

MEMORANDUM

Date: May 16, 2007 **TG:** 06076.00

To: City of Bainbridge Island Department of Public Works

From: Yonnel Gardes, The Transpo Group
Patrick Lynch, AICP, The Transpo Group

cc:

Subject: Ericksen-Hildebrand Circulation Study

Introduction

The purpose of this study is to present the results of the Ericksen-Hildebrand Circulation Study commissioned by the City of Bainbridge Island.

City Ordinance 2006-20 from November 2006 called for a new traffic study to be conducted in order to reexamine the impact of connecting Ericksen Avenue and Hildebrand Lane on the following:

1. The overall north-south circulation between Winslow Way and High School Road;
2. The intersections of Winslow Way/Ericksen Avenue, Hildebrand Lane/High School Road/SR 305, Madison Avenue/Winslow Way, and Madison Avenue/High School Road;
3. Pedestrian and bicycle access and safety;
4. New approved development within the High School Road District.

This study updates a previous study of the proposed connection of Ericksen Avenue and Hildebrand Lane between Wallace Way and High School Road. The previous study was conducted in 2001 and reported as part of the Island-Wide Transportation Study (February 2004).

Existing Conditions

Ericksen Avenue is an important north-south connection used by bicycles and pedestrians as the most direct connection between Winslow Way and High School Road.

In 2003, the City completed a project on Ericksen Avenue between Winslow Way and Wallace Way. This project constructed a sidewalk on the west side of Ericksen Avenue and bike lanes in both directions. The project also included a new pavement surface, storm water detention, water quality facilities, improvements to the water and sewer systems and under-grounding of the overhead utilities.

The section south of Wallace Way also includes a median (Photo 1).



Photo 1: Ericksen Avenue south of Wallace Way

Limited north-south connections through the Winslow area along with development pressures have resulted in vehicle traffic volumes increasingly higher on Ericksen Avenue, particularly between Winslow Way and Wyatt Avenue.

Currently the north end of Ericksen Avenue forms a dead-end at a small park facility at the intersection of Ericksen Avenue and Wallace Way (Photo 2).



Photo 2: Ericksen Avenue dead-ends at Wallace Way

Vehicles use the driveway at the Frontier Bank parking lot as an informal connection to drive between Ericksen Avenue and Hildebrand Lane. Past efforts to control

traffic volumes and turning movements included the installation of c-curb at the bank driveway and on Wallace Way, and speed bumps along the driveway. Despite these efforts, a significant amount of traffic continues to use this informal connection (Photo 3).



Photo 3: Bank driveway used as informal connection

Counts collected on November 7, 2006 between 4:00 PM and 6:00 PM indicate that traffic through the bank driveway is about 90 vehicles per hour in each direction.

Projected Land Use Changes

Existing and future land use information as projected by the City Planning Department was reviewed to understand future growth in traffic volumes in the Ericksen-Hildebrand corridor.

Land use is summarized into two basic categories, employment in terms of number of employees and households in terms of number of dwelling units. These two categories are further broken down into the following subclasses:

Households

- Single-Family (measured in dwelling units)
- Multi-Family (measured in dwelling units)

Employment

- Retail (employees)
- Office and Services (measured in employees)
- Government (measured in employees)
- Education (measured in employees)
- Warehouse (measured in employees)
- Manufacturing (measured in employees)

- Hotel/Motel (rooms)

Land use in the City's model is summarized by geographic areas called Transportation Analysis Zones or TAZs. Figures 1 and 2 highlight the TAZs that are located adjacent to the Ericksen-Hildebrand corridor and illustrate the land use by household dwelling units (Figure 1) and employees (Figure 2) for both 2006 and 2030.

Significant residential growth, approximately 770 new multi-family dwelling units are anticipated for the area north of Winslow Way while no new growth in single-family dwelling units is forecasted within the immediate study area.

Modest employment growth is forecasted along the length of the corridor with approximately 760 new employees. Most of this growth is focused at both ends of the Ericksen-Hildebrand corridor. Approximately 64% of this new job growth will be office and service based employment. Retail jobs are anticipated to account for 18% of the employment growth.

Table 1 summarizes existing and projected land use activities within the Ericksen-Hildebrand corridor.

