

Traffic Analysis - Community Recreation/Aquatics Center

Background/Project Description/Location: A 44,348 square foot Community Recreation Center has been proposed by the City of Great Falls Park & Recreation Department along the east side of Lions Park, adjacent to 29th Street South between 8th Avenue South and 10th Avenue South. A Conditional Use is required to construct this facility at this location.

Existing Facilities: Lions Park is a regional park occupying four square blocks with the exception of two lots on the southeast corner. Lions Park is a typical developed urban park, with trees and landscaping, open space, play equipment, a memorial, a vintage airplane display, a picnic pavilion, restrooms, two tennis courts, parking lots and trails.

Streets: The street network surrounding Lions Park is fully built to urban standards, including pavement, curb/gutter, sidewalk and traffic control. On three sides (north, east and west) the streets are Local roadways that carry low volumes of traffic. On the south, 10th Avenue South is a Principal Arterial, carrying high volumes of traffic through the community and designated as part of the National Highway System.

One short alley segment (10th Alley South) exists behind the two private (commercial) uses in the southeast corner.

Parking: On-street parking is available adjacent to the Park on three sides: a two-block stretch along 8th Avenue South, a two-block stretch along 27th Street South, and a 1½ block stretch along 29th Street South. No parking is allowed on the south side of Lions Park along 10th Avenue South.

A small parking lot exists next to the tennis courts along 27th Street South, and a larger lot serving the Park exists on the east, accessed from 29th Street South near the T-intersection with 9th Avenue South.

Sidewalks and Trails: Typical 5-foot sidewalks surround Lions Park and extend into the surrounding neighborhoods.

Accessible ramps are lacking on most corners, except for 10th Avenue South. Striped and signed pedestrian crossings exist at the northwest corner of the Park at the intersection of 27th Street South and 8th Avenue South to facilitate safe movements to Lincoln Elementary School at that location, which is approximately two blocks away from the proposed site of the Center.

The Public Works Department recently performed a speed study and traffic analysis of conditions at the intersection of 29th Street South and 8th Avenue South. The recommendations from the study included installing speed limit signs, but no other needs were identified. A summary of the study is attached.

A trail winds through the Park, connecting to the picnic pavilion from the west, the north, and the parking lot on the east.

Existing Traffic Volumes: Average Daily Traffic counts have been collected on area streets as shown in Table 1.

TABLE 1

STREET SEGMENT	DAILY VOLUME (DATE)	PM PEAK HOUR VOLUME
8 th Ave S (between 27 th & 28 th Sts)	966 (2021)	120 (2021)
29 th St S (between 8 th & 9 th Aves S)	782 (2021)	90 (2021)
10 th Ave S (between 27 th & 29 th Streets S)	30,509 (2019)	n/a

Proposed site access:

1. Driveways: Three approaches to the Center’s parking lots are proposed – two on 29th Street South and one access via an improved and slightly widened 10th Alley South that also connects to 29th Street South.
2. 10th Alley South: The alley would be improved and widened and would continue to provide access to the two commercial lots to the south.
3. Pedestrian access would be from existing sidewalks and an existing trail through Lions Park from the west and north.

Daily Trip Generation:

Two different methods were utilized to estimate vehicular trips generated by the proposed Center, and the highest was used to estimate the maximum estimated potential impact upon the street network. The likely scenario is that the actual trips would be somewhere in between the two, or even less assuming the pedestrian connections to the neighborhood would attract non-vehicular trips. However, using the highest figures will ensure that the impact of higher-traffic special events is reviewed.

Consultant-generated estimates: The project consultant, PROS Consulting, estimated daily visitation to be between 300 and 500 visits. Converting this to trips, and assuming a highest-impact scenario of each visit being via a single-occupancy vehicle, this amounts to a high-side estimate of 1,000 daily trip ends (coming and going). Assuming adding an additional 10% of the trips covers such additional trips made by employees and deliveries, the total daily trips can be estimated as 1,100 daily trips generated by the site using this method.

This compares closely to the trip calculation that can be estimated using industry case studies, calculated below.

