Summary of Alternative Analysis on Demand/Capacity

Table 2-10 outlines and compares all the alternatives as to the capacity increase or demand reduction each provides in the design year 2020. This chart keys on the operation of the intersections within the project area. An improvement in intersection operation equates to an overall improvement in the arterial link connected to that intersection.

For purposes of comparison, the overall average V/C ratios of the intersections are shown by alternative. Mass Transit, with the sole component of HOV lanes on Division Street, does little to improve the system within the projected study area. Mass Transit combined with the TSM alternative also is not nearly as effective as the New Facility. Although very important, the effect the alternatives have on traffic demand and capacity is only one facet of the overall effectiveness of each in fulfilling the project purpose and need. The following discussion addresses the other facets.

Alternatives Considered But Rejected

This section examines why some alternatives have been dropped from further consideration by analyzing how each alternative fails to meet the established objectives of the project purpose.

Alternative 2 — Transportation System Management (TSM)

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

Statistically, this alternative ~~meets~~ does not meet the project area capacity/demand requirements nearly as well as a build alternative (see Table 2-10). ~~However, the~~ The effectiveness of this alternative depends primarily on the traveling public's acceptance of other transportation modes. The issue truly being faced under this alternative is individual travel behavior and, for that reason, whether the identified assumptions prove true is unknown. The findings in the HCT study regarding travel behavior best outline the uncertainty of the effectiveness of this alternative.

TSM activities similar to the city of Spokane's proposed commute trip reduction program have been in place in a number of large cities throughout the United States for several years, with mixed results. The key to the program's success is the type of strategies used. In some cities, large employers have encouraged ride-sharing to the extent of purchasing vans and furnishing drivers. In other cities, centralized ride-sharing programs, including computerized ride-matching, have been established with full-time staffing. The underlying thread common to the successful programs is a variety of alternatives and complementary economic incentives to the commuter, all directed at changing commuter behavior.

A primary goal of this project is to improve mobility through this region. Relieving congestion is a facet of improving mobility. TSM programs have been undertaken in urban areas where the current degree of congestion on streets and highways is

similar to what Spokane could expect in the years ahead. To date, there is limited measurable evidence that these programs have a significant effect in relieving congestion on urban streets or highways. The unknowns are how future land use and public travel preferences will change.

The auto provides significant travel advantages. It is convenient, comfortable, secure, and perceived to be low cost. Most existing commercial and public site developments are designed for the automobile. As with all human behavior, travel preference is a complex subject. When examining some of the issues that need to be addressed to help initiate travel behavior changes, the uncertainty of general public acceptance becomes apparent. Issues such as parking costs, mixed land use development, and high density cluster development are all new to this region and the timing of their acceptance is very hard to predict.

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

This alternative does little to achieve this goal. As identified under the signal synchronization discussion, a very minimal speed improvement will be realized for vehicles traveling in the north/south directions. Under this alternative, nothing changes except signal improvements in regard to system operation. Vehicles will still be traveling on the local signalized arterials under stop-and-go conditions.

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

This alternative appears to be consistent with city of Spokane and Spokane County Comprehensive Plans. Both the plans and this alternative encourage the high density and mixed use type development that the HCT identified as necessary to promote and improve the effectiveness of a TSM program. The establishment of effective growth management components will help with the needed support structure to make this a more effective alternative.

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

This alternative is itself a multimodal concept and helps put in place some system support for the intermodal exchanges. This alternative focuses on the expansion of mode choices in the areas of bus, walking, bicycle, and the automobile. It does not provide for any high capacity transit.

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

The benefit provided by this alternative is limited. There is a reduction in the number of trips generated, which in turn reduces air quality impacts. The limitation exists in the traveling speeds provided by the use of the existing arterial system. Table 2-8 outlines the projections for several key north/south and east/west arterials in the study area. Based on the EPA MOBILE5 emission rate program, carbon monoxide emission rates will be 2.5 to 3 times greater at low arterial speeds then at freeway speeds.

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

This alternative fulfills only half of this objective. ~~The focus is on moving people and does nothing for enhancing the exchange of freight~~ The focus is on moving people but enhancing the exchange of freight is limited. Freight movement is benefited in a manner similar to other traffic when demand on the facility is reduced by the combined use of park and ride lots and increased transit ridership. The benefits are decreasing travel delays and increased safety.

