

**CITY COUNCIL
WORK SESSION AGENDA
September 10, 2018, at 7:00 p.m.
City Hall Council Chambers, 201 First Avenue East**

A. CALL TO ORDER

B. DISCUSSION ITEMS

1. Traffic Review and Recommendations

C. PUBLIC COMMENT

Persons wishing to address the council are asked to do so at this time. Those addressing the council are requested to give their name and address for the record. Please limit comments to three minutes.

D. CITY MANAGER, COUNCIL, AND MAYOR REPORTS

E. ADJOURNMENT

UPCOMING SCHEDULE / FOR YOUR INFORMATION

Next Regular Meeting – September 17, 2018, at 7:00 p.m. – Council Chambers

Next Work Session – September 24, 2018, at 7:00 p.m. – Council Chambers

Reasonable accommodations will be made to enable individuals with disabilities to attend this meeting. Please notify the City Clerk at 758-7756.



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MEMORANDUM

To: Doug Russell, City Manager
From: Susie Turner, P.E. Public Works Director
Meeting Date: September 10, 2018
Re: Traffic Reviews and Recommendations

Background:

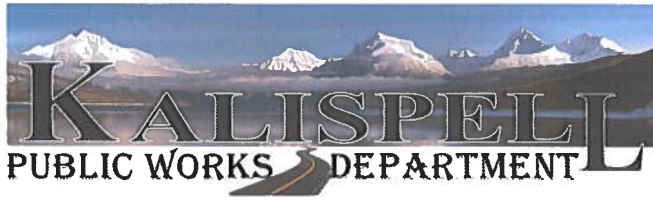
Staff will present traffic reviews and recommend updates regarding the following:

1. Development of a Standardized On Street Parking Code
 - a) Classification Designation
 - b) Intersection Management
 - c) Sight Distance Conditions
2. Diagonal Parking-Downtown Business District
3. Bus Pick Up Zone Permitting Process and Policy
4. School Zone Designations and Speed Considerations

Enclosed for reference is the BID Diagonal Parking Analysis Technical Memo prepared by City Engineering staff.

Enclosed:

BID Diagonal Parking Analysis Technical Memo



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MEMORANDUM

Date: August 20, 2018

TO: Keith Haskins, PE – City Engineer
FROM: Tom Tabler, PE – Civil Engineer
CC: Susie Turner, PE – Director of Public Works
Gene Corne – Streets Superintendent
Wade Rademacher – Police Chief
Jarod Nygren – Senior City Planner

SUBJECT: BID Diagonal Parking Analysis

Background:

In October of 2017 staff from the City Planning, Police, and Public Works as well as representatives from the Business Improvement District (BID) and a representative from the Montana Department of Transportation met and conducted a field review of the current parking space configurations within the BID. The goal of the field review was to exchange ideas and identify potential locations to improve parking within the BID. The additional parking would potentially provide spaces for visitors to the BID, as well as business employees within the BID. One idea discussed was converting some locations, where street widths would allow, from parallel parking to diagonal parking. Four locations were selected as potential candidates for this conversion and analyzed for benefits and deficiencies from making such a conversion.

All the streets reviewed are classified as local streets. The locations analyzed were:

- 1st St West (3rd Ave West to 1st Ave West);
- 3rd Street West (3rd Ave West to 1st Ave West);
- 5th Street West (1st Ave West to Main Street); and
- 3rd Street East (2nd Ave East to 3rd Ave East).

Guidance for Diagonal Parking Conversion:

Lane Shift: Diagonal parking requires more street width than parallel parking. Therefore, the travel lanes for the street may require a lane shift to accommodate the additional width of the diagonal parking area. The shift in travel lanes to accommodate diagonal parking stalls must also function with the roadway intersections currently in place. A lane shift of half the travel lane width was considered the maximum allowable for this analysis.

Lane Width: City Standards require a minimum lane width of 12-feet. In consideration of diagonal parking, a lane width reduction to 11-feet was considered. While a lane width of 11-feet is below City Standards, AASHTO¹ does allow a minimum of 11-foot lane width where practical on urban streets.

Street Width: Diagonal parking can increase the number of parking spaces along a street by utilizing less curb length per space, but also requires a wider street width. Diagonal parking was only considered on streets wide enough to accommodate diagonal parking on one side of the street, while maintaining parking on the opposite side of the street. No streets were wide enough to accommodate diagonal parking on both sides of the street.

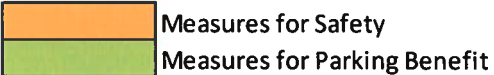
Stall Angle: Two diagonal parking angles were considered depending on street width.

