



# Curb and Gutter Evaluation Plan

**JUNE 2020**

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**City of Sturgis, South Dakota**  
**Authored by: Planning and Permitting**

**CITY OF**  
*Sturgis*

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# Executive Summary

As the City of Sturgis grows, development standards will need to be upheld to ensure that new and ongoing development is consistent and aesthetically functional to the community. City staff has reviewed existing conditions within the city limits to examine the feasibility of installing curb, gutter, and sidewalk. City staff has chosen several criteria to examine each segment of roadway without all or some of these street improvements:

- Constructability
- Planning
- Drainage
- Engineering
- Parking
- Cost

To emphasize the importance of a criteria group, a weighting factor has been assigned to apply to each group's scoring. The summation of the group scores yields the overall rank or ease adding curb and sidewalk to a section of road.

To quantify the scores, road segments have been digitized in the City's GIS system for easy review of the constructability of the curb and gutter on streets throughout the City. Due to time and budget constraints, a road will be scored as development plans and building permit applications are received.

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# 1. Introduction

## 1.1 General Overview

The City of Sturgis Planning and Permitting Department has been tasked with identifying areas throughout the City to determine which streets do not have curb and sidewalk, and to determine what factors would trigger the requirement for infrastructure improvements. A combination of data has been collected from on-site information as well as from the City's GIS to create a scoring system that would prioritize the installation of curb, gutter, and sidewalk based on difficulty of implementation.

## 1.2 Purpose

Curb and gutter provide both an aesthetic and functional purpose. Curbs add a distinct demarcation of roadway that is innate to driver expectancy, while adding a clear edge of property. It also allows for parking control and an efficiency in stormwater drainage. Installation of sidewalk promotes “walkability” of a neighborhood, and provides safe and easy access for young and old alike.

The scores will assist in coordinating the construction of sidewalks and additional roadside safety measures. The goal of the City of Sturgis is to “fill in the blanks” in established neighborhoods, as well as enforce development standards in new residential developments.

## 1.3 Procedure

The areas lacking curb, gutter, and sidewalk have been digitized and categorized. Field review as well as utilization of GIS and Pictometry imagery also aid in data collection. As projects are received in the Planning and Permitting office, staff will review the application and determine the need for curb, gutter and sidewalk using the criteria selected. The main triggers that will require an assessment of the current conditions of the property will be as follows:

- Subdivision of property;
- New construction or expansion of building footprint; or



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- Changes to existing infrastructure

## 1.4 Benefits of the Project

The information acquired from this analysis will allow city staff to efficiently plan the construction of curb and gutter throughout the city, as well as determining when a property should be brought up to current standards.

## 2. Data Collection

ArcGIS files have been created from the digitization of aerial maps. Aerial photography is flown every 3-4 years, so the 2019 aerial imagery provided by Pictometry was utilized in the digitization process. On-site inspection will determine the criteria needed to formulate a rating system for the installation requirements for curb and gutter. The following groups of criteria will be considered in order to rate a street section:

- Constructability
  - Is there an existing retaining wall? Will one be required?
  - Is there an existing sidewalk? If so, what is the condition?
  - If curb and gutter is installed, will ADA improvements need to be installed?
  - What is the required setback distance?
  - What is the condition of the existing pavement?
  - What is the width of the adjacent street?
- Planning
  - What is the zoning classification of the area?
  - Does the installation of curb and gutter in this area fall in line with other Capital Improvement projects the city has planned?
  - Will it tie in to existing infrastructure?
- Drainage
  - Are there existing drainage structures?
  - Will conditions improve if drainage structures are installed?
- Engineering
  - What is the functional classification of the street in question?

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- What is the water quality potential of the area in question?
  - What is the slope or road grade of the planned/existing subdivision?
  - Cost
    - What is the number of utility impacts if curb and gutter were to be installed?
    - What is the number of miscellaneous impacts if curb and gutter were to be installed?
    - What is the length of the section in question?

The listed criteria will be considered when assigning a rating to each scoring group. A summation of the weighted scores produces an overall difficulty rating score.

### 3. Scoring System

The assigned scoring ranges from 0 to 10 allowing for score variability within the large amount of collected data. Criteria with a possibility of two answers will be assigned either a 0 or a 10. Criteria with a possibility of three answers will be assigned a 0, 5, or 10. The number of scoring criteria varies amongst the differing categories. To present an even playing field, a category average score will be calculated before the final score. The average score is the total score for the category divided by the number of criteria in the category. A weighted scoring factor was discussed and decided upon by the Public Works and Planning and Permitting Departments to be enacted upon the average category score. An Excel spreadsheet will be utilized to average the scores in each category, apply the desired category weighting factor, and sum each category score to produce a final score. The higher the score, the easier curb is to construct and the higher the overall benefit of constructing improvements in the desired section. All assigned scores and scoring criteria are based on the opinion of the city engineer.

