Improve Energy Efficiency in the Moving of People and Freight

Minor improvements due to some additional increase in actual travel speeds over the no build alternative would be expected.

Alternative 9 — Facility of a Lesser Scope

A lesser facility does not meet the goals of the region because it would only serve through traffic. Since the average trip length in Spokane is approximately 7.5 miles and a lesser facility would provide slower travel speeds than a full access controlled freeway, internal commute trips would not likely divert from their current routes to use the lesser facility.

In addition, the EIS review did not show that a lesser facility was a feasible alternative. The preferred alternative includes 4 to 8 new travel lanes with full access control. A lesser facility would result in greater congestion than the preferred alternative by the design year of 2020.

Spokane has made many improvements to existing arterials. Division Street was recently improved and converted into a one way couplet. Maple was converted to a one way couplet with Ash Street in the recent past, as well as Lincoln and Monroe. These types of improvements are quickly reaching their limits in the Spokane area. Few, if any, options to improve existing arterials remain available.

Alternatives Selected for Further Study

Alternative 1 — No-Build

This alternative is described earlier in this document. It has been carried forward to provide a baseline against which to weigh the new facility alternatives.

The existing city, county, and state arterial street system would be improved as described above. However, under this alternative, LOS on existing facilities is expected to decline, even with the identified improvements. Normal maintenance, some capacity improvements, and minor safety improvements would occur to ensure the continued utility of the facilities; however, most nonstandard elements would remain. Maintenance costs would be expected to increase.

Improvements along I-90 are as described in the I-90 "Four Lakes to Idaho State Line" Final Environmental Impact Statement (July 1989). They are part of the long-range plan for the area. All improvements as outlined will add some capacity and improve safety to this section of I-90 facility, and will add new lanes to the I-90 mainline and modify interchange ramps. Each improvement project would be examined for compatibility with any NSF new facility proposal at the time that improvement is needed and funded.

New Facility Alternatives

The following outlines how the New Facility Alternative meets the objectives outlined under the purpose of this project and why this alternative is being carried forward as the primary solution to the Spokane area's transportation needs.

Reduce Congestion as Much as Practicable in the Overall Transportation System in Accommodating or Reducing Trips Projected for the Design Year 2020

As a stand-alone solution, the construction of a new facility best meets this objective. Discussion under Analysis of Impact on Capacity/Demand Resulting From the Construction of a New Facility, above, touches on key areas where the NSF provides relief. This is further supported by the results outlined on Table 2-10, which show that the NSF has the lowest average V/C ratio. Combined with the proposed South Valley Arterial, the NSF provides system continuity from the north and southeast county areas, both projected for high growth and contributing most of the traffic demand in 2020.

Improve System Linkage Between Major North Side Arterial and State Routes by Reducing Travel Times

This alternative shows considerable improvement over those discussed above in meeting this objective. First, it allows for a limited access connection between I-90, US 290, US 2, and US 395. This provides a means of expedient travel between these facilities without using the local arterial street system. Analysis shows this results in an annual time savings of 982,707 hours during the peak hours for the year 2010.

As mentioned previously, congestion costs money. This alternative provides a more efficient facility for the movement of people and goods. Travel time saved by businesses results in faster delivery times, reduced shipping costs, lower product prices, and all around greater efficiency. Reducing congestion brings with it lower vehicle operating costs, more efficient use of time, and less air pollution.

Be Consistent With Regional Planning With Flexibility to Meet the Needs of the Washington State Growth Management Act as Implemented in Spokane County

Construction of an NSF is identified in numerous state and local plans as a necessary component in the area's transportation system.

State Plans

The NSF is identified in the *Washington Statewide Multimodal Transportation Plan* as a part of the overall 20-year vision for roadway system expansion. This plan specifically defines service objectives and proposes strategies for maintaining, preserving, and improving the state highway system.

Local Agency Plans

City of Spokane Arterial Street Plan (April 1986)

This plan identifies a new controlled access facility NSF in the northeast part of the city.

Spokane County — Transportation Element of the 1990 Comprehensive Plan

This plan identifies the NSF as a key element in the arterial plan for the northeast quadrant of Spokane.

Neighborhood Plans — City of Spokane

Hillyard Neighborhood Design Plan (1985)

This plan identifies a limited access facility as desirable to divert a large volume of through traffic off Market Street, and provide additional access needed to facilitate development of the many acres of undeveloped industrial land east of Hillyard.

Chief Garry Park Specific Plan

Based on the 1986 citywide Arterial Street Plan, the Chief Garry Park Neighborhood does not oppose the NSF, identifying it as having minimal impact on the residential portion of the neighborhood.

Support or Facilitate the Implementation of Multimodal Use Concepts, Such as a High Capacity Transportation Corridor

This alternative meets this objective through its incorporation of facilities for multimodal and HCT use. The "build" designs incorporate provisions for park and ride lots and HOV lanes. Stage construction of the ultimate NSF facility will allow flexibility in the timing and the extent to which these systems are developed. The approach to NSF construction could be to purchase right of way required for the ultimate facility, and build roadway lanes in stages. This would allow time for acceptance of the alternative modes of travel. If such acceptance equates to a high demand for the alternative mode systems, fewer lanes might be needed, and the remaining right of way could be used for expansion into systems such as LRT, busways, or other applicable HCT systems.

