

Final Technical Report Fremont Bridge Approach Replacement Project

Economic Elements

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City of Seattle

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Introduction

The goal of the Fremont Bridge Approach Replacement Project is to replace the existing substandard approaches with approaches that meet current structural standards. Because this project is replacing existing structures, it is expected to have only temporary impacts. This report examines the impacts of the project on the residents' travel patterns and on the regional and local economy.

Project Description

[Monica for my suggested revisions on the project description refer to the AQ report pages 1-4 which I will provide later].The Fremont Bridge is located in north Seattle and spans the Lake Washington Ship Canal, providing an important transportation link between the Fremont and Queen Anne neighborhoods (see Figure 1). It is a drawbridge with two lanes in each direction for vehicles, with sidewalks for non-motorized users. In 1998, a condition report completed for the approach structures found them to be structurally deficient and functionally obsolete by Washington State Department of Transportation (WSDOT) standards. The study concluded that replacement of the existing bridge approaches was the prudent course of action.

The main purpose of this project is to replace the existing sub-standard bridge approaches (located north and south of the bridge itself) with new approaches that meet current structural design standards. The bascule bridge portion will not be affected by this project. The approaches are the elevated roadways at each end of the bridge that connect to city streets (see Figure 2). Improvements would replace the existing structures for the north and south approaches, and seismically retrofit and strengthen the north approach off-ramp. Sidewalks and railings on the approach structure would also be replaced. The new bridge approach structures would be located in the same location as the existing structures. The north and south approach structures have average centerline lengths of 534 feet and 124 feet, respectively .

The project also includes some additional components, which are described in more detail below. (I suppose the basic info here should be consistent in all the discipline reports. For example, in the Air Quality Report we say, "The project also includes five additional components, which are described in more detail below."

Replacement of Operations and Maintenance Shop

The City of Seattle owns and operates the Fremont Bridge Operations and Maintenance Facility. This building is located underneath the southern approach of the bridge. The facility includes a 3,600 square foot building area, 10 parking spaces, and a yard area. The existing building includes an electrical shop and administrative offices. The existing two-story concrete structure would be removed prior to the removal of the eastern half of the southern approach structure. The building would be deconstructed, and all material would be disposed of according to the City of Seattle Standard Specifications (Seattle 2003b).

A new Operations and Maintenance Facility will be constructed based on one of two designs: Scheme 1 or Scheme 4. The City of Seattle will determine the final design scheme at a later date in the project design. The building areas listed below are maximum estimates that are expected to decrease as the project moves through value engineering.

With the Scheme 1 design, the building would be located underneath and structurally integrated with the bridge approach. The administration offices and electrical shop would be located on the second level with access to the parking yard through the building. An open-air parking yard would be located on the south/east side of the shop area. This scheme would provide a maximum of 6,960 square feet of building area and 5,370 square feet of open-yard.

In the Scheme 4 design the majority of the parking area would be underneath the bridge approach with an approximate 1,600 square foot shop building area that is structurally independent of the approach structure. This design includes a separate building with a maximum of 900 square feet on the first floor and 3,000 square feet on the top floor. This building was designed with a larger top floor to create a more environmental-friendly and aesthetically pleasing building as well to provide some covered parking and yard area. This building would be constructed at the east end of the site adjacent to the bridge and an open paved yard of 4,950 square feet and 1,100 square feet of covered shed shop area. With the Scheme 4 design, the loading area is separated from the parking spaces on the north side of the lot to allow free access to the majority of the parking yard area.

Upgrade Mechanical and Electrical System

The project would also upgrade the mechanical/electrical system used to raise and lower the drawbridge. This minor work is part of the regular maintenance of the drawbridge. Although this work will take place over the Lake Washington Ship Canal, no material will enter the water. The electrical work would include a number of elements. The major components of this work are listed below:

1. Removal and replacement of all existing electrical equipment, motors, controls, conduit and wire. Work will be sequenced and coordinated with structural and mechanical activities to minimize impact to the roadway and waterway traffic.
2. Installation of new service entrance equipment including: meter sockets, current transformer enclosures, and main disconnect circuit breakers at both North and South bascule piers.
3. Installation of two standby engine generator sets, automatic transfer switches and associated equipment. The generators shall be sized for operation of the bascule leaves and for the house lighting and outlets.

In addition, the mechanical system of the drawbridge would be upgraded with the following work elements:

1. Removal of bridge reduction machinery from the platforms on the bascule piers.
Removal of line shafts and reduction machinery on each side of each bascule leaf.

2. Installation of new motors, brakes and enclosed reduction machinery on each side of each bascule leaf.
3. Replacement of bridge center lock system.
4. Installation and removal of a temporary bridge operating system consisting of a City-provided winch system, wire ropes and blocks.

Replacement of Existing Pedestrian/Bicycle Stairs

This project includes a proposal to widen the existing stairs from the Burke-Gilman Trail to the northern bridge approach. The current width of the stairs is approximately 3 feet, and the new stairs would be approximately 6 feet wide. The increased width would allow two people carrying bicycles to use the stairs at the same time. This project will not change the existing stairs in the vicinity of the southern approach. During construction of the approaches, the current stairs will need to be removed as they are attached to the approach structures. If the stairs are not replaced, the current stairs will be reused to maintain the connection from the Burke-Gilman Trail to the northern bridge approach.

Acquisition of Property

The project also includes the possible acquisition of a small “sliver” of land on the south side of the Ship Canal. The land is part of a triangle-shaped parcel that is bounded by Florentia Street, Nickerson Street and 4th Avenue North (see Figure 1). An espresso stand and restaurant are the current occupants. The parcel also includes a parking lot for the patrons of the restaurant and espresso stand. The land that the City may acquire is approximately 555 square feet that runs parallel to 4th Avenue North between Florentia and Nickerson Streets.

This acquisition will allow increased room for bicycles to access the Fremont Bridge on 4th Avenue North. The taking of this land may cause the existing espresso stand to be relocated approximately 8 feet to the west. The existing espresso stand is near the street edge in the parking lot.

The espresso stand may need to be closed temporarily during the relocation. It is not expected the espresso stand will need to be closed more than one week. There are currently a number of entrances from the adjacent streets to the parking lot. Some of these entrances may be closed during construction, but patrons of the espresso stand will still be able to access it. The total construction impact to the espresso stand is not anticipated to be longer than 4 or 5 months.

The City will implement mitigation measures that would include signs with notification of possible closures dates. In addition, the City will provide signs to redirect patrons to the new location. As part of the possible acquisition, a Hazardous Materials Report is being developed to examine the soil in vicinity for possible contamination.