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

This alternative ~~fails completely to~~ does not fully meet this objective. Freight movement is benefited in a manner similar to other traffic when conflict points are reduced by decreasing travel delays while increasing safety. However with operation on the existing city/county arterial system, there remains a high number of conflict points, signalized intersections, etc., associated with urban principal arterials despite full implementation of anticipated TSM measures.

An examination of statistics for statewide accident and fatality rates for 1992 shows the urban principal arterial had over twice the accident rate of an interstate facility: 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 as compared to 0.31 per 100 MVM. As indicated in Chapter 1, numerous arterials within the study area rank well above the statewide average, and, based on the nature of the system and projected congestion, safety would remain a concern.

Improve Energy Efficiency in the Moving of People and Freight

This alternative would be expected to reduce the total energy consumed in the project design year by about roughly the same percentage as the reduction of trips projected (6.2 percent).

The remaining trips will use the existing arterial system and will maintain low average speeds and stop-and-go conditions, which are not conducive to faster travel times and improved energy efficiency. This will result in little improvement in the area of moving freight efficiently and, as discussed above, this can equate to increases costs in goods and services.

Alternative 3 — Mass Transit

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

Development of HCT in the Spokane area is just now being studied. Findings indicate that for HCT to be effective, several major changes must take place, such as in land use and in the public's travel behavior. A finding in the SRTC HCT System Plan Phase 1 is, "Traffic and ridership estimates are so dependent on land use decisions that a lack of consensus on community life style and future densities can doom a system to failure. HCT systems are usually so expensive that ridership cannot be assumed to come from some pent-up existing demand, but rather usage

must be nurtured through TDM programs, land use policies, and marketing programs." The effectiveness of each of these critical facets is hard to predict.

As stated, land use densities are critical to the effectiveness of HCT systems. Transit serves as a good example. Currently, it is estimated that only two percent of all the "person trips" in Spokane County and about three to four percent of all "journey-to-work trips" are by transit. This compares to 90 percent by automobile. If land use density doubled, it is possible that transit patronage could double. Growth in the Spokane area is projected to follow the pattern established by existing land use and zoning. Overall densities, currently averaging below 10 dwellings per hectare (4.0 dwellings per acre), are not expected to change considerably. The exceptions are the few areas where increases may be experienced, resulting in numbers approaching 17.3 dwellings per hectare (7.0 dwellings per acre). Based on these numbers, transit ridership in 2020 could approach a total of 4 to 6 percent of person trips.

Short of drastic measures that would provide a distinct advantage in using mass transit instead of the automobile, there is very little likelihood that commuters in Spokane will shift to mass transit to a degree that will measurably and cost-effectively reduce congestion on the arterial system during peak periods. The best example of drastic measures is a change in parking policies. According to the SRTC HCT System Plan findings, when parking is paid by the user and alternative transportation modes are available, a significant number of commuters change modes. Spokane has subsidized its parking, as have cities in many other parts of the country. Changes, such as employees paying for parking and/or parking taxes on both commercial and private parking spaces, are being considered.

As shown in Table 2-10, the HOV component of this alternative would serve only as a spot improvement and would not have much influence systemwide. The analysis of a Division Street HOV system applies a very optimistic outlook. The numbers represent an ideal situation and are not indicative of the actual system design. A major fault with the system is the lack of any time savings, a criteria that is very important in helping make the HOV system effective. With the stop-and-go conditions along the corridor, it is very unlikely that the 30 second to one minute per mile time savings could be realized.

The physical characteristics of the Division Street corridor are another drawback. The fact that the route provides frequent right-turn access to abutting businesses, plus left-turn movements at the major intersections, creates safety concerns. The relative high speed of vehicles in the HOV lane, coupled with the turning movements, would be conducive to an increase in accidents.

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

Under ideal conditions, this alternative would lower traveling times; however, only carpools and buses would receive the benefit. The remaining trips are still on the existing arterial system. Vehicles will be traveling on the local signalized arterials under stop-and-go conditions. As identified above, the time savings realized by the users of the HOV lane will be minimal.

The discussions of costs associated with congestion for the two alternatives above also applies to this Mass Transit Alternative.