- 45-degree parking stalls provide the most spaces and are preferred for diagonal parking configurations. For 45-degree parking on one side of the street, the roadway width must be a minimum of 49-feet wide. This width will accommodate the diagonal parking stalls on one side (19-feet), two travel lanes (11-feet each), and parallel parking (8-feet) on the other side ($19 + 22 + 8 = 49$).
- 35-degree parking stalls provide fewer spaces than 45-degree parking stalls, but can accommodate a slightly narrower road. For 35-degree parking stalls on one side of the street, the roadway width must be a minimum of 48-feet wide. This width will accommodate the diagonal parking stalls on one side (18-feet), two travel lanes (11-feet each), and parallel parking (8-feet) on the other side ($18 + 22 + 8 = 48$).

Decision Matrix:

A decision matrix was developed to evaluate each location considered for diagonal parking. The matrix provided a score for each area based on key measures for safety and parking benefit. Through the use of the decision matrix, an “apples to apples” comparison can be made between each location. Safety measures included in the matrix were lane width, lane offset, and stall angle. Parking benefit measures included in the matrix were percentage of new spaces and noted parking needs in the area.

Metric	Points		
	0	1	2
Lane Width	11' or less	11' - 12'	>12'
Lane Shift (in terms of lane width)	50%	35 - 50%	< 35%
Stall Angle	35		45
% new spaces	< 30%	30 - 40%	> 40%
Noted Parking Needs in Area	None	Some	Great



Measures for Safety (Orange)

Measures for Parking Benefit (Green)

Figure 1 - Decision Matrix used for evaluation of diagonal parking locations.

An area with a score less than 5 points creates safety deficiencies which outweigh the benefit to parking and would therefore be below a threshold staff would be willing to recommend.

¹ American Association of State Highway and Transportation Officials

Analysis:

Area 1 – 1st Street West (3rd Avenue West to 1st Avenue West)

Existing Conditions:

This portion of 1st Street West is a 49-foot wide, two-lane urban local street, with two-way traffic, and has two-hour parallel parking on both sides of the street. The current parking configuration allows for fourteen parallel stalls within the two-block area of interest.

Layout Analyzed:

The south side of the street was analyzed for diagonal parking because there are less approaches on the south side than the north side, maximizing the total number of parking spaces possible within the area. Diagonal parking provides the most spaces when installed continuously, minimizing the number of void spaces at each end. As shown in Figure 2 and 3 below, a single diagonal parking stall can take up almost as much curb length as two parallel parking stalls.

Although the street is wide enough to accommodate 45-degree diagonal parking stalls, this configuration would create too large of a lane shift. Therefore, 35-degree diagonal parking stalls were imposed onto the current parkable curb lengths with travel lanes shifted to the north. To accommodate the travel lane shift, the centerline of the street was shifted to the north 5.5 feet. This conversion would reduce the current travel lane widths to 11.5 feet, but would keep the lane shift under the allowable half lane width. By adding diagonal parking, the two blocks of street would see an increase of two parking stalls.

