

The Monroe/Lincoln Corridor:



*transportation
investments*



*with community
involvement*



*SRTC
Spokane Regional
Transportation Council*

TABLE OF CONTENTS

SUMMARY	1
BACKGROUND	6
INTRODUCTION.....	6
STUDY AREA.....	6
MODEL OVERVIEW	7
ALTERNATIVE ANALYSIS.....	7
POTENTIAL FOR ENHANCEMENTS	19
CORRIDOR PERFORMANCE	
Projected Traffic Volume Impacts	19
Travel Time Analysis.....	22
INTERSECTION PERFORMANCE	
Turning Movements.....	24
Level of Service	24
AIR QUALITY RESULTS	26
ESTIMATED COSTS	27
PUBLIC WORKSHOP NUMBER 2.....	29
PUBLIC WORKSHOP NUMBER 3.....	31

CONCLUSION33

LIST OF TABLES

Table 1: Link Volumes20
Table 2: Link Volumes20
Table 3: Traffic Volume Rankings21
Table 4: Travel Times23
Table 5: Level of Service25
Table 6: Air Quality26
Table 7: Estimated Costs28
Table 8: Results of Public Meeting Number 231
Table 9: Results of Public Meeting Number 332

APPENDICES: A through D

Appendix A..... TModel
Appendix B.....Synchro
Appendix C..... Air Quality
Appendix D..... Public Information



SUMMARY

Spokane Regional Transportation Council (SRTC) was requested by the City of Spokane in December 1999 to revisit the purpose and need for continuing the Monroe-Lincoln Couplet project that was identified in the 1987 Federal Environmental Impact Statement. The request to revisit the purpose and need for the couplet was based on several factors: the Spokane City Council decision to cancel the Lincoln Street Bridge; changes proposed in both City and County comprehensive land use plans, as they affect travel demand; changes in public involvement to encourage neighborhood participation in the identification of potential solutions that meet the unique needs of the community; and finally, the need to identify solutions that meet State and Federal air quality standards.

During the course of the study, SRTC conducted a series of three meetings held at the Corbin Senior Center to involve people living and working in the Monroe-Lincoln Corridor. SRTC used the City of Spokane Neighborhood Services Department to identify key stakeholders and established Neighborhood Councils to ensure adequate notification of meetings. In addition, SRTC mailed out over 400 letters, notifying people of meetings. Attendance at these meetings ranged from 85 people during the early stages to 35 at the last meeting. This was expected as citizen concerns expressed

early in the process were evaluated and incorporated into the study's analysis. Clearly, the most pressing issues for people living, working and traveling in the Monroe-Lincoln Corridor centered on the volume and speed of traffic. Most residents having access to the Lincoln-Post-Wall Corridor, expressed concern over the speed and volume of traffic, as well as typical arterial streets' harsh appearance in deep-rooted, established neighborhoods and neighborhood commercial areas.

Businesses located on lower Monroe Street, in the vicinity of the Monroe Street Bridge, expressed concern over the speed of traffic. Their opinion was that high-speed traffic creates an unfriendly atmosphere for pedestrians walking to and from downtown to destinations like the Spokane County Courthouse Complex, Regional Health District building and retail businesses. Most meeting participants acknowledged simply shifting traffic into someone else's back yard was not an appropriate or well-considered solution for Spokane as the city moves toward a higher quality of living environment. With these concerns in mind, SRTC developed a series of alternatives for public review and comment.

Initially the alternatives focused on two operational issues in the corridor identified through the use of travel demand modeling: first the need to ensure movement of people and goods in the corridor, and second the need to provide adequate capacity between the

Monroe Street Bridge and Indiana to address the significant number of turning movements in the area. The sizeable number of turning movements is due in part to traffic traveling to the County Courthouse campus, and the Veterans Memorial Arena. The distribution of traffic in the Northwest Boulevard, Indiana, Monroe and Post streets area is also a factor. Attempting to address these issues, SRTC developed alternatives originating from public comment at The Monroe-Lincoln Corridor, Public Meeting Number 1. These alternatives considered a significantly shorter couplet in the corridor than selected in the 1987 approved Final Environmental Impact Statement (FEIS). In the FEIS, the selected alternative extended the existing couplet south of the Spokane River and northward to Francis Avenue (S.R. 291).

SRTC's analysis determined a couplet using Monroe and Lincoln/Post northward as far as Indiana could meet the travel demand needs beyond the 20-year planning horizon. Travel demand based on the centers and corridors land use plans being considered **did not** justify extending the couplet further north to Francis. This particular finding weighed heavily when re-defining potential improvements on Post and Wall streets north of Indiana where a neighborhood sensitive arterial design could be incorporated into the corridor. The remainder of the analysis considered what road and operational changes could be implemented south of Indiana to meet the 20-year

travel demand forecasts.

SRTC introduced alternatives one through four at the workshop Monroe-Lincoln Corridor Public Meeting Number 2 on January 24, 2001. The four alternatives addressed the travel demand on the south end of the corridor, while at the same time allowing for revised arterial design standards being considered for Post and Wall Streets north of Indiana. The alternatives included:

Alternative 1 – The No-Build alternative, which would keep the arterials as they are today. This would still include updating traffic signal timing plans as needed and would take into account closure of the Post Street Bridge once the Monroe Street Bridge is rehabilitated.

Alternative 2 – A three-lane couplet on Monroe and Lincoln/Post as far as Indiana. This would terminate the couplet at Indiana and reduce Post Street to one lane in each direction from Indiana northward. Monroe would be one-way south from Indiana, while Lincoln/Post would be northbound. A crossover from Monroe to Lincoln would be constructed at the north end of the Monroe Street Bridge to move northbound traffic to Lincoln Street.

Alternative 3 – A four-lane couplet using Monroe and Lincoln/Post, as far as Shannon, where a roundabout would be created using Monroe, Post, Indiana and Shannon. Monroe would be southbound, while Lincoln/Post

would be northbound. A crossover from Monroe to Lincoln would be constructed at the north end of the Monroe Street Bridge to move northbound traffic to Lincoln Street. From Shannon northward, Post would be reduced to one lane in each direction with the remaining right of way used to create a neighborhood friendly street design, with transit and bikeway accommodations.

Alternative 4 – A short three-lane couplet on Monroe and Lincoln/Post would provide one-way traffic as far as the vicinity of Maxwell, where northbound traffic would transition back to Monroe Street before Indiana. Post and Wall streets north of Sinto/Maxwell would be one lane in each direction, with the remaining right of way used to create a neighborhood friendly street design, with transit and bikeway accommodations.

A presentation including each alternative addressed its impact on travel demand, intersection congestion, travel time in the corridor, and air quality. They were then graphically compared with each other to demonstrate their relative strengths and weaknesses. After presenting the four alternatives, those attending the meeting were asked to give their preference of the four alternatives and encouraged to provide written comments for SRTC to consider as part of the continuous report development. While this was not a scientific sampling, it allowed SRTC staff to assess the strengths and weaknesses of

each alternative from the public's perspective.

