



CITY OF KIRKLAND
PLANNING & BUILDING DEPARTMENT
123 5TH AVENUE, KIRKLAND, WA 98033
425.587.3600 ~ www.kirklandwa.gov

MEMORANDUM

To: Kirkland Hearing Examiner
From: Tony Leavitt, Senior Planner
Thang Nguyen, Transportation Engineer
Adam Weinstein, AICP, SEPA Responsible Official
Date: June 11, 2020
File: **SEP18-00313**
Subject: **APPEAL OF STATE ENVIRONMENTAL POLICY ACT (SEPA)**
DETERMINATION FOR CONTINENTAL DIVIDE MIXED USE PROJECT

HEARING EXAMINER DIRECTION

Consider the SEPA Determination Appeal regarding the Continental Divide Mixed Use Project and either:

- Affirm the decision being appealed;
- Reverse the decision being appealed; or
- Modify the decision being appealed.

BACKGROUND

The subject property (containing multiple parcels and addresses) is located along NE 85th Street between 131st Avenue NE and 132nd Avenue NE. The applicant, Continental Divide LLC, is proposing to construct a three-story mixed-use building with a total of 134 residential units and approximately 3,400 square feet of office space on top of a parking garage. A separate single-story 4,000 square foot commercial building will be constructed adjacent to NE 85th Street with a surface parking lot to the north of the building.

The parking garage will have two vehicular access points, one along 131st Avenue NE and one along 132nd Avenue NE. The surface parking lot will be accessed only from 131st Avenue NE. The proposed garage driveway on 131st Avenue NE will provide one-way access into the garage. The proposed garage driveway on 132nd Avenue NE will provide two-way access, but it will be limited to right-turn entering and exiting.

A SEPA Determination of Nonsignificance (DNS) was issued on December 2, 2019. The Environmental Checklist, Determination, and additional environmental information are included as Attachment 1.

Timely appeals of the SEPA Determination were filed on December 10, 2019 by Reid Borsuk and Sarah Yao (see Attachment 2) and on December 12, 2019 by Alex Sidles of Bricklin and Newman LLP representing the Rose Hill Community Group (see Attachment 3)

Pursuant to KMC 24.02.230(f), if a land use permit does not include an open record public hearing but provides for an open record appeal (such as Design Review Board decisions), the SEPA appeal will be consolidated with the open record appeal and decided upon by the hearing examiner. A timely SEPA appeal will be placed on hold until the City's final decision on the underlying permit is issued. Then, if the underlying permit decision is appealed administratively, both appeals will be decided at a consolidated open record appeal hearing.

The Design Review Board Decision was appealed by Alex Sidles of Bricklin and Newman LLP representing the Rose Hill Community Group. As a result, both appeals will be decided at a consolidated open record appeal hearing.

ANALYSIS

SEPA Determination

The SEPA "threshold determination" is the formal decision as to whether the proposal is likely to cause a significant adverse environmental impact for which mitigation cannot be easily identified. The SEPA Rules state that *significant* "means a reasonable likelihood of more than a moderate adverse impact on environmental quality [WAC 197-11-794(1)]". In addition, *significant* involves an analysis of the context, intensity, and severity of the impact.

Many environmental impacts are mitigated by City codes and development regulations. For example, the Kirkland Zoning Code has regulations that protect sensitive areas, limit noise, provide setbacks, establish height limits, etc. Where City regulations have been adopted to address an environmental impact, it is presumed that such regulations are adequate to achieve sufficient mitigation [WAC 197-11-660(1)(e) and (g)]. Therefore, when requiring project mitigation based on adverse environmental impacts, the City would first consider whether a regulation has been adopted for the purpose of mitigating the environmental impact in question.

The SEPA DNS, issued on December 2, 2019, determined that the proposal is not likely to cause any significant adverse environmental impacts for which mitigation cannot be identified.

SEPA Appeal Procedures

The Kirkland Municipal Code establishes the required procedural guidelines for SEPA Appeals in section 24.02.230. KMC Section 24.02.230.b establishes the following parties as able to appeal the SEPA determination: the applicant or proponent; any agency with jurisdiction; and any individual or other entity who is specifically and directly affected by the proposed action. KMC Section 24.02.230.g.2 establishes the applicant or proponent, City staff, and persons who have appealed the threshold determination under KMC 24.02.30.b. are able to participate in the appeal.

The SEPA Appeal Procedures listed in KMC Section 24.02.230.i identify that: the matters to be considered and decided upon in the appeal are limited to the matters raised in the notice of appeal; the decision of the responsible official shall be accorded substantial weight; all testimony will be taken under oath; and the decision of the hearing body considering the appeal shall be the final decision on any appeal of a threshold determination including a Mitigated Determination of Nonsignificance.

The Hearing Examiner will consider the appeal and the testimony received during the public hearing in making her decision to either: affirm the decision being appealed; reverse the decision being appealed; or modify the decision being appealed. Within eight (8) calendar days after the public hearing, the Hearing Examiner will issue a written decision on the appeal.

Staff Response to Appellants Borsuk and Yao

The following discussion includes Reid Borsuk and Sarah Yao's points of appeal followed by staff's response:

1. The Concurrency Test Notice for the project expired on June 22, 2019 and a new concurrency test notice must be issued with updated underlying data.

Staff Response: *It is true that the original concurrency test notice expired prior to staff receiving the required transportation impact analysis (TIA) report. Thus, subsequent to the submittal of the TIA report, the applicant re-applied for a new transportation concurrency test. The development passed concurrency and a new concurrency test notice was granted on September 4, 2019 with an expiration date of September 4, 2020 (see Attachment 4).*

2. The trip generation assignments found within the traffic impact analysis generate mathematically impossible traffic flows. These errors consistently lose vehicles in trip estimates between points where there is no possibility of vehicles being removed from the traffic flow. This error means that all projections of intersection proportional share cannot be done correctly given bad source data. It's not possible from this traffic impact analysis to determine if any intersections are being overloaded with this new traffic.

Staff Response: *The morning and evening peak hour trip generation assignment is demonstrated in Figure 5 (see below). There are no errors in Figure 5. However, Figure 5 may not have provided a clear explanation of the project traffic assignment to the appellants. There are asterisks by the driveway volumes (labeled 4, 5, and 6) to note that the driveway volumes represent gross project trips, while the project trips at the off-site intersections (labeled 1, 2, and 3) only present "net new" trips (i.e., proposed development trips minus existing project site trips). Since the driveways are new, there is no way to calculate net new trips at these locations.*

The traffic count data used in the transportation analysis included trips from the previous use at the development site. For proper accounting of the new development's traffic and impact, only net new development traffic is shown at off-site intersections in Figure 5, because the existing traffic counts at the off-site intersections include traffic generated by the previous uses at the site. Those trips must be subtracted out of the development's gross trip assignment (Figure 5) in order to evaluate potential intersection impacts. The figure below provides the project trips (in red) that are accounted within the intersection traffic counts.

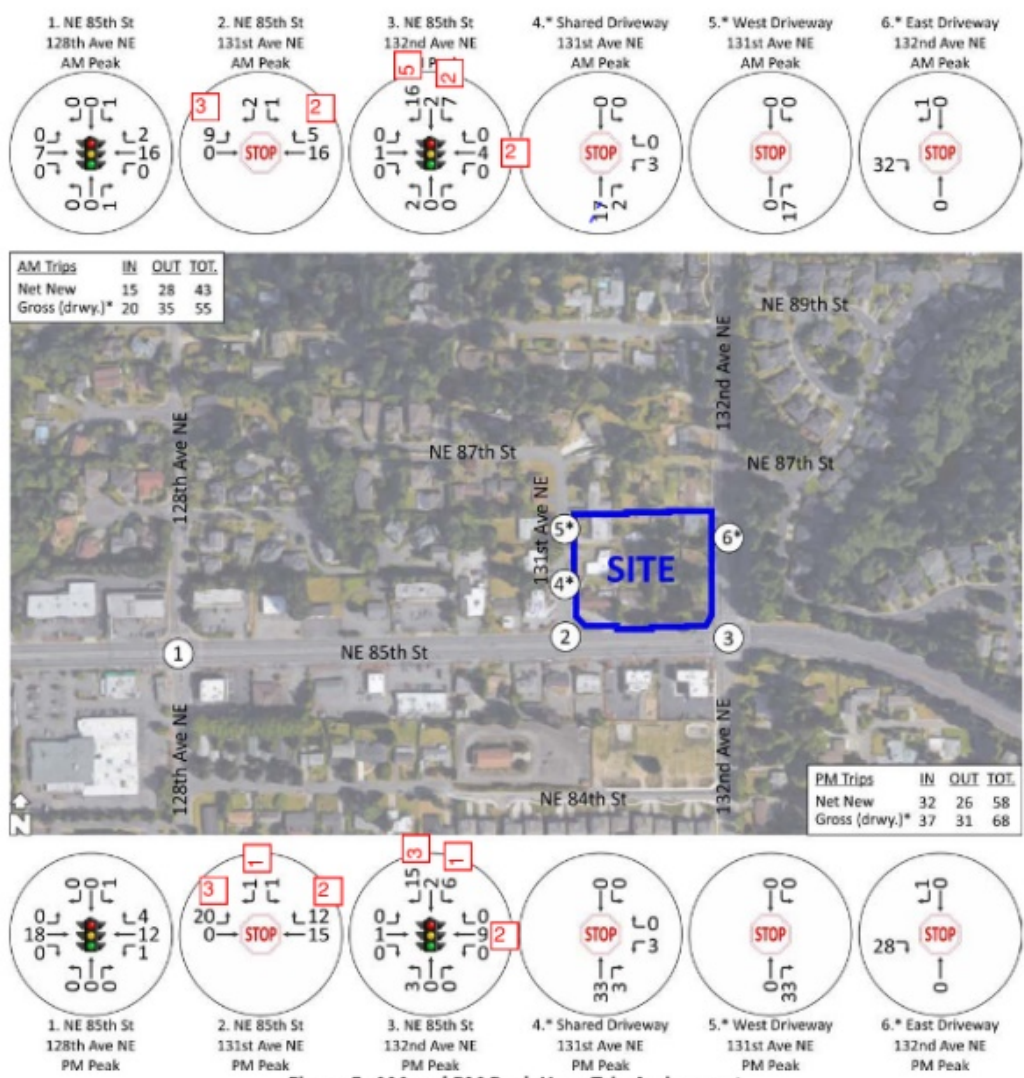


Figure 5: AM and PM Peak Hour Trip Assignment

Project Trips
accounted in the
existing traffic
counts XX

For example, assume the new development generates 15 gross trips. If the existing traffic count volume at an off-site intersection is 10 trips and two of those trips are generated by the previous use at the site then those two existing trips must be subtracted from the proposed development traffic assignment so that when you compute the "future with development" condition by adding the existing traffic count (10 trips) plus 13 net new trips, it results in 23 trips (8 existing background traffic + 2 existing from the project site + 13 net new trips from the project site; total trips from the development site is $2 + 13 = 15$ trips). If the calculations failed to take into account the trips generated by the existing use at the site, the intersection analysis would show 17 project-related trips, which would not be accurate. The traffic volumes that are in the level of service calculations fully account for the gross traffic from the proposed development.

If the site was vacant at the time the existing traffic counts were collected, then the traffic analysis would simply show the gross development trips at the off-site intersections, which would be added to the existing traffic counts to develop the traffic volumes for the "future with development" condition.

3. The SEPA checklist provided by the applicant failed to correctly account for self-admitted solar impact to neighboring properties.

Staff Response: *The City has not adopted specific regulations to address solar access. Here, based upon the developer's agreement to an increased setback of 30 feet from the north property line, the City believes solar access to the north neighbors has not been unreasonably affected. As part of the property rezone in 2015, the Final Environmental Impact Statement (EIS) concluded that the increased height (from 30 feet to 35 feet) was mitigated by the increased setback from the northern property line as noted in the Planning Commission Revisions, Land Use Patterns and Plans and Policies sections (see Attachment 5). This increased setback would also benefit solar access to the north of the project site.*

Staff Response to Appellants Rose Hill Community Group

The following discussion includes the Community Group's points of appeal followed by staff response:

1. Traffic Impacts:
 1. There will be more daily trips than the SEPA Checklist and Traffic Impact Analysis indicate.
 2. Pedestrians will be exposed to traffic on 131st due to no sidewalks.
 3. Delays will occur on 131st Avenue NE when accessing NE 85th Street.
 4. Risk to pedestrians on 132nd Avenue NE including school aged children in the morning.
 5. TIA Crash Data and Traffic Volumes is obsolete.

Staff Response:

1. *The project's daily trips are calculated independent of the background traffic and other pipeline development. The daily trips presented in the SEPA checklist and transportation impact analysis report are accurate. The appellant has not demonstrated how or why there will be more daily trips generated by the development than accounted for in the TIA.*

2. *Per nexus requirements, the City cannot require the applicant to improve an existing deficiency beyond the project's frontages if the project is not making a significant contribution to that deficiency. The City can only require the applicant to construct the project frontage to existing standards. Sidewalks will be constructed along the development site frontage on 131st Avenue NE. All of the project driveways have adequate safe sight distance to see approaching pedestrians. Therefore, the proposed development does not pose a significant danger to pedestrians on 131st Avenue NE.*
3. *Based on the level of service analysis and traffic queue analysis at the intersection of NE 85th Street/131st Avenue NE, the additional traffic from the development will not create a significant delay or impacts to 131st Avenue NE. In an effort to minimize impacts to residents along 131st Avenue NE, Public Works staff required the applicant to restrict traffic from exiting the garage onto 131st Avenue NE; therefore, the driveway to the parking garage is designed to be an entrance with a narrow one-way garage door that does not allow two-way traffic. Furthermore, the garage door cannot be opened from the inside by drivers. All traffic from the garage will exit from the driveway located at 132nd Avenue NE. The majority of the morning traffic to/from the commercial shared driveway accessing the surface parking lot (19 trips) will enter from NE 85th Street and an insignificant amount of trips (approximately three) will exit from the driveway to NE 85th Street.*
4. *Previously, there were three driveways along the project frontage on 132nd Avenue NE and those driveways required residents to back out into the street. Those three driveways will be reduced to one with the development. Although there will be more traffic accessing the site with the development, the driveway condition is improved by not have residents backing out into the street, which is more dangerous than heading out front first. The development driveway at 132nd Avenue NE has adequate sight distance and drivers will have more than adequate sight distance to see pedestrians approaching the driveway from the sidewalk. The analysis of traffic safety has been assessed in the TIA report and review by City staff and the conclusion is there will not be a significant risk to children, particularly taking into account the new sidewalk along 131st Avenue NE.*
5. *If there is an Expedia park-and-ride on 132nd Avenue NE, it is a use that has not been approved by the City. The background traffic growth subsequent to the review and approval of the transportation impact analysis (TIA) report is not relevant to the proposed development impact. The applicant is not required to mitigate for background traffic and the impacts of other developments. The TIA report has shown, and staff agrees, that the proposed development will not create a significant transportation impact. The development's traffic did not trigger the City's level of service standard that would require off-site mitigation. Based on the City's TIA Guidelines, the applicant is required to assess the historical traffic accident data available at the time the transportation report was being prepared. The TIA report followed the City's TIA Guidelines and is complete, and staff's assessment is that changes in traffic conditions since collection of the initial TIA data would not result in new impacts not identified in the TIA. Furthermore, higher traffic volumes alone do not increase traffic accidents (and in many cases, higher traffic volumes and slower traffic reduce the prevalence of severe injuries).*

2. There will be a significant environmental impact from increased noise, especially for the houses to the north, from the roughly 200 new parking spaces and roughly 130 new residential units. The SEPA Checklist merely says that “no significant long-term noise impacts are anticipated,” without providing any analysis of the current noise baseline or what future noise impacts from the project would be. This constitutes a failure to consider an important environmental issue.

Staff Response: *The City has noise regulations in the zoning code to address potential noise impacts, thus, noise is not analyzed under SEPA. KZC Section 115.95.1 adopts by reference the maximum environmental noise level in WAC 173-60, which states the following:*

WAC 173-60-040 – Maximum Permissible Environmental Noise Levels requires that noise from commercial living accommodations, retail and office (Class B EDNA – Environmental Designation for Noise Abatement) cannot exceed 57 dBA when entering residential property (Class A EDNA) during the hours of 7:00 a.m. and 10:00 p.m. Between the hours of 10:00 p.m. and 7:00 a.m., the noise level cannot exceed 47 dBA.

At any hour of the day or night the applicable noise limitations described above may be exceeded for any receiving property by no more than:

- *5 dBA for a total of 15 minutes in any one-hour period; or*
- *10 dBA for a total of 5 minutes in any one-hour period; or*
- *15 dBA for a total of 1.5 minutes in any one-hour period.*

In addition, WAC Sections 173-60-050(4)(a) and (k) exempt sounds created by motor vehicles as well as natural phenomena and unamplified human voices from the maximum noise levels described above.

Any violation of the noise regulations would be addressed through the City’s Code Enforcement proceedings. Furthermore, the vast majority of the project parking spaces would be within a structure, thus reducing parking-related noise impacts on surrounding uses.

3. Continental Divide will significantly impact views from the properties to the north. The SEPA Checklist falsely claims that “No views will be obstructed by the project.” In addition, the Checklist claims that “Setbacks along the North, East and West facades provide additional variation in massing, and the material treatment on all sides of the building have been presented to the Design Review Board for acceptance of aesthetic quality.” However, the DRB has not yet completed its review of these supposed provisions, so it’s premature for the checklist to conclude that these provisions adequately address view impacts.

Staff Response: *The appellant has not provided evidence showing what views, if any, will be impacted by the project. Furthermore, appellant has not demonstrated that any views which may be impacted are legally entitled to protection. In general, private views are not protected by City regulations and policies.*

4. There will be severe impacts on adjacent properties to the north from shade. The total shading of one of the houses for part of the day during winter is a particularly significant impact. The partial shading of four of the houses for part of the day during winter, spring, and fall is also significant. Shading from this project will last part or all of the day for the majority of days of the year. The Checklist falsely describes these shading impacts as "minimal." In reality, they are significant. The Checklist claims the project's shading "would not affect the potential use of solar energy by adjacent properties." This, too, is incorrect, and constitutes a failure to consider an important environmental impact.

Staff Response: *The City has not adopted specific regulations to address solar access, as allowed by RCW 64.04.140. The City recognizes the importance of solar energy systems and balances the equities in development when such systems are involved. Here, based upon the developer's agreement to an increased setback of 30 feet from the north property line, the City believes solar access to the north neighbors has not been unreasonably affected. As part of the property rezone in 2015, the Final Environmental Impact Statement (EIS) concluded that the increased height (from 30 feet to 35 feet) was mitigated by the increased setback from the northern property line as noted in the Planning Commission Revisions, Land Use Patterns and Plans and Policies sections (see Attachment 5). This increased setback would also benefit solar access to the north of the project site and help to reduce the shading impacts of the project.*

5. Continental Divide will result in the demolition of old, affordable housing on the property. The new units, because they are new, will likely charge higher rent. Yet nowhere in the SEPA materials is there any disclosure or consideration of Continental Divide's impact on housing.

Staff Response: *The City has affordable housing requirements to address the loss of older housing units on the subject property. Pursuant to City requirements, the project is required to provide at least 10 percent of the units as affordable housing units as defined in Chapter 5 of the KZC. The project resulted in the demolition of 8 existing housing units and the proposed project will need to provide at least 13 affordable units. In addition, no evidence has been provided showing that the previous housing on the site was affordable as defined by City regulations. Based on current market conditions, it is highly likely that the previous residential units on the site would not have been affordable to households making less than 80% of the Area Median Income.*

6. The applicant's SEPA materials do not discuss the environmental impacts of demolishing the houses. There is no analysis of the possible effects of asbestos release from the demolished houses, nor the possible effects of damaging the demolished houses' septic tanks.

Staff Response: *All residences on the property have been demolished and were required to meet City and State requirements related to asbestos and vacating septic tanks. As a result, there are no environmental impacts as a result of the demolitions.*

7. The City's August 6, 2019 electronic plan review comments for BMU19-04993 and BNR19-0459 (building permits applied for but not issued) indicates that the developer's tree retention plan does not depict all significant trees on the property. The SEPA Checklist claims that "All vegetation to be removed will be replaced by a mix of new coniferous and deciduous trees, evergreen groundcovers and shrubs, and new street trees," but that statement is false, given that the tree retention plan does not even depict all trees.

Staff Response: *The City uses KZC Chapter 95 to regulate tree retention plan reviews. The applicant submitted the required tree plan information (including depiction of all significant trees) as part of the building permit application process and the City has completed the review. All significant trees on the site will be removed, but the project will be required to install landscape buffers along the east, north and west property lines that will include numerous deciduous and coniferous trees.*

8. The project's lighting scheme has not been finalized. It is still under consideration by the Design Review Board, which has requested further information regarding lighting. Until the lighting scheme has been finalized, it is premature to conclude, in a DNS, that lighting impacts will not be significant.

Staff Response: *The City has adopted lighting regulations that this project must satisfy, so lighting is not considered under SEPA. As part of the building permit application, the applicant submitted a lighting plan to satisfy the Rose Hill Business District requirements for exterior lighting pursuant to KZC Section 115.85.2. The City has completed review of the lighting plan and the plan complies with the requirements of this section.*

9. The August 6 electronic plan review comments also indicate that there may be insufficient fire lane access. In light of the City's uncertainty as to whether fire engines can physically access all of the property, it was premature to conclude, in a DNS, that there will be no significant impacts to fire services.

Staff Response: *As part of the building permit application, the applicant submitted a fire access plan that was reviewed by the City's Fire Marshall and approved as adequate and protective of public safety, with conditions.*

10. Immediately across 132nd, within the boundaries of the City of Redmond, is a community of single-family homes called the Pointe. The Pointe subdivision includes a large native-growth protection area, part of which is directly across the street from the Continental Divide project. The Pointe's NGPA is habitat for the following, documented species: barred owl, woodpeckers, bobcat, Nuttall rabbit, Douglas squirrel, and various passerines. Many of these species nest in the NGPA. The SEPA Checklist fails to consider the impacts of the Continental Divide project on wildlife within the adjacent NGPA.

Staff Response: *According to the City of Redmond's Property Viewer mapping program, the NGPA on the Pointe property is approximately 250 feet from the subject property and the stream is approximately 420 feet from the subject property (see Attachment 6). Two streets (132nd Avenue NE (a minor arterial) and 133rd Avenue NE (a private road)) are located between the subject property and the NGPA. Additionally, existing residences in the Pointe project are located between the subject property and NGPA and border the NGPA. Staff concludes that the project will not have a significant environmental impact on the NGPA and the associated wildlife given the distance of the NGPA from the subject property and the location and function of existing improvements that currently act as a barrier to the stream buffer's function as a habitat area.*

11. Immediately across 132nd, within the boundaries of the City of Redmond, is a stream and wetland that is part of the Pointe NGPA. None of the SEPA materials address the presence of this stream and wetland or consider the project's impacts on the stream and wetland, such as increased street runoff from additional traffic.

Staff Response: A review by the City's Public Works Department concluded that storm water from the project will be piped into an existing storm water system in the 132nd Avenue NE right-of-way. This system continues north to NE 97th Street and then into the City of Redmond's system. The project will have no surface water impacts on the stream and wetland on The Pointe property.

12. The approval of Continental Divide will result in an overburdening of one or more of the roads in its vicinity, resulting in one or more roads falling below the established level of service standard. Therefore, the City should not have approved the Concurrency Test.

Staff Response: Transportation concurrency is based on the person trip capacity that is available for development. Currently, the City has 5,867 person trips available for development and this balance accounts for the proposed development. The intersection level of service is not relevant to the transportation concurrency test. The City does not have a roadway level of service. Therefore, the applicant's assertion is incorrect.

CONCLUSION AND RECOMMENDATION

Based on review of the appellant's submittal, staff analysis and response, the City concludes that there are no significant adverse environmental impacts associated with the proposal that cannot be mitigated by City codes and development regulations. The City recommends the Hearing Examiner affirm the City's SEPA Determination of Nonsignificance.

ATTACHMENTS

1. SEPA DNS Memo Enclosures
2. Appeal Letter filed by Reid Borsuk and Sarah Yao
3. Appeal Letter filed by Alex Sidles of Bricklin and Newman LLP (on behalf of the Rose Hill Community Group)
4. Traffic Concurrency Test Notice Memo dated September 4, 2019
5. Griffis Rezone Final and Draft EIS
6. City of Redmond Property Viewer Map



CITY OF KIRKLAND

Planning and Building Department
123 5th Avenue, Kirkland, WA 98033
www.kirklandwa.gov ~ 425.587.3600

***RE-ISSUED TO CLARIFY APPEAL PROVISIONS**

DETERMINATION OF NON-SIGNIFICANCE (DNS)

DATE RE-ISSUED: December 2, 2019

City Planner: Tony Leavitt

File No.: SEP18-00313

Phone: (425) 587-3253

Project Name: Continental Divide Mixed-Use Project

Email: tleavitt@kirklandwa.gov

Project Location/Address: 8505 132nd Avenue NE

Proponent: Continental Divide LLC

Project Description: Construction of a mixed-use development to include 134 apartment units and a total of approximately 7,400 square feet of office and commercial uses. An associated parking garage and surface parking lot for up to 200 parking stalls is proposed.

The lead agency is the City of Kirkland.

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

Comment Period Information:

This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date issued. Comments must be submitted to Tony Leavitt, project planner at tleavitt@kirklandwa.gov by **5:00 PM on December 16, 2019**. Please reference file number SEP18-00313.

Responsible Official:

11/18/19

Adam Weinstein, AICP, Planning & Building Director
City of Kirkland
Planning & Building Department
123 Fifth Avenue, Kirkland, WA 98033 – 425.587.3600

Date

Appeal Information:

You may appeal this determination to the Planning & Building Department at City of Kirkland, 123 Fifth Avenue, Kirkland, WA 98033 no later than **5:00 PM on December 16, 2019** (date, 14 days from date issued) by a Written Notice of Appeal. You should be prepared to make specific factual objections and reference case number SEP18-00313. Contact Tony Leavitt, project planner in the Planning & Building Department at 425.587.3253 to ask about the procedures for SEPA appeals. See also KMC 24.02.230 Administrative Appeals.

*** Additional Information Regarding SEPA Appeals:**

KMC 24.02.230(a) states that administrative appeals of SEPA Determinations are available only in instances where there is an open record hearing on the underlying governmental action (such as Process IIA and IIB decisions). SEPA appeals must be filed within fourteen days of the date the SEPA determination is issued (KMC 24.02.230(c)(1)). A timely SEPA appeal will be placed on hold until the open record hearing on the underlying governmental action is scheduled. Then, both the SEPA appeal and underlying governmental action will be consolidated at one open record hearing.

Pursuant to KMC 24.02.230(f), if a land use permit does not include an open record public hearing but provides for an open record appeal (such as Design Review Board and Process I decisions), the SEPA appeal will be consolidated with the open record appeal and decided upon by the hearing examiner. A timely SEPA appeal will be placed on hold until the City's final decision on the underlying permit is issued. Then, if the underlying permit decision is appealed administratively, both appeals will be decided at a consolidated open record appeal hearing. If the underlying permit decision is not appealed, then there will be no administrative SEPA appeal available and judicial appeal procedures may be followed.

Publish in The Seattle Times on: December 2, 2019

Distribute this notice with a copy of the Environmental Checklist to:

GENERAL NOTICING

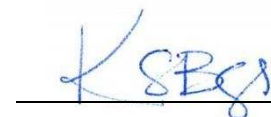
- Department of Ecology - Environmental Review
- Muckleshoot Tribal Council - Environmental Division, Tribal Archeologist
- Muckleshoot Tribal Council - Environmental Division, Fisheries Division Habitat
- Cascade Water Alliance – Director of Planning
- Finn Hill Neighborhood Association
- Lake Washington School District No. 414: Budget Manager and Director of Support Services
- Washington State Dept. of Archaeology & Historic Preservation
- King County Dept. of Transportation - Employer Transportation Representative
- Seattle & King County Public Health - SEPA Coordinator

AGENCIES WITH JURISDICTION, AFFECTED AGENCIES, AND/OR INTERESTED PARTIES

- Department of Ecology - Environmental Review
- Department of Fish and Wildlife – Olympia
- Muckleshoot Tribal Council - Environmental Division, Fisheries Division Habitat Program
- City of Redmond - Director, Planning Dept.
- Parties of Record

cc: Applicant
Planning Department File, Case No. SAR18-00254

Distributed by: _____



(Karin Bayes, Office Specialist)

December 2, 2019

Date



CITY OF KIRKLAND
Planning and Building Department
123 Fifth Avenue, Kirkland, WA 98033
425.587.3600 - www.kirklandwa.gov

MEMORANDUM

To: Adam Weinstein, AICP, SEPA Responsible Official

From: Tony Leavitt, Associate Planner

Date: November 15, 2019

File: SEP18-00313

Subject: **ENVIRONMENTAL DETERMINATION FOR CONTINENTAL DIVIDE MIXED USE PROJECT**

PROPOSAL

The subject property (containing multiple parcels and addresses) is located along NE 85th Street between 131st Avenue NE and 132nd Avenue NE (see Enclosure 1). The applicant, Continental Divide LLC, is proposing the construction of a three-story mixed-use building with a total of 134 residential units and approximately 3,400 square feet of office space on top of a parking garage. A separate single-story 4,000 square foot commercial building will be constructed adjacent to NE 85th Street with a surface parking lot to the north of the building (see Enclosure 2).

The parking garage will have two vehicular access points along 131st Avenue NE and one along 132nd Avenue NE. The surface parking lot will be accessed only from 131st Avenue NE. The proposed garage driveway on 131st Avenue NE will provide one-way access into the garage. The proposed garage driveway on 132nd Avenue NE will provide two-way access, but it will be limited to right-turn entering and exiting.

ENVIRONMENTAL ISSUES

The SEPA "threshold determination" is the formal decision as to whether the proposal is likely to cause a significant adverse environmental impact for which mitigation cannot be identified. If it is determined that a proposal may have a significant adverse impact that cannot be mitigated, an Environmental Impact Statement (EIS) would be required. Many environmental impacts are mitigated by City codes and development regulations. For example, the Kirkland Zoning Code has regulations that protect sensitive areas, limit noise, provide setbacks, establish height limits, etc. Where City regulations have been adopted to address an environmental impact, it is presumed that such regulations are adequate to achieve sufficient mitigation [WAC 197-11-660(1)(e) and (g)]. Therefore, when requiring project mitigation

based on adverse environmental impacts, the City would first consider whether a regulation has been adopted for the purpose of mitigating the environmental impact in question.

I have had an opportunity to visit the site, review the environmental checklist (Enclosure 3), the Traffic Impact Analysis (Enclosure 4) prepared by the applicant's consultant, and the Traffic Impact Analysis Review Memo prepared by the City's Transportation Engineer (Enclosure 5). Based on a review of these materials, the main environmental issue related to the project is potential traffic impacts. Additional environmental issues including noise impacts and lighting impacts can be addressed through applicable zoning code regulations.

TRAFFIC IMPACTS

The scope of traffic impact analysis was approved by the City Transportation Engineer and the traffic report was completed in accordance with the City of Kirkland Traffic Impact Analysis Guidelines (TIAG).

Public Works Staff concluded that the proposed project will not create significant transportation impacts and that no transportation mitigation is required.

During the traffic review for the project, Staff did identify the need for a second southbound left turn lane at the intersection of NE 85th Street and 132nd Avenue NE to improve the southbound level of the service for the intersection. As a part of frontage improvement requirements, the applicant will be required to contribute to the improvement project by dedicating a 12-foot easement along the project frontage on 132nd Avenue NE.

CONCLUSION

It will be necessary to further analyze certain aspects of the proposal to determine if the project complies with all the applicable City codes and policies. That analysis is most appropriately addressed within the review of the building permit. In contrast, State law specifies that this environmental review under the State Environmental Policy Act (SEPA) is to focus only on potential significant impacts to the environment that could not be adequately mitigated through the Kirkland regulations and Comprehensive Plan.¹

Based on my review of the submitted information, I have not identified any significant adverse environmental impacts. Therefore, I recommend that a Determination of Non-Significance be issued for this proposed action.

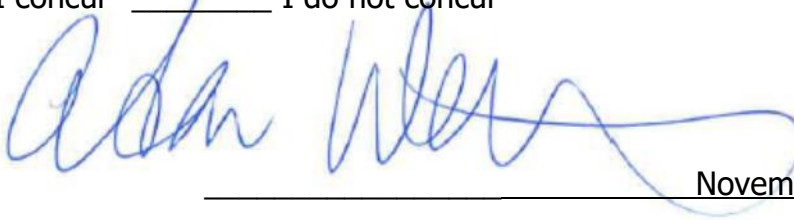
SEPA ENCLOSURES

¹ESHB 1724, adopted April 23, 1995

1. Vicinity Map
 2. Site Plan
 3. Environmental Checklist
 4. Traffic Impact Analysis
 5. Traffic Impact Analysis Review Memo prepared by Thang Nguyen
-

Review by Responsible Official:

____X____ I concur _____ I do not concur



November 18, 2019

Adan Weinstein, AICP, Planning Director

Date:

CONTINENTAL DIVIDE MIXED USE

City of
Redmond

SUBJECT PROPERTY

RH 8



APPENDIX | SITE PLAN / LEVEL 1 FLOOR PLAN

SEP18-00313
ENCLOSURE 2



APPENDIX | LEVEL 2 FLOOR PLAN

SEP18-00313
ENCLOSURE 2



APPENDIX | LEVEL 3 FLOOR PLAN

SEP18-00313
ENCLOSURE 2





SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [\[help\]](#)

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [\[help\]](#)

1. Name of proposed project, if applicable: [\[help\]](#)

Continental Divide Mixed Use Development

2. Name of applicant: [\[help\]](#)

Encore Architects

3. Address and phone number of applicant and contact person: [\[help\]](#)

Andrew Hoyer
1402 Third Ave, Suite 1000
Seattle, WA 98101
206-790-2076

4. Date checklist prepared: [\[help\]](#)

October 9, 2019

5. Agency requesting checklist: [\[help\]](#)

City of Kirkland – Development Service and Planning Department

6. Proposed timing or schedule (including phasing, if applicable): [\[help\]](#)

Construction to begin after appropriate permits are received. The anticipated start of construction is during the first quarter of 2020. Construction duration will be approximately 12 to 18 months.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [\[help\]](#)

No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [\[help\]](#)

Geotechnical Engineering Report prepared by Geotech Consultants, Inc. (Dated April 2, 2108)
Transportation Study by Transportation Solutions, Inc. (Dated April 10, 2018)

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [\[help\]](#)

No

10. List any government approvals or permits that will be needed for your proposal, if known. [\[help\]](#)

City of Kirkland Design Review/Land Use Permit
City of Kirkland Building Permit
Northshore Utility District – Approval of water/sewer utility extensions
Stormwater General Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [\[help\]](#)

Demolition of (8) existing single-family residential structures. Construction of a 3-story mixed-use building of approximately 183,000 sf with 134 residential units and +/- 3,300 SF of office space, over a garage with parking stalls for approximately 175 cars. Construction of a separate 1-story commercial building of +/- 4,000 SF and surface parking for approximately 25 vehicles.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [\[help\]](#)

ADDRESS:

8505 132nd Ave NE, Kirkland, WA

LEGAL DESCRIPTIONS:

LOT 3, PER CHICAGO TITLE COMMITMENT NO. 0073994-ETU:

LOT 3 OF PLAT OF THREE PINES ADDITION, DIVISION NO. 2, AS PER PLAT RECORDED IN VOLUME 56 OF PLATS, PAGE 44, RECORDS OF KING COUNTY;

EXCEPT THE SOUTH 20 FEET CONVEYED TO KING COUNTY FOR THE NE 85TH STREET BY DEED RECORDED UNDER RECORDING NO. 6527010; AND EXCEPT THAT PORTION CONVEYED TO THE STATE OF WASHINGTON BY DEED RECORDED UNDER RECORDING NO. 6653005;

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

LOT 4, PER CHICAGO TITLE COMMITMENT NO. 0076287-ETU:

LOT 4, PLAT OF THREE PINES ADDITION, DIVISION NO. 2, AS PER PLAT RECORDED IN VOLUME 56 OF PLATS, PAGE 44, RECORDS OF KING COUNTY, WASHINGTON;

LESS ST. HIGHWAY

AND EXCEPT THAT PORTION CONVEYED TO THE CITY OF KIRKLAND BY DEED RECORDED UNDER RECORDING NO. 20130712000837, RECORDS OF KING COUNTY, WASHINGTON;

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

LOT 5, PER CHICAGO TITLE COMMITMENT NO. 0049957-ETU:

LOT 5, THREE PINES ADDITION, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 52 OF PLATS, PAGE 31, RECORDS OF KING COUNTY;

EXCEPT THOSE PORTIONS CONVEYED TO THE STATE OF WASHINGTON FOR ROAD PURPOSES RECORDED UNDER RECORDING NO. 6618398 AND 6618399;

AND EXCEPT PORTION DEEDED TO THE CITY OF KIRKLAND BY DEED RECORDED UNDER RECORDING NO. 20101008000422.

LOT 6, PER RIGHT-OF-WAY IMPROVEMENT EASEMENT, AFN 20120706000375:
LOT 6, THREE PINES ADDITION, ACCORDING TO THE PLAT RECORDED IN VOLUME 52 OF PLATS, PAGE 31, RECORDS OF KING COUNTY;

EXCEPT THOSE PORTIONS CONVEYED TO THE STATE OF WASHINGTON FOR ROAD PURPOSES RECORDED FEBRUARY 2, 1970 AND FEBRUARY 10, 1970 UNDER RECORDING NOS. 6615421, 6618398 AND 6618399.

LOT 7, PER CHICAGO TITLE COMMITMENT NO. 0049957-ETU:
LOT 7, THREE PINES ADDITION, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 52 OF PLATS, PAGE 31, RECORDS OF KING COUNTY, WASHINGTON.

LOT 8, PER QUIT CLAIM DEED, AFN 20160412002011:
LOT 8 IN THREE PINES ADDITION NUMBER 2, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 56 OF PLATS, PAGE 44, RECORDS OF KING COUNTY, WASHINGTON.

LOT 9, PER CHICAGO TITLE COMMITMENT NO. 0056824-06:
LOT 9, THREE PINES ADDITION NUMBER 2, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 56 OF PLATS, PAGE 44, IN KING COUNTY, WASHINGTON.

TOGETHER WITH THE WEST 15 FEET IN WIDTH OF 131ST AVENUE NORTHEAST LYING ADJACENT TO SAID LOT 9 AS VACATED BY KING COUNTY COMMISSIONERS IN VOLUME 70 OF COMMISSIONERS RECORDS ON PAGE 70.

SITUATE IN THE CITY OF KIRKLAND, COUNTY OF KING, STATE OF WASHINGTON.

LOT 7, PER RELEASE OF LIEN, AFN 20150915001048:
LOT 7, BURKE-FARRARS KIRKLAND DIVISION NO. 21, PLAT BLOCK 65, SE-4-25-5. SITUATE IN THE CITY OF KIRKLAND, COUNTY OF KING, STATE OF WASHINGTON.

B. ENVIRONMENTAL ELEMENTS [\[help\]](#)

1. Earth [\[help\]](#)

a. General description of the site: [\[help\]](#)

(circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other

Generally flat, slight overall slope downward to the north.

b. What is the steepest slope on the site (approximate percent slope)? [\[help\]](#)

There are no steep slopes on, or near, the site. There is a short fill slope leading downward from the sidewalk along NE 85th St to the vacant gravel lot in the southeast corner of the site. This filled slope is less than 6 feet tall.

- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [\[help\]](#)

The soils at the site consist of some locations of fill or topsoil, approximately 2 feet deep, over approximately 2 feet deep of loose, heavily weathered gravelly, silty sand, over native soils of dense glacial till. Some of these soils will be removed within the below grade building footprint during excavation.

- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [\[help\]](#)

No.

- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [\[help\]](#)

Approximately 27,000 cubic yards will be excavated to construct a partially subsurface parking structure. Granular material will be imported for capillary breaks beneath the building slabs, drive and walk base material, and backfill against walls as needed.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [\[help\]](#)

Because clearing activity will expose site soils to weathering events, limited site erosion could occur. Best Management Practices will be used to minimize erosion.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [\[help\]](#)

Approximately 70% of the site will be surfaced with impervious building, pavement and walkways. Limited pervious landscaped areas will be constructed around the perimeter of the site. Additional pervious areas will be constructed within the building footprint where structured landscaping planters are proposed.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [\[help\]](#)

The proposed construction will include erosion controlling measures that are detailed on a temporary erosion and sediment control plan. These include cover measures to limit erosion, perimeter controls to capture eroded soil, and treatment measures to remove sediment from runoff.

2. Air [\[help\]](#)

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [\[help\]](#)

The proposed project could result in temporary increases in localized air quality emissions associated with particulates and construction-related vehicles. It is anticipated that the primary source of temporary, localized increases in air quality emissions would result from particulates associated with on-site demolition, excavation, and site preparation. While the potential for increased, air quality emissions could occur throughout the potential 18-month construction process, the timeframe of greatest potential impact would be a period of approximately 3-4 months at the outset of the project in conjunction with the demolition and excavation. Temporary, localized emissions associated with carbon monoxide and hydrocarbons would result from diesel and gasoline-powered construction equipment operating on-site, construction traffic accessing the project site, and construction worker traffic.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [\[help\]](#)

Although it is not clear what odors are actually emitted from adjacent sites, all surrounding sites are required to comply with applicable federal, state and local regulations regarding air emissions. Additional odors and emissions from adjacent street traffic, and buses will also affect the site.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any: [\[help\]](#)

The proposed project has been designed to conform to applicable regulations and standards of agencies regulating air quality in City of Kirkland. These include the Environmental Protection Agency (EPA), Washington State Department of Ecology (DOE), and the Puget Sound Clean Air Agency (PSCAA). The contractor would be required to comply with PSCAA regulations, including Regulation I, Section 9.11 (prohibiting emission of air contaminants that would be injurious to human health) and Regulation I Section 9.15 (prohibiting the emission of fugitive dust), unless reasonable precautions are employed.

Mitigation measures to reduce and/or control impacts to air will include:

- Watering surfaces to control dust, the use of temporary ground covers, sprinkling the project site with approved dust palliatives, or use of temporary stabilizations practices upon the completion of grading.

Garage exhaust from this project will be exhausted per International Mechanical Code requirements.

3. Water [\[help\]](#)

a. Surface Water:

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [\[help\]](#)

There are no surface bodies of water on or adjacent to the site.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [\[help\]](#)

No.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [\[help\]](#)

Not applicable.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [\[help\]](#)

Not applicable.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [\[help\]](#)

No, the site is not within a FEMA mapped 100-year floodplain.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [\[help\]](#)

None. This quantity does not include temporary dewatering of the excavation. The average dewatering rate is estimated at 5 gallons per minute (gpm).

b. Ground Water:

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [\[help\]](#)

No.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [\[help\]](#)

None, Sanitary waste will be conveyed by municipal sewer system.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [\[help\]](#)

The bulk of the site runoff is from the building roof, courtyard or adjacent sidewalks and driveways. Roof and courtyard runoff will be collected with internal roof drains or gutters and conveyed to a detention vault that will temporarily store runoff and release it at reduced flows. Impervious paving at the surface parking lot will be piped to a modular treatment structure and then to the detention vault. The vault provides approximately 41,000 cubic feet of temporary runoff storage before releasing it to the existing storm drain at the southwest corner of the site.

- 2) Could waste materials enter ground or surface waters? If so, generally describe. [\[help\]](#)

There is almost no opportunity for waste to reach groundwater from the completed project site. Waste materials could reach site runoff, where runoff could possibly occur, with the primary source being vehicle-borne wastes such as dripping oil or wiper fluid from vehicles in the commercial parking lot.

- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [\[help\]](#)

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [\[help\]](#)

Runoff control and treatment measures are consistent with requirements outlined in the 2017 *King County Surface Design Manual* and City of Kirkland amendments to that manual. Flow control measures include the detention vault which is designed to temporarily store runoff before releasing it at predeveloped rates. Runoff from new pollution generating impervious surfaces will be treated by a media filtration system before flowing into the detention vault. This approach achieves Enhanced Basic Treatment as defined by the State Department of Ecology and provides pollutant removal.

4. **Plants** [\[help\]](#)

a. Check the types of vegetation found on the site: [\[help\]](#)

☒ deciduous tree: alder, maple, aspen, other
☒ evergreen tree: fir, cedar, pine, other

- ☒ shrubs
- ☒ grass
- ☐ pasture
- ☐ crop or grain
- ☐ Orchards, vineyards or other permanent crops.
- ☐ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- ☐ water plants: water lily, eelgrass, milfoil, other
- ☐ other types of vegetation

- b. What kind and amount of vegetation will be removed or altered? [\[help\]](#)

35 evergreen and 25 deciduous trees will be removed, along with a variety of existing foundation and parking area shrub plantings.

- c. List threatened and endangered species known to be on or near the site. [\[help\]](#)

No endangered species are known to be on or near the site.

- d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [\[help\]](#)

All vegetation to be removed will be replaced by a mix of new coniferous and deciduous trees, evergreen groundcovers and shrubs, and new street trees. New planting areas will be around the perimeter of the site, around buildings, and within the proposed courtyard.

- e. List all noxious weeds and invasive species known to be on or near the site. [\[help\]](#)

No noxious weeds or invasive species are known to be on or near the site.

5. Animals [\[help\]](#)

- a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [\[help\]](#)

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

None known.

- b. List any threatened and endangered species known to be on or near the site. [\[help\]](#)

None known.

- c. Is the site part of a migration route? If so, explain. [\[help\]](#)

The general Puget Sound area is located within the Pacific Flyway which extends from Alaska to Mexico and South America. The proposed project would not interfere with the Pacific Flyway and there is no evidence that it is an important part of the Flyway given its already-developed status.

- d. Proposed measures to preserve or enhance wildlife, if any: [\[help\]](#)

Given urban condition there is currently no wildlife on site save typical urban species. The project's increase in quantity and quality of vegetation , including the use of native plants, may enhance beneficial habitat.

- e. List any invasive animal species known to be on or near the site. [\[help\]](#)

None known.

6. Energy and Natural Resources [\[help\]](#)

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [\[help\]](#)

We are using electricity for the majority of the project's energy needs. Natural gas will be used for the hot water heaters and, where possible, HVAC heating. There will be a photovoltaic system on the roof for meeting Energy Code requirements.

- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [\[help\]](#)

Minimal shading on the adjacent properties to the north. North properties are separated by a 30' wide open space. The shading would not affect the potential use of solar energy by adjacent properties.

- c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [\[help\]](#)

The project will incorporate a well-insulated thermal envelope and efficient vinyl windows to reduce heating and cooling loads inside the building. Lighting throughout the building will be reduced significantly compared to code allowances using a full LED lighting design. The hotwater heating system will recirculate heated water to reduce energy demands. Additionally, the project will feature a solar photovoltaic panel array to generate electricity on-site.

7. Environmental Health [\[help\]](#)

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [\[help\]](#)

Potential for risk of exposure to chemicals incidental to construction practices.

Prior to demolition, a hazardous materials survey will be undertaken, and any potential risks will be mitigated. The contractor will be required to comply with the Puget Sound Clean Air Agency's (PSCAA) Regulation I, Section 9.15, requiring reasonable precautions to avoid dust emissions and Regulation I, Section 9.11, requiring the best available measures to control emissions of odor-bearing contaminants. The contractor will be required to comply with recommendations in the Washington Associated General Contractor brochure "Guide to Handling Fugitive Dust from Construction Projects."

- 1) Describe any known or possible contamination at the site from present or past uses.

[\[help\]](#)

There is no historic land use known on the property that would indicate the likely presence of any hazardous material in soil or groundwater. In the event that hazardous materials are encountered during the excavation of the site, an environmental engineering firm will be engaged to provide supervision of the handling and disposal of the material in accordance with applicable laws, regulations and guidelines, and will also be engaged to obtain regulatory closure of the site with the Department of Ecology.

- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [\[help\]](#)

None.

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [\[help\]](#)

Small amounts of diesel fuel for construction equipment. No potential toxic or hazardous chemicals are envisioned to be stored used or produced in the operating life of the project.

- 4) Describe special emergency services that might be required. [\[help\]](#)

Construction practices will be in place to minimize the potential for events requiring emergency services. An established protocol will also provide quick responses to any issues that arise related to this proposal. No special emergency services will be required in the operating life of the project.

- 5) Proposed measures to reduce or control environmental health hazards, if any: [\[help\]](#)

Ventilation for subsurface parking areas will be incorporated to maintain air quality in the garage. Vapor and air retarding barriers will be used throughout the proposed project to minimize the potential for other environmental health hazards.

b. Noise [\[help\]](#)

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [\[help\]](#)

Traffic noise from adjacent streets, NE 85th Street and 132nd Ave NE. Bus stop on NE 85th St, and emergency vehicles noises will affect the site.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [\[help\]](#)

Construction-related noise associated with the proposed project would be the most noticeable and include work performed on-site in conjunction with the proposed building, work performed on-site at construction staging locations, and noise associated with construction related traffic. Residential uses and adjacent business uses in the immediate vicinity of the project site could experience occasional noise-related impacts throughout the construction process. Construction noise would be relatively short-term and is expected to be most noticeable during the initial demolition, excavation and foundation phases of the project.

Once the building is operational, no significant long-term noise impacts are anticipated. Indirect sources of noise would include vehicle traffic noise from the project's parking garage.

- 3) Proposed measures to reduce or control noise impacts, if any: [\[help\]](#)

Construction workers will be encouraged to utilize public transportation to the extent feasible. The construction schedule will be set to prioritize enclosure of the building to mitigate noise from the site.

Parking will be located within structure and underground. The parking access will be set back from the property line.

8. Land and Shoreline Use [\[help\]](#)

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [\[help\]](#)

Single-family residential, small businesses, and a parking lot currently occupy the site. The proposed residential and commercial uses will not affect adjacent land uses.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [\[help\]](#)

No.

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [\[help\]](#)

No.

