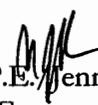


ATTACHMENT N:

TRAFFIC IMPACT ASSESSMENT REPORT

DATE: October 27, 2005

TO: Greg Kappers, Director Land Acquisitions
Prescott Homes

FROM: Michael Read, P.E.  Jennifer Ting, P.E.
Transportation Engineering Northwest, LLC

RE: Echo Lake Townhomes, Shoreline, WA - Traffic Impact Assessment

Transportation Engineering Northwest, LLC (TENW) is assisting Prescott Homes, Inc. in evaluating vehicular and pedestrian site access, safety, and circulation issues for the proposed up to 18-unit residential development known as *Echo Lake Townhomes* in Shoreline, WA. The study area is located to the northwest of Echo Lake Waterfront Condominiums, which is accessed via N 199th Street and N 198th Street to the east of Aurora Avenue N (SR 99). A study area map shown in **Figure 1**.

Primary site access to the project site is proposed via extension of an existing private access roadway located in the northwest section of the existing Echo Lake Waterfront Condominiums site, which accesses N 198th Street. Emergency-only access would be provided onto N 199th Street and would be restricted through the use of an emergency gate. The proposed site plan is illustrated in **Figure 2**.

This study addresses the following:

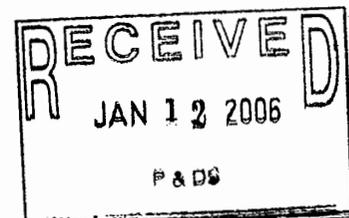
- Inventory of existing conditions.
- Assessment of nonmotorized safety and circulation issues.
- Evaluation of future site access driveway circulation and improvements.
- Summary of recommendations.