While the public preference surrounded Alternative 2 and Alternative 1 (in that order), a significant number requested an evaluation of a fifth alternative. This new alternative would consider maintaining two-way traffic on both Monroe and Lincoln Streets. SRTC agreed to conduct the additional analysis, taking into account previously developed and agreed to design features north of Indiana. The alternative is described as follows:

Alternative 5 - A crossover from Monroe Street to Lincoln Street with two-way traffic and accommodation for the development of relocated Bridge Avenue. Lincoln Street would be developed with one lane of traffic in each direction and a center left turn lane to accommodate business access. Pedestrian, bicycle, and street landscape accommodations would be developed northward to Indiana. After Indiana Street, the center left turn lane would be optional, as far as Buckeye. Further north on Post and Wall Streets, the road would be reconstructed to restore the road and sidewalks. Provisions would be made to designate and sign the Lincoln/Post/Wall corridor as a bicycle route.

Monroe Street from the bridge northward would remain a two-way street. Reconstruction of Monroe would continue northward to Francis, including both roadway and sidewalk improvements. From the Bridge to Indiana

additional efforts would be necessary to develop a Context Sensitive Design as advocated by FHWA. Issues unique to this segment of Monroe Street include: a narrow right-of-way backed up to historic buildings, high volumes of turning movements to major activity centers, (Health District, Courthouse, Arena) and the anticipated development of the Summit Properties located on the north bank west of Monroe Street.

Results of Analysis

At the request of the citizens, SRTC examined the potential for enhancement projects within the corridor. SRTC performed traffic volume analysis, travel time analysis, level of service analysis and air quality analysis. The results follow:

No-Build: This alternative presents the least opportunity for enhancement projects. Since no additional lane width is vacated for this alternative, an enhancement project would be limited to existing space on the side walks. Traffic volumes for this scenario are highest compared with other alternatives. This alternative has the second slowest travel times, on average. Thirteen intersections would have a projected level of service D, E, or F. Seven intersections appear to be above the national ambient air quality standard (NAAQS). The estimated cost for this alternative is \$2.3 million in 2001 dollars.

Alternative 2: This alternative presents a favorable opportunity for enhancements by utilizing

three of four lanes. In the North Hill and Emerson / Garfield Neighborhoods, Post and Wall is reduced to one-lane in each direction. Bike lanes, streetscapes or other improvements are options for the remaining right of way. This alternative generates the second lowest traffic volumes, in general, on Lincoln and Monroe and travel times rank the fastest, on average. Level of service analysis shows six intersections could improve in average delay, and none would worsen. Four intersections appear to fall below the air quality conformity determination and would require mitigation evaluations. The estimated cost for this alternative is \$5.86 million in 2001 dollars.

Alternative 3: This alternative presents little opportunity for enhancements because the couplet utilizes four lanes. However, by reducing the travel lanes to three, enhancements could be added. Traffic volumes for this scenario are intermediate compared to other alternatives. This alternative generates the slowest travel time, on average. Level of service analysis shows eight intersections would have less average delay, and one would have more. Five intersections appear to have air quality problems and would require mitigation evaluations. The estimated cost for this alternative is \$3.98 million in 2001 dollars.

Alternative 4: This alternative presents moderate opportunity for enhancements because the couplet uses three of four lanes. This alternative involves the second highest traffic

volumes in general on Lincoln and Monroe and the third fastest average travel time. Level of service analysis shows five intersections would have slight improvements in average delay, and three would worsen. One intersection appears to have an air quality problem and would need further evaluation. The estimated cost for this alternative is \$5.2 million in 2001 dollars.

Alternative 5: This alternative presents the most opportunity for enhancements since the corridor uses a minimum of two lanes and a maximum of three lanes. The remain-

ing right-of-way could be used for bike lanes, streetscapes or other enhancement projects. This alternative includes the lowest traffic volumes, in general, on Lincoln and Monroe. Travel times are the second fastest, on average. Southbound travel times are slightly higher than the No-Build on Monroe, but improve on Lincoln. Level of service analysis suggests six intersections could improve in average delay, and two would worsen. All of the intersections meet the air quality conformity determination. The estimated cost for this alternative is \$5.86 million in 2001 dollars.

The table below lists each planning factor and its most favorable alternative:

Low Traffic Volume	Alternative 5
High Traffic Volume.....	No-Build
Travel Time.....	Alternative 2
Level of Service	Alternative 2
Air Quality	Alternative 5
Opportunity for Enhancements	Alternative 5
Low Estimated Costs	No-Build

BACKGROUND

In April 1994 Spokane Regional Transportation Council (SRTC) completed the Monroe-Lincoln Couplet Phase 1 Intersection Evaluation Report. At the request of the City of Spokane, SRTC evaluated current operating characteristics (i.e., level of service, travel times and air quality) along the corridor for existing and future conditions as well as for revised conditions resulting from the implementation of a couplet with a Lincoln Street Bridge. The findings in 1994 report showed that intersections in the Monroe-Lincoln Corridor from Main to Indiana operated at a poor level of service. The findings showed modifications of traffic patterns from a pair of two-way streets to a pair of one-way streets led to better traffic flow.

Since then the Lincoln Street Bridge has been cancelled, and both the City of Spokane and Spokane County have progressed significantly in the development of comprehensive land use plans that are consistent with the Growth Management Act. This report describes possible transportation improvements for the Monroe-Lincoln Corridor without the Lincoln Street Bridge, with updated comprehensive land use plans and with feedback from interested citizens and neighborhoods in the corridor.

INTRODUCTION

In December 1999 SRTC was requested by the City of Spokane City Council, through the Public Works Department, to conduct an analysis using citizen-input concerning signal coordination, air quality, and travel demand on the Monroe-Lincoln corridor. The impetus for this was the City Council's desire to improve future traffic flow through the Monroe/ Lincoln corridor in light of canceling the Lincoln Street Bridge,

while respecting the needs of the neighborhoods. To provide an objective review of possible improvement proposals, SRTC conducted citizen input meetings and developed traffic improvement analysis. The citizen meeting was held on January 25, 2000, at the Corbin Senior Activity Center with approximately 60 people in attendance.

The meeting attendees were informed of the Monroe-Lincoln corridor history and were provided with future year traffic estimates that predicted heavy usage of the corridor. The attendees were asked to break into small groups to brainstorm proposals that would address traffic congestion, neighborhood safety and aesthetic concerns. The specific areas addressed were:

- 1) Transportation characteristics
- 2) Transportation alternatives
- 3) Neighborhood enhancements.

Many residents voiced the need to keep their neighborhoods attractive and safe. Traffic calming strategies were proposed along with trees and greenbelts and offset sidewalks (Appendix D). SRTC evaluated proposals by using models (e.g. TModel, Synchro and CAL3QHC). Computer modeling was conducted on the proposals to identify those, which merited further consideration. The composite alternatives were made available for public review on the SRTC website: www.srtc.org.