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

This alternative appears to be consistent with city of Spokane and Spokane County Comprehensive Plans. Both the plans and this alternative encourage the high density and mixed use type development that the HCT identified as necessary to promote and improve the effectiveness of a TSM program. The establishment of effective growth management components will help with the needed support structure to make this a more effective alternative.

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

This alternative is itself a multimodal concept and helps put in place some system support for the intermodal exchanges. This alternative focuses on HCT, with consideration of bus, walking, bicycle, and automobile modes. The effectiveness of the intermodal exchanges depends on acceptance of the mixed use and high density concepts such as the "Transit" Villages identified in the HCT System Plan. Using a route such as Division Street as an HCT corridor will prove very difficult in both the design and political/public acceptance.

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

The benefit provided by this alternative is limited. There is a reduction in the number of trips generated, which in turn reduces air quality impacts. The limitation exists in the traveling speeds provided by the use of the existing arterial system. Table 2-8 outlines the projections for several key north/south and east/west arterials in the study area. Based on the EPA MOBILE5 emission rate program, carbon monoxide emission rates will be 2.5 to 3 times greater at low arterial speeds then at freeway speeds.

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

This alternative fulfills only half of this objective. The focus is on moving people and does nothing for enhancing the exchange of freight.

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

This alternative fails ~~completely~~ to meet this objective. It requires operation on the existing city/county arterial system, which means the high number of conflict points, signalized intersections, etc., associated with urban principal arterials will remain. As identified earlier, construction of the HOV lane will compound safety concerns.

An examination of the statistics for statewide accident and fatality rates in 1992 shows the urban principal arterial had over twice the accident rate of an interstate facility: 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 as compared to 0.31 per 100 MVM. As

indicated in Chapter 1, numerous arterials within the study area rank well above the statewide average, and, based on the nature of the system and projected congestion, safety would remain a concern.

Improve Energy Efficiency in the Moving of People and Freight

This alternative would be expected to reduce the total energy consumed in the project design year by about roughly the same percentage as the reduction of trips projected (4.1 percent impact of transit, plus very minimal reduction from HOV improvements on Division Street).

The remaining trips will use the existing arterial system and will maintain low average speeds and stop-and-go conditions, which are not conducive to faster travel times and improved energy efficiency. This will result in little improvement in the area of moving freight efficiently, and could equate to increased costs in goods and services.

Alternative 4 — Improvements to Existing Facilities

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

In other cities, extensive arterial improvements typically have not resulted in acceptable system-wide level of service. Instead, experience shows that there is the potential for congested peak hours to expand into an extended congested peak period as commuters try to adjust. Intersections remain the key determinate as to the efficiency of this alternative. What this alternative equates to is additional stop-and-go capacity associated with the at-grade intersection environment of the local arterial system, which can result in a low level of service.

~~The operational management strategies discussed under TSM above touch on the projected potential for intersection improvement on the major northside arterials. As the TSM discussion shows a 16-17.5% increase in capacity can be realized at intersections where systems have not already been updated. Table 2-10 shows which intersections the improvements can be applied. The improvement is limited due to many systems being already in place. Of the 34 critical intersections 13 could benefit from system improvement.~~

Constructing improvements to existing arterials would be very costly, both monetarily and in terms of neighborhood and business disruptions. Considering the need for an additional 12 lanes, right of way needs alone are substantial. Public and political acceptance of such a solution is very questionable. ~~Public and political acceptance of such a solution is very questionable, considering the experiences with the current Division Street widening project.~~ The recent Division Street widening, though received well by the traveling public, did meet with resistance from some of the affected businesses.

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

This alternative provides an expanded arterial system with the same stop-and-go characteristics that currently exist. Vehicles will still be required to travel on local

signalized arterials. Overall travel times along the arterials would be expected to improve over the no-build condition. Signalization is a controlling factor and as discussed earlier, identified improvements that would increase signalization efficiency are limited throughout the project study area.

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

This alternative is not consistent with regional planning. City of Spokane and Spokane County Comprehensive Plans focus on providing safe and efficient transportation. Statistically, this alternative does not meet this goal.

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

This alternative fails to meet this objective. The capacity increases are assumed to accommodate the projected demand, with no provisions for expansion or modification to accommodate multimodal or 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 little air quality benefit. It is expected that it will become increasingly difficult to develop roadway improvement projects that meet air quality conformity requirements, due to additional traffic volumes traveling at less efficient speeds.

