
DRAFT TECHNICAL MEMORANDUM

DATE: September 13, 2010

TO: Jeremy Gorden (City of Fargo)

COPY: Mike Gorman (HWS), Jim Jussel (HWS), Rich Caplan (RCA),
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FROM: Austin Yates (HWS)

RE: NP Avenue and 1st Avenue North Corridor Development Plan –
Alternatives Analysis and Recommendation

Alternatives Analysis Summary and Recommendation

At the beginning of this study, the Study Review Committee and the study team formulated a mission statement to guide this study:

NP and 1st Avenue North Corridor Development Plan Mission Statement

“This study will recommend a plan that accommodates all travelers: pedestrians, bicyclists, transit users, and drivers. The plan’s design and safety features will improve the physical health of individuals, the environmental quality of the community, and further increase opportunities for development.”

The mission statement is the yardstick with which to measure the fitness of each alternative to become the preferred alternative. Through Study Review Committee meeting and the public input process, three alternatives were developed (not including the No Build option):

- **No Build.** Taking no action; leaving the corridors as they are today: one-way, with three lanes. 1st Avenue North would remain three lanes westbound and NP Avenue would remain three lanes eastbound.
- **Alternative 1: 2+1.** Leaving two lanes in the direction of the existing one-way operations and using the third lane for two-way traffic. 1st Avenue North would be two lanes westbound and one lane eastbound. NP Avenue would be two lanes eastbound and one lane westbound. Parallel Parking will be provided on both side of NP Avenue and 1st Avenue North.

- **Alternative 2: Two-way, Two-lane.** This alternative features two-way traffic, like Alternative 1, but the existing three lane roadways would be converted to one lane in each direction with a center two-way left-turn lane. In this alternative, both NP Avenue and 1st Avenue North would have the same configuration: one lane westbound, one lane eastbound, and a center turn lane. Parallel Parking will be provided on both side of NP Avenue and 1st Avenue North.
- **Alternative 3: One-way, Two-lane.** Leaving the existing one-way operations but reducing the three lanes to two lanes. 1st Avenue North would be two lanes westbound and NP Avenue would be two lanes eastbound. This option will provide Parallel Parking on both side of NP Avenue and 1st Avenue North.

Each alternative was analyzed with respect to the tenets identified in the mission statement. The following briefly describes the alternatives in relation to the mission statement.

Accommodation of all travelers

Accommodation of Pedestrians

There is no doubt that one-way roadways efficiently move motorized vehicular traffic. The elimination of conflicting turning movements enables unparalleled progression of traffic due to the coordinability of the traffic signals. However, a result of such well-timed signals is increased vehicle speeds. Such speeds can be dangerous to pedestrians and cyclists attempting to use the roadway facilities. Two-way traffic has the effect of slowing overall vehicle speeds due to drivers simply seeing cars heading in the opposite direction, as well as losing the level of progression of a one-way facility. Granted, pedestrians crossing two-way traffic must negotiate traffic flow from two directions instead of one (on a one-way street) but if the number of lanes is kept the same, there will be the same number of conflict points with vehicles. In the unfortunate event of pedestrian-involved crash, the reduced speed of a two-way street can translate to increased survivability of pedestrians.

Each of the alternatives feature pedestrian amenities such as intersection and midblock curb extensions to provide better crossing locations for the pedestrians.

Accommodation of Bicyclists

Each alternative will feature a bike lane on both NP Avenue and 1st Avenue North. Due to roadway width restrictions, there can only be one bike lane on each of NP Avenue and 1st Avenue North. To have a shared bike lane or a striped bike lane led to interesting discussions with the cycling community in Fargo-Moorhead. In order to be consistent with bicycle facilities elsewhere in Fargo, it was determined that separate, striped bike lanes will be included in this study.

Each alternative includes the addition of a striped bike lane to both NP Avenue and 1st Avenue North. In Alternative 1, the bike lanes are on the single lane of the 2+1 (an eastbound bike lane on the south side of 1st Avenue North and a westbound bike lane on the north side of NP Avenue). The bike lane was placed there to enable the cyclists to only have to maneuver through one lane of traffic (in the same direction) to make a left turn and to keep cyclists on the opposite side of the street from transit buses. Metro Area Transit, the bus agency in Fargo-Moorhead, has determined that a conversion to two-way traffic would not alter their existing

route structure; buses will be on the two-lane side of 2+1. Additionally, having the bike lane on the single lane side of the 2+1 enables bikes to make right turns to access the block between NP Avenue and 1st Avenue North.

In Alternative 2, the bike lanes will be in the same location as Alternative 1: an eastbound bike lane on the south side of 1st Avenue North and a westbound bike lane on the north side of NP Avenue. As discussed under Alternative 1, the bike lane on this side keeps bikes and buses on opposite sides of the street and allows for right turns to access the block between NP Avenue and 1st Avenue North.

Alternative 3 features bike lanes on the right side of each one-way street, in the prevailing direction of traffic: a westbound bike lane on the north side of 1st Avenue North and an eastbound bike lane on the south side of NP Avenue. The bike lanes were placed on the right side of the one-way pairs to provide a smooth transition at the eastern and western ends of the project. If placed on the left side of the one-way streets the bike lanes would terminate against oncoming traffic at the eastern and western ends of the project. Whereas the right side would provide the opportunity for the rider continue with the flow of traffic.