STUDY AREA

For the purposes of this report the Monroe-Lincoln corridor study area is defined as the area bounded by Division Street on the east, Maple/Ash Corridor on the west, Francis on the north, and the north bank of the Spokane River. The intersection of Main and Monroe was evaluated because of air qual-

ity concerns. The term “Monroe-Lincoln” includes Wall and Post streets as part of the scope of analysis.

MODEL OVERVIEW

Computer models are used to understand changes in traffic due to growth or improvements to roads and intersections. Models are a representation of actual conditions used to quantify impacts and benefits. Results from the model are best used to indicate trends not exact circumstances. SRTC used three models to study the Monroe-Lincoln Corridor; one to assess the overall growth and distribution of traffic (TMODEL), another to evaluate traffic signals and coordination of traffic flow (SYNCHRO), and the last to determine air quality for the different alternatives (CAL3QHC). These models are the same tools used by transportation professionals nationwide to conduct other transportation analysis.

Results were developed for forecast year 2020 to maintain consistency with other planning that meets Growth Management Act requirements. This study also used planning data from local jurisdictions and the Metropolitan Transportation Plan.

ALTERNATIVE ANALYSIS

SRTC distributed a feedback questionnaire to all of the participants at the Monroe-Lincoln Corridor Public Meeting No. 2 on January 24, 2001. The public involved in the meeting preferred Alternative 2 but disliked the one-way streets (the couplet). These comments lead to the development and analysis of Alternative 5. Five composite alternatives were then evaluated with respect to travel demand, intersection levels of service and air quality.

The Comprehensive Plan for Spokane has not been adopted at the time, therefore, each alternative was evaluated using two comprehensive growth management land use alternatives, Centers & Corridors and Current Patterns. The Centers & Corridors alternative focuses future growth in mixed-use (neighborhood and business) district centers, neighborhood centers, employment centers, and along mixed-use transportation corridors. The Current Patterns alternative is based upon past growth and development practices which were used in the city for the past 40 years. Similarities occurred between the two land use alternatives with the traffic volumes and level of service. SRTC focused on the Centers & Corridors land use alternative since it is under further consideration.

The alternatives for the Monroe-Lincoln Corridor are described on the following pages.



Participants at Public Meeting No. 2 learn about the alternatives.

Understanding the Alternatives



NO-BUILD ALTERNATIVE

No physical changes to the current arterial system in the study area. Operational changes would continue to occur as traffic volumes and travel patterns change with growth and development.



*Figure 1: Monroe / Lincoln
Corridor No -Build Alternative*



ALTERNATIVE 2

A three-lane Lincoln / Monroe couplet, northbound / southbound respectively, from Bridge Avenue to Indiana; a two-way street with one lane in each direction from Indiana to Francis using Post and Wall.



*Figure 2: Monroe / Lincoln
Corridor as
proposed by Alternative 2*



ALTERNATIVE 3

A four-lane Lincoln & Post/Monroe couplet from Bridge Avenue to Shannon;
a one-way on Indiana eastbound from Monroe to Post, and a one-way westbound on
Shannon from Post to Monroe.



photo illustration

ALTERNATIVE 4

A three-lane Monroe-Lincoln couplet from Bridge Avenue to Maxwell; a two-way roadway starting at the intersection of Lincoln and Boone and crossing to Monroe in vicinity of Maxwell.

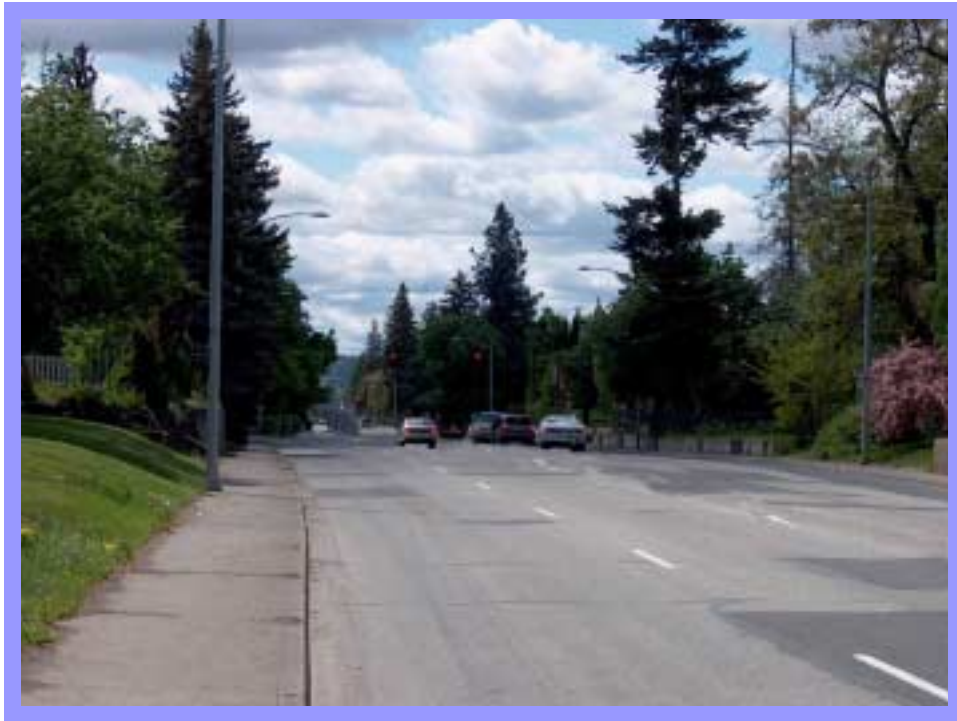
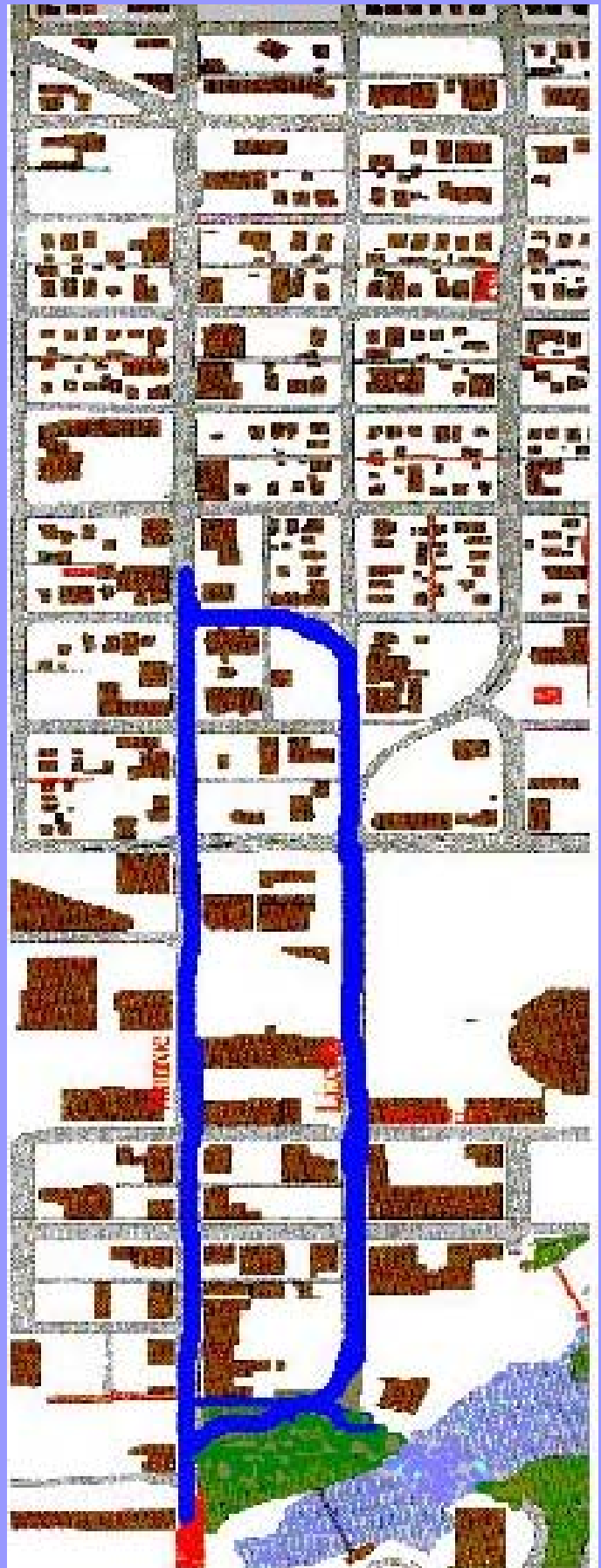