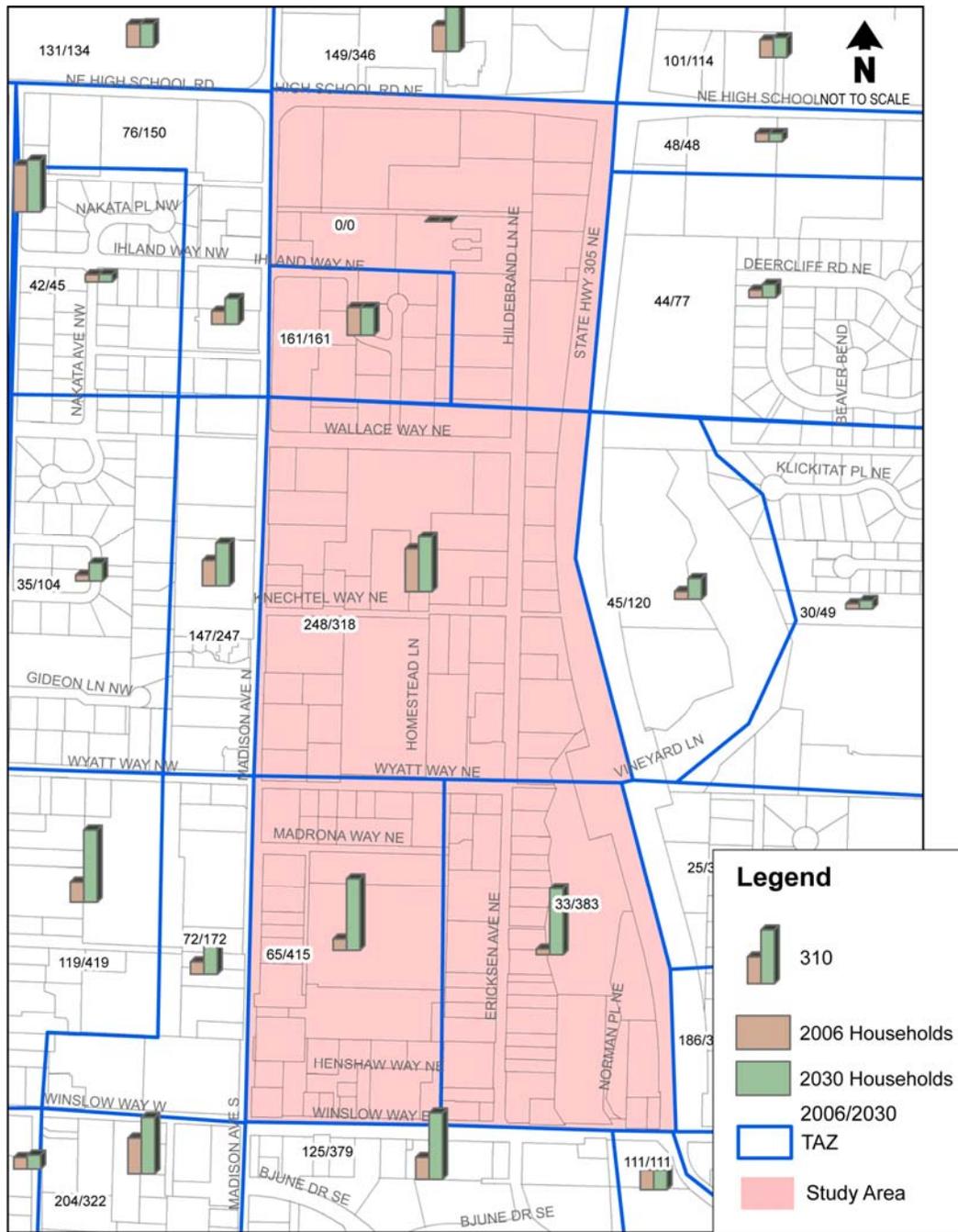


Figure 1: Changes in Dwelling Units

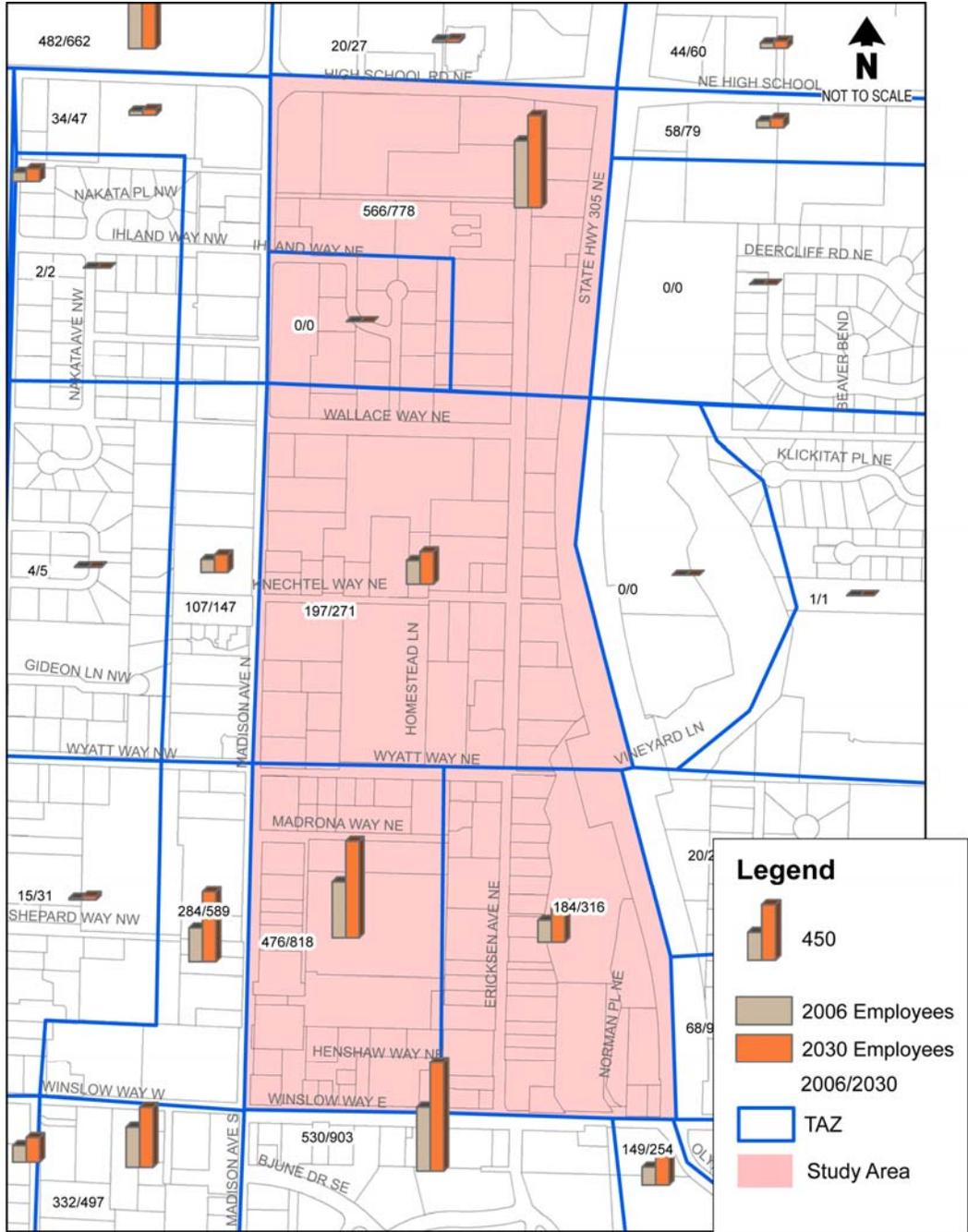


Figure 2: Changes in Employment

Table 1. Ericksen-Hildebrand Corridor Land Use Summary
2030 Land Use

Land Use Type	2006	2030	Difference	Total Growth	Compound Annual Growth
Households					
Single-Family (dwelling units)	19	19	0	0%	0.0%
Multi-Family (dwelling units)	488	1,258	770	158%	4.0%
Total	507	1,277	770	152%	3.9%
Employment					
Retail (employees)	270	405	135	50%	1.7%
Office and Services (employees)	915	1,400	485	53%	1.8%
Government (employees)	129	211	82	64%	2.1%
Education (employees)	0	0	0	0%	0%
Warehouse (employees)	84	124	40	48%	1.6%
Manufacturing (employees)	25	43	18	72%	2.3%
Total	1,423	2,183	760	53%	1.8%
Hotel					
Hotel (rooms)	46	46	0	0%	0%

1. Group Quarters is included in Multi-Family households.
2. Does not include Park & Ride or Hotel land use types.
3. Includes TAZs 39, 3901, 3902, 46, and 4601.

Household dwelling units through the corridor are forecasted to experience significant growth with 3.9% compound annual growth rate. As stated above, this residential growth is anticipated to be multi-family dwelling units and is expected to occur in the area north of Winslow Way and south Wyatt Way.

Employment, in general, is anticipated to experience modest growth with a compound annual growth rate of 1.8%. Most of this employment will be office and services oriented jobs.

The Ericksen-Hildebrand corridor is anticipated to develop with a mix of land use types. In addition, land use densities are forecasted to increase within the immediate study area with an increase in multi-family dwelling units and office, service, and retail based employment. Mixed use development facilitates more walking and biking trips as the distance between where people live is in close proximity to jobs and services.

North-South Circulation Volumes

The extension of Ericksen Avenue north of Wallace Way would have an impact on other north-south streets used to travel between Winslow Way and High School Road such as Madison Avenue, Grow Avenue, SR 305, and Ferncliff Avenue.

In order to analyze those impacts, the City of Bainbridge Island transportation model was used. Four different scenarios were studied:

- Existing conditions (as of 2006);
- Existing conditions with the Ericksen-Hildebrand connection;
- 2030 conditions without the connection;
- 2030 conditions with the connection.

The 2030 model incorporates the latest population and employment forecasts developed by the City, and accounts for a number of transportation improvements in the area.

The scenarios with the connection assumed that traffic calming measures would be implemented throughout the corridor between Winslow Way and High School Road, based on design recommendations described later in this memo (see Pedestrian and Bicycle Access and Safety section). The intersection of Wallace Way and Ericksen Avenue was assumed to be treated as an all-way stop in the modeled scenarios with the connection.

The total traffic during the afternoon peak hour under the four studied scenarios is shown on Figure 3.

The volumes on the north-south streets in the Winslow area are projected to grow by more than 30% on average between 2006 and 2030. All north-south streets are expected to experience increased traffic volumes.

The extension of Ericksen Avenue north of Wallace would primarily affect traffic volumes along Ericksen Avenue and Hildebrand Lane between Wyatt Way and High School Road. All other locations would show only minimal changes in traffic volumes (less than 10%) with and without the connection. In particular, the connection is not expected to generate any additional traffic on Ericksen Avenue south of Wyatt Way.

Forecasted volumes through the new connection, as indicated by the traffic model, are 285 vehicles in 2006 and 410 vehicles in 2030. This volume should be compared with the existing 195 vehicles, which were counted through the bank driveway in November 2006, in evaluating net new traffic growth through the connection.

With the 2006 scenarios, traffic volumes during the afternoon peak hour are expected to increase by approximately 20% both north of the connection (on Hildebrand Lane) and south of the connection (on Ericksen Avenue between Wallace Way and Wyatt Way).

With the 2030 scenarios, traffic volumes during the afternoon peak hour are expected to increase by approximately 15% north (on Hildebrand Lane) and south of the connection (on Ericksen Avenue between Wallace Way and Wyatt Way).

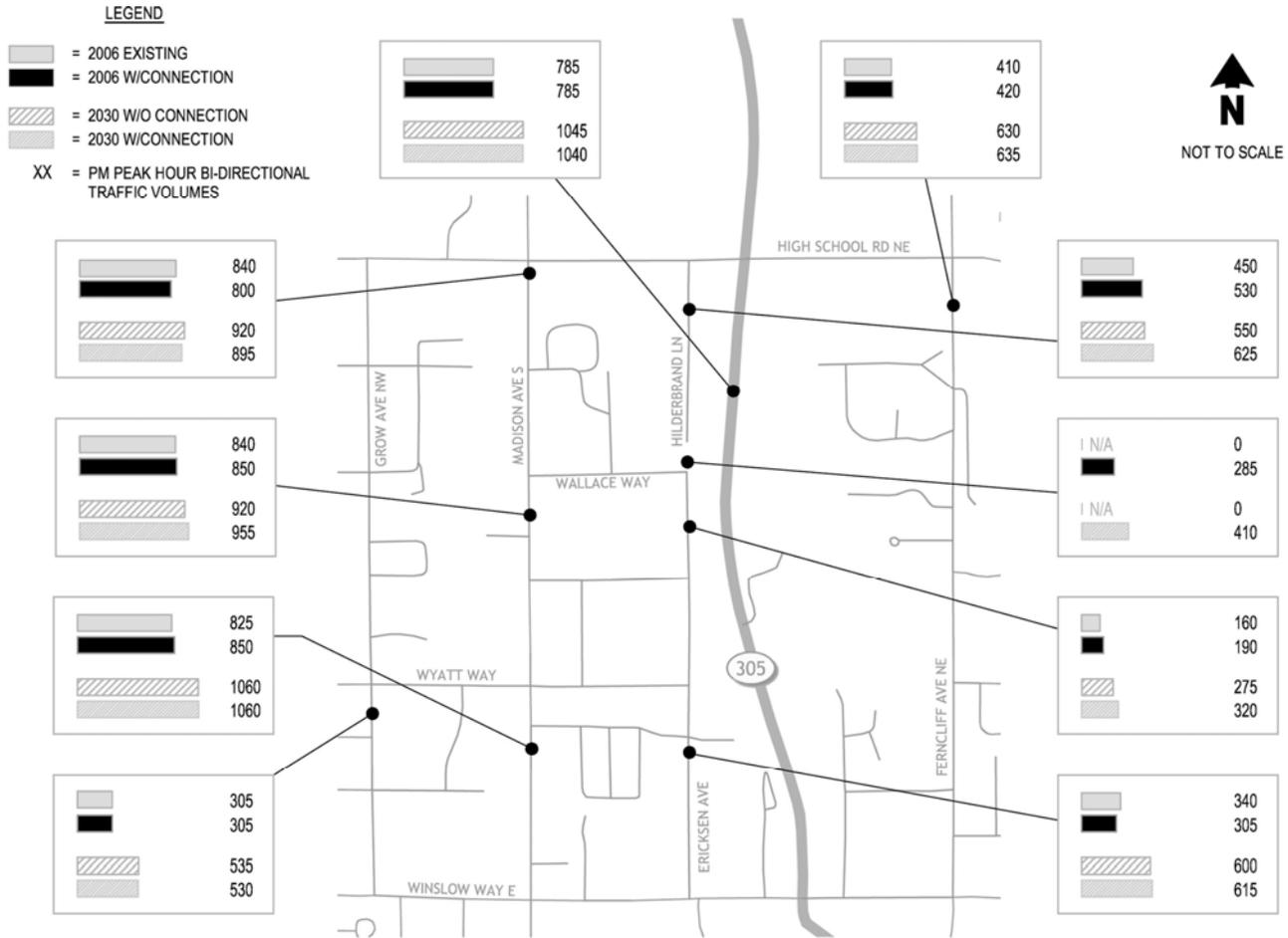


Figure 3: North-South Volumes

Intersection Operations

Existing and future traffic conditions were analyzed at nine intersections along Ericksen Avenue, Hildebrand Lane, High School Road and Winslow Way. Those intersections were selected as likely to be the most directly impacted by the proposed connection.

Intersection performances were analyzed for the afternoon peak hour, using the Synchro software program except the roundabout at High School Road and Madison Avenue which was analyzed with the Sidra software. Synchro and Sidra conduct level-of-service (LOS) analyses according the 2000 Highway Capacity Manual (HCM) methodology.

The City of Bainbridge Island has set level of service D as the minimum acceptable within the Winslow area for secondary arterials and collector streets including Winslow Way, High School Road, Madison Avenue, Ericksen Avenue, Wyatt Way, and Ferncliff Avenue.

The LOS results are presented on Table 2 and Figure 4.

Existing conditions during the afternoon peak hour are shown to be acceptable based on the intersection level of service analysis. The proposed connection, however, would bring additional traffic at the High School Road/Hildebrand Lane intersection which would operate at level of service E. The critical movement (highest delay) at that intersection is the northbound left-turn movement.

Projections for 2030 show an increase of traffic volumes on all streets within the study area. Two intersections are projected to fail the level of service criteria in 2030: High School Road/Hildebrand Lane (LOS E) and Ericksen Avenue/Winslow Way (LOS F). The proposed connection would bring the High School Road/Hildebrand Lane intersection performance to LOS F as well.

Table 2. Level of Service Analysis

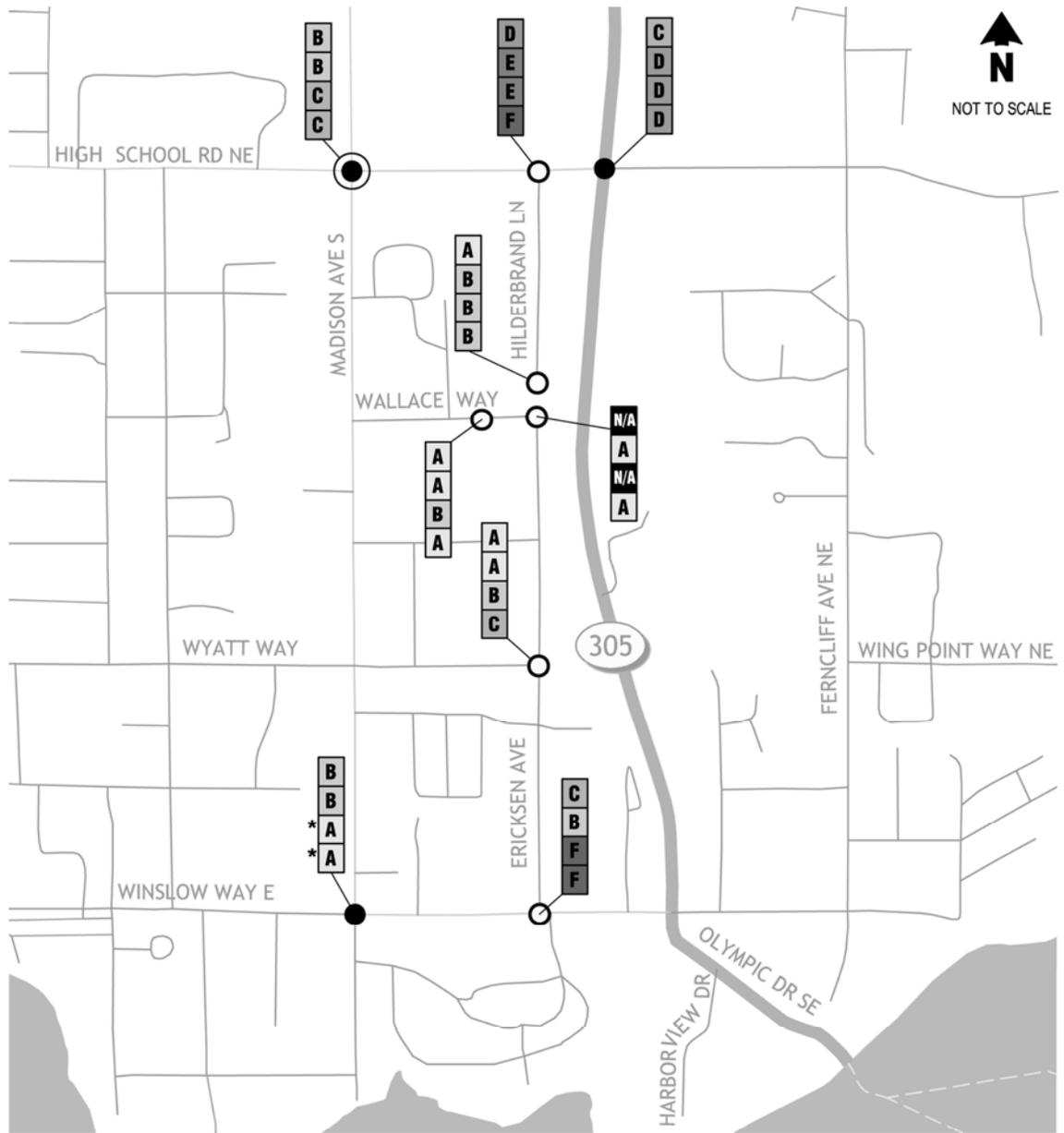
Intersection	2006 Existing			2006 w/connection			2030 w/o connection			2030 w/ connection		
	<i>LOS</i> ¹	<i>Delay</i> ²	<i>V/C</i> ³ or <i>WM</i> ⁴	<i>LOS</i>	<i>Delay</i>	<i>V/C</i> or <i>WM</i>	<i>LOS</i>	<i>Delay</i>	<i>V/C</i> or <i>WM</i>	<i>LOS</i>	<i>Delay</i>	<i>V/C</i> or <i>WM</i>
<i>Weekday PM Peak Hour</i>												
Winslow Way & Ericksen Avenue	C	17.0	SB	B	13.0	SB	F	>100	SB	F	>100	SB
Wyatt Way & Ericksen Avenue	A	10.0	NB	A	9.0	NB	B	15.0	NB	C	16.0	NB
Wallace Way & Ericksen Avenue	N/A	N/A	N/A	A	8	NB	N/A	N/A	N/A	A	9.0	NB
Wallace Way & Bank Driveway	A	10.0	SB	A	9.0	SB	B	11.0	SB	A	10.0	SB
Bank Driveway & Hildebrand Lane	A	10.0	EB	B	11.0	EB	B	10.0	EB	B	12.0	EB
High School Road & Hildebrand Lane	D	31.0	NBL	E	40.0	NBL	E	43.0	NBL	F	64.0	NBL
High School Road & SR 305	C	34.0	0.57	D	36.0	0.57	D	45.0	0.73	D	43.0	0.74
Madison Avenue & High School Road	B	15.0	0.80	B	12.0	0.63	C	22.0	0.96	C	21.0	0.94
Madison Avenue & Winslow Way	B	13.0	NB	B	13.0	NB	A	7.0	0.45	A	7.0	0.45

1. Level of service, based on 2000 Highway Capacity Manual methodology or ICU methodology.

2. Average delay in seconds per vehicle.

3. V/C = volume-to-capacity ratio for signalized intersections.

4. WM = worst movement reported for un-signalized intersections. NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NBL = Northbound Le



N
NOT TO SCALE

* = SIGNALIZED IN 2030

LEGEND

- X** = 2006 EXISTING
- X** = 2006 W/CONNECTION
- X** = 2030 W/O CONNECTION
- X** = 2030 W/CONNECTION
- = SIGNALIZED INTERSECTION
- = UNSIGNALIZED INTERSECTION
- ⊙ = ROUNDABOUT

**SIGNALIZED INTERSECTION
LEVEL OF SERVICE SCALE**

- A** = 0 TO 10 (SEC/VEH)
- B** = 10 TO 20 (SEC/VEH)
- C** = 20 TO 35 (SEC/VEH)
- D** = 35 TO 55 (SEC/VEH)
- E** = 55 TO 80 (SEC/VEH)
- F** = 80+ (SEC/VEH)

**UNSIGNALIZED INTERSECTION
LEVEL OF SERVICE SCALE**

- A** = 0 TO 10 (SEC/VEH)
- B** = 10 TO 15 (SEC/VEH)
- C** = 15 TO 25 (SEC/VEH)
- D** = 25 TO 35 (SEC/VEH)
- E** = 35 TO 50 (SEC/VEH)
- F** = 50+ (SEC/VEH)

Figure 4: Level of Service Analysis

Pedestrian and Bicycle Access and Safety

Safety and accessibility for non-motorized transportation modes are important issues to consider in the context of the proposed changes on the Ericksen Avenue and Hildebrand Lane corridor. Facilities should be improved for better pedestrian and bicycle accessibility and traffic calming devices should be incorporated in the proposed design. This section will describe the range of possible measures that could enhance pedestrian and cycling accessibility of non-motorized travel on the corridor.

Current non-motorized transportation facilities on Ericksen Avenue south of Wallace Way include a six-foot sidewalk on the west side of Ericksen Avenue, and 3-foot bicycle lanes on the west and east sides of Ericksen Avenue (See Photo 1). There is also a median treatment along Ericksen Avenue between Knechtel Avenue and Wallace Way.

Recommended improvements for bicycle and pedestrian circulation are illustrated on Figure 5. These include:

- Reduced vehicle travel lane widths;
- Wider bicycle lanes;
- Extension of the existing median;
- Creation of a new urban roundabout.

While it may not be necessary to construct new sidewalks on both sides of Ericksen along the entire corridor, enhancement to the bicycle lane widths can be accommodated by reducing travel lane widths on the southern portion of the corridor. This improvement is consistent with Association of American State Highway Transportation Officials (AASHTO) standards for bicycle facilities (Association of American State Highway Transportation Officials. *Guide for the Development of Bicycle Facilities*, Washington, D.C. 1999). In order to accommodate wider bicycle lanes on Ericksen Avenue and along the connector route, the automobile travel lane would be narrowed to ten feet. This would require some re-striping work, and would contribute to making the roadway appear narrower and thus lowering vehicle speeds.

The narrower travel lanes could be complemented by other traffic calming measures such as the extension of the existing median and the creation of a new urban roundabout at Ericksen Avenue/Wallace Way.

On Ericksen Avenue between Wyatt Way and Wallace Way the existing median/park-strip could be extended. If the median is extended as far south as possible, it will act as a traffic calming device by reducing vehicle speeds and increasing the separation between opposing directions of traffic. A median could also be created on the section of Hildebrand Lane north of Wallace Way. Medians provide a unique landscape opportunity and can increase a community's sense of place (Dan Burden. *Streets and Sidewalks, People and Cars: The Citizen's Guide to Traffic Calming*, Local Government Commission Center for Livable Communities, Sacramento, CA. 2000).

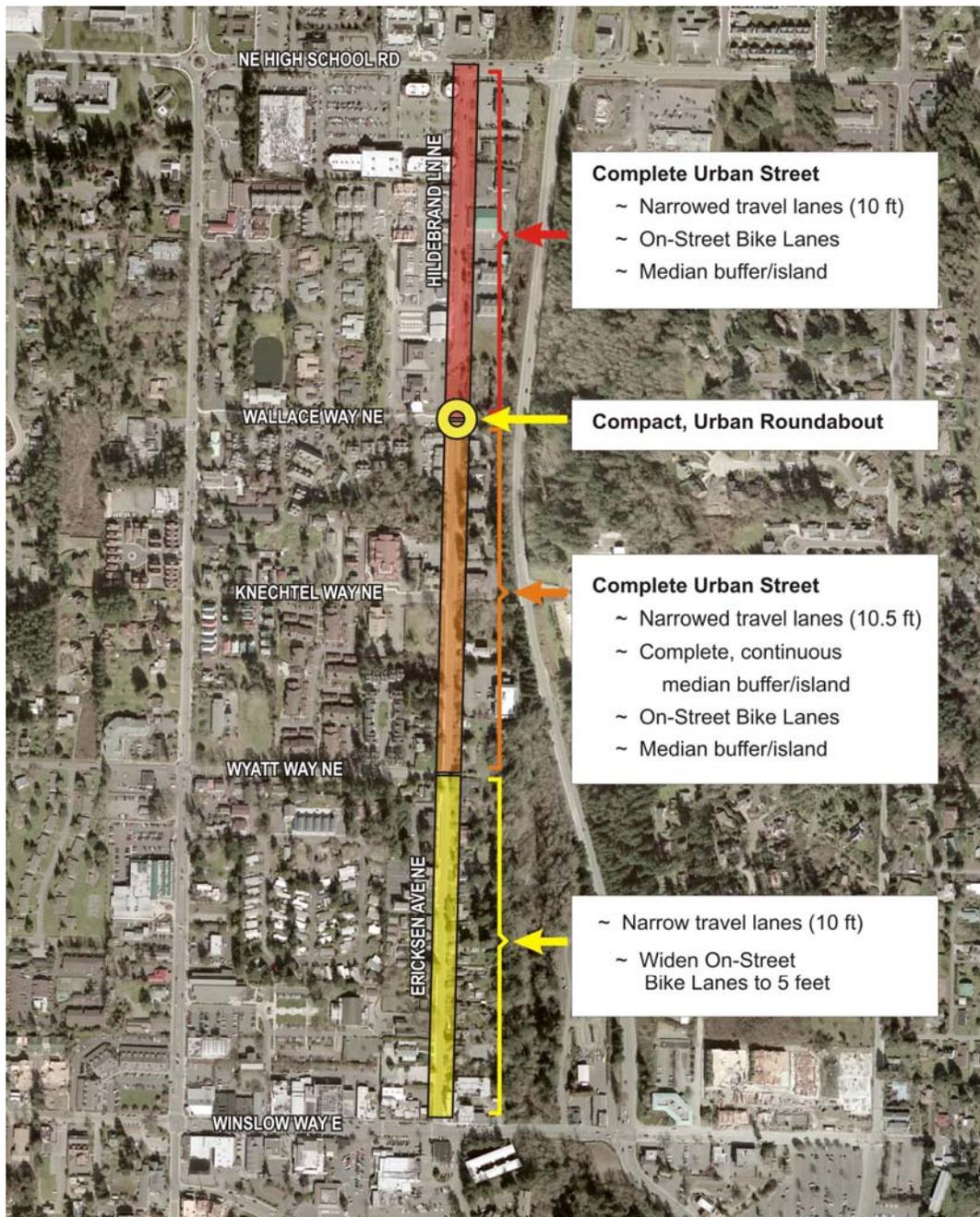


Figure 5: Potential Non-Motorized Design Elements for the Ericksen Avenue Corridor

Another idea to explore is the creation of a compressed urban roundabout at the intersection of Ericksen Avenue and Wallace Way (see Figure 6 for an example). It could contribute to moderate traffic speeds and volumes. These raised islands are typically placed in intersections, and force drivers to slow down to yield to other traffic. Traffic circulates the raised intersection in a counter-clockwise direction, and exits the “circle” by turning right onto the destination street. The Wallace Way and Ericksen Avenue intersection is a good candidate for this type of treatment. If a roundabout is placed here, special design measures will be necessary to accommodate pedestrians in the intersection. For example, the crosswalks will need to be placed at an adequate distance before the intersection so that pedestrians have a clearly designated and safe crosswalk; the typical recommendation is one car length beyond the yield line. Also, bicycle lanes are not typical components of roundabouts; therefore, bicycle lane drops and additions will be necessary along the corridor.

The comprehensive effect of measures including a widened bicycle lane, an extended median, and a traffic circle will be to lower automobile speeds. The volume of cut-through traffic will be minimized because of the decreased speeds. The lower level of automobile traffic will reinforce the safety and accessibility of the corridor for non-motorized transportation.

LOCAL STREET ROUNDABOUT

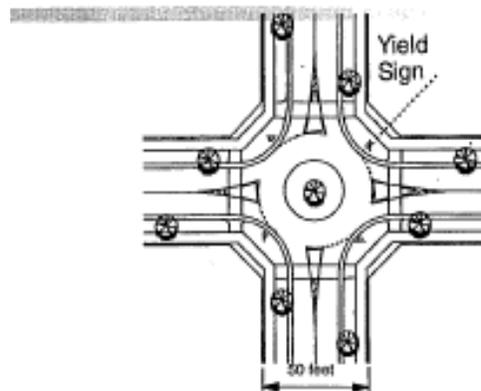


Figure 6: Local Street Roundabout example
(Source: Burden)