The importance and definition of the scoring criteria are described as follows:

#### **Constructability**

**Required MSE Wall** — based upon the opinion of the city engineer. The addition of curb and gutter may cut into a slope where a wall is deemed necessary to stabilize exposed earth. If an MSE wall is required, the score will be 0. If an MSE wall is not required, the score will be 10.

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**Existing Sidewalk** — the existence of a paved path for pedestrians at the side of the road. If sidewalk is present, curb construction will be beneficial by adding a safety factor for pedestrians, and rate as a 10. If no sidewalk is present, the score will be 0.

**Required ADA Improvements** — Curb and gutter will in some cases terminate into existing sidewalks at street corners. Curbs are seen as an obstacle for pedestrians and the installation in such areas of concern must pass ADA approval. ADA improvements will make curb and gutter more difficult. If ADA improvements will be required, the score will be 0, otherwise the score will be 10.

**Setback distance** — the distance between the property lot line of the frontage road and the front building line. A larger setback allows for an ease in construction due to the increase in accessibility. A setback distance of less than 10ft will score a 0. A distance greater than 20 will score a 10.

**Existing Pavement Condition** — based upon the opinion of the city engineer. Pavement in better condition will be easier to saw cut, remove and replace than deteriorated pavement. Accordingly, pavement in great condition will score a 10 while pavement in moderate condition will score a 5. Pavement in poor condition will score a 0.

**Street Width** — the distance between the existing pavement edges. The installation of curb and gutter will make the street narrower. Streets wider than 30 feet will be labeled as sufficiently wide and will receive a score of 10. Street widths in between 15 and 30 feet will be labeled as moderately wide and will receive a score of 5. Street widths of less than 15 ft will be labeled as narrow and receive a score of 0.

## **Planning**

**Zoning Classification** — Higher zoning classifications typically allow improvements to be constructed closer to the property line. This increases the likelihood of encountering obstructions at proposed curb locations compared to lower zoned properties. Commercial properties also see less benefit from curb than residential

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properties that are closer to the roadway. These constraints will make curb construction more difficult, perceived value by commercial property owners lower, and right of way difficult to acquire. Higher zoning class such as commercial or industrial will have a lower score (0) than residential classes (10).

**Capital Improvement Plan** — The City of Sturgis has released a capital improvement plan containing future construction jobs for the city. The addition of curb and gutter into areas fitting the capital improvement plan will increase the efficiency of the money spent on said projects. Sections without curb that fall under a capital improvement plan to be completed within the next 2 years will receive a score of 0. Sections that are included within a plan to be completed within 2-4 years will receive a score of 5. Sections that do not fall under a capital improvement plan project within the next 4 years will receive a score of 10.

**Surrounding Infrastructure** — In an effort to connect existing neighborhoods and “fill in the gaps”, surrounding infrastructure will be taken into consideration to determine if curb, gutter, and sidewalk will be effectively interconnected. If an adjacent property has curb, gutter, and sidewalk, the assigned score will be 10. If an adjacent property does not have this infrastructure, the assigned score will be 0.

### **Drainage**

**Existing Storm Sewer System**— based upon the opinion of the city engineer. Curb and gutter channels storm runoff to a collection point. A major decision point is whether a storm sewer system is in place to collect runoff. If a storm sewer system is in place, the score will be 10. If a storm sewer system is not in place, the score will be 0.

**Storm Sewer System Required**— based upon the opinion of the city engineer. If storm sewer infrastructure is required to be installed to improve overall drainage conditions, it will be scored a 0. If it is not necessary to install storm sewer infrastructure, it will be scored a 10.

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## **Engineering**

**Functional Classification** — Roadways with a higher classification will have increased traffic and pavement sections. This condition will increase the difficulty of construction and increase the cost of replacing the adjacent pavement. Curb installed on the local classification roads will score a 10 and curb installed on the non-local classifications will be scored a 0.

**Water Quality Potential** — Roadways with the ability to provide water quality features such as raingardens or filter strips will increase the water quality of the runoff. These features usually require space and grade to create a horizon of material used in filtering the water. Areas that facilitate these features will receive a score of 10. While areas that are difficult to implement these features will score a 0.

**Slope/Road Grade** – based upon the opinion of the city engineer. Slope, or steepness of terrain varies considerably in and around Sturgis and will need to be considered on a case-by-case basis. A slope of less than a 2% grade (minimum) will be scored a 10, and a slope between 2-6% (moderate) will be scored a 5, and a slope greater than 6% (extreme) will be scored a 0.

## **Cost**

**Utility Impacts** — Utility conflicts, both above and below ground, can create significant obstacles to curb construction. The number of utilities and the size of each will impact the difficulty of curb construction. Areas that, in the opinion of the engineer have numerous or significantly large utilities will score lower than areas with no utilities. Accordingly, less than 2 utility conflicts will score 10, 2-4 conflicts will score a 5, and 4 or more utility conflicts will score a 0.