photo illustration

*Figure 4: Monroe / Lincoln
Corridor as
proposed by Alternative 4*



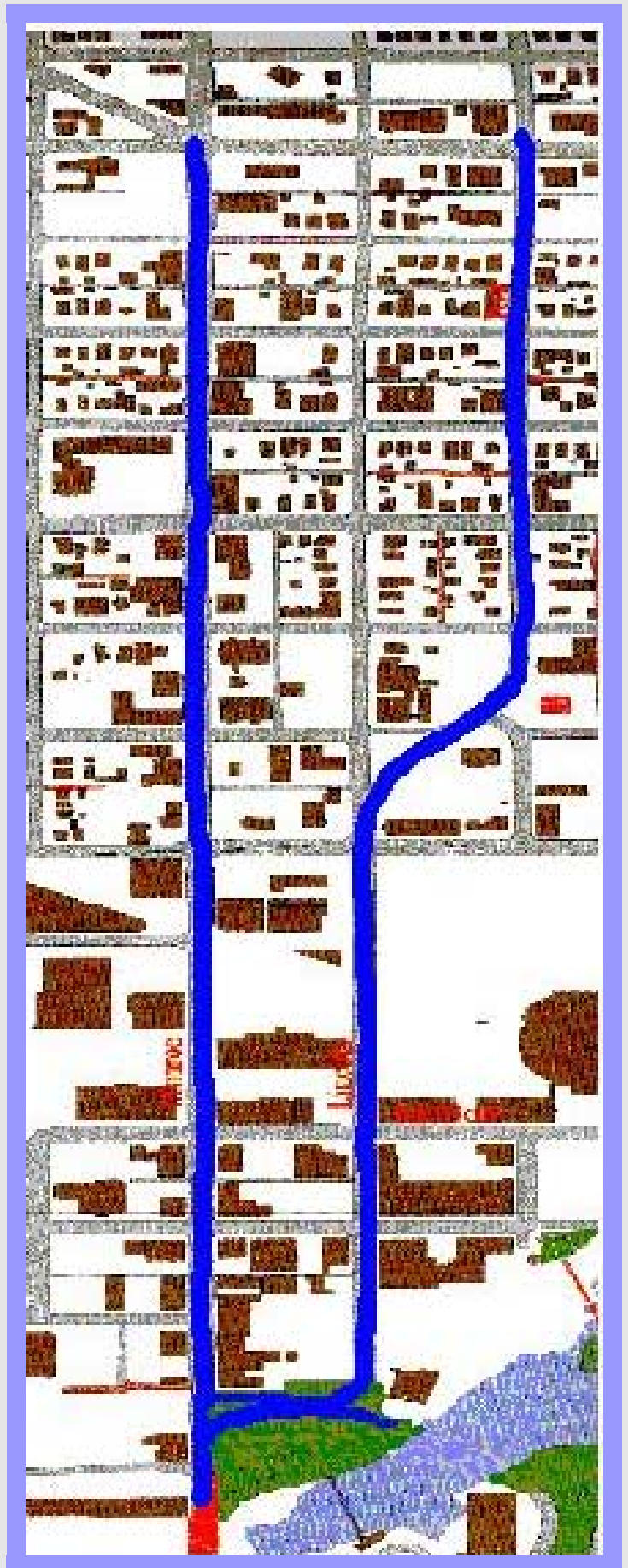
ALTERNATIVE 5

Monroe-Lincoln both maintain two-way traffic. On Lincoln Street there would be one-lane in each direction with a center turn lane in between from Bridge Avenue to Indiana. Monroe would remain as in its current configuration pending a thorough design study taking into account existing pedestrian and business concerns and what possibilities exist for the Summit Properties located immediately west of the Monroe Street Bridge.

Post Street Looking North at Knox



*Figure 5: Monroe / Lincoln
Corridor as
proposed by Alternative 5*



POTENTIAL FOR ENHANCEMENTS

During the neighborhood brainstorming session, residents asked to enhance the neighborhood for other activities. Suggestions included: adding street trees, broadening and offsetting sidewalks, creating a boulevard, adding a dedicated bicycle path/lane, providing additional on-street parking, and implementing traffic-calming strategies with trees and greenbelts (Appendix D).

The potential for enhancement projects in this corridor is related to finding additional space. Space can be added by removing travel lanes or roadway width. Alternatives that remove excess travel lanes and provide unused width of the roadway will have a higher potential to accommodate enhancements.

No-Build Alternative: This alternative would support the least amount of enhancements because traveled roadway width remains unchanged. Street trees, bus pullouts and shelters are examples of possible enhancements.

Alternative 2: This alternative provides a favorable opportunity for enhancements because the couplet, on Monroe and Lincoln, uses three of four lanes from Bridge Avenue to the vicinity of Indiana. In the North Hill and Emerson / Garfield Neighborhoods Post and Wall are reduced to one-lane in each direction from Indiana to the Post Street hill.

Alternative 3: This alternative presents little opportunity for enhancements since the couplet on Monroe and Lincoln uses all four existing travel lanes. By reducing the travel lanes to three, enhancement projects could be added.

Alternative 4: This alternative presents moderate opportunity for enhancements because the couplet on Monroe and Lincoln uses three of four lanes from Bridge Avenue to the vicinity of Maxwell.

Alternative 5: This alternative provides the most opportunity for enhancements because the corridor would have reduced number of travel lanes, providing opportunities for parking, bike lanes, street trees, improved sidewalks, and transit improvements from Bridge Avenue to the bottom of Post Street Hill.