With the addition of the bike lane, each of the improvement alternatives provides an opportunity for the bicyclist to use the bike lane a mode of transportation.

Accommodation of Transit Users

MAT Bus has determined that a two-way conversion will not alter their existing bus routes in downtown Fargo, as previously stated. Since transit users are typically also pedestrian or bicycle travelers, the two-way alternatives, Alternatives 1 and 2 would better accommodate them, as stated previously. However, Alternative 1 has a clear advantage over Alternative 2 because the 2+1 provides a travel lane to allow vehicles to legally pass around a bus stopping to embark/debark riders. Alternative 2, having only one travel lane in each direction, would mean that a bus stopping would temporarily halt the flow of traffic in that lane.

Alternative 1 accommodates transit users better than the other alternatives.

Accommodation of Drivers

None of the alternatives can move traffic as efficiently as the existing, one-way, three-lane system. In fact, the existing configuration is underutilized. Each of the corridors has a well timed coordinated signal system that provides excess capacity resulting in very good levels of service. Each alternative proposes a reduction in capacity on NP Avenue and 1st Avenue North; however, reducing the capacity of those streets only slightly worsens the overall traffic operation. As described in the “Alternatives Development and Analysis” section, each of the improvement alternatives will result in acceptable levels of service. Each of the study intersection will operate with a Level of Service “C” or better during the peak morning and afternoon commuter periods.

As opposed to comparing intangible concepts like level of service and delay, perhaps a more fruitful basis of comparison of the alternatives would be travel time, i.e., the length of time it would take a driver to go from 2nd Street to University Drive (or vice versa) on each of the arterials: 1st Avenue North, NP Avenue, and Main Avenue. Using SimTraffic simulation software, the future year PM peak hour scenarios were simulated in order

to compare arterial travel time. The travel times computed in SimTraffic for each arterial under the future Year 2035 No Build condition are approximately 4 minutes. The travel times for any of the alternatives will not increase (i.e., worsen) more than one minute for the overall corridor from 2nd Street to University. There will be a slight increase of travel time on Main Avenue due to traffic volumes shifting south to utilize Main Avenue, but again, the increase in travel time is slight, approximately 30 seconds.

Any disadvantage in increased delay and travel time for converting NP Avenue and 1st Avenue North to two-way traffic is made up by decreasing the amount of indirect travel experienced in a one-way system. For example, consider destination of the parking lot on the south side of NP Avenue between Broadway and 8th Street North. If one is traveling from the south of downtown on 6th Street South and wishes to park in that parking lot, there are two routes today: first, to take Main Avenue to 8th Street to NP Avenue or second, to take Broadway to 1st Avenue North to Roberts Street to NP Avenue. In either case, there is at least two blocks of indirect travel. If NP Avenue was two-way, however, the shortest available trip is possible: Broadway to NP Avenue. Two-way traffic on NP Avenue and 1st Avenue North is more advantageous to drivers than a one-way system.

Comparing the two-way alternatives, Alternative 1 is much better than Alternative 2. Keeping two lanes of the existing three lanes in either direction enable the prevailing flow to remain on NP Avenue and 1st Avenue North. While the goals of this study are not exclusive to traffic operations, a consideration of traffic operations into the whole study would suggest that Alternative 1 is the best alternative for drivers.

In terms of accommodating all travelers, each alternative has its own strengths and weaknesses. Overall, the alternative with the potential to best accommodate all travelers is Alternative 1, the 2+1.

Design and Safety Features

Improving the Physical Health of Individuals

Creating more walkable, complete streets, which permits safe movement of all travelers, can increase the physical health of individuals. Features such as improved sidewalks and bike lanes allow people to not have to rely so heavily on a personally-owned vehicle for transportation. Slowing speeds of automobiles can reduce the severity of crashes, particularly automobile-pedestrian or automobile-bicycle crashes.

Alternatives 1 and 2 can better improve the physical health of individuals by providing a reduction of travel speeds along NP Avenue and 1st Avenue North.

Improving the Environmental Quality of the Community

More green space, especially in a downtown location, can greatly improve the environmental quality of a community. Generally speaking, streetscaping features would be part of the final design of any alternative. Particularly with the two-way alternatives, changing the geometry of the NP Avenue & Roberts Street/8th Street intersection may provide for an enlargement of Ole Tangen Triangle Park.

Each of the alternatives provide an improvement to the environmental quality of the community when compared the existing conditions.

Further Increasing Opportunities for Development

As shown in the corridor economics analysis, two-way traffic will provide a significant economic impact to the Downtown Fargo area that will provide for more opportunities for development compared to the existing configuration. This factor is the main factor that differentiates the two-way alternatives from the one-way alternatives.

Summary and Recommendation

As discussed in the Alternative Analysis Section and in the steering committee conference calls, the operational analysis of each alternative indicates that each alternative will operate with acceptable levels of service. There is no doubt there will be an increase in congestion through the downtown area when compared to the existing condition. As stated before, the purpose of this study was to assess the best alternative to improve access to all modes of travel and encourage development growth. The results of the engineering analyses in the study indicate that one alternative does not separate itself from the other two alternatives. The ultimate separating factor is the economic benefit that will develop with the addition of two-way access to each of these corridors.

It is the recommendation of the study team that Alternative 1, the 2+1 configuration, be carried forward for more detailed analysis as the preferred alternative.