**Miscellaneous Impacts** — Items in this category will be used to define any features that are not defined in other criteria. These features will increase the difficulty of construction curb and will be scored through a range. Fewer items will score higher than more items. Less than 2 impacts will score a 10, 2-4 impacts will score a 5, and greater than 4 will be assigned a score of 0.



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**Length of No Curb Section** — the length of curb section that will be constructed will affect the overall cost of construction. The section must have similar properties that reflect a consistent score. That is, if the section features change from one end to the other, the section will be broken and scored separately based on its individual criteria. Conversely, long sections exhibiting similar properties may be scored jointly. However, their extra length will indicate a high cost when reviewing cost by street. Street lengths of less than 100 ft. to be improved will be scored a 10. Street lengths between 100 and 300 will be scored a 5 and street section longer than 300 feet to be improved will score a 0.

## 4. Group Weighting Factor

The weighting factor for each group of categories puts importance to the group's overall contribution to the final difficulty rating. Each group was reviewed by a team from the City and the GBA team. The weighting factor considers history of projects and future planning in the development of the score. The weighting factors range from one being the least important to ten being the most important group. The weighting factors are easily modified if the importance of the category has changed.

## 5. Data Collection Examples

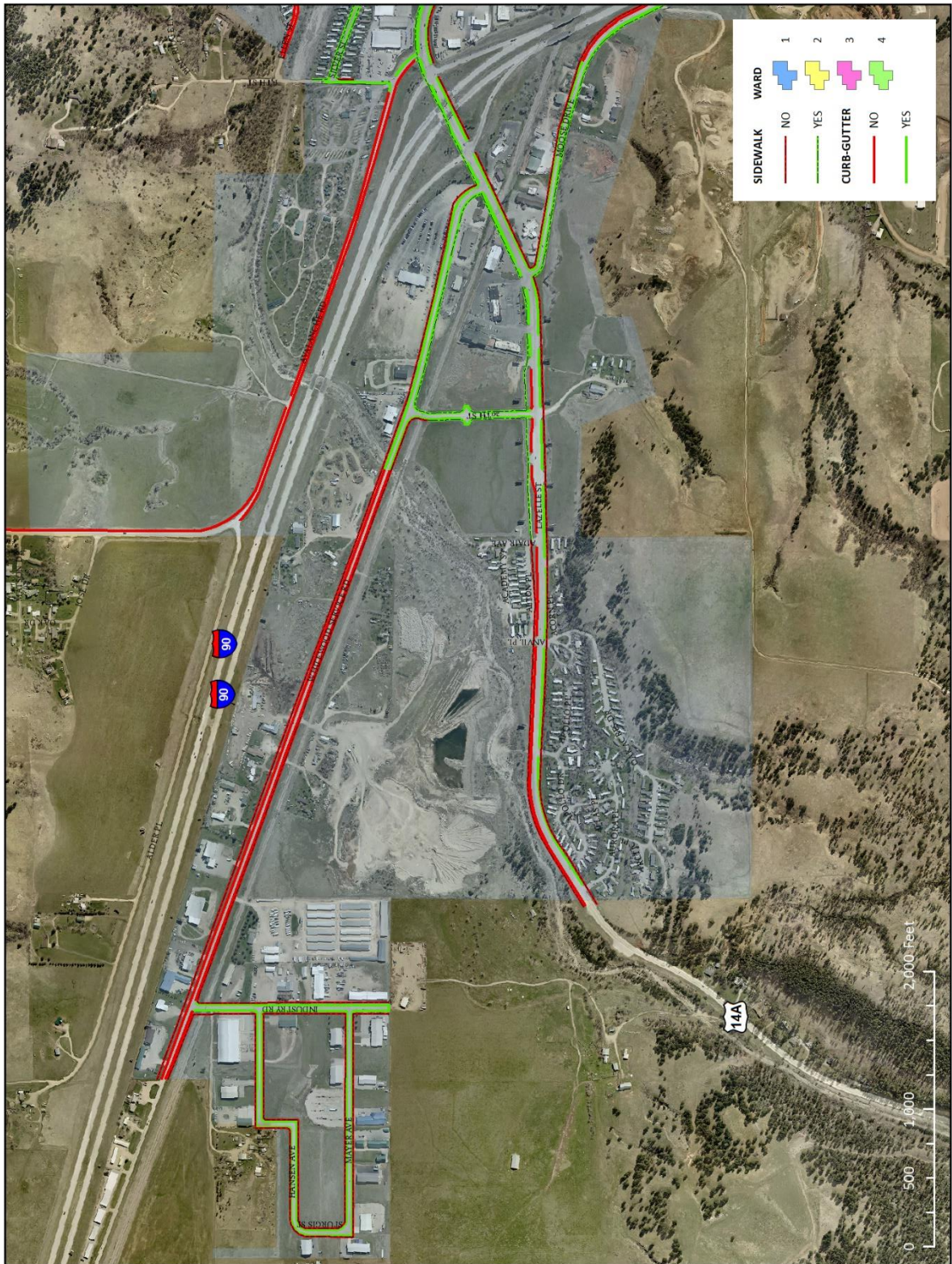
To illustrate the field investigation and data collection, a street with partial curb and gutter was selected. A portion of Hurley Drive was used as a pilot test for the implementation of the curb and gutter plan. The street was annexed in the late 1990s in a primarily rural area. The street was built on a ditch drainage system with a culvert near the middle of the section. A natural drainage passes through the area. The area is privately owned on both sides with partial sidewalk on the east side. The neighboring Palisades Subdivision was built several years after the Hurley Drive area was annexed, and current street improvements adjoin the older houses along Hurley Drive. Using the weighted scoring system as seen below, the total weighted score was 115 or low priority.