Conform to the State Implementation Plan (SIP) for CO and PM10 and Provide the Maximum Practicable Air Quality Benefit within the Nonattainment Area

This alternative provides substantial air quality benefits. Construction of the NSF will aid the area in meeting National Ambient Air Quality Standards. (See the Air Quality Section of this EIS for details.) Based on the EPA MOBILE5 emission rate program, Carbon Monoxide emission rates will be 2.5 to 3 times less for vehicles traveling at freeway speeds than for vehicles traveling at low the speeds projected for local arterials. A freeway pulls considerable traffic off the local arterial system, resulting in fewer vehicles traveling through the critical intersections that are or may become air quality "hot-spots."

Accommodate or Improve Intermodal Transfers in Such Areas as Car to Bus (Park and Ride Lots) and Rail/Truck Freight Movement

As identified above, the NSF will provide park and ride facilities and HOV lanes. Location of the new facility will also provide a more efficient means for freight traffic to enter and egress the industrial/commercial areas along the northeast side of Spokane. This includes the rail to truck exchange that has been cited as having growth potential east of Hillyard.

Transportation is a key element in most industrial, commercial, and service trades in Washington State. Northeastern Washington relies heavily on a well developed system of railroads, airports, and highways to ship goods and raw materials.

Business and recreation travel places a high demand on transportation systems and affects the ability of a region to attract tourism, conventions, and special events.

Business growth is also affected by the availability of a good transportation system. The Spokane Economic Development Council has indicated that the lack of a northside freeway is a concern to businesses that might consider locating to the Spokane area.

Provide for Safe Movement of People and Freight by Providing a Limited Access Facility With Fewer Points of Conflict Than That of Local Signalized Major Arterials

The NSF is the only alternative that meets this objective, because it is a limited access facility. Conflict points will be localized around the proposed interchanges. Traffic using the freeway instead of north/south arterial streets will be subject to a much lower accident rate. Comparing traffic situations in the same year, this means that the aggregate incidence of accidents on the study area arterials, with the NSF in place, will be reduced to reflect the reduced vehicle-miles on those arterials.

Generalized accident data indicate accident rates of 5.17 per MVM for urban arterials and 1.43 per MVM for the urban freeway.

In the year 2010, for the length of the new freeway, traffic assignments will produce approximately 246 million vehicle kilometers (MVK) or 153 MVM. If the freeway traffic used the existing arterials instead, for the same distance, a projected 791 accidents would occur. The expected occurrences with the same distance traveled on the proposed freeway is 219, a reduction of 572 accidents per year. Considering that this route will be used for the transport of hazardous materials, any reduction in the accident rate is desirable.

An examination of statewide statistics for 1992 for accident and fatality rates showed that urban principal arterials had more than twice the accident rate of interstate facilities: 2.72 per MVM vs. 1.26 per MVM. The fatality rate is almost three times that of an interstate: 0.91 per 100 MVM compared to 0.31 per 100 MVM.

Improve Energy Efficiency in the Moving of People and Freight

The NSF provides for moving people and goods in an energy efficient manner. The Energy Section of this EIS identifies a yearly gasoline savings of between 3,997,395 liters (1,056,000 gallons) and 6,389,775 liters (1,688,000 gallons) when comparing the construction of the NSF to the no-build condition.

New Facility Alternative Project Limits

The southern terminus of the new facility alternatives is I-90, approximately halfway between the existing Liberty Park interchange and the existing Sprague Avenue interchange. The approximate center of the proposed NSF/I-90 interchange is Greene Street, I-90 KP 456.15 (I-90 USMP 283.44). This is approximately 1.28 kilometers (.8 mile) within the easterly limits of the city of Spokane. The northern limit of the project is approximately 16.10 kilometers (10 miles) to the north. At this point, the new roadway would connect to US 395 about .32 kilometer (.2 mile) south of the Little Spokane River in Spokane County. The actual match point would

be in the vicinity of the south pavement seat of the new bridge recently constructed across the Little Spokane River.

The project area extends along I-90 both east and west of the proposed NSF/I-90 interchange. It extends west to the Liberty Park interchange KP 453.99 (USMP 282.10) and east to the Sprague Avenue interchange KP 459.31 (USMP 285.40).

With its interchange locations, this route provides connections to three state highways and one Interstate highway. These include I-90, US 290 (Trent Avenue), US 2, and US 395. Of these four roadways, three are fully controlled access facilities: I-90 on the south end and both US 2 and US 395 on the north. Currently, there are no other limited access facilities providing a high speed/high capacity facility to the northern part of Spokane from I-90. All build alternatives would provide this link.

The following describes the design alternatives used to measure the environmental impacts identified in this study. There were numerous design iterations during the process of developing what is presented in this document. Design details and rationale for what considerations were made and how the following designs evolved are presented in the Design Technical Report. The complete report is available for review at:

Washington State Department of Transportation
2714 North Mayfair Street
Spokane, WA 99207

Design Aspects Common to All Build Alternatives

Refer to the plan sheets in Appendix D for an explanation of project sections and other design details. The technical information that follows has been condensed from a Design Technical Report.

