



Request for City Council Committee Action From the Department of Public Works

Date: April 29th, 2009

To: Honorable Sandra Colvin Roy, Chair Transportation & Public Works Committee

Subject: **Roundabout Feasibility at Chicago Av and 9th St E Intersection**

Recommendation:
Receive and File

Previous Directives:

- February 20, 2009, Council Resolution 2009R-073 requesting the sale of assessment bonds for the reconstruction of Chicago Av S (Franklin Av to 25th St E and 26th St E to 28th St E)
- February 20, 2009, Council Resolution 2009R-072 ordering the work to proceed and adopting special assessments for Chicago Av S Project – Phase II
- February 6, 2009, Council Resolution 2009R-049 ordering the City Engineer to abandon and remove areaways within the public right-of-way in conflict with the street improvement project
- February 6, 2009, Council Resolution 2009R-048 ordering the City Engineer to install parking restrictions along Chicago Av S between Franklin Av and 25th St E and 26th St E and 28th St E.
- December 12, 2008, Council Resolution 2008R-572 designating Phase II of street improvement project
- November 7, 2008, Council adopted Resolution 2008R-512 approving the layout of Chicago Ave S 14th St E to 25th St E and 26th St E to 28th St E
- October 10, 2008, Council adopted Resolution 2008R-445 amending the 2008 Capital Improvement Appropriation by \$25,000 for construction of a pedestrian flasher at Children's Hospital, paid by Children's Hospital.
- May 2, 2008, Council adopted Resolution 2008R-174 ordering the City Engineer to install parking restrictions along the 2500 block of Chicago Av S.
- May 2, 2008, Council adopted Resolution 2008R-173 requesting the sale of assessment bonds for the reconstruction of the 2500 block of Chicago Av S.
- May 2, 2008, Council adopted Resolution 2008R-172 ordering the work to proceed and adopting special assessments for the 2500 block of Chicago Av S.
- April 4, 2008, Council adopted Resolution 2008R-129 designating the Chicago Av street improvement project (25th St E to 26th St E).
- April 4, 2008, Council adopted Resolution 2008R-128 requesting the Board of Estimate and Taxation to reallocate Net Debt Bonds
- April 4, 2008, Council adopted Resolution 2008R-127 amending the 2008 Capital Improvement Appropriation Resolution to include finds for the reconstruction of Chicago Av (25th St E to 26th St E)

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Approved by:

Steven A. Kotke, P.E., City Engineer, Director of Public Works

Presenters: Ole Mersinger, Project Engineer, Transportation Planning and Engineering

Reviews

Permanent Review Committee (PRC): NA

Civil Rights Approval NA

Policy Review Group (PRG): NA

Financial Impact

No financial impact

Community Impact

Neighborhood Notification: Property Owners and the Neighborhood have been involved in numerous discussions involving a potential Round-a-bout over the past year.

City Goals:

Comprehensive Plan:

Zoning Code:

Background/Supporting Information

At the October 28th, 2008 Transportation and Public Works Committee (T&PW) meeting, Public Works requested layout approval of roundabout at the intersection of Chicago Av S and 9th St E. This committee requested that staff report back on the feasibility of placing a roundabout at the intersection. This letter is a summary of the evaluation of placing a roundabout at the intersection versus a signalized system. The current intersection is an obtuse intersection with 5 legs to Chicago Av S, 9th St E, and Centennial Place. In the mid-1980s, Public Works acquired additional right-of-way to align Chicago Av as it exists today.

In evaluating the feasibility of a roundabout, Public Works conducted meetings and discussions with various stakeholders, completed a present worth cost evaluation, and evaluated the engineering effectiveness in terms of safety, aesthetics, uses by alternative transportation modes, and future changes to traffic patterns.