Trip Generation Manual estimates: The *Trip Generation Manual* 9th Edition, Institute of Traffic Engineers (ITE), defines a “Recreational Community Center” as:

“Recreational community centers are stand-alone public facilities similar to and including YMCAs. These facilities often include classes and clubs for adults and children; a day care or nursery school; meeting rooms; swimming pools and whirlpools; saunas; tennis, racquetball, handball, basketball and volleyball courts; outdoor athletic fields/courts; exercise classes; weightlifting and gymnastics equipment; locker rooms; and a restaurant or snack bar. Public access is typically allowed, but a fee may be charged.”

Using an average trip generation from the ITE Manual, based upon actual studies, the following is the methodology for providing an estimate for trips generated by the site.

Average Vehicle Trip Ends on a Weekday (Daily Trip Generation), per 1000 Sq. Ft. Gross Floor Area:

$$44.348 (1000 \text{ sf}) \times 33.82 (\text{average daily trip ends}) = \underline{1,500 \text{ average daily trip ends}}$$

Peak Hour Traffic:

Consultant-generated estimates: The project consultant, PROS Consulting, estimated peak hour visitation to be variable, but that evening traffic (3 PM – 8 PM) would account for 50% of the daily trips. From this guidance, an average hourly trips over this 5-hour period would be:

$$550 \text{ trips}/5 = \underline{110 \text{ average PM peak hour trip ends (evening)}}$$

Trip Generation Manual estimates: The ITE *Trip Generation Manual* 9th Edition, provides the following calculation methodology:

Average Vehicle Trip Ends on a Weekday PM Peak Hour of Adjacent Street Traffic, per 1000 Sq. Feet Gross Floor Area:

$$44.348 (1000 \text{ sf}) \times 2.74 (\text{average PM peak hour – 4 to 6 PM - of adjacent street traffic trip ends}) = \underline{122 \text{ average PM peak hour trip ends (evening)}}$$

Trip Distribution: All of the vehicular trips generated by the site would use the various driveways onto 29th Street South, or would park on-street and use the various sidewalks and trails to reach the Center. Additional pedestrian and bicycle usages is expected, but no estimations of numbers are available.

Traffic coming to and leaving the site would likely be dispersed – some using 9th Avenue South to access 32nd Street South – a Collector street with a signal to allow safe access to 10th Avenue South. Other drivers would use the local street network to the north – 8th Avenue North going east or west, and 29th Street South further north. It is likely the majority of trips would use the intersection of 29th and 10th Avenue South, as that is the most direct connection to a Major Arterial that would serve as the most efficient access to the site from throughout the community.

For the purpose of estimating increase in traffic among the various roadway segments, the following percentages have been used, with growth numbers shown:

1. 29th Street South, north of 9th Avenue South: 25% of trips = 375 daily trips (31 PM peak)
2. 29th Street South, south of 9th Avenue South: 45% of trips = 675 daily trips (55 PM peak)
3. 9th Avenue South, east of 29th Street South: 30% of trips = 450 daily trips (38 PM peak)

To estimate the number of new trips beyond the intersection of 29th Street South and 8th Avenue South, the estimated number of new trips on 29th Street South north of 9th Avenue South is further divided into the following:

4. 8th Avenue South, east of 29th Street South: 40% = 150 daily trips (13 PM peak)
5. 8th Avenue South, west of 29th Street South: 50% = 188 daily trips (16 PM peak)
6. 29th Street South, north of 29th Street South: 10% = 38 daily trips (3 PM peak)

Actual trip dispersion is difficult to predict, and it would likely take some time for patrons to fall into a consistent pattern as drivers become accustomed to settling into preferred routes to find their way to and from the center. To ensure the site would have the least negative impact upon the neighborhood, the City of Great Falls Public Works Department has offered to collect traffic volumes after development - if the CUP is approved - to see if any concerning trends surface that may require additional traffic control.

Projected Growth: Using the projected trips and trip distribution percentages, the potential change in traffic is shown in Table 2 below. Note that all numbers are vehicle trips per day or vehicle trips per hour.