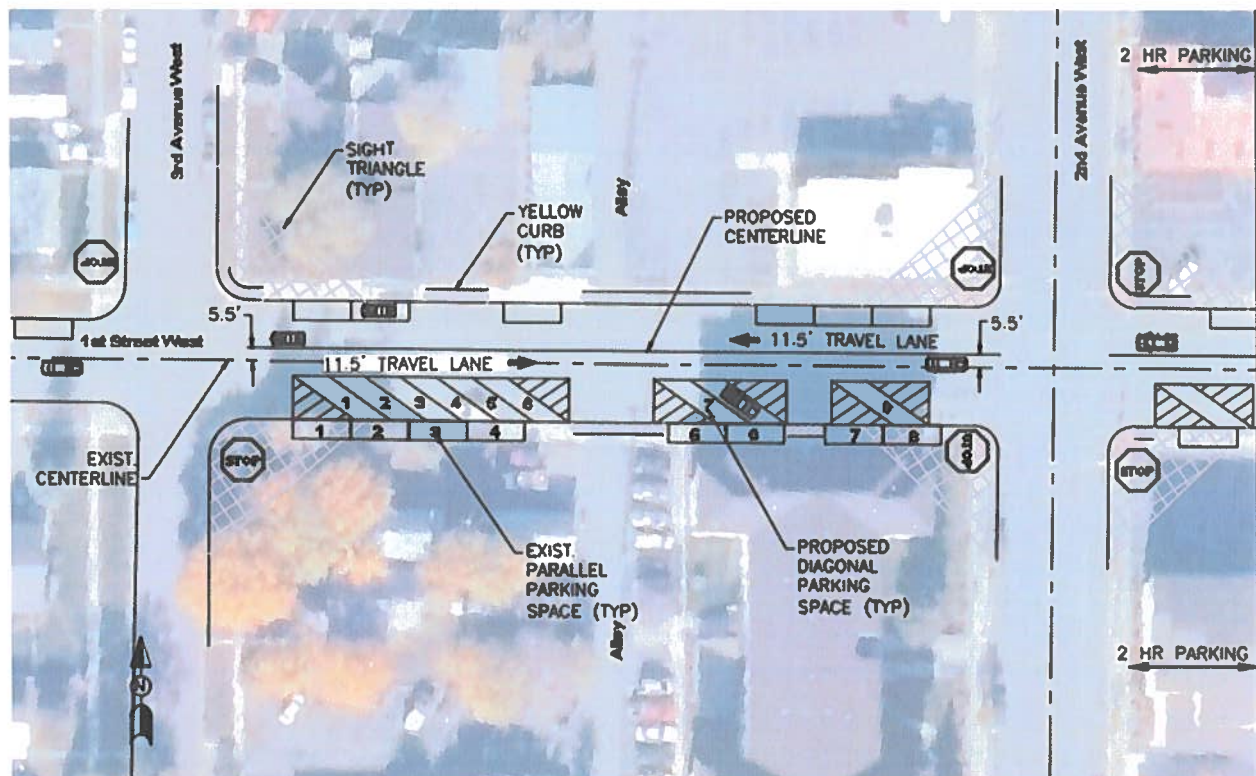


Figure 2 - 1st Street West / 3rd Ave West to 2nd Ave West

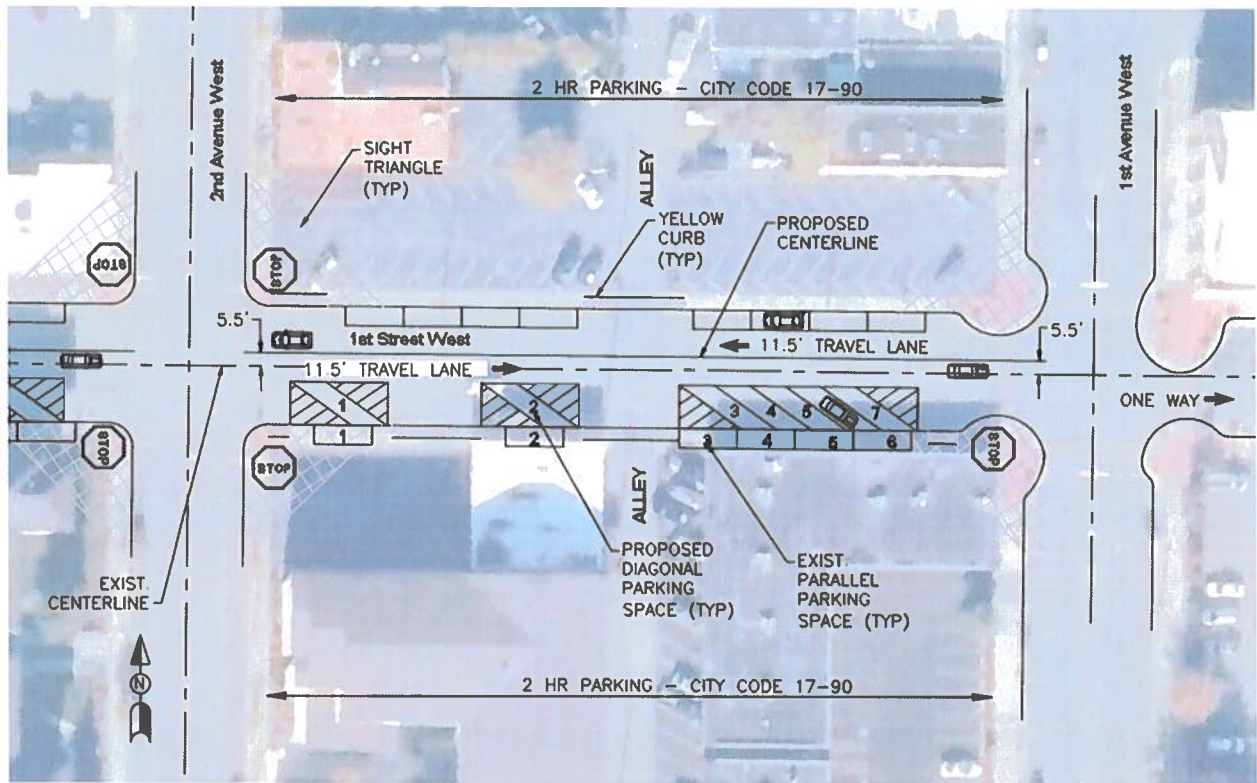


Figure 3 - 1st Street West / 2nd Ave West to 1st Ave West

Field Investigation and Observations:

After the locations were drafted over the aerial mapping; Public Works, Planning, Police, and BID representatives conducted a field visit to visualize how the conversion would impact the adjacent streets. Traffic control candles and diagonally parked vehicles were used during the field observation.

The 5.5-foot lane shift requires a significant adjustment for traffic traveling west at the 3rd Ave West intersection. The curb lines for the west leg of this intersection are narrower than the east leg and exaggerate this movement as well.

While taking measurements of the street for the exhibits most of the available parking was observed to be unused.

Matrix Score & Recommendations:

This location received one point for the travel lane width being between 11 and 12-feet (11.5-feet) and received one point for the lane offset being between 35 and 50% of the lane width (5.5-foot / 11.5 feet = 48%), for a total matrix score of **2 points**.

Due to the existing conditions, individual site analysis, field review, and matrix score of 2, staff **does not recommend** this area for diagonal parking. However, due to the low parking use observed, staff does recommend removing the 2-hour parking restrictions to allow area business employees to utilize on-street parking.

Area 2 – 3rd Street West (3rd Alley West to 2nd Alley West)

Existing Conditions:

This portion of 3rd Street West has 2 distinct widths. From 2nd Avenue West to 3rd Alley West, the street is 53.9-feet wide. From 2nd Avenue West to 2nd Alley West, the street is 48-feet wide. Both sections consist of a two-lane urban local street, with two-way traffic, and have two-hour parallel parking on both sides of the street. The current parking configuration allows for eight parallel stalls within the area of interest.

Layout Analyzed:

Although the western half of the area of interest could accommodate 45-degree diagonal parking stalls, the eastern half could not. Therefore, to maintain consistency within the area of interest, 35-degree diagonal parking stalls were examined. The south side of the street was chosen because the street has less approaches than the north side, which allows for an improved benefit to converting to diagonal parking. Parking stalls were imposed onto the current parkable curb lengths with travel lanes shifted to the north. To accommodate the travel lane shift, the centerline of the street is shifted north 4.2-feet on the west side of 2nd Ave West (3rd Alley West), and 5.0-foot north on the east side of 2nd Ave West (2nd Alley West), as shown in Figure 4 below.

This conversion would reduce the current travel lane widths west of 2nd Ave West, but more significantly reduces the travel lane widths east of the 2nd Ave West to 11.0-feet. The lane shifts still fall under the half lane requirement. By adding diagonal parking, the area of interest would see a total increase of three parking stalls.