Public and neighborhood input on the design of possible enhancements in this corridor should be a priority for the City of Spokane throughout this project.

CORRIDOR PERFORMANCE

Projected Traffic Volume Impacts

TMODEL was used to predict traffic volumes (i.e. number of vehicles using roads during the PM peak hour of travel) in the study corridor for each alternative (Appendix A). Results indicate how many trips (in general) may occur on a road and the number diverted from other roads.

Table 1 and Table 2 on the following page show traffic volumes from TMODEL for the Monroe-Lincoln Corridor. Table 1 shows the northbound and southbound volumes on Monroe and Lincoln. Table 2 shows the eastbound and westbound volumes from Francis to Boone.

Link Volumes on the Monroe / Lincoln Corridor
Volume in PM Peak Hour
Forecast Year 2020

TABLE 1						
	2000 Base	No Build	Alternative 2	Alternative 3	Alternative 4	Alternative 5
On Monroe:						
South of Francis	1802	2287	2269	2222	2464	2334
South of Wellesley	2325	2893	2541	2702	2951	2527
South of Garland	2339	2902	2781	2796	2950	2794
South of Indiana	1067 SB	1208 SB	1828 SB	1460 SB	919 SB	1051 SB
South of Boone	636 SB	783 SB	2102 SB	1695 SB	1081 SB	595 SB
On the Bridge	1681 SB	2404 SB	3056 SB	2242 SB	2314 SB	2068 SB
On Lincoln:						
South of Francis	1337	1596	1612	1639	1730	1703
South of Wellesley	1447	1734	1655	963	1850	1557
South of Garland	1660	2199	2082	2280	2102	1968
South of Indiana	821 NB	1632 NB	1601 NB	2090 NB	532 NB	1149 NB
South of Boone	970 NB	1560 NB	1396 NB	2435 NB	1755 NB	1755 NB

* Note: SB = southbound only; NB = northbound only
 Shaded area = links used for traffic analysis

Link Volumes East and West of Monroe / Lincoln Corridor
Volume in PM Peak Hour
Forecast Year 2020

TABLE 2						
	2000 Base	No Build	Alternative 2	Alternative 3	Alternative 4	Alternative 5
W of Monroe & Francis	2582	3146	3094	3139	3056	3049
W of Monroe & Wellesley	1897	2174	1951	2217	2189	1984
W of Monroe & Garland	793	926	1103	1138	855	1134
W of Monroe & Indiana	567	731	820	837	754	747
W of Monroe & Boone	1140	1617	1571	1443	1563	1507
W of Monroe & Broadway	1417	2000	1971	2065	2090	1850
E of Lincoln & Francis	363	2717	2793	2733	2749	2796
E of Lincoln & Wellesley	1996	2563	2855	2604	2512	2867
E of Lincoln & Garland	775	1146	1158	1210	979	1064
E of Lincoln & Indiana	1751	2249	2169	2148	2251	2111
E of Lincoln & Boone	1336	1873	1949	1864	2003	1761
E of Lincoln & Broadway	704	1024	1113	1020	1121	1179

In order to rank traffic volumes for each alternative, link volumes were selected in the Garland District (Table 3) for the forecast year 2020 . For the year 2000, the total traffic volumes

(northbound and southbound) between Wellesley and Garland on both Monroe and Lincoln are 3999 vehicles, and between Indiana and Boone is 1888 vehicles.

***Monroe-Lincoln Corridor Alternatives
Traffic Volume Rankings for the Forecast Year 2020
Table 3***

On Monroe & Lincoln Between:	No-Build	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wellesley & Garland	5101	4863	5076	5052	4762
Indiana & Boone	2840	3429	3550	1451	2200

For the No-Build Alternative total traffic volumes (northbound and southbound) are 5101 vehicles between Wellesley and Garland on Monroe and Lincoln, and between Indiana and Boone there are 2840 vehicles.

For Alternative 2 total traffic volumes (northbound and southbound) decrease from 5101 vehicles (No-Build) to 4863 vehicles (Alternative 2) on Monroe and Lincoln, between Wellesley and Garland. Also, volumes increase between Indiana and Boone on Monroe and Lincoln from 2840 vehicles (No-Build) to 3429

vehicles (Alternative 2).

For Alternative 3 total traffic volumes (northbound and southbound) decrease from 5101 vehicles (No-Build) to 5076 vehicles (Alternative 3) on Monroe and Lincoln, between Wellesley and Garland. Volumes increase between Indiana and Boone on Monroe and Lincoln from 2840 vehicles (No-Build) to 3550 vehicles (Alternative 3). The volumes decrease on Boone from 1617 vehicles (No-Build) to 1443 vehicles (Alternative 3), which may be caused by traffic utilizing Shannon.

For Alternative 4 total traffic volumes (northbound and southbound) decrease from 5101 vehicles (No-Build) to 5052 vehicles (Alternative 4) on Monroe and Lincoln, between Wellesley and Garland. Also, volumes decrease between Indiana and Boone on Monroe and Lincoln from 2840 vehicles (No-Build) to 1451 vehicles (Alternative 4). The traffic volumes increase on Indiana and Boone from 2249 vehicles (No-Build) to 2251 vehicles (Alternative 4).

For Alternative 5 total traffic volumes (northbound and southbound) seem to decrease from 5101 vehicles (No-Build) to 4762 vehicles (Alternative 5) on Monroe and Lincoln, between Wellesley and Garland. Also, volumes decrease between Indiana and Boone on Monroe and Lincoln from 2840 vehicles (No-Build) to 2200 vehicles (Alternative 5). The volumes decrease on Boone from 1617 vehicles (No-Build) to 1507 vehicles (Alternative 5).

For Alternatives 2, 3 and 5 the average volumes on Monroe and Lincoln decrease between Francis and Boone and increase south of Boone. For Alternative 4 the average volumes increase on Monroe and Lincoln between Francis and Boone and decrease south of Boone.

TRAVEL TIME ANALYSIS

Travel times throughout the corridor measured using TModel are reported in Table 4. Travel time, a prime factor in trip decision-making, is the amount of time necessary to travel from one intersection to another along a corridor. Faster travel time alternatives attract trips. Travel times for the Monroe-Lincoln Corridor reported in Table 4 are from Bridge Avenue to Francis Ave. and on Lincoln and Monroe, northbound and southbound. The travel-times for the year 2000 are significantly faster than any of the alternatives travel-times in the year 2020. (See Table 4)



*Monroe / Lincoln Corridor
Forecast Year 2020
Table 4*

Northbound on Lincoln from:	Travel Time	Difference between:
Bridge Avenue to Francis	minutes: seconds	Alternatives & No-Build
No-Build	32:10	
Alternative 2	27:54	- 4:56
Alternative 3	40:05	+ 8:35
Alternative 4	29:10	- 3:00
Alternative 5	25:56	- 6:54
Southbound on Lincoln from:		
Francis to Bridge Avenue		
No-Build	26:19	
Alternatives 2, 3 & 4	Due to configurations of the alternatives there are no comparable times.	
Alternative 5	25:32	- 1:27
Northbound on Monroe from:		
Bridge Avenue to Francis		
No-Build	25:27	
Alternatives 2, 3 & 4	Due to configurations of the alternatives there are no comparable times.	
Alternative 5	26:47	- 1:15
Southbound on Monroe from:		
Francis to Bridge Avenue		
No-Build	23:18	
Alternative 2	21:46	- 2:12
Alternative 3	22:21	- 1:06
Alternative 4	23:44	+ 0:26
Alternative 5	24:28	+ 1:10

TRAVEL TIMES (continued)

The No-Build Alternative predicts in 2020 northbound travel (i.e., from Bridge Avenue to Francis) on Lincoln will take 32:10 and on Monroe 25:27. Southbound travel (i.e., from Francis to Bridge Avenue) on Lincoln will take 26:10 and on Monroe 23:18.