### Curb and Gutter Evaluation

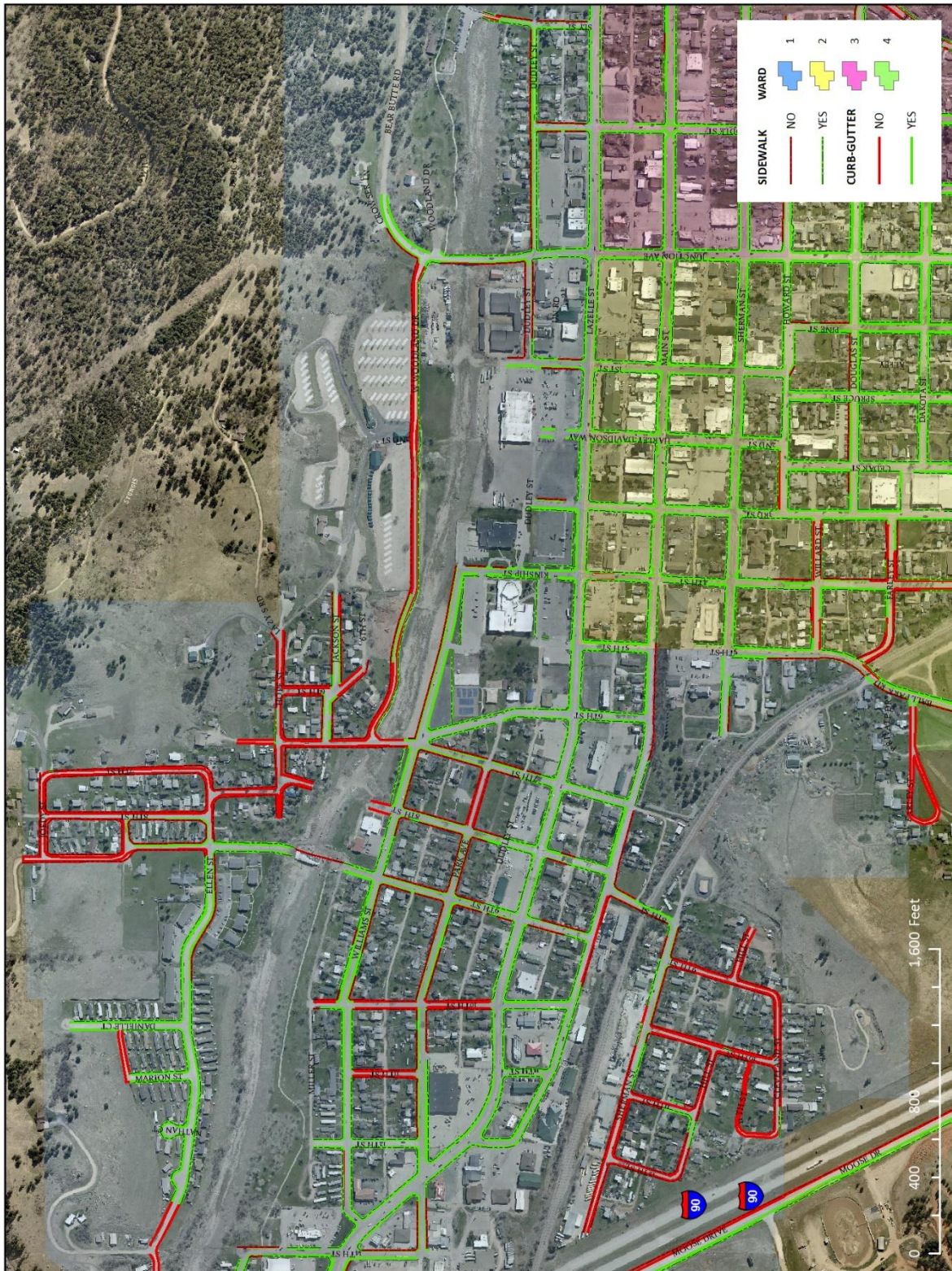
Employee:	Liz Wunderlich			
Date Inspected:				
Location:	2150 Hurley Drive			
End Streets:	Dolan Creek Rd, Palisades Lp			
		<b>Constructability</b>	<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Wall Required	N		10	
Existing Sidewalk (Y or N)	N	Yes (Y) No(N)	0	
ADA Improvements Req	Y		0	
Setback Distance	26	ft	5	
Pavement Condition	A	Poor (P) Average (A) Excellent (E)	5	17.86
Width of Street	24	ft	5	
Other			0	
		<b>Planning</b>	<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Zoning	R	Residential (R ) Commercial ( C ) Highway Service (HS) Industrial (IND)	10	40.00
Capital Improvement Plan	NF	Immediately (1-2 yrs) (IM) Near Future (2-4 yrs) (NF) Distant Future (4+ yrs) (DF)	5	
Surrounding Infrastructure	N	Yes (Y) No(N)	0	
		<b>Drainage</b>	<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Existing Storm Sewer	N	Yes (Y) No(N)	0	0.00
Storm Sewer Req	Y		0	
		<b>Engineering</b>	<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Functional Classification	L	Local (L) Non-Local (NL)	10	
Water Quality Potential	M	Low (L) Medium (M) High (H)	5	20.00
Slope	4	Minimal <2% Moderate 2-6% Extreme >6%	5	
		<b>Cost</b>	<b>SCORE</b>	<b>WEIGHTED SCORE</b>
# of Utility Impacts	3	Impacts	5	
# of Miscellaneous Impacts	1	Impacts	10	
Length of 'No Curb' Section	751	ft	0	37.14
Average Drainage Score			0	
Average Constructability Score			3.57	
		<b>TOTAL SCORE</b>		<b>115.00</b>
Difficulty Evaluation Rating	Low Priority <150	Medium Priority	High Priority 175 >185	