- c. Describe any structures on the site. [\[help\]](#)

There are seven single-family wood-framed structures on the project site, along with associated sheds and garages. One portion of the site, at the corner of NE 85th St and 132nd Ave NE, is a gravel parking area.

- d. Will any structures be demolished? If so, what? [\[help\]](#)

All structures, site components, and the gravel parking area will all be demolished.

- e. What is the current zoning classification of the site? [\[help\]](#)

RH-8

- f. What is the current comprehensive plan designation of the site? [\[help\]](#)

NE 8th St Subarea Plan – Rose Hill Business District (Office/Retail)

- g. If applicable, what is the current shoreline master program designation of the site? [\[help\]](#)

Not applicable.

- h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [\[help\]](#)

No. See attached maps.

- i. Approximately how many people would reside or work in the completed project? [\[help\]](#)

+/- 170 people would reside in 134 residential units, with approx.. 3 leasing/maintenance employees. Approximately 25 people would be employed in office space in the main mixed-use building, and an additional 10-30 people in office/retail space in the separate commercial building.

- j. Approximately how many people would the completed project displace? [\[help\]](#)

Approximately 15 people would be displaced.

- k. Proposed measures to avoid or reduce displacement impacts, if any: [\[help\]](#)

Property owners contacted any remaining residential tenants and provided all necessary notices required. All tenants will be relocated far in advance of demolition.

- L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [\[help\]](#)

The project will go through City of Kirkland permitting process (including planning review) as well as Design Review Board meeting process.

- m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [\[help\]](#)

Not applicable.

9. Housing [\[help\]](#)

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [\[help\]](#)

Approximately 134 residential units including a range of market-rate pricing, mainly middle income. 14 residential units (10% of the overall 134) will be dedicated to Affordable Housing or low-income.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [\[help\]](#)

7 middle-income single-family homes would be eliminated.

- c. Proposed measures to reduce or control housing impacts, if any: [\[help\]](#)

The project will provide an additional 134 units to the city of Kirkland, Rose Hill area housing market. This will have no adverse housing impacts, but will help fulfill the current demand for housing close to places of work.

10. Aesthetics [\[help\]](#)

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [\[help\]](#)

The structure will be +/- 39'-6" above average grade for the site, with one elevator penthouse and one stair penthouse extending to +/- 40'-0" above average grade. The principal exterior materials will include fiber-cement panel and wood-tone lap siding, masonry, glazed storefront, and architectural concrete.

- b. What views in the immediate vicinity would be altered or obstructed? [\[help\]](#)

No views will be obstructed by the project. The site currently limits views on adjacent properties.

- b. Proposed measures to reduce or control aesthetic impacts, if any: [\[help\]](#)

The project is designed to reduce the perceived mass and to create a residential scale from all sides of the building. Setbacks along the North, East and West facades provide additional variation in massing, and the material treatment on all sides of the building have been presented to the Design Review Board for acceptance of aesthetic quality.

11. Light and Glare [\[help\]](#)

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [\[help\]](#)

No significant light or glare will occur because the majority of the facades will be low-albedo materials. Minimal reflections from unit windows will occur in the early morning and late evening.

The proposed exterior luminaires are almost all full cut-off luminaires. Security lighting will produce some glare and uplight. There may also be some decorative luminaires at the courtyard with glowing uplight components.

- b. Could light or glare from the finished project be a safety hazard or interfere with views? [\[help\]](#)

No.

- c. What existing off-site sources of light or glare may affect your proposal? [\[help\]](#)

Nearby commercial buildings along NE 85th St to the west of the site could potentially produce glare on the proposed project during the late evening due to reflections from window system glazing.

- d. Proposed measures to reduce or control light and glare impacts, if any: [\[help\]](#)

Exterior lighting will be controlled by a system with a timeclock to ensure it is only on from dusk to dawn.

12. Recreation [\[help\]](#)

- a. What designated and informal recreational opportunities are in the immediate vicinity? [\[help\]](#)

Forbes Lake, Rose Hill Meadows Park, North Rose Hill Woodlands Park, Willows Run Golf Complex

- b. Would the proposed project displace any existing recreational uses? If so, describe. [\[help\]](#)

No.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [\[help\]](#)

Open space with a circulation path, dog run, and seating area will be provided along the north property line. A patio on the north side of the building and a central courtyard will also be provided for residents. A public plaza along NE 85th St will be created between the two commercial buildings and around the existing bus stop.

13. Historic and cultural preservation [\[help\]](#)

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe. [\[help\]](#)

None known.

- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [\[help\]](#)

None known.

- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of

archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.
[\[help\]](#)

Not applicable.

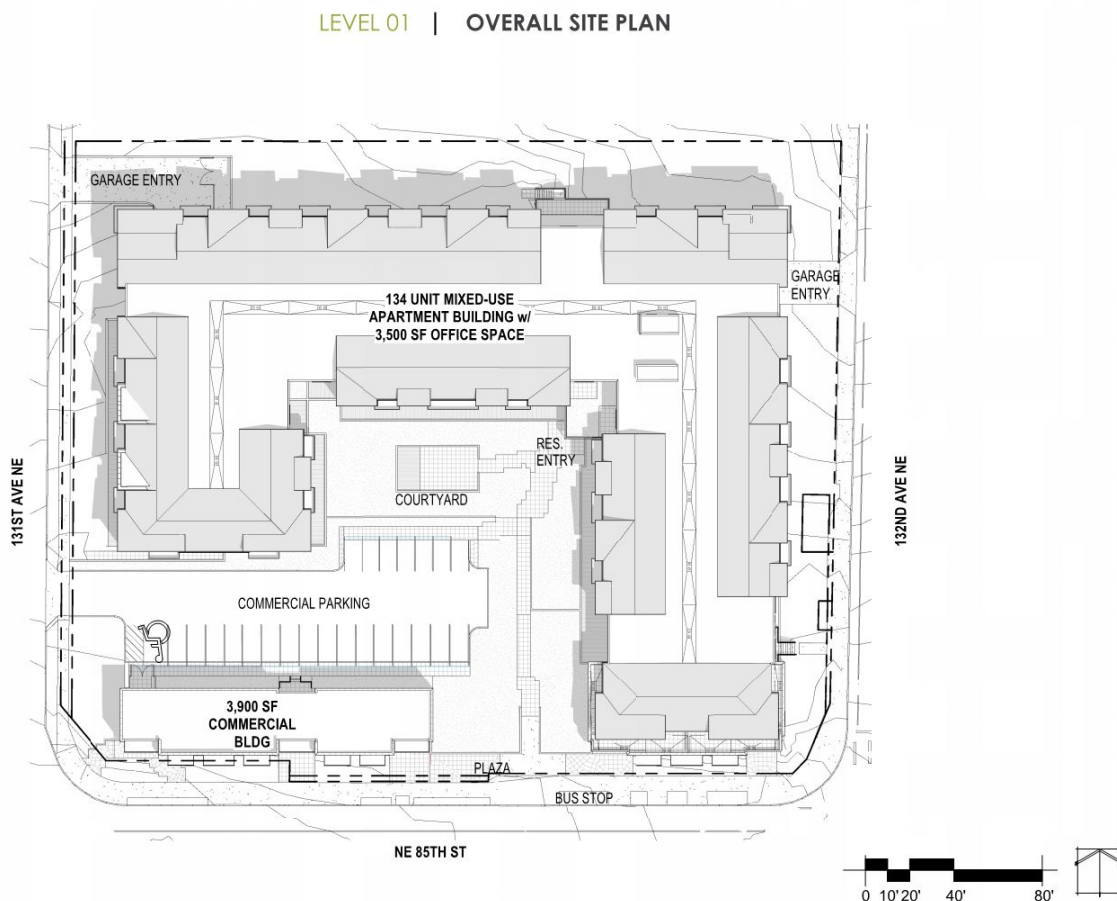
- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [\[help\]](#)

Not applicable.

14. Transportation [\[help\]](#)

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [\[help\]](#)

The proposed development is located along the north side of NE 85th St, and between 131st Ave NE and 132nd Ave NE in Kirkland, WA. Site accesses will be provided along 131st Ave NE and 132nd Ave NE, as shown on the preliminary site plan below.



NE 85th St is classified as a primary arterial street, and 132nd Ave NE is classified as a secondary arterial street. 131st Ave NE is a dead-end residential street.

- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [\[help\]](#)

The site is currently served by King county Metro Routes 248 & 238. There is an existing bus stop on the site for westbound Route 248, and the eastbound stop for Route 248 is across NE 85th St. An existing stop for northbound Route 238 is across the street from the site on 132nd Ave NE, and the southbound stop for Route 238 is on 132nd Ave NE, south of the site and across NE 85th St.

- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [\[help\]](#)

The project provides 24 off-street public parking spaces for commercial spaces and 176 parking spaces for residents in a controlled-access garage. The project does not eliminate any public parking spaces.

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [\[help\]](#)

The project will make improvements to pedestrian sidewalks bordering the property, including a 5'-0" ROW dedication and new sidewalk along 131st Ave NE. The project will also re-pave portions of 131st Ave NE as part of an underground utility extension along the street. Additional street improvements will include plantings, hard-scape elements, and street trees.

- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [\[help\]](#)

No.

- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [\[help\]](#)

Transportation Solutions, Inc performed a traffic study for the project, using Institute of Transportation Engineers (ITE) methodologies from the 9th Edition of the ITE Trip Generation Manual. The project will generate an estimated 498 net new weekday daily vehicle trips, including 42 net new AM peak hour trips and 52 net new PM peak hour trips.

- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [\[help\]](#)

No.

- h. Proposed measures to reduce or control transportation impacts, if any: [\[help\]](#)

In addition to on-site and nearby frequent public transit options, off-street parking will be provided for building residences and commercial spaces. Bicycle storage and amenity space will also be provided to encourage bike use.

15. Public Services [\[help\]](#)

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [\[help\]](#)

No, adequate services are in the vicinity. Minimal impacts for additional services would occur due to the increased number of residents in the area.

- b. Proposed measures to reduce or control direct impacts on public services, if any. [\[help\]](#)

The project applicant will pay impact fees to the City of Kirkland and Lake Washington School District. Applicant will also pay connection fees to the Northshore Utility District. Fees are established to allow public agencies to recoup the costs of the additional demand for schools, parks and similar services. All fees are levied on a pre-determined cost based on the number of units.

16. Utilities [\[help\]](#)

- a. Circle utilities currently available at the site: [\[help\]](#)
electricity, natural gas, water, refuse service, telephone, sanitary sewer, ~~septic system~~,
other _____

- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [\[help\]](#)

Electric – Puget Sound Energy
Natural Gas - Puget Sound Energy
Water/Sewer/Refuse – Waste Management
Voice/Data - Century Link, Comcast, Wave Broadband
Cable – Comcast, Century Link

Construction activities will be limited to providing connections to surrounding utility mains to the project. This will include connections in the public right-of-way.

C. Signature [\[help\]](#)

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee ANDREW HOYER

Position and Agency/Organization ENCORE ARCHITECTS

Date Submitted: 10.9.19



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Continental Divide
8505 132nd Ave NE

Traffic Impact Analysis
TRAN17-00236

Kirkland, WA

July 2018

Updated: September 2018



Prepared for:
Merit Homes
and
the City of Kirkland

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1. Executive Summary

This Traffic Impact Analysis summarizes the traffic impacts associated with development of Continental Divide, referred herein as the “Project”.

The Project is a residential mixed-use site at 8505 132nd Ave NE. The proposal redevelops eight existing land parcels and includes 134 multifamily units and 7,500 SF of commercial office space. Site accesses are proposed off 132nd Ave NE and 131st Ave NE.

The Project generates:

- 55 AM peak hour total (gross) driveway trips and 43 net new trips split 15 in and 28 out
- 68 PM peak hour total (gross) driveway trips and 58 net new trips split 32 in and 26 out

Confirmation of the Project “passing” Kirkland’s Traffic Concurrency requirements was provided by City of Kirkland staff on June 22, 2018.

With the Project, local intersections satisfy the City of Kirkland’s level of service (LOS) impact criteria; and thus, SEPA mitigation is not warranted.

The Project is proposed with 200 onsite parking spaces which satisfies City of Kirkland’s parking requirements.

The Applicant will be responsible for providing frontage improvements consistent with City of Kirkland’s design standards and paying Kirkland’s traffic impact fee.

2. Introduction

This Traffic Impact Analysis summarizes the traffic impacts associated with Continental Divide, the “Project”. The Project is proposed as a residential mixed-use development located at 8505 132nd Ave NE. This study is formatted to generally follow the City’s Traffic Impact Analysis Guidelines.

2.1. Project Location

The Project is located north of NE 85th Street, west of 132nd Ave NE and east of 131st Ave NE.

The Project will redevelop eight existing land parcels:

- 124190-0025 – single family home
- 863550-0025 – single family home
- 863550-0030 – single family home
- 863550-0035 – single family home
- 863570-0015 – 2,100 sq. ft. office
- 863570-0020 – single family home
- 863570-0025 – single family home
- 863570-0030 – single family home

The site is in the Rose Hill Business District and is zoned RH 8.

A vicinity map is included as Figure 1.

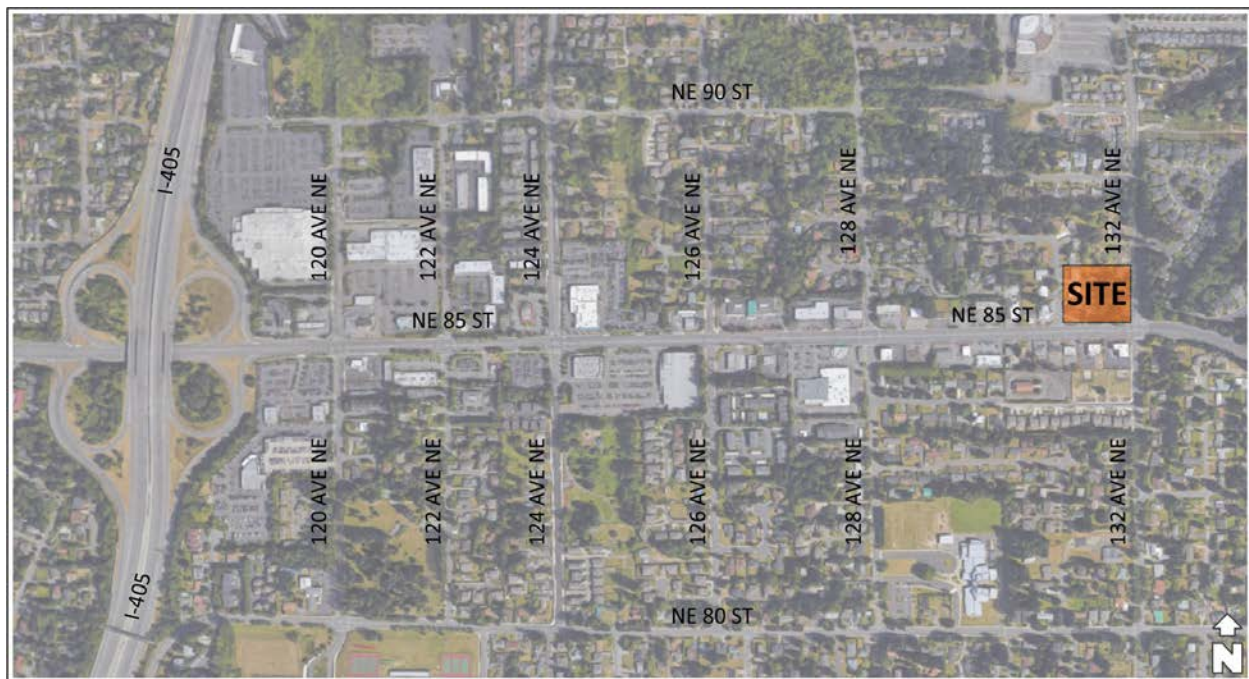


Figure 1: Vicinity Map

2.2. Project Description

The Project includes 134 multifamily units, 7,00 SF of commercial office space and 200 onsite parking spaces.

The RH 8 zoning requirements state that the Public Works Official may require access from side streets; and/or encourage shared driveways; and circulation and parking areas; restrict access to right turn in and out; or prohibit access to NE 85th Street. The Project proposes three site accesses, located on 131st Ave NE and 132nd Ave NE and no direct access to NE 85th Street.

Primary access, the “East Driveway”, is off 132nd Ave NE. The driveway provides access to and from the site’s parking garage and will be restricted to right-in and right-out only due to existing sloped mountable curb on 132nd Ave NE. The driveway is located at the northeast corner of the proposed building.

Two site accesses are proposed off 131st Ave NE. The West Driveway is a secondary inbound-only access to the parking garage. The driveway is at the northwest corner of the site.

The Shared Driveway, also on 131st Ave NE, is at the southeast corner of the site and provides access to commercial (customer) and residential guest parking. There are 25 shared customer and guest parking spaces proposed in the shared parking area. The shared use parking area is not connected to the parking garage.

A conceptual site plan is included as Figure 2.

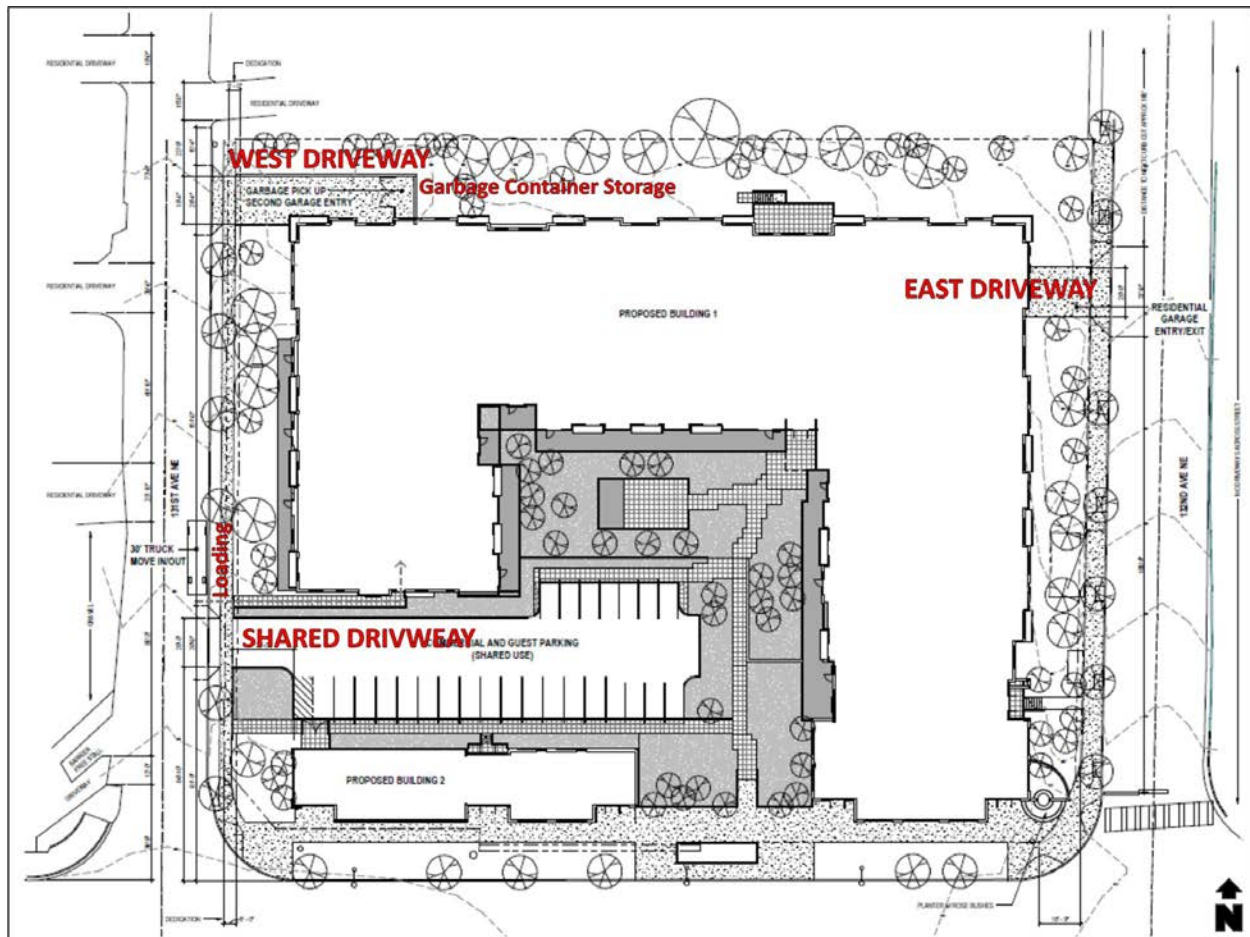


Figure 2: Site Plan

Figure 2B shows the parking garage layout.

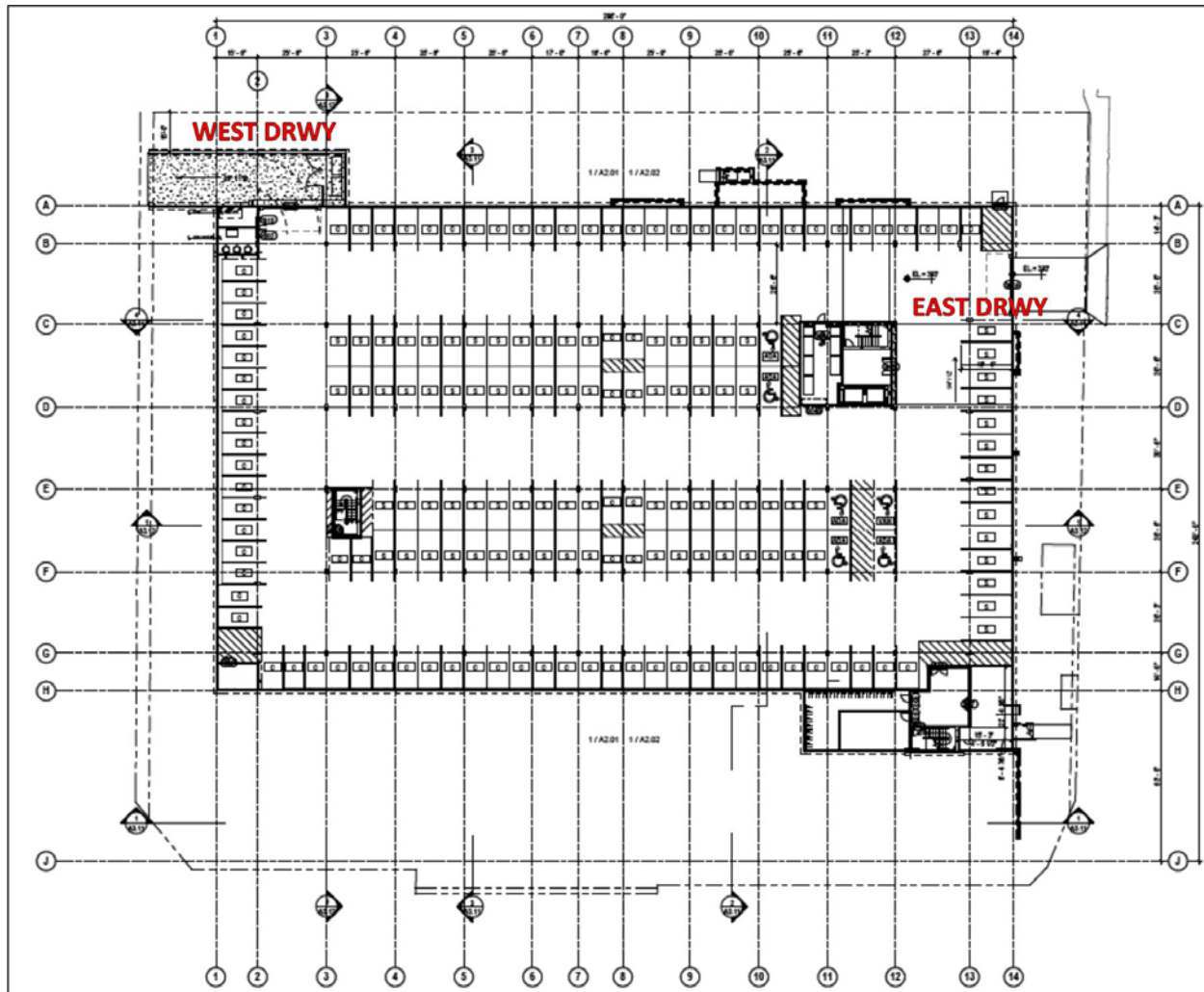


Figure 3: Parking Garage

The Project is anticipated to be complete and occupied by 2020.

3. Trip Generation, Distribution and Assignment

This section documents the trip generation, distribution and peak hour assignment forecasts.

3.1. Trip Generation

The trip generation forecast is based on the data and methodology from the ITE Trip Generation Manual (10th Edition). Table 1 summarizes the trips generated by the proposed Project.

Table 1: Trip Generation Forecast

| Land Use (ITE Code) | Size | Trip Rate ¹ | Trips In | Trips Out | Trips Total |
|---------------------------------|-----------|-------------------------------|------------|------------|-------------|
| Mid-Rise Multifamily (LU 221) | 134 units | $T = 5.45 (X) - 1.75$ | 365 | 365 | 729 |
| General Office (LU 710) | 7,500 SF | 0.00974 | 37 | 37 | 73 |
| <i>Gross Driveway Trips</i> | | | 401 | 401 | 802 |
| Existing Single-Family (LU 210) | 7 units | $\ln(T) = 0.92 \ln(X) + 2.71$ | (45) | (45) | (90) |
| Existing Office (LU 710) | 2,000 SF | 0.00974 | (10) | (10) | (20) |
| <i>Existing Trips</i> | | | (55) | (55) | (110) |
| Net New Daily Trips | | | 346 | 346 | 692 |
| Mid-Rise Multifamily (LU 221) | 134 units | $\ln(T) = 0.98 \ln(X) - 0.98$ | 12 | 34 | 46 |
| General Office (LU 710) | 7,500 SF | 0.00116 | 8 | 1 | 9 |
| <i>Gross Driveway Trips</i> | | | 20 | 35 | 55 |
| Existing Single-Family (LU 210) | 7 units | $T = 0.71 (X) + 4.8$ | (3) | (7) | (10) |
| Existing Office (LU 710) | 2,000 SF | 0.00116 | (2) | (0) | (2) |
| <i>Existing Trips</i> | | | (5) | (7) | (12) |
| Net New AM Trips | | | 15 | 28 | 43 |
| Mid-Rise Multifamily (LU 221) | 134 units | $\ln(T) = 0.96 \ln(X) - 0.63$ | 36 | 23 | 59 |
| General Office (LU 710) | 7,500 SF | 0.00115 | 1 | 8 | 9 |
| <i>Gross Driveway Trips</i> | | | 37 | 31 | 68 |
| Existing Single-Family (LU 210) | 7 units | $\ln(T) = 0.96 \ln(X) + 0.20$ | (5) | (3) | (8) |
| Existing Office (LU 710) | 2,000 SF | 0.00115 | (0) | (2) | (2) |
| <i>Existing Trips</i> | | | (5) | (5) | (10) |
| Net New PM Trips | | | 32 | 26 | 58 |

¹ Average trip rate used, unless otherwise indicated. For fitted curve equations "T" = trips and "X" = size

The trip generation methodology is consistent with the May 31, 2018 Continental Divide Trip Generation memorandum included with the May 31, 2018 Concurrency Management Review Application.

The trip generation analysis is inclusive office employees and customers and resident tenants and guests.

3.2. Office Employee and Customer and Resident and Guest Trips

Data from the ITE Trip Generation Manual does not separate trips specific to office employees and customers and resident tenants and guests.

The Urban Land Institute (ULI) includes recommendations for the peak parking demand rates for office employee and visitors and for residents and guests. These demand ratios were applied to the trip generation forecasts to estimate the splits between office employee and visitors and for residents and guests, more details of these demand ratios are provided in Section 7.2.

Table 2 summarizes the trip generation forecast for office employee and visitors and for residents and guests.

Table 2: Trip Generation Forecast Employee-Visitor and Resident-Guest

| Land Use | Ratio | | Trips | | Total Trips |
|-----------------------------|-------------------|----------------|-------------------|----------------|-------------|
| | Resident/Employee | Guest/Customer | Resident/Employee | Guest/Customer | |
| Mid-Rise Multifamily | 91% | 9% | 663 | 66 | 729 |
| General Office | 92% | 8% | 67 | 6 | 73 |
| <i>Gross Driveway Trips</i> | | | 730 | 72 | 802 |
| Existing Single-Family | 91% | 9% | (82) | (8) | (90) |
| Existing Office | 92% | 8% | (18) | (2) | (20) |
| <i>Existing Trips</i> | | | (100) | (10) | (110) |
| Net New Daily Trips | | | 630 | 62 | 692 |
| Mid-Rise Multifamily | 91% | 9% | 42 | 4 | 46 |
| General Office | 92% | 8% | 8 | 1 | 9 |
| <i>Gross Driveway Trips</i> | | | 50 | 5 | 55 |
| Existing Single-Family | 91% | 9% | (9) | (1) | (10) |
| Existing Office | 92% | 8% | (2) | (0) | (2) |
| <i>Existing Trips</i> | | | (11) | (1) | (12) |
| Net New AM Trips | | | 39 | 4 | 43 |
| Mid-Rise Multifamily | 91% | 9% | 54 | 5 | 59 |
| General Office | 92% | 8% | 8 | 1 | 9 |
| <i>Gross Driveway Trips</i> | | | 62 | 6 | 68 |
| Existing Single-Family | 91% | 9% | (7) | (1) | (8) |
| Existing Office | 92% | 8% | (2) | (0) | (2) |
| <i>Existing Trips</i> | | | (9) | (1) | (10) |
| Net New PM Trips | | | 53 | 5 | 58 |

¹ Average trip rate used, unless otherwise indicated. For fitted curve equations “T” = trips and “X” = size

3.3. Trip Distribution and Peak Hour Travel Assignment

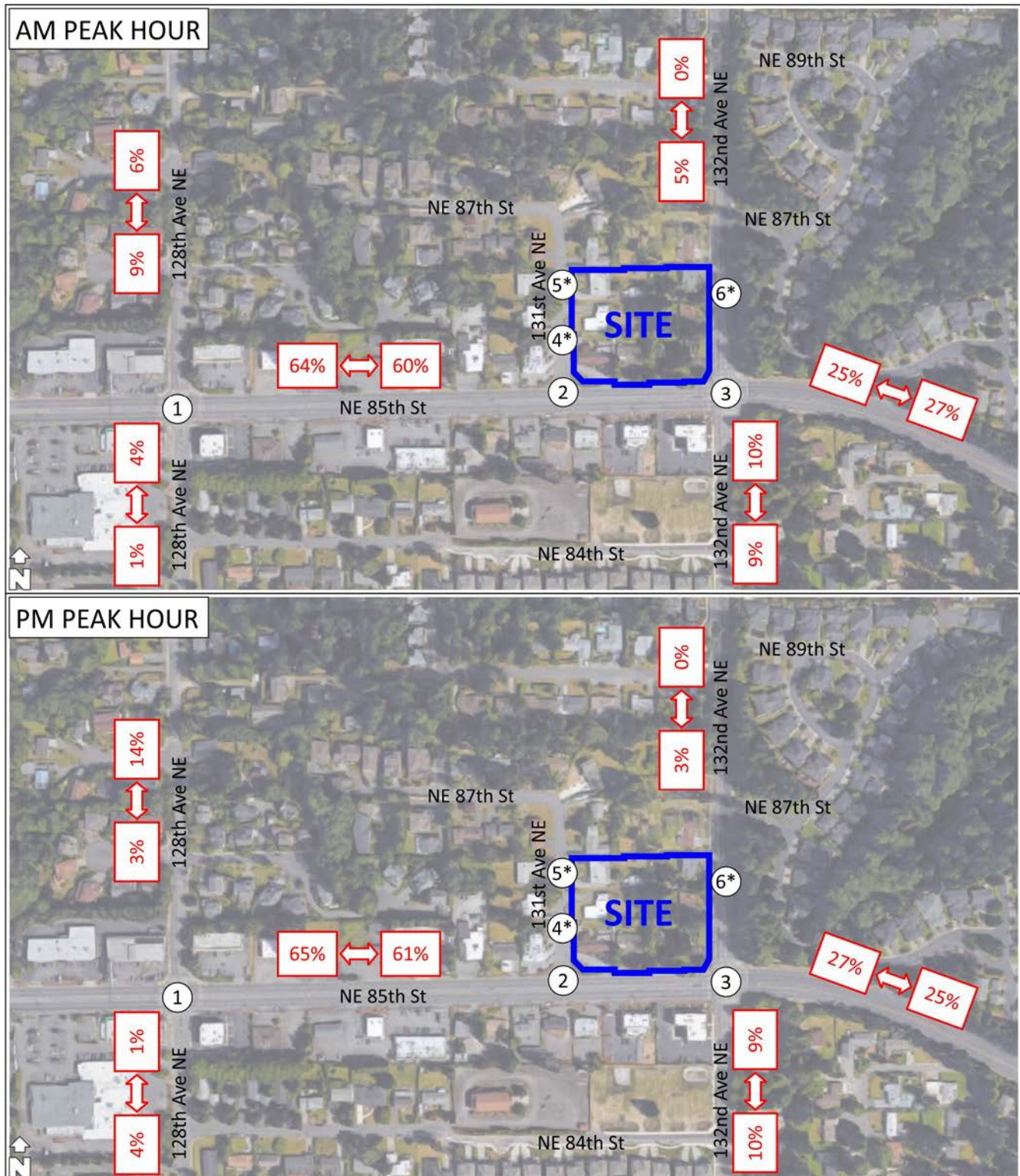
The trip distribution was provided by the City of Kirkland through the Project’s original Transportation Concurrency review, dated May 22, 2017.

Transportation Concurrency was updated per the new site plan and the City of Kirkland informed the Applicant that the updated proposal “passed” concurrency. The City of Kirkland’s concurrency memorandum is included in the Applicant and is dated June 22, 2018.

For this analysis, it is assumed that all the office employees and residents will be able to use the parking garage accessible via 131st Ave NE and 132nd Ave NE. Egress from the parking garage is limited to 132nd Ave NE only, due to the site’s current configuration. All visitors and guests are assigned to the Shared Driveway. This split allows the shared parking area, at the Shared Driveway to be better used by the site and so that this area can be used by delivery, garbage and move-in/move-out vehicles off 131st Ave NE.

More discussion on shared parking is included in Section 7.2.

The AM peak hour and PM peak hour trip distributions and assignments forecast for the Project are illustrated in Figures 4 and 5.



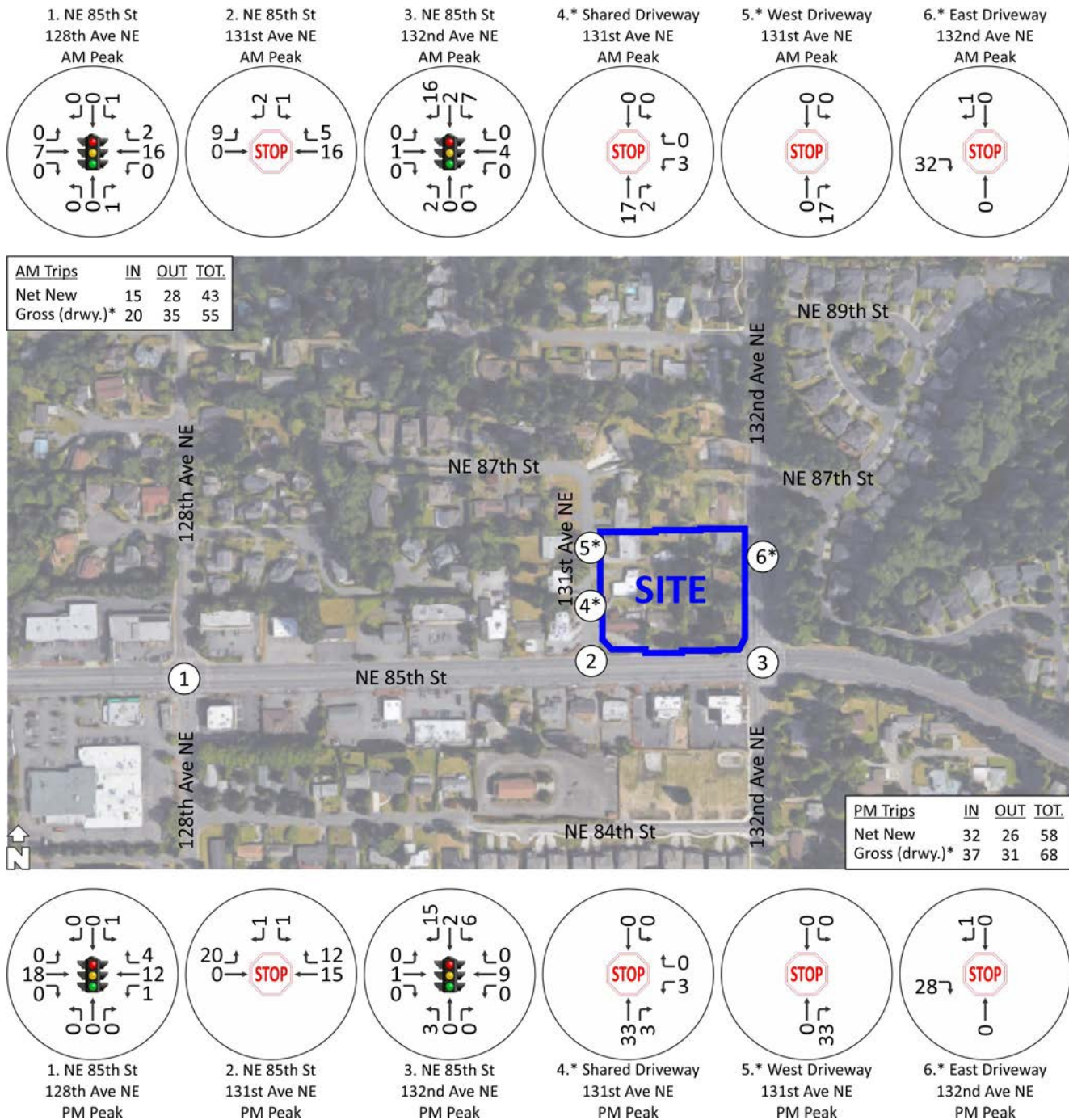


Figure 5: AM and PM Peak Hour Trip Assignment

3.4. Intersection Proportionate Shared Calculations

The study area for this analysis is defined based on Intersection Proportionate Share Calculations, output is included in the Appendix. The proportionate share is used to relate the Project's daily trips to the capacity at major intersections. The City of Kirkland defines an impacted intersection, if its proportionate share ratio is greater than 1%. Intersection's with a ratio greater than 1% are included in the study area for further analysis.

Figure 6 summarizes the proportionate share calculations at local intersection around the site.

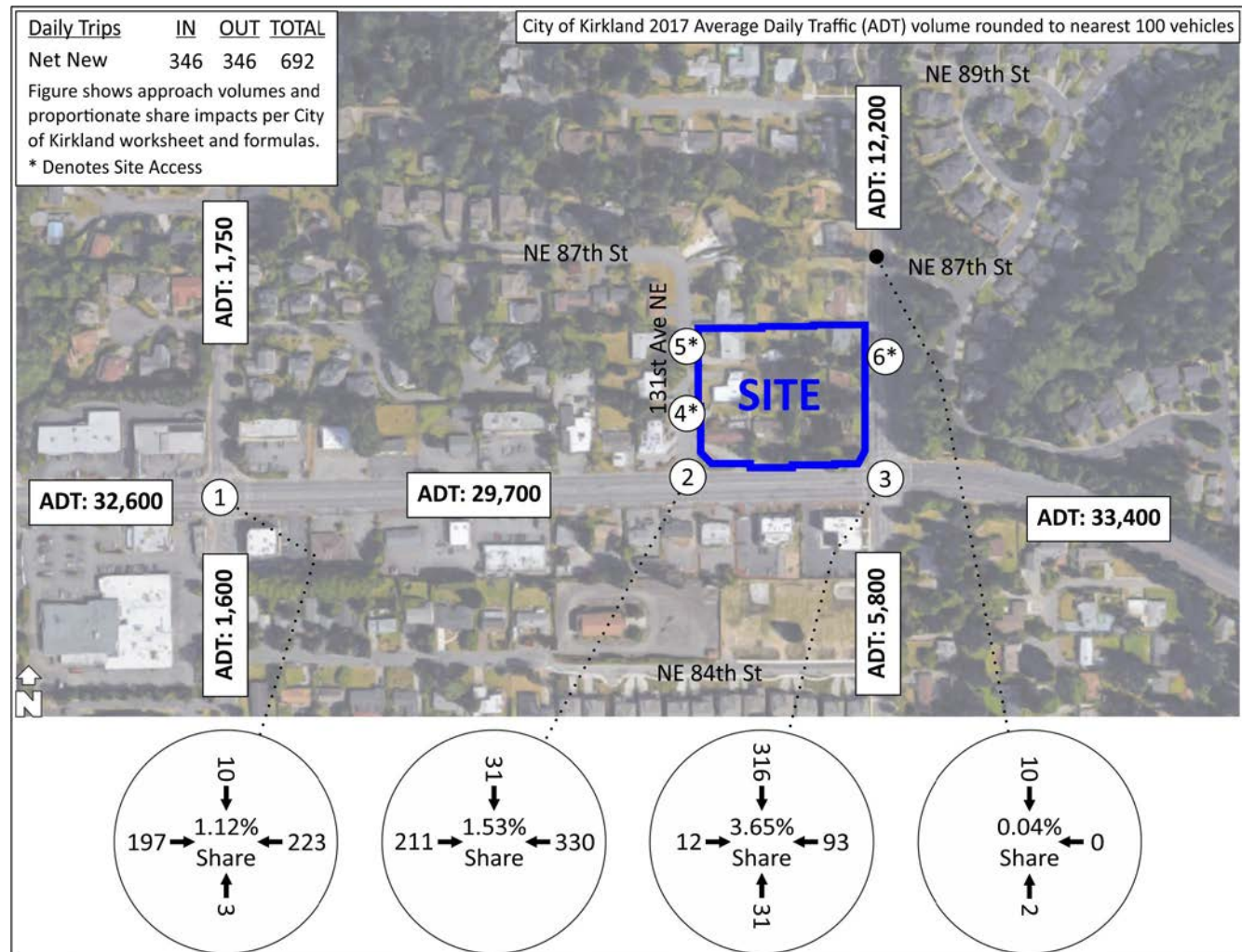


Figure 6: Average Daily Traffic Volumes and Intersection Proportionate Share

The study area intersections include: (1) NE 85th Street and 128th Ave NE; (2) NE 85th Street and 131st Ave NE; and (3) NE 85th Street and 132nd Ave NE.

Project accesses are identified as: (4) Shared Driveway and 131st Ave NE; (5) West Driveway and 131st Ave NE; and (6) East Driveway and 132nd Ave NE.

4. Existing Conditions

4.1. Major Roadways

Major roadways in the study area are described below:

- NE 85th Street is classified as a Principal Arterial. East of 132nd Ave NE, the roadway changes to Redmond Way and is in the City of Redmond's jurisdiction. NE 85th Street has a 5-lane cross-section with two general purpose lane each eastbound and westbound and a center left turn lane. NE 85th Street includes curb, gutter and sidewalk on both sides of the street. The posted speed is 35 mph.
- 132nd Ave NE is classified as a Minor Arterial. 132nd Ave NE has a two-lane cross-section with one lane each northbound and southbound. Fronting the project site, 85th Street widens to include a left turn pocket at its signalized intersection with. Near the site, NE 85th Street includes curb, gutter and sidewalk on both sides of the street. The posted speed is 35 mph.
- 131st Ave NE is a local two-lane street, oriented north-south. The roadway has no lane or shoulder markings. At NE 85th Street, 131st Ave NE is stop-sign controlled with no turn restrictions. The speed limit is 25-mph.

4.2. Transit and Non-Motorized Facilities

King County Metro Transit routes 238 and 248 provide service on NE 85th Street and 132nd Ave NE. The routes provide weekday and weekend service to and from Bothell (MT 238) and to and from Redmond (MT 248).

Roadways fronting the site include curb, gutter and sidewalk.

4.3. Safety

A crash history was obtained from WSDOT for the period between 2012 and 2016 for the study area. Table 3 summarizes the crash history by year and by total number of injuries reported.

Table 3: Crash History by Year 2012-2016

| Location Source: WSDOT | Reported Crashes | | | | | Crash Rate ^{1,3} | Injury Rate ^{2,3} |
|--------------------------------|------------------|------|------|------|------|------------------------------|-------------------------------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | | |
| Intersection | | | | | | MEV | MEV |
| NE 85th at 128th Ave | 7 | 4 | 3 | 6 | 2 | 0.37 | 0.15 |
| NE 85th at 131st Ave | 0 | 1 | 1 | 1 | 1 | 0.07 | 0.06 |
| NE 85th at 132nd Ave | 7 | 5 | 8 | 6 | 9 | 0.57 | 0.20 |
| NE 87th at 132nd Ave | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| Segment | | | | | | MVM | MVM |
| NE 85th (128th to 131st Ave) | 6 | 4 | 4 | 7 | 5 | 2.65 | 0.71 |
| NE 85th (131st to 132nd Ave) | 4 | 0 | 4 | 3 | 1 | 2.78 | 1.16 |
| NE 85th east of 132nd Ave | 1 | 0 | 1 | 1 | 1 | 0.69 | 0.00 |
| 131st Ave north of NE 85th | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| 132nd Ave south of NE 85th | 0 | 0 | 0 | 1 | 1 | 2.00 | 0.00 |
| 132nd Ave (NE 85th to 87th St) | 0 | 0 | 0 | 0 | 1 | 0.55 | 0.55 |
| 132nd Ave north of NE 87th | 1 | 1 | 1 | 0 | 0 | 1.42 | 0.47 |

¹ Crashes per millions entering vehicles (MEV) at intersection or per million vehicle miles traveled (MVM)

² Injuries per MEV at intersection or per MVM; injuries represent the total number of injuries reported

³ Volumes are based on year 2017 ADT volumes, from the City of Kirkland

Table 4 summarizes the crash history by total crash type.

Table 4: Crash History by Type 2012-2016

| Location Source: WSDOT | Rear End | At Angle | Left Turn | Right Turn | Side- swipe | Ped. | Other/ Object |
|--------------------------------|-------------|-------------|--------------|---------------|----------------|------|------------------|
| Intersection | | | | | | | |
| NE 85th at 128th Ave | 11 | 5 | 0 | 1 | 3 | 0 | 2 |
| NE 85th at 131st Ave | 2 | 0 | 1 | 0 | 0 | 1 | 0 |
| NE 85th at 132nd Ave | 19 | 6 | 5 | 1 | 2 | 0 | 2 |
| NE 87th at 132nd Ave | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Segment | | | | | | | |
| NE 85th (128th to 131st Ave) | 10 | 5 | 3 | 1 | 6 | 0 | 1 |
| NE 85th (131st to 132nd Ave) | 6 | 4 | 0 | 0 | 1 | 0 | 1 |
| NE 85th east of 132nd Ave | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 131st Ave north of NE 85th | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 132nd Ave south of NE 85th | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 132nd Ave (NE 85th to 87th St) | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 132nd Ave north of NE 87th | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

There were 109 total crashes reported. 38 crashes included at least one reported injury. The injury reports were split between 31 possible, 6 evident, and 1 serious injury. There were no fatalities reported during the 5-year period.

Overall, the number of crashes per year has decreased: 2012 had 26 crashes, 2013 had 15 crashes, 2014 had 22 crashes, 2015 had 25 crashes, and 2016 had 21 crashes reported.

Rear end crashes made up 49% of the crashes reported followed by at angle (20%), sideswipe (12%), left turn (8%), and right turn (3%). The remaining 8% of the crashes were split between 1 pedestrian incident, 3 incidents with stationary objects, and 5 incidents classified as other. Rear ends are common at signalized intersections, at angle and turn related crashes are common at unsignalized approaches to and from a side-street and when there are concurrent or improper turns at signalized intersections, and sideswipes are common on multilane roadways and at locations where there are lane changes.

Between 2008 and 2012 the City of Kirkland averaged 4.5 crashes per year at signalized intersections. The average number of crashes at NE 85th Street and 132nd Ave NE was 7.0 which is higher than the city average. The average number of crashes at NE 85th Street and 128th Ave NE was 4.4 which is just under the city average.

While number of crashes per year measures the overall crash frequency, it does not account for the volume of vehicle traffic through an intersection. Crash rates, crashes per million entering vehicles or per million vehicles miles traveled, are typically used to evaluate high crash locations. Crash rates of 1.0 or greater at intersection and of 10.0 or greater on road segments are typically used to identify high crash locations.

At NE 85th Street and 132nd Ave NE the crash rate was 0.57 crashes per million entering vehicles and the injury rate was 0.20 injuries per million entering vehicles. Both ratios are less than 1.0, so while the crash frequency is greater than the city average, the number of crashes compared to the vehicle volume passing through the intersection does not warrant the intersection's designation as a high crash location.

At NE 85th Street and 132nd Ave NE, the number of rear end crashes decreased from 2012 (6) to 2016 (3). During the same period the numbers of turn related (at angle and left and right turn) crashes at the intersection increased. In 2015, the City of Kirkland completed improvements to the NE 85th Street corridor including improving signal operations at 132nd Ave NE. The improvement likely contributed to the reduction in rear end crashes at this intersection. Coincidentally, with the improvement, turn-related crashes may have increased due to changes in signal phasing including more concurrent and permissive turning movements at the intersection. Possibly inexpensive improvements include changing “permissive” phases to “protected-only” or disallowing right turns on “red”. It is cautioned that said safety improvements would reduce the capacity of the intersection.

At NE 85th Street and at 131st Ave NE, in 2013 there was one pedestrian-related crash involving a vehicle making a right turn out of 131st Ave NE and in 2016 there was one crash involving a large truck making an improper left turn NE 85th Street into 131st Ave NE.

Also, on NE 85th Street at 131st Ave NE there were one crash each in 2014 and 2015 involving rear ends in the eastbound lanes on NE 85th Street, and both incidents were noted as involving inattentive driving.