In comparison to the No-Build Alternative, Alternative 2 would reduce travel time about 5 minutes northbound and about 2 minutes southbound.

Alternative 3 indicates the slowest travel times northbound, an additional eight minutes from the No-Build Alternative. Conversely, southbound travel times improve by one minute. It appears the addition of northbound lanes in this alternative attracts more vehicles to the corridor that will cause more congestion and increase travel times.

Alternative 4 improves northbound travel time by three minutes and southbound by only 26 seconds.

Alternative 5 has the most reduction in time northbound, almost seven minutes on Lincoln and one minute faster on Monroe. Southbound travel time is faster by a minute on Lincoln but slower by a minute on Monroe.

Alternative 2, 3 and 4 are only considered from northbound on Lincoln and southbound on Monroe, but the No-Build Alternative and Alternative 5 are considered from both northbound and southbound on Lincoln and northbound and southbound on Monroe.

INTERSECTION PERFORMANCE

Turning Movements

Turning movements represent the direction and number of trips as they move (i.e. left turn, right turn, and through) within an intersection. TMODEL was used to project turning movements to evaluate intersection performance (SYNCHRO) and air quality impacts (CAL3QHC). All turning movements for the Monroe-Lincoln Corridor are for the weekday evening peak period, which is typically the highest volume of traffic during the day.

Level of Service

Level of service (LOS), an indicator of how well traffic is moving through an intersection, is classified in terms of average delay per vehicle in seconds. Level of service ranges from A to F with A considered the most desirable for drivers. A description of each LOS in terms of average delay per vehicle follows.

Level of Service	Average Delay/Vehicle (sec)
A	< 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80

LOS operation at A, B, C or D is most desirable to drivers. Neighborhoods may prefer less desirable LOS operations because delays at intersections often cause drivers to choose faster options.

SYNCHRO 4.0 was used to determine the LOS at signalized intersections for the evening peak period to identify changes resulting from the alternatives. Intersection timing was optimized, meaning that the best red and green light computer generated light times were used for the entire project so city traffic signals would remain synchronized. SYNCHRO files are found in the Appendix B.

Table 5 presents the Monroe-Lincoln

Corridor LOS results. Twenty-four intersections were evaluated. Air quality regulations required the evaluation of thirteen intersections' conformity because LOS was D, E or F. See Table 6 (below). SRTC compared Alternatives 2, 3, 4 and 5 with the No-Build Alternative to see if the alternative would make the intersection operate with less delay. Alternative 2 appears to be the most improved, but there was not a significant amount of change in any of the alternatives.

<i>Level of Service for Monroe / Lincoln Corridor Forecast Year 2020 Table 5</i>	No-Build	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Monroe & Francis*	F	F	F	F	F
Monroe & Wellesley	E	E	E	E	F
Monroe & Garland	F	E	E	F	F
Monroe & Montgomery	A	A	A	A	A
Monroe & Shannon			A		
Monroe & Indiana	F	F	B	F	F
Monroe & Maxwell	F	F	E	F	F
Monroe & Boone	C	B	B	A	D
Monroe & Mallon			A	B	
Monroe & Broadway	F	F	F	F	E
Monroe & Main	F	F	E	F	F
Wall & Francis	F	F	F	F	F
Wall & Wellesley	E	E	D	F	E
Wall & Garland	B	B	B	B	B
Post & Garland	B	B	B	A	B
Post & Buckeye	C	B	C	A	B
Post & Shannon			A		
Post & Indiana	F	C	C	E	D
Post & Maxwell	E	B	E	F	D
Post & Boone	F	C	E	E	E
Post & Mallon			B	C	
Post & Broadway	F	C	F	F	E
Spokane Falls & Main WB	A	A	B	B	A
Main WB & Main EB	A	A	A	A	A
* Note: All of the alternatives are optimized					
Shaded = air quality analysis required					

AIR QUALITY RESULTS

State and federal air quality conformity regulations require carbon monoxide (CO) non-attainment areas to evaluate proposed projects for conformity with national ambient air quality standards (NAAQS). This requires evaluating CO concentrations at affected signalized intersections within the alternatives (Appendix C). The NAAQS is defined in terms of parts per million (ppm) for CO.

The current NAAQS for CO is nine ppm for an eight-hour average. The conformity analysis must indicate a project does not cause a new hot spot (i.e., CO concentrations of 9 ppm or higher), worsen an existing hot spot, or delay timely attainment of the standard. Using the CAL3QHC model, Table 6 shows the results of the air quality analyses.

*8-Hour CO Concentrations at Intersections Requiring AQ
Analysis (in ppm) for Forecast Year 2020
Table 6*

	No Build	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Monroe & Francis	7.7	8.0	7.8	7.8	7.9
Monroe & Wellesley	9.6*	7.8	7.7	7.5	9.3*
Monroe & Garland	6.8	7.2	6.7	6.6	7.9
Monroe & Indiana	9.2*	13.2*	8.9	9.2*	8.4
Monroe & Maxwell	10.0*	11.0*	10.9*	9.9*	8.6
Monroe & Broadway	9.6*	10.8*	11.9*	10.0*	8.4
Monroe & Main	14.0*	13.5*	14.0*	14.0*	13.3*
Wall & Francis	7.5	7.7	7.5	7.7	7.7
Wall & Wellesley	7.5	6.9	7.2	7.4	7.4
Post & Indiana	6.8	6.8	10.0*	7.1	7.1
Post & Maxwell	9.2*	10.5*	11.0*	9.1*	8.4
Post & Boone	9.8*	9.2*	8.8	9.0*	7.9
Lincoln & Broadway	8.7	8.6	10.4*	8.4	7.9
Number of Exceedances	7	6	6	6	2
Creates or Worsens a Modeled Hot-Spot	-	4	5	1	0

* = Modeled Exceedance **Bold** = Creates or Worsens a Hot Spot

AIR QUALITY RESULTS

(continued)

Alternatives 2, 3, 4, and 5 were compared with the No-Build Alternative. Table 6 shows seven modeled exceedances in the No-Build Alternative when compared to six modeled exceedances in Alternative 2, 3, and 4, and 2 modeled exceedances in Alternative 5. Alternative 2 worsens four hot spots. Alternative 3 creates two hot spots and worsens three hot spots. Alternative 4 worsens only one hot spot. Finally, Alternative 5 does not create or worsen any hot-spots. It appears that Alternative 5 is the most favorable for air quality CO levels at this time.