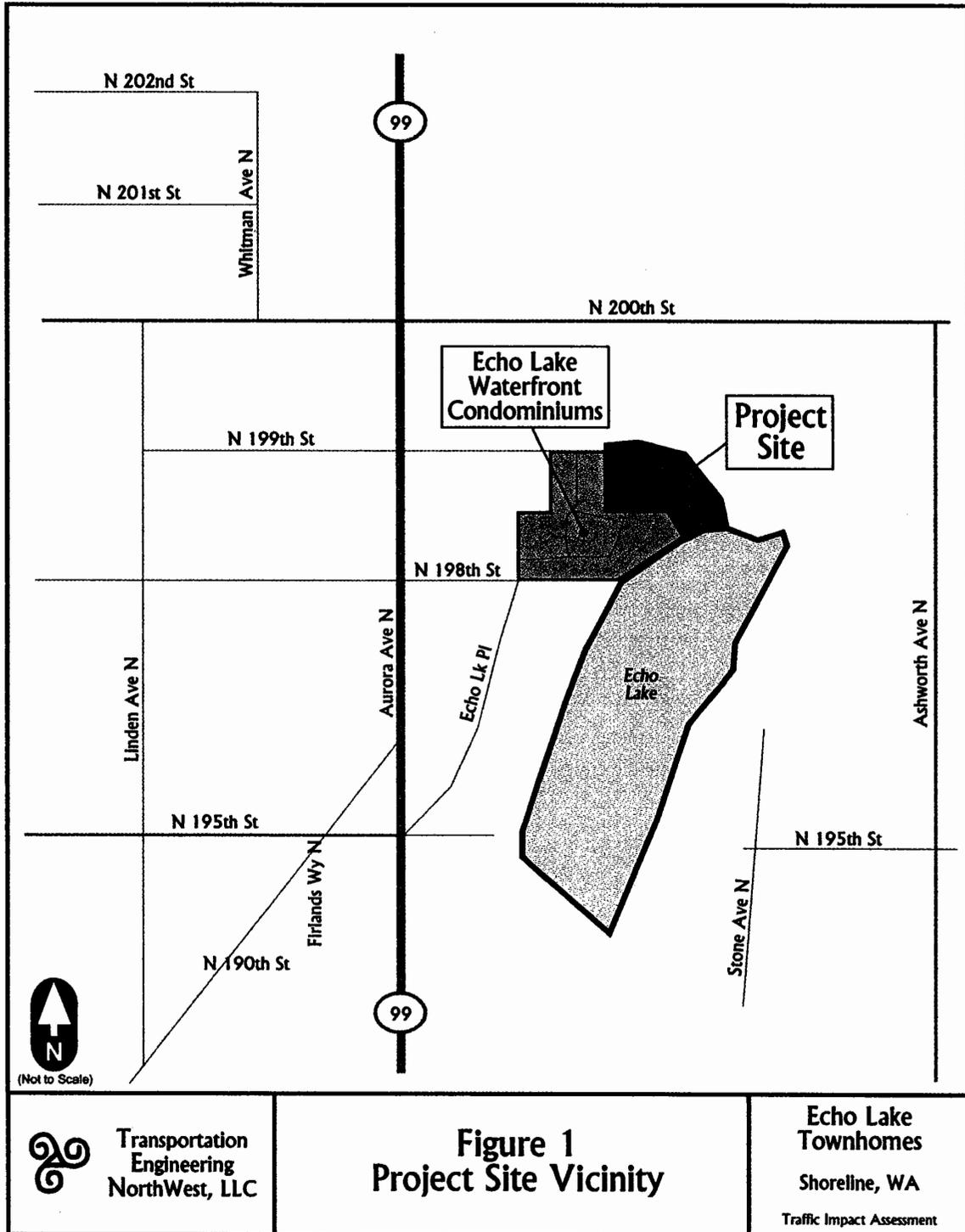
Existing Conditions

This section summarizes existing roadway conditions, vehicular traffic volumes, public transportation service locations, and nonmotorized transportation.

Roadway Conditions

The following paragraphs describe existing vicinity arterial roadways. Roadway characteristics are described in terms of facility type, number of lanes, and posted speed limits.