TABLE 2

STREET SEGMENT	DAILY VOLUME (DATE)	PROJECTED GROWTH	PROJECTED DAILY VOLUME	PEAK HOUR VOLUME	PROJECTED GROWTH	PROJECTED PEAK HR VOLUME
8 th Ave S (between 27 th & 28 th Streets S)	966 (2021)	188	1,154	120	16	136
29 th St S (between 8 th & 9 th Aves S)	782 (2021)	375	1,157	143	27	170
10 th Ave S (between 27 th & 29 th Streets S)	30,509 (2019)	600*	31,109*	n/a	n/a	n/a
9 th Ave S (east of 29 th St S)	n/a	450	n/a	N/A	38	n/a

**assumes maximum potential growth (if all new southbound vehicles turned or came from west)*

Based upon the projected increases, 29th Street South and 8th Avenue South around Lions Park could carry around 1,500 vehicles per day with 8th Avenue South traffic possibly increasing by around 20%. However, this increase is expected to be only 16 additional vehicles at peak hour. Traffic on 29th Street South, just south of 8th Avenue North, would increase by 48%, with a PM peak-hour increase of 27, or one every two minutes, on average. Traffic increases are expected to be noticeable, but no congestion or capacity problems would be expected, as the total numbers are average for a local roadway. The increase in traffic on 10th Avenue South would be negligible.

Pedestrian and Bicycle Facilities: Public sidewalks surround Lions Park and extend into the surrounding neighborhood. On-site sidewalks are proposed, and should be closely and carefully reviewed for connectivity to the main sidewalks as well as existing Lions Park trails.

No specific bicycle route improvements are required, but placement of bike racks or secure bicycle storage on-site is encouraged to attract non-motorized trips and, therefore, reduce vehicular trips.

Recommendations/Conclusions: The existing street network has sufficient capacity to accommodate the traffic that would be generated by the proposed development. This analysis of current and future traffic can be summarized into the following **main findings:**

- Local streets have adequate capacity to accommodate the projected future traffic. Even though the increase in traffic volumes would be small, the immediate neighbors would likely notice the increase. Intersection traffic controls should be considered, if warranted.
- Pedestrian access is ideal, connecting the proposed site with the community in all directions. However, intersections in the immediate vicinity of the Center do not have ADA ramps at the sidewalk corners, and should be improved.
- Safety and congestion at 29th Street South and 10th Avenue South is dependent upon driver behavior, as sufficient alternative routes exist.

A few other **observations** are worth noting:

1. Traffic volumes to and from the south along 29th Street South are expected to be manageable. There is a possibility that access into the 29th Street South driveway into the Glass Doctor business on the northwest corner of 29th Street South and 10th Avenue South could be reduced at peak times, but the business has alternate access off both the alley and 10th Avenue South so would still have access to their business.
2. 9th Avenue South would see increased traffic, and there could be a need for traffic control at intersections leading to 32nd Street South.
3. The functionality and safety of the intersection of 29th Street South would depend upon the route choices of drivers, and would vary greatly depending upon the amount of traffic on 10th Avenue South and availability of gaps. The proposed location of the Center has enough alternate routes that drivers would be able to avoid this intersection at peak hour times.

Based upon the review of current conditions and future projected volumes, the following **recommendations** are provided:

1. Provision of bicycle parking and/or secure bicycle storage is recommended to reduce the number of vehicular trips. Such facilities would be installed in compliance with Title 17, Chapter 36 of City Code.
2. Full connections between the site and the trails in Lions Park should be made and designed for direct and safe pedestrian and bicycle travel. This is especially important since the existing parking lot for Park users would be replaced by parking adjacent to the Center. The proposed site plan is missing a few key connections and, in one case, shows a primary trail connection passing through a basketball court.
3. Traffic control at nearby intersections should be reviewed and, if warranted, installed soon after opening the Center, especially at 8th Avenue South and 29th Street South and at 9th Avenue South and 29th Street South. Given the projected increase in traffic on 29th Street South, it is likely that traffic control at these intersections could be necessary soon after opening the Center. Intersections further to the east along 9th Avenue South should also be monitored for future traffic control needs, if warranted.
4. Full curb ramps at all corners surrounding Lions Park should be installed as soon as monies are available to provide safe and convenient pedestrian connections for all users.
5. After opening of the Center, prohibition of parking on one or both sides of portions of 29th Street South may be warranted due to the narrowness of the street. Traffic movements along this street segment should be reviewed soon after opening.
6. Safety and delays at 29th Street South and 10th Avenue South should be monitored. If future conditions warrant the need, signalization may be an option that could be pursued with the Montana Department of Transportation.