It is important to note, the acquisition of this land is a possibility. It not known at this point of the City will have the funds to acquire this land.

Underwater Cables

Submarine cables currently lay on the bottom of the Ship Canal, which provide power and communications to the north bascule portion of the bridge. These cables have been

in place since 1917 when the bridge opened. This project will replace these cables, and it is envisioned the new submarine cable(s) will be laid on the bottom of the Ship Canal and allowed to sink down by its own weight into the mud/silt. It is not expected the original cables will be removed as part of this project. In addition, stormwater facilities for the bridge approaches will be modified to provide oil-water separation and water quality wet vaults as required under the City of Seattle drainage ordinance, Title 22.800 Stormwater, Grading, and Drainage Control Code.

Phasing of Project

The entire project including all the components will take approximately 30 to 34 months beginning in 2005. This time period will include approximately 18 months to replace the approaches as well as an additional six months to complete the construction of the new mechanical and electrical system. The bridge maintenance shop construction will follow the mechanical and electrical system work and will take up to nine months to complete. During approach construction, the project would maintain full bridge operations (two lanes each way and both sidewalks) for approximately the first nine months while constructing a new micro-pile substructure beneath the existing approach structure deck, followed by half bridge closure (one lane in each direction and one sidewalk maintained) for an additional nine months while the approach structure deck is replaced one half at a time. The current plan assumes up to 10 full bridge closures (weekends only) to accommodate girder placement and possibly bridge deck pours. Although it is expected that full bridge closures would take place on nights and weekends, it is possible some full closures could occur during weekdays. Any full closures of the bridge during weekdays would be brief. In addition, weekday closures would only take place when it was determined to be more efficient than a weekend or night closure and with community support.

The Burke-Gilman and Ship Canal Trails would be closed in the vicinity of the project due to safety concerns. Users of these trails would be detoured around areas of construction. The City will close the Burke-Gilman Trail for up to approximately 24 months and the Ship Canal Trail for up to approximately 34 months. Once the approaches are replaced and the mechanical and electrical system work is completed, the City will reopen the Burke-Gilman Trail. The City will reopen the Ship Canal Trail once the new bridge maintenance shop is completed.

The Project Alternatives for Replacement of Approaches

Five build alternatives have been considered for replacement of the Fremont Bridge approaches. To develop and evaluate these alternatives, a *Type, Size and Location Study* was prepared by Parsons Brinckerhoff in March 2003. The post-construction configuration of the approaches and other bridge improvements are the same for all the alternatives. The alternatives vary only in terms of construction methods, project duration, and pedestrian/vehicle access over the bridge or across the Ship Canal during construction. Construction of the approaches is planned to begin in 2005 and is expected to last 18 to 24 months, depending largely on whether or not traffic is maintained on the bridge during construction. All alternatives would require some full bridge closures on nights and weekends. Although it is expected that full bridge closures would take place on nights and weekends, it is possible that some full closures could occur during weekdays. Any full closures of the bridge during weekdays would be brief, and weekday closures would only take place when it was determined to be more efficient than a weekend or night closure. Each alternative is briefly described in the following section. It is important to note that all references to bridge closures include both the north and south bridge approaches.

Figure 1: Project Vicinity



Project Vicinity Map

Alternative 1: This alternative would close the entire bridge for 12 to 24 months while the existing approach structures are completely removed and new approach structures are built on drilled shaft foundations.

Alternative 2: This alternative would consist of one half of the bridge being closed for 18 to 20 months. Half of the existing approach structures would be removed and a new half-structure would be built on drilled shaft foundations, then the second half would be removed and built. During the time period when one half of bridge would be closed, one lane would be open in each direction.

Alternative 3 (the Preferred Alternative): This alternative would support full bridge operations (two lanes each way and both sidewalks) for 9 to 12 months. Construction of a new micro-pile substructure would take place under the existing approach structure deck. While the approach structure deck is replaced one half at a time, half the bridge (one lane each way and one sidewalk) would be closed for 9 to 12 months.

Alternative 4: This alternative would include full bridge operations (two lanes each way and both sidewalks) for 9 to 12 months during construction of a new drilled shaft substructure beneath the existing approach structure deck. Half the bridge would be closed (one lane each way and one sidewalk maintained) for 9 to 12 months while the approach structure deck is replaced one half at a time.

Alternative 5: This alternative would support full bridge operations (two lanes each way and both sidewalks) for 9 to 12 months while constructing a new wall substructure beneath the existing approach structure deck. This would be followed by half bridge closure (one lane each way and one sidewalk) for 9 to 12 months while the approach structure deck is replaced one half at a time.

Alternative 6 (No Action Alternative): In this alternative, the bridge approaches would not be replaced. The City of Seattle may need to close the bridge due to safety concerns because the current bridge approaches are deteriorating.

To determine the preferred alternative, the project team used the following evaluation criteria:

- Maintenance of Traffic
- Construction Cost
- Community Impacts
- Constructability
- Environmental Impacts
- Structural Impacts
- Right of Way Requirements
- Amenities and Aesthetics
- Long-Term Operations and Maintenance
- Overall Construction Impacts

Based on the evaluation criteria, Alternative 3 became the preferred alternative. Most significantly, it would disrupt traffic the least. The alternatives that disrupted traffic the least have been the most heavily supported (over 90%) by the public involvement process to date. Alternatives 1 and 2 would cause the greatest traffic disruptions, so they were dropped from further study. The traffic disruptions from Alternatives 3, 4 and 5 would not be as great. However, Alternatives 4 and 5 scored lower in a number of the other evaluation criteria, so they were precluded from further study. The *Type, Size and Location Study* (Parsons Brinckerhoff, March 2003) includes a more detailed discussion on the evaluation of all the alternatives.

As previously discussed, the alternatives differ only in construction methods, project duration, and pedestrian/vehicle access over the bridge or across the Ship Canal during construction. Because a Preferred Build Alternative has already been identified through the *Type, Size and Location Study*, this analysis compares the Preferred Build Alternative to the No Action Alternative.

Figure 2: Fremont Bridge Approach Replacement Project

(Insert CAD drawing here)

Studies and Coordination

This economic analysis follows the WSDOT *Environmental Procedures Manual*. Information for this analysis was obtained from local government resource materials published on the Internet, discussions with community and business representatives, and local newspapers.