General Roadway Geometrics

Design Speed

Desirable 112 km/h (70 mph), Minimum 80 km/h (50 mph)

Travel Lanes

3.7 meters (12 ft.) with 3.0 meters (10 ft.) shoulders

HOV Lanes

3.7 meters (12 ft.)

Ramp Lanes

4.5 meters [(15 ft. (min)] with 0.6 meters (2 ft.) to 2.4 meters (8 ft.) shoulders

Median Width

6.6 meters (22 ft.) [3.0 meters (10 ft.) shoulders + 0.6 meters (2 ft.) for barrier]

Lane Configuration

8 lanes from I-90 to Francis Avenue Interchange

3 general purpose lanes and one HOV lane each direction

6 lanes from Francis Avenue to US 2

2 general purpose lanes and one HOV lane each direction

4 lanes US 2 to US 395

2 general purpose lanes each direction and no HOV lane

Interchange ramps will be one or two lanes as required to meet traffic volumes.

Illumination

Illumination will be designed in accordance with WSDOT design standards, using materials and techniques that achieve an optimum energy efficient illumination design.

I-90 Corridor

The I-90 corridor consists of two major design features: the C/D System and NSF interchange. These elements are common to both the Market/Greene and Havana "build" alternatives.

The I-90 C/D system runs in an east-west direction between the existing Liberty Park interchange and Sprague Avenue interchange. (See Appendix D.) The approximate length is 4.8 kilometers (3 miles).

For discussion purposes, the I-90 C/D has been addressed as two separate elements: (1) the mainline, consisting of lanes presently in use on I-90; and (2) the C/D lanes. The mainline would accommodate through traffic with no access allowed to or from these lanes within the project corridor. The C/D lanes would handle traffic access to and from local arterials, existing interchanges, and the NSF interchange.

I-90 Mainline

The I-90 mainline will remain a six lane facility composed of three lanes in each direction of travel. See Figures 2-5 and 2-6. The need for a fourth lane as identified in the "Four Lakes to Idaho State Line" EIS was found not to exist under an NSF "build" scenario. Traffic modeling did not include it, and the 2020 LOS of B/C for the I-90 mainline with the C/D in place supports this design assumption.

The existing 3.0 meter (10 feet) center median will be widened to 6.6 meters (22 feet), consisting of 3.0 meter (10 feet) shoulders and a 0.6 meter (2 feet) concrete median barrier strip.

After construction of the NSF interchange, these lanes will become express type lanes, allowing no on or off access between Liberty Park and Sprague Avenue interchanges.

There are no provisions for mass transit or HOV lanes on the mainline in this project. Depending on the findings of the SRTC HCT study regarding HOV lanes, they could be accommodated on the mainline if required. The North Spokane Freeway interchange with I-90 will require a FHWA interstate access approval which is expected to be granted