Overall, the number of crashes in the eastbound direction on NE 85th Street from just west of 131st Ave NE to 132nd Ave NE was 5 per year in 2015 and 2016 compared to 9 crashes in 2012. Rear end crashes make up the highest number percentage (64%) of crashes in the eastbound direction. The number of eastbound rear end crashes was highest in 2012, with 6, and in 2016 there were 3 rear end crashes.

There were 8 collisions reported on 132nd Ave NE between NE 88th Street and NE 85th Street and including the NE 85th Street intersection. Six of those collisions involved vehicles traveling in the southbound direction: 3 rear end crashes (2013, 2015 and 2016), one right turn crash (2014), one at angle (2016) and one “other” (2016). In 2016, the at angle and “other” crashes involved improper backing maneuvers.

5. Traffic Volumes

5.1. *Existing Volumes*

The weekday AM (7-9 AM) and PM (4-6 PM) peak hours represent the times when traffic on adjacent public roadways are highest and these periods are typically used to evaluate traffic impacts. For this study, the proposed residential and office uses are forecast to generate more traffic on weekdays than on weekends.

AM and PM peak hour weekday traffic volumes were collected at the study intersections on Wednesday, May 18, 2017. The peak hour intersection turning movement volumes are illustrated in Figure 7. The turning movement volumes are rounded to the nearest multiple of 5 to account for day-to-day fluctuations in traffic. The peak hour counts are included in the Appendix.

5.2. *2020 Without-Project Volumes*

The Project is forecast to be complete by 2020. Future 2020 without-Project, or background, traffic conditions represent the future baseline conditions used to evaluate the incremental increases in traffic due to the Project. The future background conditions incorporate planned roadway improvements, pipeline project trips and regional traffic growth into the traffic forecast.

The City of Kirkland's 2017-2022 Capital Improvement Program (CIP) identifies the following transportation improvements within the study area:

- 132nd Ave NE Crosswalk Upgrade. Crosswalk improvements at various locations. Start 2018. Funded at \$250,000.
- Citywide Greenways Network Project. 128th Ave NE from NE 75th Street to NE 116th Street. Construct greenway network: markings, signage, crossing treatments, traffic calming, etc. Duration 2018-2019. Funded at \$800,000.
- 132nd Ave NE Roadway Improvements. From NE 85th Street to NE 120th Street. Widen roadway for bike lanes and turn lanes. Start: Undetermined. Cost: \$25,170,000.

The 2015 update of the North Rose Hill Neighborhood Plan also anticipates other future street and non-motorized connections that will improve local circulation and connectivity as infill occurs in the neighborhood.

City of Kirkland annual traffic volumes show that daily traffic has decreased on NE 85th Street and on 132nd Ave NE since 2013. To be conservative, a 2% annual growth rate between 2017 and 2020 was assumed. The growth rate includes all non-Project traffic volume growth in the local area.

Figure 8 illustrates the future without-Project peak hour traffic volumes.

5.3. *2020 With-Project Volumes*

Future 2020 with-Project traffic volumes represent conditions with the Project complete and occupied. Peak hour Project-generated trips were superimposed onto the future 2020 without-Project traffic volumes to project future traffic conditions with the Project occupied.

Figure 9 illustrates the year 2020 with-Project peak hour traffic volumes.

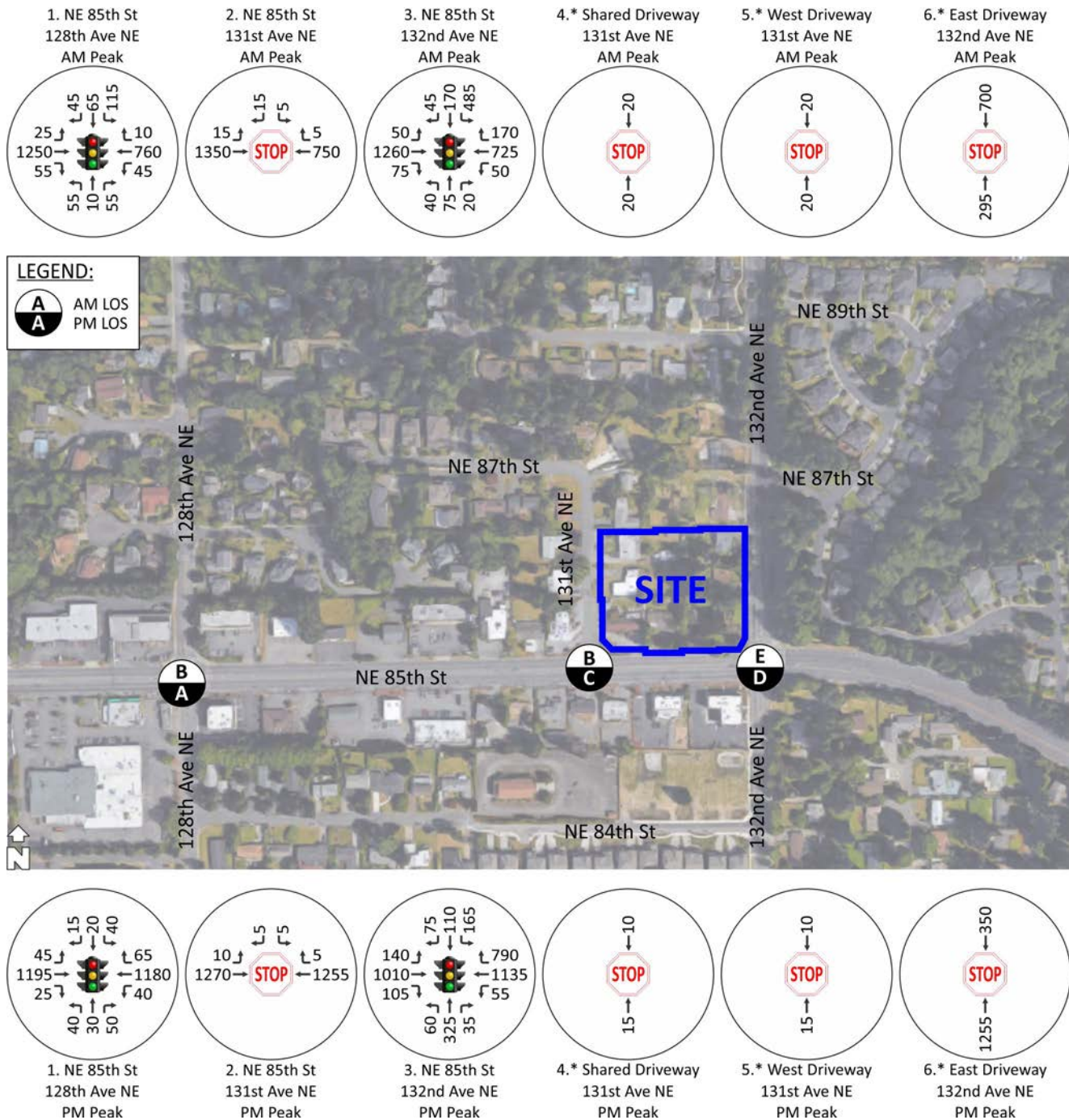


Figure 7: 2017 Existing AM and PM Peak Hour Volumes

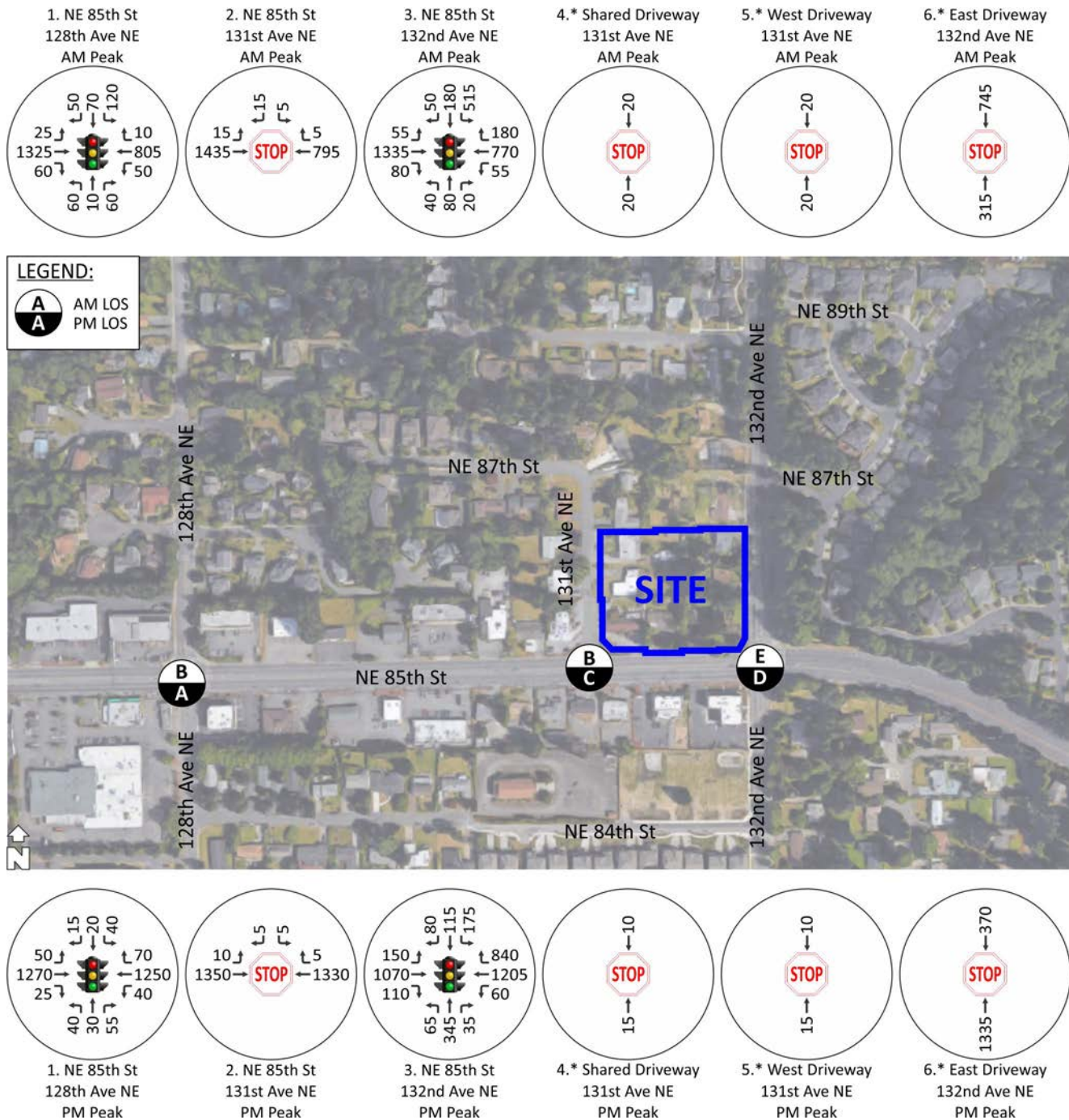


Figure 8: 2020 Without-Project (Background) Peak Hour Volumes

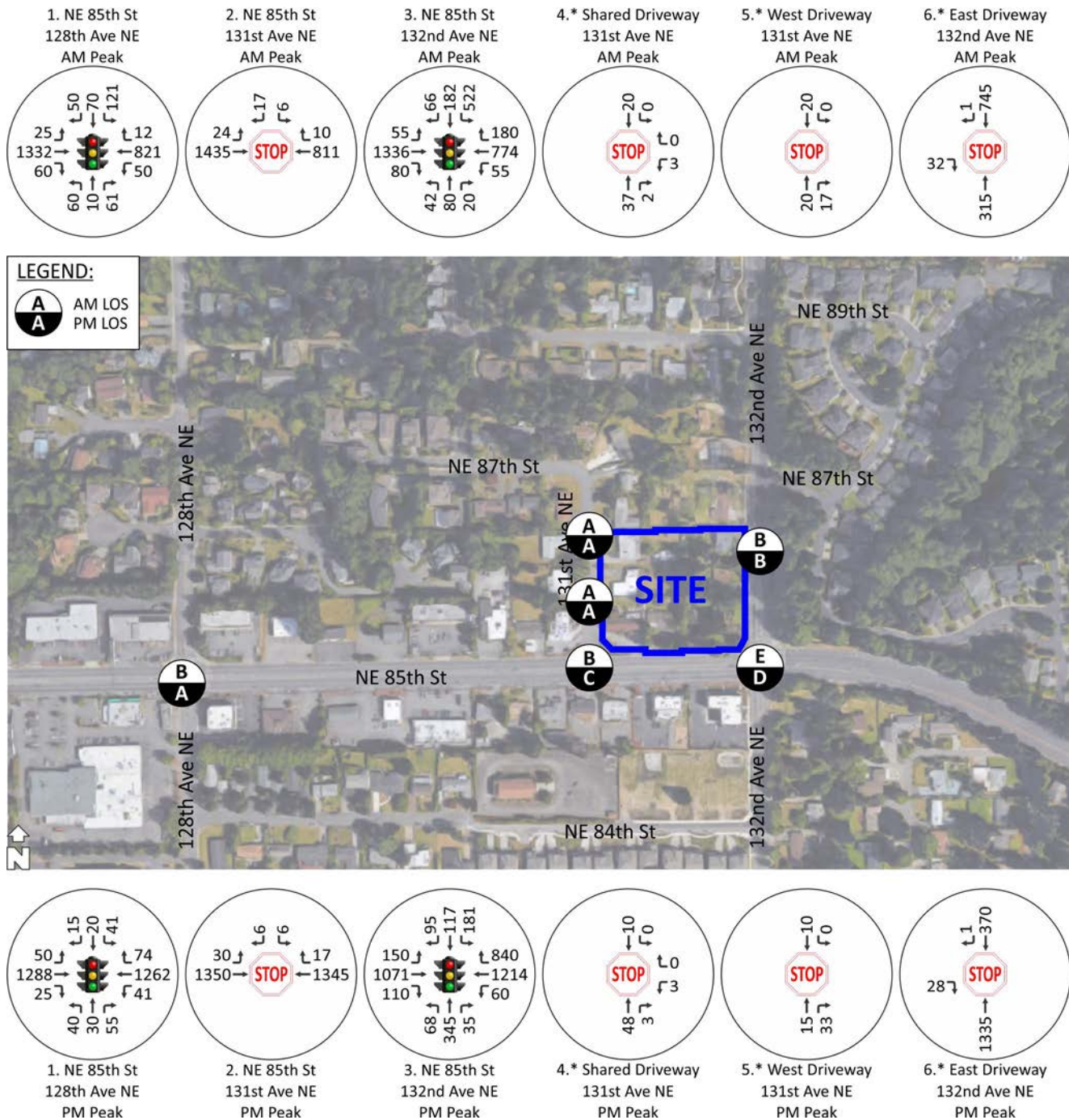


Figure 9: 2020 With-Project Peak Hour Volumes

6. Traffic Analysis

Highway Capacity Manual 2010 methodology was used to compute the traffic operations, specifically the level of service (LOS) and delay, of the study intersections. For this analysis, the Synchro computer program was used to evaluate intersection operations. This study incorporates City of Kirkland signal timing information.

Table 5 summarizes the City of Kirkland's SEPA requirements for mitigation at major intersections.

Table 5: With-Project Intersection Level of Service Impact Criteria

| Peak Hour | Impact Threshold ¹ |
|-----------|--|
| LOS A-D | No mitigation needed |
| LOS E | Mitigation needed if proportional share exceeds 15% of the intersection capacity |
| LOS F | Mitigation needed if proportional share exceeds 5% of the intersection capacity |

¹ Source: City of Kirkland Traffic Impact Analysis Guidelines; (Revised August 2012)

Table 6 summarizes the AM and PM Peak hour intersection operations for existing and future without-Project and with-Project conditions. Intersection capacity reports are included in the Appendix.

Table 6: AM and PM Peak Hour Intersection Level of Service and Delay

| Intersection | Avg. ¹ / Mvmt. ² | Existing | | 2020 Background | | 2020 With-Project | |
|-------------------------|---|----------|--------------------|-----------------|--------------------|-------------------|--------------------|
| | | LOS | Delay ³ | LOS | Delay ³ | LOS | Delay ³ |
| AM Peak Hour | | | | | | | |
| NE 85th / 128th Ave | Avg. | B | 15.0 | B | 15.3 | B | 15.3 |
| NE 85th / 131st Ave | SB Stop | B | 13.8 | B | 14.3 | B | 14.7 |
| | EB Left | A | 9.3 | A | 9.5 | A | 9.7 |
| NE 85th / 132nd Ave | Avg. | E | 66.4 | E | 71.6 | E | 73.2 |
| East Drwy / 132nd Ave | EB Stop | - | - | - | - | B | 14.9 |
| Shared Drwy / 131st Ave | WB Stop | - | - | - | - | A | 8.8 |
| West Drwy / 131st Ave | WB Stop | - | - | - | - | A | - |
| PM Peak Hour | | | | | | | |
| NE 85th / 128th Ave | Avg. | A | 9.1 | A | 9.5 | A | 9.5 |
| NE 85th / 131st Ave | SB Stop | C | 22.8 | C | 24.5 | C | 25.9 |
| | EB Left | B | 12.2 | B | 12.8 | B | 13.4 |
| NE 85th / 132nd Ave | Avg. | D | 40.1 | D | 45.2 | D | 46.0 |
| East Drwy / 132nd Ave | EB Stop | - | - | - | - | B | 10.8 |
| Shared Drwy / 131st Ave | WB Stop | - | - | - | - | A | 8.8 |
| West Drwy / 131st Ave | WB Stop | - | - | - | - | A | - |

¹ Average intersection LOS and delay, for the signalized intersection

² Movement LOS and delay, for unsignalized intersections and site access

³ Delay expressed in seconds of vehicle delay

All study intersections satisfy the City of Kirkland LOS and SEPA impact criteria with the Project.

Vehicle queue lengths were computed using SimTraffic. Average and 95th-percentile queue outputs are summarized in Table 7. The average queue represents the queue anticipated during most of the peak hour. The 95th-percentile queue is a statistical calculation based on 95th-percentile traffic volumes which represent 3 total minutes of the peak one-hour analysis period. 95th-percentile queues are typically used in design. The discussion that following compares in-field queue observations with the calculated queues.

Table 7: Future with-Project Calculated Vehicle Queues

| Intersection | Mvmt. | Avail. Storage ¹ | AM Peak Hour | | PM Peak Hour | |
|-------------------------|-------------|--------------------------------|-------------------|-------------------|-------------------|-------------------|
| | | | 50-Q ² | 95-Q ³ | 50-Q ² | 95-Q ³ |
| NE 85th / 128th Ave | WB App. | 870 | 50 | 104 | 71 | 121 |
| NE 85th / 131st Ave | SB App. | - | 25 | 64 | 17 | 46 |
| | EB Left | TWLTL | 11 | 43 | 20 | 51 |
| NE 85th / 132nd Ave | EB Left | 190 | 86 | 250 | 146 | 286 |
| | EB Th/Th-Rt | - | 313 | 450 | 286 | 383 |
| | SB Left | 120 | 213 | 230 | 203 | 238 |
| | SB Th-Rt | 350 | 255 | 282 | 241 | 304 |
| East Drwy / 132nd Ave | EB App. | - | 118 | 135 | 85 | 156 |
| Shared Drwy / 131st Ave | WB App. | - | 5 | 23 | 3 | 18 |
| West Drwy / 131st Ave | WB App. | - | - | - | - | - |

¹ Available storage length / TWLTL = Two-Way Left-Turn Lane intersection

² Average queue

³ 95th-percentile queue

6.1.1. NE 85th Street and 128th Ave NE

The signalized intersection is forecast to operate at LOS B in the AM peak hour and LOS A in the PM peak hour with the Project. The addition of the Project trips is not anticipated to significantly increase delay and no mitigation is warranted.

The link distance between 128th Ave NE and 131st Ave NE is 870 feet. With the Project, the 95th-percentile westbound queue on NE 85th Street was calculated at 104 feet in the AM peak hour (about 5 car lengths) and 121 feet in the PM peak hour (about 6 car lengths).

Spot observations were made of existing queues in the westbound lanes approaching 128th Ave NE in 2018. AM queues were observed on August 14 (7:30 to 7:45 AM), August 15 (7:10 to 7:20 AM), and August 17 (7:15 to 7:30 AM). PM queues were observed on August 9 (5:30 to 6:00 PM) and August 16 (5:45 to 6:10 PM).

For most of the morning observation times the queue extended to 5 vehicles (about 120 feet) in the westbound lanes. During one signal cycle the queue extended to about 20 car lengths back from the intersection. The westbound queues appeared to clear during the movements' "green time".

During the PM peak hour, the maximum queue was typically 20 vehicles (about 400 feet). The westbound queue appeared to clear during the movements' "green time". On August 16 at around 5:50 PM, the westbound queue was observed to extend to about 40 vehicles (about 800 feet). The observer did not note if the queue fully cleared during the "green time"; however, the queue time appeared to only last a few seconds. The queue also did not prevent vehicles from entering NE 85th Street; and nearer 128th Ave NE, right turners from driveways can enter the NE 85th Street since drivers typically yielded for right turns from the driveways.

Typically, vehicles start by queuing in the outside-curb lane and spread to the inside lane when the westbound approach is "red". Queuing in the outside lane is significantly less in this section of NE 85th Street compared to the conditions nearer 124th Ave NE and the I-405 interchange.

Overall, the existing observed queues, were longer than the those from the simulation model. Travel to and from 131st Ave NE was not blocked by congestion. And in the future if the queue were to extend to 131st Ave

NE, then the intersection delay would be longer. The field review suggests that the extended right turn delay would not prevent right turn movement to and from 131st Ave NE.

6.1.2. NE 85th Street and 131st Ave NE

The southbound approach is stop-sign controlled at is forecast to operate at LOS B in the AM peak hour and LOS D in the PM peak hour with the Project. While there will be additional congestion generated with the addition of the Project, the delay impacts are within the City of Kirkland's acceptable thresholds.

Project trips generated to and from 131st Ave NE are summarized below:

- 9 lefts in, 5 rights in, 1 left out and 2 rights out in the AM peak hour
- 20 lefts in, 12 rights in, 1 left out and 1 right out in the PM peak hour

With the Project, the 95th-percentile southbound queue was calculated at 64 feet in the AM peak hour (about 3 car lengths) and 46 feet in the PM peak hour (about 2 car lengths).

With the Project, the 95th-percentile eastbound left turn queue was calculated at 43 feet in the AM peak hour and 51 feet in the PM peak hour (both are about 2.5 car lengths).

Spot observations were made in 2018 at the intersection to identify the impacts of queues and access to and from 131st Ave NE. AM peak hour observations were made on August 14 (7:30-7:45 PM), August 15 (7:10-7:20), and August 17 (7:15 and 7:30 AM). PM peak hour observations were made on August 9 (5:30-6:00 PM), August 15 (5:00-5:10 PM), and August 16 (5:45-6:10 PM).

The existing southbound queue on 131st Ave NE was not observed to extend past two vehicles (about 40 feet) waiting to enter NE 85th Street. Southbound lefts were required to wait longer rights and delays were longer in the PM peak hour than in the AM peak hour.

The existing eastbound left turn queue to 131st Ave NE was observed at one vehicle in the center lane waiting for a gap in westbound traffic. During the observations, the eastbound left to 131st Ave NE, was not blocked by vehicles making a left at the adjacent 132nd Ave NE intersection. The link distance between 131st Ave NE and 132nd Ave NE is about 320 feet.

During the AM peak hour 64% of the traffic on NE 85th Street is eastbound and during the PM peak hour the eastbound and westbound traffic are about 50% in each direction. The intersection's PM peak hour volume is about 20% higher than the AM peak hour volume. During both peak periods the traffic volume counts showed a high number of right turns compared to left turns at this intersection.

The volumes and progression of vehicles past the intersection impacts the ability for drivers to enter and exit 131st Ave NE. The signalized intersections at 128th Ave NE and 132nd Ave NE create stops on NE 85th Street that create gaps for vehicles to access 131st Ave NE.

Most Project traffic at this intersection is forecast to and from the west. Gaps in the westbound traffic flow for right turns are reasonable now and are anticipated to be acceptable in the future.

Positioned at 131st Ave NE, the observer was able to observe vehicles approaching from the adjacent signalized intersections at 128th Ave NE and 132nd Ave NE. During the field observations, it was noted that there was no stop bar stripe approaching the intersection or centerline stripe on 131st Ave NE.

The observer performed the left turn maneuvers into and out of 131st Ave NE in May 2017 and in August 2018. In the AM peak hour, left turns were made without using of the center lane to facilitate a two-stage movement. In the AM peak hour, traffic platoons approaching from the east and west allowed a reasonable amount of time for the driver to discern when to enter NE 85th Street.

In the PM peak hour, left turns from 131st Ave NE required a longer wait time than in the AM peak hour. The TSI staff vehicle on one occasion used the center lane to perform a two-stage movement to merge with eastbound traffic on NE 85th Street, and on this instance eastbound through traffic approaching 132nd Ave NE was stacked past 131st Ave NE. On other occasions the center lane was not required to complete the movement as the staff vehicle waited for the eastbound queue to clear and for a gap in the westbound traffic flow. Westbound gaps are available during the PM peak hour observations, eastbound queues tended to be in the outside-curb lane approaching 132nd Ave NE, which also allowed left turns from 131st Ave NE.

The crash records from 2012 to 2016 did not show a crash pattern related to 131st Ave NE. The records identified a right turn-out incident in 2013 and a left turn-in incident in 2016. No left turn-out incidents were reported. Additionally, during this period the number of eastbound crashes on NE 85th Street were less in 2015 and 2016 (5 crashes each) than in 2012 (9 crashes) and the number of rear end crashes also decreased from 2012 (6 crashes) to 2016 (3 crashes).

Vehicle delay at 131st Ave NE meets the City of Kirkland standards. The traffic flow on NE 85th Street currently allows traffic to flow to and from 131st Ave NE and in the future gaps in the traffic stream are forecast to be acceptable with the Project. And no crash patterns were identified related to 131st Ave NE. Even with queues periodically extending to 131st Ave NE, the intersection is not experiencing grid lock and the delays for vehicles exiting 131st Ave NE are reasonable.

6.1.3. NE 85th Street and 132nd Ave NE

The signalized intersection operates at LOS E in the AM peak hour and LOS D in the PM peak hour now and with the Project.

The Project's intersection proportionate share impact, based on daily traffic generated and the City of Kirkland's definition of intersection capacity, was calculated at 3.64% (see Figure 6). In the AM peak hour, there are 16 Project trips forecast at this intersection, which represents a 0.9% increase in the AM peak hour future volume without and with the Project. The Project impacts do not meet the threshold of the City of Kirkland's mitigation requirements.

With the Project, the AM peak hour the eastbound left turn movement operates at LOS B and the through lanes operate at LOS D. As stated in the previous section, most of the AM volume on NE 85th Street is in the eastbound direction.

In the AM peak hour, the southbound left turn movement is calculated to be overcapacity. The AM peak left turn volume represents about 68% of the volume on the southbound approach, with the remaining traffic in the through-right lane. The Project adds 26 AM peak hour trips to the southbound approach: 7 left turns, 2 vehicles through the intersection and 16 right turns. With the East Driveway to the garage access limited to egress only at this location, the impacts to 132nd Ave NE in the southbound direction are unavoidable. However, the intersection does operate within the City of Kirkland's LOS thresholds and SEPA mitigation is not required.

In the PM peak hour, the northbound approach is overcapacity without the Project and northbound queues were observed to extend beyond NE 84th Street. With the Project, the eastbound left turn movement operates at LOS D and the through lanes operate at LOS B. Also, the intersection's southbound volumes are split more evenly, compared to the AM peak hour, between the left lane and through-right lane.

The signal timing at 132nd Ave NE is most heavily weighted to maintain traffic flow, coordination and progression the NE 85th Street corridor; and thus, the "green time" on 132nd Ave NE is less which creates more delay on the side street.

With the Project, the average eastbound left turn queue was calculated at 86 feet in the AM peak hour (about 4.5 car lengths) and 146 feet in the PM peak hour (about 7.5 car lengths). The 95th-percentile left turn queue was calculated at 250 feet in the AM peak hour (about 12.5 car lengths) and 286 feet in the PM peak hour (about 14.5 car lengths).

With the Project, the average queue in the two eastbound through lanes was calculated at 313 feet in the AM peak hour (about 15.5 car lengths) and 286 feet in the PM peak hour (about 14.5 car lengths). The 95th-percentile queue was calculated at 450 feet in the AM peak hour (about 22.5 car lengths) and 383 feet in the PM peak hour (about 19 car lengths).

In August 2018, spot observations were made at this intersection to observe the traffic flow on NE 85th Street. During the existing peak hour observations, the peak hour left turn queue from 132nd Ave NE did not appear to extend to 131st Ave NE and cleared during the movement's "green time" at the signal. Based on future eastbound left turn traffic operations, AM and PM peak hour queues will be longer than they are currently but are also forecast to cleared during the movement's "green time". Using the City of Kirkland signal timing information, future average and 95th-percentile left turn queues were not computed to impact 131st Ave NE.

Existing vehicle queues in the eastbound through lanes approaching 132nd Ave NE were observed to extend past 131st Ave NE. The existing eastbound through queue extended to around 20 car lengths in both peak hours. The eastbound queue did clear during the eastbound "green time" at the signal. Field observations confirmed that the eastbound queue did not build instantaneously when the signal turned "red" for the eastbound approach, which indicates the that 128th Ave NE signal is providing gaps between vehicles platoons approaching 132nd Ave NE from the west. When the eastbound and westbound movements at the intersection stopped there are gaps available for vehicles to enter and exit 131st Ave NE.

With the Project, the average southbound left turn queue was calculated at 213 feet in the AM peak hour (about 10.5 car lengths) and 203 feet in the PM peak hour (about 10 car lengths). The 95th-percentile left turn queue was calculated at 230 feet in the AM peak hour (about 11.5 car lengths) and 238 feet in the PM peak hour (about 12 car lengths).

With the Project, the average southbound through-right lane queue was calculated at 255 feet in the AM peak hour (about 13 car lengths) and 241 feet in the PM peak hour (about 12 car lengths). The 95th-percentile through-right turn queue was calculated at 282 feet in the AM peak hour (about 14 car lengths) and 304 feet in the PM peak hour (about 15 car lengths).

Existing AM and PM peak hour queues southbound on 132nd Ave NE, were observed to extend to beyond the Project access which is about 190 feet to the north of NE 85th Street. Unlike the queue calculations, the AM peak hour queue was observed to be longer than the PM peak hour queue.

During the August 2018 spot observations, the AM peak hour queue did extend to 16 vehicles on occasion and was typically observed to extend 4 to 6 vehicles back from the NE 85th Street. The left turn demand is higher in the AM peak hour than in the PM peak hour.

Unlike the AM peak hour conditions, the PM peak hour southbound queue was also observed to spread more between the left lane and shared through-right lane, which is consistent with the traffic volume split by-lane. The maximum southbound queue was observed at 12 vehicles in the left lane in the PM peak hour. The spot observations did not distinguish total queue length by lane.

With southbound vehicle queues projected to stacking beyond the Project access in the peak hours, movements out from the site will be required to wait for a gap in the traffic flow to enter 132nd Ave NE.

Outside of the weekday peak hours, stacking in the southbound direction on 132nd Ave NE at NE 85th Street is negligible and there are nominal traffic surges outside of the peak hours.

The City of Kirkland has a future capital project to widen 132nd Ave NE to a 3-lane section which would increase the storage area available for southbound lefts to stack.

6.2. Project Accesses

The Project includes two separate parking areas: a parking garage, to primarily serve tenants, and a shared parking area for customers and guests. The site accesses' function and operations are discussed below.

The sight distance triangle for each access is included in Figure 10 and shows that the available sightlines satisfy the City of Kirkland's minimum standards.

6.2.1. East Driveway

The East Driveway is a Type E2 driveway off 132nd Ave NE. The driveway is the primary access to and from the Project's parking garage and is located at the building's northeast corner. The driveway is 185 feet north of NE 85th Street and over 150 feet south of NE 87th Street.

The access will be restricted to right turns in and right turns out by existing sloped mountable curb on 132nd Ave NE. The driveway operates at LOS B.

In the AM peak hour, average queues exiting the garage were computed to extend to 118 feet (about 6 car lengths) and 95th-percentile queues were computed to extend to 135 feet (about 7 car lengths). In the PM peak hour, average queues exiting the site were computed to extend to 85 feet (about 4 car lengths) and 95th-percentile queues were computed to extend to 156 feet (about 8 car lengths).

Peak hour Project-generated vehicle queues are not forecast to adversely impact the public roadway network.

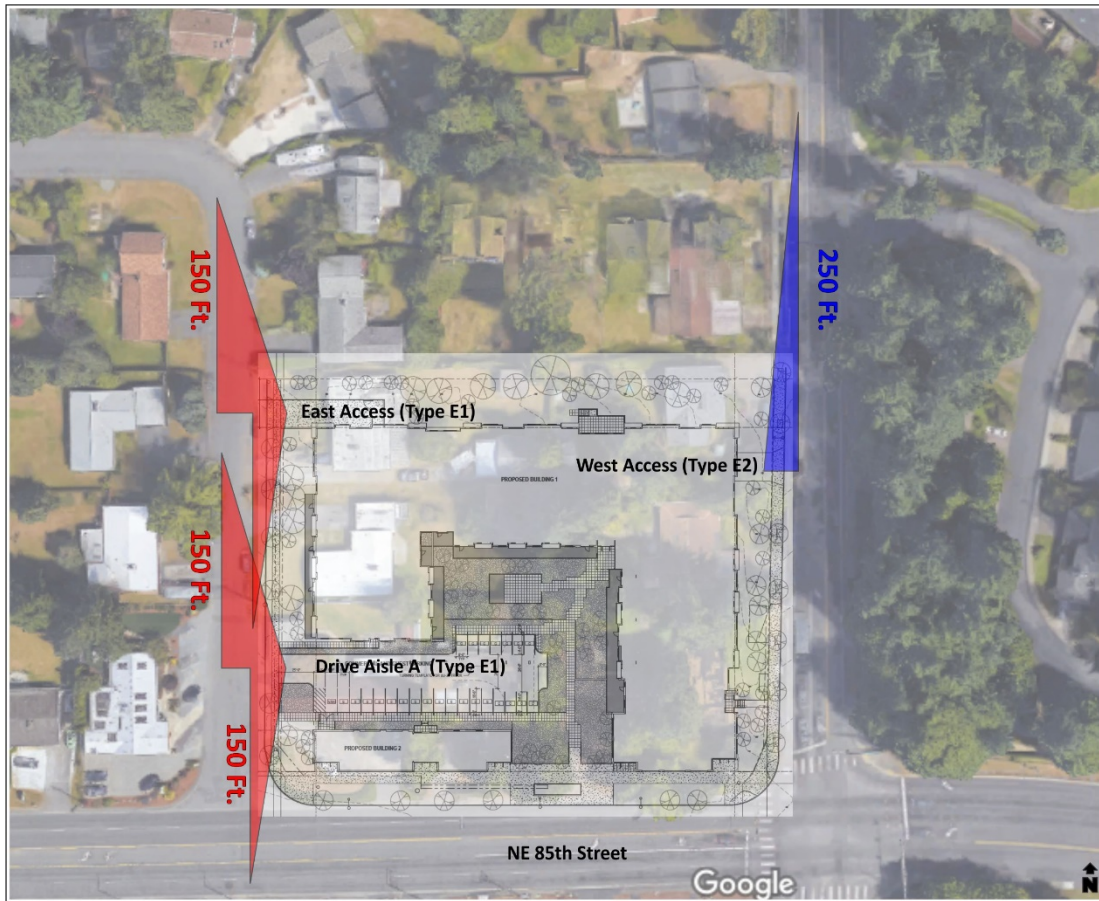


Figure 10: Sight Distance Triangles

6.2.2. Shared Driveway

The Shared Driveway is a Type E1 driveway off 131st Ave NE. The driveway provides access to the designated customer and guest parking area. The driveway is about 82 feet north of NE 85th Street and 57 feet from the northwest curb return on 131st Ave NE and NE 85th Street. The driveway is also 151 feet south of the West Driveway.

The driveway operates at LOS A in year 2020. Queue impacts on 131st Ave NE are measured from NE 85th Street and are not forecast to block the driveway. Vehicle queues related to driveway access, do not impact the offsite roadway network.

6.2.3. West Driveway

The West Driveway is a type E1 driveway off 131st Ave NE. The driveway provides a secondary inbound only access to the parking garage. The driveway location meets the minimum offset requirements from the site's north property line and is at the northwest corner of the building.

6.2.4. Loading and Garbage

A loading zone is proposed along the site frontage off 131st Ave NE. Move-in/move-out and deliveries loading off 131st Ave NE will be required to use the NE 87th Street and 130th Ave NE intersection as a public turnaround to head back to NE 85th Street. Both NE 87th Street and 130th Ave NE are public streets and the turnaround movement is a three-point turn.

Garbage pick-up is proposed off 131st Ave NE at the west driveway. A garbage vehicle is not able to travel through the parking garage from 131st Ave NE to 132nd Ave NE.

6.2.5. Driveway Variance

A variance is required to allow three site driveways. The proposed driveways are forecast to support the needs of the site and allow for separate access to the shared parking area for customers and guests and to the parking garage for tenants (including office employees).

A variance is required for the West Driveway location to be less than 50 feet from an existing single-family driveway on 131st Ave NE. As an inbound-only access, the potential for conflicts between the proposed driveway and adjacent single-family driveway are limited.

Mitigation measures include:

- The East Driveway will be maintained as a right turn in and right turn out driveway off 132nd Ave NE.
- A loading zone is proposed on 131st Ave NE for loading activities from deliveries and move-in/move-out vehicles. A 45-foot (minimum) section of curb is recommended to be painted “yellow” for on-street loading activities.
- To reduce the need for garbage vehicles to back onto to the street, Property Management is recommended to move site garbage containers to the street for ease of pick-up.
- Property management to “manage” onsite garbage, move-in/move-out and delivery truck activities. Applicant can vet their management plan with Kirkland. If required a Transportation Management Program can be established to document compliance and enforce violations.

6.3. Sunday Traffic Impacts

Traffic impacts generated by weekend uses, like a church, are generally confined to traffic surges prior to and after a church service. The times of these traffic surges are generally known, by the service schedule, and while inconvenient for a short time period, do not last for the entirety of the day and occur one day per week.

The proposed multifamily and office, are forecast to generate fewer trips on weekends compared to weekdays.

Churchome Kirkland located north of the site includes three Sunday services at 8:30 AM, 10:30 AM and 12:30 PM. Garage egress during those occasions will be impeded similar to current peak hour conditions where vehicles queue back from 85th Street NE on 132nd Ave NE.

7. Parking

7.1. *Parking Requirements*

Table 8 summarizes the multifamily tenant parking per the City of Kirkland Zoning Code (KZC).

The Applicant proposes 35 covered bicycle parking spaces. The multifamily parking requirement computations incorporate the City of Kirkland's vehicle parking reduction allowance for covered bicycle parking.

The KZC requires 10% of the multifamily units to be designated as affordable housing, which have a separate parking requirement than the market price units. The requirements for both affordable and market price housing are provided in the table below.

Table 8: Multifamily Tenant Parking

| Use | Size | Parking Ratio | Parking Required |
|--|---|-------------------------------------|------------------|
| Studio Unit (Non-AHU ¹) | 55 | 1.2 / unit ² | 66 |
| 1-Bed Unit (Non-AHU ¹) | 51 | 1.3 / unit ² | 66 |
| 2-Bed Unit (Non-AHU ¹) | 15 | 1.6 / unit ² | 24 |
| Non-AHU Total | 121 | | 156 |
| Studio Unit (AHU ¹) | 6 | 1.0 / unit ³ | 6 |
| 1-Bed Unit (AHU ¹) | 6 | 1.0 / unit ³ | 6 |
| 2-Bed Unit (AHU ¹) | 1 | 1.0 / unit ³ | 1 |
| AHU Total | 13 | | 13 |
| Resident Sub-Total | | | 169 |
| Covered & secure bicycle Parking Reduction | 35 bicycle spaces | 1 / 6 bicycle spaces; maximum of 5 | (5) |
| Resident Total | | | 164 |
| Resident Guest Parking | | Resident Parking X 10% ⁴ | 16 |
| Office Space | 7,500 SF | 1 / 300 SF ² | 25 |
| Total Parking | | | 205 |
| Parking Shared ⁵ | (shared parking between office and resident guests) | | 25 |
| Total with Shared Parking | | | 189 |

1 AHU = Affordable Housing Unit
2 KZC 53.84.050

3 KZC 112.15.1.a
4 KZC 112.20.4.b, excludes AHU units

5 KZC 105.20
6 KZC 105.45

Guest parking will be shared with the customer parking accessible via the Shared Driveway. The KZC 105.45 states that "[t]wo (2) or more uses may share a parking area if the number of parking spaces provided is equal to the greatest number of required spaces for uses operating at the same time. Shared parking is evaluated in Section 7.2.

The Project proposes 200 onsite parking spaces. 175 spaces are proposed in a parking garage for tenants. The resident tenant parking supply (164 spaces) is supported in the parking garage. Garage access is via the West Driveway and East Driveway. There are 11 parking spaces available in the garage for use by office employees.

25 spaces are proposed in the shared parking area for customers and guests. The parking area satisfies the KZC office parking requirements, which are greater than the requirements for resident guest parking.

On-street parking along the 131st Ave NE frontage will also be created for use by the public and for loading vehicles. The future public parking created offsite is not included in the parking supply total.

With shared parking the proposed onsite parking supply satisfies the requirements of the KZC.

7.2. Shared Parking

The time-of-day profile is used to justify shared parking for the Project.

Because the Applicant is not requesting a variance from the City of Kirkland's parking requirements, the parking by land use requirements from the KZC are retained for this analysis.

A weekday time-of-day parking profile was developed for the residential and office components of the Project based on the recommended time-of-day factors published in the Urban Land Institute's (ULI) *Shared Parking, Second Edition, 2006*. From the ULI information, during weekends, the office parking profile is less with the office closed and the residential parking profile is similar.

Figure 11 shows that the proposed parking supply (200 total parking spaces) is reasonable and that the Project can accommodate the cumulative parking requirements from the KZC, using the time-of-day data from ULI. For the office land use, the ULI visitor-to-employee parking ratio is 8% visitor-to-82% employee.

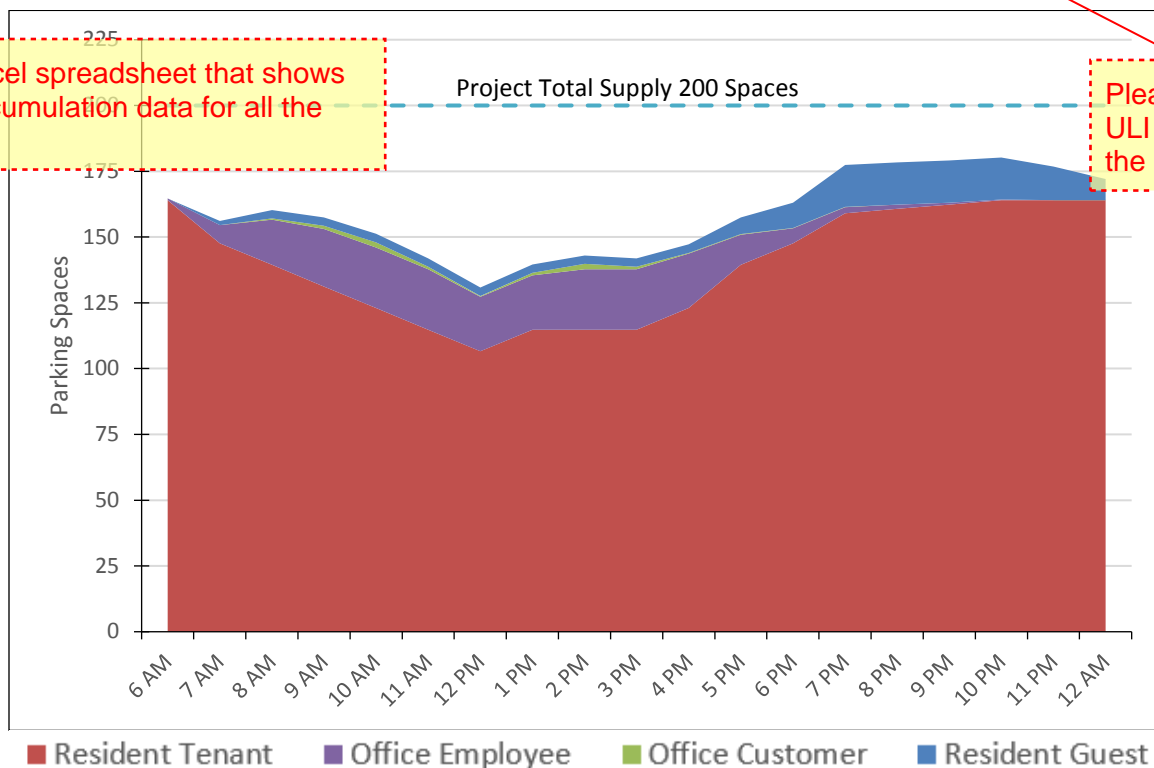


Figure 11: Project Total Parking Profile (Residential and Office Components)

Figure 12 shows the weekday time-of-day parking profile if the office employee and customer parking and the resident guest parking were shared.

The shared parking supply, of 25 spaces, is forecast to be exceeded by up to three vehicles, on occasion, between 10 AM and 4 PM.

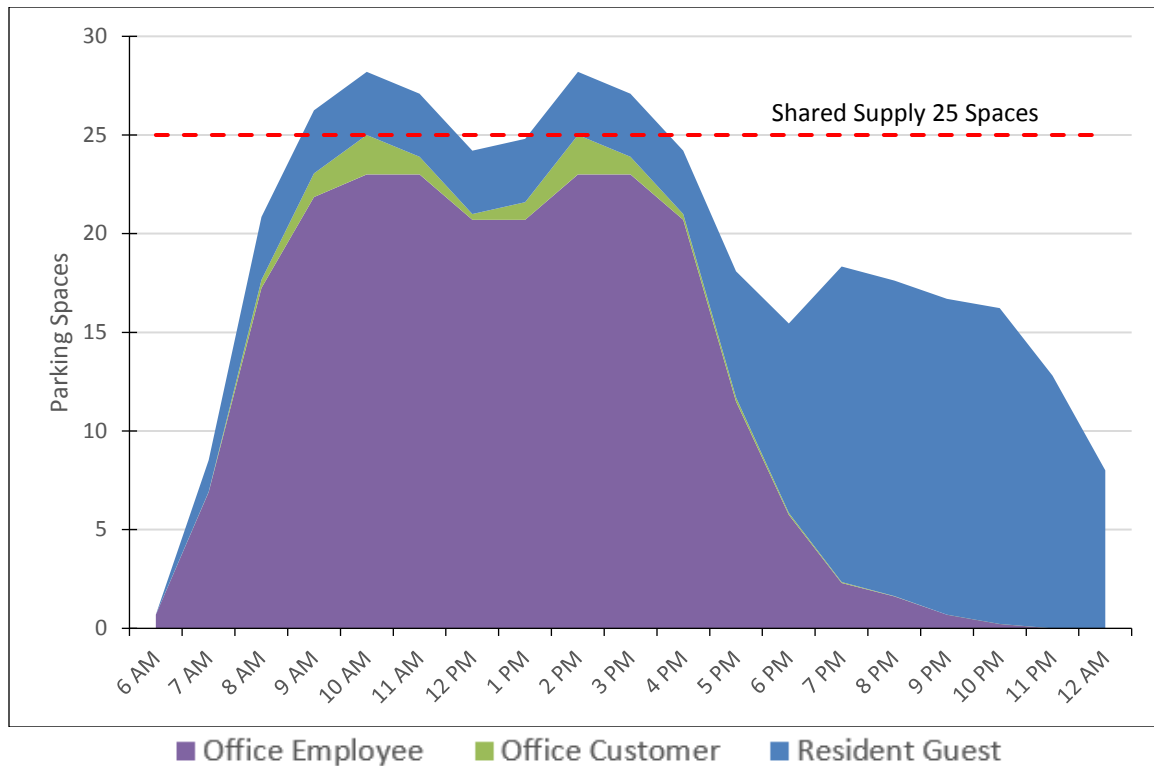


Figure 12: Shared Parking Profile 1 – Office Component and Residential Guests

To minimize the potential for parking spillover, it is recommended that that applicant designate space in the parking garage for office employees. There are 164 resident parking spaces required and an estimated 23 office employee parking spaces needed.

Figure 13 shows that the 175-space parking garage can accommodate both residents and the office employee parking, based on the time-of-day parking profiles for each land use.

Figure 14 shows that the 25 shared parking spaces can accommodate both office customers and resident guests.

The LOS analyses above, include all office employee trips being generated to and from the parking garage.

what does LOS have to do with parking? Please explain

Provide a table that shows all the land uses and their parking accumulations and their total on an hourly basis to reflect all the figures presented.

