City of Madison Traffic Engineering

Spaight Street—Traffic Calming Options

1.0 Background

Crash History
For the six year time frame from January of 2013 to January of 2019, there was one police-reported crash at the Spaight / Dickinson intersection. That crash occurred on November 30, 2016 and involved a driver on northbound Dickinson not yielding the right-of-way to a westbound Spaight Street driver.

Speed
A speed study from data collected in October of 2018 showed that the average speed was 22 mph. The 85th percentile speed was 28 mph and seven percent of traffic was over 30 mph. To put this in perspective, Spaight Street had the fifth highest speeds of the seven streets to receive speed humps in 2019.

School Area
This location is near Marquette Elementary School and O'Keefe Middle School. Both sidewalks along Spaight Street are "school walk routes". The crosswalks across Spaight Street at South Baldwin Street and at Rogers Street are considered "school crosswalks". The crosswalks across Spaight at Dickinson are not designated as school crosswalks because students are encouraged to cross at Spaight Street at either Baldwin or Rogers, which are both all-way stop intersections. See Figure 1 for the school's traffic plan that is provided to parents.

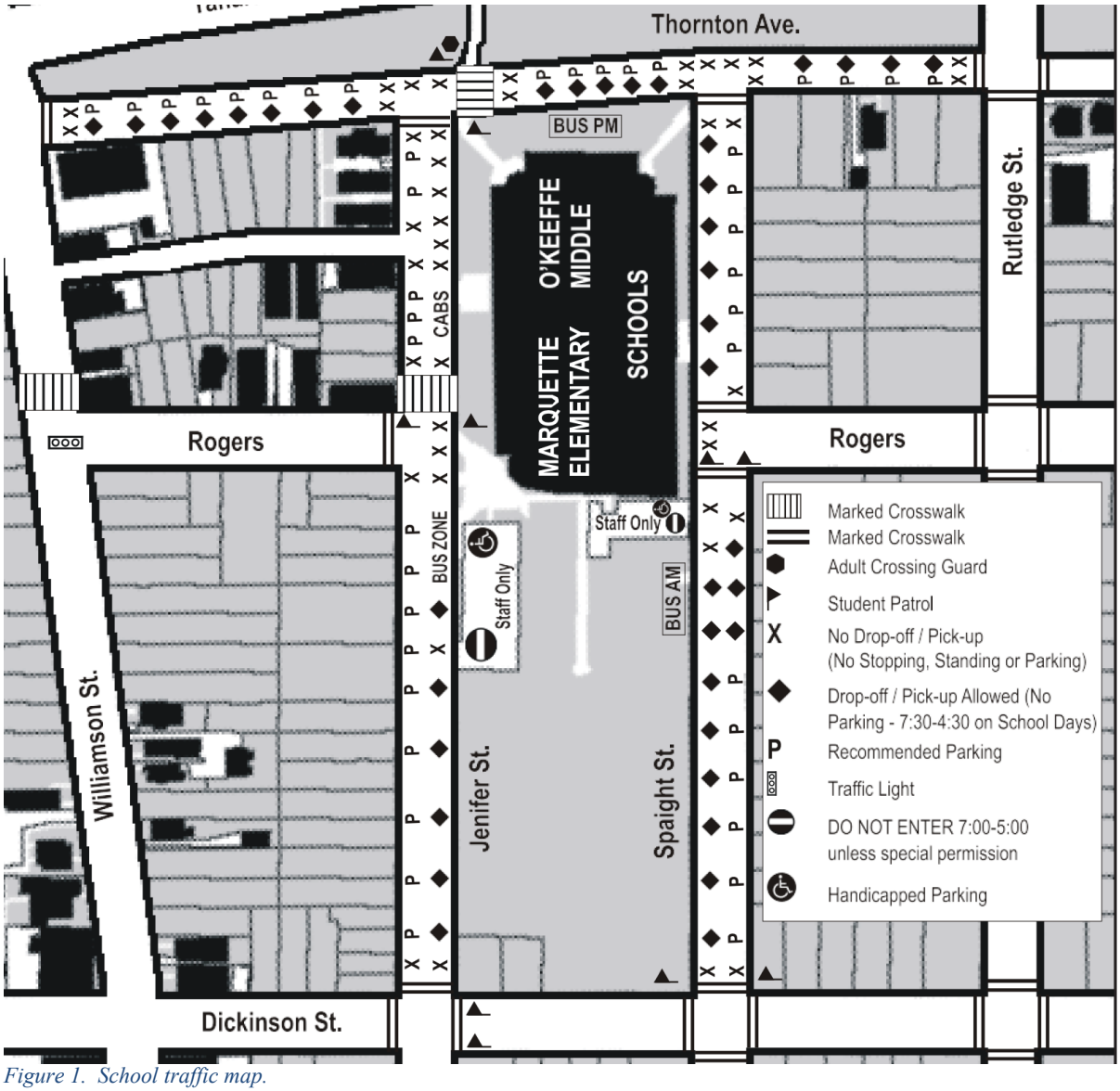


Figure 1. School traffic map.

On-Street Parking

The north side of Spaight Street on the 1400 block is adjacent to the school property and signed as "No Parking Any Time" and used as a student drop-off and pick-up location. In general, all other areas of Spaight Street has parking allowed except for street sweeping restrictions on Monday mornings for the south side of the street and Tuesday mornings for the north side of the street. Parking is highly utilized on these street blocks, especially on school days as school staff use the on-street parking in addition to the residents of the Spaight Street.

Speed Hump Survey

In March 2018, residents of Spaight Street, between Baldwin and Rogers, approved three total speed humps as shown in Figure 2 by a vote of 20 in favor and six opposed. The plan included two speed humps on the 1300 block spaced 180 feet apart. The ideal spacing of speed humps is approximately 300 feet. The planned speed hump on the 1400 block would be located in the only location available due to the narrow driveway spacing.

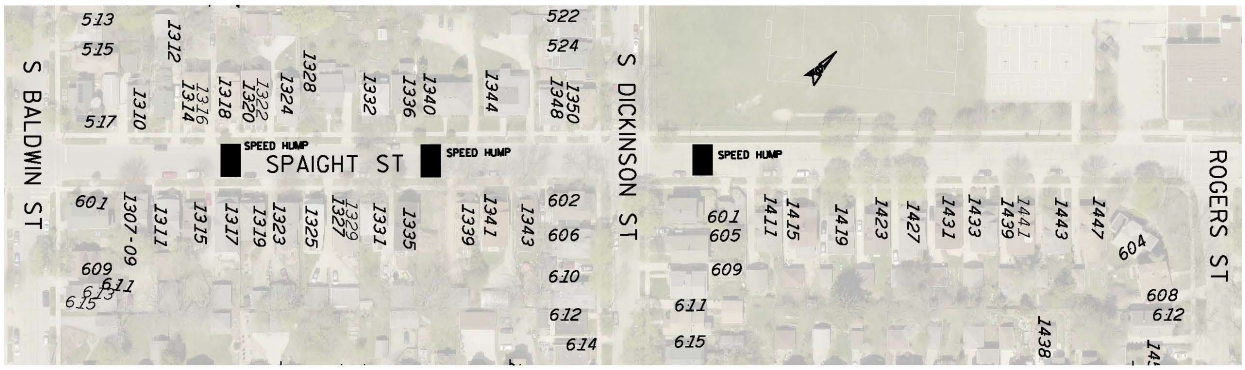


Figure 2. Speed hump plan approved by residents.

Buses

Metro Transit bus routes #3 and #38 run east/west along Spaight Street. There are bus stops at the nearside locations of South Dickinson Street for both directions of travel and a westbound bus stop at the nearside of South Baldwin Street. Metro Transit has concerns that adding traffic calming devices will further delay buses and negatively impact the buses' on-time performance at transfer points. In addition to Metro Transit buses, school buses run west on Spaight Street in the morning after dropping off students and run west to a right-turn onto Dickinson in the afternoons after picking up students.

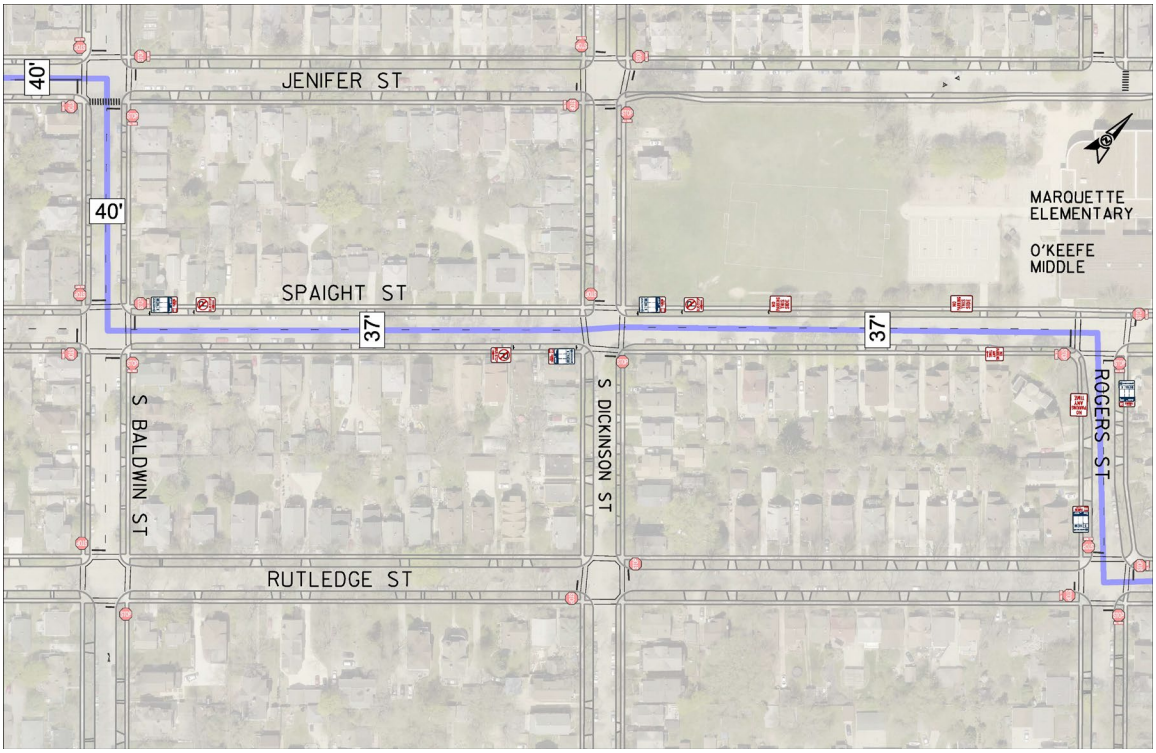


Figure 3. Existing Metro Transit bus route with street widths and stop-control.

The purpose of this report is to analyze the various traffic-calming devices and options for the 1300 and 1400 blocks of Spaight Street (South Baldwin Street to Rogers Street).

2.0 Traffic-Calming Options

The following tools are available in the Neighborhood Traffic Management Program for City Traffic Engineering to install to reduce speeds on a street and/or increase safety:

1. Speed Humps
2. Traffic Circle
3. Pedestrian Refuge Islands
4. Curb Bumpouts

In addition, Traffic Engineering Staff were asked by the Transportation Commission to evaluate these alternative options, which are currently not part of the Neighborhood Traffic Management Program:

5. All-Way Stop
6. Additional Parking
7. Street Narrowing

Each of this options will be analyzed separately below.

(1) Speed Humps

The speed humps that the City of Madison use are 22 feet long, which includes six foot ramps and a ten foot flat section in the middle. The humps are 3.5 inches tall.

Figure 4. Speed hump example (Spaight St at Orton Park).

Studies show that properly spaced speed humps are the most effective tool to reduce traffic speed to 25 mph along a street. This reduction in speed is regardless of the amount of speeding on the street prior to speed hump installation. The reason for this is because it is simply not possible to maintain speeds over 30 mph when speed humps are present.

Some of the negative aspects of speed humps are the noise created at the hump as vehicles pass over and the increased difficulty in plowing the street—the street can still be plowed, but snow plow drivers must take extra care and time at speed hump locations. In addition, if speed humps are placed too frequently, residents may consider them a nuisance. If they are placed too far apart, drivers may speed between the speed humps. Vehicles with a long wheel base, such as buses and trucks cannot travel over speed humps at the same rate of speed as a passenger vehicle, as the ramping and the ten foot flat section of the speed humps are designed for passenger vehicles.

(2) Traffic Circle

Traffic circles slow traffic by using horizontal deflection. An ideal traffic circle will deflect traffic along the major street enough to slow traffic, while still maintaining all turning movements for a vehicle up to the size of a Metro Transit bus. The geometry of the Spaight/Dickinson intersection allows for good eastbound vehicle deflection. However, westbound vehicle deflection is less prominent as the small curb radius on the northwest corner of the intersection means that a right-turning bus would need to extend further into the middle of the intersection, reducing the size of circle than could be constructed. Due to this, a traffic circle may not have the desired effect of reducing westbound Spaight Street speeds. A traffic circle would result in the loss of one parking space on the south side of Spaight Street, east of the intersection. A draft traffic circle is shown in Figure 6, below.

Figure 5. Traffic circle example (N Third St & E Dayton St).

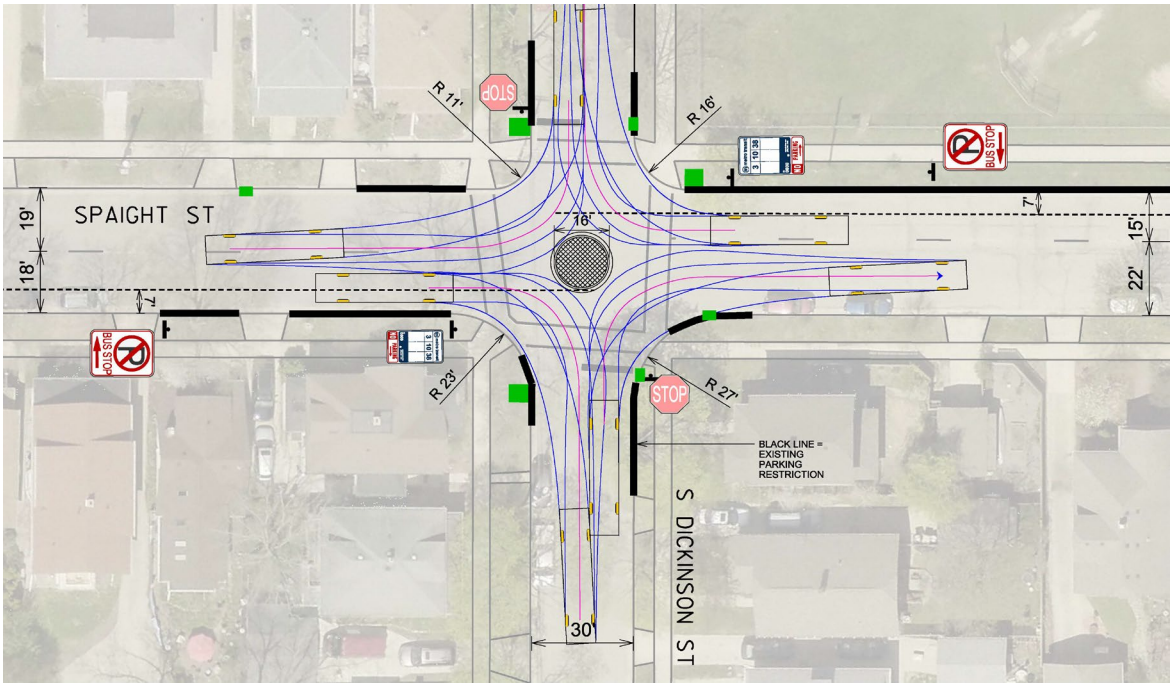


Figure 6. Draft layout of traffic circle at Spaight St & Dickinson St.

(3) Pedestrian Refuge Islands

Pedestrian refuge islands could be installed on both legs of Spaight Street at the Dickinson intersection. The islands would not affect water drainage, so the storm sewer configuration would not need to change. The islands would likely be the same size as the islands currently located on Spaight Street at Orton Park, which are seven feet wide from face of curb to face of curb. This leaves 15 feet for the travel lanes. With islands present, traffic would not be able to pass Metro Transit buses that are stopped at the bus stops, which would increase safety at the intersection. However, islands would likely have minimal effect at reducing speeds midblock.

Figure 7. Pedestrian refuge island example (Spaight St at Orton Park).

(4) Curb Bumpouts

Curb bumpouts narrow the street at a specific location—usually either an intersection or mid-block crossing to reduce the length of a crosswalk. While this creates a more residential "feel" to the street, the effect on speeds would likely be minimal. On the positive side, it creates a shorter, easier crossing for pedestrians and provides better visibility for pedestrians. An issue with any curb work is the effect on water drainage. Storm sewer inlets and pipes would need to be relocated, which substantially increases the cost of the project. Modifications of this type are typically implemented as part of a larger street reconstruction project.

Figure 8. Curb bumpout example (E Mifflin St at N Hancock St).

(5) All-Way Stop at South Dickinson Street

The existing condition at the Spaight/Dickinson intersection is a two-way stop-controlled intersection with the stops on Dickinson Street. Metro Transit bus routes operate east/west along Spaight Street with bus stops at the nearside location of the Dickinson intersection.

Stop signs are an important traffic control device, and when used at the right location, under the right conditions, are a valuable and effective device. At the same time, when used incorrectly their use can create problems and worsen conditions and safety.

Stop signs are used to assign the right-of-way when there is a crash problem or where traffic volumes are so high that people cannot find a safe gap in traffic. However, stop signs are often requested with the goal of reducing traffic speed and/or for improving safety for pedestrians. It is logical that if you make someone stop then the speeds overall will decrease. While speeds near the intersection are reduced, they are not affected along the greater length of the street and in some instances drivers, who do slow or stop, try to make up for the lost time and increase travel speed away from the intersection.

Studies have found at locations with unwarranted Stops, motorist compliance can be poor. At this location--given the nature of the street an All-Way Stop signs are likely to be seen by motorists as what they consider a “nuisance” stop, since there are existing all-way stops to the east and west on Spaight Street. As a result, we expect that drivers will be less likely to obey the signs and “run” the stop or roll through the intersection. When drivers start rolling through an intersection safety is reduced. It is also a concern for children who believe adults obey the law and follow the rules, and when they enter a street believing approaching traffic will stop and it does not, the end result can be the very thing the neighborhood is concerned about--a crash involving a child. This is especially concerning near a school.

Finally, adding a new stop-controlled intersection to the Metro bus routes would negatively impact their on-time performance at transfer points more than any other traffic calming option.

(6) Additional Parking

Spaight Street is 37 feet wide from face of curb to face of curb. The 1300 block has parking on both sides and the 1400 block has parking allowed only on the non-school side of the street. The school side of the street is signed as "No Parking Any Time". While this signing does not allow parking, it does allow for student pick-up. Due to the length of street currently signed as "No Parking Any Time", removing the restriction for ~160 feet east of the existing "No Parking, Bus Stop" sign. This would allow enough space for approximately eight vehicles to park. The existing street offset centerline pavement marking skips would need to be ground off and repainted on the true centerline. While this configuration is possible, Traffic Engineering staff would not recommend this as the combination of a relatively narrow street (37 feet), parking on both sides with fairly high parking demand, and bus routes may necessitate alternate-side parking during the winter. This is the configuration at the west end of Jenifer Street, which is a 38 foot wide street with bus routes. Alternate-side parking is in place from December 1 through March 15 each year.

(7) Street Narrowing

The 1400 block of Spaight Street could be narrowed, while maintaining the current parking restrictions. The current lane widths are a 15 foot westbound lane and a 22 foot eastbound lane. The street could be narrowed by as much as three feet while maintaining adequate width for parking on the south side of the street. However, narrowing the street would involve extensive curb and terrace replacement as well as storm sewer relocation.

This location is flat with a low elevation. The existing storm sewer inlet on the northeast corner of the intersection is a high-capacity, terrace inlet (see Figure 9). Relocating the curb and storm sewer would be relatively expensive compared to other traffic calming options.

Figure 9. Terrace inlet at Spaight & Dickinson.

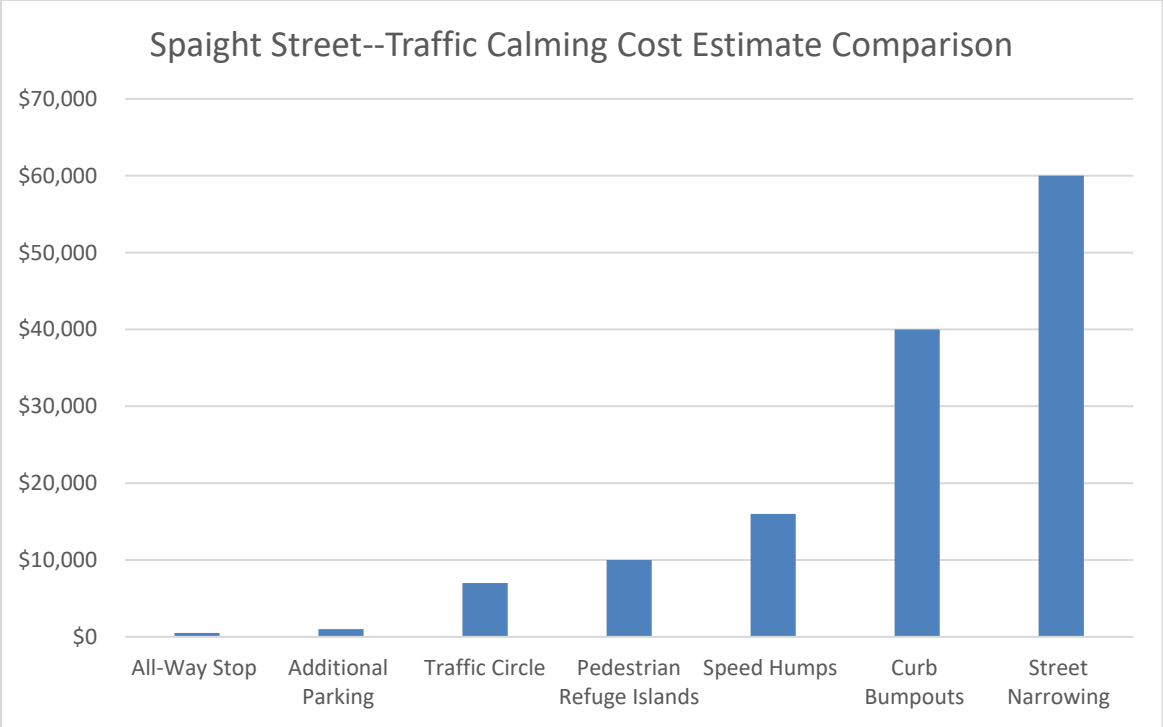
While street narrowing changes the "feel" of the street and will reduce speeds somewhat, the speed reduction is not as great as with deflection devices such as speed humps or traffic circles.

3.0 Cost Comparison

In terms of cost, these traffic-calming options can be divided into three categories, from least expensive to most expensive:

1. Signing and marking changes only
    a. All-Way Stop
    b. Additional Parking
2. Concrete work
    a. Traffic Circle
    b. Pedestrian Refuge Islands
    c. Traffic Circle
3. Concrete work with storm sewer work
    a. Curb bumpouts
    b. Street narrowing

The estimated cost of each option is shown in the chart below.



4.0 Recommendation

City Traffic Engineering's recommendation is to install one speed hump on the 1300 block and one speed hump on the 1400 block. While this is one speed hump fewer than originally proposed to the residents via the survey, the two speed humps would still be spaced less than 400 feet and would still be most effective at reducing speed along the Spaight Street. Reducing from three to two speed humps decreases the effect on Metro buses and Traffic Engineering Staff feels this is an appropriate compromise.

These speed humps could be installed within the next three weeks under the current traffic calming contract and would be the most cost effective option to reduce speeds. While the other traffic calming options would offer some benefit, especially at the Dickinson intersection, no other option would have the desired effect of reducing traffic speeds along the length of the street that speed humps would have. In addition, any other alternative would require a new resident survey and would need to wait until the 2020 construction season to be installed.