It is important to note that there are mitigation strategies that can be evaluated to alleviate air quality problems. Some of these mitigation strategies include changing signal timing or modifying lane configurations (i.e. adding turn pockets, through lanes, or free right turn pockets). For the purposes of this planning study, specific mitigation strategies were not evaluated for each intersection. Once the alternatives are narrowed, further mitigation strategies should be evaluated.

ESTIMATED COSTS

The City of Spokane developed the following estimated costs for the first four alternatives in preparation for the Monroe-Lincoln Corridor Public Meeting #2. Alternative

5 was derived as a result of this meeting and project costs were not derived directly for this alternative by city staff. However, because Alternative 5 right-of-way requirements are identical to right-of-way requirements for Alternative 2, project costs are assumed comparable. Table 7 outlines estimated project costs by alternative.

The No-Build Alternative does not include physical changes, however it includes costs to rehabilitate portions of the corridor, which fail in the outer years.

Alternative 2 is a three-lane couplet to Indiana. This alternative uses three of four lanes.

Alternative 3 is a four-lane couplet to Shannon with one-way heading westbound on Shannon and one-way heading eastbound on Indiana. This alternative uses all four lanes.

Alternative 4 is a three-lane couplet to the vicinity of Maxwell. This alternative uses three of four lanes.

Alternative 5 is a one-lane corridor (northbound and southbound) with a possible middle turn lane). With similar configurations of Alternative 2 (a three-lane couplet), Alternative 5 (two lanes with a potential middle turn lane) has comparable estimated costs.

Monroe-Lincoln Corridor Alternatives
Estimated Costs by Alternatives in Millions of (2001) dollars
Table 7

No-Build (status quo)	\$ 2.3
Alternative 2 (3-lane to Indiana)	\$ 5.86
Alternative 3 (4-lane to Shannon)	\$ 3.98
Alternative 4 (3-lane to Maxwell)	\$ 5.2
Alternative 5 (1-lane each direction)	\$ 5.86

Federal funding could be available through the Transportation Equity Act for the 21st Century. Also, the city could apply for Congestion Mitigation for Air Quality (CMAQ) funds, Surface Transportation Program (STP) funds, and Transportation Enhancements funds for segments of the alternatives. In addition, State funding through the Transportation Improvement Board (TIB) would be possible on a competitive basis.

SUMMARY OF FINDINGS

All of the alternatives indicate that potential level of service conditions will continue to be a problem. The Monroe-Lincoln corridor will continue to carry a significant amount of vehicles regardless of which alternative is chosen. Also, with any of these alternatives there will be potential air quality problems requiring further evaluation.

No-Build Alternative: This alternative presents the least opportunity for enhancement projects. Since no additional lane width is vacated for this alternative, an enhancement project would be limited to existing space on the sidewalks. Traffic volumes for this scenario are highest compared with other alternatives. This alternative has the second

slowest travel times, on average. Thirteen intersections would have a projected level of service D, E, or F. Seven intersections appear to be above the national ambient air quality standard (NAAQS). The estimated cost for this alternative is \$2.3 Million in 2001 dollars.

Alternative 2: This alternative presents a favorable opportunity for enhancements by utilizing three of four lanes. In the North Hill and Emerson / Garfield Neighborhoods, Post and Wall is reduced to one-lane in each direction. Bike lanes, streetscapes or other improvements are options for the remaining right-of-way. This alternative generates the second lowest traffic volumes, in general, on Lincoln and Monroe and travel times rank the fastest, on average. Level of service analysis shows six intersections could improve in average delay, and none would worsen. Four intersections appear to fall below the air quality conformity determination and would require mitigation evaluations. The estimated cost for this alternative is \$5.86 Million.

Alternative 3: This alternative presents little opportunity for enhancements because

the couplet utilizes four lanes. However, by reducing the travel lanes to three, enhancements could be added. Traffic volumes for this scenario are intermediate compared to other alternatives. This alternative generates the slowest travel time, on average. Level of service analysis shows eight intersections would have less average delay, and one would have more. Five intersections appear to have air quality problems and would require mitigation evaluations. The estimated cost for this alternative is \$3.98 Million in 2001 dollars.

Alternative 4: This alternative presents moderate opportunity for enhancements because the couplet uses three of four lanes. This alternative involves the second highest traffic volumes in general on Lincoln and Monroe and the third fastest average travel time. Level of service analysis shows five intersections would have slight improvements in average delay, and three would worsen. One intersection appears to have an air quality problem and would need further evaluation. The estimated cost for this alternative is \$5.2 Million in 2001 dollars.

Alternative 5: This alternative presents the most opportunity for enhancements since the corridor uses a minimum of two lanes and a maximum of three lanes. The remaining right-of-way could be used for bike lanes, streetscapes or other enhancement projects. This alternative includes the lowest traffic volumes, in general, on Lincoln and Monroe. Travel times are the second fastest, on average. Southbound travel times are slightly higher than the No-Build on Monroe, but improve on Lincoln. Level of service analysis suggests six intersections could improve in average delay, and two would worsen. All of the intersections meet the air quality

conformity determination. The estimated cost for this alternative is \$5.86 Million in 2001 dollars.

PUBLIC WORKSHOP NUMBER 2

A second public workshop for the Monroe-Lincoln Corridor was held in the Henderson Room at the Corbin Sr. Center on January 24, 2001. This workshop was designed to encourage public discussion of the four alternatives stemming from ideas generated by citizens attending the January 2000 workshop, and to determine the public's preferred alternative.

Announcements of the public workshop were sent to over 500 interested citizens and public notices faxed to all forms of local media.

The Spokesman-Review ran a brief the day of the meeting and sent a reporter to cover the meeting. A larger article was published the day following the meeting.

Sign in sheets indicate a total of 60 workshop attendees. Fifty-four people stayed for the small group discussion and cast their votes for a preferred alternative. Two individuals came late missing both the presentation and small group discussions. Their votes are listed separately.

Workshop Outline

The two-hour workshop began with a brief presentation, led by SRTC transportation manager Glenn Miles, of the past year's analysis of four feasible alternatives (as explained earlier in the report). After a question and answer session, workshop attendees split into six random groups for a closer look at the alternatives.

Small Groups

Individuals found a letter from A to F attached to their chair that determined the group they would participate in. When the presentation ended, the audience was asked to notice the letters posted around the room indicating their group's discussion area. Six facilitators, five from SRTC and one from City of Spokane's Planning Department, conducted group discussions about each alternative.

Meeting Materials

A brochure was distributed which included line drawings of the four alternatives, information from the presentation and the Monroe-Lincoln draft report. Maps, with Mylar overlays indicating the routes of the four alternatives were posted at each group's designated meeting place. A chart representing where each alternative stood in studied areas (potential for enhancements, travel times, air quality and intersection/traffic volumes) was also posted for each group. Green voting sheets and blue comment forms were distributed.