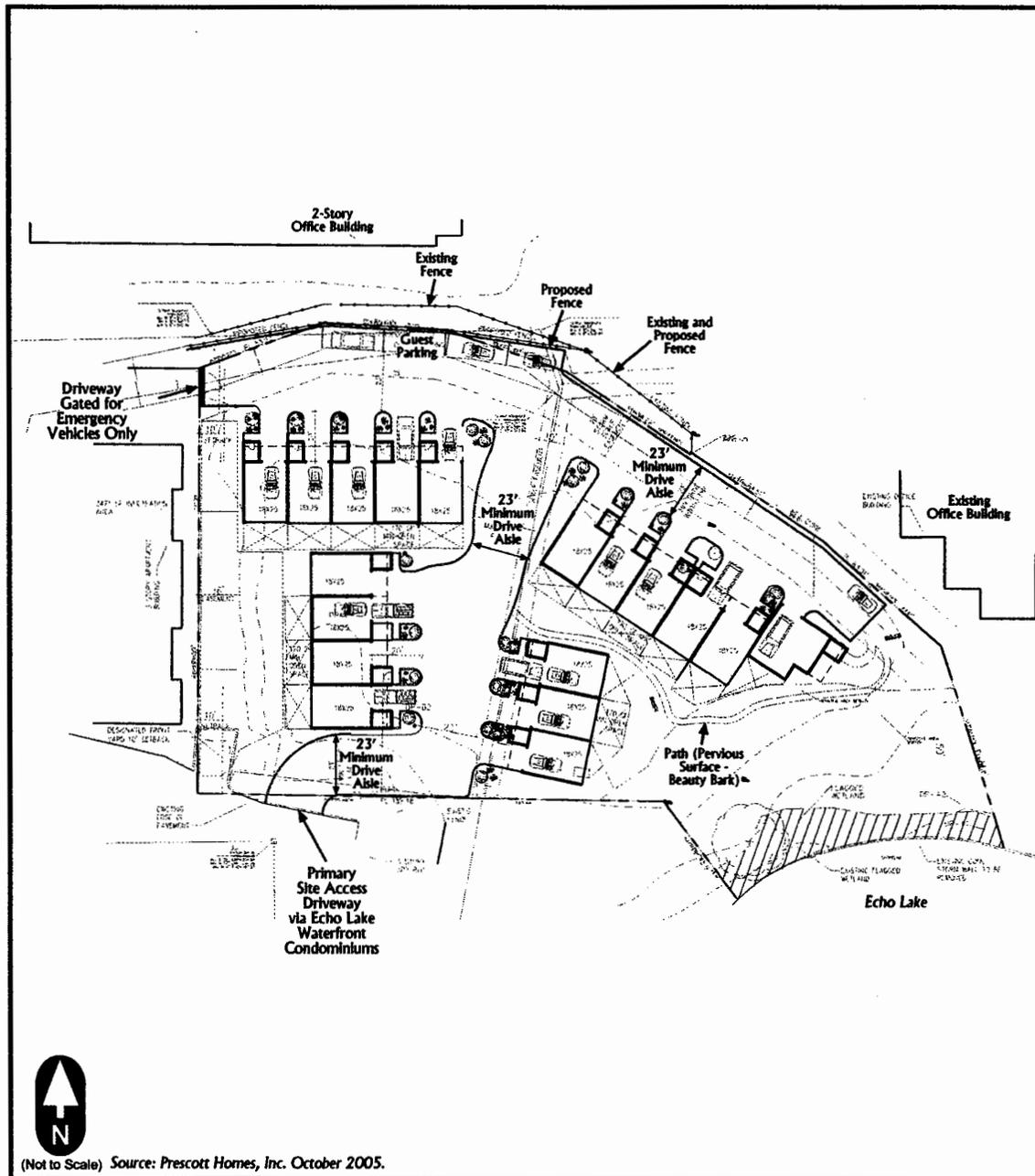




Transportation
 Engineering
 Northwest, LLC

Figure 1
Project Site Vicinity

**Echo Lake
 Townhomes**
 Shoreline, WA
 Traffic Impact Assessment



 <p>Transportation Engineering Northwest, LLC</p>	<p>Figure 2 Proposed Site Plan</p>	<p>Echo Lake Townhomes Shoreline, WA Traffic Impact Assessment</p>
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N 198th Street east of Aurora Avenue N (SR 99) is a two-lane unchannelized roadway with up to 22 feet of travel pavement serving one single-family residential home, parking for two commercial buildings, and dead ends into the Echo Lake Waterfront Condominiums. A 10-foot paved parallel parking lane is provided on the north side of the street from Aurora Avenue N (SR 99) to the single-family home driveway and for 2 parallel parking stalls on the south side of the street immediately east of Aurora Avenue N (SR 99). The roadway has an approximate grade of six percent. There is no posted speed limit sign, but it is assumed to be 25 mph.

N 199th Street is a two-lane unchannelized roadway with up to 17 feet of pavement. The roadway serves five single-family homes and parking to a commercial building, and pedestrian access to an apartment/condominium complex. The roadway dead ends into the Echo Lake Waterfront Condominiums. The roadway has an approximate grade of 3 percent. There is no posted speed limit sign, but it is assumed to be 25 mph.

Aurora Avenue N (SR 99) is a north-south, four-lane principal, urban arterial with a two-way, center left-turning lane. Travel lanes are generally 12 feet wide with approximately 10-foot paved shoulders on both sides of the street. Curbs, gutters and sidewalks are located along various retail property frontages of Aurora Avenue N (SR 99). The posted speed limit is 40 mph.

Echo Lake Place is a one-way northbound roadway providing access to parking areas for apartment/condominium complexes and commercial buildings abutting Aurora Avenue N (SR 99) on the west side of the street, and two single-family residential homes and an approximate 25-unit apartment/condominium complex on the east side of the street. The paved roadway is a minimum of 12 feet. The posted speed limit is 25 mph.

Site Roadways within Echo Lake Waterfront Condominiums include a two-lane unchannelized roadway with a 23-to 24-foot paved travel lane width. There is no posted speed limit within the development, however, vehicles traveling within the site were observed to be traveling slowly due to short distances, speed bumps, and the six percent grade of the site access roadway on N 198th Street.

