DEPARTMENT OF PUBLIC WORKS
TRAFFIC & PARKING SERVICES DIVISION
MINNEAPOLIS, MINNESOTA

Hennepin Avenue and 1st Avenue Two-Way Conversion Evaluation Report July, 2010

Introduction and Purpose

The Two-Way Conversion Project was identified in the Access Minneapolis Downtown Action Plan[1], which was adopted by City Council in June 2007. In the fall of 2008 Public Works was directed by Minneapolis City Council to convert Hennepin Avenue and 1st Avenue to two-way street operation. The broader goal and important considerations relating to roadway design for the two-way conversion, as envisioned by the Downtown Action Plan are to:

- Enhance Economic Vitality
- Improve Local Property Access
- Promote Improved Multimodal Use
- Improve Block to Block Access/Circulation
- Maintain Safety
- Maintain Efficiency

In June of 2009, the City started construction on Hennepin and 1st Avenues for the purpose of converting the roadways from one way to two way traffic operation. This Report is a project biography for the purpose of providing a summary of the project's history, implementation and evaluation.

This report includes the following sections:

Project Scope
Design Considerations
Design Alternatives
Recommended Alternative
Phase 1 Implementation
Phase 1 Status
Phase 1 Data and Evaluation
Phase 1 Summary and Conclusions
Phase 2 Implementation

For this report and to simply the discussion, the references to 1st Avenue mean both Hawthorne and 1st Avenues unless otherwise specifically stated.

[1] Access Minneapolis Downtown Action Plan, 10-Year Transportation Action Plan, City of Minneapolis, June 29, 2007.

Project Scope

The specific objective of accommodating two-way operation on both Hennepin Avenue and 1st Avenue is to strike a balance between transportation modes and competing needs of all stakeholders. The project scope included the following key goals:

- Provide two-way operation that safely accommodates vehicles, bicycles, transit and pedestrians
- Provide design alternatives that maximize the corridor capacity and retain the street curbs in their present locations.
- Maintain a bicycle facility within the corridor with the secondary goal of encouraging an increase in the number of bicyclists
- Maximize on-street parking along 1st Avenue
- Accommodate two-way operation with a $3.6 million dollar construction budget.
- Implement by Fall 2009 prior to the opening of the Target Field ballpark in April 2010.

Design Considerations

At the outset of the project, several design considerations items were identified to help frame the potential design alternatives. These included:

- Construction Budget/ Overall Street width
- Access/Circulation
- Transit
- Bicycle Facilities
- On-Street Parking
- Events
- Loading/Unloading
- Pedestrians
- State and City Standards and Guidelines

All of these roadway user and stakeholder needs compete for limited roadway space. With the Two-Way Conversion Project and throughout the remainder of the corridor, the existing curb lines and street widths did not change. Hennepin Avenue is 59 feet and 1st Avenue is 56 feet measured face of curb to face of curb. This factor is a significant constraint and governed many decisions. Developing an alternative that maximizes the corridor priorities and minimizes the trade-offs was the end goal.

Design Alternatives

In total 23 design alternatives were considered for Hennepin Avenue and 1st Avenue. The design options included the combination of integrating various roadway lane typical section alternatives (3-lane, 4-lane and 5-lane) with various bicycle lane options (center running, curb side, one-way pair and shared lane).

An assessment of each option was measured against the following objectives:

- **Bicycle Safety.** Qualitative assessment and comparison of expected level of safety based upon motor vehicle-bike conflict points and critical conflicts. Critical conflict points refer to those locations where a motor vehicle is making a turning move, but may unexpectedly cross paths with a bicyclist approaching from behind or out of the driver's field of vision.
- **Motor Vehicle Traffic Operations/Safety**. Qualitative assessment and comparison of the alternatives expected impact to motor vehicle traffic and motorist safety and its flexibility to accommodate event traffic.
- **Transit and Delivery Loading/Unloading Conflicts**. Qualitative assessment of an alternatives potential to have conflicts with transit and/or delivery vehicles.
- **Pedestrian Conflicts**. Qualitative assessment of an alternatives potential to have conflicts with pedestrians.
- **Traffic Laws and Ordinances**. Qualitative assessment of an alternatives compliance with applicable traffic laws and ordinances. A bicycle facility should not encourage or require bicyclists to operate in a manner inconsistent with the State Statues.
- **Continuity/Consistency of Bike Routing.** Qualitative assessment of an alternatives overall consistency or continuity along the bike route. Optimal continuity/consistency would not require the bicyclist to transition lanes or merge within the route to the least consistent design of the route requiring multiple turns and/or transferring to a different street.
- **Skill Level (Accommodate Type A and Type B/C Bicyclists)**. Qualitative assessment of an alternatives ability to accommodate bicyclist types. Comparison of the expected comfort level and the cyclist ability's required to merge, enter and exit the bike lane facility. Encourages more Type B/C bicyclists to use the corridor.
- **Accessibility to Bike Lane from Cross-Streets.** Qualitative assessment of how easy or difficult or convenient it is for a bicycle to gain access to the bicycle lane from an intersecting bike lane or from an approaching cross-street.
- **Directness of Bike Route.** Qualitative assessment evaluating how direct the bike route alternatives line of travel from Lyndale Avenue S. to 8th Street NE/SE.
- **MSA Standards / City Design Guidelines**. Qualitative assessment of how well the alternatives meet the MSA lane width standards and the City Design Guidelines.
- **Maintenance.** Qualitative assessment of the effort required to maintain pavement markings, signing and snow removal.
- **Accommodate On-Street Parking/Loading**. Qualitative assessment of an alternatives potential to accommodate on-street parking or loading zones or the alternatives impact to these considerations.

Ultimately, Public Works developed 9 conceptual design layouts that were further evaluated and presented to the public and project stakeholders.

The selection of the preferred design alternative was a result of public input, a detailed traffic operation analysis, and a safety evaluation.