## 6. Existing Conditions

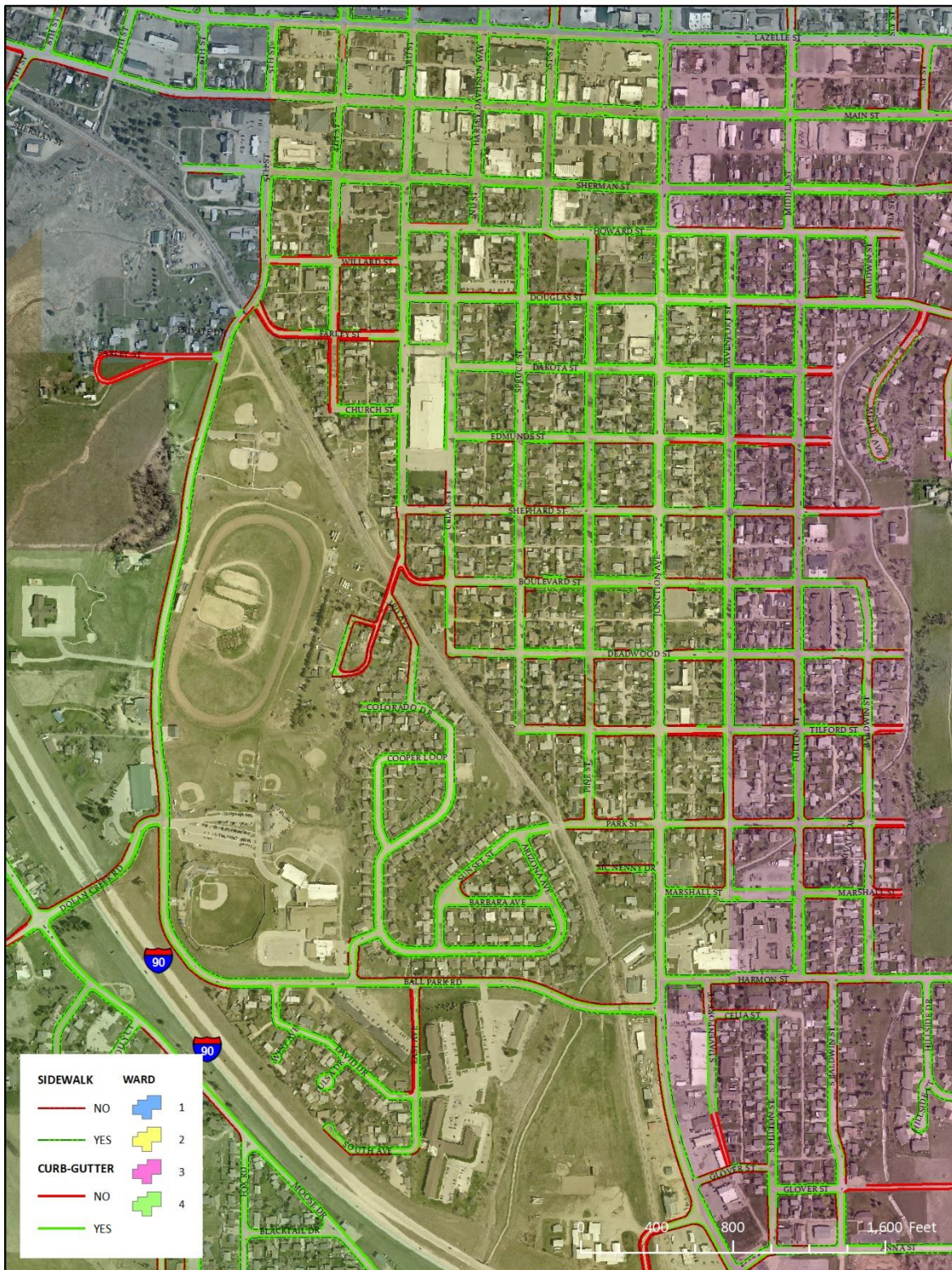
To illustrate the current conditions of curb, gutter, and sidewalk installation, a map was created to indicate the existence of the street improvements. Installed sidewalk will be indicated as a green- and black-dashed line, and areas lacking sidewalk will be indicated as a red- and black-dashed line. Existing curb and gutter will be indicated as a solid green line, and the lack of curb and gutter will be indicated as a solid red line. A comprehensive plan proactively targeting priority areas can be completed as time allows. When this is completed, existing areas and future undeveloped areas will be rated on a scale of High, Medium, and Low Priority.