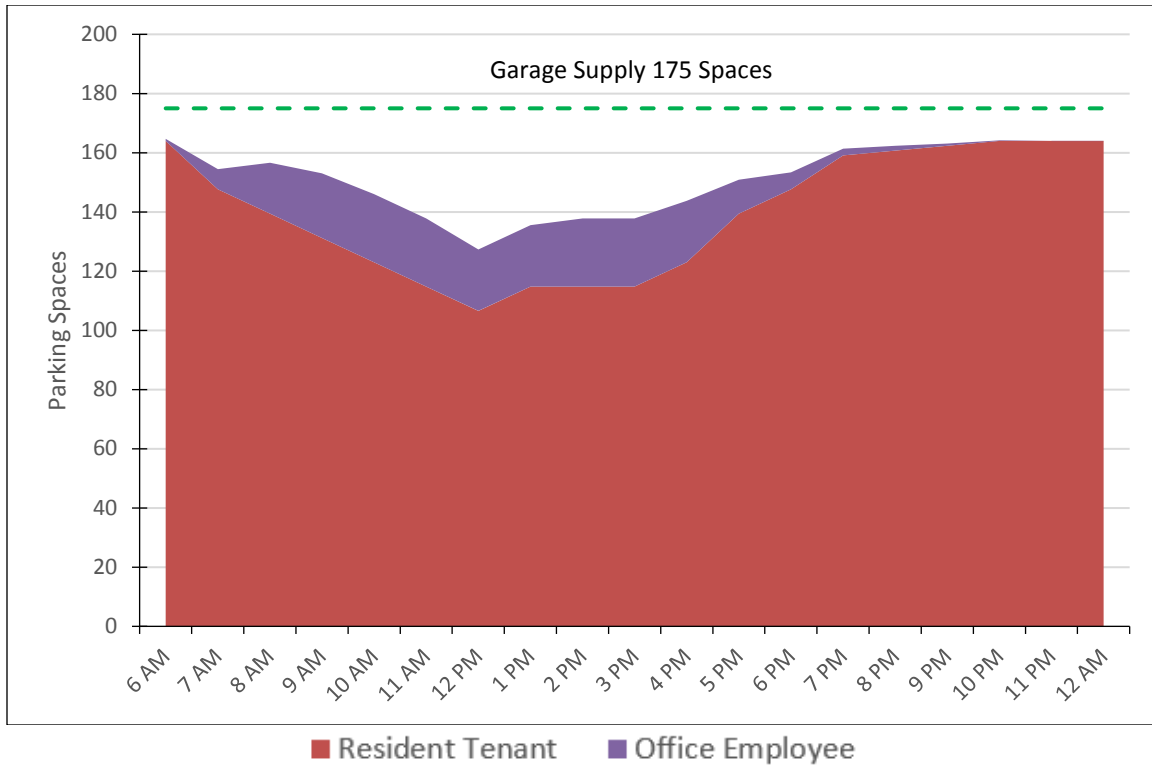


Figure 13: Garage Parking Profile with Tenants (Residential and Office)

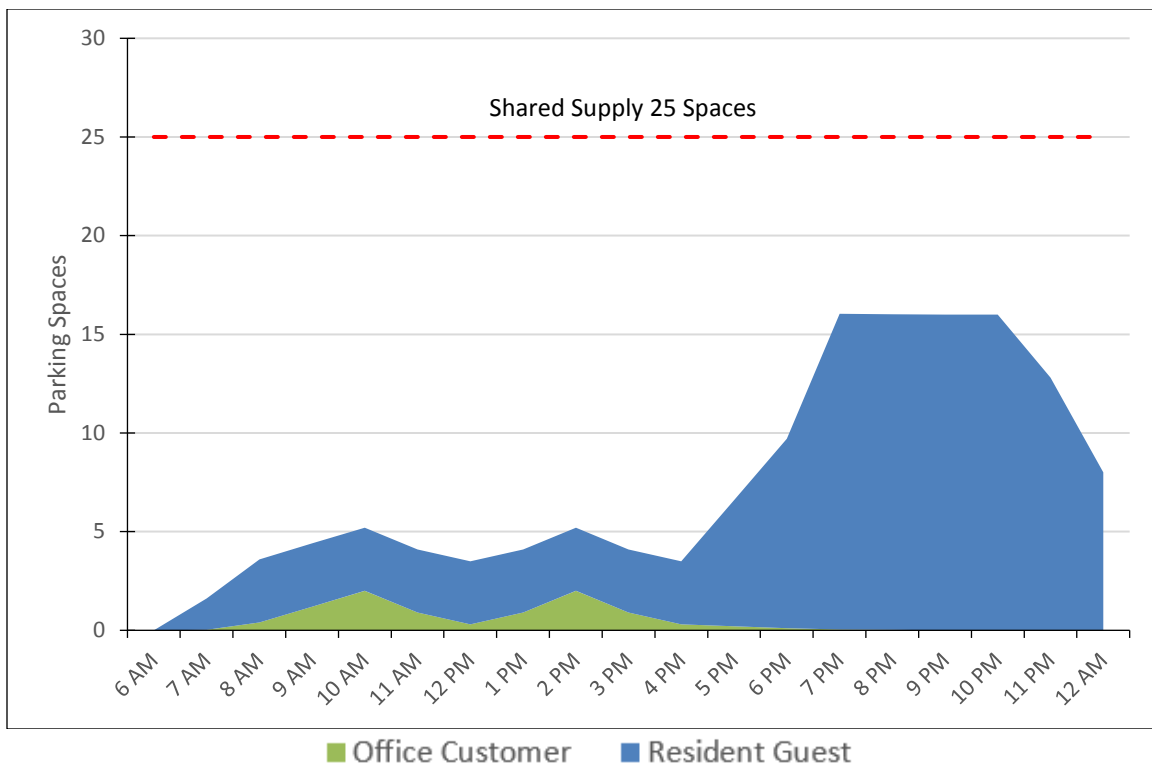


Figure 14: Garage Parking Profile (Resident and Office Staff)

8. Mitigation

8.1. *Concurrency and SEPA*

The Project satisfies the City of Kirkland’s traffic concurrency requirements, and no concurrency mitigation is warranted.

With the Project, the public intersections on NE 85th Street at 128th Ave NE, 131st Ave NE and 132nd Ave NE operate within the City of Kirkland’s LOS impact criteria and no SEPA mitigation is required.

8.2. *Site Access*

Vehicle queuing southbound on 132nd Ave NE extend past the Project’s East Driveway, particularly in the AM peak hour. The East Driveway is restricted to right-in/right-out with sloped mountable curb on 132nd Ave NE and operates at LOS B with less than 15 seconds of calculated delay for vehicles exiting the site. Sightlines at the East Driveway satisfy the City of Kirkland’s minimum sight distance requirements. Mitigation is not warranted.

The Shared Driveway and West Driveway both operate at LOS A. Vehicle queues on 131st Ave NE are not forecast to extend to either proposed access. Also, 131st Ave NE intersection operates within the City of Kirkland’s standards and there are adequate gaps forecast in eastbound and westbound traffic flow on NE 85th Street to allow ingress and egress to 131st Ave NE. Sightlines at the Shared Driveway and West Driveway satisfy the City of Kirkland’s minimum sight distance requirements. Mitigation is not warranted.

A loading zone is recommended on 131st Ave NE to support loading activities from deliveries and move-in/move-out vehicles. A 45-foot (minimum) section of curb is recommended to be painted “yellow” for on-street loading activities.

Also, to reduce the need for garbage vehicles to back onto to the street, Property Management is recommended to move site garbage containers to the street for ease of pick-up.

Lastly, property management to “manage” onsite garbage, move-in/move-out and delivery truck activities. Applicant can vet their management plan with Kirkland. If required a Transportation Management Program can be established to document compliance and enforce violations.

8.3. *Parking*

The Project’s parking supply satisfies the City of Kirkland requirements with shared parking. Recommendations are provided in the previous section for office-employees to have access to park in the parking garage.

8.4. *Frontage and Transportation Impact Fees*

Frontage improvement will improve connectivity to the non-motorized transportation network surrounding the site and frontage improvements will be designed per the City of Kirkland’s design guidelines.

The Applicant will also be responsible for payment of transportation impact fees for new development. Table 9 summarizes the fee estimate, based on the 2018 fee schedule.

Table 9: Transportation Impact Fee Estimate

| Land Use | Size | Fee Rate | Fee Estimate |
|-------------------------------|-------------|-----------------|---------------------|
| Proposed Multifamily | 134 units | \$3,154.00 | \$422,636 |
| Proposed Office | 7,500 SF | \$8.80 | \$66,000 |
| Credit Existing Single-Family | 7 units | \$(5,533.00) | \$(38,731) |
| Credit Existing Office | 2,100 SF | \$(8.80) | \$(18,480) |
| Total Estimate | | | \$431,425 |

The Project's transportation impact fee is estimated to at \$431,425. Fee credits for affordable dwelling units and any adjustments based on the final sizes of the proposed uses, will be accounted for with the City of Kirkland's final fee computation. The transportation impact fee is due at the time the building permit is issued.

Appendix



CITY OF KIRKLAND

Department of Public Works

123 Fifth Avenue, Kirkland, WA 98033 425.587.3800

www.kirklandwa.gov

MEMORANDUM

To: Tony Leavitt, Senior Planner

From: Thang Nguyen, Transportation Engineer

Date: June 22, 2018

Subject: Continental Development Traffic Concurrency Test Notice, Tran17-00236

The purpose of this memo is to inform you that the proposed Continental mixed-use development project has passed traffic concurrency. The previous concurrency test notice had expired on May 22, 2018. The applicant has resubmitted for a concurrency test and the project has passed traffic concurrency.

Project Description

Continental Divide is a residential mixed-use development proposed at 8505 132nd Avenue NE. The proposal includes redevelopment of eight parcels located north of NE 85th Street, west of 131st Avenue NE and east of 132nd Avenue NE. The proposal includes: 134 apartment units and 7,400 sq. ft. of office space in a three-story building. Garage accesses are proposed off 131st Avenue NE and 132nd Avenue NE. The project build out and full occupancy is anticipated to be by the end of 2020.

Trip Generation

Based on the ITE Trip Generation Manual 9th Edition, the proposed project will generate a net new of 691 daily, 43 AM peak hour vehicle, 58 PM peak hour vehicle and 110 PM peak hour person trips. Attached to this memorandum is the trip generation report.

This memo will serve as the concurrency test notice for the proposed project. Per *Section 25.10.020 Procedures* of the KMC (Kirkland Municipal Code), this Concurrency Test Notice will expire in one year (June 22, 2019) unless a development permit and certificate of concurrency are issued or an extension is granted.

EXPIRATION

The concurrency test notice shall expire and a new concurrency test application is required unless:

1. A complete SEPA checklist, traffic impact analysis (TIA) and all required documentation are submitted to the City within 90 calendar days of the concurrency test notice (September 20, 2018).
2. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test

Memorandum to Tony Leavitt
June 22, 2018
Page 2 of 2

notice. (A Certificate of Concurrency is issued at the same time a development permit or a building permit is issued if the applicant holds a valid concurrency test notice.)

3. A Certificate of Concurrency shall expire six years from the date of issuance of the concurrency test notice unless all building permits are issued for buildings approved under the concurrency test notice.

APPEALS

The concurrency test notice may be appealed by the public or agency with jurisdiction. The concurrency test notice is subject to an appeal until the SEPA review process is complete and the appeal deadline has passed. Concurrency appeals are heard before the Hearing Examiner along with any applicable SEPA appeal. For more information, refer to the Kirkland Municipal Code, Title 25. If you have any questions, please call me at x3869.

cc: Energov Tran17-00236

Proportional Share Impact Worksheet

Input appropriate information in green cells

Project Name:

Continental Divide

Intersection No.

NA

Major Street¹

NE 85th St

Minor Street¹

131st Ave NE

of Lanes*=

2

of Lanes*=

1

Through
Lanes¹¹ See "Intersection Description" worksheet for descriptions¹ May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

9/6/2018

Daily Project Traffic Entering the Intersection

(Total of both approaches divided by two)

Major Street Volume $V_1 =$ Daily
Volumes

275.5

Entering Leg
Volumes *

211

340

Major

(Total of both approaches divided by two)

Minor Street Volume $V_2 =$

15.5

0

31

Minor

*Do not leave cell empty for zero volume

Determine Geometric Factors

| Number of Lanes | | Geometric Factors | | | |
|-----------------|--------------|-------------------|-------|-------|-------|
| Major Street | Minor Street | f_1 | f_2 | f_3 | f_4 |
| 2 | 2 | 1.000 | 1.330 | 1.000 | 1.330 |
| 2 | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| 1 | 2 | 0.833 | 1.330 | 0.833 | 1.330 |
| 1 | 1 | 0.833 | 1.000 | 0.833 | 1.000 |

| | | | |
|-------|-------|-------|-------|
| f_1 | f_2 | f_3 | f_4 |
| 1 | 1 | 1 | 1 |

Calculate Base Percentages

$$P_1 = V_1 / (10,000 \times f_1) = 2.76\%$$

$$P_2 = V_2 / (5,000 \times f_2) = 0.31\%$$

$$P_3 = V_1 / (15,000 \times f_3) = 1.84\%$$

$$P_4 = V_2 / (2,500 \times f_4) = 0.62\%$$

Calculate Proportional Share

$$S_1 = (P_1 + P_2) / 2 = 1.53\%$$

$$S_2 = (P_3 + P_4) / 2 = 1.23\%$$

$$\text{Intersection Proportional Share} = \text{Maximum of } S_1 \text{ and } S_2 = 1.53\%$$

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: JPKH

Company: TSI

Proportional Share Impact Worksheet

Input appropriate information in green cells

Project Name:

Continental Divide

Intersection No.

401

Major Street¹

NE 85th St

Minor Street¹

132nd Ave NE

Through
Lanes¹

of Lanes*=

2

of Lanes*=

1

¹ See "Intersection Description" worksheet for descriptions¹ May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

9/6/2018

Daily Project Traffic Entering the Intersection

(Total of both approaches divided by two)

Major Street Volume $V_1 =$ Daily
Volumes

52.5

Entering Leg
Volumes *

12

93

Major

(Total of both approaches divided by two)

Minor Street Volume $V_2 =$

173.5

31

316

Minor

*Do not leave cell empty for zero volume

Determine Geometric Factors

| Number of Lanes | | Geometric Factors | | | |
|-----------------|--------------|-------------------|-------|-------|-------|
| Major Street | Minor Street | f_1 | f_2 | f_3 | f_4 |
| 2 | 2 | 1.000 | 1.330 | 1.000 | 1.330 |
| 2 | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| 1 | 2 | 0.833 | 1.330 | 0.833 | 1.330 |
| 1 | 1 | 0.833 | 1.000 | 0.833 | 1.000 |

| | | | |
|-------|-------|-------|-------|
| f_1 | f_2 | f_3 | f_4 |
| 1 | 1 | 1 | 1 |

Calculate Base Percentages

$$P_1 = V_1 / (10,000 \times f_1) = 0.53\%$$

$$P_2 = V_2 / (5,000 \times f_2) = 3.47\%$$

$$P_3 = V_1 / (15,000 \times f_3) = 0.35\%$$

$$P_4 = V_2 / (2,500 \times f_4) = 6.94\%$$

Calculate Proportional Share

$$S_1 = (P_1 + P_2) / 2 = 2.00\%$$

$$S_2 = (P_3 + P_4) / 2 = 3.65\%$$

$$\text{Intersection Proportional Share} = \text{Maximum of } S_1 \text{ and } S_2 = 3.65\%$$

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: JPKH

Company: TSI

Proportional Share Impact Worksheet

Input appropriate information in green cells

Project Name:

Continental Divide

Intersection No.

NA

Major Street¹

131st Ave NE

Minor Street¹

NE 87th Ave

of Lanes*=

1

of Lanes*=

1

Through
Lanes¹¹ See "Intersection Description" worksheet for descriptions¹ May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

9/6/2018

Daily Project Traffic Entering the Intersection

(Total of both approaches divided by two)

Major Street Volume $V_1 =$ Daily
Volumes
6Entering Leg
Volumes *

2

10

Major

(Total of both approaches divided by two)

Minor Street Volume $V_2 =$

0

0

0

Minor

*Do not leave cell empty for zero volume

Determine Geometric Factors

| Number of Lanes | | Geometric Factors | | | |
|-----------------|--------------|-------------------|-------|-------|-------|
| Major Street | Minor Street | f_1 | f_2 | f_3 | f_4 |
| 2 | 2 | 1.000 | 1.330 | 1.000 | 1.330 |
| 2 | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| 1 | 2 | 0.833 | 1.330 | 0.833 | 1.330 |
| 1 | 1 | 0.833 | 1.000 | 0.833 | 1.000 |

| | | | |
|-------|-------|-------|-------|
| f_1 | f_2 | f_3 | f_4 |
| 0.833 | 1 | 0.833 | 1 |

Calculate Base Percentages

$$P_1 = V_1 / (10,000 \times f_1) = 0.07\%$$

$$P_2 = V_2 / (5,000 \times f_2) = 0.00\%$$

$$P_3 = V_1 / (15,000 \times f_3) = 0.05\%$$

$$P_4 = V_2 / (2,500 \times f_4) = 0.00\%$$

Calculate Proportional Share

$$S_1 = (P_1 + P_2) / 2 = 0.04\%$$

$$S_2 = (P_3 + P_4) / 2 = 0.02\%$$

Intersection Proportional Share = Maximum of S_1 and S_2 = 0.04%
Significant Intersection? no

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: JPKH

Company: TSI

Proportional Share Impact Worksheet

Input appropriate information in green cells

Project Name:

Continental Divide

Intersection No.

412

Major Street¹

NE 85th St

Minor Street¹

128th Ave NE

of Lanes*=

2

of Lanes*=

1

Through
Lanes¹¹ See "Intersection Description" worksheet for descriptions¹ May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

9/6/2018

Daily Project Traffic Entering the Intersection

(Total of both approaches divided by two)

Major Street Volume $V_1 =$ Daily
Volumes

210

Entering Leg
Volumes *

197

223

Major

(Total of both approaches divided by two)

Minor Street Volume $V_2 =$

6.5

3

10

Minor

*Do not leave cell empty for zero volume

Determine Geometric Factors

| Number of Lanes | | Geometric Factors | | | |
|-----------------|--------------|-------------------|-------|-------|-------|
| Major Street | Minor Street | f_1 | f_2 | f_3 | f_4 |
| 2 | 2 | 1.000 | 1.330 | 1.000 | 1.330 |
| 2 | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| 1 | 2 | 0.833 | 1.330 | 0.833 | 1.330 |
| 1 | 1 | 0.833 | 1.000 | 0.833 | 1.000 |

| | | | |
|-------|-------|-------|-------|
| f_1 | f_2 | f_3 | f_4 |
| 1 | 1 | 1 | 1 |

Calculate Base Percentages

$$P_1 = V_1 / (10,000 \times f_1) = 2.10\%$$

$$P_2 = V_2 / (5,000 \times f_2) = 0.13\%$$

$$P_3 = V_1 / (15,000 \times f_3) = 1.40\%$$

$$P_4 = V_2 / (2,500 \times f_4) = 0.26\%$$

Calculate Proportional Share

$$S_1 = (P_1 + P_2) / 2 = 1.12\%$$

$$S_2 = (P_3 + P_4) / 2 = 0.83\%$$

Intersection Proportional Share = Maximum of S_1 and S_2 = 1.12%

Significant Intersection? yes

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: JPKH

Company: TSI

Proportional Share Impact Worksheet

Input appropriate information in green cells

Project Name:

Continental Divide

Intersection No.

NA

Major Street¹

NE 85th St

Minor Street¹

126th Ave NE

of Lanes*=

2

of Lanes*=

1

Through
Lanes¹¹ See "Intersection Description" worksheet for descriptions¹ May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

9/6/2018

Daily Project Traffic Entering the Intersection

(Total of both approaches divided by two)

Major Street Volume $V_1 =$ Daily
Volumes

173

Entering Leg
Volumes *

183

Major

(Total of both approaches divided by two)

Minor Street Volume $V_2 =$

7

14

Minor

*Do not leave cell empty for zero volume

Determine Geometric Factors

| Number of Lanes | | Geometric Factors | | | |
|-----------------|--------------|-------------------|-------|-------|-------|
| Major Street | Minor Street | f_1 | f_2 | f_3 | f_4 |
| 2 | 2 | 1.000 | 1.330 | 1.000 | 1.330 |
| 2 | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| 1 | 2 | 0.833 | 1.330 | 0.833 | 1.330 |
| 1 | 1 | 0.833 | 1.000 | 0.833 | 1.000 |

| | | | |
|-------|-------|-------|-------|
| f_1 | f_2 | f_3 | f_4 |
| 1 | 1 | 1 | 1 |

Calculate Base Percentages

$$P_1 = V_1 / (10,000 \times f_1) = 1.73\%$$

$$P_2 = V_2 / (5,000 \times f_2) = 0.14\%$$

$$P_3 = V_1 / (15,000 \times f_3) = 1.15\%$$

$$P_4 = V_2 / (2,500 \times f_4) = 0.28\%$$

Calculate Proportional Share

$$S_1 = (P_1 + P_2) / 2 = 0.94\%$$

$$S_2 = (P_3 + P_4) / 2 = 0.72\%$$

Intersection Proportional Share = Maximum of S_1 and S_2 = 0.94%
Significant Intersection? no

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: JPKH

Company: TSI



Prepared for: **Transportation Solutions, Inc.**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 132nd Ave NE & Redmond Way/NE 85th St

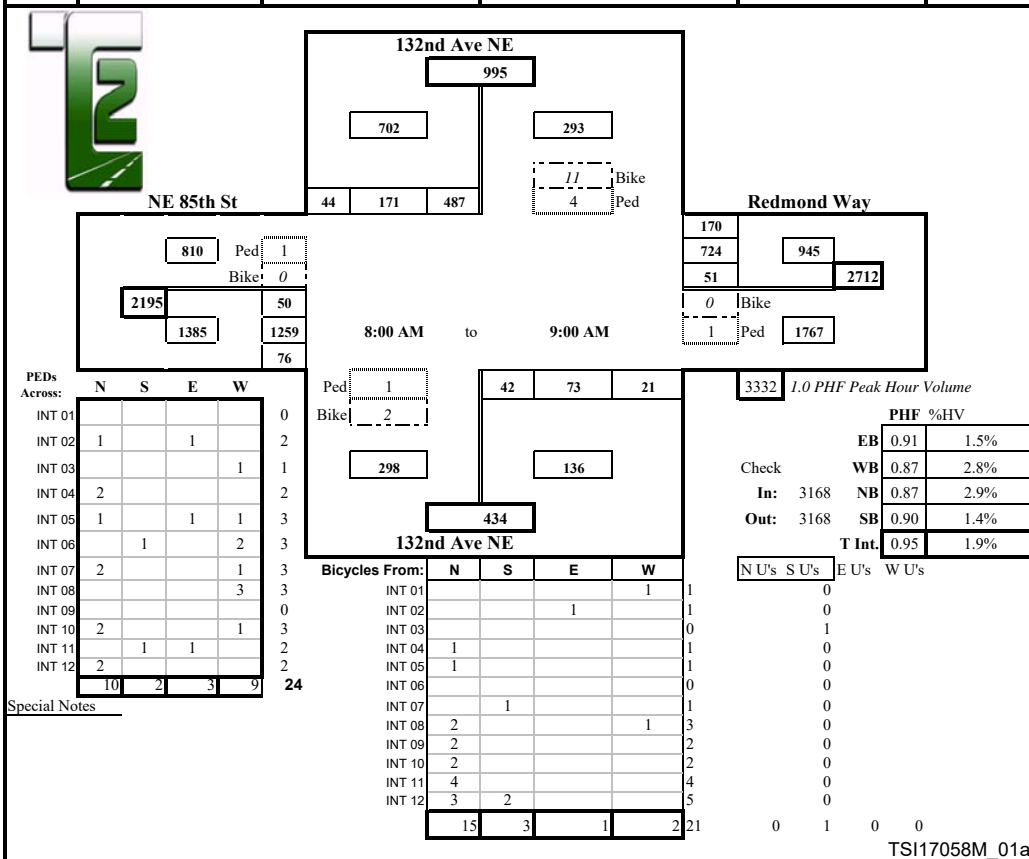
Date of Count: Thurs 5/18/2017

Location: Kirkland, Washington

Checked By: Jess

| Time Interval Ending at | From North on (SB) 132nd Ave NE | | | | From South on (NB) 132nd Ave NE | | | | From East on (WB) Redmond Way | | | | From West on (EB) NE 85th St | | | | Interval Total |
|-------------------------|------------------------------------|-----|----|----|------------------------------------|----|----|----|----------------------------------|----|-----|----|---------------------------------|----|-----|----|----------------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | |
| 6:15 A | 0 | 20 | 17 | 11 | 0 | 3 | 4 | 2 | 2 | 5 | 74 | 3 | 3 | 4 | 169 | 6 | 318 |
| 6:30 A | 1 | 40 | 15 | 6 | 0 | 5 | 4 | 4 | 4 | 3 | 79 | 9 | 1 | 1 | 140 | 8 | 314 |
| 6:45 A | 0 | 66 | 22 | 15 | 0 | 4 | 3 | 3 | 3 | 3 | 97 | 13 | 4 | 7 | 196 | 4 | 433 |
| 7:00 A | 1 | 80 | 37 | 18 | 1 | 9 | 8 | 2 | 2 | 5 | 116 | 25 | 4 | 5 | 199 | 11 | 515 |
| 7:15 A | 2 | 87 | 47 | 22 | 0 | 7 | 9 | 4 | 4 | 14 | 127 | 20 | 4 | 2 | 206 | 17 | 562 |
| 7:30 A | 5 | 101 | 71 | 23 | 3 | 18 | 28 | 14 | 3 | 5 | 152 | 31 | 1 | 9 | 212 | 23 | 687 |
| 7:45 A | 1 | 122 | 65 | 26 | 1 | 22 | 28 | 5 | 5 | 8 | 188 | 23 | 2 | 10 | 264 | 20 | 781 |
| 8:00 A | 5 | 129 | 70 | 24 | 4 | 19 | 14 | 8 | 6 | 8 | 175 | 41 | 3 | 16 | 271 | 20 | 795 |
| 8:15 A | 2 | 108 | 37 | 15 | 1 | 12 | 18 | 5 | 5 | 11 | 182 | 29 | 5 | 15 | 280 | 18 | 730 |
| 8:30 A | 2 | 139 | 47 | 9 | 1 | 6 | 15 | 5 | 8 | 18 | 180 | 36 | 7 | 9 | 315 | 20 | 799 |
| 8:45 A | 4 | 116 | 50 | 9 | 1 | 14 | 20 | 2 | 7 | 7 | 172 | 37 | 4 | 13 | 349 | 17 | 806 |
| 9:00 A | 2 | 124 | 37 | 11 | 1 | 10 | 20 | 9 | 6 | 15 | 190 | 68 | 5 | 13 | 315 | 21 | 833 |

| | | | | | | | | | | | | | | | | | |
|-------------------------------|------|------|-----|-----|------|-----|-----|----|------|-----|------|-----|------|-----|------|-----|------|
| Total Survey | 25 | 1132 | 515 | 189 | 13 | 129 | 171 | 63 | 55 | 102 | 1732 | 335 | 43 | 104 | 2916 | 185 | 7573 |
| Peak Hour: 8:00 AM to 9:00 AM | | | | | | | | | | | | | | | | | |
| Total | 10 | 487 | 171 | 44 | 4 | 42 | 73 | 21 | 26 | 51 | 724 | 170 | 21 | 50 | 1259 | 76 | 3168 |
| Approach | 702 | | | | 136 | | | | 945 | | | | 1385 | | | | 3168 |
| %HV | 1.4% | | | | 2.9% | | | | 2.8% | | | | 1.5% | | | | 1.9% |
| PHF | 0.90 | | | | 0.87 | | | | 0.87 | | | | 0.91 | | | | 0.95 |



Prepared for: **Transportation Solutions, Inc.****Traffic Count Consultants, Inc.**

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

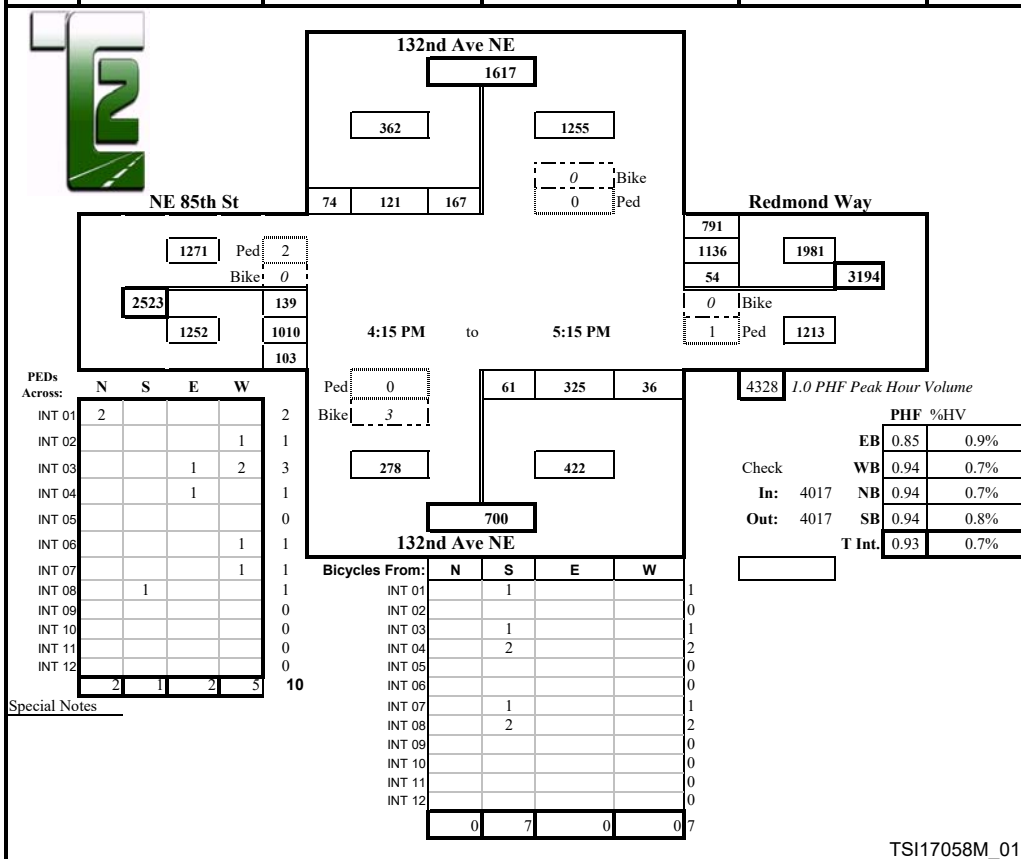
Intersection: 132nd Ave NE & Redmond Way/NE 85th St**Date of Count:** Thurs 5/18/2017**Location:** Kirkland, Washington**Checked By:** Jess

| Time Interval Ending at | From North on (SB) 132nd Ave NE | | | | From South on (NB) 132nd Ave NE | | | | From East on (WB) Redmond Way | | | | From West on (EB) NE 85th St | | | | Interval Total |
|-------------------------|------------------------------------|----|----|----|------------------------------------|----|----|----|----------------------------------|----|-----|-----|---------------------------------|----|-----|----|----------------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | |
| 3:45 P | 0 | 51 | 29 | 19 | 0 | 20 | 49 | 17 | 5 | 8 | 239 | 133 | 3 | 31 | 218 | 16 | 830 |
| 4:00 P | 0 | 52 | 30 | 15 | 0 | 14 | 61 | 8 | 2 | 9 | 245 | 154 | 8 | 36 | 251 | 23 | 898 |
| 4:15 P | 1 | 52 | 28 | 16 | 1 | 22 | 73 | 6 | 1 | 14 | 257 | 177 | 4 | 26 | 243 | 22 | 936 |
| 4:30 P | 2 | 54 | 24 | 18 | 0 | 16 | 76 | 7 | 2 | 11 | 274 | 193 | 5 | 30 | 258 | 19 | 980 |
| 4:45 P | 0 | 44 | 28 | 22 | 2 | 17 | 86 | 9 | 5 | 11 | 275 | 189 | 2 | 31 | 234 | 28 | 974 |
| 5:00 P | 1 | 44 | 34 | 16 | 1 | 15 | 78 | 7 | 3 | 12 | 280 | 211 | 3 | 27 | 224 | 33 | 981 |
| 5:15 P | 0 | 25 | 35 | 18 | 0 | 13 | 85 | 13 | 3 | 20 | 307 | 198 | 1 | 51 | 294 | 23 | 1082 |
| 5:30 P | 1 | 39 | 39 | 25 | 0 | 13 | 83 | 8 | 2 | 18 | 266 | 188 | 2 | 38 | 248 | 15 | 980 |
| 5:45 P | 0 | 47 | 21 | 15 | 1 | 15 | 86 | 11 | 1 | 23 | 220 | 171 | 1 | 32 | 261 | 22 | 924 |
| 6:00 P | 2 | 32 | 23 | 13 | 2 | 24 | 72 | 12 | 3 | 17 | 230 | 141 | 1 | 42 | 253 | 21 | 880 |
| 6:15 P | 1 | 37 | 16 | 10 | 1 | 24 | 68 | 3 | 0 | 16 | 268 | 157 | 7 | 39 | 217 | 19 | 874 |
| 6:30 P | 1 | 28 | 19 | 16 | 0 | 17 | 72 | 10 | 2 | 15 | 281 | 138 | 6 | 40 | 221 | 28 | 885 |


| | | | | | | | | | | | | | | | | | |
|--------------|---|-----|-----|-----|---|-----|-----|-----|----|-----|------|------|----|-----|------|-----|-------|
| Total Survey | 9 | 505 | 326 | 203 | 8 | 210 | 889 | 111 | 29 | 174 | 3142 | 2050 | 43 | 423 | 2922 | 269 | 11224 |
|--------------|---|-----|-----|-----|---|-----|-----|-----|----|-----|------|------|----|-----|------|-----|-------|

Peak Hour: 4:15 PM to 5:15 PM

| | | | | | | | | | | | | | | | | | |
|----------|------|-----|-----|----|------|----|-----|----|------|----|------|-----|------|-----|------|-----|------|
| Total | 3 | 167 | 121 | 74 | 3 | 61 | 325 | 36 | 13 | 54 | 1136 | 791 | 11 | 139 | 1010 | 103 | 4017 |
| Approach | 362 | | | | 422 | | | | 1981 | | | | 1252 | | | | 4017 |
| %HV | 0.8% | | | | 0.7% | | | | 0.7% | | | | 0.9% | | | | 0.7% |
| PHF | 0.94 | | | | 0.94 | | | | 0.94 | | | | 0.85 | | | | 0.93 |



TS117058M_01p



Prepared for: **Transportation Solutions, Inc.**


Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 131st Ave NE & NE 85th St **Date of Count:** Thurs 5/18/2017
Location: Kirkland, Washington **Checked By:** Jess

| Time Interval Ending at | From North on (SB) 131st Ave NE | | | | From South on (NB) Business Drwy | | | | From East on (WB) NE 85th St | | | | From West on (EB) NE 85th St | | | | Interval Total | |
|-------------------------------|------------------------------------|---|---|----|-------------------------------------|---|---|---|---------------------------------|---|-----|---|---------------------------------|----|------|---|----------------|------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | | |
| 6:15 A | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 88 | 1 | 4 | 0 | 176 | 0 | 266 | |
| 6:30 A | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 83 | 0 | 0 | 0 | 157 | 0 | 242 | |
| 6:45 A | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 114 | 0 | 4 | 1 | 210 | 0 | 326 | |
| 7:00 A | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 137 | 1 | 5 | 0 | 198 | 0 | 338 | |
| 7:15 A | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 155 | 0 | 4 | 1 | 230 | 0 | 388 | |
| 7:30 A | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 184 | 2 | 1 | 0 | 238 | 0 | 427 | |
| 7:45 A | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 228 | 1 | 3 | 2 | 305 | 0 | 542 | |
| 8:00 A | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 6 | 0 | 200 | 3 | 3 | 1 | 313 | 0 | 522 | |
| 8:15 A | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 4 | 0 | 200 | 0 | 6 | 1 | 293 | 1 | 500 | |
| 8:30 A | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 7 | 0 | 179 | 2 | 6 | 8 | 357 | 0 | 550 | |
| 8:45 A | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 171 | 1 | 5 | 5 | 356 | 0 | 536 | |
| 9:00 A | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 198 | 3 | 5 | 1 | 344 | 0 | 550 | |
| Total Survey | | | | | | | | | | | | | | | | | | 5187 |
| Peak Hour: 8:00 AM to 9:00 AM | | | | | | | | | | | | | | | | | | |
| Total | 1 | 3 | 0 | 13 | 0 | 0 | 0 | 0 | 18 | 0 | 748 | 6 | 22 | 15 | 1350 | 1 | 2136 | |
| Approach | 16 | | | | 0 | | | | 754 | | | | 1366 | | | | 2136 | |
| %HV | 6.3% | | | | n/a | | | | 2.4% | | | | 1.6% | | | | 1.9% | |
| PHF | 0.80 | | | | n/a | | | | 0.94 | | | | 0.94 | | | | 0.97 | |



131st Ave NE

37

16 21

13 0 3

3

NE 85th St

6 748 754 2107

0 0 0 1353

2127 15 1366 1350 1

8:00 AM to 9:00 AM

2200 1.0 PHF Peak Hour Volume

PHF %HV

| | | |
|-----------|------|------|
| EB | 0.94 | 1.6% |
| WB | 0.94 | 2.4% |
| In: 2136 | NB | n/a |
| Out: 2136 | SB | 0.80 |
| T Int. | 0.97 | 1.9% |

N U's S U's E U's W U's

| | | | | |
|--------|---|---|---|---|
| INT 01 | 0 | 0 | 0 | 0 |
| INT 02 | 0 | 0 | 0 | 0 |
| INT 03 | 0 | 0 | 0 | 0 |
| INT 04 | 0 | 0 | 0 | 0 |
| INT 05 | 0 | 0 | 0 | 0 |
| INT 06 | 0 | 0 | 0 | 0 |
| INT 07 | 0 | 0 | 1 | 0 |
| INT 08 | 0 | 0 | 1 | 0 |
| INT 09 | 0 | 0 | 0 | 1 |
| INT 10 | 0 | 0 | 0 | 0 |
| INT 11 | 1 | 0 | 0 | 0 |
| INT 12 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 2 |

Business Drwy

1

0 0 0

1 0

10

Special Notes



Prepared for: **Transportation Solutions, Inc.**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

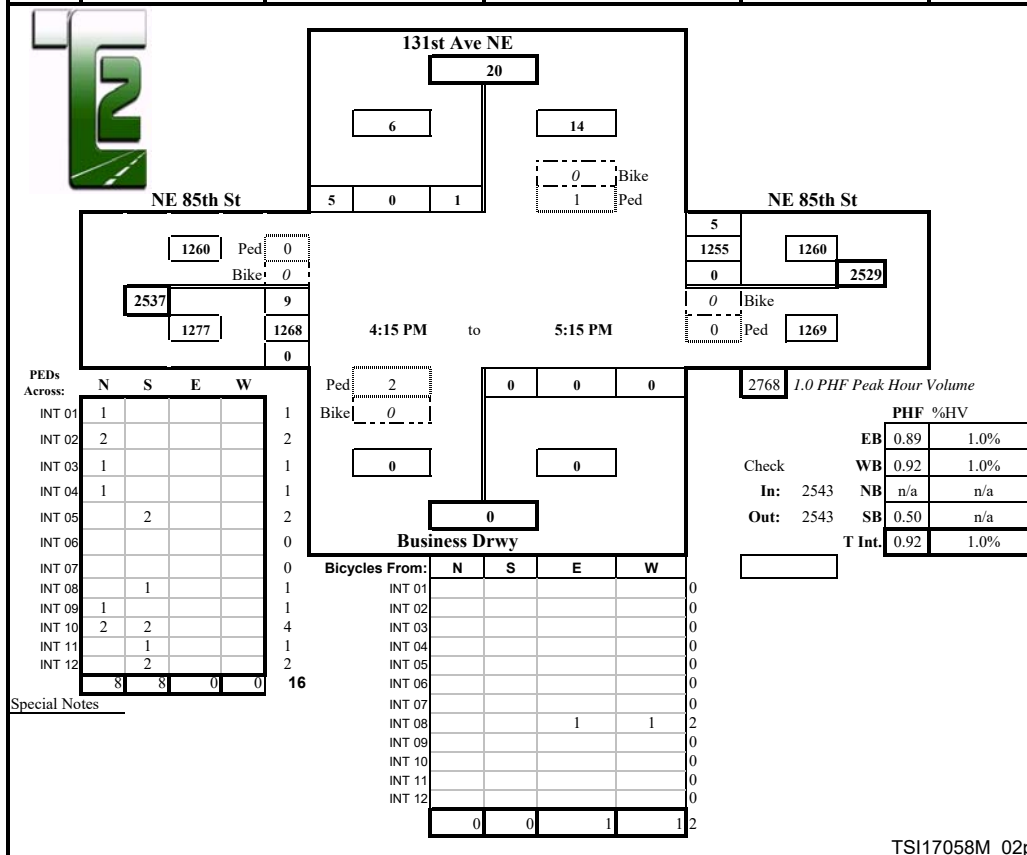
WBE/DBE

Intersection: 131st Ave NE & NE 85th St
Location: Kirkland, Washington


Date of Count: Thurs 5/18/2017
Checked By: Jess

| Time Interval Ending at | From North on (SB) 131st Ave NE | | | | From South on (NB) Business Drwy | | | | From East on (WB) NE 85th St | | | | From West on (EB) NE 85th St | | | | Interval Total |
|-------------------------|------------------------------------|---|---|---|-------------------------------------|---|---|---|---------------------------------|---|-----|---|---------------------------------|---|-----|---|----------------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | |
| 3:45 P | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 5 | 0 | 281 | 1 | 2 | 3 | 273 | 0 | 562 |
| 4:00 P | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 278 | 2 | 7 | 3 | 271 | 0 | 557 |
| 4:15 P | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 301 | 2 | 3 | 1 | 294 | 0 | 602 |
| 4:30 P | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 301 | 2 | 6 | 4 | 315 | 0 | 623 |
| 4:45 P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 339 | 2 | 2 | 0 | 282 | 0 | 623 |
| 5:00 P | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 285 | 0 | 4 | 3 | 314 | 0 | 605 |
| 5:15 P | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 330 | 1 | 1 | 2 | 357 | 0 | 692 |
| 5:30 P | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 293 | 2 | 2 | 2 | 292 | 0 | 593 |
| 5:45 P | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 264 | 3 | 1 | 0 | 313 | 0 | 585 |
| 6:00 P | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 277 | 2 | 2 | 3 | 311 | 0 | 596 |
| 6:15 P | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 272 | 2 | 5 | 4 | 279 | 0 | 559 |
| 6:30 P | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 315 | 1 | 5 | 2 | 275 | 0 | 595 |

| | | | | | | | | | | | | | | | | | |
|-------------------------------|------|---|---|----|-----|---|---|---|------|---|------|----|------|----|------|---|------|
| Total Survey | 1 | 9 | 0 | 20 | 0 | 4 | 0 | 0 | 26 | 0 | 3536 | 20 | 40 | 27 | 3576 | 0 | 7192 |
| Peak Hour: 4:15 PM to 5:15 PM | | | | | | | | | | | | | | | | | |
| Total | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 12 | 0 | 1255 | 5 | 13 | 9 | 1268 | 0 | 2543 |
| Approach | 6 | | | | 0 | | | | 1260 | | | | 1277 | | | | 2543 |
| %HV | n/a | | | | n/a | | | | 1.0% | | | | 1.0% | | | | 1.0% |
| PHF | 0.50 | | | | n/a | | | | 0.92 | | | | 0.89 | | | | 0.92 |



TS117058M_02p



Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 128th Ave NE & NE 85th St

Date of Count: Thurs 5/18/2017

Location: Kirkland, Washington

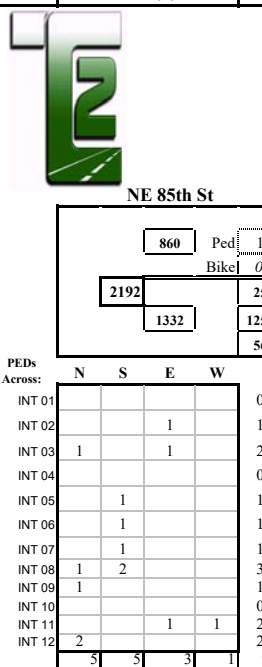
Checked By: Jess

| Time Interval Ending at | From North on (SB) 128th Ave NE | | | | From South on (NB) 128th Ave NE | | | | From East on (WB) NE 85th St | | | | From West on (EB) NE 85th St | | | | Interval Total |
|-------------------------|------------------------------------|----|----|----|------------------------------------|----|---|----|---------------------------------|----|-----|---|---------------------------------|---|-----|----|----------------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | |
| 6:15 A | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 1 | 86 | 0 | 3 | 0 | 183 | 2 | 278 |
| 6:30 A | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 5 | 3 | 92 | 1 | 2 | 0 | 145 | 4 | 252 |
| 6:45 A | 0 | 3 | 2 | 7 | 0 | 1 | 1 | 5 | 3 | 4 | 110 | 1 | 4 | 2 | 203 | 4 | 343 |
| 7:00 A | 0 | 4 | 1 | 0 | 0 | 3 | 1 | 1 | 3 | 1 | 140 | 1 | 6 | 2 | 205 | 10 | 369 |
| 7:15 A | 1 | 5 | 5 | 5 | 0 | 3 | 0 | 0 | 4 | 4 | 143 | 1 | 5 | 2 | 216 | 5 | 389 |
| 7:30 A | 0 | 10 | 9 | 7 | 0 | 6 | 2 | 2 | 3 | 2 | 194 | 0 | 2 | 6 | 236 | 13 | 487 |
| 7:45 A | 0 | 6 | 8 | 8 | 0 | 4 | 1 | 8 | 3 | 5 | 222 | 3 | 5 | 2 | 301 | 14 | 582 |
| 8:00 A | 2 | 14 | 12 | 9 | 0 | 10 | 3 | 2 | 7 | 9 | 205 | 2 | 3 | 4 | 300 | 10 | 580 |
| 8:15 A | 0 | 18 | 7 | 10 | 0 | 12 | 5 | 5 | 4 | 13 | 199 | 6 | 5 | 6 | 296 | 16 | 593 |
| 8:30 A | 0 | 35 | 16 | 17 | 0 | 23 | 2 | 22 | 6 | 26 | 168 | 1 | 7 | 6 | 339 | 15 | 670 |
| 8:45 A | 0 | 34 | 21 | 8 | 0 | 15 | 3 | 23 | 5 | 4 | 190 | 3 | 5 | 5 | 286 | 12 | 604 |
| 9:00 A | 0 | 28 | 19 | 10 | 0 | 3 | 1 | 5 | 3 | 4 | 205 | 2 | 4 | 8 | 330 | 13 | 628 |

| | | | | | | | | | | | | | | | | | |
|--------------|---|-----|-----|----|---|----|----|----|----|----|------|----|----|----|------|-----|------|
| Total Survey | 3 | 159 | 101 | 84 | 0 | 85 | 19 | 75 | 46 | 76 | 1954 | 21 | 51 | 43 | 3040 | 118 | 5775 |
|--------------|---|-----|-----|----|---|----|----|----|----|----|------|----|----|----|------|-----|------|

Peak Hour: 8:00 AM to 9:00 AM

| | | | | | | | | | | | | | | | | | |
|----------|------|-----|----|----|------|----|----|----|------|----|-----|----|------|----|------|----|------|
| Total | 0 | 115 | 63 | 45 | 0 | 53 | 11 | 55 | 18 | 47 | 762 | 12 | 21 | 25 | 1251 | 56 | 2495 |
| Approach | 223 | | | | 119 | | | | 821 | | | | 1332 | | | | 2495 |
| %HV | n/a | | | | n/a | | | | 2.2% | | | | 1.6% | | | | 1.6% |
| PHF | 0.82 | | | | 0.63 | | | | 0.94 | | | | 0.93 | | | | 0.93 |



PEDs Across:

| | N | S | E | W |
|---------------|----------|----------|----------|----------|
| INT 01 | | | | |
| INT 02 | | | 1 | |
| INT 03 | 1 | | 1 | |
| INT 04 | | | | |
| INT 05 | | 1 | | |
| INT 06 | | 1 | | |
| INT 07 | | 1 | | |
| INT 08 | 1 | 2 | | |
| INT 09 | 1 | | | |
| INT 10 | | | | |
| INT 11 | | | 1 | 1 |
| INT 12 | 2 | | | |
| Totals | 5 | 5 | 3 | 1 |

Special Notes

8:00 AM to 9:00 AM

| Bicycles From: | N | S | E | W |
|----------------|----------|----------|----------|----------|
| INT 01 | | | | |
| INT 02 | | | | |
| INT 03 | | | | |
| INT 04 | | | | |
| INT 05 | | | | |
| INT 06 | | | | |
| INT 07 | | | 1 | 1 |
| INT 08 | | | 1 | 1 |
| INT 09 | | | | |
| INT 10 | | | | |
| INT 11 | | | | |
| INT 12 | | | | |
| Totals | 0 | 0 | 1 | 3 |

2680 1.0 PHF Peak Hour Volume

| | PHF | %HV |
|---------------|------|------|
| EB | 0.93 | 1.6% |
| WB | 0.94 | 2.2% |
| NB | 0.63 | n/a |
| SB | 0.82 | n/a |
| T Int. | 0.93 | 1.6% |

Check In: 2495 Out: 2495

Conditions:

TSI17058M_03a

Prepared for: **Transportation Solutions, Inc.****Traffic Count Consultants, Inc.**