Public Involvement

Extensive public involvement occurred to develop the project. The public participation efforts included presentations made to key downtown stakeholders, workshops with the Minneapolis Bicycle Advisory Committee (BAC) and general public meetings. The following outlines the public participation:

- Minneapolis Bicycle Advisory Committee presentations on October 1, 2008, November 12, 2008 and February 4, 2009.
  - October 1, 2008. Meeting held to discuss the Hennepin Avenue Bicycle Planning project and to present the conceptual layouts.
  - November 12, 2008. Meeting held to present the recommended alternative concept design layouts and specific design elements included for Hennepin Avenue and 1st Avenue. The BAC motioned to approve the preferred alternatives. The motion carried eight votes to one.
  - February 4, 2009. Meeting held to provide an update on the recommended alternative design layouts and to discuss the evaluation of options to improve connections to other major bikeways at the northern and southern ends of the Downtown (2nd Street N and 12th Street N, respectively). The BAC approved the recommended connection alternative unanimously.
- Downtown Transportation Management Organization presentation on October 23, 2008.
- Hennepin 2010 Partners presentation on October 30, 2008.
- Warehouse District Business Association presentation on November 11, 2008.
- Downtown Bar Owners presentation on November 18, 2008.
- The Downtown Council presentation on November 26, 2008
- Block meetings: A series of block meetings (two blocks per meeting, 12 meetings in total) were conducted between October 16 and October 28, 2008. The purpose of the block meetings was to provide an opportunity for individual business owners, adjacent property owners or property managers to ask questions or discuss specific issues relating to their block.
- Public meetings. Three large group public open houses were held over the course of the Bicycle Plan and in coordination with the Two-Way Conversion Project. The public open houses were held on the following dates:
  - October 8, 2008 (Information Meeting)
  - October 21, 2008 (Information meeting)
  - December 3, 2008 (Recommended Alternative)

Traffic Operations

A key of objective of the 2007 Downtown Action Plan was to provide concepts that provide acceptable traffic operations, or at a minimum operate under similar conditions as the one-way configuration. Public Works evaluated the nine design alternatives using VISSIM traffic analysis software. The simulation model was used to best replicate the interaction between buses, bicycles, vehicles and pedestrians as they relate to the operation capacity of the corridor. The key conclusions include:

- Every design alternative included a few problem intersections under two-way operation. In effect, Hennepin Avenue and 1st Avenue are expected to balance out to their peak hour capacity.
- Left turn lanes on Hennepin Avenue are critical to accommodating the downtown circulation patterns.
- A three lane section on Hennepin Avenue cannot work without significant motor vehicle delay and congestion. The analysis concluded that two lanes in each direction, plus left turns are required to accommodate the traffic demand.
- A minimal capacity difference was found between providing a 5-lane section with general traffic in the right lane or marking the right lane as a right turn/bus and bike only lane. The frequency of bus service, bus stops and right turn delay incurred by waiting for pedestrians significantly reduces the capacity of this right lane.
- On 1st Avenue, left turn lanes were not found necessary; however, four moving lanes are required to accommodate peak hour traffic volumes.
- Four lanes or more would be necessary to accommodate event traffic circulation.
- During off peak periods, the traffic analysis found that a 3-lane section (2 lanes plus appropriate turning and/or bypass provisions) would be sufficient between 9 AM and 3 PM and after 6 PM (non-event days).

Safety Evaluation

The conversion from one-way to two-way operation introduces added conflict points, thus increasing the probability of incidents. Most typical crash type increases expected under two-way operation include right angle, left turn and sideswipe/lane changing. Another key element is the ability to safely integrate a bicycle facility in the midst of two-way traffic. To address bicycle safety, the existing Hennepin Avenue and 1st Avenue crashes were evaluated (2004-2008 data). The evaluation found the following:

- 38 total vehicle/bicycle crashes
- 31 of the 38 occurred on Hennepin Avenue between 1st and 12th Street.
- 84% of the 31 crashes were left turn related with over half of these being directly related to the left hook (i.e., bicycle approaching from behind the motorist out of their field of vision and the motorist turning in front of the bicycle).

In evaluation of the design alternatives, and working with the stakeholders, the following key safety considerations in relation to bicycle facilities were considered:

- The left hook and left squeeze (vehicle encroaching into bike lane and forcing bicyclist to react left or right) is the primary concern with center running bicycle lanes. The bicycling community voiced this as a significant concern.
- The right squeeze at bus stop locations was a primary concern on Hennepin Avenue. Given the bus volume and number of bus stops, several stakeholders voiced this issue as a significant concern, if not fatal flaw to providing curb side bicycle lanes on Hennepin Avenue.
- Public Works experience with one way streets and one-way bicycle lanes expected the occurrence of wrong way bicyclists to be a significant concern with any option

containing one-way bicycle lanes on two-way streets (i.e., northbound bike lane on Hennepin Avenue and southbound bicycle lane on 1st Avenue).

These safety concerns and others were qualitatively assessed with each design alternative and contributed greatly to Public Works design recommendations.

Recommended Alternative

Public Works presented the recommended alternative to the public on December 3, 2008 with slight updates presented to the BAC in February 2009. The design recommendations as implemented in October 2009 are summarized below:

Hennepin Avenue

The evaluation weighed all the design, operation and safety evaluation, including public feedback. Given the design characteristics and considerations two key conclusions were made:

- Left turn lanes are required.
- Two moving lanes, plus a left turn lane is required to accommodate the traffic and transit volume demands.

Considering the street width and the transit and vehicle operation needs, Public Works did not believe exclusive bicycle lanes could be safely implemented on Hennepin Avenue and still meet City and Mn/DOT MSA design standards. Therefore, the recommended design for Hennepin Avenue was a shared lane bicycle facility with a signed bus, bike and right turn lane. The design best met the project objectives in comparison to the other alternatives and was recommended based on the following:

- Balances the motor vehicle operation and marks the roadway consistent with how the predominate number of motorists are expected to utilize or operate on Hennepin Avenue.
- Improves vehicle safety by minimizing lane changes and weaving around stopped buses.
- Provides exclusive left turn lanes and maintains the intended access/circulation through downtown in serving the business community.
- Expected to improve bicycle safety by promoting awareness and two-party responsibility between both the motorist and the bicycle.
- Improves transit service and operation by reducing motor vehicle conflicts.
- Reduces bicycle conflicts with curbside uses and transit stops by delineating the bicycles to the left.
- Removes bicycles from conflicts with same direction left turning motor vehicles.
- Encourages a “complete street” or “complete corridor” approach to the transportation system when considering 1st Avenue and Nicollet Mall. Three different facilities will be provided to serve the varying skill levels of all bicyclists traveling through downtown.

- Provides continuity and consistent bicycle alignment along both directions of Hennepin Avenue in transitioning southwest of 12th Street and transition across the Hennepin Avenue Bridge into northeast Minneapolis.
- Does not require special pavement rehabilitation or snow removal maintenance activities.
- Meets MSA design standards and minimum lane width requirements on all block segments.

1st Avenue

The design considerations and characteristics of 1st Avenue present a difficult challenge. 1st Avenue is 56 feet wide and based upon the project objective and traffic operation analysis the design needed to include:

- Bicycle lanes
- Maximize On-street parking
- Provide the flexibility for four travel lanes in accommodating peak hour and event traffic demands.