Existing Traffic Volumes

TENW conducted vehicular traffic counts on N 198th Street between Aurora Avenue N (SR 99) and the Echo Lake Waterfront Condominiums site during typical peak hours of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. on Wednesday, October 26th, 2005. The a.m. peak hour was found to be between 8:00 to 9:00 a.m. and the p.m. peak hour was determined to be 5:00 to 6:00 p.m. Vehicular traffic volumes on N 198th Street were observed to be 58 vehicles (16 eastbound and 41 westbound) during the a.m. peak hour and 65 vehicles (41 eastbound and 24 westbound) during the p.m. peak hour.

Public Transportation Service Locations

King County–Metro provides public transportation services in the vicinity of the project site. Transit routes 301, 342, 358 and 373 stop on Aurora Avenue N (SR 99) south of N 200th Street for southbound travel and north of N 198th Street for northbound travel. The Aurora Village Transit Center park-and-ride lot is located on N 200th Street in the vicinity of Ashworth Avenue N and serves King County Metro Routes 301, 303, 331, 342, 346, 358, and 373 and Community Transit Routes 100, 101, 118, 130, and 131. All transit stops are located less than ¼-mile walking distance of the project site. The Aurora Village Transit Center is located less than ½-mile walking distance of the proposed development.

Nonmotorized Transportation

TENW conducted nonmotorized traffic counts on N 198th Street between Aurora Avenue N (SR 99) and the Echo Lake Waterfront Condominiums site during typical peak hours of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. on Wednesday, October 26th, 2005. The peak hour was observed to be the same as for vehicular traffic: 8:00 to 9:00 a.m. during the morning peak hour and 5:00 to 6:00 p.m. during the evening peak hour.

Nonmotorized traffic volumes on N 198th Street were observed to be 3 pedestrians traveling westbound during the a.m. peak hour and 3 pedestrian (2 eastbound and 1 westbound) during the p.m. peak hour. No bicycle traffic was observed. No additional nonmotorized traffic occurred outside of the a.m. and p.m. peak hours during the 2-hour traffic counts. It should be noted that none of the pedestrian traffic during the p.m. peak hour were related to the Echo Lake Waterfront Condominiums but traveled to/from Echo Lake Place and existing single-family homes on N 198th Street.

N 198th Street provides access to 102 condominiums as part of Echo Lake Waterfront Condominiums, 2 commercial buildings, and 1 single-family home. In addition, there are 12 apartments/condominiums and 1 single-family home that could potentially use N 198th Street for pedestrian access. Therefore, there are a total of up to 156 residential units that have access to N 198th Street for vehicular use. This results in an existing pedestrian utilization rate of 0.02 (pedestrian volumes divided by residential units) during both the a.m. and p.m. peak hour on N 198th Street.

A school bus stop was observed stopping for one middle-school aged child at the entrance of Echo Lake Waterfront Condominiums at the intersection of Echo Lake Place and N 198th Street with a pick-up at about 8:45 a.m. and a drop-off at about 3:40 p.m.

Traffic Impact Assessment

This section documents new trips generated by the project development, and impacts to nonmotorized and vehicular site access, circulation and safety issues.

Trip Generation

Trip generation rates compiled by the Institute of Transportation Engineers (ITE) *Trip Generation, 7th Edition*, 2003, were used to estimate daily traffic, a.m. and p.m. peak hour traffic that would be generated by the proposed action. Average rate equations (ITE land use code 230) were used based upon total units to estimate new trips generated by the proposed 18-unit townhouse residential development.

Table 1 summarizes trip generation by the proposed action. An estimated total of 110 daily, 8 a.m. peak hour (1 entering and 7 exiting), and 9 p.m. peak hour vehicular trips (6 entering and 3 exiting) would be generated at full build-out and occupancy of the project.