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

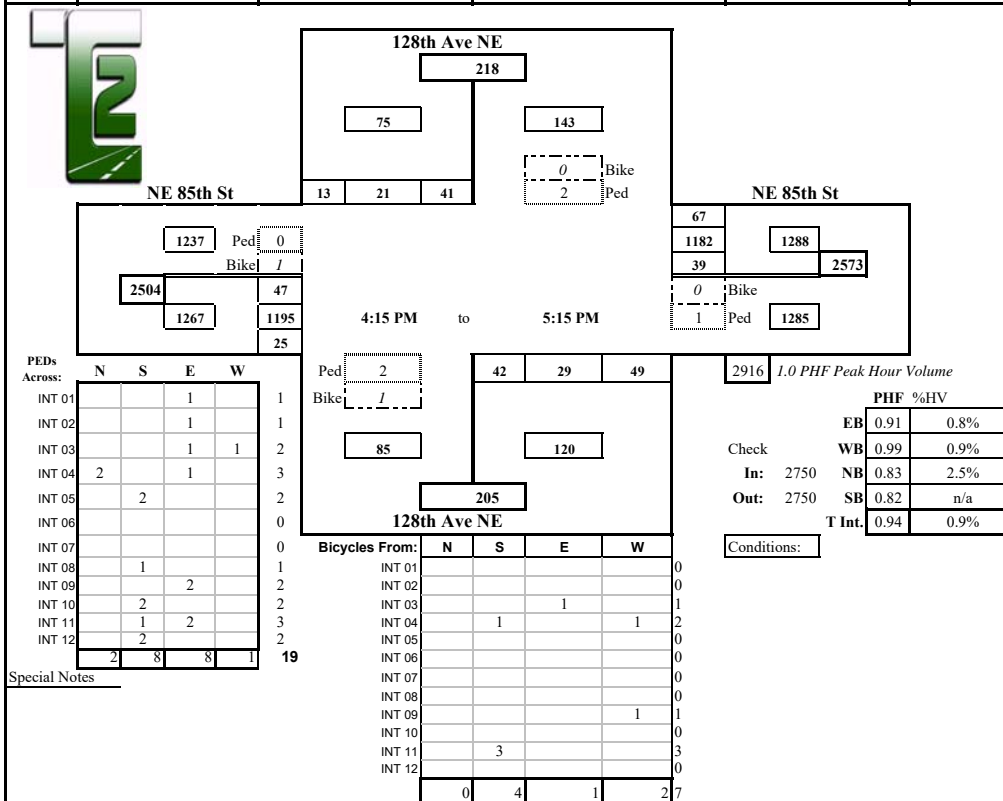
Intersection: 128th Ave NE & NE 85th St**Date of Count:** Thurs 5/18/2017**Location:** Kirkland, Washington**Checked By:** Jess

| Time Interval Ending at | From North on (SB) 128th Ave NE | | | | From South on (NB) 128th Ave NE | | | | From East on (WB) NE 85th St | | | | From West on (EB) NE 85th St | | | | Interval Total |
|----------------------------|------------------------------------|----|----|---|------------------------------------|----|----|----|---------------------------------|----|-----|----|---------------------------------|----|-----|----|-------------------|
| | T | L | S | R | T | L | S | R | T | L | S | R | T | L | S | R | |
| 3:45 P | 0 | 1 | 1 | 4 | 0 | 15 | 7 | 12 | 5 | 7 | 270 | 2 | 2 | 5 | 260 | 10 | 594 |
| 4:00 P | 0 | 6 | 7 | 2 | 0 | 12 | 5 | 12 | 2 | 3 | 252 | 7 | 8 | 8 | 254 | 8 | 576 |
| 4:15 P | 0 | 3 | 6 | 5 | 1 | 3 | 3 | 7 | 1 | 4 | 291 | 12 | 3 | 8 | 282 | 9 | 633 |
| 4:30 P | 0 | 5 | 6 | 3 | 1 | 9 | 5 | 13 | 1 | 7 | 307 | 7 | 4 | 8 | 305 | 8 | 683 |
| 4:45 P | 0 | 11 | 2 | 3 | 1 | 12 | 9 | 15 | 5 | 7 | 302 | 13 | 2 | 8 | 268 | 4 | 654 |
| 5:00 P | 0 | 13 | 3 | 6 | 1 | 7 | 7 | 11 | 2 | 12 | 298 | 11 | 3 | 19 | 290 | 7 | 684 |
| 5:15 P | 0 | 12 | 10 | 1 | 0 | 14 | 8 | 10 | 3 | 13 | 275 | 36 | 1 | 12 | 332 | 6 | 729 |
| 5:30 P | 0 | 9 | 4 | 3 | 1 | 7 | 13 | 9 | 2 | 10 | 288 | 21 | 3 | 9 | 288 | 17 | 678 |
| 5:45 P | 0 | 14 | 7 | 8 | 0 | 16 | 12 | 11 | 0 | 13 | 228 | 17 | 1 | 16 | 283 | 9 | 634 |
| 6:00 P | 0 | 18 | 2 | 6 | 0 | 5 | 15 | 13 | 1 | 13 | 275 | 17 | 2 | 13 | 296 | 7 | 680 |
| 6:15 P | 0 | 8 | 4 | 5 | 0 | 10 | 12 | 8 | 1 | 7 | 247 | 12 | 5 | 13 | 263 | 6 | 595 |
| 6:30 P | 0 | 9 | 1 | 2 | 0 | 12 | 3 | 6 | 2 | 6 | 325 | 14 | 6 | 12 | 251 | 2 | 643 |

| | | | | | | | | | | | | | | | | | |
|-------|---|-----|----|----|---|-----|----|-----|----|-----|------|-----|----|-----|------|----|------|
| Total | 0 | 109 | 53 | 48 | 5 | 122 | 99 | 127 | 25 | 102 | 3358 | 169 | 40 | 131 | 3372 | 93 | 7783 |
|-------|---|-----|----|----|---|-----|----|-----|----|-----|------|-----|----|-----|------|----|------|

| | | | | | | | | | | | | | | | | | |
|--|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | Peak Hour: 4:15 PM to 5:15 PM | | | | | | | | | | | | | | | | |
|--|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

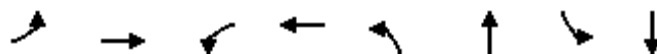
| | | | | | | | | | | | | | | | | | |
|----------|------|----|----|----|------|----|----|----|------|----|------|----|------|----|------|----|------|
| Total | 0 | 41 | 21 | 13 | 3 | 42 | 29 | 49 | 11 | 39 | 1182 | 67 | 10 | 47 | 1195 | 25 | 2750 |
| Approach | 75 | | | | 120 | | | | 1288 | | | | 1267 | | | | 2750 |
| %HV | n/a | | | | 2.5% | | | | 0.9% | | | | 0.8% | | | | 0.9% |
| PHF | 0.82 | | | | 0.83 | | | | 0.99 | | | | 0.91 | | | | 0.94 |



TS117058M_03p

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 25 | 1250 | 45 | 760 | 55 | 10 | 120 | 70 |
| Future Volume (vph) | 25 | 1250 | 45 | 760 | 55 | 10 | 120 | 70 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 |
| Minimum Split (s) | 9.0 | 27.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 20.0 | 61.0 | 20.0 | 61.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 16.7% | 50.8% | 16.7% | 50.8% | 10.0% | 22.5% | 10.0% | 22.5% |
| Yellow Time (s) | 3.0 | 5.0 | 3.4 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 5.0 | 4.4 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 83.8 | 77.0 | 85.2 | 80.4 | 20.1 | 12.3 | 20.2 | 15.7 |
| Actuated g/C Ratio | 0.70 | 0.64 | 0.71 | 0.67 | 0.17 | 0.10 | 0.17 | 0.13 |
| v/c Ratio | 0.06 | 0.62 | 0.19 | 0.35 | 0.28 | 0.34 | 0.55 | 0.50 |
| Control Delay | 5.6 | 15.6 | 4.7 | 3.0 | 41.4 | 18.6 | 50.6 | 45.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.6 | 15.6 | 4.7 | 3.0 | 41.4 | 18.6 | 50.6 | 45.6 |
| LOS | A | B | A | A | D | B | D | D |
| Approach Delay | | 15.5 | | 3.1 | | 28.5 | | 48.1 |
| Approach LOS | | B | | A | | C | | D |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 31 (26%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 15.2

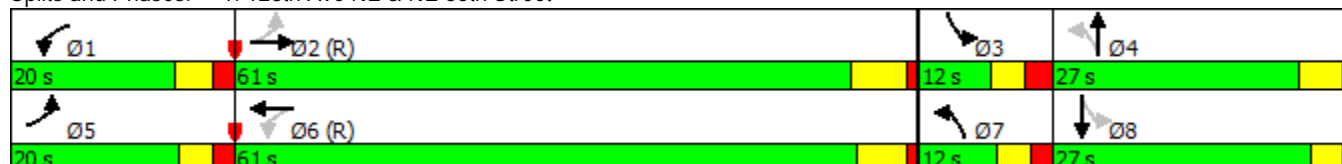
Intersection LOS: B

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15





















Splits and Phases: 1: 128th Ave NE & NE 85th Street



HCM 2010 Signalized Intersection Summary

1: 128th Ave NE & NE 85th Street

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: AM





| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 25 | 1250 | 55 | 45 | 760 | 10 | 55 | 10 | 60 | 120 | 70 | 50 |
| Future Volume (veh/h) | 25 | 1250 | 55 | 45 | 760 | 10 | 55 | 10 | 60 | 120 | 70 | 50 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 27 | 1344 | 59 | 48 | 817 | 11 | 59 | 11 | 65 | 129 | 75 | 54 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cap, veh/h | 546 | 2287 | 100 | 293 | 2404 | 32 | 197 | 22 | 128 | 236 | 113 | 81 |
| Arrive On Green | 0.03 | 0.66 | 0.65 | 0.07 | 1.00 | 1.00 | 0.05 | 0.09 | 0.08 | 0.06 | 0.11 | 0.10 |
| Sat Flow, veh/h | 1774 | 3454 | 151 | 1774 | 3576 | 48 | 1810 | 237 | 1398 | 1810 | 1024 | 738 |
| Grp Volume(v), veh/h | 27 | 688 | 715 | 48 | 404 | 424 | 59 | 0 | 76 | 129 | 0 | 129 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1836 | 1774 | 1770 | 1854 | 1810 | 0 | 1635 | 1810 | 0 | 1762 |
| Q Serve(g_s), s | 0.6 | 25.8 | 25.9 | 1.0 | 0.0 | 0.0 | 3.5 | 0.0 | 5.3 | 7.5 | 0.0 | 8.4 |
| Cycle Q Clear(g_c), s | 0.6 | 25.8 | 25.9 | 1.0 | 0.0 | 0.0 | 3.5 | 0.0 | 5.3 | 7.5 | 0.0 | 8.4 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.03 | 1.00 | | 0.86 | 1.00 | | 0.42 |
| Lane Grp Cap(c), veh/h | 546 | 1172 | 1216 | 293 | 1190 | 1247 | 197 | 0 | 149 | 236 | 0 | 194 |
| V/C Ratio(X) | 0.05 | 0.59 | 0.59 | 0.16 | 0.34 | 0.34 | 0.30 | 0.00 | 0.51 | 0.55 | 0.00 | 0.66 |
| Avail Cap(c_a), veh/h | 733 | 1172 | 1216 | 461 | 1190 | 1247 | 231 | 0 | 313 | 236 | 0 | 352 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.8 | 11.2 | 11.3 | 8.5 | 0.0 | 0.0 | 46.1 | 0.0 | 52.4 | 46.6 | 0.0 | 51.5 |
| Incr Delay (d2), s/veh | 0.0 | 2.2 | 2.1 | 0.3 | 0.8 | 0.7 | 0.8 | 0.0 | 2.7 | 2.7 | 0.0 | 3.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.5 | 19.1 | 19.7 | 0.9 | 0.5 | 0.5 | 3.2 | 0.0 | 4.5 | 7.2 | 0.0 | 7.7 |
| LnGrp Delay(d),s/veh | 5.9 | 13.4 | 13.3 | 8.8 | 0.8 | 0.7 | 47.0 | 0.0 | 55.0 | 49.2 | 0.0 | 55.3 |
| LnGrp LOS | A | B | B | A | A | A | D | | E | D | | E |
| Approach Vol, veh/h | 1430 | | | | 876 | | | | 135 | | | |
| Approach Delay, s/veh | 13.2 | | | | 1.2 | | | | 51.5 | | | |
| Approach LOS | B | | | | A | | | | D | | | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.6 | 84.5 | 12.0 | 15.0 | 7.4 | 85.7 | 9.7 | 17.2 | | | | |
| Change Period (Y+Rc), s | 5.4 | 6.0 | 5.5 | 5.0 | 5.0 | * 6 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 14.6 | 55.0 | 6.5 | 22.0 | 15.0 | * 56 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.0 | 27.9 | 9.5 | 7.3 | 2.6 | 2.0 | 5.5 | 10.4 | | | | |
| Green Ext Time (p_c), s | 0.1 | 17.9 | 0.0 | 0.9 | 0.0 | 26.3 | 0.0 | 0.8 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 15.0 | | | | | | | | | | | |
| HCM 2010 LOS | B | | | | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: AM

Intersection

Int Delay, s/veh 0.2





















| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|--------------------------|---|---|---|------|---|------|
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 15 | 1350 | 750 | 5 | 5 | 15 |
| Future Vol, veh/h | 15 | 1350 | 750 | 5 | 5 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 0 | 2 | 2 | 0 | 6 | 6 |
| Mvmt Flow | 15 | 1392 | 773 | 5 | 5 | 15 |

| Major/Minor | Major1 | Major2 | Minor2 |
|----------------------|--------|--------|---------------|
| Conflicting Flow All | 778 | 0 | 0 1503 392 |
| Stage 1 | - | - | - - 776 - |
| Stage 2 | - | - | - - 727 - |
| Critical Hdwy | 4.1 | - | - - 6.92 7.02 |
| Critical Hdwy Stg 1 | - | - | - - 5.92 - |
| Critical Hdwy Stg 2 | - | - | - - 5.92 - |
| Follow-up Hdwy | 2.2 | - | - - 3.56 3.36 |
| Pot Cap-1 Maneuver | 848 | - | - - 108 596 |
| Stage 1 | - | - | - - 404 - |
| Stage 2 | - | - | - - 429 - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 846 | - | - - 106 594 |
| Mov Cap-2 Maneuver | - | - | - - 237 - |
| Stage 1 | - | - | - - 404 - |
| Stage 2 | - | - | - - 421 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.1 | 0 | 13.8 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 846 | - | - | - | 432 |
| HCM Lane V/C Ratio | 0.018 | - | - | - | 0.048 |
| HCM Control Delay (s) | 9.3 | - | - | - | 13.8 |
| HCM Lane LOS | A | - | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.1 |









Timings 3: 132nd Ave NE & NE 85th Street/Redmond Way

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 50 | 1260 | 50 | 725 | 170 | 40 | 75 | 20 | 485 | 170 |
| Future Volume (vph) | 50 | 1260 | 50 | 725 | 170 | 40 | 75 | 20 | 485 | 170 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 7.8 | 31.6 | 11.8 | 26.6 | 7.8 | 7.8 | 33.7 | 11.8 | 7.8 | 32.6 |
| Total Split (s) | 20.0 | 48.0 | 16.0 | 44.0 | 30.0 | 15.0 | 26.0 | 16.0 | 30.0 | 41.0 |
| Total Split (%) | 16.7% | 40.0% | 13.3% | 36.7% | 25.0% | 12.5% | 21.7% | 13.3% | 25.0% | 34.2% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.4 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | 0.0 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 64.3 | 58.6 | 64.3 | 58.6 | 83.6 | 11.2 | 11.0 | 18.6 | 24.7 | 28.9 |
| Actuated g/C Ratio | 0.54 | 0.49 | 0.54 | 0.49 | 0.70 | 0.09 | 0.09 | 0.16 | 0.21 | 0.24 |
| v/c Ratio | 0.15 | 0.82 | 0.30 | 0.45 | 0.16 | 0.26 | 0.47 | 0.07 | 1.39 | 0.51 |
| Control Delay | 23.1 | 43.5 | 17.0 | 22.4 | 1.3 | 53.2 | 60.2 | 0.5 | 229.2 | 43.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.1 | 43.5 | 17.0 | 22.4 | 1.3 | 53.2 | 60.2 | 0.5 | 229.2 | 43.8 |
| LOS | C | D | B | C | A | D | E | A | F | D |
| Approach Delay | | 42.7 | | 18.4 | | | 49.3 | | | 172.4 |
| Approach LOS | | D | | B | | | D | | | F |

Intersection Summary
























| | |
|---|------------------------|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green | |
| Natural Cycle: 145 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.39 | |
| Intersection Signal Delay: 64.4 | Intersection LOS: E |
| Intersection Capacity Utilization 83.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 20 s | 44 s | 30 s | 26 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø8 | Ø7 |
| 16 s | 48 s | 41 s | 15 s |

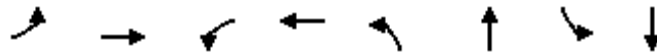
HCM 2010 Signalized Intersection Summary 3: 132nd Ave NE & NE 85th Street/Redmond Way

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: AM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 50 | 1260 | 75 | 50 | 725 | 170 | 40 | 75 | 20 | 485 | 170 | 45 |
| Future Volume (veh/h) | 50 | 1260 | 75 | 50 | 725 | 170 | 40 | 75 | 20 | 485 | 170 | 45 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.94 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1845 | 1845 | 1845 | 1845 | 1845 | 1845 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 53 | 1326 | 79 | 53 | 763 | 179 | 42 | 79 | 21 | 511 | 179 | 47 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| Cap, veh/h | 340 | 1712 | 102 | 196 | 1821 | 1143 | 217 | 136 | 180 | 369 | 220 | 58 |
| Arrive On Green | 0.02 | 0.34 | 0.33 | 0.05 | 0.52 | 0.52 | 0.12 | 0.07 | 0.07 | 0.21 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1774 | 3395 | 202 | 1757 | 3505 | 1566 | 1757 | 1845 | 1473 | 1792 | 1431 | 376 |
| Grp Volume(v), veh/h | 53 | 690 | 715 | 53 | 763 | 179 | 42 | 79 | 21 | 511 | 0 | 226 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1827 | 1757 | 1752 | 1566 | 1757 | 1845 | 1473 | 1792 | 0 | 1807 |
| Q Serve(g_s), s | 1.7 | 41.9 | 42.2 | 1.7 | 16.0 | 4.2 | 2.6 | 5.0 | 1.5 | 24.7 | 0.0 | 14.5 |
| Cycle Q Clear(g_c), s | 1.7 | 41.9 | 42.2 | 1.7 | 16.0 | 4.2 | 2.6 | 5.0 | 1.5 | 24.7 | 0.0 | 14.5 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.21 |
| Lane Grp Cap(c), veh/h | 340 | 892 | 921 | 196 | 1821 | 1143 | 217 | 136 | 180 | 369 | 0 | 277 |
| V/C Ratio(X) | 0.16 | 0.77 | 0.78 | 0.27 | 0.42 | 0.16 | 0.19 | 0.58 | 0.12 | 1.39 | 0.00 | 0.81 |
| Avail Cap(c_a), veh/h | 503 | 892 | 921 | 273 | 1821 | 1143 | 217 | 320 | 327 | 369 | 0 | 533 |
| HCM Platoon Ratio | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.7 | 33.6 | 33.7 | 21.4 | 17.7 | 5.0 | 47.2 | 53.8 | 47.2 | 47.7 | 0.0 | 49.1 |
| Incr Delay (d2), s/veh | 0.2 | 6.5 | 6.4 | 0.7 | 0.7 | 0.3 | 0.4 | 3.9 | 0.3 | 189.6 | 0.0 | 5.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.5 | 29.9 | 30.8 | 1.5 | 12.5 | 3.4 | 2.3 | 4.8 | 1.1 | 56.9 | 0.0 | 12.2 |
| LnGrp Delay(d),s/veh | 14.9 | 40.1 | 40.1 | 22.1 | 18.4 | 5.3 | 47.7 | 57.7 | 47.5 | 237.3 | 0.0 | 54.9 |
| LnGrp LOS | B | D | D | C | B | A | D | E | D | F | | D |
| Approach Vol, veh/h | | 1458 | | | 995 | | | 142 | | | 737 | |
| Approach Delay, s/veh | | 39.1 | | | 16.3 | | | 53.2 | | | 181.3 | |
| Approach LOS | | D | | | B | | | D | | | F | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.9 | 66.9 | 30.0 | 14.1 | 10.8 | 65.1 | 20.1 | 24.0 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.6 | | | | |
| Max Green Setting (Gmax), s | * 14 | * 38 | * 24 | * 20 | * 10 | * 42 | * 9.2 | * 35 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.7 | 18.0 | 26.7 | 7.0 | 3.7 | 44.2 | 4.6 | 16.5 | | | | |
| Green Ext Time (p_c), s | 0.1 | 15.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.2 | 1.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 64.4 | | | | | | | | |
| HCM 2010 LOS | | | | E | | | | | | | | |
| Notes | | | | | | | | | | | | |

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 25 | 1325 | 50 | 805 | 60 | 10 | 120 | 70 |
| Future Volume (vph) | 25 | 1325 | 50 | 805 | 60 | 10 | 120 | 70 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 |
| Minimum Split (s) | 9.0 | 27.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 20.0 | 61.0 | 20.0 | 61.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 16.7% | 50.8% | 16.7% | 50.8% | 10.0% | 22.5% | 10.0% | 22.5% |
| Yellow Time (s) | 3.0 | 5.0 | 3.4 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 5.0 | 4.4 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 83.6 | 76.8 | 85.4 | 80.4 | 20.1 | 12.3 | 20.2 | 15.7 |
| Actuated g/C Ratio | 0.70 | 0.64 | 0.71 | 0.67 | 0.17 | 0.10 | 0.17 | 0.13 |
| v/c Ratio | 0.06 | 0.66 | 0.23 | 0.37 | 0.31 | 0.34 | 0.55 | 0.50 |
| Control Delay | 5.7 | 16.8 | 7.6 | 3.1 | 42.1 | 18.6 | 50.6 | 45.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.7 | 16.8 | 7.6 | 3.1 | 42.1 | 18.6 | 50.6 | 45.6 |
| LOS | A | B | A | A | D | B | D | D |
| Approach Delay | | 16.6 | | 3.3 | | 29.4 | | 48.1 |
| Approach LOS | | B | | A | | C | | D |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 31 (26%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 15.7

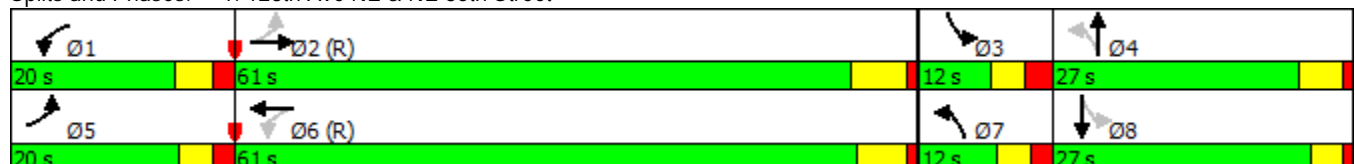
Intersection LOS: B

Intersection Capacity Utilization 61.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: 128th Ave NE & NE 85th Street























HCM 2010 Signalized Intersection Summary

1: 128th Ave NE & NE 85th Street





2020 Without Project

Timing Plan: AM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 25 | 1325 | 60 | 50 | 805 | 10 | 60 | 10 | 60 | 120 | 70 | 50 |
| Future Volume (veh/h) | 25 | 1325 | 60 | 50 | 805 | 10 | 60 | 10 | 60 | 120 | 70 | 50 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 27 | 1425 | 65 | 54 | 866 | 11 | 65 | 11 | 65 | 129 | 75 | 54 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cap, veh/h | 524 | 2266 | 103 | 270 | 2393 | 30 | 204 | 22 | 133 | 241 | 113 | 81 |
| Arrive On Green | 0.03 | 0.66 | 0.65 | 0.07 | 1.00 | 1.00 | 0.05 | 0.09 | 0.09 | 0.06 | 0.11 | 0.10 |
| Sat Flow, veh/h | 1774 | 3448 | 157 | 1774 | 3579 | 45 | 1810 | 237 | 1399 | 1810 | 1024 | 738 |
| Grp Volume(v), veh/h | 27 | 730 | 760 | 54 | 428 | 449 | 65 | 0 | 76 | 129 | 0 | 129 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1835 | 1774 | 1770 | 1855 | 1810 | 0 | 1636 | 1810 | 0 | 1762 |
| Q Serve(g_s), s | 0.6 | 28.9 | 29.1 | 1.1 | 0.0 | 0.0 | 3.8 | 0.0 | 5.3 | 7.5 | 0.0 | 8.4 |
| Cycle Q Clear(g_c), s | 0.6 | 28.9 | 29.1 | 1.1 | 0.0 | 0.0 | 3.8 | 0.0 | 5.3 | 7.5 | 0.0 | 8.4 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 0.02 | 1.00 | | 0.86 | 1.00 | | 0.42 |
| Lane Grp Cap(c), veh/h | 524 | 1163 | 1206 | 270 | 1183 | 1240 | 204 | 0 | 155 | 241 | 0 | 194 |
| V/C Ratio(X) | 0.05 | 0.63 | 0.63 | 0.20 | 0.36 | 0.36 | 0.32 | 0.00 | 0.49 | 0.54 | 0.00 | 0.66 |
| Avail Cap(c_a), veh/h | 710 | 1163 | 1206 | 436 | 1183 | 1240 | 231 | 0 | 314 | 241 | 0 | 352 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 6.0 | 12.0 | 12.1 | 9.6 | 0.0 | 0.0 | 45.6 | 0.0 | 52.0 | 46.2 | 0.0 | 51.5 |
| Incr Delay (d2), s/veh | 0.0 | 2.6 | 2.5 | 0.4 | 0.9 | 0.8 | 0.9 | 0.0 | 2.4 | 2.3 | 0.0 | 3.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.5 | 21.1 | 21.9 | 1.0 | 0.5 | 0.5 | 3.5 | 0.0 | 4.5 | 7.2 | 0.0 | 7.7 |
| LnGrp Delay(d),s/veh | 6.1 | 14.6 | 14.6 | 9.9 | 0.9 | 0.8 | 46.4 | 0.0 | 54.3 | 48.5 | 0.0 | 55.3 |
| LnGrp LOS | A | B | B | A | A | A | D | | D | D | | E |
| Approach Vol, veh/h | | 1517 | | | 931 | | | 141 | | | 258 | |
| Approach Delay, s/veh | | 14.4 | | | 1.4 | | | 50.7 | | | 51.9 | |
| Approach LOS | | B | | | A | | | D | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.7 | 83.9 | 12.0 | 15.4 | 7.4 | 85.2 | 10.2 | 17.2 | | | | |
| Change Period (Y+Rc), s | 5.4 | 6.0 | 5.5 | 5.0 | 5.0 | * 6 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 14.6 | 55.0 | 6.5 | 22.0 | 15.0 | * 56 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.1 | 31.1 | 9.5 | 7.3 | 2.6 | 2.0 | 5.8 | 10.4 | | | | |
| Green Ext Time (p_c), s | 0.1 | 17.4 | 0.0 | 0.9 | 0.0 | 29.2 | 0.0 | 0.8 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 15.3 | | | | | | | | |
| HCM 2010 LOS | | | | B | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2020 Without Project
Timing Plan: AM





















| Intersection | | | | | | |
|--------------------------|---|---|---|--------|---|------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 15 | 1435 | 795 | 5 | 5 | 15 |
| Future Vol, veh/h | 15 | 1435 | 795 | 5 | 5 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 0 | 2 | 2 | 0 | 6 | 6 |
| Mvmt Flow | 15 | 1479 | 820 | 5 | 5 | 15 |
| | | | | | | |
| Major/Minor | Major1 | Major2 | | Minor2 | | |
| Conflicting Flow All | 825 | 0 | - | 0 | 1593 | 415 |
| Stage 1 | - | - | - | - | 822 | - |
| Stage 2 | - | - | - | - | 771 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.92 | 7.02 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.92 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.92 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.56 | 3.36 |
| Pot Cap-1 Maneuver | 814 | - | - | - | 94 | 575 |
| Stage 1 | - | - | - | - | 382 | - |
| Stage 2 | - | - | - | - | 407 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 812 | - | - | - | 92 | 573 |
| Mov Cap-2 Maneuver | - | - | - | - | 220 | - |
| Stage 1 | - | - | - | - | 382 | - |
| Stage 2 | - | - | - | - | 399 | - |
| | | | | | | |
| Approach | EB | WB | | SB | | |
| HCM Control Delay, s | 0.1 | 0 | | 14.3 | | |
| HCM LOS | B | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | |
| Capacity (veh/h) | 812 | - | - | - | 409 | |
| HCM Lane V/C Ratio | 0.019 | - | - | - | 0.05 | |
| HCM Control Delay (s) | 9.5 | - | - | - | 14.3 | |
| HCM Lane LOS | A | - | - | - | B | |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.2 | |

Timings

2020 Without Project

Timing Plan: AM

3: 132nd Ave NE & NE 85th Street/Redmond Way

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 55 | 1335 | 55 | 770 | 180 | 40 | 80 | 20 | 515 | 180 |
| Future Volume (vph) | 55 | 1335 | 55 | 770 | 180 | 40 | 80 | 20 | 515 | 180 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 7.8 | 31.6 | 11.8 | 26.6 | 7.8 | 7.8 | 33.7 | 11.8 | 7.8 | 32.6 |
| Total Split (s) | 20.0 | 48.0 | 16.0 | 44.0 | 30.0 | 15.0 | 26.0 | 16.0 | 30.0 | 41.0 |
| Total Split (%) | 16.7% | 40.0% | 13.3% | 36.7% | 25.0% | 12.5% | 21.7% | 13.3% | 25.0% | 34.2% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.4 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | 0.0 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 64.0 | 58.1 | 64.0 | 58.1 | 83.1 | 10.7 | 11.3 | 19.1 | 24.7 | 29.7 |
| Actuated g/C Ratio | 0.53 | 0.48 | 0.53 | 0.48 | 0.69 | 0.09 | 0.09 | 0.16 | 0.21 | 0.25 |
| v/c Ratio | 0.18 | 0.88 | 0.32 | 0.48 | 0.17 | 0.27 | 0.49 | 0.07 | 1.48 | 0.53 |
| Control Delay | 23.3 | 46.7 | 17.7 | 23.3 | 1.3 | 54.2 | 60.3 | 0.4 | 263.8 | 43.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.3 | 46.7 | 17.7 | 23.3 | 1.3 | 54.2 | 60.3 | 0.4 | 263.8 | 43.6 |
| LOS | C | D | B | C | A | D | E | A | F | D |
| Approach Delay | | 45.8 | | 19.1 | | | 50.0 | | | 195.8 |
| Approach LOS | | D | | B | | | D | | | F |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.48

Intersection Signal Delay: 71.3

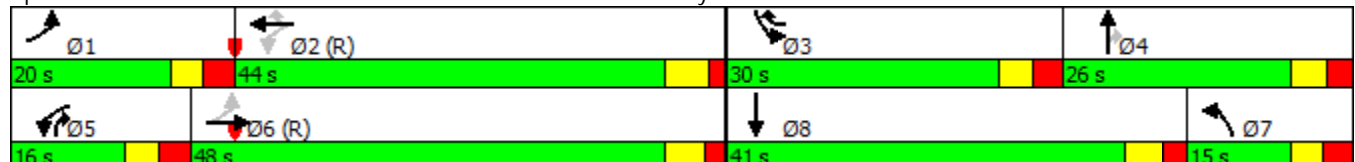
Intersection LOS: E

Intersection Capacity Utilization 89.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way

























HCM 2010 Signalized Intersection Summary

3: 132nd Ave NE & NE 85th Street/Redmond Way

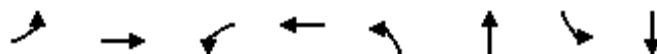
2020 Without Project

Timing Plan: AM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  | |
| Traffic Volume (veh/h) | 55 | 1335 | 80 | 55 | 770 | 180 | 40 | 80 | 20 | 515 | 180 | 50 |
| Future Volume (veh/h) | 55 | 1335 | 80 | 55 | 770 | 180 | 40 | 80 | 20 | 515 | 180 | 50 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.94 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1845 | 1845 | 1845 | 1845 | 1845 | 1845 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 58 | 1405 | 84 | 58 | 811 | 189 | 42 | 84 | 21 | 542 | 189 | 53 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| Cap, veh/h | 322 | 1698 | 101 | 182 | 1804 | 1136 | 206 | 140 | 186 | 369 | 228 | 64 |
| Arrive On Green | 0.02 | 0.34 | 0.33 | 0.05 | 0.51 | 0.51 | 0.12 | 0.08 | 0.08 | 0.21 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1774 | 3394 | 202 | 1757 | 3505 | 1566 | 1757 | 1845 | 1476 | 1792 | 1409 | 395 |
| Grp Volume(v), veh/h | 58 | 731 | 758 | 58 | 811 | 189 | 42 | 84 | 21 | 542 | 0 | 242 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1827 | 1757 | 1752 | 1566 | 1757 | 1845 | 1476 | 1792 | 0 | 1804 |
| Q Serve(g_s), s | 1.9 | 45.5 | 45.9 | 1.9 | 17.5 | 4.5 | 2.6 | 5.3 | 1.5 | 24.7 | 0.0 | 15.6 |
| Cycle Q Clear(g_c), s | 1.9 | 45.5 | 45.9 | 1.9 | 17.5 | 4.5 | 2.6 | 5.3 | 1.5 | 24.7 | 0.0 | 15.6 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 322 | 885 | 914 | 182 | 1804 | 1136 | 206 | 140 | 186 | 369 | 0 | 293 |
| V/C Ratio(X) | 0.18 | 0.83 | 0.83 | 0.32 | 0.45 | 0.17 | 0.20 | 0.60 | 0.11 | 1.47 | 0.00 | 0.83 |
| Avail Cap(c_a), veh/h | 482 | 885 | 914 | 256 | 1804 | 1136 | 206 | 320 | 329 | 369 | 0 | 532 |
| HCM Platoon Ratio | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.1 | 35.1 | 35.2 | 23.5 | 18.4 | 5.2 | 47.9 | 53.7 | 46.8 | 47.7 | 0.0 | 48.6 |
| Incr Delay (d2), s/veh | 0.3 | 8.6 | 8.6 | 1.0 | 0.8 | 0.3 | 0.5 | 4.0 | 0.3 | 225.7 | 0.0 | 5.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.7 | 32.6 | 33.6 | 1.7 | 13.5 | 3.7 | 2.3 | 5.2 | 1.1 | 63.6 | 0.0 | 13.0 |
| LnGrp Delay(d),s/veh | 15.4 | 43.7 | 43.8 | 24.5 | 19.2 | 5.5 | 48.4 | 57.7 | 47.1 | 273.3 | 0.0 | 54.6 |
| LnGrp LOS | B | D | D | C | B | A | D | E | D | F | | D |
| Approach Vol, veh/h | | 1547 | | | 1058 | | | 147 | | | 784 | |
| Approach Delay, s/veh | | 42.7 | | | 17.0 | | | 53.5 | | | 205.8 | |
| Approach LOS | | D | | | B | | | D | | | F | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.2 | 66.4 | 30.0 | 14.4 | 10.9 | 64.6 | 19.4 | 25.1 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.6 | | | | |
| Max Green Setting (Gmax), s | * 14 | * 38 | * 24 | * 20 | * 10 | * 42 | * 9.2 | * 35 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.9 | 19.5 | 26.7 | 7.3 | 3.9 | 47.9 | 4.6 | 17.6 | | | | |
| Green Ext Time (p_c), s | 0.1 | 14.9 | 0.0 | 0.3 | 0.0 | 0.0 | 0.2 | 1.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 71.6 | | | | | | | | |
| HCM 2010 LOS | | | | E | | | | | | | | |
| Notes | | | | | | | | | | | | |

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 25 | 1332 | 50 | 821 | 60 | 10 | 121 | 70 |
| Future Volume (vph) | 25 | 1332 | 50 | 821 | 60 | 10 | 121 | 70 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 | 4.0 | 6.0 |
| Minimum Split (s) | 9.0 | 27.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 20.0 | 61.0 | 20.0 | 61.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 16.7% | 50.8% | 16.7% | 50.8% | 10.0% | 22.5% | 10.0% | 22.5% |
| Yellow Time (s) | 3.0 | 5.0 | 3.4 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 5.0 | 4.4 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 83.6 | 76.8 | 85.4 | 80.4 | 20.1 | 12.3 | 20.2 | 15.7 |
| Actuated g/C Ratio | 0.70 | 0.64 | 0.71 | 0.67 | 0.17 | 0.10 | 0.17 | 0.13 |
| v/c Ratio | 0.06 | 0.67 | 0.23 | 0.38 | 0.31 | 0.34 | 0.56 | 0.50 |
| Control Delay | 5.7 | 16.8 | 7.8 | 3.4 | 42.1 | 18.6 | 50.9 | 45.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.7 | 16.8 | 7.8 | 3.4 | 42.1 | 18.6 | 50.9 | 45.6 |
| LOS | A | B | A | A | D | B | D | D |
| Approach Delay | | 16.6 | | 3.6 | | 29.3 | | 48.2 |
| Approach LOS | | B | | A | | C | | D |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 31 (26%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 15.8

Intersection LOS: B

Intersection Capacity Utilization 62.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: 128th Ave NE & NE 85th Street























HCM 2010 Signalized Intersection Summary

1: 128th Ave NE & NE 85th Street

2020 With Project





Timing Plan: AM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 25 | 1332 | 60 | 50 | 821 | 12 | 60 | 10 | 61 | 121 | 70 | 50 |
| Future Volume (veh/h) | 25 | 1332 | 60 | 50 | 821 | 12 | 60 | 10 | 61 | 121 | 70 | 50 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 27 | 1432 | 65 | 54 | 883 | 13 | 65 | 11 | 66 | 130 | 75 | 54 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cap, veh/h | 517 | 2272 | 103 | 269 | 2393 | 35 | 202 | 22 | 131 | 238 | 111 | 80 |
| Arrive On Green | 0.03 | 0.66 | 0.65 | 0.07 | 1.00 | 1.00 | 0.05 | 0.09 | 0.09 | 0.06 | 0.11 | 0.10 |
| Sat Flow, veh/h | 1774 | 3448 | 156 | 1774 | 3570 | 53 | 1810 | 234 | 1401 | 1810 | 1024 | 738 |
| Grp Volume(v), veh/h | 27 | 733 | 764 | 54 | 438 | 458 | 65 | 0 | 77 | 130 | 0 | 129 |
| Grp Sat Flow(s), veh/h/ln | 1774 | 1770 | 1835 | 1774 | 1770 | 1853 | 1810 | 0 | 1635 | 1810 | 0 | 1762 |
| Q Serve(g_s), s | 0.6 | 29.0 | 29.2 | 1.1 | 0.0 | 0.0 | 3.8 | 0.0 | 5.4 | 7.5 | 0.0 | 8.5 |
| Cycle Q Clear(g_c), s | 0.6 | 29.0 | 29.2 | 1.1 | 0.0 | 0.0 | 3.8 | 0.0 | 5.4 | 7.5 | 0.0 | 8.5 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 0.03 | 1.00 | | 0.86 | 1.00 | | 0.42 |
| Lane Grp Cap(c), veh/h | 517 | 1166 | 1209 | 269 | 1186 | 1242 | 202 | 0 | 153 | 238 | 0 | 191 |
| V/C Ratio(X) | 0.05 | 0.63 | 0.63 | 0.20 | 0.37 | 0.37 | 0.32 | 0.00 | 0.50 | 0.55 | 0.00 | 0.67 |
| Avail Cap(c_a), veh/h | 704 | 1166 | 1209 | 436 | 1186 | 1242 | 229 | 0 | 313 | 238 | 0 | 352 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 6.0 | 11.9 | 12.0 | 9.6 | 0.0 | 0.0 | 45.7 | 0.0 | 52.2 | 46.4 | 0.0 | 51.6 |
| Incr Delay (d2), s/veh | 0.0 | 2.6 | 2.5 | 0.4 | 0.9 | 0.8 | 0.9 | 0.0 | 2.6 | 2.6 | 0.0 | 4.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.5 | 21.2 | 21.9 | 1.0 | 0.5 | 0.5 | 3.5 | 0.0 | 4.6 | 1.0 | 0.0 | 7.8 |
| LnGrp Delay(d),s/veh | 6.0 | 14.5 | 14.5 | 9.9 | 0.9 | 0.8 | 46.6 | 0.0 | 54.7 | 49.0 | 0.0 | 55.7 |
| LnGrp LOS | A | B | B | A | A | A | D | | D | D | | E |
| Approach Vol, veh/h | | 1524 | | | 950 | | | 142 | | | 259 | |
| Approach Delay, s/veh | | 14.4 | | | 1.4 | | | 51.0 | | | 52.4 | |
| Approach LOS | | B | | | A | | | D | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.7 | 84.1 | 12.0 | 15.2 | 7.4 | 85.4 | 10.2 | 17.0 | | | | |
| Change Period (Y+Rc), s | 5.4 | 6.0 | 5.5 | 5.0 | 5.0 | * 6 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 14.6 | 55.0 | 6.5 | 22.0 | 15.0 | * 56 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.1 | 31.2 | 9.5 | 7.4 | 2.6 | 2.0 | 5.8 | 10.5 | | | | |
| Green Ext Time (p_c), s | 0.1 | 13.1 | 0.0 | 0.7 | 0.0 | 18.0 | 0.0 | 0.6 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 15.3 | | | | | | | | |
| HCM 2010 LOS | | | | B | | | | | | | | |
| Notes | | | | | | | | | | | | |

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.





















HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: AM

| Intersection | | | | | | |
|--------------------------|---|---|---|--------|---|------|
| Int Delay, s/veh | 0.3 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 24 | 1435 | 811 | 10 | 6 | 17 |
| Future Vol, veh/h | 24 | 1435 | 811 | 10 | 6 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 0 | 2 | 2 | 0 | 6 | 6 |
| Mvmt Flow | 25 | 1479 | 836 | 10 | 6 | 18 |
| | | | | | | |
| Major/Minor | Major1 | Major2 | | Minor2 | | |
| Conflicting Flow All | 846 | 0 | - | 0 | 1630 | 426 |
| Stage 1 | - | - | - | - | 841 | - |
| Stage 2 | - | - | - | - | 789 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.92 | 7.02 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.92 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.92 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.56 | 3.36 |
| Pot Cap-1 Maneuver | 800 | - | - | - | 89 | 566 |
| Stage 1 | - | - | - | - | 374 | - |
| Stage 2 | - | - | - | - | 398 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 798 | - | - | - | 86 | 564 |
| Mov Cap-2 Maneuver | - | - | - | - | 213 | - |
| Stage 1 | - | - | - | - | 374 | - |
| Stage 2 | - | - | - | - | 386 | - |
| | | | | | | |
| Approach | EB | WB | | SB | | |
| HCM Control Delay, s | 0.2 | 0 | | 14.7 | | |
| HCM LOS | | | | B | | |
| | | | | | | |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | |
| Capacity (veh/h) | 798 | - | - | - | 394 | |
| HCM Lane V/C Ratio | 0.031 | - | - | - | 0.06 | |
| HCM Control Delay (s) | 9.7 | - | - | - | 14.7 | |
| HCM Lane LOS | A | - | - | - | B | |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.2 | |

Timings

3: 132nd Ave NE & NE 85th Street/Redmond Way

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 55 | 1336 | 55 | 774 | 180 | 42 | 80 | 20 | 522 | 182 |
| Future Volume (vph) | 55 | 1336 | 55 | 774 | 180 | 42 | 80 | 20 | 522 | 182 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 7.8 | 31.6 | 11.8 | 26.6 | 7.8 | 7.8 | 33.7 | 11.8 | 7.8 | 32.6 |
| Total Split (s) | 20.0 | 48.0 | 16.0 | 44.0 | 30.0 | 15.0 | 26.0 | 16.0 | 30.0 | 41.0 |
| Total Split (%) | 16.7% | 40.0% | 13.3% | 36.7% | 25.0% | 12.5% | 21.7% | 13.3% | 25.0% | 34.2% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.4 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | 0.0 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 63.6 | 57.7 | 63.6 | 57.7 | 82.7 | 11.8 | 11.6 | 19.4 | 24.7 | 26.4 |
| Actuated g/C Ratio | 0.53 | 0.48 | 0.53 | 0.48 | 0.69 | 0.10 | 0.10 | 0.16 | 0.21 | 0.22 |
| v/c Ratio | 0.18 | 0.88 | 0.33 | 0.48 | 0.17 | 0.26 | 0.47 | 0.07 | 1.50 | 0.64 |
| Control Delay | 23.8 | 47.2 | 18.1 | 23.8 | 1.4 | 53.4 | 59.0 | 0.4 | 271.7 | 48.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.8 | 47.2 | 18.1 | 23.8 | 1.4 | 53.4 | 59.0 | 0.4 | 271.7 | 48.7 |
| LOS | C | D | B | C | A | D | E | A | F | D |
| Approach Delay | | 46.3 | | 19.5 | | | 49.0 | | | 199.8 |
| Approach LOS | | D | | B | | | D | | | F |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.50

Intersection Signal Delay: 73.3

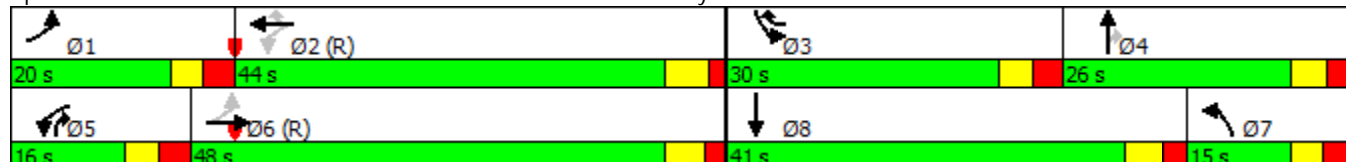
Intersection LOS: E

Intersection Capacity Utilization 89.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way


























HCM 2010 Signalized Intersection Summary

3: 132nd Ave NE & NE 85th Street/Redmond Way

2020 With Project

Timing Plan: AM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 55 | 1336 | 80 | 55 | 774 | 180 | 42 | 80 | 20 | 522 | 182 | 66 |
| Future Volume (veh/h) | 55 | 1336 | 80 | 55 | 774 | 180 | 42 | 80 | 20 | 522 | 182 | 66 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.94 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1845 | 1845 | 1845 | 1845 | 1845 | 1845 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 58 | 1406 | 84 | 58 | 815 | 189 | 44 | 84 | 21 | 549 | 192 | 69 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| Cap, veh/h | 321 | 1699 | 101 | 182 | 1805 | 1136 | 191 | 140 | 185 | 369 | 224 | 81 |
| Arrive On Green | 0.02 | 0.34 | 0.33 | 0.05 | 0.51 | 0.51 | 0.11 | 0.08 | 0.08 | 0.21 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1774 | 3394 | 202 | 1757 | 3505 | 1566 | 1757 | 1845 | 1476 | 1792 | 1316 | 473 |
| Grp Volume(v), veh/h | 58 | 731 | 759 | 58 | 815 | 189 | 44 | 84 | 21 | 549 | 0 | 261 |
| Grp Sat Flow(s), veh/h/ln | 1774 | 1770 | 1827 | 1757 | 1752 | 1566 | 1757 | 1845 | 1476 | 1792 | 0 | 1789 |
| Q Serve(g_s), s | 1.9 | 45.6 | 45.9 | 1.9 | 17.6 | 4.5 | 2.7 | 5.3 | 1.5 | 24.7 | 0.0 | 17.0 |
| Cycle Q Clear(g_c), s | 1.9 | 45.6 | 45.9 | 1.9 | 17.6 | 4.5 | 2.7 | 5.3 | 1.5 | 24.7 | 0.0 | 17.0 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 |
| Lane Grp Cap(c), veh/h | 321 | 886 | 915 | 182 | 1805 | 1136 | 191 | 140 | 185 | 369 | 0 | 305 |
| V/C Ratio(X) | 0.18 | 0.83 | 0.83 | 0.32 | 0.45 | 0.17 | 0.23 | 0.60 | 0.11 | 1.49 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 481 | 886 | 915 | 256 | 1805 | 1136 | 191 | 320 | 329 | 369 | 0 | 528 |
| HCM Platoon Ratio | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.1 | 35.1 | 35.2 | 23.5 | 18.4 | 5.2 | 48.9 | 53.7 | 46.8 | 47.7 | 0.0 | 48.3 |
| Incr Delay (d2), s/veh | 0.3 | 8.6 | 8.6 | 1.0 | 0.8 | 0.3 | 0.6 | 4.1 | 0.3 | 233.9 | 0.0 | 6.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.7 | 32.6 | 33.6 | 1.7 | 13.5 | 3.7 | 2.5 | 5.2 | 1.1 | 65.1 | 0.0 | 13.9 |
| LnGrp Delay(d),s/veh | 15.4 | 43.7 | 43.8 | 24.5 | 19.2 | 5.5 | 49.5 | 57.8 | 47.1 | 281.6 | 0.0 | 55.2 |
| LnGrp LOS | B | D | D | C | B | A | D | E | D | F | | E |
| Approach Vol, veh/h | | 1548 | | | 1062 | | | 149 | | | 810 | |
| Approach Delay, s/veh | | 42.7 | | | 17.1 | | | 53.8 | | | 208.6 | |
| Approach LOS | | D | | | B | | | D | | | F | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.2 | 66.4 | 30.0 | 14.4 | 10.9 | 64.7 | 18.3 | 26.1 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.6 | | | | |
| Max Green Setting (Gmax), s | * 14 | * 38 | * 24 | * 20 | * 10 | * 42 | * 9.2 | * 35 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.9 | 19.6 | 26.7 | 7.3 | 3.9 | 47.9 | 4.7 | 19.0 | | | | |
| Green Ext Time (p_c), s | 0.1 | 12.1 | 0.0 | 0.3 | 0.1 | 0.0 | 0.2 | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 73.2 | | | | | | | | |
| HCM 2010 LOS | | | | E | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
3: 132nd Ave NE & NE 85th Street/Redmond Way

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: AM

User approved pedestrian interval to be less than phase max green.




* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 TWSC
4: 131st Ave NE & Drive Aisle A

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: AM

Intersection

Int Delay, s/veh 0.4

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|--------------------------|---|------|---|------|------|---|
| Lane Configurations |  | |  | | |  |
| Traffic Vol, veh/h | 3 | 0 | 37 | 2 | 0 | 20 |
| Future Vol, veh/h | 3 | 0 | 37 | 2 | 0 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 0 | 40 | 2 | 0 | 22 |




| Major/Minor | Minor1 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 63 | 41 | 0 |
| Stage 1 | 41 | - | - |
| Stage 2 | 22 | - | - |
| Critical Hdwy | 6.42 | 6.22 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - |
| Pot Cap-1 Maneuver | 943 | 1030 | - |
| Stage 1 | 981 | - | - |
| Stage 2 | 1001 | - | - |
| Platoon blocked, % | | - | - |
| Mov Cap-1 Maneuver | 943 | 1030 | - |
| Mov Cap-2 Maneuver | 943 | - | - |
| Stage 1 | 981 | - | - |
| Stage 2 | 1001 | - | - |

| Approach | WB | NB | SB |
|----------------------|-----|----|----|
| HCM Control Delay, s | 8.8 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL | SBT |
|-----------------------|-----|----------|-------|------|
| Capacity (veh/h) | - | - | 943 | 1567 |
| HCM Lane V/C Ratio | - | - | 0.003 | - |
| HCM Control Delay (s) | - | - | 8.8 | 0 |
| HCM Lane LOS | - | - | A | A |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 |

HCM 2010 TWSC
5: 131st Ave NE & West Access

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: AM




| Intersection | | | | | | |
|--------------------------|---|----------|---|------|------|---|
| Int Delay, s/veh | 0 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  | |  | | |  |
| Traffic Vol, veh/h | 0 | 0 | 20 | 17 | 0 | 20 |
| Future Vol, veh/h | 0 | 0 | 20 | 17 | 0 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 22 | 18 | 0 | 22 |
| Major/Minor | Minor1 | Major1 | Major2 | | | |
| Conflicting Flow All | 53 | 31 | 0 | 0 | 40 | 0 |
| Stage 1 | 31 | - | - | - | - | - |
| Stage 2 | 22 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 960 | 1049 | - | - | 1583 | - |
| Stage 1 | 997 | - | - | - | - | - |
| Stage 2 | 1006 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 960 | 1049 | - | - | 1583 | - |
| Mov Cap-2 Maneuver | 960 | - | - | - | - | - |
| Stage 1 | 997 | - | - | - | - | - |
| Stage 2 | 1006 | - | - | - | - | - |
| Approach | WB | NB | SB | | | |
| HCM Control Delay, s | 0 | 0 | 0 | | | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL | SBT | | |
| Capacity (veh/h) | - | - | - | 1583 | - | |
| HCM Lane V/C Ratio | - | - | - | - | - | |
| HCM Control Delay (s) | - | - | 0 | 0 | - | |
| HCM Lane LOS | - | - | A | A | - | |
| HCM 95th %tile Q(veh) | - | - | - | 0 | - | |

HCM 2010 TWSC
6: 132nd Ave NE & East Access

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: AM

Intersection

Int Delay, s/veh 0.4

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|---|------|---|---|------|
| Lane Configurations | |  | |  |  | |
| Traffic Vol, veh/h | 0 | 32 | 0 | 315 | 745 | 1 |
| Future Vol, veh/h | 0 | 32 | 0 | 315 | 745 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 0 | 0 | 0 | 3 | 1 | 0 |
| Mvmt Flow | 0 | 34 | 0 | 332 | 784 | 1 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 785 | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.2 | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.3 | - |
| Pot Cap-1 Maneuver | 0 | 396 | 0 |
| Stage 1 | 0 | - | 0 |
| Stage 2 | 0 | - | 0 |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 396 | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 14.9 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT EBLn1 | SBT | SBR |
|-----------------------|-----------|-------|-----|
| Capacity (veh/h) | - | 396 | - |
| HCM Lane V/C Ratio | - | 0.085 | - |
| HCM Control Delay (s) | - | 14.9 | - |
| HCM Lane LOS | - | B | - |
| HCM 95th %tile Q(veh) | - | 0.3 | - |

Queuing and Blocking Report

2020 With Project

Intersection: 1: 128th Ave NE & NE 85th Street

| Movement | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB |
|-----------------------|-----|------|------|-----|-----|-----|----|------|----|------|
| Directions Served | L | T | TR | L | T | TR | L | TR | L | TR |
| Maximum Queue (ft) | 68 | 300 | 292 | 70 | 87 | 100 | 68 | 123 | 74 | 230 |
| Average Queue (ft) | 23 | 199 | 195 | 40 | 44 | 50 | 41 | 57 | 64 | 136 |
| 95th Queue (ft) | 77 | 320 | 315 | 75 | 93 | 104 | 75 | 122 | 87 | 246 |
| Link Distance (ft) | | 1312 | 1312 | | 896 | 896 | | 1442 | | 1106 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 100 | | | 100 | | | 50 | | 50 | |
| Storage Blk Time (%) | | 20 | | 0 | 0 | | 14 | 11 | 33 | 34 |
| Queuing Penalty (veh) | | 5 | | 1 | 0 | | 11 | 7 | 43 | 44 |

Intersection: 2: NE 85th Street & 131st Ave NE

| Movement | EB | EB | EB | WB | WB | SB |
|-----------------------|----|-----|-----|-----|-----|----|
| Directions Served | L | T | T | T | TR | LR |
| Maximum Queue (ft) | 41 | 232 | 246 | 8 | 16 | 52 |
| Average Queue (ft) | 11 | 106 | 116 | 1 | 2 | 25 |
| 95th Queue (ft) | 43 | 240 | 259 | 16 | 23 | 64 |
| Link Distance (ft) | | 896 | 896 | 333 | 333 | 76 |
| Upstream Blk Time (%) | | | | | | 4 |
| Queuing Penalty (veh) | | | | | | 1 |
| Storage Bay Dist (ft) | 50 | | | | | |
| Storage Blk Time (%) | 0 | 18 | | | | |
| Queuing Penalty (veh) | 2 | 5 | | | | |

Intersection: 3: 132nd Ave NE & NE 85th Street/Redmond Way

| Movement | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | SB | SB |
|-----------------------|-----|-----|-----|-----|------|------|-----|----|------|-----|-----|-----|
| Directions Served | L | T | TR | L | T | T | R | L | T | R | L | TR |
| Maximum Queue (ft) | 232 | 355 | 359 | 79 | 224 | 241 | 64 | 90 | 152 | 80 | 219 | 277 |
| Average Queue (ft) | 86 | 309 | 313 | 38 | 135 | 147 | 24 | 48 | 85 | 21 | 212 | 255 |
| 95th Queue (ft) | 250 | 450 | 445 | 83 | 245 | 262 | 61 | 98 | 161 | 74 | 230 | 282 |
| Link Distance (ft) | | 333 | 333 | | 2768 | 2768 | | | 1519 | | | 220 |
| Upstream Blk Time (%) | | 17 | 20 | | | | | | | | 36 | 68 |
| Queuing Penalty (veh) | | 129 | 152 | | | | | | | | 0 | 560 |
| Storage Bay Dist (ft) | 250 | | | 240 | | | 700 | 90 | | 100 | 270 | |
| Storage Blk Time (%) | | 33 | | | 1 | | | 2 | 10 | 0 | 36 | 68 |
| Queuing Penalty (veh) | | 19 | | | 0 | | | 2 | 6 | 0 | 93 | 376 |

Queuing and Blocking Report 2020 With Project

Intersection: 4: 131st Ave NE & Drive Aisle A

| Movement | WB | SB |
|-----------------------|-----|----|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 21 | 8 |
| Average Queue (ft) | 5 | 2 |
| 95th Queue (ft) | 23 | 19 |
| Link Distance (ft) | 116 | 86 |
| Upstream Blk Time (%) | | 0 |
| Queuing Penalty (veh) | | 0 |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 5: 131st Ave NE & West Access

| Movement | | |
|-----------------------|--|--|
| Directions Served | | |
| Maximum Queue (ft) | | |
| Average Queue (ft) | | |
| 95th Queue (ft) | | |
| Link Distance (ft) | | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 6: 132nd Ave NE & East Access

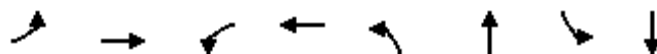
| Movement | EB | SB |
|-----------------------|-----|-----|
| Directions Served | R | TR |
| Maximum Queue (ft) | 119 | 727 |
| Average Queue (ft) | 118 | 715 |
| 95th Queue (ft) | 135 | 729 |
| Link Distance (ft) | 116 | 698 |
| Upstream Blk Time (%) | 100 | 86 |
| Queuing Penalty (veh) | 0 | 0 |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Network Summary

Network wide Queuing Penalty: 1456

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 45 | 1195 | 40 | 1180 | 40 | 30 | 40 | 20 |
| Future Volume (vph) | 45 | 1195 | 40 | 1180 | 40 | 30 | 40 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 17.0 | 74.0 | 17.0 | 74.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 13.1% | 56.9% | 13.1% | 56.9% | 9.2% | 20.8% | 9.2% | 20.8% |
| Yellow Time (s) | 3.0 | 4.0 | 3.5 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.5 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 99.4 | 93.4 | 99.1 | 93.2 | 15.9 | 9.5 | 15.1 | 10.5 |
| Actuated g/C Ratio | 0.76 | 0.72 | 0.76 | 0.72 | 0.12 | 0.07 | 0.12 | 0.08 |
| v/c Ratio | 0.15 | 0.51 | 0.14 | 0.52 | 0.23 | 0.50 | 0.26 | 0.24 |
| Control Delay | 5.0 | 10.5 | 1.8 | 2.4 | 48.2 | 35.1 | 49.7 | 39.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.0 | 10.5 | 1.8 | 2.4 | 48.2 | 35.1 | 49.7 | 39.3 |
| LOS | A | B | A | A | D | D | D | D |
| Approach Delay | | 10.3 | | 2.4 | | 39.5 | | 44.9 |
| Approach LOS | | B | | A | | D | | D |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 94 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 8.8

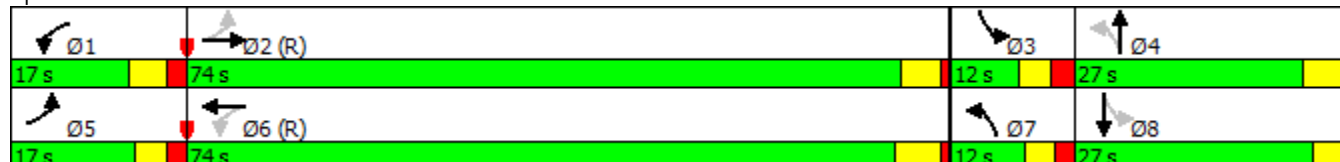
Intersection LOS: A

Intersection Capacity Utilization 53.5%

ICU Level of Service A

Analysis Period (min) 15





















Splits and Phases: 1: 128th Ave NE & NE 85th Street



HCM 2010 Signalized Intersection Summary

1: 128th Ave NE & NE 85th Street

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: PM





| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 45 | 1195 | 25 | 40 | 1180 | 65 | 40 | 30 | 50 | 40 | 20 | 15 |
| Future Volume (veh/h) | 45 | 1195 | 25 | 40 | 1180 | 65 | 40 | 30 | 50 | 40 | 20 | 15 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.99 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 48 | 1271 | 27 | 43 | 1255 | 69 | 43 | 32 | 53 | 43 | 21 | 16 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 |
| Cap, veh/h | 412 | 2556 | 54 | 350 | 2467 | 135 | 211 | 52 | 86 | 166 | 85 | 65 |
| Arrive On Green | 0.03 | 0.71 | 0.71 | 0.06 | 1.00 | 1.00 | 0.04 | 0.08 | 0.07 | 0.04 | 0.09 | 0.08 |
| Sat Flow, veh/h | 1792 | 3579 | 76 | 1792 | 3441 | 189 | 1774 | 628 | 1041 | 1810 | 991 | 755 |
| Grp Volume(v), veh/h | 48 | 634 | 664 | 43 | 651 | 673 | 43 | 0 | 85 | 43 | 0 | 37 |
| Grp Sat Flow(s),veh/h/ln | 1792 | 1787 | 1868 | 1792 | 1787 | 1843 | 1774 | 0 | 1669 | 1810 | 0 | 1746 |
| Q Serve(g_s), s | 0.9 | 20.5 | 20.5 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.4 | 2.8 | 0.0 | 2.6 |
| Cycle Q Clear(g_c), s | 0.9 | 20.5 | 20.5 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.4 | 2.8 | 0.0 | 2.6 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.10 | 1.00 | | 0.62 | 1.00 | | 0.43 |
| Lane Grp Cap(c), veh/h | 412 | 1276 | 1334 | 350 | 1281 | 1321 | 211 | 0 | 138 | 166 | 0 | 150 |
| V/C Ratio(X) | 0.12 | 0.50 | 0.50 | 0.12 | 0.51 | 0.51 | 0.20 | 0.00 | 0.62 | 0.26 | 0.00 | 0.25 |
| Avail Cap(c_a), veh/h | 532 | 1276 | 1334 | 465 | 1281 | 1321 | 254 | 0 | 295 | 204 | 0 | 322 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 4.3 | 8.2 | 8.2 | 5.9 | 0.0 | 0.0 | 51.6 | 0.0 | 58.0 | 51.8 | 0.0 | 55.7 |
| Incr Delay (d2), s/veh | 0.1 | 1.4 | 1.3 | 0.2 | 1.4 | 1.4 | 0.5 | 0.0 | 4.4 | 0.8 | 0.0 | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.8 | 15.9 | 16.4 | 0.7 | 0.9 | 0.9 | 2.6 | 0.0 | 5.6 | 2.6 | 0.0 | 2.3 |
| LnGrp Delay(d),s/veh | 4.4 | 9.6 | 9.6 | 6.0 | 1.4 | 1.4 | 52.1 | 0.0 | 62.4 | 52.6 | 0.0 | 56.5 |
| LnGrp LOS | A | A | A | A | A | A | D | | E | D | | E |
| Approach Vol, veh/h | 1346 | | | 1367 | | | | 128 | | 80 | | |
| Approach Delay, s/veh | 9.4 | | | 1.6 | | | | 58.9 | | 54.4 | | |
| Approach LOS | A | | | A | | | | E | | D | | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.7 | 97.3 | 9.3 | 14.7 | 8.3 | 97.7 | 8.8 | 15.2 | | | | |
| Change Period (Y+Rc), s | 5.5 | * 5.5 | 5.5 | 5.0 | 5.0 | 5.5 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | * 69 | 6.5 | 22.0 | 12.0 | 68.5 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.8 | 22.5 | 4.8 | 8.4 | 2.9 | 2.0 | 4.8 | 4.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 30.7 | 0.0 | 0.4 | 0.0 | 37.9 | 0.0 | 0.5 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 9.1 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: PM

Intersection

Int Delay, s/veh 0.1





















| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|--------------------------|---|---|---|------|---|------|
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 10 | 1270 | 1255 | 5 | 5 | 5 |
| Future Vol, veh/h | 10 | 1270 | 1255 | 5 | 5 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 11 | 1380 | 1364 | 5 | 5 | 5 |

| Major/Minor | Major1 | Major2 | Minor2 |
|----------------------|--------|--------|------------|
| Conflicting Flow All | 1370 | 0 | 0 2079 685 |
| Stage 1 | - | - | - 1367 - |
| Stage 2 | - | - | - 712 - |
| Critical Hdwy | 4.1 | - | - 6.8 6.9 |
| Critical Hdwy Stg 1 | - | - | - 5.8 - |
| Critical Hdwy Stg 2 | - | - | - 5.8 - |
| Follow-up Hdwy | 2.2 | - | - 3.5 3.3 |
| Pot Cap-1 Maneuver | 508 | - | - 47 395 |
| Stage 1 | - | - | - 206 - |
| Stage 2 | - | - | - 453 - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 508 | - | - 46 395 |
| Mov Cap-2 Maneuver | - | - | - 146 - |
| Stage 1 | - | - | - 206 - |
| Stage 2 | - | - | - 443 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.1 | 0 | 22.8 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 508 | - | - | - | 213 |
| HCM Lane V/C Ratio | 0.021 | - | - | - | 0.051 |
| HCM Control Delay (s) | 12.2 | - | - | - | 22.8 |
| HCM Lane LOS | B | - | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.2 |

Timings 3: 132nd Ave NE & NE 85th Street/Redmond Way

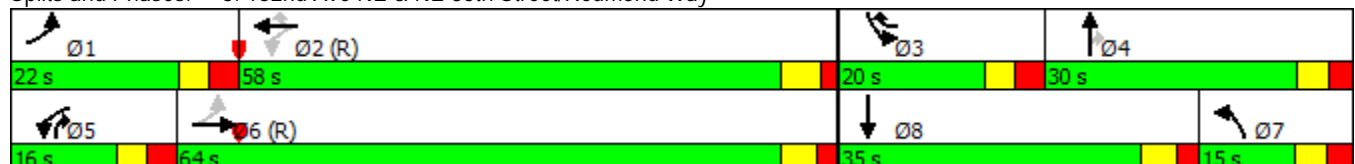
| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 140 | 1010 | 55 | 1135 | 790 | 60 | 325 | 35 | 165 | 110 |
| Future Volume (vph) | 140 | 1010 | 55 | 1135 | 790 | 60 | 325 | 35 | 165 | 110 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 9.0 | 31.6 | 11.8 | 26.6 | 9.0 | 9.0 | 33.7 | 11.8 | 9.0 | 32.7 |
| Total Split (s) | 22.0 | 64.0 | 16.0 | 58.0 | 20.0 | 15.0 | 30.0 | 16.0 | 20.0 | 35.0 |
| Total Split (%) | 16.9% | 49.2% | 12.3% | 44.6% | 15.4% | 11.5% | 23.1% | 12.3% | 15.4% | 26.9% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.5 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 74.1 | 64.5 | 64.9 | 57.7 | 77.5 | 16.5 | 24.8 | 32.6 | 14.7 | 25.4 |
| Actuated g/C Ratio | 0.57 | 0.50 | 0.50 | 0.44 | 0.60 | 0.13 | 0.19 | 0.25 | 0.11 | 0.20 |
| v/c Ratio | 0.64 | 0.68 | 0.28 | 0.77 | 0.83 | 0.29 | 0.97 | 0.08 | 0.88 | 0.55 |
| Control Delay | 44.5 | 28.4 | 16.3 | 35.2 | 25.3 | 54.6 | 93.9 | 0.3 | 94.6 | 49.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.5 | 28.4 | 16.3 | 35.2 | 25.3 | 54.6 | 93.9 | 0.3 | 94.6 | 49.1 |
| LOS | D | C | B | D | C | D | F | A | F | D |
| Approach Delay | | 30.2 | | 30.8 | | | 80.4 | | | 70.5 |
| Approach LOS | | C | | C | | | F | | | E |

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 72 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 39.3
 Intersection Capacity Utilization 86.5%
 Analysis Period (min) 15
























Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way



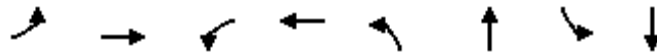
HCM 2010 Signalized Intersection Summary 3: 132nd Ave NE & NE 85th Street/Redmond Way

SEP18-00313
ENCLOSURE 4
2017 Existing
Timing Plan: PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 140 | 1010 | 105 | 55 | 1135 | 790 | 60 | 325 | 35 | 165 | 110 | 75 |
| Future Volume (veh/h) | 140 | 1010 | 105 | 55 | 1135 | 790 | 60 | 325 | 35 | 165 | 110 | 75 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 151 | 1086 | 113 | 59 | 1220 | 849 | 65 | 349 | 38 | 177 | 118 | 81 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cap, veh/h | 210 | 1614 | 168 | 247 | 1697 | 946 | 302 | 359 | 372 | 203 | 142 | 97 |
| Arrive On Green | 0.06 | 0.49 | 0.49 | 0.04 | 0.47 | 0.47 | 0.17 | 0.19 | 0.19 | 0.11 | 0.14 | 0.13 |
| Sat Flow, veh/h | 1792 | 3269 | 340 | 1792 | 3574 | 1599 | 1792 | 1881 | 1574 | 1792 | 1041 | 714 |
| Grp Volume(v), veh/h | 151 | 593 | 606 | 59 | 1220 | 849 | 65 | 349 | 38 | 177 | 0 | 199 |
| Grp Sat Flow(s),veh/h/ln | 1792 | 1787 | 1821 | 1792 | 1787 | 1599 | 1792 | 1881 | 1574 | 1792 | 0 | 1755 |
| Q Serve(g_s), s | 5.6 | 32.7 | 32.8 | 2.1 | 35.4 | 60.1 | 4.1 | 24.0 | 2.5 | 12.6 | 0.0 | 14.4 |
| Cycle Q Clear(g_c), s | 5.6 | 32.7 | 32.8 | 2.1 | 35.4 | 60.1 | 4.1 | 24.0 | 2.5 | 12.6 | 0.0 | 14.4 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 210 | 883 | 900 | 247 | 1697 | 946 | 302 | 359 | 372 | 203 | 0 | 239 |
| V/C Ratio(X) | 0.72 | 0.67 | 0.67 | 0.24 | 0.72 | 0.90 | 0.22 | 0.97 | 0.10 | 0.87 | 0.00 | 0.83 |
| Avail Cap(c_a), veh/h | 326 | 883 | 900 | 314 | 1697 | 946 | 302 | 359 | 372 | 203 | 0 | 402 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.3 | 24.9 | 25.0 | 19.8 | 27.2 | 23.1 | 46.6 | 52.3 | 39.0 | 56.7 | 0.0 | 54.8 |
| Incr Delay (d2), s/veh | 4.6 | 4.1 | 4.0 | 0.5 | 2.7 | 13.0 | 0.4 | 40.1 | 0.1 | 31.7 | 0.0 | 7.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 5.4 | 23.9 | 24.4 | 1.9 | 25.1 | 38.5 | 3.7 | 23.0 | 1.9 | 12.7 | 0.0 | 11.9 |
| LnGrp Delay(d),s/veh | 31.0 | 29.0 | 29.0 | 20.3 | 29.9 | 36.1 | 47.0 | 92.3 | 39.1 | 88.4 | 0.0 | 62.2 |
| LnGrp LOS | C | C | C | C | C | D | D | F | D | F | | E |
| Approach Vol, veh/h | | 1350 | | | 2128 | | | 452 | | | 376 | |
| Approach Delay, s/veh | | 29.2 | | | 32.1 | | | 81.3 | | | 74.5 | |
| Approach LOS | | C | | | C | | | F | | | E | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 13.6 | 66.3 | 20.0 | 30.1 | 11.1 | 68.8 | 27.2 | 22.9 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.7 | | | | |
| Max Green Setting (Gmax), s | * 16 | * 52 | * 14 | * 24 | * 10 | * 58 | * 9.2 | * 29 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.6 | 62.1 | 14.6 | 26.0 | 4.1 | 34.8 | 6.1 | 16.4 | | | | |
| Green Ext Time (p_c), s | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 20.3 | 0.7 | 0.8 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 40.1 | | | | | | | | | |
| HCM 2010 LOS | | | D | | | | | | | | | |
| Notes | | | | | | | | | | | | |

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 50 | 1270 | 41 | 1250 | 40 | 30 | 40 | 20 |
| Future Volume (vph) | 50 | 1270 | 41 | 1250 | 40 | 30 | 40 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 17.0 | 74.0 | 17.0 | 74.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 13.1% | 56.9% | 13.1% | 56.9% | 9.2% | 20.8% | 9.2% | 20.8% |
| Yellow Time (s) | 3.0 | 4.0 | 3.5 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.5 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 99.4 | 93.3 | 99.1 | 93.1 | 15.9 | 9.5 | 15.1 | 10.5 |
| Actuated g/C Ratio | 0.76 | 0.72 | 0.76 | 0.72 | 0.12 | 0.07 | 0.12 | 0.08 |
| v/c Ratio | 0.18 | 0.54 | 0.15 | 0.55 | 0.23 | 0.52 | 0.27 | 0.24 |
| Control Delay | 5.4 | 11.0 | 1.9 | 2.5 | 48.1 | 34.0 | 49.8 | 39.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.4 | 11.0 | 1.9 | 2.5 | 48.1 | 34.0 | 49.8 | 39.2 |
| LOS | A | B | A | A | D | C | D | D |
| Approach Delay | | 10.8 | | 2.5 | | 38.5 | | 44.9 |
| Approach LOS | | B | | A | | D | | D |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 94 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 9.0

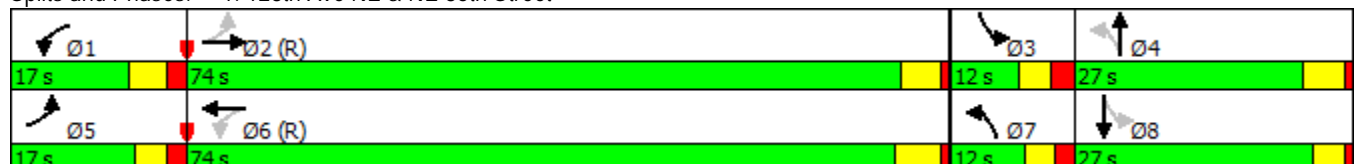
Intersection LOS: A

Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: 128th Ave NE & NE 85th Street























HCM 2010 Signalized Intersection Summary

2020 Without Project





1: 128th Ave NE & NE 85th Street

Timing Plan: PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 50 | 1270 | 25 | 41 | 1250 | 70 | 40 | 30 | 55 | 40 | 20 | 15 |
| Future Volume (veh/h) | 50 | 1270 | 25 | 41 | 1250 | 70 | 40 | 30 | 55 | 40 | 20 | 15 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.99 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 53 | 1351 | 27 | 44 | 1330 | 74 | 43 | 32 | 59 | 43 | 21 | 16 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 |
| Cap, veh/h | 390 | 2546 | 51 | 325 | 2450 | 136 | 216 | 50 | 93 | 165 | 89 | 68 |
| Arrive On Green | 0.03 | 0.71 | 0.70 | 0.06 | 1.00 | 1.00 | 0.04 | 0.09 | 0.08 | 0.04 | 0.09 | 0.08 |
| Sat Flow, veh/h | 1792 | 3584 | 72 | 1792 | 3439 | 191 | 1774 | 585 | 1078 | 1810 | 991 | 755 |
| Grp Volume(v), veh/h | 53 | 673 | 705 | 44 | 690 | 714 | 43 | 0 | 91 | 43 | 0 | 37 |
| Grp Sat Flow(s), veh/h/ln | 1792 | 1787 | 1868 | 1792 | 1787 | 1843 | 1774 | 0 | 1663 | 1810 | 0 | 1747 |
| Q Serve(g_s), s | 1.0 | 22.8 | 22.8 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.9 | 2.8 | 0.0 | 2.6 |
| Cycle Q Clear(g_c), s | 1.0 | 22.8 | 22.8 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.9 | 2.8 | 0.0 | 2.6 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.10 | 1.00 | | 0.65 | 1.00 | | 0.43 |
| Lane Grp Cap(c), veh/h | 390 | 1270 | 1327 | 325 | 1273 | 1313 | 216 | 0 | 143 | 165 | 0 | 156 |
| V/C Ratio(X) | 0.14 | 0.53 | 0.53 | 0.14 | 0.54 | 0.54 | 0.20 | 0.00 | 0.64 | 0.26 | 0.00 | 0.24 |
| Avail Cap(c_a), veh/h | 509 | 1270 | 1327 | 439 | 1273 | 1313 | 259 | 0 | 294 | 203 | 0 | 322 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 4.4 | 8.7 | 8.8 | 6.4 | 0.0 | 0.0 | 51.2 | 0.0 | 57.8 | 51.4 | 0.0 | 55.2 |
| Incr Delay (d2), s/veh | 0.2 | 1.6 | 1.5 | 0.2 | 1.7 | 1.6 | 0.4 | 0.0 | 4.6 | 0.8 | 0.0 | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.9 | 17.2 | 17.8 | 0.7 | 1.1 | 1.1 | 2.5 | 0.0 | 6.0 | 2.6 | 0.0 | 2.3 |
| LnGrp Delay(d),s/veh | 4.5 | 10.3 | 10.3 | 6.6 | 1.7 | 1.6 | 51.7 | 0.0 | 62.4 | 52.2 | 0.0 | 56.0 |
| LnGrp LOS | A | B | B | A | A | A | D | | E | D | | E |
| Approach Vol, veh/h | | 1431 | | | 1448 | | | 134 | | | 80 | |
| Approach Delay, s/veh | | 10.1 | | | 1.8 | | | 58.9 | | | 54.0 | |
| Approach LOS | | B | | | A | | | E | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.7 | 96.9 | 9.3 | 15.2 | 8.4 | 97.1 | 8.8 | 15.6 | | | | |
| Change Period (Y+Rc), s | 5.5 | * 5.5 | 5.5 | 5.0 | 5.0 | 5.5 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | * 69 | 6.5 | 22.0 | 12.0 | 68.5 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.8 | 24.8 | 4.8 | 8.9 | 3.0 | 2.0 | 4.8 | 4.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 32.0 | 0.0 | 0.5 | 0.1 | 42.0 | 0.0 | 0.6 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 9.5 | | | | | | | | | |
| HCM 2010 LOS | | | A | | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2020 Without Project
Timing Plan: PM

| Intersection | | | | | | |
|--------------------------|---|---|---|--------|---|------|
| Int Delay, s/veh | 0.1 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 10 | 1350 | 1330 | 5 | 5 | 5 |
| Future Vol, veh/h | 10 | 1350 | 1330 | 5 | 5 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 11 | 1467 | 1446 | 5 | 5 | 5 |
| | | | | | | |
| Major/Minor | Major1 | Major2 | | Minor2 | | |
| Conflicting Flow All | 1451 | 0 | - | 0 | 2203 | 726 |
| Stage 1 | - | - | - | - | 1448 | - |
| Stage 2 | - | - | - | - | 755 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 473 | - | - | - | 39 | 372 |
| Stage 1 | - | - | - | - | 186 | - |
| Stage 2 | - | - | - | - | 430 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 473 | - | - | - | 38 | 372 |
| Mov Cap-2 Maneuver | - | - | - | - | 132 | - |
| Stage 1 | - | - | - | - | 186 | - |
| Stage 2 | - | - | - | - | 420 | - |
| | | | | | | |
| Approach | EB | WB | | SB | | |
| HCM Control Delay, s | 0.1 | 0 | | 24.5 | | |
| HCM LOS | C | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | |
| Capacity (veh/h) | 473 | - | - | - | 195 | |
| HCM Lane V/C Ratio | 0.023 | - | - | - | 0.056 | |
| HCM Control Delay (s) | 12.8 | - | - | - | 24.5 | |
| HCM Lane LOS | B | - | - | - | C | |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.2 | |

Timings

2020 Without Project

Timing Plan: PM

3: 132nd Ave NE & NE 85th Street/Redmond Way



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 150 | 1070 | 60 | 1205 | 840 | 65 | 345 | 35 | 175 | 115 |
| Future Volume (vph) | 150 | 1070 | 60 | 1205 | 840 | 65 | 345 | 35 | 175 | 115 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 9.0 | 31.6 | 11.8 | 26.6 | 9.0 | 9.0 | 33.7 | 11.8 | 9.0 | 32.7 |
| Total Split (s) | 22.0 | 64.0 | 16.0 | 58.0 | 20.0 | 15.0 | 30.0 | 16.0 | 20.0 | 35.0 |
| Total Split (%) | 16.9% | 49.2% | 12.3% | 44.6% | 15.4% | 11.5% | 23.1% | 12.3% | 15.4% | 26.9% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.5 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 74.3 | 64.4 | 64.6 | 57.2 | 77.0 | 15.9 | 24.8 | 32.8 | 14.7 | 26.0 |
| Actuated g/C Ratio | 0.57 | 0.50 | 0.50 | 0.44 | 0.59 | 0.12 | 0.19 | 0.25 | 0.11 | 0.20 |
| v/c Ratio | 0.68 | 0.73 | 0.33 | 0.82 | 0.89 | 0.32 | 1.04 | 0.08 | 0.93 | 0.56 |
| Control Delay | 47.7 | 30.5 | 17.9 | 38.0 | 31.4 | 56.2 | 108.2 | 0.3 | 104.6 | 49.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 47.7 | 30.5 | 17.9 | 38.0 | 31.4 | 56.2 | 108.2 | 0.3 | 104.6 | 49.3 |
| LOS | D | C | B | D | C | E | F | A | F | D |
| Approach Delay | | 32.5 | | 34.8 | | | 92.0 | | | 75.4 |
| Approach LOS | | C | | C | | | F | | | E |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 72 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 43.6

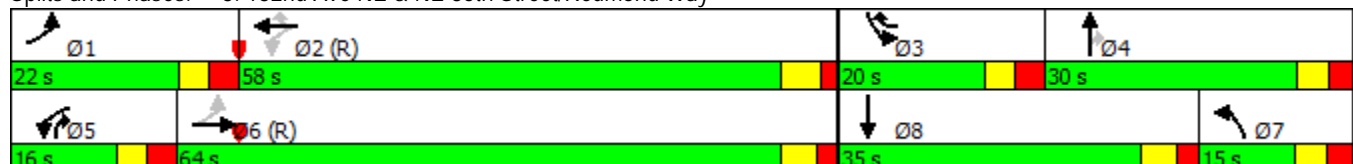
Intersection LOS: D

Intersection Capacity Utilization 91.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way


























HCM 2010 Signalized Intersection Summary

3: 132nd Ave NE & NE 85th Street/Redmond Way

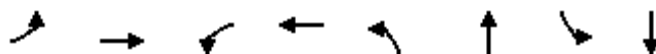
2020 Without Project

Timing Plan: PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 150 | 1070 | 110 | 60 | 1205 | 840 | 65 | 345 | 35 | 175 | 115 | 80 |
| Future Volume (veh/h) | 150 | 1070 | 110 | 60 | 1205 | 840 | 65 | 345 | 35 | 175 | 115 | 80 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 161 | 1151 | 118 | 65 | 1296 | 903 | 70 | 371 | 38 | 188 | 124 | 86 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cap, veh/h | 205 | 1614 | 165 | 231 | 1686 | 941 | 291 | 359 | 373 | 203 | 148 | 102 |
| Arrive On Green | 0.07 | 0.49 | 0.49 | 0.05 | 0.47 | 0.47 | 0.16 | 0.19 | 0.19 | 0.11 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1792 | 3274 | 335 | 1792 | 3574 | 1599 | 1792 | 1881 | 1574 | 1792 | 1036 | 718 |
| Grp Volume(v), veh/h | 161 | 627 | 642 | 65 | 1296 | 903 | 70 | 371 | 38 | 188 | 0 | 210 |
| Grp Sat Flow(s),veh/h/ln | 1792 | 1787 | 1822 | 1792 | 1787 | 1599 | 1792 | 1881 | 1574 | 1792 | 0 | 1754 |
| Q Serve(g_s), s | 6.0 | 35.7 | 35.9 | 2.4 | 39.1 | 61.3 | 4.4 | 24.8 | 2.5 | 13.5 | 0.0 | 15.2 |
| Cycle Q Clear(g_c), s | 6.0 | 35.7 | 35.9 | 2.4 | 39.1 | 61.3 | 4.4 | 24.8 | 2.5 | 13.5 | 0.0 | 15.2 |
| Prop In Lane | 1.00 | | 0.18 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 205 | 881 | 898 | 231 | 1686 | 941 | 291 | 359 | 373 | 203 | 0 | 250 |
| V/C Ratio(X) | 0.79 | 0.71 | 0.71 | 0.28 | 0.77 | 0.96 | 0.24 | 1.03 | 0.10 | 0.93 | 0.00 | 0.84 |
| Avail Cap(c_a), veh/h | 315 | 881 | 898 | 296 | 1686 | 941 | 291 | 359 | 373 | 203 | 0 | 402 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.7 | 25.8 | 25.9 | 20.9 | 28.5 | 25.3 | 47.5 | 52.6 | 38.8 | 57.1 | 0.0 | 54.4 |
| Incr Delay (d2), s/veh | 7.0 | 4.9 | 4.8 | 0.7 | 3.4 | 21.0 | 0.4 | 56.5 | 0.1 | 43.4 | 0.0 | 8.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 6.0 | 25.9 | 26.4 | 2.2 | 27.4 | 45.8 | 4.0 | 33.3 | 1.9 | 14.1 | 0.0 | 12.6 |
| LnGrp Delay(d),s/veh | 34.7 | 30.6 | 30.7 | 21.6 | 31.9 | 46.3 | 47.9 | 109.1 | 39.0 | 100.5 | 0.0 | 62.9 |
| LnGrp LOS | C | C | C | C | C | D | D | F | D | F | | E |
| Approach Vol, veh/h | | 1430 | | | 2264 | | | 479 | | | 398 | |
| Approach Delay, s/veh | | 31.1 | | | 37.4 | | | 94.6 | | | 80.7 | |
| Approach LOS | | C | | | D | | | F | | | F | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 14.0 | 65.9 | 20.0 | 30.1 | 11.2 | 68.7 | 26.4 | 23.7 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.7 | | | | |
| Max Green Setting (Gmax), s | * 16 | * 52 | * 14 | * 24 | * 10 | * 58 | * 9.2 | * 29 | | | | |
| Max Q Clear Time (g_c+I1), s | 8.0 | 63.3 | 15.5 | 26.8 | 4.4 | 37.9 | 6.4 | 17.2 | | | | |
| Green Ext Time (p_c), s | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 18.6 | 0.7 | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 45.2 | | | | | | | | | |
| HCM 2010 LOS | | | D | | | | | | | | | |
| Notes | | | | | | | | | | | | |

Timings

1: 128th Ave NE & NE 85th Street



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 50 | 1288 | 41 | 1262 | 40 | 30 | 41 | 20 |
| Future Volume (vph) | 50 | 1288 | 41 | 1262 | 40 | 30 | 41 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Permitted Phases | 2 | | 6 | | 4 | | 8 | |
| Detector Phase | 5 | 2 | 1 | 6 | 7 | 4 | 3 | 8 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 9.5 | 26.5 | 9.5 | 27.0 | 9.5 | 27.0 |
| Total Split (s) | 17.0 | 74.0 | 17.0 | 74.0 | 12.0 | 27.0 | 12.0 | 27.0 |
| Total Split (%) | 13.1% | 56.9% | 13.1% | 56.9% | 9.2% | 20.8% | 9.2% | 20.8% |
| Yellow Time (s) | 3.0 | 4.0 | 3.5 | 4.5 | 3.0 | 4.0 | 3.0 | 3.0 |
| All-Red Time (s) | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.5 | 1.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.5 | 4.5 | 4.0 | 4.0 | 4.5 | 3.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Min | None | Min |
| Act Effect Green (s) | 99.4 | 93.3 | 99.1 | 93.1 | 15.9 | 9.5 | 15.1 | 10.5 |
| Actuated g/C Ratio | 0.76 | 0.72 | 0.76 | 0.72 | 0.12 | 0.07 | 0.12 | 0.08 |
| v/c Ratio | 0.18 | 0.55 | 0.15 | 0.56 | 0.23 | 0.52 | 0.27 | 0.24 |
| Control Delay | 5.4 | 11.1 | 2.0 | 2.7 | 48.1 | 34.0 | 50.0 | 39.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.4 | 11.1 | 2.0 | 2.7 | 48.1 | 34.0 | 50.0 | 39.2 |
| LOS | A | B | A | A | D | C | D | D |
| Approach Delay | | 10.9 | | 2.7 | | 38.5 | | 45.0 |
| Approach LOS | | B | | A | | D | | D |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 94 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15





















Splits and Phases: 1: 128th Ave NE & NE 85th Street



HCM 2010 Signalized Intersection Summary

1: 128th Ave NE & NE 85th Street





SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 50 | 1288 | 25 | 41 | 1262 | 74 | 40 | 30 | 55 | 41 | 20 | 15 |
| Future Volume (veh/h) | 50 | 1288 | 25 | 41 | 1262 | 74 | 40 | 30 | 55 | 41 | 20 | 15 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.99 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1900 | 1863 | 1863 | 1900 | 1900 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 53 | 1370 | 27 | 44 | 1343 | 79 | 43 | 32 | 59 | 44 | 21 | 16 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 |
| Cap, veh/h | 386 | 2548 | 50 | 320 | 2442 | 143 | 215 | 50 | 92 | 165 | 89 | 67 |
| Arrive On Green | 0.03 | 0.71 | 0.70 | 0.06 | 1.00 | 1.00 | 0.04 | 0.09 | 0.08 | 0.04 | 0.09 | 0.08 |
| Sat Flow, veh/h | 1792 | 3585 | 71 | 1792 | 3427 | 201 | 1774 | 585 | 1078 | 1810 | 991 | 755 |
| Grp Volume(v), veh/h | 53 | 682 | 715 | 44 | 699 | 723 | 43 | 0 | 91 | 44 | 0 | 37 |
| Grp Sat Flow(s),veh/h/ln | 1792 | 1787 | 1869 | 1792 | 1787 | 1841 | 1774 | 0 | 1663 | 1810 | 0 | 1747 |
| Q Serve(g_s), s | 1.0 | 23.2 | 23.3 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.9 | 2.8 | 0.0 | 2.6 |
| Cycle Q Clear(g_c), s | 1.0 | 23.2 | 23.3 | 0.8 | 0.0 | 0.0 | 2.8 | 0.0 | 6.9 | 2.8 | 0.0 | 2.6 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.11 | 1.00 | | 0.65 | 1.00 | | 0.43 |
| Lane Grp Cap(c), veh/h | 386 | 1270 | 1328 | 320 | 1274 | 1312 | 215 | 0 | 141 | 165 | 0 | 156 |
| V/C Ratio(X) | 0.14 | 0.54 | 0.54 | 0.14 | 0.55 | 0.55 | 0.20 | 0.00 | 0.64 | 0.27 | 0.00 | 0.24 |
| Avail Cap(c_a), veh/h | 504 | 1270 | 1328 | 434 | 1274 | 1312 | 259 | 0 | 294 | 202 | 0 | 322 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 4.4 | 8.8 | 8.8 | 6.5 | 0.0 | 0.0 | 51.3 | 0.0 | 57.9 | 51.5 | 0.0 | 55.3 |
| Incr Delay (d2), s/veh | 0.2 | 1.6 | 1.6 | 0.2 | 1.7 | 1.7 | 0.4 | 0.0 | 4.8 | 0.9 | 0.0 | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.9 | 17.6 | 18.3 | 0.7 | 1.1 | 1.1 | 2.5 | 0.0 | 6.0 | 2.6 | 0.0 | 2.3 |
| LnGrp Delay(d),s/veh | 4.5 | 10.4 | 10.4 | 6.7 | 1.7 | 1.7 | 51.8 | 0.0 | 62.7 | 52.3 | 0.0 | 56.1 |
| LnGrp LOS | A | B | B | A | A | A | D | | E | D | | E |
| Approach Vol, veh/h | | 1450 | | | 1466 | | | 134 | | | 81 | |
| Approach Delay, s/veh | | 10.2 | | | 1.8 | | | 59.2 | | | 54.0 | |
| Approach LOS | | B | | | A | | | E | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.7 | 96.9 | 9.4 | 15.1 | 8.4 | 97.2 | 8.8 | 15.6 | | | | |
| Change Period (Y+Rc), s | 5.5 | * 5.5 | 5.5 | 5.0 | 5.0 | 5.5 | 5.0 | * 5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | * 69 | 6.5 | 22.0 | 12.0 | 68.5 | 7.0 | * 23 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.8 | 25.3 | 4.8 | 8.9 | 3.0 | 2.0 | 4.8 | 4.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 22.4 | 0.0 | 0.3 | 0.1 | 26.3 | 0.0 | 0.4 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 9.5 | | | | | | | | | |
| HCM 2010 LOS | | | A | | | | | | | | | |
| Notes | | | | | | | | | | | | |

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.





















HCM 2010 TWSC
2: NE 85th Street & 131st Ave NE

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: PM

| Intersection | | | | | | |
|--------------------------|---|---|---|------|---|------|
| Int Delay, s/veh | 0.3 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  |  |  | |  | |
| Traffic Vol, veh/h | 30 | 1350 | 1345 | 17 | 6 | 6 |
| Future Vol, veh/h | 30 | 1350 | 1345 | 17 | 6 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 33 | 1467 | 1462 | 18 | 7 | 7 |
| | | | | | | |
| Major/Minor | Major1 | | Major2 | | Minor2 | |
| Conflicting Flow All | 1480 | 0 | - | 0 | 2270 | 740 |
| Stage 1 | - | - | - | - | 1471 | - |
| Stage 2 | - | - | - | - | 799 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 461 | - | - | - | 35 | 364 |
| Stage 1 | - | - | - | - | 181 | - |
| Stage 2 | - | - | - | - | 408 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 461 | - | - | - | 32 | 364 |
| Mov Cap-2 Maneuver | - | - | - | - | 124 | - |
| Stage 1 | - | - | - | - | 181 | - |
| Stage 2 | - | - | - | - | 379 | - |
| | | | | | | |
| Approach | EB | | WB | | SB | |
| HCM Control Delay, s | 0.3 | | 0 | | 25.9 | |
| HCM LOS | | | | | D | |
| | | | | | | |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | |
| Capacity (veh/h) | 461 | - | - | - | 185 | |
| HCM Lane V/C Ratio | 0.071 | - | - | - | 0.071 | |
| HCM Control Delay (s) | 13.4 | - | - | - | 25.9 | |
| HCM Lane LOS | B | - | - | - | D | |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 0.2 | |

Timings

3: 132nd Ave NE & NE 85th Street/Redmond Way

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 150 | 1071 | 60 | 1214 | 840 | 68 | 345 | 35 | 181 | 117 |
| Future Volume (vph) | 150 | 1071 | 60 | 1214 | 840 | 68 | 345 | 35 | 181 | 117 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+ov | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Permitted Phases | 6 | | 2 | | 2 | | | 4 | | |
| Detector Phase | 1 | 6 | 5 | 2 | 3 | 7 | 4 | 5 | 3 | 8 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 2.0 | 10.0 | 6.0 | 20.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Minimum Split (s) | 9.0 | 31.6 | 11.8 | 26.6 | 9.0 | 9.0 | 33.7 | 11.8 | 9.0 | 32.7 |
| Total Split (s) | 22.0 | 64.0 | 16.0 | 58.0 | 20.0 | 15.0 | 30.0 | 16.0 | 20.0 | 35.0 |
| Total Split (%) | 16.9% | 49.2% | 12.3% | 44.6% | 15.4% | 11.5% | 23.1% | 12.3% | 15.4% | 26.9% |
| Yellow Time (s) | 3.0 | 3.6 | 3.0 | 3.9 | 3.0 | 3.0 | 3.2 | 3.0 | 3.0 | 3.5 |
| All-Red Time (s) | 2.8 | 2.0 | 2.8 | 1.7 | 2.8 | 2.8 | 2.5 | 2.8 | 2.8 | 2.2 |
| Lost Time Adjust (s) | -0.5 | -1.0 | -0.5 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Total Lost Time (s) | 5.3 | 4.6 | 5.3 | 4.6 | 4.8 | 5.3 | 5.2 | 5.3 | 5.3 | 5.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | None | Min | None | None | Min |
| Act Effect Green (s) | 74.3 | 64.4 | 64.6 | 57.2 | 77.0 | 14.9 | 24.8 | 32.8 | 14.7 | 27.1 |
| Actuated g/C Ratio | 0.57 | 0.50 | 0.50 | 0.44 | 0.59 | 0.11 | 0.19 | 0.25 | 0.11 | 0.21 |
| v/c Ratio | 0.68 | 0.73 | 0.34 | 0.83 | 0.89 | 0.36 | 1.04 | 0.08 | 0.97 | 0.59 |
| Control Delay | 47.6 | 30.8 | 17.9 | 38.3 | 31.4 | 58.5 | 108.2 | 0.3 | 112.1 | 48.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 47.6 | 30.8 | 17.9 | 38.3 | 31.4 | 58.5 | 108.2 | 0.3 | 112.1 | 48.7 |
| LOS | D | C | B | D | C | E | F | A | F | D |
| Approach Delay | | 32.7 | | 35.0 | | | 92.1 | | | 78.0 |
| Approach LOS | | C | | C | | | F | | | E |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 72 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 44.2

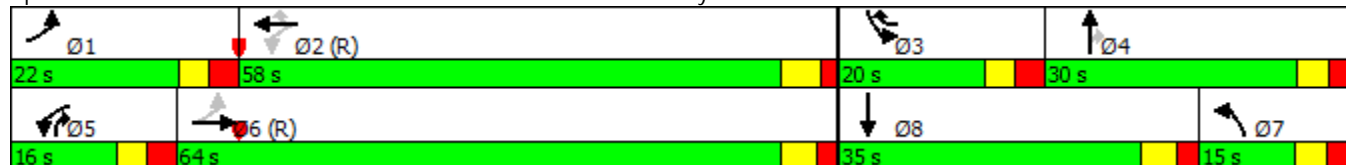
Intersection LOS: D

Intersection Capacity Utilization 91.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: 132nd Ave NE & NE 85th Street/Redmond Way


























HCM 2010 Signalized Intersection Summary

3: 132nd Ave NE & NE 85th Street/Redmond Way

2020 With Project

Timing Plan: PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 150 | 1071 | 110 | 60 | 1214 | 840 | 68 | 345 | 35 | 181 | 117 | 95 |
| Future Volume (veh/h) | 150 | 1071 | 110 | 60 | 1214 | 840 | 68 | 345 | 35 | 181 | 117 | 95 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1881 | 1881 | 1900 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1881 | 1900 |
| Adj Flow Rate, veh/h | 161 | 1152 | 118 | 65 | 1305 | 903 | 73 | 371 | 38 | 195 | 126 | 102 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cap, veh/h | 205 | 1614 | 165 | 230 | 1684 | 940 | 274 | 359 | 373 | 203 | 146 | 118 |
| Arrive On Green | 0.07 | 0.49 | 0.49 | 0.05 | 0.47 | 0.47 | 0.15 | 0.19 | 0.19 | 0.11 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1792 | 3274 | 335 | 1792 | 3574 | 1599 | 1792 | 1881 | 1574 | 1792 | 964 | 780 |
| Grp Volume(v), veh/h | 161 | 628 | 642 | 65 | 1305 | 903 | 73 | 371 | 38 | 195 | 0 | 228 |
| Grp Sat Flow(s),veh/h/ln | 1792 | 1787 | 1822 | 1792 | 1787 | 1599 | 1792 | 1881 | 1574 | 1792 | 0 | 1744 |
| Q Serve(g_s), s | 6.0 | 35.7 | 35.9 | 2.4 | 39.5 | 61.2 | 4.7 | 24.8 | 2.5 | 14.1 | 0.0 | 16.6 |
| Cycle Q Clear(g_c), s | 6.0 | 35.7 | 35.9 | 2.4 | 39.5 | 61.2 | 4.7 | 24.8 | 2.5 | 14.1 | 0.0 | 16.6 |
| Prop In Lane | 1.00 | | 0.18 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.45 |
| Lane Grp Cap(c), veh/h | 205 | 881 | 898 | 230 | 1684 | 940 | 274 | 359 | 373 | 203 | 0 | 264 |
| V/C Ratio(X) | 0.79 | 0.71 | 0.71 | 0.28 | 0.78 | 0.96 | 0.27 | 1.03 | 0.10 | 0.96 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 314 | 881 | 898 | 296 | 1684 | 940 | 274 | 359 | 373 | 203 | 0 | 400 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.8 | 25.8 | 25.9 | 21.0 | 28.6 | 25.4 | 48.6 | 52.6 | 38.8 | 57.4 | 0.0 | 53.9 |
| Incr Delay (d2), s/veh | 7.1 | 4.9 | 4.8 | 0.7 | 3.6 | 21.2 | 0.5 | 56.5 | 0.1 | 52.3 | 0.0 | 11.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 6.0 | 25.9 | 26.4 | 2.2 | 27.6 | 45.9 | 4.2 | 33.3 | 1.9 | 15.1 | 0.0 | 13.7 |
| LnGrp Delay(d),s/veh | 34.8 | 30.7 | 30.7 | 21.6 | 32.2 | 46.6 | 49.1 | 109.1 | 39.0 | 109.7 | 0.0 | 65.6 |
| LnGrp LOS | C | C | C | C | C | D | D | F | D | F | | E |
| Approach Vol, veh/h | | 1431 | | | 2273 | | | 482 | | | 423 | |
| Approach Delay, s/veh | | 31.2 | | | 37.6 | | | 94.5 | | | 86.0 | |
| Approach LOS | | C | | | D | | | F | | | F | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 14.1 | 65.8 | 20.0 | 30.1 | 11.2 | 68.7 | 25.2 | 24.9 | | | | |
| Change Period (Y+Rc), s | * 5.8 | * 5.6 | * 5.8 | * 5.8 | * 5.8 | * 5.6 | * 5.8 | * 5.7 | | | | |
| Max Green Setting (Gmax), s | * 16 | * 52 | * 14 | * 24 | * 10 | * 58 | * 9.2 | * 29 | | | | |
| Max Q Clear Time (g_c+I1), s | 8.0 | 63.2 | 16.1 | 26.8 | 4.4 | 37.9 | 6.7 | 18.6 | | | | |
| Green Ext Time (p_c), s | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 17.3 | 0.5 | 0.6 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 46.0 | | | | | | | | | |
| HCM 2010 LOS | | | D | | | | | | | | | |
| Notes | | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
3: 132nd Ave NE & NE 85th Street/Redmond Way




SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: PM

User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.




