



Grand Avenue Project Design Rationale Memo:

Existing conditions:

Grand Avenue today runs within a straight 80-foot ROW corridor from Cretin Avenue at its western terminus to Dale Street where Grand then weaves further east to West 7th Street at its eastern terminus. Typical street characteristics are as follows:

- Sidewalk width: 6 feet
- Boulevard width: 7 feet
- Roadway width: 55 feet
 - Parking lanes: ~10 feet (incl. 2 ½ foot curb and gutter)
 - Through-lanes: ~12 feet
 - Left turn lane: 10 feet

Grand Avenue generally has no intersection crossing improvements to aid pedestrians aside from five intersections between Syndicate St and Milton St where bumpouts have been installed in a separate project. These bumpouts are larger than the typical 6 feet, at 8 feet, creating a crossing width of 38 feet, outside of these improved crossings, typical crossing conditions are unchanged from roadway width at 55 feet.

Grand Avenue has a unique block segment through Macalester College's campus.

Street characteristics for the block between Macalester St and Snelling Ave are as follows:

- Sidewalk width: 6 feet
- Boulevard width: 16 feet
- Roadway width: 36 feet
 - Through-lanes: 14 feet
 - Center median: 8 feet

Preferred Concept Design:

Public Works took significant feedback and collected relevant data in order to formulate a project layout which serves the needs of our local businesses and residents, improves safety on the corridor for all users, slows motor vehicles and maximizes green space. Grand Avenue is an active and mixed-use street which saw a majority of its building stock built prior to the discontinuation of the street car which ran the length of the street from its initial construction in 1890 to the end of the streetcar system in 1955. As a result of this development pattern, a high density of pedestrian oriented businesses exists along Grand Avenue still today. Acknowledging this land use pattern, Public Works intends to redesign Grand Avenue to be a premiere pedestrian experiences where safety and traffic calming is emphasized to encourage continued pedestrian oriented business and aid in their continued success.





Overall, the existing width of the roadway today is wider than standard widths for operation of the street based upon the existing alignment. Grand Avenue will be reconstructed to typical widths for street operations with expanded space for pedestrian traffic and boulevard space with designs increasing safety for pedestrian crossing at intersections and mid-block at certain locations.

Typical features of the street following reconstruction:

- Sidewalk width: 6 feet
- Boulevard width: 10 feet
- Roadway width: 48 feet
 - Parking: 8 feet
 - Through-lane: 11 feet
 - Left turn lane: 10 feet

In addition to the above characteristics:

- Sidewalk width in high pedestrian traffic areas: 8 feet
- Boulevard width in high pedestrian traffic areas: 8 feet

Generally, the cross section of the Macalester College block will remain as-is except for following the above convention for high pedestrian traffic area to expand the sidewalk space to 8 feet and reducing the boulevard width to 14 feet.

Aside from typical characteristics, unique intersections and segments of Grand will receive specific improvements.

At Cambridge Street: The intersection will feature different improvements in order to facilitate safe crossing for students of the adjacent Hidden River Jr High.

West leg of Grand Avenue:

- Sidewalk: 8 feet
- Boulevard: 8 feet (paved on the south side, landscaped on the north side)
- Sidewalk extension: 6 feet (on the south side)
- Through-lanes: 11 feet (westbound) / 13 feet (eastbound)
- Parking lane: 8 feet (westbound)
- Center median island: 10 feet

East leg of Grand Avenue:

- Sidewalk: 8 feet
- Boulevard: 8 feet (paved on both sides)
- Sidewalk extension: 6 feet (on both sides)
- Through-lanes: 13 feet
- Center left turn lane: 10 feet

The rationale for this alignment is as follows. Hidden River Jr High drives higher volumes of pedestrians crossing the street on the western leg of Grand Avenue and many of those pedestrians are students walking to or from school. Public Works conducted a pedestrian crossing study to determine typical pedestrian activity during a day while school is in session. This study found that the west leg of Grand



Avenue saw four times as many crossings as the east leg (405 a day to 104 a day) and that the peak hour of crossing activity on the west leg corresponded with the end of the school day and saw 88 crossings in the peak hour compared to 20 in the peak hour for the east leg.

Public Works considered a full intersection closure for Cambridge Street, to accommodate bike and pedestrian crossings across Grand Avenue. However, local residents and businesses objected to a full closure due to impacts to loading and unloading for immediately adjacent businesses and diverted delivery and visitor traffic to parallel residential side streets. Additionally, significant safety improvements can be made without a full closure, the partial median as proposed will provide increased safety benefits for the west crossing which sees the majority of pedestrian crossings and all of the student crossings, while bumpouts provide safety improvements for crossings on the east leg.

On the west leg of Grand Avenue design compromises were required to be made in order to accommodate vehicle movements. There is 19 feet from the center median island and the northern curb line. The reasoning behind this is that large vehicles, namely school buses, would not be able to make a right turn from Cambridge St onto westbound Grand Ave if there was a bumpout included on the northwest quadrant of Grand Ave. Public Works has been in discussion with school staff about reserving space on Grand Ave for overflow bus pickup and drop off as Cambridge St will be utilized for parent pick up and drop off and pedestrian improvements on Summit Avenue could reduce bus space on the northern side of the school property. However, 19 feet from the curb line to the center median island is in line with similar improvements made both in St Paul and in Minneapolis along similar streets nearby schools. The installation of the refuge island, which will provide additional traffic calming measures by installing curb into the center of the street, restrict left turning onto Cambridge St and allow for two-stage crossing will provide greater safety benefits than a standard bumpout design at this unique intersection along Grand Ave.

Between Macalester Street and Snelling Avenue: The block segment will feature a unique layout which will be carried forward from a previous project done in coordination with Macalester College and Public Works in 2008. This project constructed the center median and established the current layout. The reconstruction will narrow the street width to be in line with the other segments of Grand Avenue but will maintain the existing layout between the crossing points. The pedestrian space will be widened to better facilitate high pedestrian volumes found on campus and the boulevard space will be narrowed slightly to accommodate this, however at 14-feet, will remain much wider than is found elsewhere on Grand Avenue.

Grand Ave block segment between the east and west mid-block crossings:

- Sidewalk width: 8 feet
- Boulevard width: 14 feet
- Roadway width: 36 feet
 - Through-lanes: 14 feet
 - Center median: 8 feet
- Mid-block crossings through this section will be consolidated down to two from the existing three points. These crossings will be improved to legal crossings with signage, marking and be raised in order to maximize accessibility and traffic calming through the college campus.



The rationale behind this layout and design are as follows. Through lanes within the mid-block segment need to be at 14 feet due to the restricted nature of the current design. Roadway widths need to incorporate curb reaction space when curbing is present. For outer curbs (those which are located on the outside of the roadway), minimum reaction distance is two feet, for inner curbs (those which are located on the center median) the minimum reaction distance is one foot, meaning the lane width will be typical (11 feet) but will be 14 feet when including the required reaction distances.

Raised crossings are a traffic calming treatment which are employed at crossings where pedestrian traffic is high enough, or when slowing vehicles and inducing increased yielding rates are desired. The mid-block crossings at Macalester College are a unique situation for college campuses in the region, few campuses have a major street running directly through the middle of them as is the case of Macalester College. This situation drives huge volumes of pedestrians across Grand Avenue all day during a typical day while school is in session, more crossings were observed at three crossings (4,800 per day) than any other location in the city. Raised crossings will provide a clear pedestrian through route, slow vehicles to observe the intended design speed of Grand Avenue (25 MPH), induce higher yielding rates of motorists and provide a visual transition into and out of the campus block. Ramps lengths for the crossings will be designed to accommodate larger vehicles but accommodation should not supersede safety and speed reduction goals of the design.

Grand Ave block segment between Macalester St and west mid-block crossing:

- Sidewalk width: 8 feet
- Boulevard width: 8 feet
- Roadway width: 48 feet
 - Loading lanes: 8 feet
 - Through lanes: 11 feet
 - Left turn lane: 10 feet

This segment of the block will conform to typical design widths found on the other locations along Grand Avenue.

Grand Ave block segment between Snelling Ave and east mid-block crossing:

- Sidewalk width: 8 feet
- Boulevard width: 6 feet
- Roadway width: 52 feet
 - Bus stops: 10 feet
 - Through lanes: 11 feet
 - Left turn lane: 10 feet

The roadway width through this segment will be slightly larger to accommodate bus stops found here today. Metro Transit has communicated that this stop is the highest ridership location along the Route 63 and dwell times here are longer than other stop locations along the route. Additionally, Route 63 employs larger articulated buses during peak hours which require additional space at stop locations to ensure that there is room for other vehicles to pass safely. In light of this need, additional space will be provided to ensure dwelling buses do not encroach into the through lanes and cause bottlenecks to traffic. Bumpouts



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on Grand Avenue at Snelling Avenue are proposed to be expanded to 8 feet to ensure crossing distance will not be impacted by additional space needed for buses.