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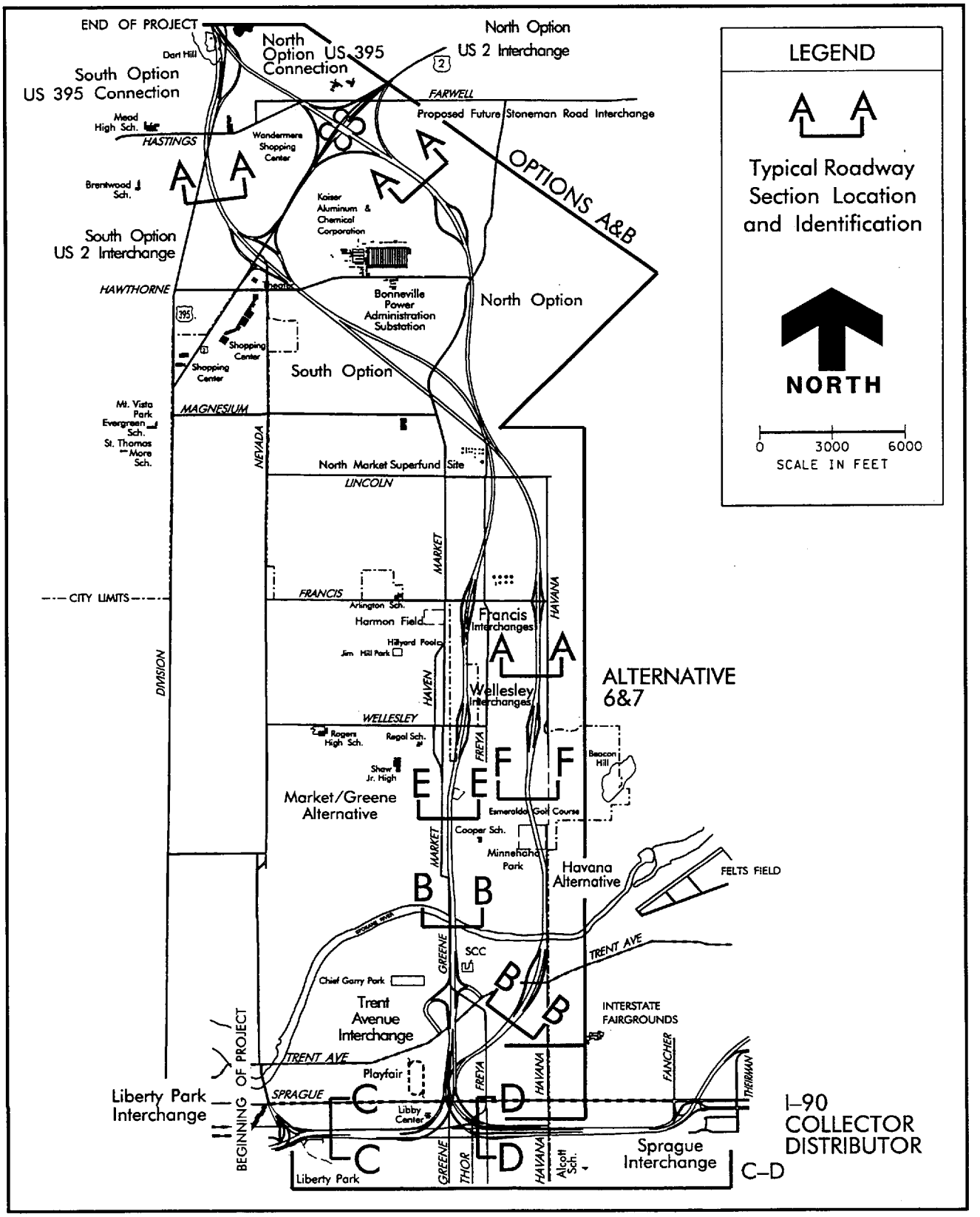