Existing planning documents and reports relevant to historic and current economic conditions in the project area were reviewed, including adopted comprehensive plans for the City of Seattle and neighborhood plans for the Fremont and Queen Anne neighborhoods. The project is consistent with all of these adopted plans. Results from the *Fremont Bridge Approach Replacement Project: Type, Size, and Location Study* (Parsons Brinckerhoff, March 2003) were also reviewed and incorporated into this analysis.

The information obtained was used to qualitatively and quantitatively describe the existing general economic characteristics of the project area. Because it is difficult to quantify the linkages between roadway improvements and development or job growth, the assessment of potential impacts was limited to a qualitative analysis. Economic indicators such as real estate transactions, property assessment valuations, and county tax rolls were not analyzed due to the temporary, short-term nature of this project.

Public Involvement

Businesses, residents, commuters, schools, and transit and emergency service providers as well as the Pedestrian Advisory Board and Bicycle Advisory Council have been contacted to engage the public in this project. Communication with the community began with stakeholder interviews to identify key challenges and the preferred means of communication in August 2002. These interviews included a group of citizens that represented neighbors, commuters, large and small business owners, employees, and institutions. A Citizen Advisory Group was then assembled consisting of large employers, the Fremont Chamber of Commerce, the North Seattle Industrial Association, and neighborhood representatives to provide advice on ways to communicate with the public. A public meeting and open house were also held to gain community input in the fall of 2002. A newsletter was then distributed throughout the community and project information has been posted on the City of Seattle website. The initial public outreach suggests community members understand the project need and accept the reduction in bridge capacity during construction. Community members strongly support keeping one lane of traffic open in each direction during construction. Field interviews with employers were not specifically conducted because the extensive public outreach efforts included a number of discussions with employers in the project area. An additional newsletter was mailed to businesses and residents in the area surrounding the bridge in early December 2003. In addition, a community open house is planned for the spring or early summer of 2004, when sufficient design work is ready for the community to review.

The public involvement efforts will continue throughout the project. It is expected there will be additional meetings with the public and Citizen Advisory Group as well as the publication of more newsletters. The continued outreach will result in construction mitigation strategies that offer the most community support.

The economic analysis included a survey of new industrial and commercial development in the project area. The most significant development is the planned construction of another large office building in the Quadrant Lake Union Center east campus. The project is already permitted and designed, but awaits a long-term tenant before the building will be built.

Affected Environment

The project area for this analysis encompasses the boundaries of the urban village/center of Fremont (south of North 40th Street to the water and Ashworth Avenue North to the east and 3rd Avenue Northwest to the west). This report will also discuss impacts to the northern slope of Queen Anne (north of West McGraw Street to the water and Westlake Avenue to the east and 15th Avenue West to the west). The project area is shown in Figure 3.

This section describes existing economic conditions in the project area. Specific topics discussed include the overall setting of the project area, residents' travel patterns, the regional and local economy, and employment trends.

Setting

The Fremont neighborhood started in the 1880s as a settlement around a sawmill, bordering a shallow reach of wetlands between Lake Union and Puget Sound. The community grew to a town of 5,000 before it became part of Seattle in 1891. In 1916 the wetlands between Lake Union and Puget Sound were dredged by the federal government to create a deep-water connection called the Lake Washington Ship Canal. This project created a wide water barrier between Fremont and downtown Seattle. To restore and improve transportation between these two communities, the Fremont Bridge was built and opened in 1917.

By 1919 the Bryant Lumber and Shingle Mill had expanded to both sides of Fremont Avenue North. A rail line to the north was franchised to the Northern Pacific Railroad (Bothell Branch) and a rail spur from North 34th Street accessed the west and east sides of the lumber mill. Historic maps indicate a sash and door factory, lumber sheds, scattered lumber storage, and an office on the west side of Fremont Avenue North. A planing mill, drying kilns, machine shop, and sawmill were located on the east side. By 1950 much of the lumber mill on each side of Fremont Avenue North had been reconstructed. A new planing and sorting mill was constructed on the east side of Fremont Avenue North, and new work shops and lumber sheds were constructed on the west side. By 1968 the lumber mill had been replaced. The former mill buildings on the west side were converted to steel product manufacturing, housewares, and house trailer construction. On the east side was a building/housing tile and floor covering warehouse and a parts warehouse.

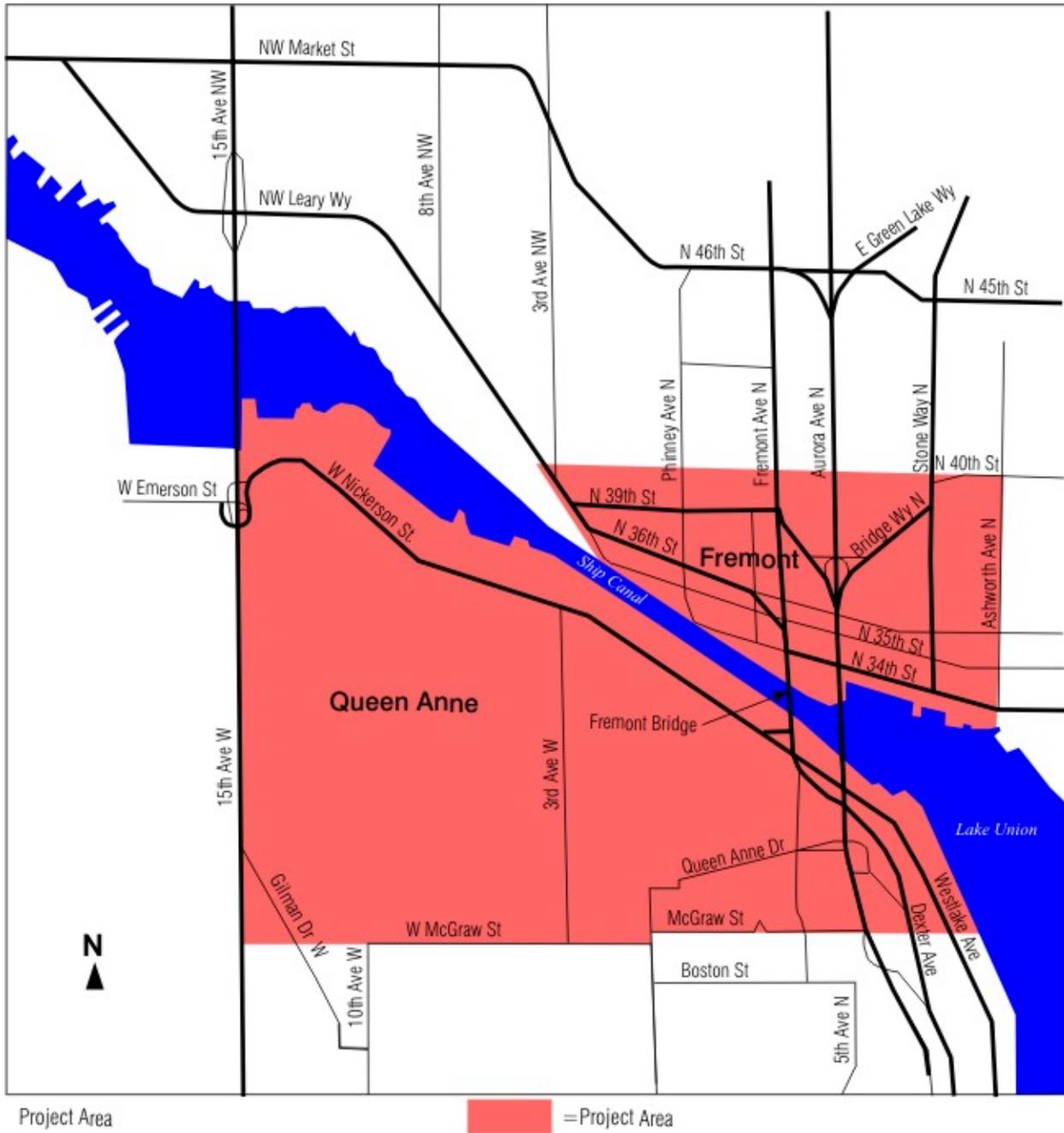
The area on the south approach (Seattle side) of the Fremont Bridge was primarily residential prior to 1917. An operations and maintenance shop was constructed by the City of Seattle under the south approach to the Fremont Bridge and is accessed by the "Lower Roadway." By 1917 a Shell Oil Company pumping station was constructed immediately south of Nickerson Street, across the street from the project site. Maps from the 1950s indicate a railroad right-of-way under the south approach.