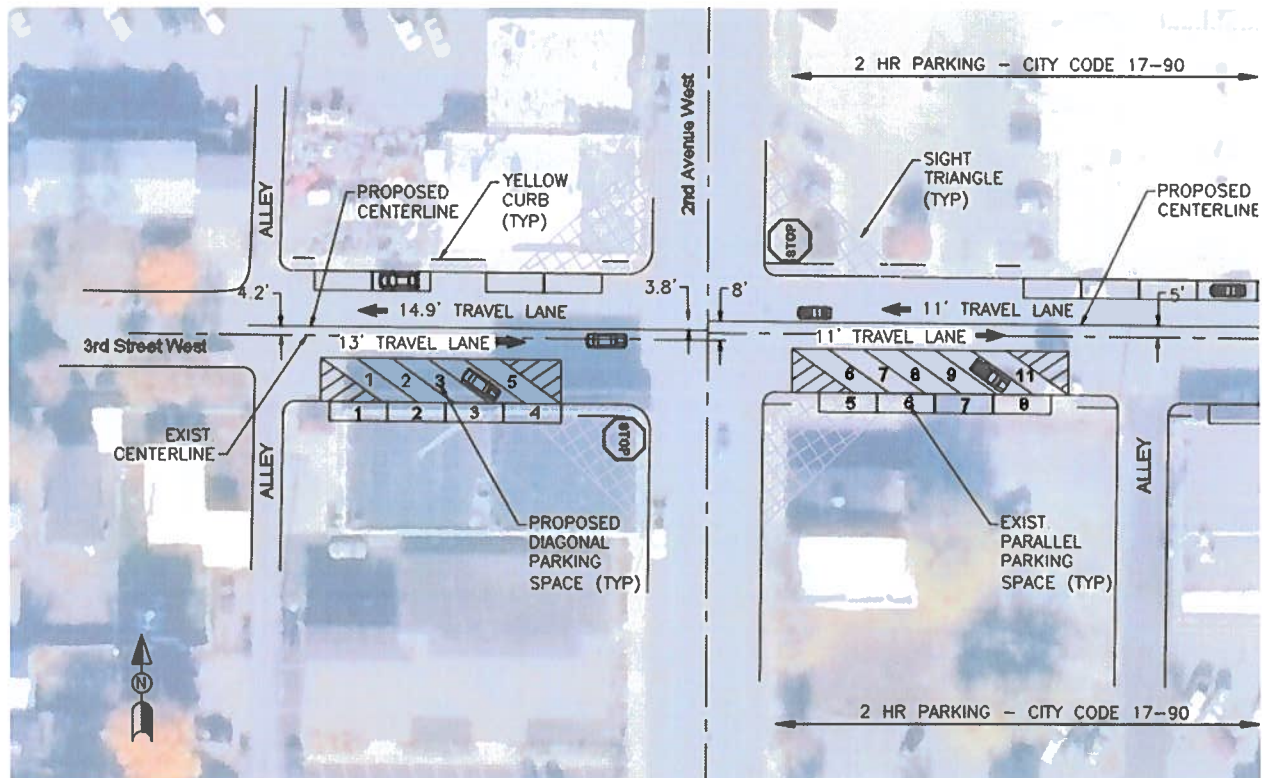


Figure 4 - 3rd St West / 2nd Ave West

Field Investigation and Observations:

The 4.2-foot lane shift requires a substantial adjustment for traffic traveling west at 3rd Alley West. The street cross-section west of 3rd Alley West is much narrower and would require a quick adjustment for westbound traffic.

The diagonal parking on the east side of 2nd Ave West would require the travel lanes to be 11-feet in width.

While taking measurements of the street for the exhibits, the available parking west of 2nd Ave West was observed to be unused on the south side of the street. Parking on the east side of 2nd Ave West was observed to be used regularly by citizens going to the post office. While the parking on the east side of the intersection was seeing regular use, the parking lot for the post office was not being used.

Matrix Score and Recommendations:

This location received two separate scores:

- The area west of 2nd Avenue West received 2 points for lane width being more than 12-feet (13-foot for eastbound and 14.9 for westbound) and 2 points for lane shift being less than 35% of the lane width (4.2-feet / 13-feet = 32%), for a total of 4 points.
- The area east of 2nd Avenue West received 1 point for the lane shift being between 35 and 50% of the lane width (5-feet / 11-feet = 45%) and 2 points for the creation of new spaces being above 40% (2 new spaces / 4 existing spaces = 50%), for a total of 3 points.

Neither location received a matrix score above the threshold for staff to recommend moving forward. The deficiencies created by the lane shift at the alleys and the narrower travel lanes outweighs the benefits of the three additional parking stalls. Therefore, staff **does not recommend** this area for diagonal parking.

Although residents were using on-street parking for access to the post office, the post office's existing parking lots were underutilized. Therefore, staff does recommend the removal of the 2-hour parking restrictions to allow area business employees to utilize on-street parking.

Area 3 – 5th Street West (1st Avenue West to Main Street)

Existing Conditions:

This portion of 5th Street West is a 53-foot wide, two-lane urban street, with two-way traffic, and has two-hour parallel parking on both sides of the street. The current parking configuration allows for seven parallel stalls within the area of interest.

Layout Analyzed:

The north side of the street was chosen for diagonal parking stall analysis due to having fewer approaches than the south side. Due to the wide street width and to maximize the number of potential spaces, 45-degree diagonal parking stalls were imposed onto the current parkable curb lengths, with travel lanes shifted to the south. The centerline of the street would be shifted to the south 3.9 feet, as shown in Figure 5 below. This conversion would reduce the current travel lane widths to 12 feet for westbound traffic and 15 feet for east bound traffic. The lane shifts would still remain under the half lane guidance. By adding diagonal parking, the street could see an increase of four parking stalls.