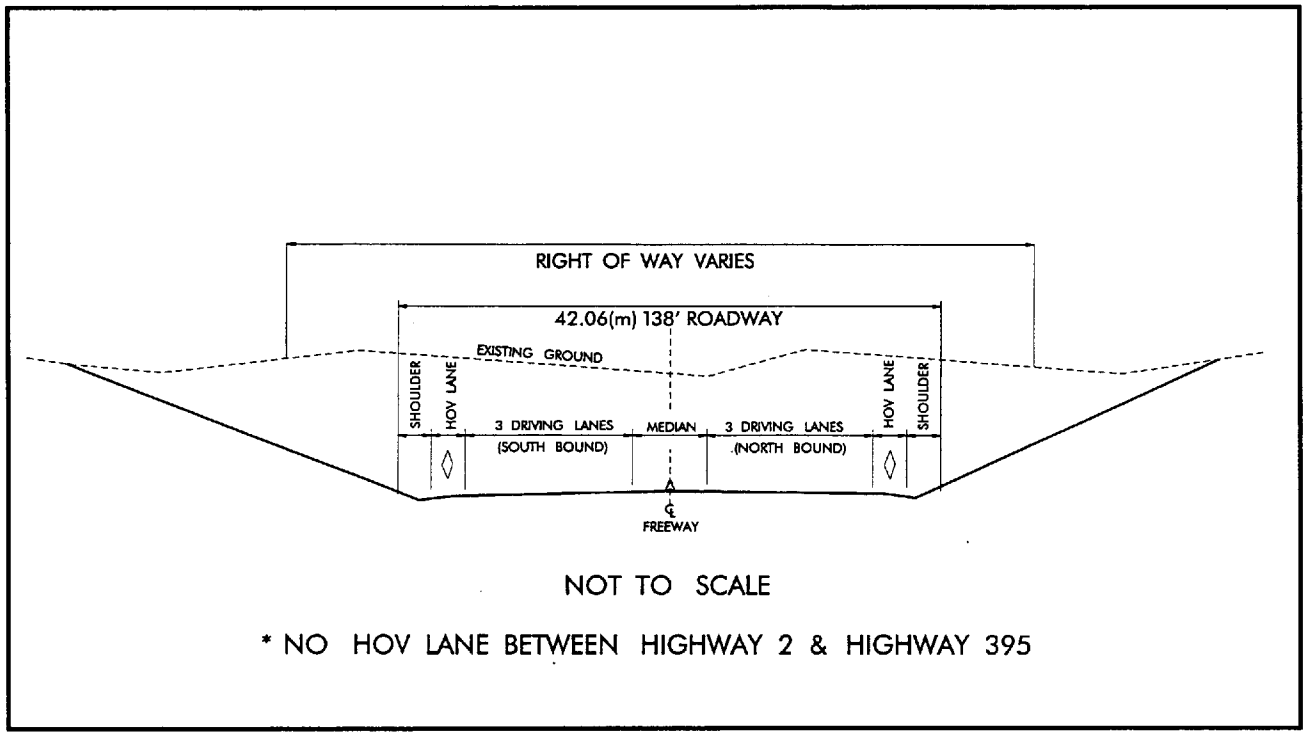
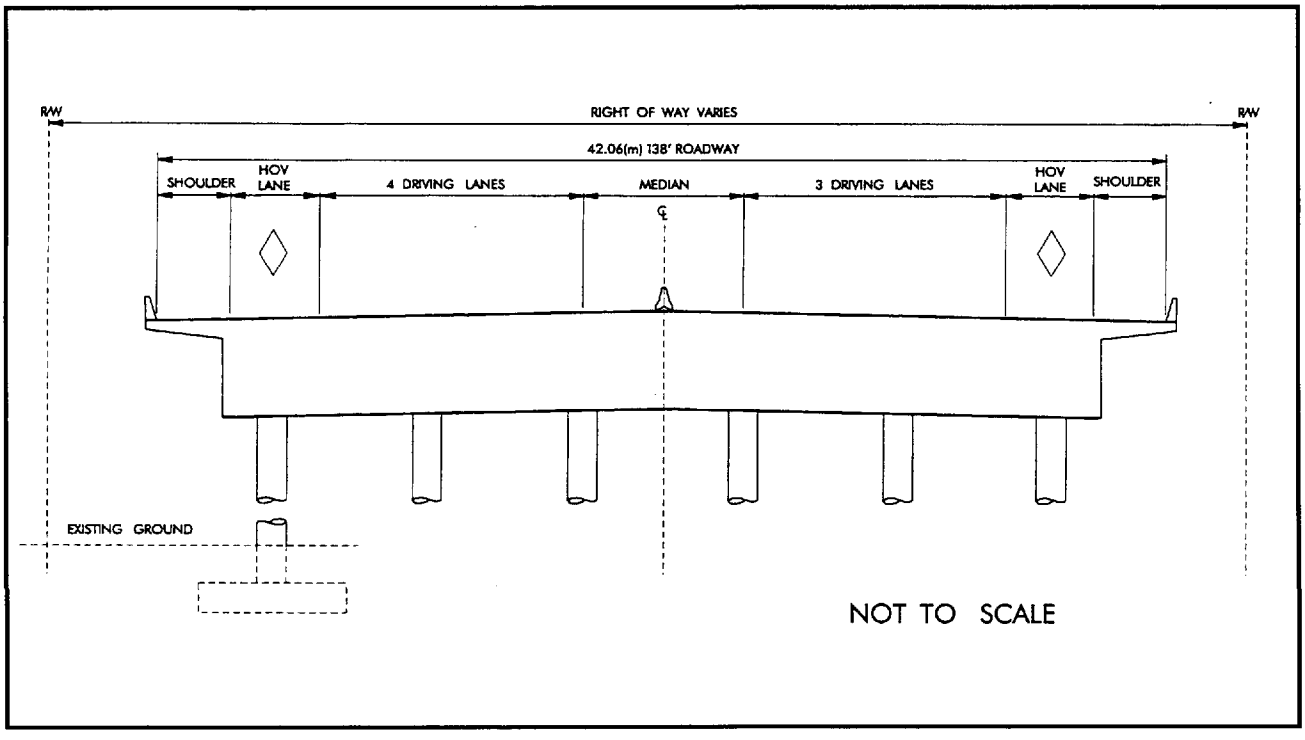


