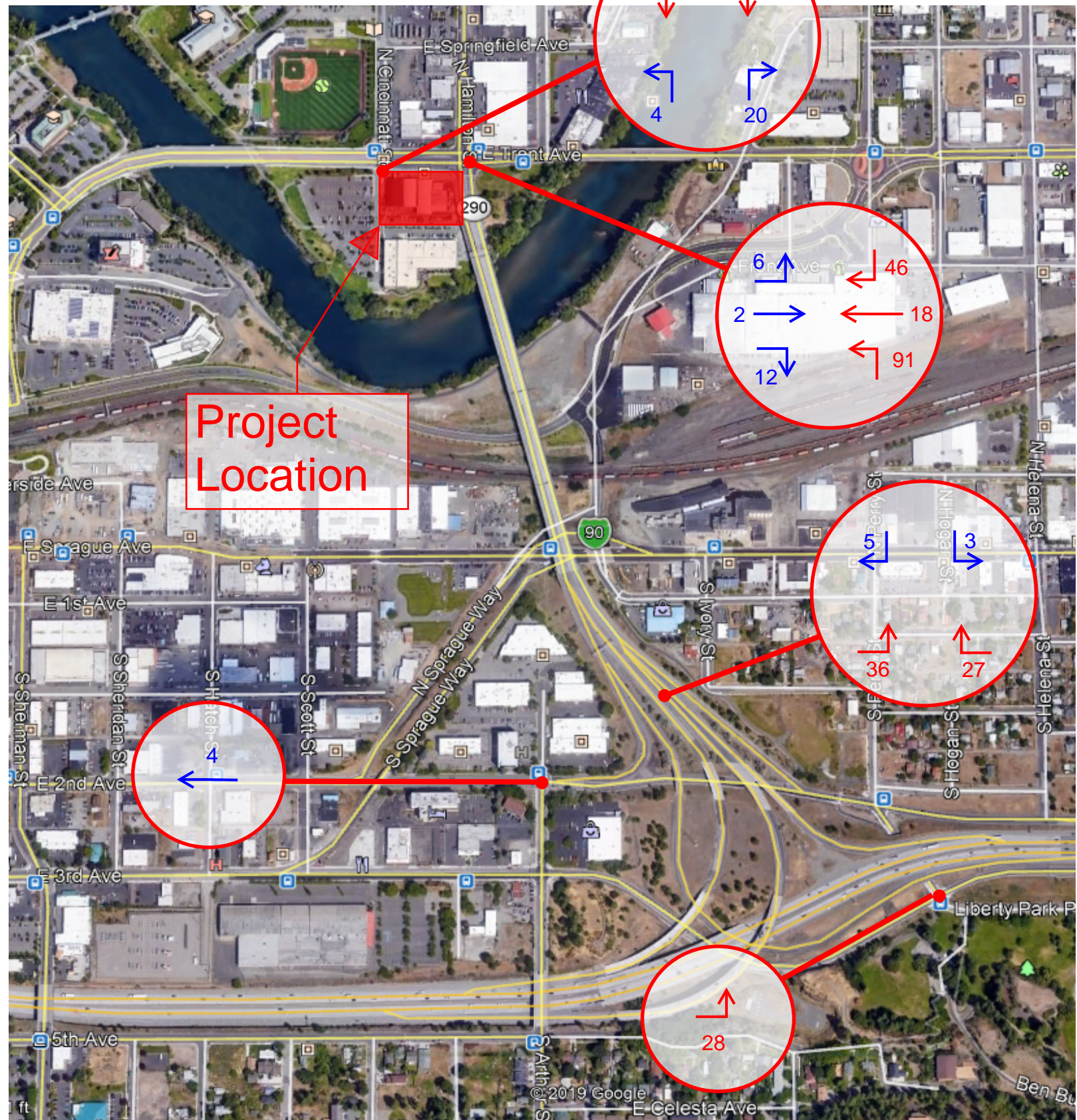
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Appendix III

Appendix IV

Trip Distribution - AM Peak Hour

- 182 Entering Trips
- 24 Exiting Trips



Trip Distribution - PM Peak Hour

- (3) Entering Trips
- 74 Exiting Trips