Table 1: Project Trip Generation

Land Use	ITE Land Use Code	Dwelling Units (X)	A.M. Peak Trip Generation			P.M. Peak Trip Generation			Daily Trip Generation
			Enter	Exit	Total	Enter	Exit	Total	
Condominiums/Townhouses	230	18	1	7	8	6	3	9	110

Source: ITE *Trip Generation Manual*, 7th Edition, 2003.

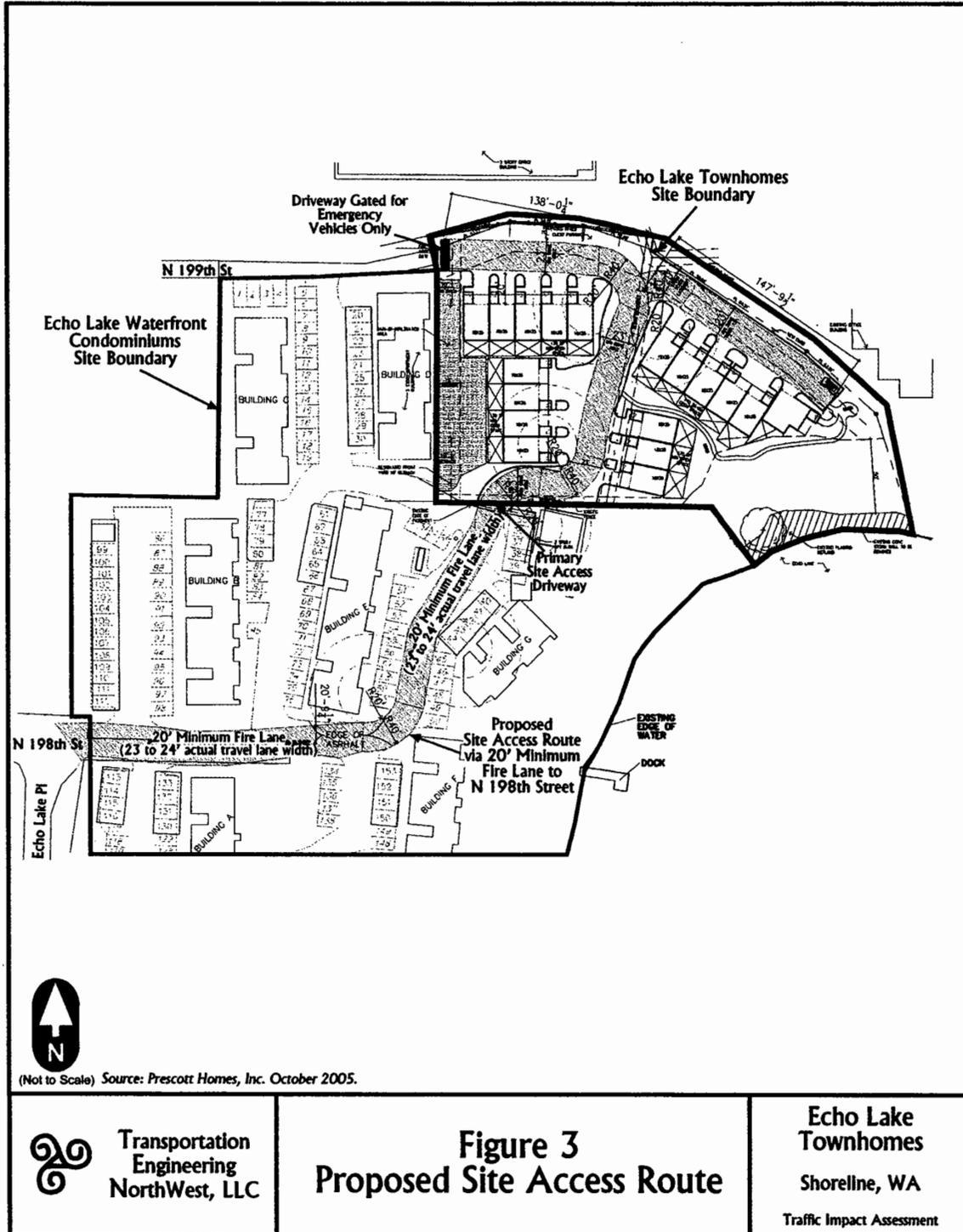
Nonmotorized Transportation Impacts

With an existing pedestrian utilization rate of 0.02 on N 198th Street and an additional 18 residential units for the proposed *Echo Lake Townhomes* development would result in a future nonmotorized generation of approximately 1 pedestrian or less during both the a.m. and p.m. peak hour. Therefore, there would be less than 5 pedestrians with the proposed development utilizing N 198th Street during both the a.m. and p.m. peak hour, which is an insignificant amount.