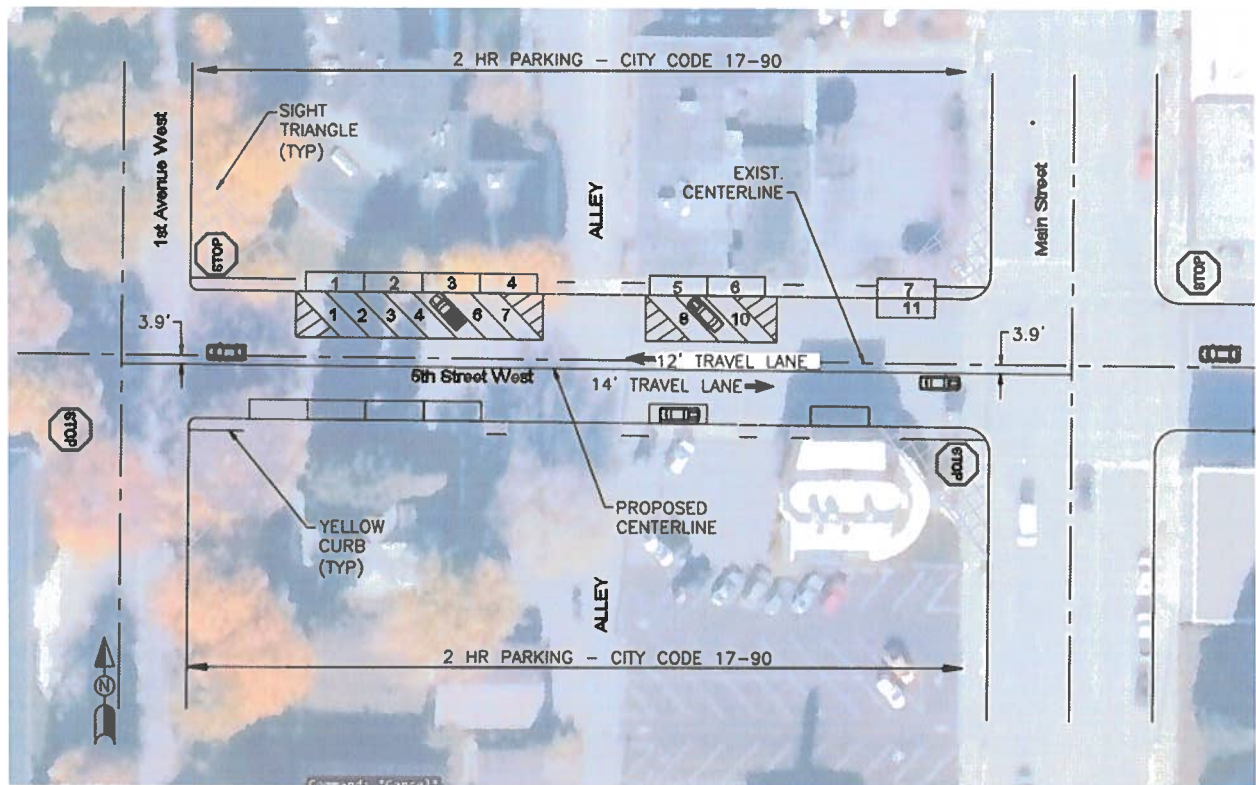


Figure 5 - 5th St West / 1st Ave West to Main Street

Field Investigation and Observations:

The 3.9-foot lane shift fits well with the adjacent intersections. Having stop conditions for 5th Street West at both intersections aids traffic to make the necessary adjustments.

Matrix Score and Recommendations:

This location received two points for lane width being greater than or equal to 12 feet (12-foot for westbound and 14-foot for eastbound), 1 point for lane shift being between 35 and 50% of lane width ($3.9\text{-feet} / 12\text{-feet} = 33\%$), 2 points for the stall angle being 45-degrees, and 2 points for the creation of new spaces being greater than 40% ($4\text{ new spaces} / 7\text{ existing spaces} = 57\%$), for a total of 7 points.

Due to the existing conditions, individual site analysis, field review, and matrix score of seven, staff **recommends** this area for diagonal parking. Additionally, staff recommends removing the 2-hour parking restrictions to allow area business employees to utilize on-street parking.

Area 4 – 3rd Street East (2nd Avenue East to 3rd Avenue East)

Existing Conditions:

This portion of 3rd Street East is a 51-foot wide, two-lane urban local street, with two-way traffic, and has two-hour parallel parking on both sides of the street. The current parking configuration allows for eight parallel stalls within the area of interest.

Layout Analyzed:

The south side of this street was analyzed for diagonal parking because there are fewer approaches. 45-degree diagonal parking stalls were imposed onto the current park able curb lengths with travel lanes shifted to the north. To accommodate the diagonal parking, the centerline of the street would be shifted to the north 2.9-feet, as shown in Figure 6 below. By adding diagonal parking, this area of interest could see an increase of six parking stalls.