Table 2-8 outlines the projections for several key north/south and east/west arterials in the study area. Based on the EPA MOBILE5 emission rate program, carbon monoxide emission rates will be 2.5 to 3 times greater at low arterial speeds then at freeway speeds.

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

This alternative will function similarly to the existing system; no improvements for accommodating or enhancing the exchange of freight or other modal systems would take place.

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

This alternative fails ~~completely~~ to meet this objective. It requires operation on the existing city/county arterial system, which means the high number of conflict points, signalized intersections, etc., associated with urban principal arterials will remain. As identified earlier, construction of the HOV lane will compound safety concerns.

An examination of the statistics for statewide accident and fatality rates for 1992 shows the urban principal arterial had over twice the accident rate of an interstate facility: 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 as compared to 0.31 per 100 MVM. As

indicated in Chapter 1, numerous arterials within the study area rank well above the statewide average, and, based on the nature of the system and projected congestion, safety would remain a concern.

Improve Energy Efficiency in the Moving of People and Freight

The movement of people and goods in an energy efficient manner is not achieved. The system will maintain low average speeds and stop-and-go conditions that are not conducive to lower travel times and better energy efficiency.

Alternative 5 — Hamilton/Perry

This alternative would meet the purpose and need for the project; however, it was eliminated from further consideration during formulation of the project Final Study Plan that was approved by the Interdisciplinary Team (IDT) on August 27, 1991.

Environmental impacts of each route alternative were assessed in a "broad brush" preliminary analysis. A summary matrix for the 28 environmental study areas was prepared, including a decision matrix (see Appendix C). Overall, the Hamilton/Perry route had the most adverse impacts of the three basic route alternatives, including the highest number of properties impacted by disruptions and displacements (not including work along I-90).

The IDT determined that elimination of the Hamilton/Perry route would enhance public and local government support for the project by reducing potential adverse community and environmental impacts. Written comments received from the July 1991 Agency Scoping and Public Open House meetings were considered in this decision, and included:

- A letter from the Mayor of Spokane
- A City Planning Commission Resolution
- Comments from the Logan Neighborhood Group
- Comments from Gonzaga Prep High School

Eliminating this alternative is consistent with conclusions from past studies, city plans, and neighborhood plans, including:

- 1988 "North Spokane Transportation Plan: Long-Term Transportation Improvements"
- City Comprehensive Plan, Arterial Street Plan
- The Hillyard Neighborhood Specific Plan
- The Chief Garry Neighborhood Specific Plan
- The Logan Neighborhood Specific Plan

Alternative 8 -- Bypass/Beltway

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

The bypass/beltway as planned provides minimal additional capacity to the transportation system. It instead improves the linkage of existing routes to improve traffic flow and meets driver expectations for an arterial road.

The SRTC study indicates the Stoneman Road - Argonne Road leg would accommodate a significant number of east side trips as the North Spokane Freeway is developed.

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

Travel speeds would not be expected to improve due to lack of access control and lower design speeds for vertical and horizontal alignment. Signed speed limits would be between 35 and 45 mph. Actual travel speeds would average lower due to stopping for signalized intersections and turning movements.

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

Other than the TPU a bypass/beltway is not included in current local or regional plans.

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

This alternative fails to meet this objective. The capacity increases do not meet the projected demand, with no provisions for expansion or modification to accommodate multimodal or High Capacity Transportation (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 little air quality benefit. It is expected that it will become increasingly difficult to develop roadway improvement projects that meet air quality conformity requirements, due to additional traffic volumes traveling at less efficient speeds.

Based on the EPA MOBILE5 emission rate program, Carbon Monoxide emission rates will be 2.5 to 3 times greater at low arterial speeds that at freeway speeds.

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

This alternative could accommodate development of park and ride lots for commuters. Their value would be diminished due to the lower speeds and ultimately lack of HCT capability. Both legs could enhance mode transfers (Changes in one type of carrier to another type) mostly Rail/Truck.

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

This alternative fails to meet this objective. It requires, for the majority of the route, to operate on the existing city/county arterial system. Ultimately, a high number of conflict points, signalized intersection, driveways, etc., associated with urban principal arterials will remain.

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.