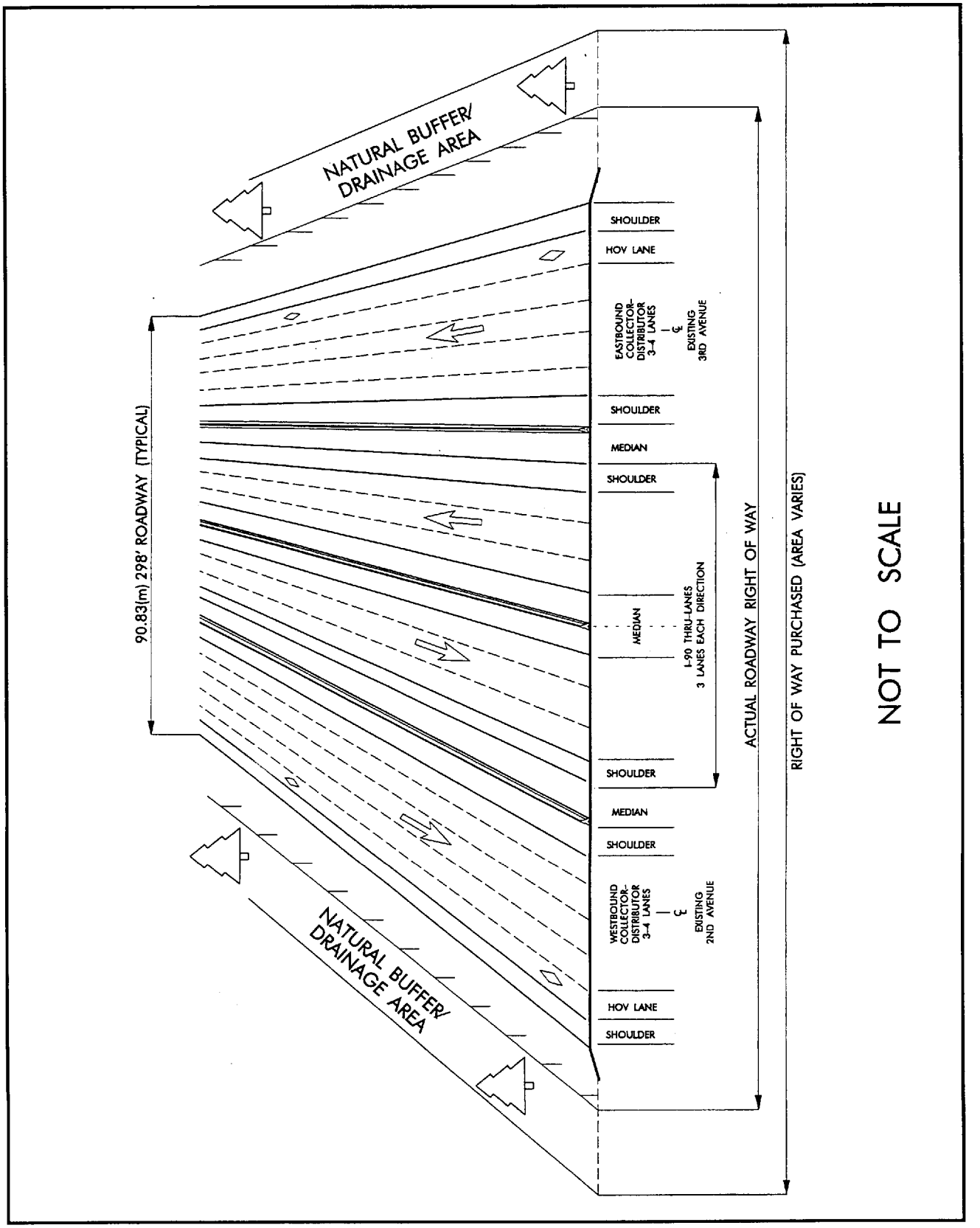
Design Sections
Figure 2-2



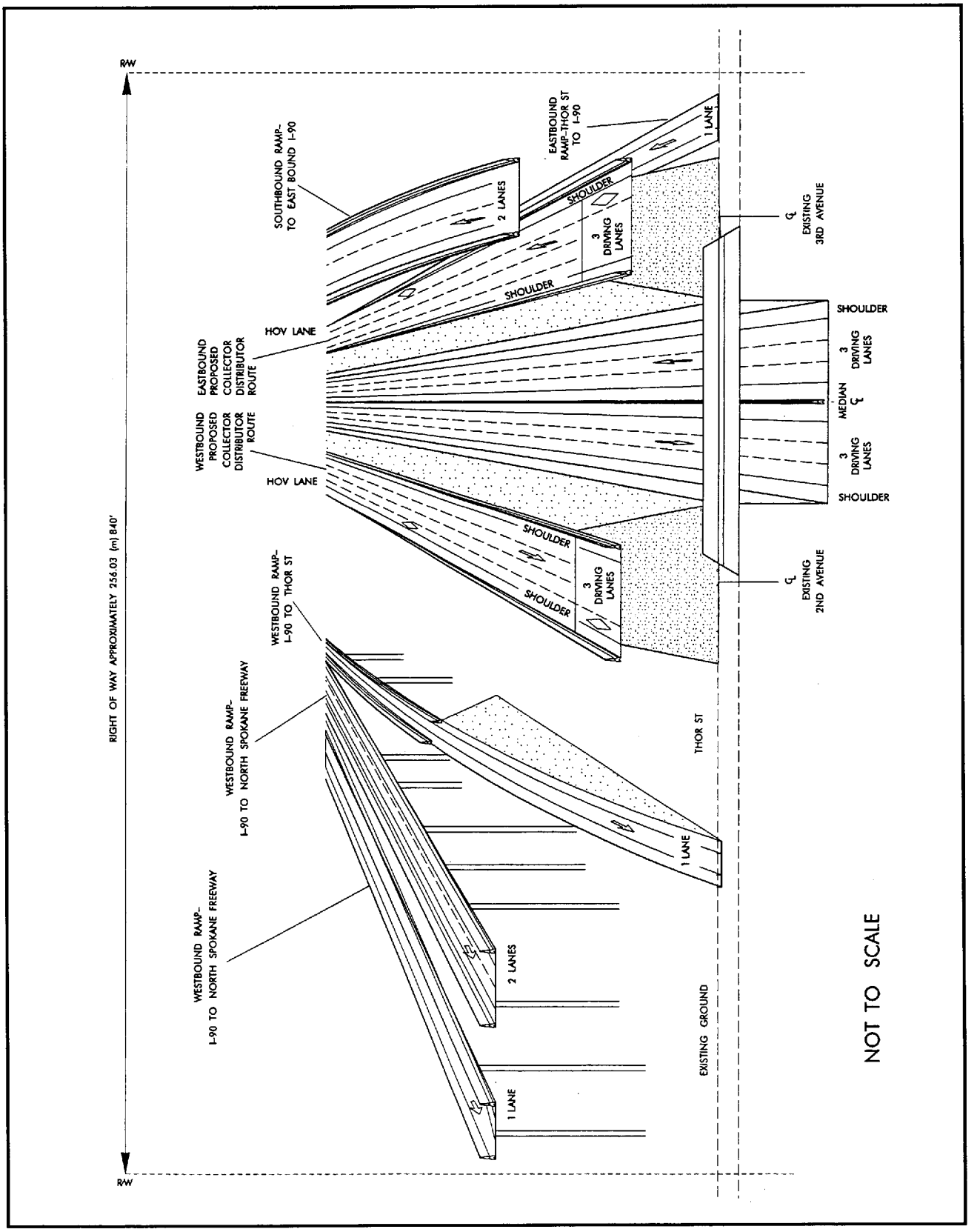
Typical Roadway Section A North Spokane Freeway
Figure 2-3