A paved pervious pathway would be located on the southeast section of the proposed development. It is recommended that a painted crosswalk be provided on the central north-south site access roadway in the vicinity of the paved pathway within the proposed *Echo Lake Townhomes* project. No additional nonmotorized transportation facility improvements would be required as part of this project.

Vehicular Site Access, Safety and Circulation Issues

Figure 3 shows the proposed travel route for the *Echo Lake Townhomes*, which is illustrated as the "20' Minimum Fire Lane." It should be noted, that field inventory conducted by TENW indicates that this internal site roadway ranges between 23 and 24 feet in width. Primary site access to the project site is proposed via extension of an existing private access roadway located in the northwest section of the existing Echo Lake Waterfront Condominiums site, accessing N 198th Street directly.



Emergency-only access would connect to the eastern dead end of N 199th Street and serve emergency vehicles only. This access roadway would be gated to restrict vehicular travel from utilizing the route onto N 199th Street.

There is an existing chain-link fence located along the northern perimeter of the project site. This fence would be relocated along certain sections and would encompass the full length of the existing fence to restrict pedestrian access between the project site and apartment/condominium/office complexes and the Aurora Village Transit Center located to the north of the project site. A proposed new curb located along the northern section of the site would also prevent vehicles from traveling between the project site and apartment/condominium/office complexes and the Aurora Village Transit Center.

Gated Emergency-Only Access Driveway

Fire and other emergency response vehicles (i.e., ambulance, aid cars, etc.) would have secondary access via N 199th Street at a gated restricted entry on the property's northwestern boundary at the existing dead end of N 199th Street. Access for emergency vehicles at this secondary entry would be accommodated through installation of standard Opticom pre-emption devices that are typically used at key traffic signal systems to pre-empt and prioritize fire and emergency vehicles through signalized intersections. Opticom emitters on fire, emergency and police vehicles would trigger the vehicular gates to automatically open, with a lock box (Knox-Box system) backup override using a common security key in case of power failure.

Vicinity and Internal Circulation

Within the *Echo Lake Townhomes* site, internal access would consist of two roadways: 1) an existing north-south roadway located through the middle of the proposed site, and 2) an emergency-only east-west roadway located at the northern perimeter of the site that accesses the gated restricted driveway onto N 199th Street. The two internal site roadways intersect one another in a T-configuration. These roadways would be paved and approximately 23 feet in width. The proposed internal site roadways provide adequate two-way general vehicular and emergency access for the 18-unit townhome complex.

The primary site access roadway would be marked as a fire lane with a 20-foot minimum pavement width. There are currently two "No Parking Fire Lane" signs located within the Echo Lake Waterfront Condominiums site (see **Figure 4**). These signs do not meet the City of Shoreline's Fire Department *Marking of Fire Lanes* standards. Therefore, the proposed designated fire lane signs and any new additional signs should meet the City of Shoreline's Fire Department standards to include red letters on white background with a red border. Additionally, the pavement adjacent to the yellow painted vertical curbs should read with block lettering, "No Parking – Fire Lane" and also be painted in yellow.