HCM 2010 TWSC
4: 131st Ave NE & Drive Aisle A

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: PM

| Intersection | | | | | | |
|--------------------------|---|----------|---|------|-------|---|
| Int Delay, s/veh | 0.4 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  | |  | | |  |
| Traffic Vol, veh/h | 3 | 0 | 48 | 3 | 0 | 10 |
| Future Vol, veh/h | 3 | 0 | 48 | 3 | 0 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 0 | 52 | 3 | 0 | 11 |
| Major/Minor | Minor1 | Major1 | Major2 | | | |
| Conflicting Flow All | 65 | 54 | 0 | 0 | 55 | 0 |
| Stage 1 | 54 | - | - | - | - | - |
| Stage 2 | 11 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 941 | 1013 | - | - | 1550 | - |
| Stage 1 | 969 | - | - | - | - | - |
| Stage 2 | 1012 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 941 | 1013 | - | - | 1550 | - |
| Mov Cap-2 Maneuver | 941 | - | - | - | - | - |
| Stage 1 | 969 | - | - | - | - | - |
| Stage 2 | 1012 | - | - | - | - | - |
| Approach | WB | NB | SB | | | |
| HCM Control Delay, s | 8.8 | 0 | 0 | | | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL | SBT | | |
| Capacity (veh/h) | - | - | 941 | 1550 | - | |
| HCM Lane V/C Ratio | - | - | 0.003 | - | - | |
| HCM Control Delay (s) | - | - | 8.8 | 0 | - | |
| HCM Lane LOS | - | - | A | A | - | |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - | |

HCM 2010 TWSC
5: 131st Ave NE & West Access

SEP18-00313
ENCLOSURE 4
2020 With Project
Timing Plan: PM

| Intersection | | | | | | |
|--------------------------|---|----------|---|------|------|---|
| Int Delay, s/veh | 0 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  | |  | | |  |
| Traffic Vol, veh/h | 0 | 0 | 15 | 33 | 0 | 10 |
| Future Vol, veh/h | 0 | 0 | 15 | 33 | 0 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 16 | 36 | 0 | 11 |
| Major/Minor | Minor1 | Major1 | Major2 | | | |
| Conflicting Flow All | 45 | 34 | 0 | 0 | 52 | 0 |
| Stage 1 | 34 | - | - | - | - | - |
| Stage 2 | 11 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 970 | 1045 | - | - | 1567 | - |
| Stage 1 | 994 | - | - | - | - | - |
| Stage 2 | 1017 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 970 | 1045 | - | - | 1567 | - |
| Mov Cap-2 Maneuver | 970 | - | - | - | - | - |
| Stage 1 | 994 | - | - | - | - | - |
| Stage 2 | 1017 | - | - | - | - | - |
| Approach | WB | NB | SB | | | |
| HCM Control Delay, s | 0 | 0 | 0 | | | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL | SBT | | |
| Capacity (veh/h) | - | - | - | 1567 | - | |
| HCM Lane V/C Ratio | - | - | - | - | - | |
| HCM Control Delay (s) | - | - | 0 | 0 | - | |
| HCM Lane LOS | - | - | A | A | - | |
| HCM 95th %tile Q(veh) | - | - | - | 0 | - | |

HCM 2010 TWSC
6: 132nd Ave NE & East Access

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ENCLOSURE 4
2020 With Project
Timing Plan: PM

Intersection

Int Delay, s/veh 0.2

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | | ↑ | ↘ | |
| Traffic Vol, veh/h | 0 | 28 | 0 | 1335 | 370 | 1 |
| Future Vol, veh/h | 0 | 28 | 0 | 1335 | 370 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 1 | 1 | 0 |
| Mvmt Flow | 0 | 30 | 0 | 1435 | 398 | 1 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 398 | 0 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.2 | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.3 | - |
| Pot Cap-1 Maneuver | 0 | 656 | 0 |
| Stage 1 | 0 | - | 0 |
| Stage 2 | 0 | - | 0 |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 656 | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 10.8 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT EBLn1 | SBT | SBR |
|-----------------------|-----------|-------|-----|
| Capacity (veh/h) | - | 656 | - |
| HCM Lane V/C Ratio | - | 0.046 | - |
| HCM Control Delay (s) | - | 10.8 | - |
| HCM Lane LOS | - | B | - |
| HCM 95th %tile Q(veh) | - | 0.1 | - |

Queuing and Blocking Report 2020 With Project

Intersection: 1: 128th Ave NE & NE 85th Street

| Movement | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB |
|-----------------------|-----|------|------|-----|-----|-----|----|------|----|------|
| Directions Served | L | T | TR | L | T | TR | L | TR | L | TR |
| Maximum Queue (ft) | 81 | 250 | 229 | 47 | 106 | 119 | 65 | 146 | 64 | 72 |
| Average Queue (ft) | 37 | 159 | 134 | 24 | 48 | 71 | 32 | 68 | 31 | 32 |
| 95th Queue (ft) | 84 | 274 | 254 | 54 | 106 | 121 | 71 | 141 | 71 | 74 |
| Link Distance (ft) | | 1312 | 1312 | | 894 | 894 | | 1442 | | 1106 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 100 | | | 100 | | | 50 | | 50 | |
| Storage Blk Time (%) | 1 | 13 | | | 2 | | 10 | 25 | 10 | 9 |
| Queuing Penalty (veh) | 8 | 7 | | | 1 | | 9 | 11 | 4 | 4 |

Intersection: 2: NE 85th Street & 131st Ave NE

| Movement | EB | EB | EB | WB | SB |
|-----------------------|----|-----|-----|-----|----|
| Directions Served | L | T | T | TR | LR |
| Maximum Queue (ft) | 46 | 96 | 122 | 2 | 40 |
| Average Queue (ft) | 20 | 37 | 46 | 0 | 17 |
| 95th Queue (ft) | 51 | 150 | 166 | 5 | 46 |
| Link Distance (ft) | | 894 | 894 | 335 | 77 |
| Upstream Blk Time (%) | | | | | 1 |
| Queuing Penalty (veh) | | | | | 0 |
| Storage Bay Dist (ft) | 50 | | | | |
| Storage Blk Time (%) | 2 | 5 | | | |
| Queuing Penalty (veh) | 16 | 2 | | | |

Intersection: 3: 132nd Ave NE & NE 85th Street/Redmond Way

| Movement | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | SB | SB |
|-----------------------|-----|-----|-----|-----|------|------|-----|-----|------|-----|-----|-----|
| Directions Served | L | T | TR | L | T | T | R | L | T | R | L | TR |
| Maximum Queue (ft) | 269 | 344 | 346 | 240 | 1073 | 1113 | 722 | 108 | 1264 | 87 | 219 | 269 |
| Average Queue (ft) | 146 | 288 | 298 | 87 | 514 | 560 | 552 | 71 | 1131 | 21 | 203 | 241 |
| 95th Queue (ft) | 286 | 383 | 381 | 243 | 1218 | 1138 | 834 | 135 | 1843 | 86 | 238 | 304 |
| Link Distance (ft) | | 335 | 335 | | 2768 | 2768 | | | 1519 | | | 220 |
| Upstream Blk Time (%) | | 6 | 7 | | 0 | 0 | | | 41 | | 23 | 62 |
| Queuing Penalty (veh) | | 42 | 55 | | 0 | 0 | | | 0 | | 0 | 266 |
| Storage Bay Dist (ft) | 250 | | | 240 | | | 700 | 90 | | 100 | 270 | |
| Storage Blk Time (%) | | 17 | | | 21 | 0 | 19 | 7 | 78 | 0 | 23 | 62 |
| Queuing Penalty (veh) | | 27 | | | 14 | 1 | 125 | 28 | 86 | 0 | 52 | 121 |

Queuing and Blocking Report 2020 With Project

Intersection: 4: 131st Ave NE & Drive Aisle A

| Movement | WB |
|-----------------------|-----|
| Directions Served | LR |
| Maximum Queue (ft) | 15 |
| Average Queue (ft) | 3 |
| 95th Queue (ft) | 18 |
| Link Distance (ft) | 130 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

Intersection: 5: 131st Ave NE & West Access

| Movement | |
|-----------------------|--|
| Directions Served | |
| Maximum Queue (ft) | |
| Average Queue (ft) | |
| 95th Queue (ft) | |
| Link Distance (ft) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

Intersection: 6: 132nd Ave NE & East Access

| Movement | EB | SB |
|-----------------------|-----|-----|
| Directions Served | R | TR |
| Maximum Queue (ft) | 119 | 524 |
| Average Queue (ft) | 85 | 300 |
| 95th Queue (ft) | 156 | 611 |
| Link Distance (ft) | 116 | 698 |
| Upstream Blk Time (%) | 50 | 1 |
| Queuing Penalty (veh) | 0 | 0 |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Network Summary

Network wide Queuing Penalty: 879



CITY OF KIRKLAND

Department of Public Works

123 Fifth Avenue, Kirkland, WA 98033 425.587.3800

www.kirklandwa.gov

MEMORANDUM

To: Tony Leavitt, Senior Planner

From: Thang Nguyen, Transportation Engineer
Joel Pfundt, Transportation Manager

Date: November 13, 2019

Subject: Continental Divide Development Transportation Impact Analysis Review,
SEP18-00313

This memo summarizes staff's review of the transportation impact analysis (TIA) report *Continental Divide Development Transportation Impact Analysis* dated September 2018 submitted by the TSI, Inc. Staff's findings, recommendations and review comments are summarized below.

STAFF FINDINGS

The proposed project will not create significant State Environmental Policy Act (SEPA) transportation impacts. Although transportation related mitigation is not required with SEPA, the applicant should include all the Public Works' conditions of approval listed in the STAFF RECOMMENDATIONS section of this memorandum. These recommendations are based on the Kirkland Zoning Code Chapter 110 that address infrastructure and transportation related issues and are addressed at the development permit review stage.

Through the SEPA review process for the proposed development, staff has received public comments on the additional transportation impact from the development to the southbound queue and traffic operation at the intersection of NE 85th Street/132nd Avenue NE. In response, Public Works has reviewed the traffic condition at the intersection of NE 85th Street/132nd Avenue NE and identified a capital improvement project to address the public's concerns. In the process of updating the City's Capital Facilities Plan, the City plans to add a second southbound left-turn lane at the intersection of NE 85th Street/132nd Avenue NE to improve the southbound level of service and to reduce the southbound left-turn queue that blocks the southbound through lane and future project driveway. This capital improvement project is currently listed in the draft 2019-2035 Capital Facilities Plans (CFP) as project number TRC-13900 to be presented to the City Council for approval in December 2019. This capital improvement project is a capacity improvement project; therefore, it is eligible to be funded by the development transportation impact fee. As a part of frontage improvement requirements, the applicant will be required to contribute to the improvement project by dedicating a 12-foot easement along the project frontage on 132nd Avenue NE.

STAFF RECOMMENDATIONS

SEPA Mitigation

Transportation SEPA mitigation is not required.

Public Works Conditions

As part of subsequent development permits, the following conditions of approval are required for the proposed development to comply with Public Works standards and requirements:

System Improvements

1. Pay Transportation Impact Fee to mitigate system-wide transportation impacts.

Per the Kirkland Zoning Code, KZC 110, the following off-site and on-site requirements are to satisfy the required Public Works frontage improvements and development standards. These requirements must be completed prior to the building occupancy approval.

Off-site Requirements

1. Install c-curb along the median of the north leg of the intersection of NE 85th Street/132nd Avenue NE to eliminate left-turns into and out of the project garage driveway. The c-curb shall extend from the stop bar to 265 feet north of the intersection.
2. The applicant shall provide a 12-ft wide ROW improvement easement along the easterly property line and at the street corner for future road widening and traffic signal equipment to be done by the City. The applicant shall receive a transportation impact fee credit for the easement dedication.
3. The applicant shall provide an adequate right-of-way easement to relocate the existing signal pole to accommodate the future construction of a second southbound left-turn lane at the intersection of NE 85th Street and 132nd Avenue NE. The applicant shall receive a transportation impact fee credit for the easement dedication.
4. All easement documents shall be made ready for recording prior to permit issuance.
5. Install a "no parking" sign 10 feet south of the commercial driveway on 131st Avenue NE.
6. Install a load/unload sign 55 feet north of the commercial driveway on 131st Avenue NE for the curb area beyond the no parking zone and paint the curb yellow to designate the load/unload area. The load/unload area shall be limited to 30 minutes (unless it is a moving truck) between 7 A.M. and 10 P.M. However, moving trucks shall not be allowed to park overnight.

On Site Requirements

1. Install a "No Exit" sign within the parking garage at the driveway to 131st Avenue NE.
2. Design the parking garage driveway on 131st Avenue NE to help accommodate a commercial truck turnaround, so northbound commercial trucks on 131st Ave NE can turn

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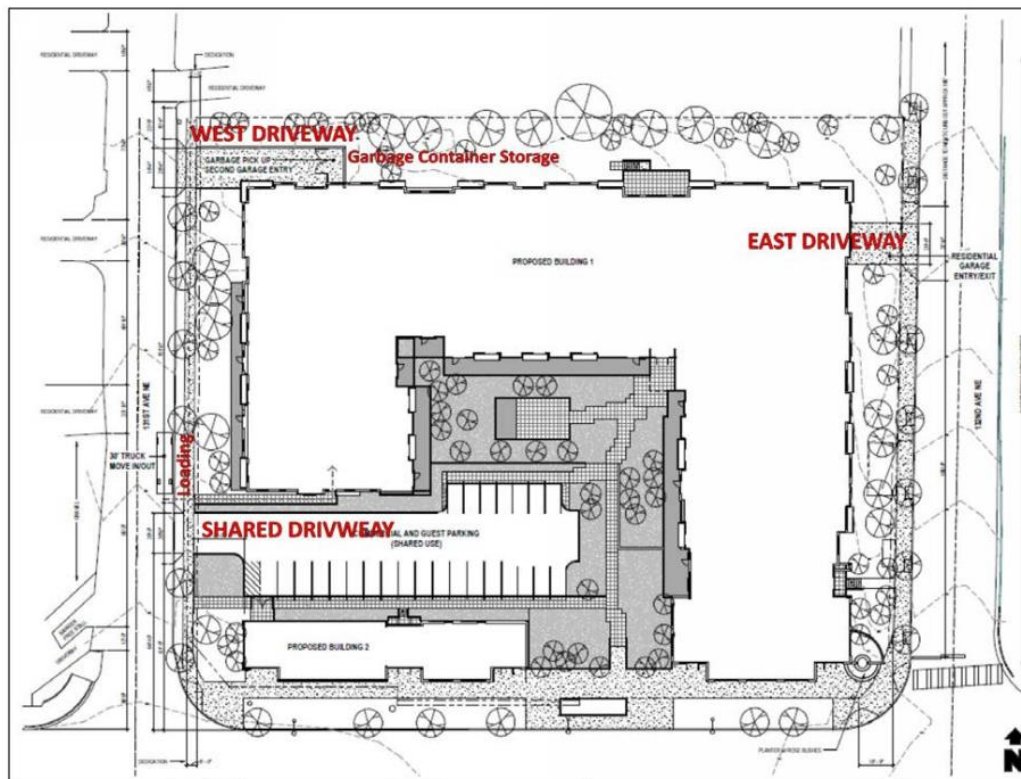
- around and travel southbound on 131st Ave NE. The design shall be submitted to public works staff for review and approval prior to final building permits.
3. Install a "No Outlet" sign on north of the garage driveway on 131st Avenue NE to minimize truck traffic impact to the residential neighborhood to the north of the project site.
 4. Install a right-turn only sign for vehicles exiting the garage driveway onto 132nd Avenue NE.
 5. Remove the proposed parking spaces located within 25 feet of the project's commercial driveway measured from behind the sidewalk into the project surface parking lot.
 6. Landscaping located in the area five feet behind the sidewalk and between the garage driveway and the pedestrian path adjacent to 132nd Avenue NE shall be no taller than three feet.
 7. The garage security gates must be located at least 25 feet from the back of the sidewalk.

Project Description

Continental Divide is a proposed residential mixed-use development located at 8505 132nd Avenue NE. The project site is on eight separate parcels located north of NE 85th Street, west of 131st Avenue NE and east of 132nd Avenue NE. The current uses on the project site are seven single-family homes and a 2,100 sq. ft. general office building. One of the parcels had a single-family house but has been demolished for over three years. The proposed development includes 134 apartment units (121 market rate units and 13 affordable units) three-story building and 7,500 sq. ft. of general office space in part of the three-story building as well as a stand-alone office building, a parking garage as well as a ground level parking lot with a total of 198 parking spaces. Garage driveways are proposed to be located on 131st Avenue NE and 132nd Avenue NE. The garage driveway on 131st Avenue NE is proposed to provide one-way ingress. The garage driveway on 132nd Avenue NE is proposed to provide two-way access, but it will be limited to right-turn entering and exiting. A separate driveway on 131st Avenue NE is proposed to provide access to the surface level parking lot for the office use (employees and office visitors) and residential visitors. Figure 1 illustrates the site layout. The project build-out and full occupancy is anticipated by the end of 2020.

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Figure 1. Site Layout



Trip Generation

The proposed project is calculated to generate 802 daily, 68 PM peak hour, and 55 AM peak hour net total trips. After subtracting the net total trips generated by the existing uses, the project is calculated to generate 692 daily, 56 PM peak hour, and 45 AM peak hour net new trips. Table 1 summarizes the trip generation for the project site.

Table 1. Trip Generation

| Land Use | | | Trips | |
|---------------------|---------------|------------|--------------|--------------|
| Proposed | Size | Daily | PM Peak Hour | AM Peak Hour |
| Mid-Rise Apartments | 134 units | 729 | 59 | 46 |
| General Office | 7,500 sq. ft. | 73 | 9 | 9 |
| Net Total | | 802 | 68 | 55 |
| Existing | | | | |
| Single-Family | 7 units | 90 | 10 | 8 |
| General Office | 2,000 sq. ft. | 20 | 2 | 2 |
| Net Total | | 110 | 12 | 10 |
| Net new | | 692 | 56 | 45 |

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TRAFFIC CONCURRENCY

The proposed project passed transportation concurrency and received a concurrency test notice September 4, 2019. Since the applicant submitted a transportation impact analysis to Public Works prior to the 90-day deadline, the concurrency test notice is currently valid until September 4, 2020 at which time the applicant must obtain a development permit and certificate of concurrency or apply and receive a concurrency test notice extension prior to its expiration.

TRAFFIC IMPACT ANALYSIS

The scope of analysis was approved by the City Transportation Engineer and the traffic report was completed in accordance with the City of Kirkland Traffic Impact Analysis Guidelines (TIAG).

The citywide trip distribution was determined by using the Bellevue-Kirkland-Redmond (BKR) traffic model.

The City's TIAG requires a level of service (LOS) analysis using the Highway Capacity Manual Operational Method for intersections that have a proportionate share equal or greater than 1%. Based on the proportionate share calculations for the full build-out of the proposed project, three off-site intersections will have 1% or more proportionate share impact. Those impacted intersections are:

Table 2. Proportional Share Impacts

| Intersections | Proportional Share Impacts |
|--|-----------------------------------|
| NE 85 th Street/128 th Avenue NE | 1.12% |
| NE 85 th Street/131 st Avenue NE | 1.53% |
| NE 85 th Street/132 nd Avenue NE | 3.65% |

Those intersections and the site driveways are required to be analyzed for AM and PM levels of service, operation and safety.

LOS Mitigation Threshold

The City requires developers to mitigate traffic impacts when one of the following two warranted conditions is met:

1. An intersection level of service is at E and the project has a proportional share of 15% impact or more at the intersection.
2. An intersection level of service is at F and the project has a proportional share of 5% impact or more at the intersection.

Off-site Traffic Impacts

The AM and PM peak hour LOS analyses were calculated for the three proportionally significant intersections. Based on the analysis, the intersection of NE 85th Street/128th Avenue NE and NE 85th Street/131st Avenue NE were calculated to operate at LOS-D or better for both peak time periods. The future level of service at both intersections are better than LOS-E, therefore LOS mitigation is not required for those intersections.

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The intersection of NE 85th Street/132nd Avenue NE was calculated to operate at LOS-E in the AM peak hour and LOS-D in the PM peak hour. Although LOS-E triggers the assessment for mitigation, mitigation is only warranted if the project contributes a 15% proportional share impact to the intersection. The project's proportional share impact is 3.65%. Therefore, the requirement to mitigate the LOS impact at this intersection is not warranted.

However, LOS is not the only criteria for assessing mitigation. Other intersection operational criteria may trigger the requirement for mitigation such as traffic conflict and safety, significant queue, etc. The public has concerns about the congestion on the southbound approach to the intersection and suggested adding a southbound right-turn lane at the intersection of NE 85th Street/132nd Avenue NE. The public has requested that the City adds a separate southbound right-turn lane at the intersection to provide additional capacity to accommodate the right-turn lane peak traffic demand and to relieve the existing congestion. Based on public comments and concerns, staff completed additional reviews of the operation of the southbound approach. After reviewing the video footage of the intersection, the significant queue and congestion at the intersection are created by the heavy southbound left-turn traffic volume. The current left-turn lane does not have the capacity to accommodate the high volume of left-turns during the AM peak hour. Therefore, the left-turn queue extends beyond the project's frontage and blocks the shared through/right-turn lane; thus, creating a bottleneck for the southbound traffic volume and limiting the AM traffic to turn right onto NE 85th Street. Thus, adding an additional right-turn lane would not solve the problem because the right-turn lane would continue to be blocked by the left-turn traffic queue with a single left-turn lane.

The solution to mitigate the blockage and improve the through-lane traffic flow is to add a second southbound left-turn lane. The second southbound left-turn lane will accommodate the left-turn lane traffic demand better. The improvement will require the widening of the north leg of the intersection (along the development's frontage on 132nd Avenue NE) by 12 feet to accommodate the additional left-turn lane. Because of the existing alignment of the opposing northbound leg is skewed to the west, widening the west side of the street by 12 feet will provide a safer lane alignment. Therefore, this project will be required to dedicate an easement of 12 feet along the entire project's frontage for the construction of the additional left-turn lane in the future. In addition, additional right-of-way will be required to locate a new signal pole at the northwest corner of the intersection.

Traffic Safety

An intersection collision rate over 1.0 collision per million entering vehicles are considered to be significant and warrants a more detail review to determine if there are any patterns that exist which need to be mitigated. Based on the 5-year crash records between 2012 and 2017, all analyzed intersections have a crash rate of less than 1.0 and none of the analyzed intersection are on the Kirkland's high accident location list. Further review indicated that there is no unusual crash pattern that would suggest that the intersections do not have adequate sight distance or intersection improvements are needed. Therefore, the intersections are considered safe and no further review is necessary.

Memorandum to Tony Leavitt
November 13, 2019
Page 7 of 8

Project Driveway Operation

All project driveways are calculated to operate at a LOS-B or better. The driveway on 132nd Avenue NE will be restricted to right-turns; therefore, left-turns will not be permitted. The applicant will be required to install 265 feet of c-curb in the median to prevent left-turns at the project driveway. The c-curb will begin from the stop bar to 265 feet north of the intersection. The left-turn restrictions will eliminate the northbound left-turn movements in and out of the project driveway; therefore, eliminating any northbound back-up to impact the NE 85th Street/132nd Avenue NE intersection. Furthermore, the c-curb will eliminate left-turn conflicts at the driveway.

The proposed garage driveway located on 131st Avenue NE will provide ingress to, but no egress from the garage. In addition, it will also provide access for garbage pickup located behind the driveway and provide a turnaround for move-in trucks to turn around. A "No Outlet" or similar sign will be required to be stalled north of the garage driveway to minimize truck traffic impact to the existing residents to the north of the site.

The driveway to the surface parking lot for commercial and residential visitors will have full ingress and egress movements. Both driveways have adequate sight distance and are forecasted to operate safely.

Sight Distance Analysis

Based on the sight distance analyses provided in the transportation report, all project driveways will meet the Public Works' minimum safe sight distance requirements. Landscaping located in the area five feet behind the sidewalk and between the garage driveway and the pedestrian path adjacent to 132nd Avenue NE shall be no taller than three feet.

To maintain adequate sight distance, on-street parking will not be allowed between the driveway for the commercial use and NE 85th Street.

Truck Loading and Circulation

The developer is required to complete half-street improvements along 131st Avenue NE to include curb, gutter and sidewalks. The distance between the project's driveways on 131st Avenue NE is approximately 155 feet. The applicant proposes to stripe approximately 45 feet of the curb between the project's driveways to use as a load/unload area for commercial vehicles and moving trucks. As discussed earlier, to limit truck impacts on the existing residential neighborhood to the north of the site, the garage driveway will be required to be designed to accommodate a truck turnaround and a "No Outlet" sign will be required to be installed to dissuade truck drivers from entering the single-family residential neighborhood.

On-Street Parking

The developer is required to complete half-street improvements along 131st Avenue NE to include curb, gutter and sidewalks. The distance between the project's driveways on 131st Avenue NE is approximately 155 feet. The applicant proposes to stripe approximately 45 feet of the curb between the project's driveways as a load/unload area for commercial vehicles and moving trucks. Approximately 100 feet of the rest of that curb space will be available for on-street parking (approximately four vehicles). Currently, approximately three vehicles can park on the

Memorandum to Tony Leavitt
November 13, 2019
Page 8 of 8

street along the project frontage where there are no driveways. The proposed project will create one additional parking space as compared to existing conditions. It is forecasted that the proposed development's parking demand can be accommodated on site; therefore, no impact to on-street parking is anticipated. The additional on-street parking and curb side load/unload area created by the proposed project will provide an additional parking space for the adjacent businesses and residents.

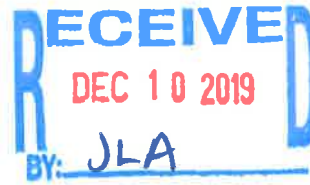
TRANSPORTATION IMPACT FEE

Per City's Ordinance 3685, a transportation impact fee is assessed for all new developments and is calculated based on the current Transportation Impact Fee Schedule, last updated January 1, 2019. Transportation impact fees are used to construct transportation capacity improvements throughout the City to help the City maintain transportation concurrency. Table 1 summarizes the transportation impact fee calculation for the proposed project. The final transportation impact fee calculations will be determined at final building permit based on the adopted transportation impact fee schedule at the time of final building permit.

Table 3. Estimated Road Impact Fee

| Land Use | Size | Impact Fee Rate | Impact Fees |
|-----------------|---------------|---------------------|------------------|
| Proposed | | | |
| Multi-Family | 134 units | \$3,154 per unit | \$422,636 |
| General Office | 7,500 sq. ft. | \$25.39 per sq. ft. | \$190,425 |
| | | Sub-Total | \$613,061 |
| Existing | | | |
| Single-family | 7 units | \$5,533 per unit | (-\$38,731) |
| General Office | 2,100 sq. ft. | \$25.39 per sq. ft. | (-\$53,319) |
| | | Sub-Total | (-92,050) |
| | | Net New Fee | \$521,011 |

cc: John Burkhalter, Development Engineer Manager



Notice of Appeal

This document is an appeal to the Determination of Non-Significance for the Continental Divide Mixed-Use Project filed on December 2, 2019 with file number SEP18-00313. My wife, Sarah Yao and I, are specifically and directly affected by the proposed development as we share the immediate northern boundary with the subject parcels.

Summary

The concurrency test notice that the applicant relies upon, TRAN17-00236, expired without extension on June 22, 2019 and is no longer valid for a certificate of concurrency. The Applicant's Traffic Impact Analysis statement contains basic mathematical errors that fail to correctly model traffic throughout the project and thus fail to properly estimate traffic impacts and mitigations. For these reasons the proposed Traffic Impact Analysis and Traffic Impact Analysis Review must be rejected and resubmitted with corrected, up-to-date notice.

Additionally, the SEPA checklist provided by the applicant failed to correctly account for self-admitted solar impact to neighboring properties (Question 6b). For this reason and to resolve the issues with the certificate of concurrency the Determination of Non-Significance should be withdrawn and replaced with a requirement for mitigation of solar impacts to neighboring properties.

Expiration of Concurrency Test Notice TRAN17-00236

In preparation for the traffic impact analysis document, Concurrency Test Notice TRAN17-00236 was issued on June 22, 2018. This document expires one year after its issuance unless either a certificate of concurrency is issued or an extension is granted. As the document's expiration date of June 22, 2019 passed without an extension, the underlying concurrency test notice has expired. In order to grant a certificate of concurrency a new concurrency test notice must be issued with updated underlying data.

Kirkland Municipal Code, Chapter 25.10.020 reads, in part:

- (7) The concurrency test notice shall expire unless a certificate of concurrency is issued or an extension of the notice is granted within one year from the date of issuance of the notice.
- (8) An applicant must apply for a new concurrency test if the notice expires or an extension is not granted.
- (9) The public works official may approve an extension of up to one year if:

- (a) The applicant submits a letter in writing requesting the extension before the expiration date, can show that he/she is not responsible for the delay in issuing the certificate of concurrency and has acted in good faith to obtain a certificate; and
- (b) If the property is serviced by a noncity Managed utility, then the applicant must submit a letter from the utility approving the extension before the expiration date.

While simultaneously page 5 of the finalized Traffic Impact Analysis states:

TRAFFIC CONCURRENCY

The proposed project passed transportation concurrency and received a concurrency test notice June 22, 2018. Since the applicant submitted a transportation impact analysis to Public Works prior to the 90-day deadline, the concurrency test notice is currently valid until June 22, 2019 at which time the applicant must obtain a development permit and certificate of concurrency or apply and receive a concurrency test notice extension prior to its expiration.

This Traffic Impact Analysis document itself was filed on October 23, 2019. This date is approximately 4 months after the expiration of the referenced concurrency test notice.

Finally, the location designated for Kirkland concurrency test notices under KMC 25.10.050 is <https://www.kirkland.wa.gov/Assets/Public+Works/Public+Works+PDFs/Transportation/Concurrency/Traffic+Impact+Analysis+Project+Status.pdf>. This required public notice contains an identical deadline for the Continental Divide Mixed Use project:

| Transportation Concurrency Status Database | | | | | | | | | |
|--|---|--|---------------------------|--|-----------------------------|----------------------------|--|--|--|
| Monday, October 28, 2019 | | | | | | | | | |
| 28-Oct-19 Concurrency Tran Case # | Project Name | Parcel Number | Proposed Land Use Type(s) | Net New PM peak hour Person trip Generation | Is SEPA Review required? | Concurrency Test Notice | Concurrency Test Notice Analysis Report must be submitted by | Concurrency Certificate (Vested w/ development permit) | Concurrency Balance (Person Trips) |
| 17-00236 | Continental Divide 8505 132nd Ave NE | 1241900025, 8635500025, 8635500030, 86355700015, 8635570002, 86355700025, 8637500030 | Mixed-Use | 110 | Yes | 6/22/2018 | 9/20/2018 | N | 6,186 |

A review of the plans filed on this project do not reveal a concurrency test notice extension filing before June 22, 2019 as required by Kirkland city code, or indeed any such extension after that time to bring this notice into the allowed time frame of this notice.

Given that the concurrency test notice for this project has expired, the owner of this project must reapply for a concurrency test notice before continuing to a certificate of concurrency.

Basic Mathematical Errors in Traffic Impact Analysis

The trip generation assignments found within the traffic impact analysis generate mathematically impossible traffic flows. These errors consistently lose vehicles in trip estimates between points where there is no possibility of vehicles being removed from the traffic flow. This error means that all projections of intersection proportional share cannot be done correctly given bad source data. It's not possible from this traffic impact analysis to determine if any intersections are being overloaded with this new traffic.

The clearest example of this can be found on Figure 5, page 8. Point 2 is the intersection of NE 85th St & 131st Ave NE. Point 4 is the new proposed shared driveway on 131st Ave NE. No turns are possible in between these two points, every vehicle traveling between these two points must come out of the stretch after going in.

The Peak AM calculations for point 2, traveling north have 9 cars turn in from the west, 5 from the east. This provides a net total 14 new vehicles entering 131st.

At point 4, of these 14 vehicles mentioned above, 2 turn into the shared driveway and 17 go straight, a net total of 19 vehicles from the 14 mentioned at point 2. 5 vehicles have appeared out of nowhere and are not accounted in travel through point 2.

Similar errors exist throughout the assignment of trips in figures 5 (page 8) and figure 9 (page 16). For a comprehensive listing of these errors in both figures see "Appendix – Erroneous calculations in traffic flow".

Additional mathematical errors are found in the bare text of the document. Section 6.1.3 (Page 20) states that the project's contribution to NE 85th Street and 132nd Ave NE is:

In the AM peak hour, there are 16 Project trips forecast at this intersection, which represents a 0.9% increase in the AM peak hour future volume without and with the Project.

While two paragraphs later it explains:

The Project adds 26 AM peak hour trips to the southbound approach [of NE 85th Street and 132nd Ave NE]: 7 left turns, 2 vehicles through the intersection and 16 right turns.

None of these numbers make sense. 7+2+16 is only 25, and 16 is far less than even only the southbound approach number.

Undisclosed solar impacts to neighboring properties

Applicant's answer to question 6b on the SEPA Environmental Checklist, page 10 reads:

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

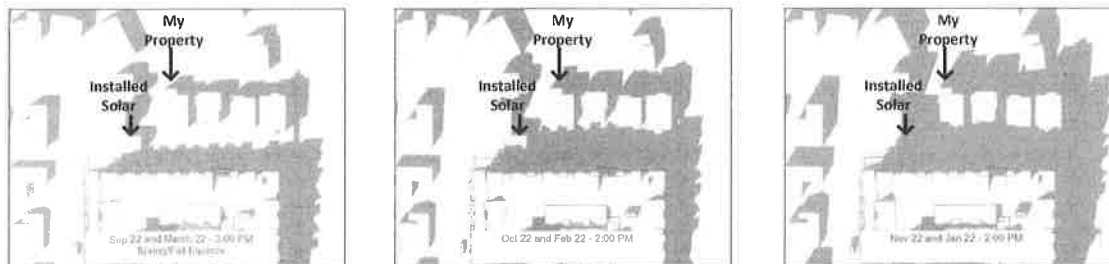
Minimal shading on the adjacent properties to the north. North properties are separated by a 30' wide open space. The shading would not affect the potential use of solar energy by adjacent properties.

This represents a material misrepresentation of both the applicant's legally required landscape buffer as well as the impact of both the buffer and proposed building on adjacent properties, including my own.

The 30' spacing referred to by the applicant as "open space" is in fact a landscape buffer, half of which is legally required under the terms of KZC 95.42 (1) (Buffer standard "A"). This standard requires a mix of deciduous and evergreen trees as well as 'Large shrubs' over 6 feet in mature height to be planted within this "open space", therefore it must have a shading impact on neighboring properties. This material misrepresentation makes it impossible to properly consider the impact on neighbor shading within the scope of SEPA review.

Additional solar studies submitted by the applicant for Design Review purposes demonstrate a clear solar impact on neighboring properties. These solar studies lack simulations of the above landscaping elements so do not represent a true measure of the structure's impact to neighboring properties, however they do represent a *minimum* expected impact to their neighbors ignoring the impact of landscaping on solar shading.

These are attached here as Attachment C -- DRV18-00312_SolarStudy, reproduced below to highlight the afternoon impact to both my house and the house of my neighbor, Rajesh Kodali.



While my impact is greatest to my backyard garden and windows, Rajesh will lose light on the solar panels installed on his property. These solar panels were installed long before this building was ever proposed.

This proposal clearly impacts the potential use of solar energy for both my property and the existing solar panels on my neighbor, Rajesh's property.

Conclusion

Given that the applicants concurrency test notice has expired, this application should be rejected for failure to maintain a valid concurrency test notice. Even if this error is not at issue, the basic mathematical errors that are found within the applicant's Traffic Impact Analysis fail to properly compute the impacts at significant intersections and driveways as required of a proper analysis.

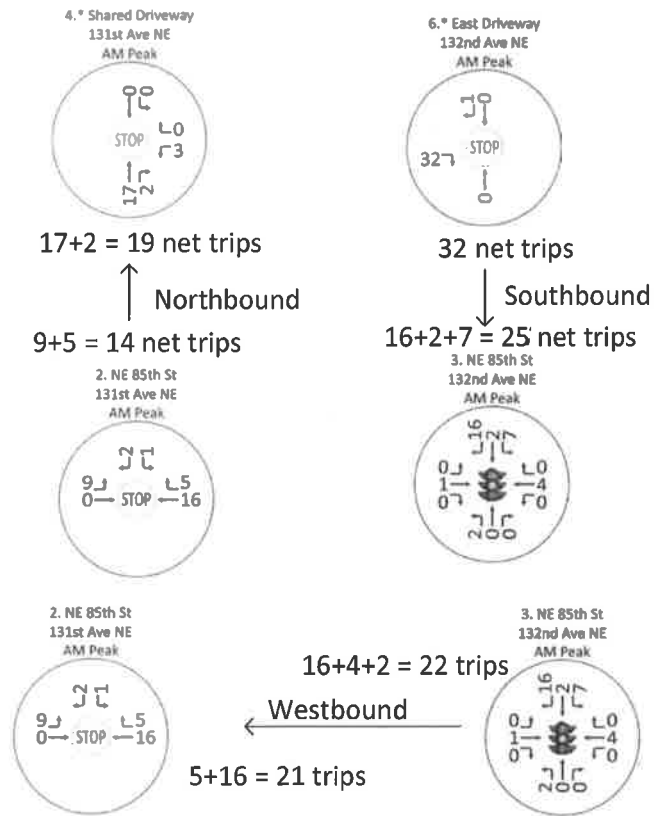
The SEPA checklist provided by the applicant misrepresents the impact of the project's shading to existing solar power and other solar uses in question 6b. For this reason and to resolve the issues with the certificate of concurrency the Determination of Non-Significance should be overturned and replaced with a requirement for mitigation of solar impacts to neighboring properties as well as an up to date set of concurrency applications.

Reid Borsuk & Sarah Yao

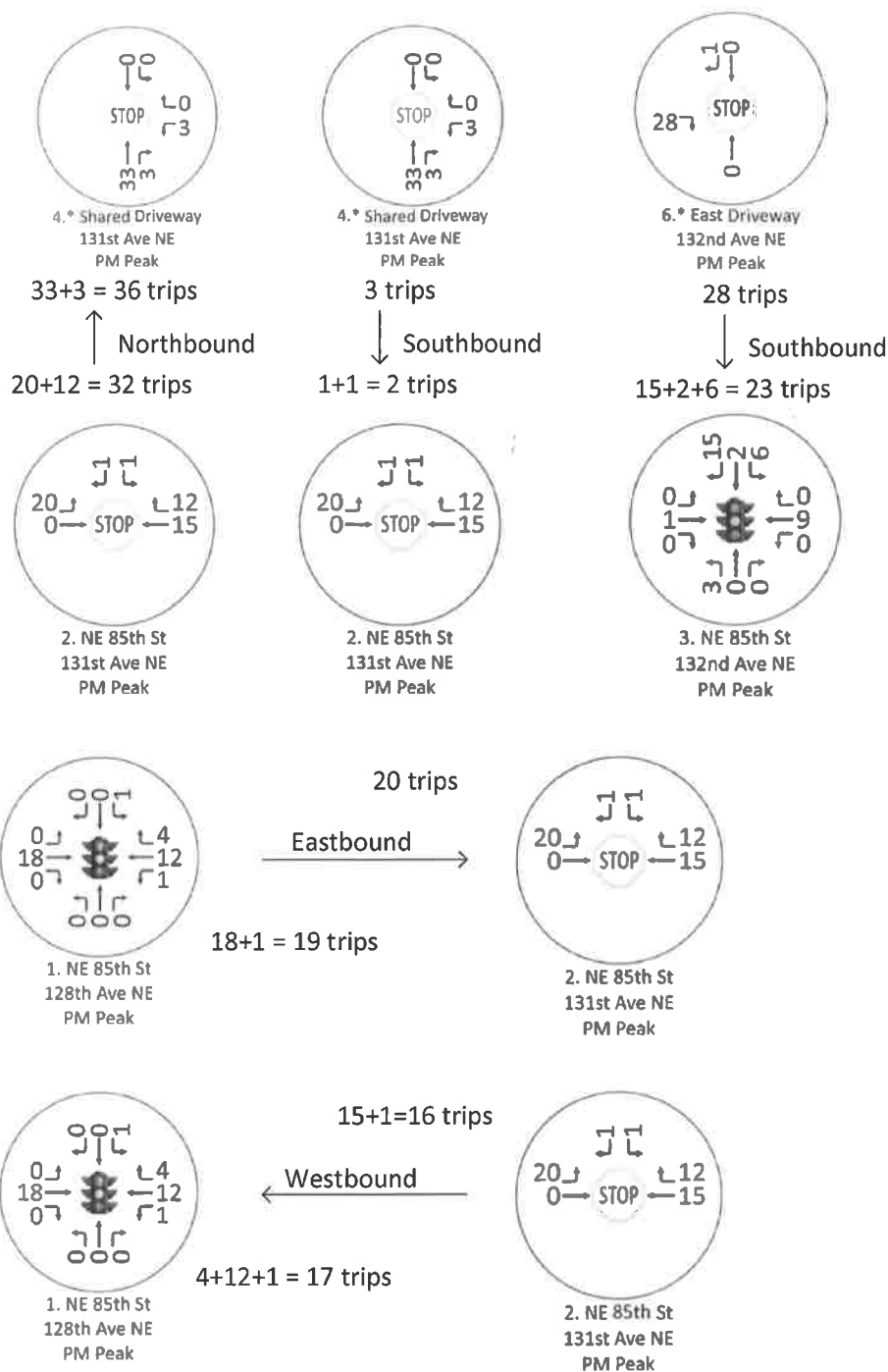
8543 132nd Ave NE

Kirkland, WA 98033

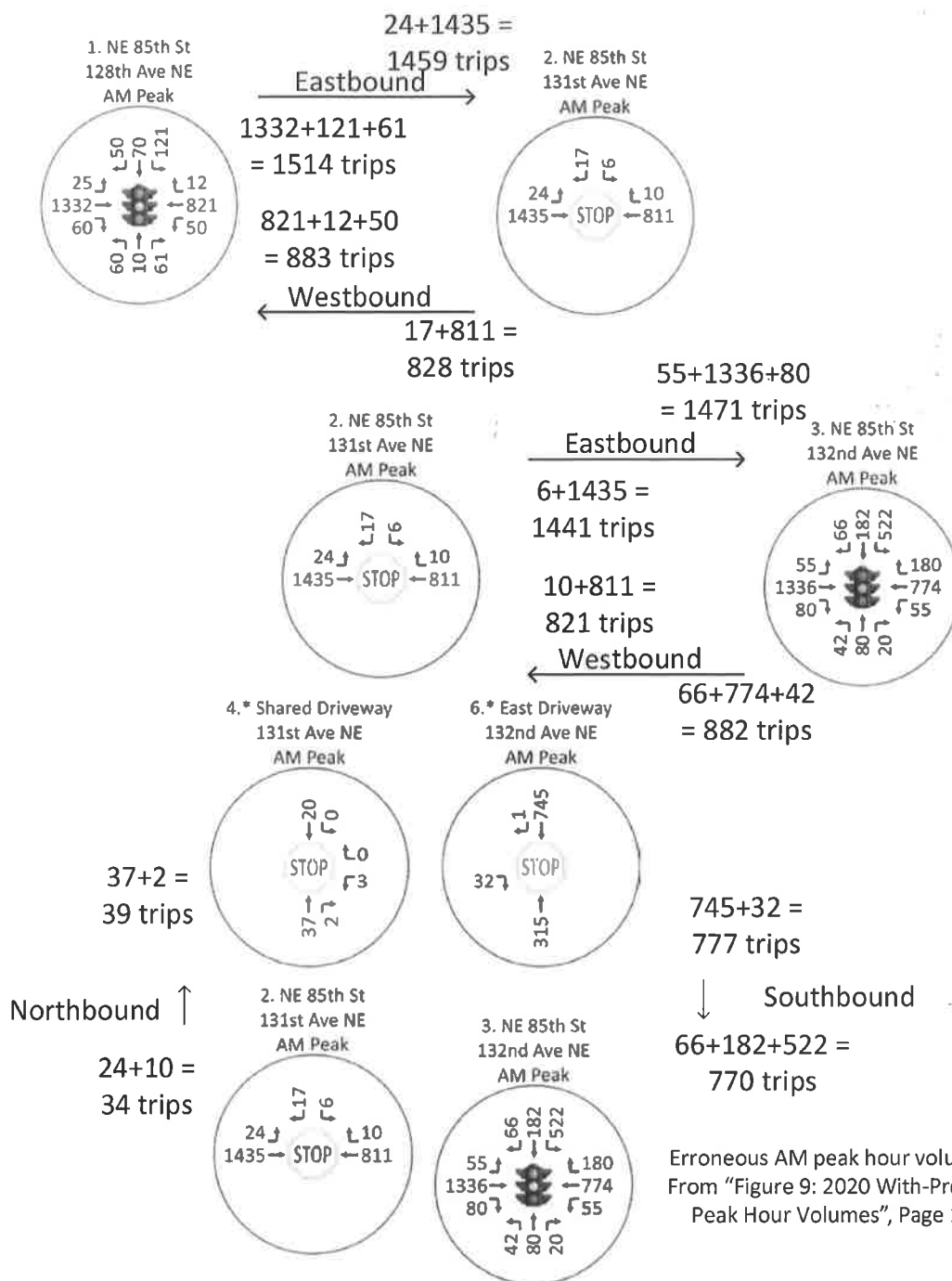
Appendix – Erroneous calculations in traffic flow

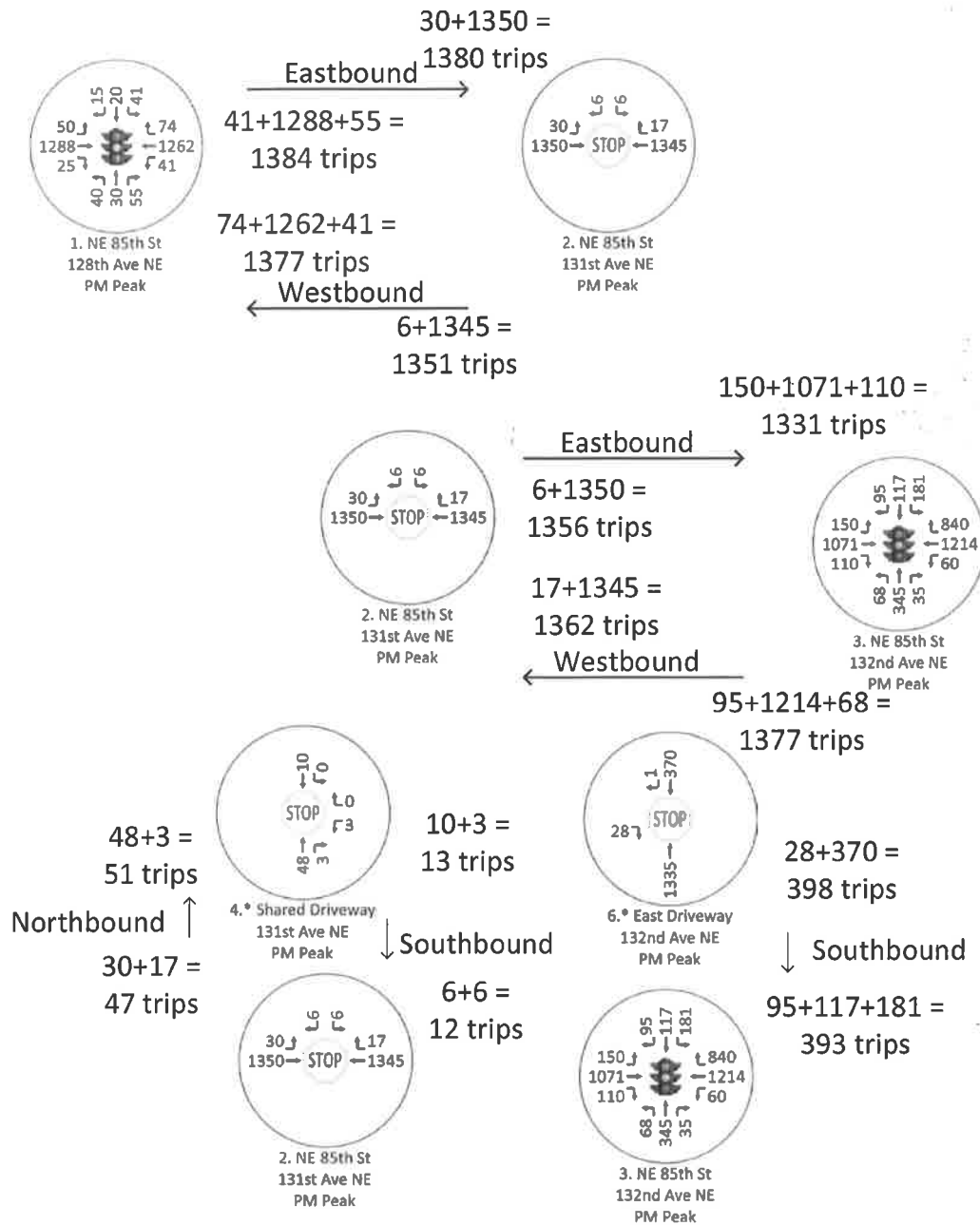


Erroneous AM new traffic flows
From "Figure 5: AM and PM Peak Hour Trip Assignment",
Page 11



Erroneous PM new traffic flows
From "Figure 5: AM and PM Peak Hour Trip Assignment",
Page 11





Erroneous PM peak hour volumes
 From "Figure 9: 2020 With-Project Peak Hour Volumes",
 Page 16

References

Attachment A

Development Concurrency. (2019). *Current development projects tested for traffic concurrency*. [online] Available at: <https://www.kirklandwa.gov/Assets/Public+Works/Public+Works+PDFs/Transportation/Concurrency/Traffic+Concurrency+Project+Status.pdf> [Accessed 8 Dec. 2019].