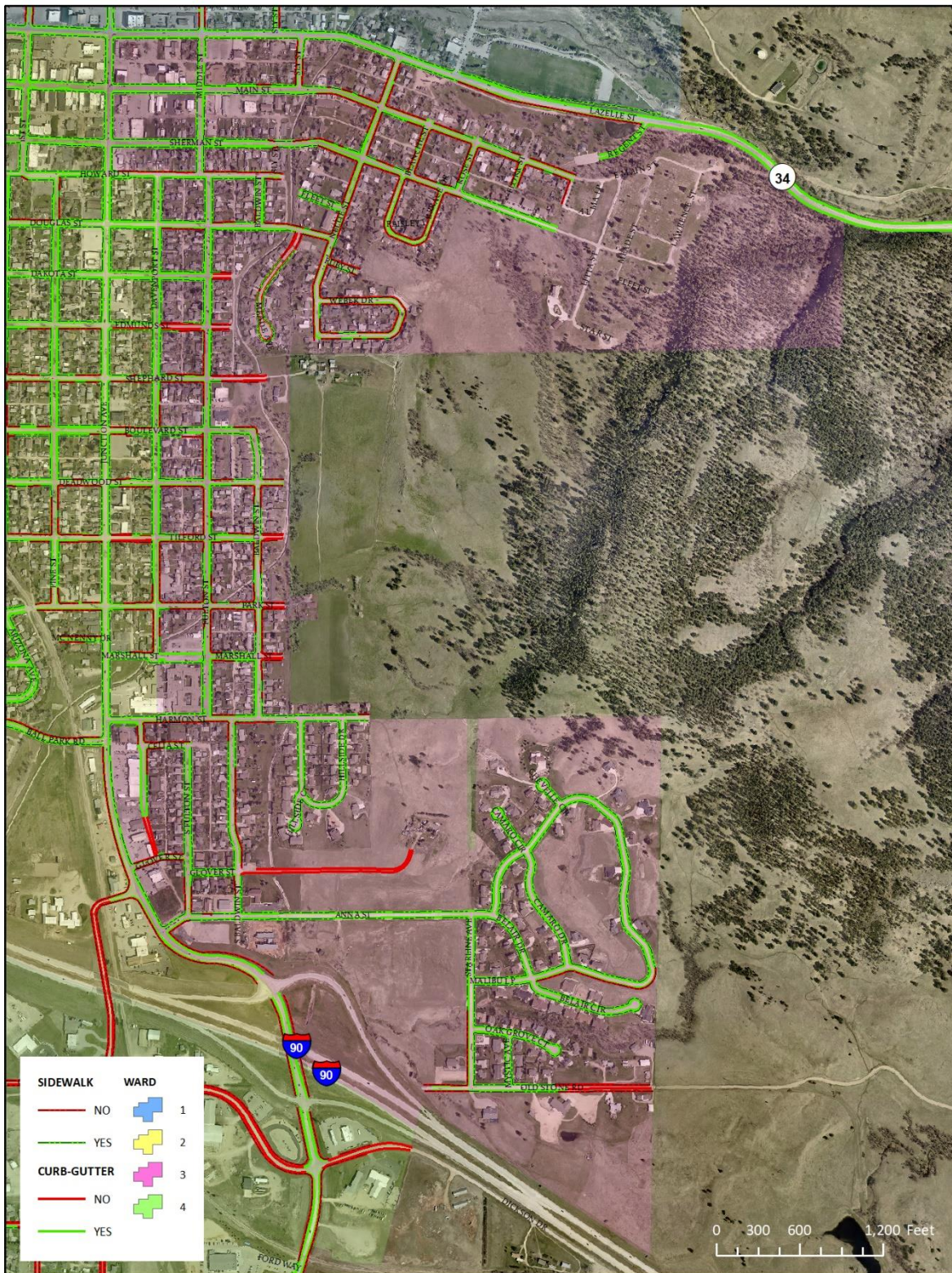




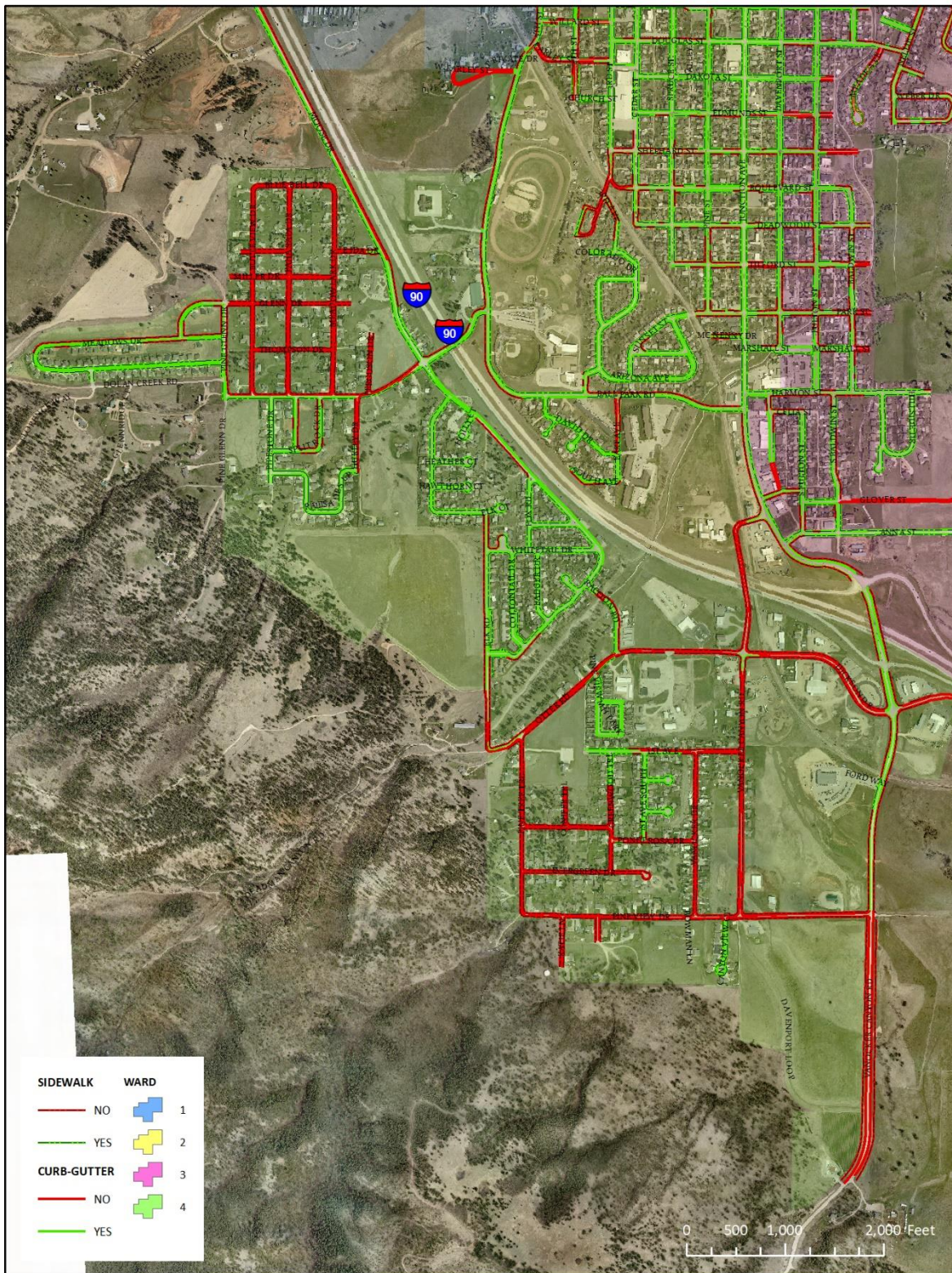












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## 7. Conclusion

The goal of the curb and gutter plan is to implement a non-biased review of when installation of curb, gutter, and sidewalk is needed on a case-by-case basis. Using this plan, City staff can apply the listed criteria identified in the plan to determine the constructability of curb improvements. The City's GIS system will aid in the investigation and ranking of street improvements, which will be based on the valuation of a building project, or when a subdivision plan is received by staff. The ranking of a street can be easily changed and scored as city staff modifies the evaluation of a street segment. After implementing the scoring system to an area that does not have curb, gutter, and sidewalk, staff can determine when these improvements must be installed.