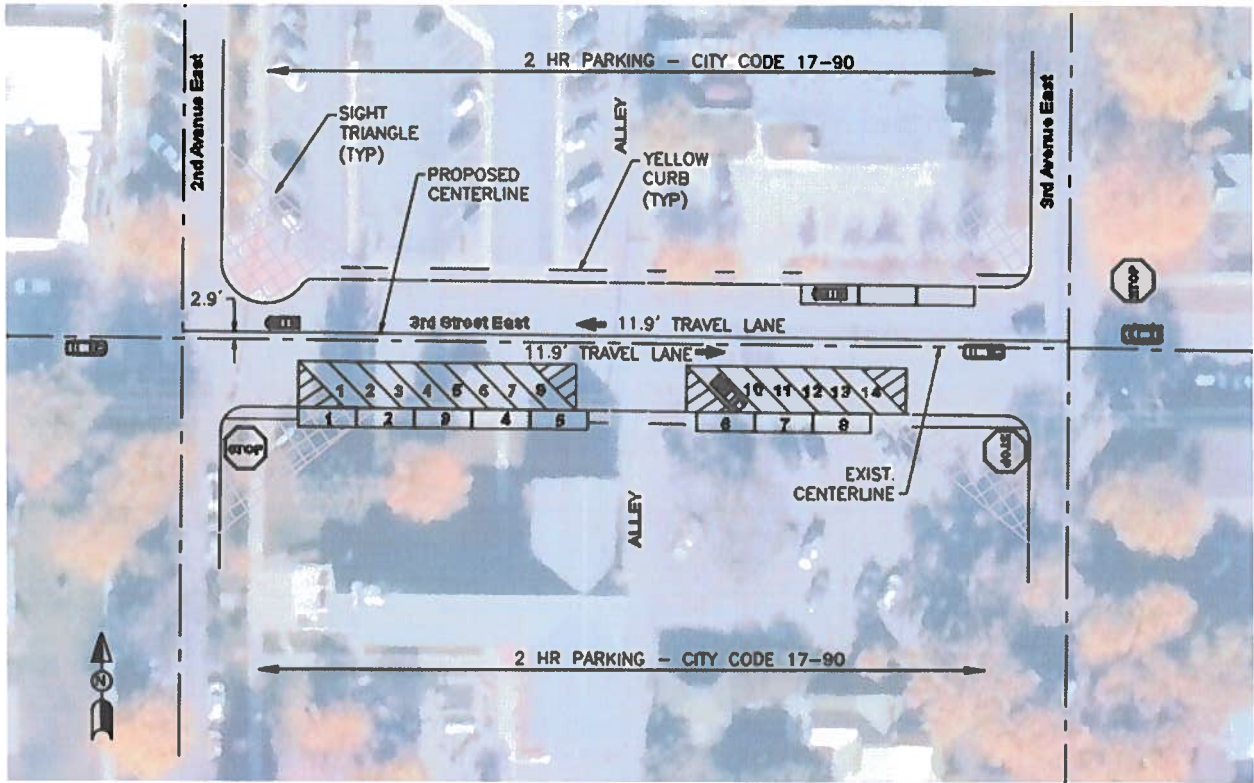


Figure 6 - 3rd St East / 2nd Ave East to 3rd Ave East

Field Investigation and Observations:

The 2.9-foot lane shift fits well with the adjacent intersections and travel lanes widths are reduced by 0.1 feet below City standard. The deficiencies created by the lane shifts are minimal and the additional parking may benefit this section of street. While conducting the field review, the area was observed to be unutilized for on-street parking.

Matrix Score and Recommendations:

This location received one point for the lane width being between 11 and 12-feet (11.9-feet), 2 points for the lane shift being less than 35% of lane width ($2.9\text{-feet} / 11\text{-feet} = 24\%$), 2 points for the stall angle being 45-degrees, and 2 points for the creation of new spaces being greater than 40% ($6\text{ new spaces} / 8\text{ existing spaces} = 75\%$), for a total of 7 points.

Due to the existing conditions, individual site analysis, field review, and matrix score of seven, staff **recommends** this area for diagonal parking. Additionally, based on the field observations of the current parking being underutilized, staff **recommends** removing the 2-hour parking restrictions to allow area business employees to utilize on-street parking.