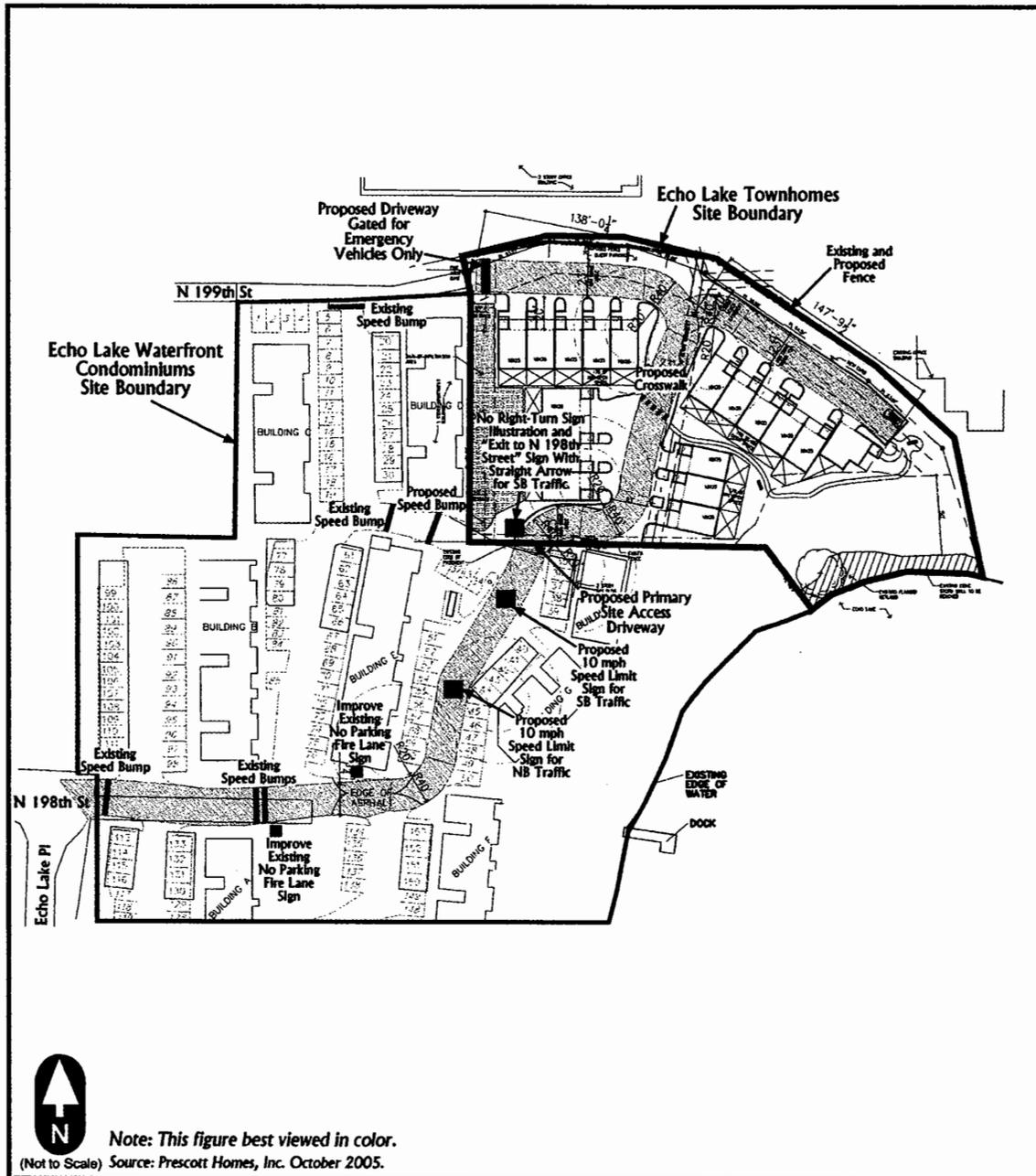
The City of Shoreline is concerned about vehicular and pedestrian traffic impacts on N 199th Street, which is why the site driveway on N 199th Street has been proposed as restricted to emergency access vehicles only. Based upon existing and proposed traffic control treatments in the project vicinity, it would be difficult for vehicles to utilize N 199th Street. A c-curb is located on Aurora Avenue N (SR 99) and extends from N 200th Street to the south beyond N 199th Street, separating northbound and southbound travel. Therefore, any project trips from existing and proposed development would be unable to make westbound left-turns onto Aurora Avenue N (SR 99) from N 199th Street and southbound left-turns from Aurora Avenue N (SR 99) onto N 199th Street. Any traffic that could potentially utilize N 199th Street would have to make northbound right-turns or westbound right-turns at the Aurora Avenue N (SR 99) and N 199th Street intersection. Due to the location of the primary site access roadway, it is unlikely that northbound right-turns would be made at N 199th Street, rather they would be made sooner at Echo Lake Place or N 198th Street. The only viable turning movement from the proposed development at the Aurora Avenue N (SR 99) and N 199th Street intersection are westbound right-turns.