Regrouping after Small Group Discussions

Individual results were entered on a spreadsheet and displayed on a screen for the group. The screen, exactly as it was shown on January 24, 2001, follows this meeting documentation in Appendix D.

Votes turned in after both the presentation and small group discussions were completed and will be mentioned in the report as late votes. Workshop participation is required for final vote tally.

The public was invited to submit the blue comment sheets by mail or fax at a later

date for inclusion in the final Monroe-Lincoln report if individuals desired more time to consider their responses.

RESULTS OF PUBLIC WORKSHOP NUMBER. 2

Table 8 (following page) shows that Alternative 2 was the public's preferred alternative. However, based on public input the night of the meeting, another alternative was investigated. Once the suggestion was deemed feasible, it was named Alternative 5.

Alternative 5 is identified as Monroe-Lincoln both maintaining one lane northbound and one lane southbound with a center turn lane in between from Bridge Avenue to Indiana.

Alternative 5 presents the most opportunity for enhancements because the corridor uses two lanes with a potential turn lane. The remaining right-of-way could be used for bike lanes, streetscapes or other enhancement projects. This alternative includes the lowest traffic volumes, in general, on Lincoln and Monroe. Northbound on Lincoln from Bridge Avenue to Francis are the lowest travel times for this alternative and travel times are slightly higher than the No-Build southbound on Monroe. Level of service analysis suggests six intersections could improve in average delay, and two would worsen. All of the intersections meet the air quality conformity determination.

Voting Totals
Table 8

	Alternative 1 No-Build	Alternative 2 3-Lane Couplet (to Indiana)	Alternative 3 4-Lane Couplet	Alternative 4 3-Lane Couplet (to Maxwell)
Group A	1	3	1	3
Group B	5	4	1	1
Group C	5	0	0	1
Group D	1	5	0	0
Group E	5	3	0	1
Group F	0	13	1	0
Total	17	28	3	6

Late votes: 2, for No-Build

***PUBLIC WORKSHOP
NUMBER 3***

A third public workshop for the Monroe-Lincoln Corridor was held in the Henderson Room at the Corbin Sr. Center on March 28, 2001. This workshop was designed to encourage public discussion of the No-Build Alternative, Alternative 2, and the alternative that was generated from the second public workshop (Alternative 5) and to determine the public’s preferred alternative.

Announcements of the public workshop were sent to over 500 interested citizens and public notices faxed to all forms of local media.

The Spokesman-Review ran a brief the day of the meeting and sent reporter to cover the meeting. A larger article was published

the day following the meeting that included an image, a rendering entitled Crossover.

Sign in sheets indicate a total of twenty-six workshop attendants.

Workshop Outline

The two-hour workshop began with a brief presentation of the analysis conducted on the three most publicly preferred (and feasible) alternatives: No-Build, Alternative 2 and Alternative 5. After a question and answer session, workshop attendees were provided a matrix listing the three choices. They were asked to rank their preferred alternative with a green, a yellow, and a red dot/sticker that was attached to the matrix. Green indicated most preferred, yellow second most preferred and red least preferred.

Results were entered on a spreadsheet and displayed on a screen for the group. All matrixes were required to have **three** dots placed on the matrix in order for it to count. Sheets with only one dot sticker were not counted in the final tally. SRTC received only one such sheet.

The public was invited to submit the comment sheets for inclusion in the final Monroe-Lincoln report if individuals desired.

RESULTS OF PUBLIC WORKSHOP NO. 3

Table 9 illustrates that Alternative 5 was the public’s preferred alternative, Alternative 1 the second preference and Alternative 2 the third.

Alternative 5 presents the most opportunity for enhancements because the corridor uses fewer travel lanes and the potential center left turn lane to accommodate access to businesses. The remaining right-of-way could be used for bike lanes, streetscapes or other enhancement projects. This alternative includes the lowest traffic volumes, in general, on Lincoln and Monroe. Northbound on Lincoln from Bridge Avenue to Francis are the lowest travel times for this alternative and travel times are slightly higher than the No-Build southbound on Monroe. Level of service analysis suggests six intersections could improve in average delay, and two would slightly worsen. All of the intersections meet the Federal air quality conformity determination.

*Results of Public Meeting Number 3
Table 9*

	Alternative 1 No-Build	Alternative 2 3 lane one-way	Alternative 5 one-lane each direction
Preference 1	1	1	24
Preference 2	17	8	1
Preference 3	8	17	1

One vote for the No-Build with only one dot on the matrix was not counted in the matrix. The requirement was each workshop participant must rank each alternative.

Conclusions and Recommendations:

Clearly the public interest and objective transportation modeling analysis as a part of this study identifies Alternative 5 as the most preferred solution to address the complex issue of balancing neighborhood concerns with the need to provide for the mobility of people and goods around the Spokane Metropolitan area. SRTC recommends the Spokane City Council accept Alternative 5 for implementation in the Monroe-Lincoln Corridor and to ensure the elements of Alternative 5 are designed and implemented while a Post Street or Monroe Street Bridge closure is underway.

Creation of a crossover from Monroe Street to Lincoln immediately north of the Monroe Street Bridge ensures Lincoln Street will continue to be a part of the regional transportation system, and provides the necessary relief to Monroe Street, especially between the bridge and Indiana. Alternative 5 fully addresses one of the original justifications for the couplet, to improve air quality, and is the only alternative that appears to meet Federal Air Quality Conformity requirements without further mitigation measures. Alternative 5 considers neighborhood concerns related to excessive and high speed traffic in residential neighborhoods while at the same time creates a neighborhood friendly street design that calms traffic and makes the Lincoln/Post/Wall corridor aesthetically pleasing for the community. SRTC recommends the consideration of a new approach to street designed on the south end of Monroe Street from Indiana to the Monroe Street Bridge.

This new approach called Context Sensitive Design should be considered due to the following facts:

- A) Historic buildings about the already narrow right of way.
- B) A relatively high number of pedestrians travel between the Central Business District and the County Campus area.
- C) Major traffic generators (Veterans Memorial Arena, Spokane County Courthouse, Spokane Regional Health District, etc.) create large numbers of turning movements in the area. There is uncertainty about the future use of the vacant land west of Monroe Street Bridge on the north bank.

These factors collectively present a design challenge if the City of Spokane wants to Think Beyond the Pavement¹ as the FHWA has advocated². This thought encourages greater investment opportunities and capitalizes on this area's close proximity to Spokane Falls. Context Sensitive Design brings a full range of stakeholders together to create a project that is in harmony with the community, while it preserves the environmental, scenic, aesthetic, historic, and natural resource value of the area.

It is further recommended that a decision on future implementation should be advanced in a timely manner.

¹ *Principles of Context Sensitive Design, Thinking Beyond the Pavement "Qualities and Characteristics,"* www.fhwa.dot.gov/csd/qualities.htm. Attached.

² *Building Roads in Sync with Communities,* by Harold E. Peaks and Sandra Hayes. Attached.