Post Analysis Discussions:

The City Police Department (Parking Enforcement Officer) was contacted to gather additional information about parking needs and behavior along the selected roadways. They believe there is a definite need for more parking within the BID and felt the two-hour parking limit within the BID was responsible for some of the parking stalls being unused during our field observations. On August 8, 2018, the Police Department submitted a work order to Traffic Signs and Signals for removal of the two-hour parking zones on 1st Street West, 2nd Street West, 3rd Street West, 4th Street West, and 5th Street West, west of 2nd Ave West. They also requested that the two-hour parking limit be removed on 5th Street East between 1st Ave East and 2nd Ave East.

Kalispell City Code 17-90 that established the two-hour parking limit within the BID did not include these street sections within its language. This work order aligns the two-hour parking limit areas with the current City Code, provides parking areas for employees who work within the BID, and concurs with staff recommendations based on individual area analysis.

Summary of Findings:

The following figure summarizes the decision matrix scorings and provides a side-by-side comparison of the streets reviewed for this analysis:

Metric	Points		
	0	1	2
Lane Width	11' or less	11' - 12'	>12'
Lane Shift (in terms of lane width)	50%	35 - 50%	< 35%
Stall Angle (degrees)	35		45
% new spaces	< 30%	30 - 40%	> 40%
Noted Parking Needs in Area	None	Some	Great

1st Street West - 3rd Ave West to 1st Ave West						
Width	Lane Shift	Angle	Spaces	Parking	Score	
1	1	0	0	0	2	

3rd Street West - 3rd Alley West to 2nd Ave West						
Width	Lane Shift	Angle	Spaces	Parking	Score	
2	2	0	0	0	4	

3rd Street West - 2nd Ave West to 2nd Alley West						
Width	Lane Shift	Angle	Spaces	Parking	Score	
0	1	0	2	0	3	

5th Street West - 1st Ave West to Main Street						
Width	Lane Shift	Angle	Spaces	Parking	Score	
2	1	2	2	0	7	

3rd Street East - 2nd Ave East to 3rd Ave Street						
Width	Lane Shift	Angle	Spaces	Parking	Score	
1	2	2	2	0	7	

	Measures for Safety
	Measures for Parking Benefit

Figure 7 - Decision Matrix and Area Scores

Area 1 – 1st Street West (3rd Avenue West to 1st Avenue West):

- Would gain two parking stalls;
- Would require a 5.5-foot shift in centerline;
- Would reduce the travel lane width to 11.5-feet;
- Would utilize 35-degree diagonal parking stalls;
- Received a decision matrix score of 2;
- **Diagonal Parking is not recommended.**
- The two-hour parking restriction west of 2nd Avenue west will be removed to comply with current City Code.
- **Removal of the 2-hour parking restriction between 2nd Avenue West & 1st Avenue West. Requires further council action to revise code.**

Area 2 – 3rd Street West (3rd Alley West to 2nd Alley West)

- Would gain three parking stalls;
- Would require a 4.2 and 5.0 foot shift in centerline;
- Would reduce the travel lane width to 11 feet;
- Would utilize 35-degree diagonal parking stalls;
- Received a decision matrix scores of 4 for the west block and 3 for the east block;
- **Diagonal parking is not recommended.**
- The two-hour parking restriction will be removed west of 2nd Avenue West to comply with current City Code.
- **Removal of the 2-hour parking restriction is recommended from 2nd Avenue West to 1st Avenue West. Requires further council action to revise code.**

Area 3 – 5th Street West (1st Avenue West to Main Street)

- Would gain 4 parking stalls;
- Would require a 3.9-foot shift in centerline;
- Would reduce the travel lanes to 12-feet and 13.9 feet;
- Would utilize 45-degree diagonal parking stalls;
- Received a decision matrix score of 7;
- **Diagonal parking is recommended.**
- **Removal of the 2-hour parking restriction is recommended. Requires further council action to revise code.**

Area 4 – 3rd Street East (2nd Avenue East to 3rd Avenue East)

- Would gain 8 parking stalls;
- Would require a 2.9-foot shift in centerline;
- Would reduce the travel lanes to 11.9-feet;
- Would utilize 45-degree diagonal parking stalls;
- Received a decision matrix score of 7;
- **Diagonal parking is recommended.**
- **Removal of the 2-hour parking restriction is recommended. Requires further council action to revise code.**

Requested Action:

Please review the findings given in this memo. If you concur with the findings, please let me know so that I can schedule the installation of the new street striping.

Further Recommendation:

Although not part of the this analysis, an evaluation of the yellow curb sections and private approaches currently in place within the BID should be completed as adjustments to these may also create additional parking stalls.