Typical Roadway Section B North Spokane Freeway
Figure 2-4



Typical Roadway Section C I-90 Mainline Collector/Distributor
Figure 2-5



Typical Roadway Section D I-90 Mainline Collector/Distributor
Figure 2-6

Access To, From, and Across I-90 facility

To enter or exit I-90, traffic from local arterials will use the proposed C/D. The existing mainline lanes will be used exclusively for east- and westbound through traffic. Because of the "expressway" nature of the mainline portion of I-90, access to and from the I-90 mainline will not be directly accommodated from the Liberty Park, Sprague, Thor/Freya, or NSF interchanges. All traffic entering or leaving I-90 from these areas must travel on the C/D to access I-90 for destinations outside the project corridor.

Location	Purpose
• Liberty Park Interchange	Access to/from C/D
• Perry Street Tunnel	Cross under I-90
• Altamont Street	Cross under I-90
• Thor/Freya Streets	Access to/from C/D and across I-90
• Havana Street	Cross under I-90
• Sprague Interchange	Access to/from C/D

I-90 Mainline Access and/or Grade Separation Locations

Error! No table of contents entries found.**Pedestrian and Bicycle Crossings**

There are currently three pedestrian and bicycle crossings over I-90. These crossings will remain at their present locations and be lengthened to accommodate the increased width of the proposed I-90 C/D system. These crossings are positioned at the following locations:

- Magnolia Street
- Regal Street
- Custer Street

I-90 Collector/Distributor

The I-90 Collector Distributor (C/D) system corridor begins near Liberty Park Interchange, running parallel to I-90 in an east-west direction. This alternative maintains this orientation until Sprague Ave. Interchange, where the C/D system ends. The entire C/D system lies between these interchanges and is approximately 4.8 kilometers (3 miles) in length.

The C/D system will consist of three 3.7 meter (12 foot) lanes and an auxiliary lane in each direction of travel. The auxiliary lanes become general purpose lanes as ramps from the NSF transition into the C/D on both sides of the interchange. The median area between the C/D and mainline lanes will consist of a 3.0 meter (10 foot) shoulder, and a 1.8 meter (6 foot) drainage and concrete median barrier strip. There will also be an additional 3.7 meter (12 foot) area for future lane expansion in each direction of travel. Interchange ramps will provide 4.6 meter (15 foot) lanes with 2.4 meter (8 foot) outside and 0.6 meter (2 foot) inside shoulders with concrete barrier guardrails. (see Figures 2-5 and 2-6).

~~The C/D will consist of three lanes and an auxiliary lane in each direction of travel. A 9.6 meter (32 feet) median area between the C/D and I-90 mainline lanes will consist of two 3.0 meter (10 feet) shoulders and a 3.7 meter (12 feet) drainage/concrete median barrier strip. There will also be an additional 3.7 meters (12 feet) of width in each direction to accommodate an HOV lane. The actual position of the HOV lane has not been determined. The design shown reflects an outside lane configuration (see Figures 2-5 and 2-6).~~

Access across I-90 and the C/D is explained above. Access to or from the C/D will be provided by ramps at the following interchanges:

Liberty Park Interchange

The Liberty Park interchange area represents the western limits of the C/D system and the I-90 project area (see Figure CD-1 in Appendix D). Eastbound I-90 enters the project corridor as three lanes. Just east of the Liberty Park interchange, these lanes would meet and parallel the C/D lanes. Eastbound access from these mainline lanes to the C/D lanes is via the Liberty Park interchange. This interchange will require modification to accommodate the proposed design. An eastbound ramp will drop from the interchange to merge with a ramp from eastbound 3rd Avenue. Westbound traffic would use an off-ramp to access Hamilton Street or 2nd Avenue. Traffic on the C/D would also access westbound I-90 using a two lane ramp in the same vicinity.

Thor/Freya Interchange

The Thor/Freya interchange would accommodate movements to local arterials only (see Figure CD-2 in Appendix D). Ramps would allow exchange of both eastbound and westbound traffic on and off the C/D system. No access to the NSF would be allowed from this area. Local traffic wishing to access the NSF must travel north on Freya Street to the Trent interchange.

Sprague Avenue Interchange

The Sprague Avenue interchange area, scheduled for reconstruction before the NSF proposal, is the eastern limit of the C/D system and the I-90 project corridor. Any changes to I-90 in this area are designed to accommodate the Sprague Avenue Interchange modifications.