Today, the junction of Fremont Avenue North at North 34th Street/Fremont Place/North 35th Street is considered "downtown Fremont". This area is a mixed-use commercial district and is Fremont's designated Hub Urban Village (Figure 3). The main land uses in downtown Fremont are commercial with some residential uses. Restaurants and shops extend north along Fremont Avenue North, and larger commercial businesses are located

on North 34th Street. In 1998, the Quadrant Corporation redeveloped the areas immediately east of Fremont Avenue North bounded by the Ship Canal to the south and North 34th Street to the north. In 2001, the company redeveloped the properties on the west side of Fremont Avenue bounded by the Ship Canal to the south and North 34th Street to the north. The company created the office complexes of Quadrant Lake Union, which were coined “West Campus” and “East Campus”. Both office complexes include a mixture of retail and offices.

The Fremont neighborhood is known for its unique character, which includes a strong interest in art. The business district has an active Chamber of Commerce. In addition, Fremont is the sponsor of two major community events: Summer Solstice Parade and Oktoberfest. The community also hosts a Sunday Flea Market. The businesses along the southern side of the Ship Canal are mainly commercial and light industrial. The northern slope of Queen Anne is primarily residential, with single-family homes and multi-family dwelling units.

Figure 3: Project Area



Regional and Local Economy

It is important to consider whether the proposed project has the potential to impact the current regional and/or local economy. In the Puget Sound region, the national recession has had a significant impact on the regional and local economies. One of the region's largest employers, the Boeing Company, has cut back its workforce and a number of dot-com businesses in the region have closed or reduced their workforces. However, the Puget Sound Regional Council (the regional planning agency) reports the region continues to have concentrations in historically significant industries such as forestry, fishing, transportation equipment manufacturing and water transportation. Table 1 lists the number of employees by economic sector for the greater Seattle area (King, Kitsap, Pierce and Snohomish counties) in 2000.

Table 1: Employees by Economic Sector in Greater Seattle Area (King, Kitsap, Pierce and Snohomish Counties)

Sector	No. Employed	% of Total
MANUFACTURING	225,690	13.1%
DURABLE GOODS	170,340	9.9%
Transportation, including aircraft	93,250	5.4%
Industrial machinery and equipment	14,850	0.9%
Lumber and wood products	12,650	0.7%
Electronics/electrical equipment	11,750	0.7%
Instruments	11,850	0.7%
Other durable goods	25,990	1.5%
NON-DURABLE GOODS	55,150	3.2%
Food and kindred products	17,190	1.0%
Printing and publishing	16,600	1.0%
Textiles, apparel, and leather	5,690	0.3%
Paper products/allied products	4,880	0.3%
Other non-durable goods	10,510	0.6%
NON-MANUFACTURING	1,499,780	86.9%
Services	524,790	30.4%
Wholesale/retail trade	408,480	23.7%
Government	262,300	15.2%
Finance, insurance, real estate	98,980	5.7%
Construction	103,380	6.0%
Transportation/public utilities	100,050	5.8%
Total Employment	1,725,470	100.0%

Adapted by the Central Puget Sound Economic Development District from Washington State Employment Security, Labor Market and Economic Analysis Branch, Labor Area Summaries

Employment in the region is expected to increase in the coming years. Table 2 displays the employment projections for the region, excluding resource or construction jobs.

Table 2: Total Employment and Projections (Full-Time Equivalent Positions)

Year	Seattle	King County	Greater Seattle Area
1970	310,286	466,592	740,927
1980	386,684	697,401	1,033,407
1990	469,802	972,567	1,445,243
2000 (est.)	527,393	1,180,564	1,804,503
2010 (est.)	608,113	1,353,664	2,075,592

Source: Puget Sound Regional Council

As discussed previously, the greater Seattle region has experienced the effects of a recession. However, the business climate of Fremont is thriving, particularly on the north side of the Ship Canal. Over the last five years, Fremont has become home to a number of large employers including Adobe Systems Inc. and Getty Images. Adobe Systems occupies over 300,000 square feet of office space. A number of new residential and retail buildings have also been established in the project area. With these new buildings, Fremont has gained a number of offices and retail businesses. Fremont’s community events including the Sunday Flea Market, the Oktoberfest celebration, and a Summer Solstice Parade have attracted over 100,000 attendees in the past.

The area on the south side of the bridge includes a funeral home, restaurants and some commercial and industrial businesses. As one might expect, many of the businesses along the Ship Canal are marine-related. Seattle Pacific University, located at the northwestern boundary of the project area, has approximately 3,700 students and 350 staff.

As part of its comprehensive planning process, the City of Seattle has estimated job growth for the Fremont area. Plans are in place for another large office building in the Quadrant Lake Union Center east campus. The project is already permitted and designed, and just awaits a long-term tenant before the building will be built. Table 3 suggests that Fremont will remain a vital employment and housing center in Seattle.

Table 3: Existing and Expected Jobs and Households in Fremont

Fremont	Existing	Expected 6-year Growth	Expected 20-year Growth
Households	3,844	222	820
Jobs	4,776	428	1,700

Source: City of Seattle Comprehensive Plan, January 2001

Similar data was not available for the lower Queen Anne or southern Ship Canal area. The regional data indicates marine related industries have been historically significant and will likely continue to have strong concentrations in Seattle. Marine activities are the basis of many of the businesses along the southern side of the Ship Canal.

Travel Patterns

By identifying major attractions in the project area and beyond, the potential origins and destinations of Fremont Bridge travelers can be highlighted. The following list summarizes some of the major attractions in the vicinity of the Fremont Bridge. Figure 4 displays the general locations of these attractions.

- Fremont: As of 2001, Fremont was home to 4,776 employees and 3,844 households. Fremont is directly adjacent to the bridge's northern approach.
- Queen Anne Hill: Queen Anne consists mainly of single-family homes and multi-family dwelling units. It also supports a business district on the top of the hill that is primarily retail businesses. Queen Anne is directly adjacent to the bridge's southern approach.
- Central Business District: Downtown Seattle includes a large concentration of commercial and retail employment sites. It is located southwest of the bridge and is less than two miles from the project area.
- Seattle Pacific University: The University employs over 350 people and has an enrollment close to 3,700. It is located one-half mile southwest of the bridge.
- Ballard: This Seattle neighborhood is northwest of the bridge and home to residences and a number of marine-related industries. Ballard is one mile from the bridge.
- University of Washington: Although this university is not within the project area, it has an enrollment of approximately 40,000 students. The main campus is northeast of the bridge and less than two miles away.
- North Seattle: North Seattle consists of many residential neighborhoods that are supported by numerous businesses and offices.
- Eastern King County Suburbs: The eastern suburbs of King County are not in close proximity to the project area, but include a number of large employers that draw employees from all over the region.

In August 2002, an Origin and Destination Study was performed to determine potential detour routes when the Fremont Bridge is partially or fully closed. The origin and destination patterns were derived from surveys of vehicles crossing the Fremont Bridge during the PM peak period. The study only noted the direction of vehicles after they crossed the bridge (it did not include their final destination or origin). This study included an assumption that longer-distance trips would be more likely to divert to alternative routes than shorter trips. The preceding list demonstrates that a number of major destinations are only a short trip from the project area.

Figure 4: Major Origins and Destinations to/from Project Area



Travel Patterns of Boaters

It is also important to note that recreational and commercial boaters pass under the Fremont Bridge as they travel through the Lake Washington Ship Canal.

Impacts

This section discusses the potential economic impacts of the Build Alternative and the No Action Alternative. Two types of impacts have been analyzed for this project: direct and construction activity impacts. Direct impacts are permanent impacts that are directly attributable to the proposed project. Construction activity impacts are impacts resulting from construction activities. Both construction activity and direct (operational) impacts are described, because they may affect the regional and local economy and travel patterns.

Direct Impacts

Regional and Local Economy

The operation of the Fremont Bridge supports the local and regional economy. The Fremont Bridge is only one of five bridges available to cross the Ship Canal. The operation of the bridge would continue to facilitate the movement of people and goods across the Ship Canal.

A small operations and maintenance facility that is owned by the City of Seattle is located under the southern bridge approach. This building will be demolished as part of this project. Replacement of the operations and maintenance building will be determined based on a pending needs evaluation. Workers will be temporarily displaced for the duration of project construction. It is not anticipated that any workers will be permanently displaced to other locations. This building will not have a direct impact on the regional and local economy.

Property Values

The proposed project is replacing the existing approaches, so traffic would not encroach further into adjacent neighborhoods. Adjacent property owners should not perceive a change in their property values.

There is a small amount of right-of-way that the City of Seattle may acquire on the south side of the Ship Canal to improve safety for southbound bicycle traffic. . This land is part of a triangle-shaped parcel of land is bounded by Florentia Street, Nickerson Street and 4th Avenue North. It is estimated to be less than 555 square feet, and is part of the detour route for non-motorized bridge users. This additional right-of-way is needed to facilitate a wider southbound curb lane, to improve bicyclist safety for riding in this lane. This minor improvement will be a permanent access improvement for non-motorized traffic after construction is completed, correct (yes – it won't be an improvement during construction)? I don't think is just for the detour during construction. Please clarify. An espresso stand and restaurant are the current occupants. The parcel also includes a parking lot for the patrons of the restaurant and espresso stand. It is important to note the acquisition of this land is a possibility. It is not known at this point if the City will have funds to acquire this land and made this non-motorized access improvement.

The taking of this land may cause the existing espresso stand to be relocated approximately 8 feet. The existing espresso stand is near the street edge in the parking lot. If it is determined relocation is necessary, the City of Seattle will formally contact impacted property and/or business owners.

It is not anticipated that this possible acquisition will impact property values.

Government Revenues

The continued operation of the bridge and its approaches would not impact government revenues.

Travel Patterns

Because the project is a replacement of the existing structure, it is not anticipated that operation of the project will impact travel patterns. Refer to the Project Phasing on page 4 for details on schedule and duration of the closure of the Bridge. During construction of the project, travelers may use alternative routes. Some travelers may continue to use these alternative routes after project completion if they find these routes more efficient. The completed project will not create any barrier effects in the local community. The project will not cut off any residents or commuters from their origins or destinations.

Operation

No significant adverse impacts are expected, so no mitigation measures are identified.

Construction Activity Impacts

During the replacement of the southern and northern approaches of the Fremont Bridge, the bridge and its approaches would be reduced to one lane in each direction for 9 months. Occasionally, construction activity would require the entire bridge to be closed to users. The current plan is for full closures to take place at night and during weekends. The construction schedule will take into account Fremont's two major events: Oktoberfest and the Summer Solstice Parade (construction will not be allowed during these events).

Regional and Local Economy

The replacement of the operations and maintenance building will be determined based on a pending needs evaluation. Is the O/M shop a regional facility (yes, it serves all 180 of SDOT's bridges in the city (don't quote me on the number)? Does it serve other bridges in the ship canal area or just the Fremont Bridge? [This is important to clarify for the Shoreline permit process.] What activities do they perform in the shop (have to confirm with Dave Chew or John Buswell)? Are they going to continue to conduct the same activities (yes)? Workers will be temporarily displaced for the duration of project construction. It is not anticipated that any workers will be permanently displaced to other locations. The replacement of the building will not have an impact on the regional and local economy.

As of March 2004, the total project cost (including all project components) was estimated to be \$32.7 million. It is expected the project would take approximately 30 to 34 months to complete and is anticipated to begin in 2005. The economic impacts resulting from the construction would primarily be associated with potential short-term employment impacts.

The direct employment effects would be the addition of construction jobs and their associated wages. FHWA has conducted studies of employment impacts resulting from federal

expenditures on highway projects. At the time of this study, FHWA estimated that a total of 7,900 full-time equivalent (FTE) jobs are directly created for every \$1 billion expended for a roadway improvement project. Using this job multiplier, an estimated 240 full-time, on-site construction jobs would be created from this project.

The construction of the proposed project would also create a demand for jobs with local, regional, and national suppliers for the construction project. FHWA research estimates a total of 19,700 FTE jobs would be indirectly created for every \$1 billion of expenditures. The wages paid to workers would be spent in the community, which in turn could create an additional induced demand for an estimated 14,500 FTE workers. For the proposed project, this demand for indirect and induced jobs would total approximately 600 workers and 442 workers, respectively.

Construction of the new approaches would create a demand for an estimated 1282 direct, indirect, and induced workers combined. These employment impacts would not be considered significant adverse impacts and would not likely stimulate the local or regional economy.

Local businesses may anticipate a decline in sales during construction as users utilize alternative routes. However, this analysis identified a number of major attractors that are within a short distance of the project area. An initial traffic analysis for the replacement of the approaches (as part of the *Type, Size and Location Study*) included an assumption that longer-distance trips are more likely to be diverted to alternative routes than shorter ones, so a significant number of travelers would still patronize businesses in the project area. In addition, the potential for lost business might be offset by construction workers patronizing commercial businesses in the project area. At this time, it is not anticipated that access to any business in the project area will be impacted during construction. Entrances and exits will still be accessible to customers, employees and others.

Property Values

During the construction period, there would be a temporary increase in air, noise, and traffic impacts in the immediate construction area, which could potentially be perceived to affect property values. However, project information will be widely distributed so all property owners and potential owners are made aware of the project schedule. A property owner or potential buyer may also consider the replacement of the approaches as a benefit compared to the No Build Alternative (in which the approaches would continue to deteriorate). It is not likely property values would be affected during the construction period. Visibility in the project area would not be impacted during construction.

There is a small amount of right-of-way that the City of Seattle plans to acquire on the south approach on the west side of the street between Florentia and Nickerson. It is estimated to be less than 555 square feet, and is part of the detour route for non-motorized bridge users. This additional right-of-way is needed to facilitate a wider southbound curb lane, to improve bicyclist safety for riding in this lane during the construction period. Is this minor non-motorized access improvement a permanent improvement or just for the detour. I think is permanent (see previous comment).

This potential taking of land may cause the existing espresso stand to be relocated permanently 8 feet to the west. The existing espresso stand is near the edge of the

parking lot. If it is determined relocation is necessary, the City of Seattle will formally contact impacted property and/or business owners. The espresso stand may need to be closed temporarily during the relocation (for maybe 5 minutes while it's lifted off it's wooden blocks and moved over). It is not expected the espresso stand will need to be closed more than one week. There are currently a number of entrances from the adjacent streets to the parking lot. Some of these entrances may be temporarily closed during construction, but patrons of the espresso stand will still be able to access it. The total construction impact to the espresso stand is not anticipated to be longer than 4 or 5 months (Not sure what is meant by total construction impact here. I would expect they might consider themselves impacted while bridge traffic is one lane each way – up to 9 months). Mitigation measures would be implemented that include signs with notification of possible closures dates.

It is not anticipated that this possible acquisition and/or relocation will impact property values.

Government Revenues

Construction of the project would not be considered a significant economic impact on local government property tax revenues. Construction of the project would result in the purchase of construction materials and in workers purchasing local goods and services. The 2003 adopted King County budget includes an anticipated \$375.9 million in sales tax revenues in 2003. The sales tax revenue from the replacement of the approaches would be only a very small percentage of the total annual sales tax revenues in the region. No multiplier effect from an increase in sales tax revenue is expected from this project.

Travel Patterns

During the 9 months when the bridge's capacity is reduced by 50 percent, current users would have the opportunity to use alternative routes. If they choose to continue crossing the Ship Canal via the Fremont Bridge during partial closures, they will experience increased travel times. The longer travel times could also translate to increased travel time for the shipment of goods. During full bridge closures, travelers could utilize a variety of alternative routes that are in close vicinity (see Figure 5 and Figure 6). During partial bridge closures, the alternative routes would likely serve as overflow routes. Given the number of alternative routes, the project should not create any barrier effect. It is not expected that the use of alternative routes would have significant impacts on neighborhood streets. Some of the alternative routes that are available are larger-capacity arterials. The Aurora Bridge (SR-99) is less than a quarter-mile from the project, and the Ballard Bridge (15th Avenue West) is less than a mile away. Both bridges cross the Ship Canal and run parallel to the Fremont Bridge.

During the upgrade of the drawbridge's mechanical/electrical system, there may be restrictions on full usage of the drawbridge. Only one side of the drawbridge may be operable at the current rate of opening and closing of the bridge, so boaters with smaller boats and smaller sailboats in the Lake Washington Ship Canal would need to cross under the bridge on one side. For larger yachts and ships both bascule bridge leaves will need to be opened which will require utilizing a temporary winch system to open one of the leaves. This temporary winch system will take longer to open and close, 12 to 15 minutes, versus 3 to 5 minutes for the one leaf opening. This is the same approach used for mechanical/electrical upgrades to the University and Ballard Bridges in the Seattle area. This

occurrence is expected to happen only briefly, but it may cause boaters to experience an increase in travel time particularly in the summer time.

Figure 5: Potential Alternative Traffic Routes in Northbound Direction

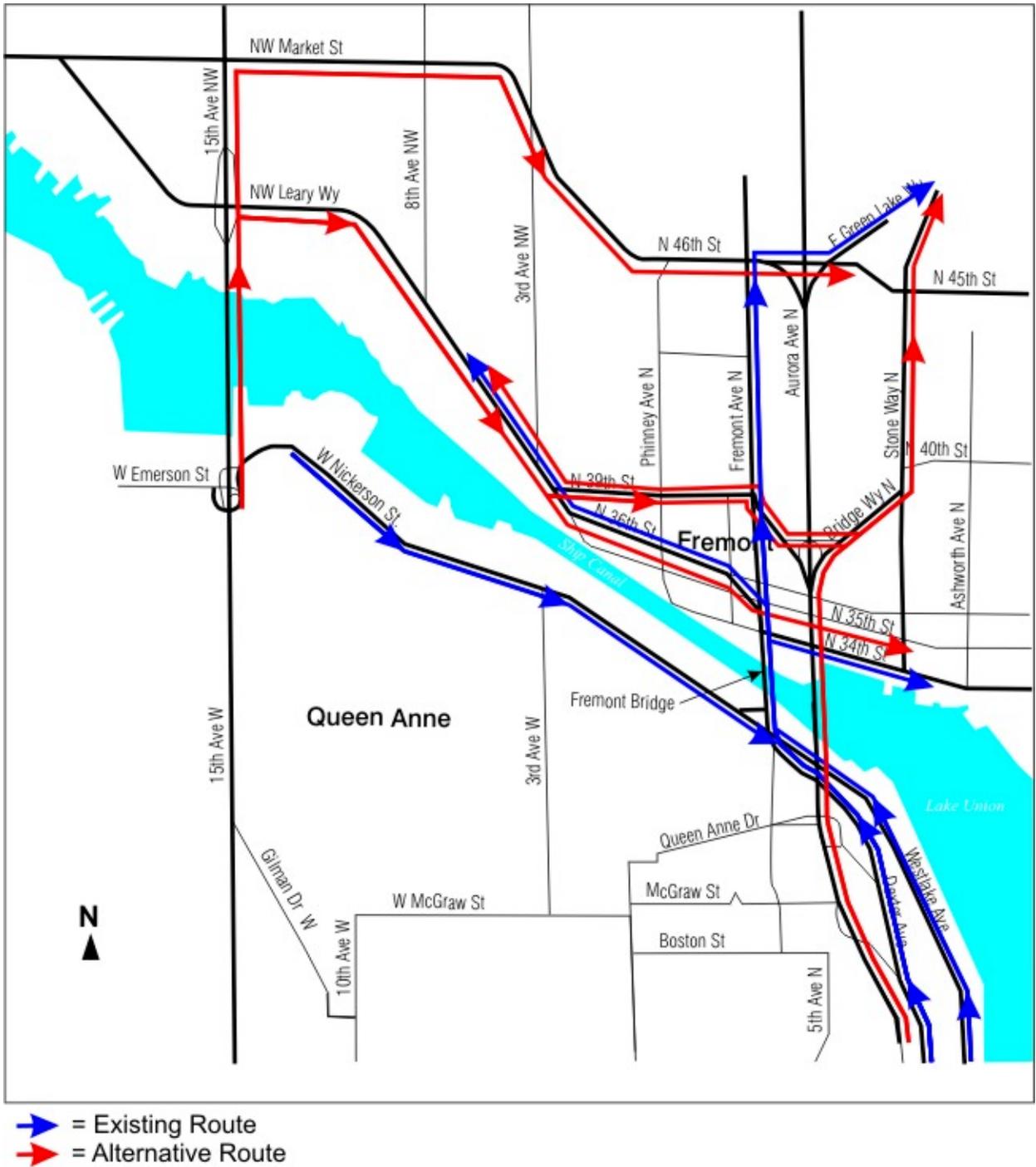
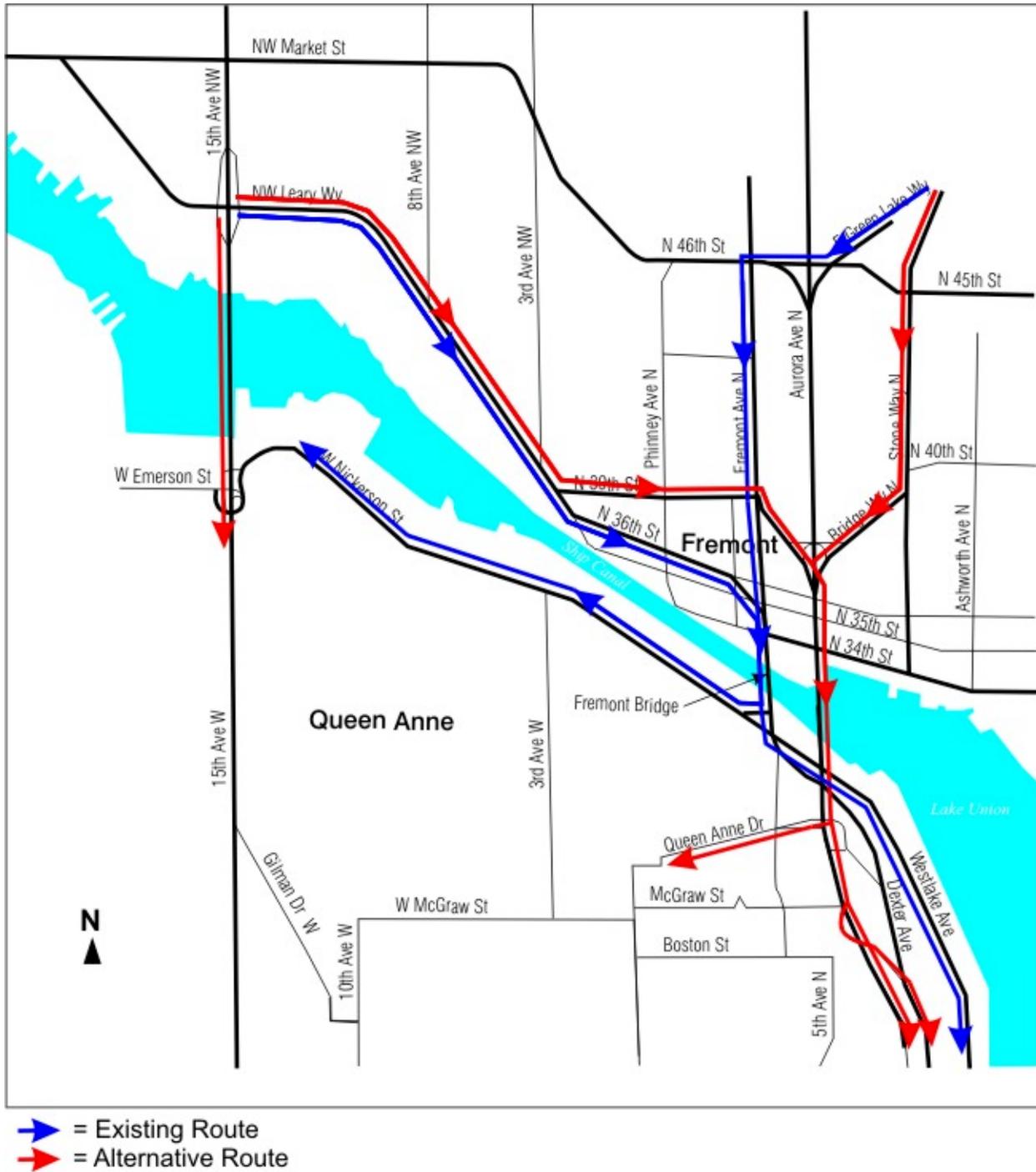


Figure 6: Potential Alternative Traffic Routes in Southbound Direction



No Action

Under the No Action Alternative the proposed project would not be constructed, and therefore no construction impacts would occur. There would be no adverse construction impacts affecting the regional or local economy, employment, government revenues or expenditures, or property values.

If the bridge approaches are not replaced, they would likely continue to deteriorate. Due to safety concerns, the City of Seattle might need to close the Fremont Bridge.

Regional and Local Economy

With the continued deterioration of the bridge approaches and the possible closure of the Fremont Bridge, travelers would use alternative routes. The use of alternative routes coupled with the loss in capacity of the Fremont Bridge would likely generate congestion and delays. Extreme congestion, delays, and a lack of predictability could also lead workers to choose to find other jobs with easier commutes in other communities. The deteriorated traffic conditions would also increase travel times for the delivery of goods and services.

Property Values

Without the replacement of the approach and possible closure of the Fremont Bridge, property values in the adjacent neighborhoods could be adversely affected. The increase in travel times could adversely affect the demand for residences in the area. For commercial and industrial properties in the Fremont and lower Queen Anne area, the increased congestion and delays could increase travel time and reduce travel predictability. Customers might choose not to patronize commercial establishments in the project area due to difficulties in accessibility. Due to longer travel times, the costs associated with transporting of goods and services could increase because of higher labor costs and vehicle operation costs. All of these factors might affect the demand and perceived value of commercial and industrial properties in the Fremont and Queen Anne area.

Government Revenues

Government revenue would not be expected to change from existing levels.

If the No Action Alternative resulted in closure of the Fremont Bridge, the closure might impact property values in nearby neighborhoods. Declining values of commercial, industrial and residential properties in the property area could lead to reduced property tax revenues for local governments.

Travel Patterns

The City may need to close the Fremont Bridge due to safety concerns under the No Action Alternative. Bridge users would take alternative routes, which may result in increases in congestion and decreased predictability of travel. Alternative routes may include neighborhood streets, causing traffic to encroach on to the local street networks. Travel times would likely increase for all users. These changes in travel patterns could adversely affect shopping patterns, and in turn businesses in the project area.

Mitigation of Preferred Build Alternative

This section identifies suggested mitigation measures that could reduce, minimize, and/or avoid potential economic impacts for the proposed project. Targeted groups (e.g., minority and low-income) have not been identified in the project area, so specific mitigation measures for these groups have not been committed. Refer to the Social Element report for more details. It is challenging to quantify the economic impacts of the proposed project, but the degree of any impact would likely be minimal and temporary. No operational impacts have been identified; so mitigation is limited to construction-related impacts. For nearby businesses, the following are planned mitigation measures to reduce and minimize any impacts:

- Work with business owners to minimize anticipated construction conflicts and inconveniences;
- Maintain communication with business owners to minimize potential adverse construction impacts (i.e., traffic detours, utility disruptions, etc.); and
- Provide additional signage and maintain access for businesses during construction activities (the City would provide additional signage).

Construction activities associated with the proposed project would occur over a fairly short time period. To avoid significant impacts to the economy, workers commuting to jobs, and the flow of goods and services in the project area, it would be important to minimize disruptions to the traffic using the Fremont Bridge. The following measures are planned mitigation to attain this goal:

- Bridge users and residents will be informed of planned construction activities, their durations, and schedules;
- Travelers will be informed of anticipated congestion and delays by posted signs, bulletins in the project's web site, etc;
- Travelers will be alerted in advance of planned road and bridge closures;
- Construction activities requiring full closures will avoid peak commute hours, if possible; and
- Construction activities requiring temporary closures of the bridge will be conducted during evening or weekend hours, if possible.
- Construction activities requiring temporary closure of the bridge will not be conducted during periods of annual seasonal peak traffic volumes, if possible.
- Construction activities near adjacent businesses may confuse potential customers. The City typically posts "Business Open" signs or arrows directing potential customers in an effort to assist the motorist and business owners.

No significant adverse construction impacts are anticipated to affect local government tax revenues or property taxes. As such, no mitigation measures are recommended to address these issues.

Summary

The replacement of the Fremont Bridge approaches is necessary to repair the deteriorating approaches and its related components. The project is consistent with the City of Seattle Comprehensive Plan and the adopted neighborhood plans for Fremont and Queen Anne. The project will have only temporary impacts during construction. The main impact is increased travel time for bridge users. The bridge will remain partially open the majority of the time, with full closures planned for nights and weekends. When the bridge is partially closed, the decrease in capacity will cause users to have longer travel times across the bridge. Furthermore, the use of alternative routes may cause some travelers to incur longer travel times.

Build Alternative: Some retail businesses in the project area may anticipate a slight decline in sales during construction. Travelers using alternative routes may find other retail businesses more convenient during the construction period. According to an estimate developed using a FHWA job multiplier, the replacement of the approaches could generate over 1262 direct, indirect and induced jobs. Some of these employees would patronize businesses in the project area, which could result in more sales for some businesses.

No Action: If the approaches are not replaced, they may continue to deteriorate and the City may be forced to close the bridge due to safety reasons. Closure of the bridge would have significant long-term impacts to travelers and businesses in the project area. Closure of the bridge would eliminate an important transportation link, particularly for retail businesses and employers in Fremont.

The impacts and mitigation of this project are summarized in Table 4. The Build Alternative is not anticipated to result in adverse economic impacts.

Table 4: Summary of Economic Impacts and Mitigation

Alternative	Construction Impacts	Operation Impacts	Mitigation Measures
No Action	With the continued deterioration of the Fremont Bridge approaches, the City would close and eventually demolish the existing structures.	Continued deterioration of approaches would lead to potential safety issues for bridge users and eventual closure of bridge. Users would lose an important transportation link to services, employment and residences.	None
Build	Possible delays on the bridge and use of alternative routes may affect residents, commuters and local businesses.	None	Notices and/or signs of planned construction activities to residents, commuters, and businesses.

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