Attachment B

Concurrency Test Notice. (2018). *Continental Development Traffic Concurrency Test Notice, Tran17-00236*. [online] Available at: <https://permitsearch.mybuildingpermit.com/PermitDetails/TRAN17-00236/Kirkland> [Accessed 8 Dec. 2019].

Attachment C

Solar Study. (2018). *Continental Divide Mixed Use Project - DRV18-00312 Part 3 as submitted on November 18, 2019*. [online] Available at: https://www.kirklandwa.gov/Assets/Planning/Planning+PDFs/Design+Review+Board/Continental+Divide+Mixed+Use+Project+-+DRV18-00312_Part3.pdf [Accessed 8 Dec. 2019].

| Transportation Concurrence Status Database | | | | | | | | | |
|--|--|--|--|--|-----------------------------|----------------------------|--|--|--|
| Monday, October 28, 2019 | | | | | | | | | |
| 28-Oct-19 Concurrence Tran Case # | Project Name | Parcel Number | Proposed Land Use Type(s) | Net New PM peak hour Person trip Generation | Is SEPA Review required? | Concurrence Test Notice | Concurrence Test Notice Analysis Report must be submitted by | Concurrence Certificate (Vested w/ development permit) | Concurrence Balance (Person Trips) |
| 2016 CFP | | | | | | | | | 8,179 |
| 17-00023 | Aliza Totem Lake Retail Center | 2826059103, 2826059098 | Miscellaneous Retail | 107 | Yes | 1/10/2017 | 4/10/2017 | Y | 6,752 |
| 17-00067 | Ford of Kirkland Auxiliary Lot | 2826059113 | Auto Sales | 11 | Yes | 2/1/2017 | 5/2/2017 | Y | 6,741 |
| 17-00054 | 330 4th Street- Plaza mixed-use | 3900101390 | Residential/commercial | 25 | Yes | 2/15/2017 | 5/16/2017 | Y | 6,716 |
| 17-00091 | Eastview Townhomes | 2726090100 | Multi-family | 10 | Yes | 1/10/2017 | 4/10/2017 | Y | 6,716 |
| 17-00118 | State Auto Apartment | 2726090100 | Multi-family | 10 | Yes | 1/10/2017 | 4/10/2017 | Y | 6,716 |
| 17-00117 | 1000-1000-1000-1000 | 2726090100 | Multi-family | 10 | Yes | 1/10/2017 | 4/10/2017 | Y | 6,716 |
| 17-00153 | Eastview Townhomes | 2726090100 | Multi-family | 10 | Yes | 1/10/2017 | 4/10/2017 | Y | 6,716 |
| 17-00187 | LifeBridge 11725 NE 118th Street | 2826059018 | Multi-family | 347 | Yes | 4/10/2017 | 7/9/2017 | N | 6,369 |
| 17-00192 | Peter Kirk Elementary, 1312 6th Street | 3982701890 | elementary school | 24 | yes | 4/18/2017 | 7/17/2017 | N | 6,345 |
| 17-00264 | Willows Pot Manufacturing | 2726059008 | manufacturing | 49 | Yes | 5/22/2017 | 8/20/2017 | Y | 6,296 |
| 17-00236 | Continental Divide 8505 132nd Ave NE | 1241900025, 8635500025, 8635500030, 86355700015, 8635570002, 86355700025, 8637500030 | Mixed-Use | 110 | Yes | 6/22/2018 | 9/20/2018 | N | 6,186 |
| 17-00428 | Lennar 11811 & 11821 NE 128th Street | 2826059220/-221 | Residential/commercial | 238 | yes | 7/14/2017 | 10/12/2017 | Y | 5,948 |
| 17-00440 | Chelsea II | 8663270011 | Residential MF | 49 | yes | 7/26/2017 | 10/24/2017 | Y | 5,899 |
| 17-00691 | The Walk Division | 5678300000, 9118300000 | Residential SF & MF | 30 | Yes | 11/17/2017 | 2/15/2018 | N | 5,869 |
| 17-00754 | Orcas Moon SF | 3890100055/55 | Single Family | 22 | Yes | 1/2/2018 | 4/2/2018 | N | 5,847 |
| 2017 Total | | | | 1012 | | | | | 5,847 |
| 18-00033 | Wendy's Redevelopment | 3900101330 | Mixed Use | 101 | Yes | 1/30/2018 | 4/30/2018 | N | 5,746 |
| 18-00044 | 204 Central Way Mixed Use | 3900101026, 3900101045 | Mixed Use | 47 | yes | 2/7/2018 | 5/8/2018 | N | 5,699 |
| 17-00423 | 223 10th Office | 1200003395 | Office | 26 | yes | 2/14/2018 | 5/15/2018 | N | 5,673 |
| 18-00106 | Finn Hill Tolls Bro | 6076500423 | Multi-family | 13 | Yes | 3/7/2018 | 6/5/2018 | N | 5,660 |
| 18-00125 | SRM Rosen Office Development | 788260-0220 | Office | 272 | yes | 8/30/2018 | 11/28/2018 | N | 5,388 |
| 18-00131 | 6th Street Office 52-515rd | 012000-0150 | General Office | 81 | Yes | 3/12/2018 | 6/10/2018 | N | 5,307 |
| 17-00584 | Terrenes Apartment 11903 NE 128th Street | 6928400026 | Residential MF | 82 | Yes | 4/12/2018 | 7/11/2018 | N | 5,225 |
| 18-00454 | NW University Master Plan | 1725059203 | College | 503 | Yes | 7/23/2018 | 10/21/2018 | N | 4,722 |
| 18-00510 | Lakeview Dr. Office | 1725059029 | General Office | 44 | Yes | 8/20/2018 | 11/18/2018 | N | 4,678 |
| 18-00526 | Rose Hill Shopping Center 12022 NE 85th Street | 1238500115, -140, -125, -135, -110 | Mixed-Use | 811 | Yes | 2/14/2019 | 5/15/2019 | N | 3,867 |
| 18-00412 | Women's Shelter | 123310-0170 | Family Service Center, Non-profit | 57 | yes | 9/12/2018 | 12/11/2018 | N | 3,810 |
| 18-00483 | Bridal Trails Shopping Center Expansion | 1241500310 | Retail and Restaurant w/ Drive-through | 69 | yes | 9/14/2018 | 12/13/2018 | N | 3,741 |
| 18-0008854 | MRM 434 Kirkland Ave | 525059068 | Residential/commercial | 181 | Yes | 9/18/2018 | 12/17/2018 | N | 3,560 |
| 18-00612 | Sisley North Office | 120000220 | General Office | 51 | yes | 10/10/2018 | 1/8/2019 | N | 3,509 |
| 18-00661 | Lake Washington HS Expansion | 925059012 | High School | 40 | Yes | 11/1/2018 | 1/30/2019 | N | 3,469 |
| 2018 Total | | | | 2378 | | | | | |
| 19-00046 | SGM Park and Ride | 7197800010 | Park and Ride Lot | 102 | Yes | 1/29/2019 | 4/29/2019 | N | 3,367 |
| 19-00275 | Woodlands (Robbins Residential) | 607650028006 | single-family & Multi-family | 27 | Yes | 6/3/2019 | 9/1/2019 | N | 3,340 |
| 19-00479 | Mira Townhouse | 1244000155 | multi-family | 9 | yes | 8/31/2019 | 11/29/2019 | N | 3,331 |
| 19-00542 | Lake Street Mixed Use | 17600000103 | Mixed Use | 105 | Yes | 10/12/2019 | 1/10/2020 | N | 3,235 |
| 19-00570 | Sisley 35th Office | 12000-0220, -0200 and -0190 | Office | 77 | Yes | 10/1/2019 | 12/30/2019 | N | 3,158 |
| 19-00598 | Mark Twain Elementary | 3888100027 | Elementary School | 17 | Yes | 10/28/2019 | 1/26/2020 | N | 3,141 |
| 19-00599 | Ben Franklin Elementary | 925059028 | Elementary School | 35 | Yes | 10/28/2019 | 1/26/2020 | N | 3,105 |
| 19-00600 | Rose Hill Elementary | 425059017 | Elementary School | 26 | Yes | 10/28/2019 | 1/26/2020 | N | 3,079 |
| 2019 Total | | | | 399 | | | | | |
| TOTAL | | | | 5109 | | | | | 3,070 |

**CITY OF KIRKLAND****Department of Public Works**

123 Fifth Avenue, Kirkland, WA 98033 425.587.3800

www.kirklandwa.gov**MEMORANDUM**

To: Tony Leavitt, Senior Planner

From: Thang Nguyen, Transportation Engineer

Date: June 22, 2018

Subject: Continental Development Traffic Concurrency Test Notice, Tran17-00236

The purpose of this memo is to inform you that the proposed Continental mixed-use development project has passed traffic concurrency. The previous concurrency test notice had expired on May 22, 2018. The applicant has resubmitted for a concurrency test and the project has passed traffic concurrency.

Project Description

Continental Divide is a residential mixed-use development proposed at 8505 132nd Avenue NE. The proposal includes redevelopment of eight parcels located north of NE 85th Street, west of 131st Avenue NE and east of 132nd Avenue NE. The proposal includes: 134 apartment units and 7,400 sq. ft. of office space in a three-story building. Garage accesses are proposed off 131st Avenue NE and 132nd Avenue NE. The project build out and full occupancy is anticipated to be by the end of 2020.

Trip Generation

Based on the ITE Trip Generation Manual 9th Edition, the proposed project will generate a net new of 691 daily, 43 AM peak hour vehicle, 58 PM peak hour vehicle and 110 PM peak hour person trips. Attached to this memorandum is the trip generation report.

This memo will serve as the concurrency test notice for the proposed project. Per *Section 25.10.020 Procedures* of the KMC (Kirkland Municipal Code), this Concurrency Test Notice will expire in one year (June 22, 2019) unless a development permit and certificate of concurrency are issued or an extension is granted.

EXPIRATION

The concurrency test notice shall expire and a new concurrency test application is required unless:

1. A complete SEPA checklist, traffic impact analysis (TIA) and all required documentation are submitted to the City within 90 calendar days of the concurrency test notice (September 20, 2018).
2. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test

Memorandum to Tony Leavitt
June 22, 2018
Page 2 of 2

notice. (A Certificate of Concurrency is issued at the same time a development permit or a building permit is issued if the applicant holds a valid concurrency test notice.)

3. A Certificate of Concurrency shall expire six years from the date of issuance of the concurrency test notice unless all building permits are issued for buildings approved under the concurrency test notice.

APPEALS

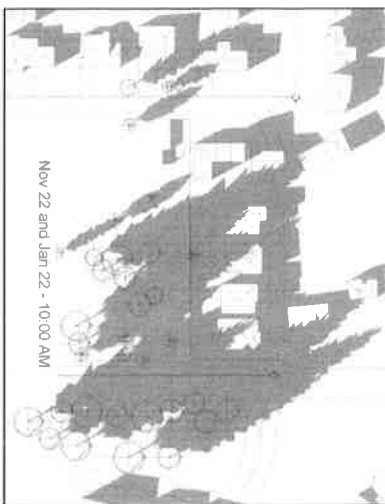
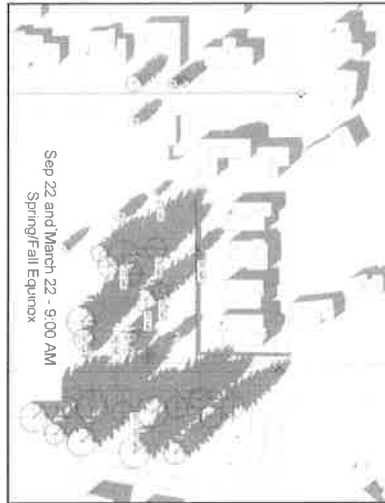
The concurrency test notice may be appealed by the public or agency with jurisdiction. The concurrency test notice is subject to an appeal until the SEPA review process is complete and the appeal deadline has passed. Concurrency appeals are heard before the Hearing Examiner along with any applicable SEPA appeal. For more information, refer to the Kirkland Municipal Code, Title 25. If you have any questions, please call me at x3869.

cc: Energov Tran17-00236

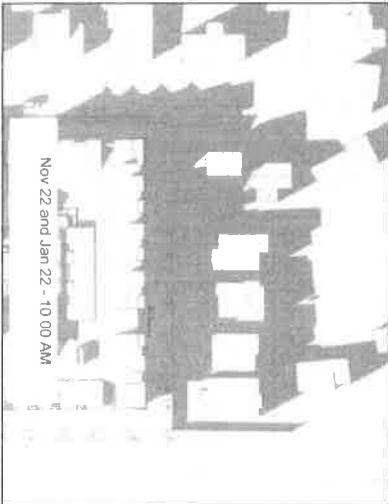
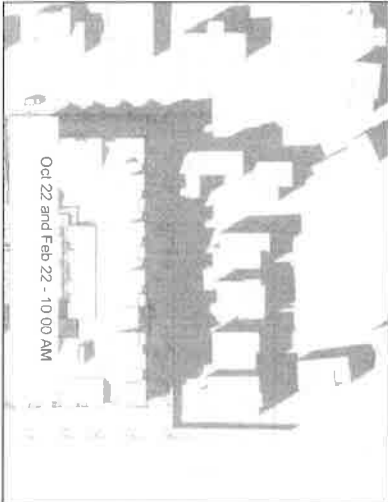
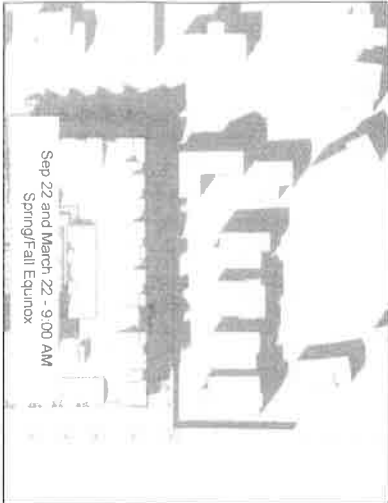
Attachment C

DRY18-00312
ATTACHMENT 3

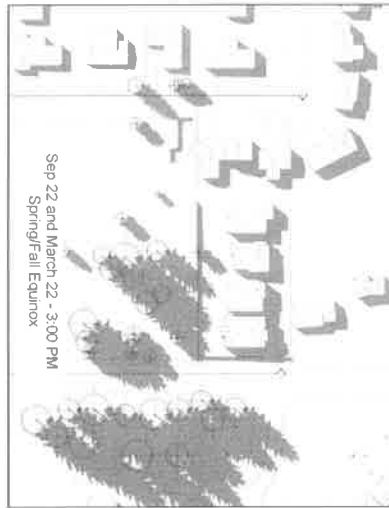
Existing Conditions



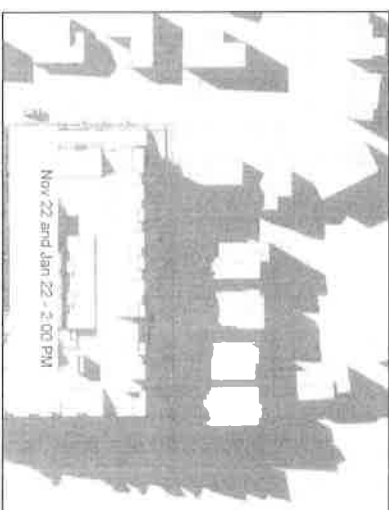
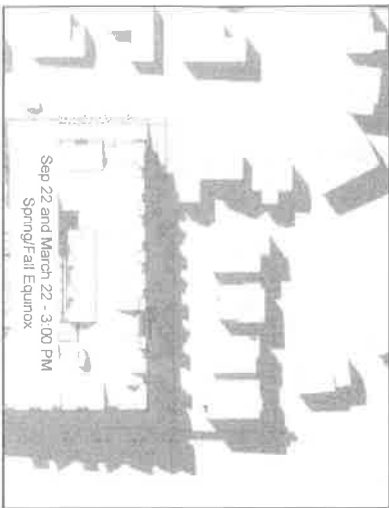
Proposed Conditions



Existing Conditions



Proposed Conditions





BRICKLIN & NEWMAN LLP
lawyers working for the environment

Reply to: Seattle Office

December 12, 2019

City of Kirkland Environmental Coordinator
Planning and Building Department
123 Fifth Avenue
Kirkland, WA 98033

Re: Notice of Appeal of Project No. SEP18-00313 (DNS for Continental Divide);
DRV18-00312 (Concurrency Test for Continental Divide)

Dear Environmental Coordinator:

On behalf of our client, the Rose Hill Community Group, this is a notice of appeal of the County's December 2, 2019 decision to issue a SEPA Determination of Nonsignificance (DNS) and Road Concurrency Test for the Continental Divide mixed-use development, projects SEP18-00313 and DRV18-00312

For the reasons stated below, the DNS does not comply with County and State rules for environmental review. Therefore, the DNS should be withdrawn.

I. Matters Being Appealed

The December 2, 2019 decision to issue a SEPA Determination of Nonsignificance (DNS) for the Continental Divide mixed-use development, project SEP18-00313 and Road Concurrency Test approval, project DRV18-00312. *See* "Notice of SEPA Determination and Road Concurrency Test," attached.

II. Specific Components Being Appealed

A. Traffic. There will be more daily trips than the SEPA Checklist and Traffic Impact Analysis indicate.

There will be significant danger to pedestrians along 131st, which will have a parking garage entrance and a parking lot entrance, but currently has no sidewalks. No sidewalks are currently proposed for 131st, even though 131st is the street with the fewest current sidewalks and the most entering/departing traffic. Pedestrians on 131st are already exposed to traffic due to the lack of sidewalks, and this exposure will now worsen.

Because most of the traffic will enter and exit Continental Divide on 131st, residents who use 131st as their sole outlet onto 85th will face increased delays. Without proper mitigation, these delays constitute a significant adverse environmental impact.

There will also be an increase in traffic along 132nd, including another parking garage entrance that will require cars to pass over a curb cut in the sidewalks. 132nd is also a safe route to school, as designated on the City's map at Plate 46. The movement of cars over the curb cut will likely be heavy in the mornings as residents drive to school—the very time children will also be most heavily using this safe route to school. The risk to children is a significant environmental impact, yet it has not been disclosed, discussed, considered, or mitigated.

In addition, there has been new development in the area since the developer's TIA. In particular, Expedia has added a new Park-and-Ride on 132nd, which contributes significant traffic volumes that have not been accounted for. The TIA's crash data (from 2012-2016) is even more out of date, and fails to account for new, higher volumes of traffic. Because the TIA is obsolete, the DNS is wrong to conclude that there will be no significant impacts from traffic.

- B. **Noise.** There will be a significant environmental impact from increased noise, especially for the houses to the north, from the roughly 200 new parking spaces and roughly 130 new residential units. The SEPA Checklist merely says that “no significant long-term noise impacts are anticipated,” without providing any analysis of the current noise baseline or what future noise impacts from the project would be. This constitutes a failure to consider an important environmental issue.
- C. **Views.** The Continental Divide will significantly impact views from the properties to the north. The SEPA Checklist falsely claims that “No views will be obstructed by the project.”

In addition, the Checklist claims that “Setbacks along the North, East and West facades provide additional variation in massing, and the material treatment on all sides of the building have been presented to the Design Review Board for acceptance of aesthetic quality.” However, the Design Review Board has not yet completed its review of these supposed provisions, so it is premature for the Checklist to conclude that these provisions adequately address view impacts. The Checklist's declaration, at this pre-review stage, that view impacts will be insignificant constitutes a failure to consider an environmental impact of this project.

- D. **Shade.** There will be severe impacts on adjacent properties to the north from shade. The total shading of one of the houses for part of the day during winter is a particularly significant impact. The partial shading of four of the houses for part of the day during winter, spring, and fall is also significant. Shading from this project will last part or all of the day for the majority of days of the year. The Checklist falsely describes these shading impacts as “minimal.” In reality, they are significant.

The Checklist claims the project's shading "would not affect the potential use of solar energy by adjacent properties." This, too, is incorrect, and constitutes a failure to consider an important environmental impact.

- E. Housing.** The Continental Divide will result in the demolition of old, affordable housing on the property. The new units, because they are new, will likely charge higher rent. Yet nowhere in the SEPA materials is there any disclosure or consideration of the Continental Divide's impact on housing. This constitutes a failure to consider an important environmental impact.
- F. Demolished Houses.** The applicant's SEPA materials do not discuss the environmental impacts of demolishing the houses. There is no analysis of the possible effects of asbestos release from the demolished houses, nor the possible effects of damaging the demolished houses' septic tanks.
- G. Tree Retention.** The City's August 6, 2019 electronic plan review comments for BMU19-04993 and BNR19-0459 (building permits applied for but not issued) indicates that the developer's tree retention plan does not depict all significant trees on the property. The SEPA Checklist claims that "All vegetation to be removed will be replaced by a mix of new coniferous and deciduous trees, evergreen groundcovers and shrubs, and new street trees," but that statement is false, given that the tree retention plan does not even depict all trees.
- H. Light Pollution.** The project's lighting scheme has not been finalized. It is still under consideration by the Design Review Board, which has requested further information regarding lighting. Until the lighting scheme has been finalized, it is premature to conclude, in a DNS, that lighting impacts will not be significant.
- I. Fire Access.** The August 6 electronic plan review comments also indicate that there may be insufficient fire land access. In light of the City's uncertainty as to whether fire engines can physically access all of the property, it was premature to conclude, in a DNS, that there will be no significant impacts to fire services.
- J. Wildlife.** Immediately across 132nd, within the boundaries of the City of Redmond, is a community of single-family homes called the Pointe. The Pointe subdivision includes a large native-growth protection area, part of which is directly across the street from the Continental Divide project. The Pointe's NGPA is habitat for the following, documented species: barred owl, woodpeckers, bobcat, Nuttall rabbit, Douglas squirrel, and various passerines. Many of these species nest in the NGPA. The SEPA Checklist fails to consider the impacts of the Continental Divide project on wildlife within the adjacent NGPA.
- K. Stream and Wetland.** Immediately across 132nd, within the boundaries of the City of Redmond, is a stream and wetland that is part of the Pointe NGPA. None of the SEPA materials address the presence of this stream and wetland or consider the project's impacts on the stream and wetland, such as increased street runoff from additional traffic.

- L. Road Concurrency.** The approval of the Continental Divide will result in an overburdening of one or more of the roads in its vicinity, resulting in one or more roads falling below the established level of service standard. Therefore, the City should not have approved the Concurrency Test.

III. Demonstration of Standing

The Rose Hill Community Group consists of homeowners and residents who live in the immediate vicinity of the Continental Divide project. The project will impact their ability to safely use the sidewalk along 132nd Ave NE (where the project will install parking access). The project will also block views from the neighboring properties. The project will also worsen traffic in the neighborhood.

The Rose Hill Community Group have commented on the project during earlier stages of review, including a written comment dated October 30, 2018.

IV. Conclusion

For the foregoing reasons, the DNS and the Road Concurrency decision should both be reversed.

Very truly yours,

BRICKLIN & NEWMAN, LLP



Alex Sidles, WSBA # 52832
1424 4th Ave, Ste. 500
Seattle, WA 98101
sidles@bnd-law.com
(206) 264-8600

Attorney for Rose Hill Group

cc: Client



CITY OF KIRKLAND

Planning and Building Department
123 5th Avenue, Kirkland, WA 98033
www.kirklandwa.gov ~ 425.587.3600

***RE-ISSUED TO CLARIFY APPEAL PROVISIONS**

DETERMINATION OF NON-SIGNIFICANCE (DNS)

DATE RE-ISSUED: December 2, 2019

City Planner: Tony Leavitt

File No.: SEP18-00313

Phone: (425) 587-3253

Project Name: Continental Divide Mixed-Use Project

Email: tleavitt@kirklandwa.gov

Project Location/Address: 8505 132nd Avenue NE

Proponent: Continental Divide LLC

Project Description: Construction of a mixed-use development to include 134 apartment units and a total of approximately 7,400 square feet of office and commercial uses. An associated parking garage and surface parking lot for up to 200 parking stalls is proposed.

The lead agency is the City of Kirkland.

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

Comment Period Information:

This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date issued. Comments must be submitted to Tony Leavitt, project planner at tleavitt@kirklandwa.gov by **5:00 PM on December 16, 2019**. Please reference file number SEP18-00313.

Responsible Official:

11/18/19

Adam Weinstein, AICP, Planning & Building Director
City of Kirkland
Planning & Building Department
123 Fifth Avenue, Kirkland, WA 98033 – 425.587.3600

Date

Appeal Information:

You may appeal this determination to the Planning & Building Department at City of Kirkland, 123 Fifth Avenue, Kirkland, WA 98033 no later than **5:00 PM on December 16, 2019** (date, 14 days from date issued) by a Written Notice of Appeal. You should be prepared to make specific factual objections and reference case number SEP18-00313. Contact Tony Leavitt, project planner in the Planning & Building Department at 425.587.3253 to ask about the procedures for SEPA appeals. See also KMC 24.02.230 Administrative Appeals.

*** Additional Information Regarding SEPA Appeals:**

KMC 24.02.230(a) states that administrative appeals of SEPA Determinations are available only in instances where there is an open record hearing on the underlying governmental action (such as Process IIA and IIB decisions). SEPA appeals must be filed within fourteen days of the date the SEPA determination is issued (KMC 24.02.230(c)(1)). A timely SEPA appeal will be placed on hold until the open record hearing on the underlying governmental action is scheduled. Then, both the SEPA appeal and underlying governmental action will be consolidated at one open record hearing.

Pursuant to KMC 24.02.230(f), if a land use permit does not include an open record public hearing but provides for an open record appeal (such as Design Review Board and Process I decisions), the SEPA appeal will be consolidated with the open record appeal and decided upon by the hearing examiner. A timely SEPA appeal will be placed on hold until the City's final decision on the underlying permit is issued. Then, if the underlying permit decision is appealed administratively, both appeals will be decided at a consolidated open record appeal hearing. If the underlying permit decision is not appealed, then there will be no administrative SEPA appeal available and judicial appeal procedures may be followed.

Publish in The Seattle Times on: December 2, 2019

Distribute this notice with a copy of the Environmental Checklist to:

GENERAL NOTICING

- Department of Ecology - Environmental Review
- Muckleshoot Tribal Council - Environmental Division, Tribal Archeologist
- Muckleshoot Tribal Council - Environmental Division, Fisheries Division Habitat
- Cascade Water Alliance – Director of Planning
- Finn Hill Neighborhood Association
- Lake Washington School District No. 414: Budget Manager and Director of Support Services
- Washington State Dept. of Archaeology & Historic Preservation
- King County Dept. of Transportation - Employer Transportation Representative
- Seattle & King County Public Health - SEPA Coordinator

AGENCIES WITH JURISDICTION, AFFECTED AGENCIES, AND/OR INTERESTED PARTIES

- Department of Ecology - Environmental Review
- Department of Fish and Wildlife – Olympia
- Muckleshoot Tribal Council - Environmental Division, Fisheries Division Habitat Program
- City of Redmond - Director, Planning Dept.
- Parties of Record

cc: Applicant
Planning Department File, Case No. SAR18-00254

Distributed by: K. Bayes December 2, 2019
(Karin Bayes, Office Specialist) Date



CITY OF KIRKLAND
Planning and Building Department
123 5th Avenue, Kirkland, WA 98033
425.587.3600 - www.kirklandwa.gov

***RE-ISSUED TO CLARIFY APPEAL PROVISIONS**

NOTICE OF SEPA DETERMINATION & ROAD CONCURRENCY TEST
CONTINENTAL DIVIDE MIXED USE PROJECT
FILE NUMBER [SEP18-00313](#) & [DRV18-00312](#)

The City of Kirkland has conducted an environmental review and road concurrency review of the following project:

Permit No.: SEP18-00313 and DRV18-00312

Proponent: Continental Divide, LLC

Address or Location of proposal: [8505 132nd Avenue NE](#)

Description of project: Construction of a mixed-use development to include 134 apartment units and a total of approximately 7,400 square feet of office and commercial uses. An associated parking garage and surface parking lot for up to 200 parking stalls is proposed.

Notice is hereby given that on December 2, 2019 the City of Kirkland re-issued a Determination of Nonsignificance (DNS) in accordance with the State Environmental Policy Act (SEPA) and Chapter 197-11 of the Washington Administrative Code.

SEPA Comments: Comments must be submitted by **5:00 PM on December 16, 2019** to the City of Kirkland, [Planning & Building Department](#), 123 Fifth Avenue, Kirkland, WA 98033. Contact Tony Leavitt, Senior Planner, for further information at 425.587.3253.

Procedures to Appeal SEPA: You may contact Tony Leavitt at 425.587.3253 to ask about the procedures for SEPA appeals):

1. A written appeal must be filed with the Environmental Coordinator by **5:00 PM on December 16, 2019** at the above address.
2. The appeal must contain a brief and concise statement of the matter being appealed, the specific components or aspects that are being appealed, the appellant's basic rationale or contentions on appeal, and a statement demonstrating standing to appeal. The following have standing to appeal: a) the applicant; b) any agency with jurisdiction; c) any individual or other entity who is specifically and directly affected by the proposed action. The appeal may also contain whatever supplemental information the appellant wishes to include.
3. Pay the fee to file an appeal. See the [Planning & Building Department Land Use Fee Schedule](#).

*** Additional Information Regarding SEPA Appeals:**

KMC 24.02.230(a) states that administrative appeals of SEPA Determinations are available only in instances where there is an open record hearing on the underlying governmental action (such as Process IIA and IIB decisions). SEPA appeals must be filed within fourteen days of the date the SEPA determination is issued (KMC 24.02.230(c)(1)). A timely SEPA appeal will be placed on hold until the open record hearing on the underlying governmental action is scheduled. Then, both the SEPA appeal and underlying governmental action will be consolidated at one open record hearing.

Pursuant to KMC 24.02.230(f), if a land use permit does not include an open record public hearing but provides for an open record appeal (such as Design Review Board and Process I decisions), the SEPA appeal will be consolidated with the open record appeal and decided upon by the hearing examiner. A timely SEPA appeal will be placed on hold until the City's final decision on the underlying permit is issued. Then, if the underlying permit decision is appealed administratively, both appeals will be decided at a consolidated open record appeal hearing. If the underlying permit decision is not appealed, then there will be no administrative SEPA appeal available and judicial appeal procedures may be followed.

Notice is hereby given that the proposed project passed the road concurrency review and the City of Kirkland issued a road concurrency test notice in accordance with the [Kirkland Municipal Code \(KMC\) Title 25](#).

Procedures to Appeal Road Concurrency:

1. Refer to [Kirkland Municipal Code \(KMC\) Chapter 25.23](#) for what decisions may not be appealed.
2. A written appeal must be filed with the Public Works Official, Thang Nguyen, by **5:00 p.m. on December 16, 2019** at the above address.
3. A concurrency appeal will follow the same process as a SEPA appeal. See No. 2 and 3 above under SEPA appeals for procedures. A separate appeal fee is required. See the [Planning & Building Department Land Use Fee Schedule](#).

There is no other opportunity to appeal road concurrency issues. Call Thang Nguyen at 425.587.3869 if you have questions about what is addressed in concurrency review.

More information is available at www.mybuildingpermit.com.

Publishing Date: December 2, 2019



CITY OF KIRKLAND

Department of Public Works

123 Fifth Avenue, Kirkland, WA 98033 425.587.3800

www.kirklandwa.gov

MEMORANDUM

To: Tony Leavitt, Senior Planner

From: Thang Nguyen, Transportation Engineer

Date: September 4, 2019

Subject: Continental Development Traffic Concurrency Test Notice,
Tran19-00511

The purpose of this memo is to inform you that the proposed Continental mixed-use development project has passed traffic concurrency. The previous concurrency test notice had expired on June 22, 2019. The applicant has resubmitted for a concurrency test and the project has passed traffic concurrency.

Project Description

Continental Divide is a residential mixed-use development proposed at 8505 132nd Avenue NE. The proposal includes redevelopment of eight parcels located north of NE 85th Street, west of 131st Avenue NE and east of 132nd Avenue NE. The proposal includes: 134 apartment units and 7,400 sq. ft. of office space in a three-story building. Garage accesses are proposed off 131st Avenue NE and 132nd Avenue NE. The project build out and full occupancy is anticipated to be by the end of 2020.

Trip Generation

Based on the ITE Trip Generation Manual 9th Edition, the proposed project will generate a net new of 692 daily, 45 AM peak hour vehicle, 56 PM peak hour vehicle and 110 PM peak hour person trips. Attached to this memorandum is the trip generation report.

This memo will serve as the concurrency test notice for the proposed project. Per *Section 25.10.020 Procedures* of the KMC (Kirkland Municipal Code), this Concurrency Test Notice will expire in one year (September 4, 2020) unless a development permit and certificate of concurrency are issued or an extension is granted.

EXPIRATION

The concurrency test notice shall expire and a new concurrency test application is required unless:

1. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test notice. (A Certificate of Concurrency is issued at the same time a development permit or a building permit is issued if the applicant holds a valid concurrency test notice.)

2. A Certificate of Concurrency shall expire six years from the date of issuance of the concurrency test notice unless all building permits are issued for buildings approved under the concurrency test notice.

APPEALS

The concurrency test notice may be appealed by the public or agency with jurisdiction. The concurrency test notice is subject to an appeal until the SEPA review process is complete and the appeal deadline has passed. Concurrency appeals are heard before the Hearing Examiner along with any applicable SEPA appeal. For more information, refer to the Kirkland Municipal Code, Title 25. If you have any questions, please call me at x3869.

cc: Energov Tran17-00511

KIRKLAND COMPREHENSIVE PLAN UPDATE & TOTEM LAKE PLANNED ACTION FEIS | AMENDMENT REQUESTS

Exhibit 4-4. PM Peak Hour Trip Generation Analysis – Basra CAR

| | Scenario 1 | Scenario 2 | | Scenario 3 | |
|-----------------|----------------------------|--|-------------------|---|---------|
| | <u>No action allowable</u> | <u>CAR proposal – Office on Basra Parcel</u> | | <u>CAR proposal – Hotel on Basra Parcel</u> | |
| Description | | | | | |
| Portion of Site | All redevelopable parcels | Basra Parcel | | Basra Parcel | |
| Use | Office | Office | Retail | Hotel | Retail |
| Lot Size (sf) | 48,351 | 48,351 | | 48,351 | |
| Building Size | 25,628 sf ¹ | FAR 1.6 | FAR 0.8 | FAR 1.6 | FAR 0.8 |
| Hotel Rooms | n/a | n/a | n/a | 119 ⁴ | n/a |
| Rate | 1.49 ² | 1.49 | 2.71 ³ | 0.60 ⁵ | 2.71 |
| Vehicle Trips | 38.2 | 115.3 | 104.8 | 71.4 | 104.8 |
| Total | 38.2 | 220.1 | | 176.2 | |

1: From development capacity analysis

2: Trips per thousand SF GFA in the PM peak hour of the adjacent street; Land Use Category 710 – General Office (ITE *Trip Generation Manual*, 9th Edition)

3: Trips per thousand SF GFA in the PM peak hour of the adjacent street; Land Use Category 826 – Specialty Retail Center (ITE *Trip Generation Manual*, 9th Edition)

4: Calculation assumes 650 gross square feet of building per hotel room. The actual number of hotel rooms could vary depending on the amount of building space that would be dedicated to other uses, such as meeting rooms, the lobby, and other amenities. <http://scholarship.sha.cornell.edu/cgi/viewcontent.cgi?article=1293&context=articles>

5: Trips per hotel room in the PM peak hour of the adjacent street; Land Use Category 310 – Hotel (ITE *Trip Generation Manual*, 9th Edition)

Source: Fehr & Peers, 2015

Public Services

Because the Planning Commission recommendation would limit the proposed rezone to the Basra property, rather than the entire LIT zone, effects on public services would be similar in nature to those described in the DEIS, though of a lesser magnitude.

Utilities and Capital Facilities

The Planning Commission recommendation would rezone only the Basra property, rather than all parcels in the Rose Hill LIT area. As a result, any future reconfiguration of utility infrastructure to serve commercial, rather than industrial, development would be reduced relative to the original amendment request.

4.6 Griffis

Planning Commission Revisions

The Planning Commission recommendation would include the same zoning amendments as the original CAR, but it would also include additional development regulations and conditions. Properties in the RH 8 zone would be limited to 30 feet in height if located within 30 feet of an RSX zone; otherwise, the maximum building height would be 35 feet. Commercial uses would be allowed in the RH 8 zone, but only if both buildings and property access were to be consolidated with a lot abutting NE 85th Street. Additionally, any residential development of four units or more in the RH 8 zone would be required to include affordable housing.

KIRKLAND COMPREHENSIVE PLAN UPDATE & TOTEM LAKE PLANNED ACTION FEIS | AMENDMENT REQUESTS

Comparison to DEIS Analysis

Land Use Patterns

Land Use outcomes under the Planning Commission recommendation would be similar to those identified in the DEIS. The addition of height limit restrictions on properties in proximity to RSX zones would improve transitions between commercial and residential areas and help minimize development incompatibilities. Additionally, the Planning Commission’s recommendation to allow commercial development if property consolidation and access requirements are met could slightly alter the land use mix in the area.

Plans and Policies

Consistency of the Planning Commission’s recommendation with plans and policies would be similar to that of the original amendment request analyzed in the DEIS. The proposed height limit on properties near RSX zones could help mitigate the adverse effects identified in the DEIS.

Population and Housing

Population and housing outcomes under the Planning Commission recommendation would be similar to those identified in the DEIS. The addition of affordable housing requirements under the Planning Commission recommendation would have a positive effect on housing affordability in Kirkland and support all three alternatives.

Employment and Economic Development

Compared to the original amendment request, the Planning Commission recommendation would produce a smaller increase in employment capacity. The proposed height limits within 30 feet of RSX zones, while beneficial to residential uses, would limit office development in these areas. Additionally, the allowance of commercial uses, which have a lower employment density than office uses, could provide a small increase in employment capacity.

Natural Environment

Natural environment outcomes under the Planning Commission recommendation would be similar to those identified in the DEIS; the added provisions for transitional height limits and affordable housing would not have any substantial effect on natural environment impacts.

Transportation

The Griffis CAR study area consists of six parcels located on the eastern border of the City of Kirkland, one to two lots north of NE 85th Street. Currently, the six parcels are zoned as RSX7.2 for low density residential, allowing a maximum of 6 dwelling units per acre. This results in a maximum of 11 dwelling units in this area and 11 total PM peak hour trips.

The proposed CAR zoning designation (Rose Hill Business District 8) would allow for a mix of multifamily residential, office, and retail uses. The allowance of RH 8 uses on the six lots within the study area would depend on direct access to the parcel from NE 85th Street. Although the CAR parcels do not abut NE 85th Street, the request applicant owns an adjacent lot with access to this street. This suggests that the redevelopment of the CAR study area as retail or office is a possible outcome of CAR approval. To reflect this possibility, two CAR build-out scenarios were analyzed – one including the office uses and a second with retail uses with both assuming parcel consolidation for direct access. The latter scenario is considered “worst case” from a trip generation standpoint since retail land use generates more PM peak hour trips per square foot of building area than offices.

The proposed Rose Hill Business District 8 zoning would accommodate a maximum FAR of 0.65 for any mix of office and retail land uses. The scenario assuming only office redevelopment would generate 78 PM peak hour vehicle trips, while the retail-only development scenario would result in 142 vehicle trips, a difference of 64 trips.

KIRKLAND COMPREHENSIVE PLAN UPDATE & TOTEM LAKE PLANNED ACTION FEIS | AMENDMENT REQUESTS

Exhibit 4-5. PM Peak Hour Trip Generation Analysis – Griffis CAR

| | Scenario 1 | Scenario 2 | Scenario 3 |
|--------------------------|-------------------------|----------------------------|----------------------------|
| Description | No action allowable | CAR proposal – office only | CAR proposal – retail only |
| Use | Low density residential | Office | Retail |
| Total area of study (sf) | 80,710 | 80,710 | 80,710 |
| Building Size | n/a | FAR = 0.65 | FAR = 0.65 |
| Residential Units | 11 | n/a | n/a |
| Rate | 1.00 ¹ | 1.49 ² | 2.71 ² |
| Vehicle Trips | 11.0 | 78.2 | 142.2 |
| Total | 11.0 | 78.2 | 142.2 |

1: Trips per dwelling unit in the PM peak hour of the adjacent street; Land Use Category 210 - Single Family Detached Housing (ITE Trip Generation Manual, 9th Edition)

2: Trips per thousand SF GFA in the PM peak hour of the adjacent street; Land Use Category 710 – General Office (ITE Trip Generation Manual, 9th Edition)

3: Trips per thousand SF GFA in the PM peak hour of the adjacent street; Land Use Category 826 – Specialty Retail Center (ITE Trip Generation Manual, 9th Edition)

Source: Fehr & Peers, 2015

Public Services

Public services outcomes under the Planning Commission recommendation would be similar to those identified in the DEIS; the added provisions for transitional height limits and affordable housing would not have any substantial effect on public services.

Utilities and Capital Facilities

The effects of the Planning Commission recommendation are anticipated to be similar to those described in the DEIS for the original amendment request. The Planning Commission's recommendation would not substantially change the utility needs described in the DEIS analysis.

4.7 Walen

Planning Commission Revisions

The original CAR requested that the NRH 5 and 6 zones be amended to allow for limited commercial uses, specifically vehicle sales and storage. The Planning Commission recommendation would add these uses in the NRH 5 zone only and would rezone the Ridgewood Village Condominiums property from RM 1.8 to NRH 5.

Comparison to DEIS Analysis

Land Use Patterns

Land Use outcomes under the Planning Commission's recommendation would be similar to those identified in the DEIS, though they would differ slightly in scope and location. Similar to the original amendment request, the Planning Commission recommendation would allow limited commercial uses (vehicle sales and storage) in the NRH 5 zone. Unlike the original amendment request, the Planning Commission's recommendation would rezone the westerly 200 feet of the Ridgewood Village property, currently zoned for multifamily (RM 1.8) to NRH 5. As a result, the Planning Commission's recommendation would potentially extend these new uses into a currently residential area, possibly increasing land use incompatibilities with other adjacent residential zones.

4.6 Griffis

Overview and Location

The study area consists of six lots at the eastern edge of the Rose Hill Business District, north of NE 85th Street between 131st Avenue NE and 132nd Avenue NE. The proposal would rezone these properties from RSX 7.2 (single family residential) to RH8 (office).

Compatibility with the Alternatives

Land Use Patterns

The subject property is located just north and adjacent to the Rose Hill Business District (NE 85th Street Subarea) boundary, within the North Rose Hill Neighborhood, and is currently being used for single family residential use. The study area consists of a mix of single family land uses. To the south of the study are existing commercial and office uses fronting on NE 85th Street, but the subject property does not have frontage on NE 85th Street. However, the adjacent property to the south with frontage along NE 85th Street is designated for office uses. Therefore, the proposed amendment is compatible with future land use and zoning designations. The proposed amendment is most compatible with Alternatives 1 and 3 that allocate greatest amount of housing and employment growth to neighborhood centers.

Plans and Policies

The proposal is generally consistent with the Growth Management Act, Vision 2040 and the King County Countywide Planning Policies. As noted below, it is not consistent with current Comprehensive Plan policy direction or supported by proposed changes in any of the alternatives.

Conversion of the study area from an LDR to an Office (O) designation would help create a more regular boundary for the northern edge of the office area. This change would expand the Rose Hill Business District and may raise questions about future designation of the residential area immediately to the west, between 128th and 130th Avenues. Similarly, access to the study area would be from 132nd or 131st Avenues NE, rather than directly from NE 85th Street as is the case with the existing O designated properties. In the case of 131st Avenue NE, increased traffic on this residential street may impact surrounding residential uses.

A potential adverse impact of this CAR may be a weakening of the boundary between residential and office designations in this area, leading to uncertainty about future change in the residential area adjacent to the new boundary. Concern about this boundary is specifically addressed in the current NE 85th Street Subarea Plan, which states that commercial development in the NE 85th Street commercial area should be defined by the land use designations in Figure NE 85-2 (NE 85th Street Land Use). Figure NE 85-2 maintains the existing office boundary in the vicinity of the study area and is not consistent with the proposed CAR. Similar guidance regarding preservation of existing residential neighborhoods is provided in the North Rose Hill neighborhood plan.

Population and Housing

The Griffis CAR would rezone six parcels of low density residential to office/business district zoning in the North Rose Hill neighborhood. The changes would increase heights slightly and increase lot coverage from 50% to 70%, also changing the use of the land. There would be a decrease in residential capacity in the North Rose Hill neighborhood as a result of this change. Alternative 2, where Neighborhood Centers are not a priority location for accommodating housing growth, would support this CAR.

Employment and Economic Development

This proposal would add more capacity for office use in the Rose Hill Business District area by rezoning several parcels from residential to office. As a result, the proposal would be most compatible with Alternative 3, which allocates the most jobs to Neighborhood Centers, including over 2,100 new jobs in the Rose Hill Business District.

KIRKLAND COMPREHENSIVE PLAN UPDATE & TOTEM LAKE PLANNED ACTION DEIS | AMENDMENT REQUESTS

Natural Environment

The proposed CAR would not have adverse effects on geohazard risk, water resources, or plants and animals. The study area does not contain any mapped geologically hazardous areas, wetlands, or streams. Vegetation is limited to small patches of low-functioning landscape trees. Impervious surfaces would increase under this alternative, but compliance with stormwater control and treatment standards would minimize potential impacts.

Transportation

The Griffis CAR study area consists of six parcels located on the eastern border of the City of Kirkland, one to two lots north of NE 85th Street. Currently, the six parcels are zoned as RSX7.2 for low density residential, allowing a maximum of 6 dwelling units per acre. This results in a maximum of 5 dwelling units in this area and 5 total PM peak hour trips. At the highest intensity of development, the proposed Rose Hill Business District 8 zoning would allow full redevelopment of the property into office space with a maximum FAR of 0.65. The office land use allowable under this proposal would generate 38 PM peak hour vehicle trips.

Exhibit 4.6-1. PM Peak Hour Trip Generation Analysis – Griffis CAR

| | Scenario 1 | Scenario 2 |
|--------------------------|-------------------------|-------------------|
| Description | No action allowable | CAR proposal |
| Use | Low density residential | Office |
| Total area of study (sf) | 72,125 | 72,125 |
| Building Size | n/a | FAR = 0.65 |
| Residential Units | 5.4 | n/a |
| Rate | 1.00 ¹ | 1.49 ² |
| Vehicle Trips | 10.0 | 69.9 |
| Total | 10.0 | 69.9 |

1: Trips per dwelling unit in the PM peak hour of the adjacent street; Land Use Category 210 - Single Family Detached Housing (ITE *Trip Generation Manual*, 9th Edition)

2: Trips per thousand SF GFA in the PM peak hour of the adjacent street; Land Use Category 710 – General Office (ITE *Trip Generation Manual*, 9th Edition)

Public Services

The proposed rezoning from low density residential to office zoning would reduce demand for certain public services such as schools, but potentially increase the demand for police and fire services, access to parks and open space. Nearby parks likely to be affected include the Forbes Lake Park.

Because of its proximity to the Rose Hill neighborhood Center, the Griffis Citizen Amendment Request is most closely aligned with the No Action Alternative or Alternative 3.

Utilities and Capital Facilities

This study area examines changing the existing Residential Zoning to Office. The zoning surrounding this study area is Low Density Residential and Office. Given the small size of the site area and the existing Office zoning that abuts the sites, it is unlikely that there will need to be any additional water and sewer infrastructure or upsizing of existing infrastructure to meet demand. Both water and sewer service for this study area are provided by the City of Kirkland.

The proposed changes for this study most closely align with Alternative 3 because it results in employment growth within the Rose Hill neighborhood center.