Of the four eastbound C/D lanes, the two inside lanes will merge with the I-90 mainline; the two remaining outside C/D lanes will exit to Sprague Avenue interchange.

Sprague Avenue interchange is the beginning of the westbound C/D lanes. Westbound I-90 enters the C/D by use of a ramp. This ramp merges with a ramp from Sprague Avenue interchange, forming a four lane C/D.

I-90/NSF Interchange

The I-90/NSF interchange is located west of the Thor/Freya interchange at the point where Greene Street intersects with I-90. The two NSF build alternative alignments will begin at a common point where the lanes from the NSF interchange converge, approximately Main Street. This would mark the end of the interchange and the beginning of the viaduct sections for each alternative.

Beginning at the centerline of I-90, the interchange runs approximately 1370 meters (4500 feet) north to its end. This interchange will collect east/west traffic from the C/D and transfer it onto the NSF.

All ramps on the interchange will consist of two lanes. The exception is a single lane directional ramp, associated with the Market/Greene Alternative only, which is needed to safely accommodate traffic exiting at the Trent Avenue Interchange. The ramps do not allow for the establishment of HOV lanes without incorporating non-standard design dimensions; i.e., 3.7 meter (12 foot) lanes and nonstandard shoulders.

Access To, From, and Across the Facility

Access to and from the interchange will be from the NSF north- and southbound and the C/D east- and westbound. No local street access will be provided at this interchange. Local traffic wishing to access the NSF will be required to travel to either Liberty Park, Sprague Avenue, or Trent Avenue interchange.

Access across the facility will be made on major arterials as they presently exist. Local streets located under the interchange will be eliminated. Traffic going west on local streets north of I-90 will use the Sprague Avenue interchange.

HOV Lanes

To help increase the efficiency of the proposed "build" route alternatives, HOV lanes are incorporated into the facility design. Design specifics are described in each area. Use of an HOV system will help meet federal clean air requirements and support the region's overall mobility needs. This approach is in line with federal, state, and local goals for HCT system development (SRTC HCT System Plan Phase 1 June 1993).

Based on the HCT study, numerous supportive actions are needed to make effective use of HCT modes including HOV lanes. These include such things as land use planning and zoning, along with transit oriented development. Because of uncertainty as to the results of planning efforts in these areas, it is imperative that the NSF facility allow flexibility to accommodate other HCT modes if conditions change and support develops for alternative HCT modes.

Based on the projected growth trends and potential growth areas in this region, several generalized transportation corridors and major activity centers stand out as having the greatest potential for HCT related activities. This is based on current conditions and levels of zoning and land use. The NSF and Spokane Valley Corridors are in areas of the greatest projected increase in growth and development and rate highest in terms of HCT potential. The NSF is identified, along with Division Street and the Maple/Ash Couplet, as providing the needed framework for serving access demands to North Spokane.

The HOV concept is completely new to the Spokane area. The HCT Plan now being developed identifies the NSF corridor as an important part of an overall transportation demand management program. Although there is no specific regional HOV system plan, HCT has identified the NSF as having HOV potential. For this reason, the designs for the "build" route alternatives show HOV lanes as part of the ultimate facility.

Many factors come into play in determining the effectiveness of an HCT system such as HOV, and it is impossible to predict what will occur. Consequently, the key to the NSF facility is flexibility. A staged approach to facility development would allow future assessment of the needs and help determine the timing of system development.

Alternative 6 — Market/Greene (Preferred Alternative)

Major Transportation Design Features

The Market/Greene corridor begins at the I-90 interchange and runs due north and parallel to Greene Street (see Appendix D). The alternative maintains this northerly alignment until it reaches the North and South Option split in the vicinity of Lincoln Road.

The approximate length of this alternative is 8.0 kilometers (5 miles) from the divergence point at the I-90 interchange to the divergence point of the North and South Option split.

From the I-90 divergence point to Illinois Avenue, the Market/Greene Alternative is a viaduct structure (see Figure 2-4). From Illinois Avenue to just north of Francis Avenue, the facility is depressed (see Figures 2-7 and 2-8). The remainder of the route follows basically the existing terrain (see Figure 2-3). Interchanges are located at major arterial and state highway crossings along the route.

Access To, From, and Across the NSF Facility

Access to or from the freeway would be only at ramp terminals at all interchanges, using signalized intersections or directional ramps between arterials (see Table 2-12).

Access To, From, and Across the NSF Facility	
• I-90 to Vic. Illinois Avenue Viaduct streets; also crosses the Spokane River	Allow access across NSF via local
• Euclid Avenue	Cross over NSF
• Wellesley Avenue Interchange	Access to/from and across NSF
• Francis Avenue Interchange	Access to/from and across NSF
• Freya Street between Francis Ave and	Cross over NSF
• Lincoln Road	Cross under NSF

NSF Market/Greene Alternative (Preferred Alternative) Access and/or Grade Separation Locations
Table 2-12

A portion of Freya Street located just east of Tosco tank farm would require relocation. Relocation would be to the west of the present Freya Street location.