In consideration of these items, the traffic/safety evaluation, public input and other design considerations, Public Works recommended the installation of curbside bicycle lanes, with an offset managed parking/peak hour drive lane. The design met the project objectives and best balanced the competing demands. Other prevailing factors in the recommendation include:

- Best balances the lane use demands between peak hour, off peak and event traffic demands. In other words, the design provides for the greatest flexibility to maximize traffic capacity when needed and to utilize the pavement for other uses (parking) during off peak periods when not needed.
- Maximizes the on-street parking to serve the business community.
- Enhances curbside activity by reducing the conflicts with general traffic.
- Provides for a traditional four-lane roadway with curb side bicycle lanes during the heaviest traveled periods (bicycles and motorists).
- Minimizes the potential for door zone bicycle crashes. Traditional bicycle lanes (adjacent to narrow parking and drive lanes) result in the bicyclist traveling in the driver side door zone or as an alternative in the vehicle moving lane. The 1st Avenue design places the bicycle on the passenger side, which has a much less probability of door openings. In addition, the bicyclist can escape towards the curb instead of a moving travel lane.
- Provides for a better accommodation for Type B and Type C bicyclists than traditional lanes by providing separation from the moving travel lane or parking protected bicycle lane. A subset goal of the conversion was to increase bicycling in downtown. Providing a facility that has the potential to be more comfortable to riders other than the Type A cyclists progresses in that direction.
- The parking protected bicycle lanes are expected to result in a safer design and a reduction in conflicts between bicycles and motorists.
- The offset parking lane provides a sense of increased pedestrian space and an improved environment for sidewalk cafes'.

- Providing the bicycle lanes on 1st Avenue in combination with the shared bicycle facility on Hennepin Avenue and the full time access to Nicollet Mall, the north/south bicycle movements on western end of downtown have improved access to all connections and destinations. In addition, direct bicycle access can be provided to Target Field and Target Center.
- The design met the City and Mn/DOT MSA lane width standards allowing Public Works to meet the fall 2009 implementation schedule.

Any other option, without placing bicyclists down the center of the roadway would result in the loss of a vehicle lane, the loss of on-street parking or the loss of bicycle lanes. At the time of the design process, these trade offs were not deemed acceptable.

Phase 1 Implementation

Traffic Signals

The 1st phase of this construction was to modify the 24 traffic signals located within the project limits to accommodate 2-way traffic. The modification of the traffic signals not only included the addition of traffic signal indications for both directions of travel, but also countdown pedestrian signal indications and overhead signal mast arms that extend across the road for better visibility and safety improvement. Foundations and wiring also needed to be installed to accommodate mast arms and additional signals. The traffic signal work was to be completed, before any striping work could be done as two-way traffic would need to have signal indications in both directions. This work was the most substantial part of the project. This work still continues with 1st Avenue being substantially complete and Hennepin Avenue being approximately 75% complete. The traffic signal work was approximately $1.9M.

Pavement Seal Coat and Intersection Improvements

While the signal work was progressing, Public Works seal coated Hennepin and 1st Avenues for the purpose of eliminating existing pavement markings in preparation for the new pavement marking configuration. As part of the seal coat work, a special red tinted rock was used to identify the bike lanes on 1st Avenue. This work was 100% complete in August of 2009. The seal coat work was approximately $118,000

There were two intersection improvements at 9th and 12th Streets. At these two intersections changes were made to realign the 9th Street intersection and allow northbound movements at 12th Street. These intersection improvements was approximately $1.5M

Signs and Pavement Markings

The new pavement marking configuration would include bike lanes, shared lane markings, messages, and bike boxes. The seal coating of the roadway also allowed bike lanes on 1st Avenue N. to be identified with a special seal coat chip color. Once the seal coat was completed, the City installed temporary pavement markings that could manage traffic until the signal work was completed to the point where one-way traffic could be converted to two-way. In October of 2009, once all the previous work was

completed to the point where two-way traffic could be accommodated, the roadway was striped and signed. The striping and signing of both Hennepin and 1st Avenue N. was completed in one day. This work included the installation of shared lane markings, bike boxes, crosswalks, bike lanes, traffic lanes, and 350 Signs. Immediately after the striping and signing was done, the roadways were opened to two-way traffic. These efforts were approximately $79,000.

Dynamic Parking Lane (DPL)

The DPL was not part of the Hennepin/1st Project Scope. As part of the Target Field Ballpark Traffic Action Plan, Public Works installed overhead dynamic message signs along 1st Avenue for the purpose of displaying parking and way finding information in coordination with events. The DPL system was fully operational starting mid-May of 2010. The installation included 23 signs and structures for mounting the signs as well as internal wifi modems for communicating to a central location. The DPL effort was approximately $632,000 and was funded by another budget.

Phase 1 Status

Phase I is not yet complete and traffic signal work continues on Hennepin Avenue. In addition, data collection and evaluation are part of the Phase 1 efforts. Based on this evaluation Public Works would develop and implement further refinements as part of Phase II.

Phase 1 Data and Evaluation

The City has gone through an extensive evaluation of Hennepin and 1st Avenues to gauge the effectiveness of the new configuration as it pertains to safety, bicycling, operations, and parking. The summarized data illustrates the effectiveness of the Project and the benefit to roadway users.

Summary of Public Comments

Listed below are the most common comments received by the public since the two-way conversion was implemented:

- Confusion occurs with utilizing the parking lane as a traffic lane
- 1st Avenue N and 5th St signal operation causing delay on 1st Avenue
- Traffic volume weighted substantially in southbound direction
- 11th Street at 1st Avenue has increased congestion during the pm peak due to left turns.
- Weekend night traffic operations degraded from one-way alignment
- Bike lane is located too close to passenger side door zone
- Snow removal is concern. Bike lane is rendered useless during winter months
- Bike lane should be colored to provide additional visual delineation
- New bicycle facilities create confusion and possible safety concerns for bicyclists
- How do wheelchair accessible vehicles load and unload on 1st Avenue.
- Deliveries (loading/unloading in bike lane)

Data and Evaluation

This section contains summarized data relevant to evaluating the operation of the Hennepin/1st Two-way Conversion Project. The summarized data includes:

Charts and Tables

Charts 1A-1D	Bicycle Volumes
Charts 2A-2C	Traffic Volumes
Charts 3A-3B	Hennepin Avenue Origin/Destination Study
Table 4	Traffic Operational Efficiency Study
Chart 5A-5B	Bicycle and Vehicular Crashes
Chart 6	1st Avenue Offset Parking Compliance
Table 7	1st Avenue On-Street Parking Spaces
Chart 8	Warehouse District On-Street Parking Meter Collections
Table 9	1st Avenue Parking Restriction Tows

Chart 1A-1D Daily Bicycle Volumes

Chart 1A

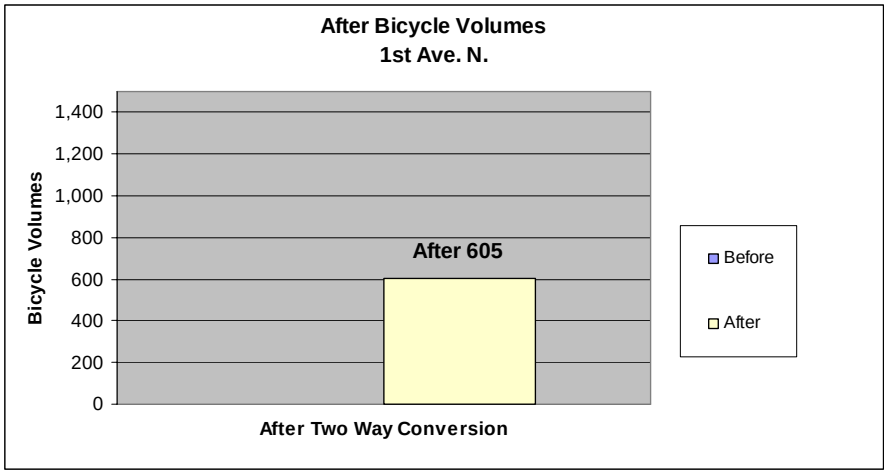


Chart 1B

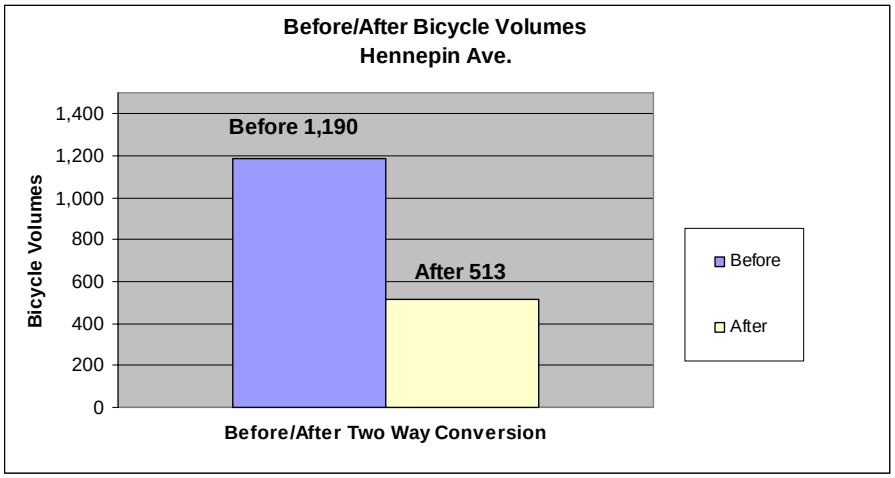
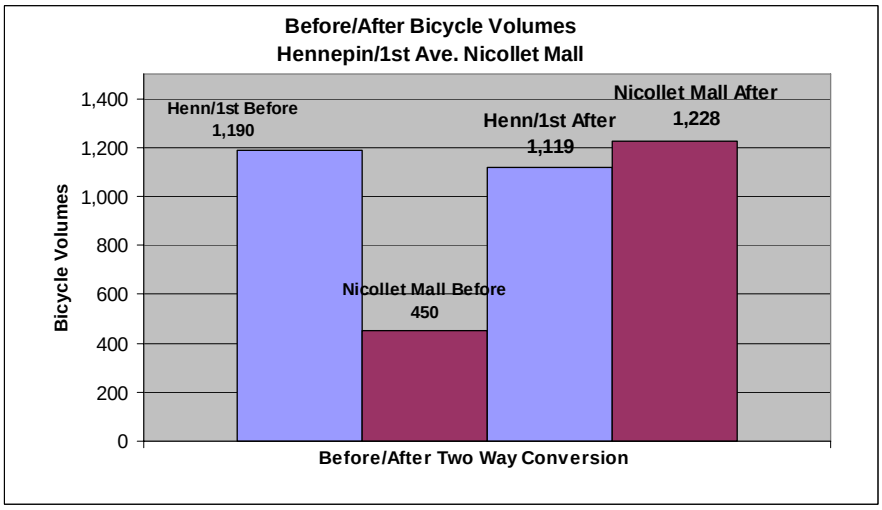


Chart 1C



In March of 2010 bicycling restrictions on Nicollet Mall were removed as part of the Marquette and 2nd Avenue project. The increase on Nicollet Mall is due to bicyclists shifting from Hennepin, Marquette and 2nd Avenues South.

Public Works is in the process of collecting additional bicycle counts on Marquette and 2nd Avenues.

Chart 1D

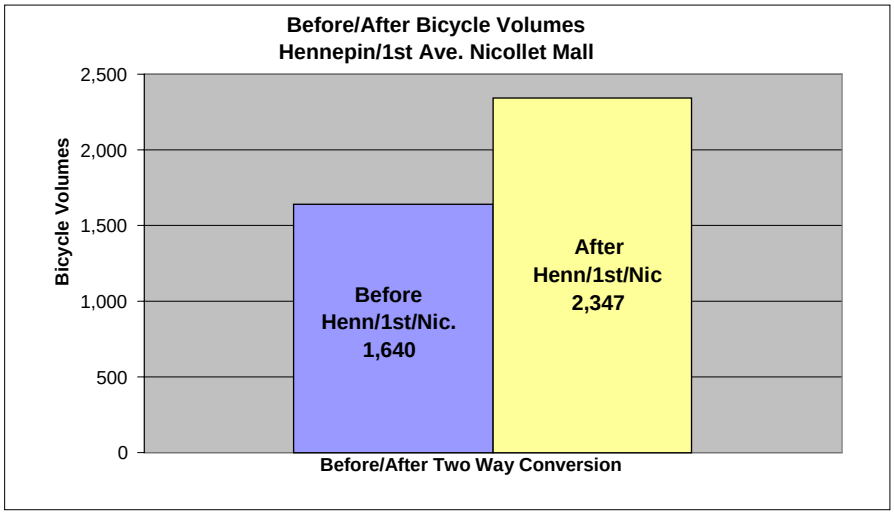


Chart 1D factors the before and after numbers with Nicollet Mall, Hennepin and 1st Avenues. The tabulation of bicycle volumes of all three roadways provides indicates an increase in bicycling of 43%.

Charts 2A-2C
Traffic Volumes Hennepin and 1st Avenues.
Average Daily Traffic

Chart 2A

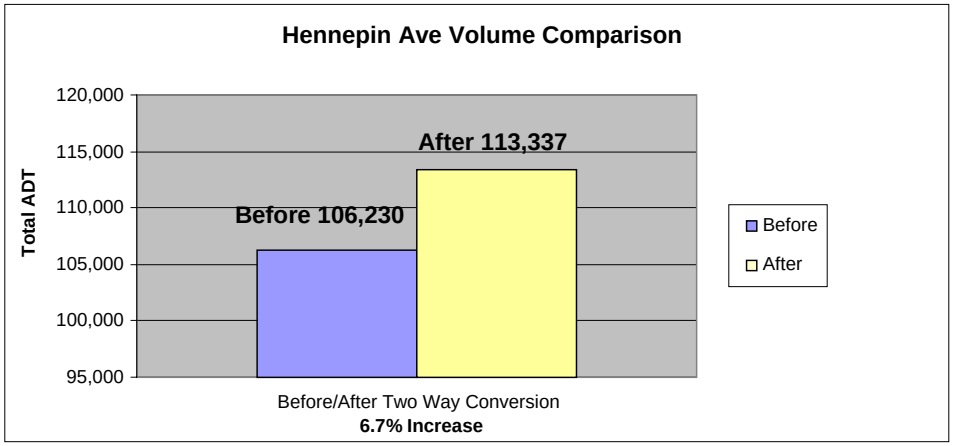


Chart 2B

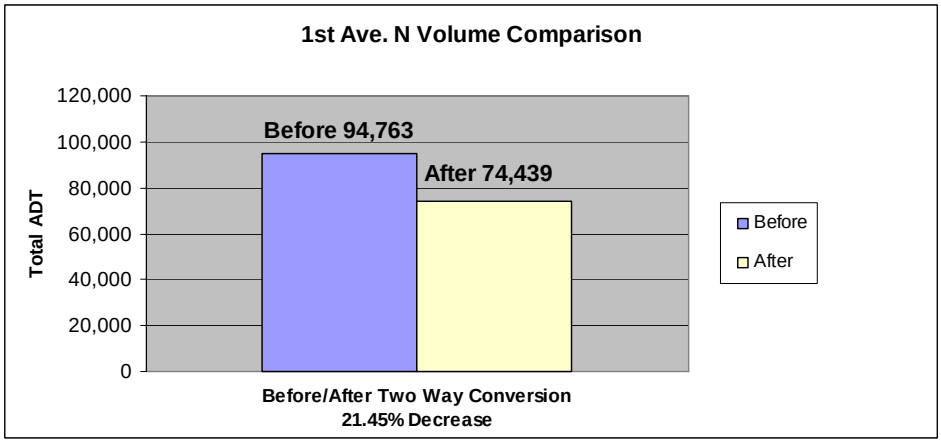


Chart 2C

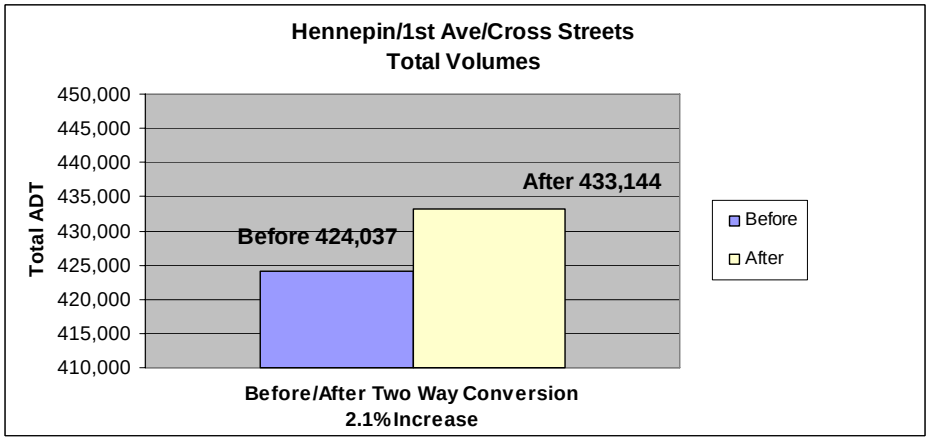


Chart 2A indicates a decrease on 1st Avenue, with a corresponding increase on Hennepin Avenue (Chart 2B). Looking at only Hennepin and 1st Avenues is only part of the picture. An area approach to examining the traffic volumes accounted for the intersecting east/west cross streets in addition to Hennepin and 1st Avenues. Chart 2C indicates an overall increase when cross street volumes are included. This is a good indication that traffic is circulating to achieve their shortest trip route.

Charts 3A-3B
Hennepin Avenue Origin/Destination Study

Chart 3A

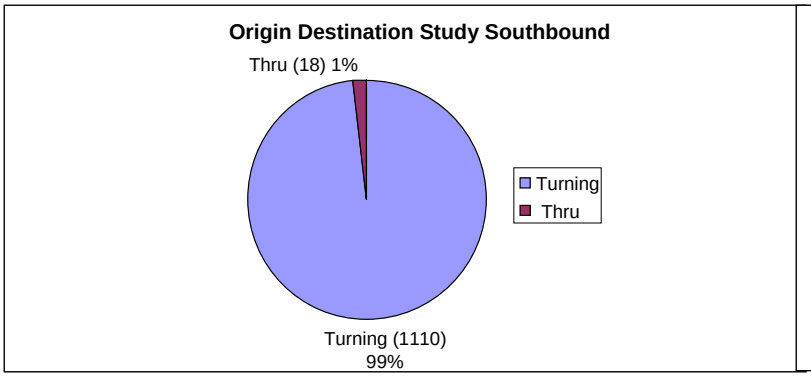
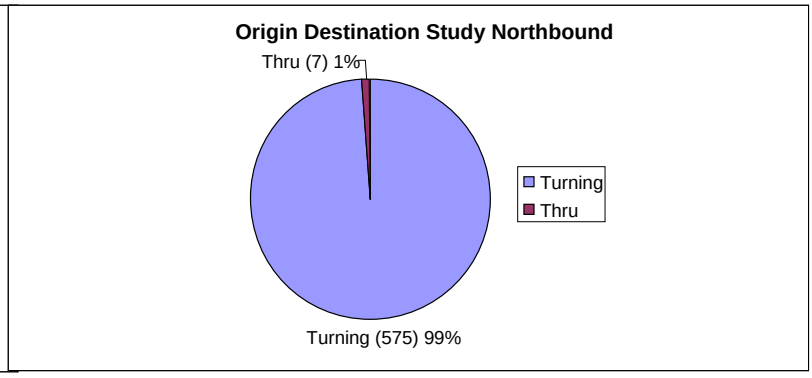


Chart 3B



Charts 3A and 3B indicates that 99% of auto traffic entering Hennepin Avenue from the south at 12th Street and from the north at 2nd Street, are at some point turning on to the cross street. This Study indicates the characteristics of Hennepin Avenue are providing more benefit as a two-way street serving access and movement downtown and not as a through street.

Table 4
Intersection Operational Summary for Hennepin and 1st Avenues

Before 4 Total Intersection Operational Failures	AM Peak	Hennepin and 4th LOS F Hennepin and 8th LOS E
	PM Peak	Hennepin and 7th LOS E 1st Ave. N. and 3rd LOS E
After 2 Total Intersection Operational Failures	AM Peak	Hennepin Ave. and 8th LOS E
	PM Peak	1st Ave. N. and 3rd St. LOS E

Note: Only for Hennepin and 1st Avenues in the study area. Other intersections upstream and downstream plus other intersections in downtown may be congested or have LOS E/F conditions,

Table 4 indicates that traffic operation efficiency has been maintained on these two streets. Based on the street capacity characteristics, assumptions can be made that traffic efficiencies are typically gained by converting two-way streets to one-way operation. However, the need for access and proper circulation, especially on Hennepin Avenue, has corresponding operational benefits with a two-way operation. This access and circulation is a key element in this resulting operational summary which maintains the corridor's efficiency at the level they were prior to the conversion. The data indicates that comparing roadway volume to roadway capacity, there is an improvement in operations based on service level thresholds. While the volumes went up 2%, the level of service stayed the same or slightly decreased. However, if all intersections are considered, regardless of thresholds, the conclusion is that the roadways are maintaining operational efficiency as compared to before the conversion..

Charts 5A-5B Crash Data
Chart 5A
Bicycle crashes before and after the conversion of Hennepin and 1st Avenues

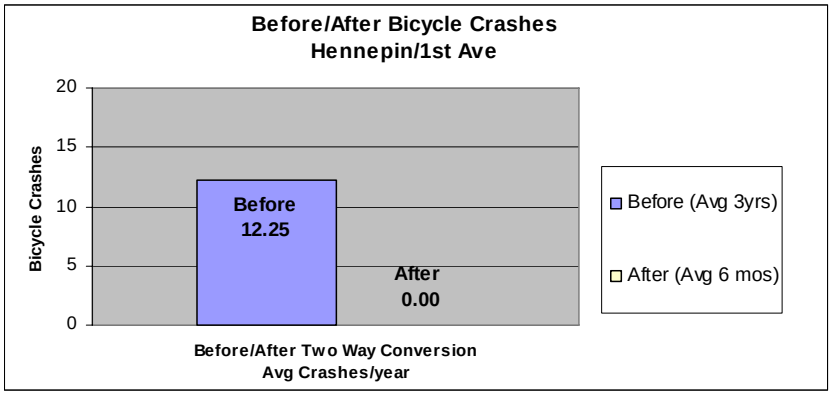
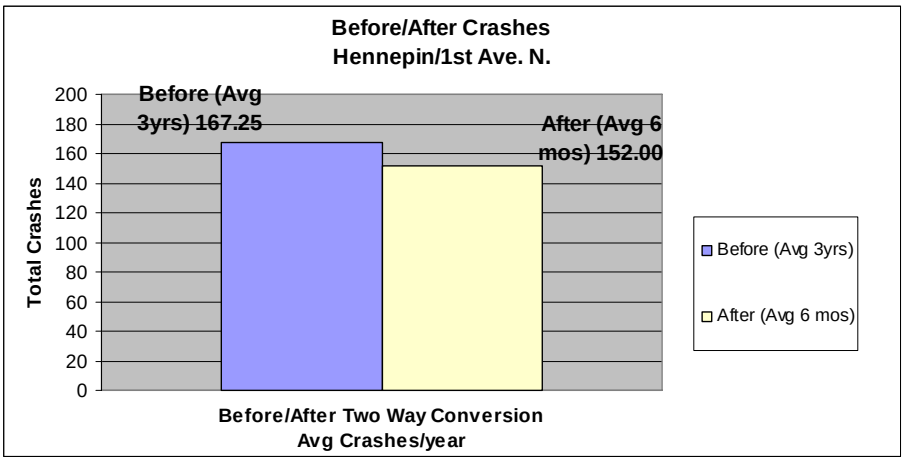
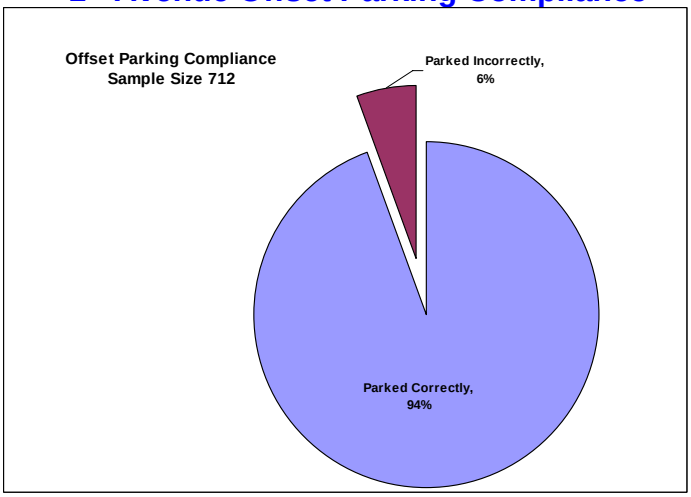


Chart 5B
Total crashes before and after the conversion of Hennepin and 1st Avenues



Bicycle crashes, as indicated in Chart 5A, have decreased dramatically since the conversion. Typically, three years of before and after crash data should be tabulated to base a conclusion. However, the current trend is definitely a benefit. Total crash volume on Hennepin/1st indicated in Chart 5B also indicates a downward trend which again is a good sign on the benefit of the conversion. Public Works will continue to monitor crashes for these two streets.

Chart 6
1st Avenue Offset Parking Compliance



The element of the Project that required the most education was the 1st Avenue offset parking configuration. Chart 6 is a sample of parking data since November of 2009. The data collected interprets an incorrect parker as at least one wheel parked on the double line. As indicated in the chart, compliance has been positive with 6% of parked vehicles being out of compliance.

Table 7
1st Avenue On-Street Parking Spaces

Time	Cross Streets	Spaces Before	Spaces After
Off Peak Period	2nd to 8th	117	95
	8th to 12th	28	7
Peak Period	2nd to 8th	117	6
	8th to 12th	28	7

Chart 8
Warehouse District On-Street Parking Meter Collections

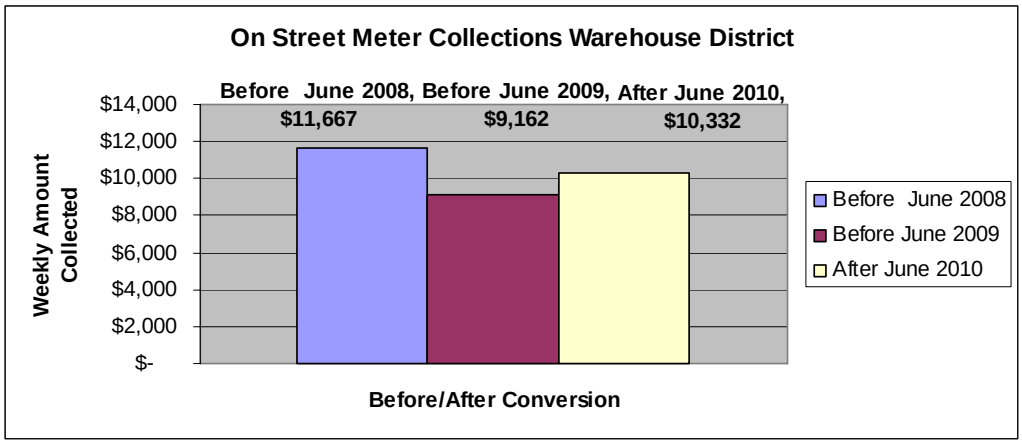


Table 7 shows the reduction in on street parking spaces from before to after the conversion along on 1st Avenue between 2nd and 12th Streets. Chart 8 provides a tabulation of the meter collections in the warehouse district. The before data includes one week in June of 2008 and 2009 plus the after tabulation includes a week in June of 2010. Considering the reduction in on street parking spaces on 1st Avenue N., the Warehouse District is remaining consistent in parking collections, which indicates parking usage is being retained.

Table 9
1st Avenue Parking Violation Tows

Year	Month	Violation		
		10pm-7am No Parking	4 – 6 pm No Parking	7 – 9 am No Parking
2009	Oct	18	23	12
	Nov	5	31	14
	Dec	0	47	13
	3 month total	***23***	***101***	***39***
2010	Jan	18	45	11
	Feb	9	42	10
	March	14	71	19
	3 month total	***41***	***158***	***40***
	Apr	2	40	7
	May	5	22	13
	June	4	25	7
	3 month total	***11***	***87***	***27***

The data contained in Table 9 indicates a higher tow rate for the afternoon peak period restriction than other times. The last three months tabulated indicate a downward trend in the number of tows. Public Works attributes the reduction to better understanding by the public and the operation of the Dynamic Message Signs. These dynamic signs supplement the traditional static parking signs with overhead electronic messages. These messages are mostly displaying on-street parking information.

Phase 1 Summary and Conclusions

In summary, the benefits of the Hennepin/1st two-way conversion are demonstrated by the data tabulated to this point. The project goals to:

- Increase Bicycling in Corridor,
- Improve Vehicle/Bicycle Safety,
- Maintain Capacity, and
- Improve Access/Circulation

have all been achieved as indicated in the charts and tables above. The data indicates:

1. There has been an increase in bicycle ridership
2. A decrease in bicycle crashes (and total crashes)
3. Traffic efficiency has been maintained
4. Access/circulation has increased in the area of the conversion.
5. There is still some confusion with regard to the parking restrictions on 1st Avenue but there is a trend towards fewer tows.
6. On street parking usage has been maintained in the warehouse district.

7. There is a 94% compliance of the offset 1st Avenue parking lane.

Evaluation will continue, however the City will implement project refinements, including repainting the streets, with confidence that the data obtained to this point indicates the success of the project in meeting the Access Minneapolis goals and will continue to provide benefits to all transportation users now and in the future.

Phase 2 Implementation

For discussion purposes and for this report, the project completion efforts are defined as Phase 2. The Phase 2 refinements are being brought forward based on the Phase 1 evaluation. These refinements will improve the project operations, safety, and the public understanding and use of the two streets. Phase 2 does not jeopardize nor compromise the integrity of the project. Public Works will implement these refinements in late July or early August 2010.

The original Project design contained striping and parking configurations based on the traffic information and traffic modeling completed in the design phase. Hennepin and 1st Avenues have now been in operation as two-way streets for 8 months. With the evaluation data tabulated in the previous section, it is apparent that some refinements to the original design can take place that would be a benefit to roadway users and adjacent properties.

1st Avenue

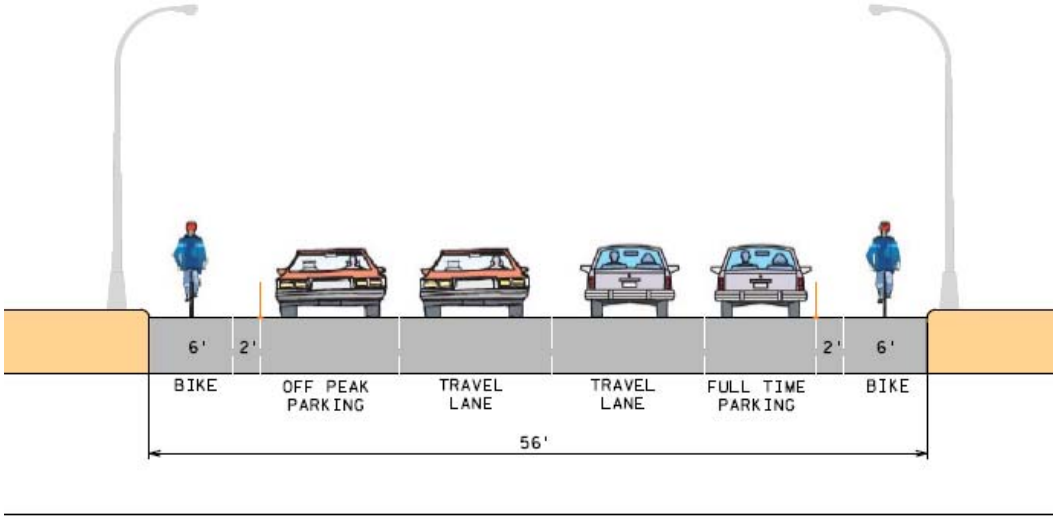
The opportunity to improve the original design is based on the low vehicular volumes in the northbound direction on 1st Avenue.

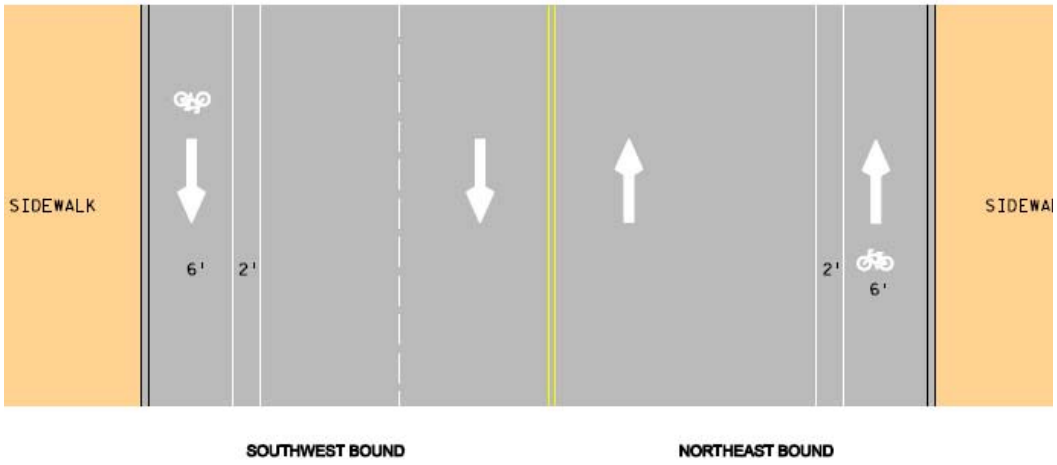
The northbound lane use on 1st Avenue was initially estimated on an assumed equal balance of traffic volumes between Hennepin and 1st Avenues. This balance resulted in an original northbound lane configuration of two lanes of travel in the am and pm peak traffic periods. The actual traffic volumes tabulated in the spring of 2010, now indicate that northbound 1st Avenue can operate with one lane at all times of the day.