Stakeholder Positions

- Elliot Park Neighborhood Inc: The Elliot Park Neighborhood Inc (EPNI) had a traffic circle at this intersection as part of their August 2002 Master Plan. At this time, EPNI has indicated that a roundabout is not a desired gateway element. They have expressed concerns over pedestrians crossing Chicago Av and 9th Street in a roundabout option and would much rather see designated pedestrian signals.
- Hennepin County Medical Center: Hennepin County Medical Center (HCMC) indicated concerns about emergency vehicles able to maneuver through a roundabout and the lack of preemptive signals found at signalized intersections. They expressed concerns about the safety of their emergency crews and ability to perform adequately while maneuvering through a roundabout. Public Works provided information on roundabouts by other emergency facilities across the country and information of roundabouts in the metro area that would be somewhat similar to the proposed roundabout. HCMC indicated they have driven one roundabout and they had more concerns which they have not yet provided Public Works.

- **Pedestrian Advisory Committee:** The Pedestrian Advisory Committee was generally not in favor of a roundabout. They felt that it would be safer for pedestrians if there were pedestrian signals to assist in crossing the intersection. Concern was also expressed that a roundabout would encourage pedestrians (in particular college students) to cut through the middle of the intersection.
- **Allied Parking, Inc:** Allied Parking indicated a concern in being located next to a roundabout and that it would cause traffic to back up into their facility and motorists would be unable to locate their establishment.
- **Other Property Owners/Users:** Other Property Owners both in and outside the Elliot Park neighborhood have expressed mixed opinions of placing a roundabout at this intersection. While some individuals liked the idea, others were concerned about a roundabout being placed in a downtown urban setting, pedestrian and bicycle movements through a roundabout and safety for these users. Skepticism was also expressed about having a streetcar passing through it.
- **City of Minneapolis Street Maintenance:** The Street Maintenance Department in Public Works would be responsible for the maintenance of a roundabout, roadway maintenance and snow/ice removal. A roundabout would not cause any special maintenance problems in comparison to a signalized intersection other than the annual maintenance costs to maintain a green space within the center of the roundabout.
- **MNDOT State Aid Office:** The MNDOT State Aid Office is charged with approving Municipal State Aid roadway plans. The Chicago and 9th intersection would need to meet the criteria set forth by MNDOT design guidance.

Cost Evaluation

Public Works completed a cost evaluation of the option of constructing a roundabout and a traffic signal system at the Chicago Av S and 9th St E intersection. Significant cost differences are as follows:

| Item | Roundabout Intersection | Traffic Signal System |
|---|-------------------------|-----------------------|
| Additional Construction Costs (Curbing, etc.) | \$30,000 | N/A |
| Approx Right-of-Way Costs | \$150,000 | N/A |
| Traffic Signal Capital Costs | N/A | \$170,000 |
| Temporary Signal during Construction | N/A | \$50,000 |
| Annual Traffic Signal Maintenance* | N/A | \$150,000 |
| Annual Right-of-Way Maintenance* | \$125,000 | N/A |
| Estimated Public Education | \$50,000 | N/A |
| Total | \$355,000 | \$370,000 |

* Total Future Maintenance Cost Calculation – Assuming 25 Years Lifespan

Over an assumed 25 year life span, it is assumed that the traffic signal will cost \$15,000 more to operate than the roundabout. This is not a significant cost difference.

Engineering Evaluation

- **Safety:** There are currently over 100 roundabouts constructed or in the process of being constructed in Minnesota. Roundabouts decrease the possibilities for vehicle crashes and eliminate serious head-on and right-angle crashes. The intersection of Chicago Ave S and 9th St E has had two recorded head on crashes in the past five years. A roundabout would eliminate this crash type. In addition, although vehicles don't stop at the intersection, the maximum vehicle speed is significantly decreased through the intersection. For a signalized intersection, vehicles will often speed up while approaching the intersection to "make the light". National studies have shown that the number of serious accidents at intersections decrease when a roundabout is installed.
- **Operational Effectiveness:** Roundabouts are functional in various scenarios. Roundabouts are located near hospitals in Burnsville and Las Vegas. They are also located adjacent fire departments such as De Pere, WI and Poipu, HI and are common in major commercial areas.

Public Works completed a computer model of the intersection using a roundabout and determined a roundabout functioned under normal traffic conditions. The roundabout functioned significantly better than a signalized intersection when calculating the Level of Service of both in accordance to MNDOT standards. The level of service refers to the amount of time, on average, a vehicle or pedestrian would find themselves waiting at the intersection. The signalized intersection had an average delay of over a minute during the afternoon rush hour. The roundabout had an average delay of less than 10 seconds during the same time period.

Public Works also completed vehicle and pedestrian counts before and after a Minnesota Vikings game in December 2008. This data was used to model the effectiveness of the roundabout being next to a parking structure that a number of sports fans parked at. It was determined that a roundabout actually allowed the parking garage to empty quicker and that pedestrians crossing the intersection caused most of the intersection delays in this scenario. Although extraneous events are not generally considered during design of a roadway, this effort was completed to demonstrate the effectiveness of the roundabout. Traffic from the parking garage during normal rush hour does not impede the effectiveness of the roundabout.

- **Aesthetics:** Roundabouts have been effectively used as community gateways at other neighborhoods/cities. Cottage Grove is one Minnesota city that has embraced this concept. Roundabouts efficiently move vehicles and decrease the amount of time vehicles spend idling at one location emitting air pollutants. Roundabouts can be landscaped to be aesthetically pleasing to those who pass by them. The City of Chicago has included roundabouts in some of their long term planning for their urban network.
- **Pedestrian/Bicyclist Users:** Bicyclists are able to maneuver through a roundabout in the traffic lane and operate under the same rules as an automobile in the roundabout. An alternative is for bicyclists to exit onto the sidewalk prior to entering the roundabout and circumvent the roundabout as a pedestrian. Pedestrian crossing at a roundabout can appear unsafe for pedestrians unfamiliar with crossing one. Pedestrian crossing differences are shorter as they are able to cross one lane of traffic at any given time and are provided a safe haven island halfway across the road. Vehicles exiting/entering the roundabout must yield to pedestrians and the number of auto-pedestrian conflict points decreases. Pedestrian crossings at a signalized intersection are longer in distance and typically involve more wait time as pedestrians wait for a walk signal. Roundabouts can be difficult for visually impaired pedestrians to navigate. Nationwide there are nearly 40

roundabouts located near schools and universities that have high volumes of pedestrians.

- **Future Street Cars:** Public Works evaluated the possibility of retrofitting a roundabout to accommodate future streetcars. Based on streetcar models available today, streetcars would need to pass through the center of the roundabout to travel down Chicago Avenue. If future vehicles exist that have tighter turning radii, they may be able to travel in the vehicle travel lane.
- **Driver/Neighborhood Education:** The largest issue associated with roundabouts is unfamiliarity with them with many motorists, pedestrians, and residents. A significant education program would need to be implemented to educate these stakeholders in order for the roundabout to function correctly and in such a close proximity to HCMC. Other municipalities (e.g., Richfield and Washington County) have spent thousands of dollars educating and receiving consent from stakeholders. Elderly pedestrians/drivers may find roundabouts challenging as they have only recently been included in drivers education programs.
- **Future Changes to Grid System:** The conversion of 9th St E from a one lane roadway to a two way roadway has been evaluated in the Downtown Transportation Action Plan. If the plan is implemented, a roundabout will be able to accommodate the additional traffic entering the intersection from 9th St E without a significant decrease in overall Level of Service. For a signalized intersection, it can be safely assumed that overall wait times for vehicles will increase and very probably that the intersection will not operate at an acceptable Level of Service.

*Roundabout data from MNDOT's Local Road Research Board "Toolbox to Evaluate the Impacts of Roundabouts on a Corridor or Roadway Network"

Summary

Construction of a roundabout at the Chicago Av and 9th St E intersection is feasible and overall the most effective engineering alternative for this intersection. Public Works recognizes that stakeholder involvement to a street project is a very important item. We presented a roundabout solution to the stakeholders and both HCMC and EPNI rejected this proposal on the basis of operational concerns. Based on this, Public Works has developed a signalized intersection at this location that would also work. This signalized intersection alternative was also provided to the stakeholders and they agreed it would meet their operational concerns.

Therefore Public Works is no longer proposing a roundabout solution for this intersection and will be coming back to Council in the near future for layout approval of this segment of Chicago Av S with a signalized intersection.

Attachments.: Evaluated Roundabout Layout

Cc: Council Member Lisa Goodman – Ward 7