**City of Great Falls
Public Works Department**

INTER-OFFICE MEMORANDUM

March 26, 2021

**TO: Kenny Jorgensen, Street/Traffic Manager
Paul Skubinna, Public Works Director**

FROM: Austin Schultz, Traffic Division Foreman

SUBJECT: 29th St S and 8th Ave S- Traffic Study

Date: 3/5/2020

* * * * *

In response to the City of Great Falls request about the Traffic impacts @ 29th St S and 8th Ave S. The study involved collecting 48 hour entering volume counts, peak hour volumes, turning movements, crash history, pedestrian activity, critical approach speed study, and speed data(provided earlier)

The intersection has no control at the current time. Crash data indicated there had only been 3 crashes in 3 years of history (2017-2020).

The City of Great Falls conducted a speed study on February 23rd – February 24th on 29th St S between 8th and 9th Ave S, and also on 8th Ave S between 28th and 29th St S. The 85th percentile speed for both locations was 26 mph. The MUTCD (Manual on Uniform Traffic Control Devices) recommends that agencies set speed limits within 5 mi/h of the 85th percentile speed of free-flowing traffic. The 85th percentile speed is the speed that 85 percent of drivers travel at or below and is one of the best indicators of a reasonable and safe speed. There are “School Speed Limit 25”/”Fines Higher” signs on 8th Ave S, east of 26th St S (eastbound) and on 8th Ave S between 27th and 28th St S (westbound).

Pedestrian activity was observed during the peak hour (2pm to 4pm) on February 17th and 18th and there was no activity crossing any of the approaches of the intersection.

A critical approach speed study was conducted on all of the approaches at the intersection. All of the approaches have adequate sight distance, but on the north approach (southbound) looking right, there are trees on the northwest corner of the intersection that are trimmed adequately by the homeowner. This seems to be the only corner that has an issue with any sight obstructions.

We did not conduct a sight distance study at this intersection because of it being so wide open on all of the approaches.

Entering volume counts were conducted on February 17th and 18th and show that the Average Daily Traffic entering the intersection is 1,162 vehicles. The major street is 8th Ave S with an average daily traffic of 639 vehicles and 29th Street S is the minor street with an ADT of 523 vehicles. The peak hour is from 2pm to 3pm with the west approach carrying the highest volume (59 vehicles)(average), followed by the south approach (36 vehicles)(average). 8th Ave S averages 54 vehicles per hour for the highest 8 hours (reference C.1). 29th St S averages 37 vehicles per hour for the same 8 hours.

- A. Intersection does not meet minimum crash history criteria
- B. Intersection does not meet minimum volume & delay criteria
- C. Intersection does not have any significant obstructions to consider assigning right of way

The criteria considered for a multi-way stop (found in the MUTCD) are as follows;

Section 2B.07 Multiway Stop Applications

Support:

Multiway stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multiway stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multiway stop control is used where the volume of traffic on the intersecting roads is approximately equal.

Guidance:

The decision to install multiway stop control should be based on an engineering study.

The following criteria should be considered in the engineering study for a multiway STOP sign installation:

- A. *Where traffic control signals are justified, the multiway stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
 - 1. *The vehicular volume entering the intersection from the **major street** approaches (total of both approaches) averages at least **300 vehicles per hour for any 8 hours** of an average day, and*
 - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the **minor street** approaches (total of both approaches) averages at least **200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but***
 - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

Option:

Other criteria that may be considered in an engineering study include:

- A. The need to control left-turn conflicts;*
- B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;*
- C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and*
- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection.*

Turning movements during the peak hour on the west and south approaches are below;

West approach – 55% Straight	South approach – 67% Straight
(eastbound) 41% Right	(northbound) 33% Left
0.03% Left	0% Right

In conclusion, assigning any right of way at this time would not be an option due to the volume data, adequate sight distance, and minimal crash history. We would recommend possibly installing speed limit signs on 29th St S and possibly on 8th Ave S. The intersection should continue to be monitored for changes in volume and delay after the proposed aquatic center is built and not rely on projected numbers.