In the Summary of Public Comments section of this report, it was stated that the width of the bike lanes was inadequate from two perspectives: 1) The bike lane width and the proximity of parked vehicles exposed bicyclists to “dooring” and 2) ADA wheelchair accessible vehicles that park and unload/load via a lift system, do not have enough clearance between the edge of the parking lane and the curb to complete this task. Eight feet is needed to lower the wheelchair lift and allow for maneuvering. The bike lane presently provides for six feet. Also within the comment section, confusion was an issue with the intermittent parking/travel lanes and about getting a parking ticket for a wheel on the double white lines.

Public Works, in order to mitigate issues received through public comments and considering that northbound volumes do not result in the need for two travel lanes in the AM or PM peak periods, will implement the below Phase 2 refinement configuration for 1st Avenue.

Refinement for 1st Avenue
Washington Ave. N to 8th St. N.





Application in Portland OR.

This refinement changes the existing layout by:

- Converting the right hand northbound travel lane to a parking lane not restricted during am and pm peak periods
- Creating two foot buffer zones on each side next to the bike lane
- To enhance this lane configuration, channelizing delineators ("Candlesticks") will be installed seasonally for additional guidance and barrier between vehicles and bicyclists.

This refinement benefits:

- Bicyclists with greater separation from travel and parking lanes to improve safety and reduce the "dooring" potential
- Wheelchair users have greater ability to load and unload from the parking areas
- Businesses have 50 more parking spaces that are available during peak periods.

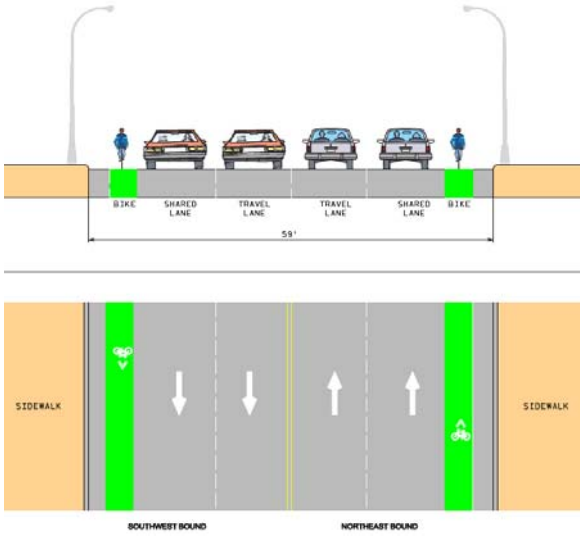
Public Works is confident that this refinement is a betterment that would have little to no degradation to the Project objectives. At the time of these refinements on 1st Avenue, Public Works will repaint the bike boxes, bike symbols, roadway striping and adjust any street signs.

Hennepin Avenue

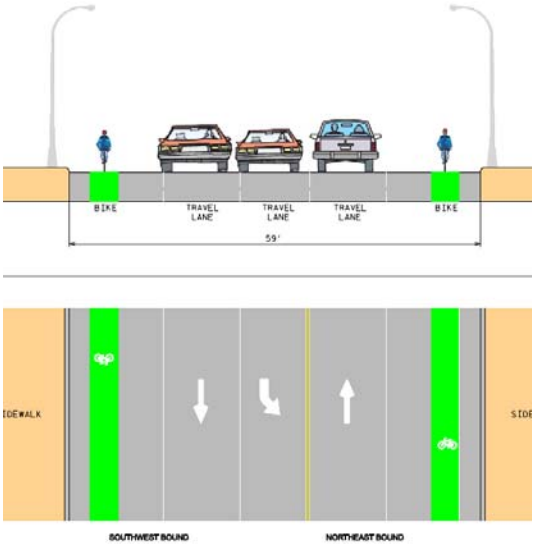
The public comments on the operation of Hennepin Avenue have been focused on traffic signal operation, offset travel lanes, and clarity for vehicles and bicycles on sharing the road. Data collection has exposed no issues on Hennepin Avenue that necessitate any lane refinements. Considering public comments to date, Public Works has installed four left turn signals on Hennepin at 3rd, 4th, 6th and 8th streets. To provide more clarity on the right hand shared lanes on Hennepin Avenue, Public Works is proposing the below striping refinements to the Hennepin Avenue Corridor,. In addition, Public Works will add lane striping through the intersections for improved transitions between offset lanes.

Refinement for Hennepin Avenue
Washington Ave. N. to 12th St.

4 lane-section with no left turns



5 lane-section with left turns



Shared Lane Application in Long Beach CA.

The revised roadway striping includes:

- Enlarging the “bus, bike, right turn” pavement text
- Adjustments to placement of the shared lane marking that better indicates where the bicyclist should ride
- Adding green color to the shared lane enhancement to provide clarity on where bicycles should best ride and to further emphasize the shared nature of this right hand lane.

Typical blocks and a Long Beach photo are shown above, this enhancement includes a green shared lane background in conjunction with the white shared lane symbol. Because this type of treatment is not included as part of the Federal Manual on Uniform Traffic Control Devices, Public Works has submitted an application and received approval from Federal Highway Administration (FHWA) experiment with this green treatment.

Because this green treatment is experimental, Public Works will continue to monitor and evaluate its effectiveness. Based on this future evaluation, Public Works will consider on an annual basis whether to continue its application.

At the time refinements are installed on Hennepin Avenue, Public Works will repaint the other roadway striping and adjust any street signs.

Schedule for Implementing Refinements

Phase 2 refinements are striping and sign modifications, which can be completed in a timely manner. Public Works will start immediately to make these refinements with completion anticipated in July or early August 2010.

Public Works welcomes the opportunity to listen and understand your comments and feedback on the Hennepin and 1st Avenue Two-Way Conversion Project. Public Works understands there may still be some concerns by the disability community and others and we will continue to have discussions. The City encourages interested parties to review this Evaluation Report, experience the new refinements to the project and then contact us. There are several ways to share your thoughts and provide input:

- call 311
- Project Web site -- http://www.ci.minneapolis.mn.us/hennepinfirst/index.asp