Increased traffic that would be generated by the proposed *Echo Lake Townhomes* project would be discouraged to use N 199th Street by providing a “No Right Turn” illustration and “Exit to N 198th Street” with an arrow for southbound movements from the primary site driveway, adding additional speed bumps to slow potential cut-through traffic within the existing Echo Lake Waterfront Condominiums site, and reminding residents through the Homeowner’s Association only to utilize N 198th Street. The location of existing and proposed speed bumps, and the proposed signage are shown in **Figure 4**.

Pedestrian access onto N 199th Street would be restricted with the installation of gates and fences, although pedestrians could still utilize N 199th Street through the Echo Lake Waterfront Condominiums site. However, based upon existing pedestrian traffic counts, pedestrian utilization on N 199th Street as a result of the proposed *Echo Lake Townhomes* would be minimal to none.

Safety Issues

During the traffic counts conducted in October 2005, vehicles were observed to travel slowly within the Echo Lake Waterfront Condominiums site due to a six percent grade of N 198th Street, which extends into the site, speed bumps, general friction of parked vehicles along the interior roadways, and short travel distances within the site. However, to manage traffic speeds within the existing Echo Lake Waterfront Condominiums site, painted 10 mph speed limit signage at select locations along the interior roadway serving the *Echo Lake Townhomes* is recommended, with enforcement provided by the Homeowner’s Association for both the Echo Lake Waterfront Condominiums and *Echo Lake Townhomes*. These locations are shown in **Figure 4**.



 **Transportation Engineering Northwest, LLC**

**Figure 4
 Proposed Site Access Improvements**

Echo Lake Townhomes
 Shoreline, WA
 Traffic Impact Assessment

Recommendations

A review of potential traffic, nonmotorized, safety, and site circulation issues was evaluated for the proposed *Echo Lake Townhomes* project. The following measures are recommended to mitigate transportation impacts:

- A painted crosswalk should be provided on the central north-south site access roadway in the vicinity of the proposed paved pathway.
- The proposed fence should encompass the full length of the existing fence to restrict pedestrian access between the project site and apartment/condominium/office complexes and the Aurora Village Transit Center located to the north of the project site. In addition, the proposed emergency vehicle-only gate would be constructed to limit direct pedestrian access onto N 199th Street.
- Fire and other emergency response vehicles would also have access to the secondary site driveway on N 199th Street through the installation of standard Opticom pre-emption devices and a Knox-Box system at a gated restricted entry on the property's western boundary at the existing dead end of N 199th Street.
- All existing and proposed designated fire lane signs within the existing Echo Lake Waterfront Condominiums and proposed *Echo Lake Townhomes* sites should meet the City of Shoreline's Fire Department standards.
- Increased traffic that would be generated by the proposed *Echo Lake Townhomes* project would be discouraged to use N 199th Street by providing a "No Right Turn" illustration and "Exit to N 198th Street" with arrow for southbound movements from the primary site driveway, adding additional speed bumps to slow potential cut-through traffic within the existing Echo Lake Waterfront Condominiums site, and reminding residents through the Homeowner's Association only to utilize N 198th Street.
- To manage traffic speeds within the existing Echo Lake Waterfront Condominiums site, painted 10 mph speed limit signage at select locations along the interior roadway serving the *Echo Lake Townhomes* is recommended, with enforcement provided by the Homeowner's Association for both the Echo Lake Waterfront Condominiums and *Echo Lake Townhomes*.