# 8. Appendices

## Field Report:

### Curb and Gutter Evaluation

Employee:			
Date Inspected:			
Location:			
End Streets:			
<b>Constructability</b>		<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Wall Required		0	
Existing Sidewalk (Y or N)	Yes (Y) No(N)	0	
ADA Improvements Req		0	
Setback Distance	ft	0	
Pavement Condition	Poor (P) Average (A) Excellent (E)	0	0.00
Width of Street	ft	0	
Other		0	
<b>Planning</b>		<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Zoning	Residential (R ) Commercial ( C ) Highway Service (HS) Industrial (IND)	FALSE	0.00
Capital Improvement Plan	Immediately (1-2 yrs) (IM) Near Future (2-4 yrs) (NF) Distant Future (4+ yrs) (DF)	FALSE	
Surrounding Infrastructure	Yes (Y) No(N)	0	
<b>Drainage</b>		<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Existing Storm Sewer	Yes (Y) No(N)	0	0.00
Storm Sewer Required		0	
<b>Engineering</b>		<b>SCORE</b>	<b>WEIGHTED SCORE</b>
Functional Classification	Local (L) Non-Local (NL)	0	
Water Quality Potential	Low (L) Medium (M) High (H) Minimal < 2%	FALSE	0.00
Slope	Moderate 2-6% Extreme >6%	10	
<b>Cost</b>		<b>SCORE</b>	<b>WEIGHTED SCORE</b>
# of Utility Impacts	Impacts	10	
# of Miscellaneous Impacts	Impacts	10	
Length of 'No Curb' Section	ft	10	0.00
Average Drainage Score		0	
Average Constructability Score		0.00	
<b>TOTAL SCORE</b>			0.00
Difficulty Evaluation Rating	Low Priority <150	Medium Priority 175 >185	High Priority >185



## Scoring Template:

CURB AND GUTTER SCORING TEMPLATE						
			DATA INPUT	INPUT SCORE	CATEGORY WEIGHT	
CONSTRUCTABILITY	WALL NEEDED	YES	Y	0	5	
		POSSIBLY	P	5		
	EXISTING SIDEWALK	NO	N	10		
		YES	Y	10		
	ADA IMPROVEMENTS	NO	N	0		
		YES	Y	10		
	SETBACK DISTANCE	< 10		0		
		= 10-20		5		
		> 20		10		
	PAVEMENT CONDITION	POOR	P	0		
AVERAGE		A	5			
EXCELLENT		E	10			
WIDTH OF STREET (FT)	< 15		0			
	= 15-30		5			
	> 30		10			
OTHER		COMMENTS				
PLANNING	ZONING	RESIDENTIAL	RES	10	8	
		COMMERCIAL	COM	7		
		HIGHWAY SERVICE	HS	5		
		INDUSTRIAL	IND	3		
	CAPITAL IMPROVEMENT PLAN (yrs)	< 2		0		
		= 1-4		5		
> 4			10			
SURROUNDING INFRASTRUCTURE	YES	Y	10			
	NO	N	0			
DRAINAGE	EXISTING STORM SEWER	YES	Y	10	8	
		NO	N	0		
	STORM SEWER REQUIRED	YES	Y	0		
		NO	N	10		
ENGINEERING	FUNCTIONAL CLASSIFICATION	LOCAL	L	10	3	
		NON-LOCAL	NL	0		
	WATER QUALITY POTENTIAL	LOW	L	0		
		MEDIUM	M	5		
	SLOPE/GRADE	HIGH	H	10		
		< 2%		10		
COST	# OF UTILITY IMPACTS	= 2-4		5	10	
		> 4		0		
		< 2		10		
	# OF MISCELLANEOUS IMPACTS	= 2-4		5		
		> 4		0		
		< 100		10		
	LENGTH OF 'NO CURB' SECTION (FT)	= 100-300		5		
		> 300		0		
		AVERAGE DRAINAGE SCORE		DETERMINED ABOVE		
	AVERAGE CONSTRUCTABILITY SCORE		DETERMINED ABOVE			
TOTAL	DIFFICULTY RATING EVALUATION	< 150	LOW PRIORITY			
		= 175	MEDIUM PRIORITY			
		> 185	HIGH PRIORITY			



Map Exhibit:

