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PROJECT MANUAL

FOR THE

RAWLINS NEEDS ASSESSMENT PROJECT
Version 1.00
January 16, 2007

Prepared for: City of Rawlins, WY

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1 FOREWORD

1.1 History

The Rawlins City Council and City Staff have identified a need for infrastructure improvements in various areas of the City. Demand on existing infrastructure is increasing due to the rapid growth occurring within the City. Limited funding is available for improvements to meet these increased demands. Pursuit of Local Improvement District (LID) formation may provide opportunities to construct more improvements with local funding participation. Planning, prioritizing and budgeting for improvements is crucial to maintain and improve existing facilities and expand for the future.

1.2 Intent

The Needs Assessment Project was created to assist the City of Rawlins in prioritizing, budgeting and planning for improvements within the City. Prioritizing improvement areas is logical to maximize the benefit of capital expended. In order to develop priorities, utility information was collected from the Department of Public Works (DPW) and areas of need were identified and prioritized by DPW personnel. The areas identified were then visually inspected by city staff to identify the surface conditions and a priority for surface condition was recorded. The information was collected and analyzed using both Geographic Information System (GIS) and spreadsheet software. The combination of the spreadsheet component and GIS component are referred to as a database throughout this document. The spreadsheet software used is Excel 2002 and is a copyrighted program of Microsoft. The GIS program used is ArcMap Version 9.2 and is copyrighted software designed by Environmental Systems Research Institute (ESRI). Both of these programs are also used by the City. The collected information was analyzed to determine the highest priority areas. Estimated quantities and costs for each individual area were developed in spreadsheet format. Tools within the spreadsheet were also developed to expedite retrieval of this information.

1.3 Project Implementation

1.3.1 Data Transfer

Designating one person to maintain and update project information (Database Manager) should be considered in the near future (January 2007). One person accessing the spreadsheet and GIS components is recommended to create and maintain technical efficiency and to reduce problems associated with multiple users. The database manager should have a general knowledge of both Excel and ArcMap. The spreadsheet will be password protected to maintain security.

A communication channel should be developed between DPW and the database manager. As projects are completed or new areas of need are identified the database must be updated. A form has been developed to allow DPW personnel to record information about completed projects or newly identified problem areas (See Appendix D). Completed forms should be transferred to the database manager for updates. It is recommended that for a trial period of one year communications between the DPW and database manager should be scheduled every two weeks.

If completed project information or new areas of interest are available the database should be updated. The two week schedule should be evaluated at the end of the first year and adjusted if necessary. Maintaining good communication and update procedures is crucial to ensure the database remains current and accurate for future use.

This database is a dynamic document that must be kept up to date to remain useful. PMPC has reviewed and tested the database for functionality. There may be some additional information necessary to get city personnel up to speed with how everything works. The Project Manual was created to assist with answers to questions and directions on how to operate the database. It is in the best interest of the City to put the program to work and take note of any problems that are found or additional documentation that may be necessary. This Project Manual is dated and labeled as Version 1.00; if new information is necessary a new Version (1.01) can be created. PMPC will assist the database manager with operation and maintenance procedures and problems if they arise. A meeting should be scheduled with the database manager and DPW on or around March 15, 2007 to discuss how the database is operating, and determine if additional documentation or assistance is needed at that time.

1.3.2 Area Selection

The City can select project areas based on prioritization or public interest. These selected improvement areas can then be forwarded to the database manager for retrieval of information including estimated quantities and costs for each project area. Information provided can then be used for budgeting and planning of infrastructure improvement projects. Further analysis can be readily performed to determine Local Improvement District boundaries and assessment to property owners within the district boundary.

1.3.2.1 Selecting Project Areas

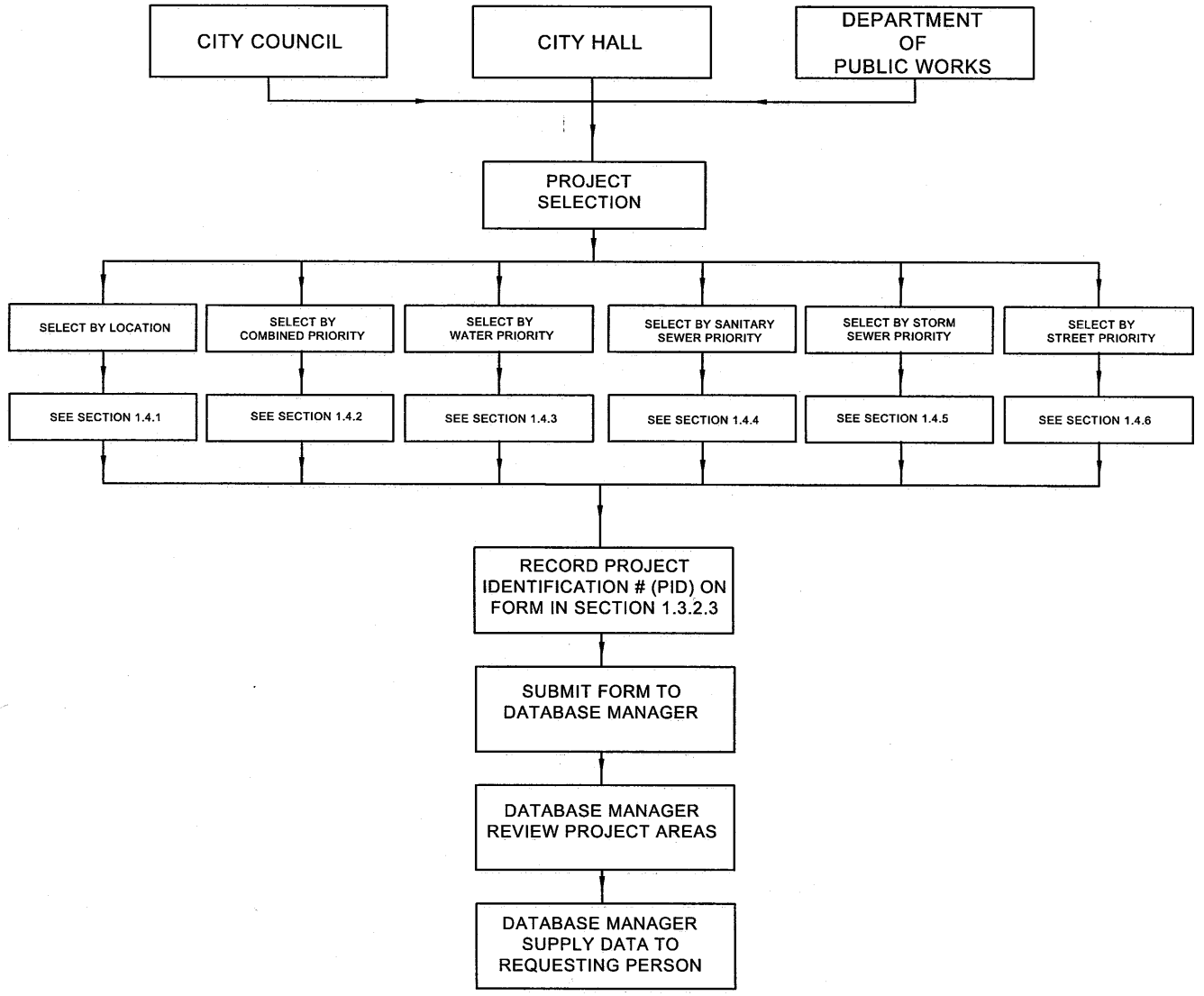
Motivation for selecting a project area may be based on one or more of the following:

- City Council – Constituent interests
- City Government – Budget and work force planning
- DPW – Planning and budgeting for infrastructural improvements
- DPW – Prioritizing improvements based on individual department or utility type
- General – Long term planning and budgeting for future improvements

1.3.2.2 Project Selection Organizational Chart

An organizational chart is provided below to illustrate the process of selecting project areas and collecting project information from the database manager.

PROJECT SELECTION ORGANIZATIONAL CHART



1.3.2.3 Selected Project Areas Form

The form shown below can be used for recording and submitting selected project areas:

SELECTED PROJECT AREAS FORM

Date: _____

Submitted By: _____

Date Received: _____

PID = Project Identification Number

PID	DESCRIPTION

NOTES:

1.3.2.4 Example Database Project Output

The database default is structured to provide quantities for replacement of all existing utilities. It is important that the database manager and DPW be able to evaluate the project area and project prioritization to determine what information should be included in the quantity and cost estimates. Selecting or omitting project utility improvements in the quantity and cost estimates can readily be performed within the spreadsheet.

Example Project Output

WATER				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL**
6" PVC MAIN	206	FT	$ 52.00	$ 10,712.00
8" PVC MAIN	0	FT	$ 54.00	$ -
10" PVC MAIN	0	FT	$ 60.00	$ -
12" PVC MAIN	0	FT	$ 66.00	$ -
20" PVC MAIN	0	FT	$ 108.00	$ -
6" GATE VALVE	2	EA	$ 2,448.00	$ 4,896.00
8" GATE VALVE	0	EA	$ 2,928.00	$ -
10" GATE VALVE	0	EA	$ 3,408.00	$ -
12" GATE VALVE	0	EA	$ 3,888.00	$ -
20" GATE VALVE	0	EA	$ 14,400.00	$ -
FIRE HYDRANTS	2	EA	$ 4,200.00	$ 8,400.00
SERVICE CONNECTION	0	EA	$ 852.00	$ -
SERVICE LENGTH	0	FT	$ 60.00	$ -
FITTINGS	2	EA	$ 1,200.00	$ 2,400.00
			TOTAL	**$ 26,408.00**

STORM SEWER				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL**
INLETS	0	EA	$ 2,760.00	$ -
18" PIPE	300	FT	$ 48.00	$ 14,400.00
24" PIPE	0	FT	$ 54.00	$ -
27" PIPE	0	FT	$ 60.00	$ -
30" PIPE	0	FT	$ 84.00	$ -
33" PIPE	0	FT	$ 108.00	$ -
36" PIPE	0	FT	$ 144.00	$ -
48" PIPE	0	FT	$ 180.00	$ -
54" PIPE	0	FT	$ 204.00	$ -
MANHOLES	0	EA	$ 5,328.00	$ -
			TOTAL	**$ 14,400.00**

SANITARY SEWER				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL**
6" PVC SEWER MAIN	0	FT	$ 49.00	$ -
8" PVC SEWER MAIN	345	FT	$ 49.00	$ 16,905.00
10" PVC SEWER MAIN	0	FT	$ 54.00	$ -
12" PVC SEWER MAIN	0	FT	$ 60.00	$ -

15" PVC SEWER MAIN	0	FT	$ 66.00	$ -
18" PVC SEWER MAIN	0	FT	$ 78.00	$ -
24" PVC SEWER MAIN	0	FT	$ 96.00	$ -
MANHOLE CONNECTIONS	3	EA	$ 2,760.00	$ 8,280.00
MANHOLES	1	EA	$ 5,124.00	$ 5,124.00
SERVICE CONNECTION	0	EA	$ 768.00	$ -
SERVICE LENGTH	0	FT	$ 64.00	$ -
			TOTAL	**$ 30,309.00**

STREET				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL**
ASPHALT	1431	SY	$ 37.00	$ 52,953.82
APPROACHES	3	EA	$ 1,764.00	$ 5,292.00
CURB AND GUTTER	570	FT	$ 42.00	$ 23,940.00
SIDEWALK	570	FT	$ 88.00	$ 50,160.00
			TOTAL	**$ 132,345.82**
			SUBTOTAL 1	**$ 203,462.82**

MISCELLANEOUS				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL**
LOCATES	1.1	BLOCK	$ 6,600.00	$ 7,260.00
REMOVALS	1.1	BLOCK	$ 8,910.00	$ 9,801.00
TRAFFIC CONTROL	1.1	BLOCK	$ 9,600.00	$ 10,560.00
SEEDING	1.1	BLOCK	$ 2,160.00	$ 2,376.00
			TOTAL	**$ 29,997.00**
			SUBTOTAL 2	**$ 233,459.82**

MOBILIZATION	1	LS	$ 24,567.00	$ 24,567.00
				$ 258,026.82

D&C ENGINEERING	1	LS	$ 54,047.00	$ 54,047.00
LEGAL FEES	1	LS	$ 13,512.00	$ 13,512.00
			TOTAL PROJECT COST	**$ 325,585.82**

1.3.2.5 Database Manager Responsibilities

The database manager shall be responsible for the following:

- Maintaining and updating the database
- Communicating with DPW
- Reviewing project selections made by City Council and city personnel
- Supplying output information from the database to city personnel
- Identifying problems within the database
- Working with City Council, city personnel and PMPC on LID projects

1.4 Project Areas and Prioritization

1.4.1 Project Area Map & Project List

The Project Area Map displays the areas that were included in Needs Assessment Project. These areas were selected based on input from the Department of Public Works and City Council. In total there are 355 areas.

The Project Area List includes all of the project areas shown on the Project Area Map. The projects are organized with the numbered streets first followed by all other streets in alphabetical order. The Project Identification Number (PID) number is also included and can be referenced for each project area.

PROJECT AREA MAP

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
47	7	Cherry	Birch
48	7	Birch	Alder
49	7	Alder	High
46	7	Walnut	Cherry
31	8	Front	Cedar
33	8	Buffalo	Pine
34	8	Pine	Spruce
32	8	Cedar	Buffalo
72	8	Alder	High
71	8	Birch	Alder
69	8	Walnut	Cherry
70	8	Cherry	Birch
52	9	Cherry	Birch
53	9	Cherry	Date
67	9	Walnut	Date
27	9	Pine	Spruce
30	9	Front	Cedar
28	9	Buffalo	Pine
29	9	Cedar	Buffalo
68	9	Birch	Alder
314	9	Alder	High
37	11	Alder	High
65	11	Cherry	Birch
54	11	Date	Cherry
45	11	Pine	Park Lot
66	11	Birch	Alder
83	11	Walnut	Date
36	12	Alder	High
56	12	Walnut	Maple
55	12	Maple	Spruce
59	12	Birch	Cherry
57	12	Date	Walnut
58	12	Cherry	Date
89	12	Pine	Spruce
88	12	Birch	Alder
91	13	Walnut	Date
92	13	Maple	Walnut
60	13	Spruce	Maple
90	13	Date	Cherry
39	14	Court Place	Cherry
94	14	Gallup	Maple
93	14	Spruce	Gallup
96	14	Walnut	Date
95	14	Maple	Walnut
41	15	Gallup	Maple
42	15	Maple	Walnut
6	19	Spruce (North)	South (1 block)
1	21	Spruce	Elm
310	23	Elm	Spruce
323	13 Alley	Alder	Mt View
319	15 Alley	Spruce	Gallup
320	15 Alley	Gallup	Maple
321	15 Alley	Maple	Walnut
322	15 Alley	Walnut	Date
318	9 Alley	Birch	Alder
209	Adams	Center	Washington
208	Adams	Center	Water
207	Adams	State	Center
152	Airport Road	Murray	Daley
153	Airport Road	Daley	Mahoney

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
154	Airport Road	Mahoney	Cedar
73	Alder	7	8
74	Alder	8	9
76	Alder	11	12
75	Alder	9	11
99	Alley	Rodeo	Rodeo
133	Alton	Cedar	Dead End East
294	Antelope	Sandra	Dead End
248	Apple	Juniper	Locust
247	Apple	State	Pinion
246	Ash	Pinion	Juniper
245	Ash	State	Pinion
215	Bennett	Donnel	Miller
216	Bennett	Miller	Davis
217	Bennett	Davis	Hugus
218	Bennett	Hugus	State
50	Birch	8	7
51	Birch	9	8
80	Birch	12	13
81	Birch	13	14
355	Buffalo Alley	3	4
26	Cedar	9	10
23	Cedar	6	7
25	Cedar	8	9
24	Cedar	7	8
146	Cedar	Sinclair Station	Last Motel Entrance
227	Center	Adams	McKinley
230	Center	Jefferson	Madison
229	Center	Washington	Jefferson
226	Center	Pershing	Adams
228	Center	McKinley	Washington
231	Center	Madison	Monroe
347	Center	Jones	McClain
63	Cherry	11	12
64	Cherry	12	13
82	Cherry	Alley	14
61	Cherry	13	Alley
62	Cherry	9	11
333	City Market	Park Lot	Park Lot
122	Colorado	Cedar	Buffalo
118	Colorado	Maple	Walnut
119	Colorado	Spruce	Maple
117	Colorado	Walnut	Mahoney
120	Colorado	Pine	Spruce
121	Colorado	Buffalo	Pine
116	Colorado	Mahoney	Daley
113	Colorado	Ryan	Murray
115	Colorado	Daley	McMicken
114	Colorado	McMicken	Ryan
304	Colorado	Cedar	Railroad
21	Coulson	Coulson	Dead End
40	Court Place	13	14
158	Daley	Higley	Seiloff
159	Daley	Seiloff	Airport Road
326	Daley Alley	Stanford	Koontz
331	Daley Alley	Colorado	Illinois
332	Daley Alley	Illinois	Rodeo
327	Daley Alley	Koontz	Higley
328	Daley Alley	Seiloff	Higley
312	Darnley	Higley	Inverness

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
166	Davis	Sage Hills	End
186	Davis	McKinley	Washington
184	Davis	Grant	Pershing
183	Davis	Jackson	Grant
250	Davis	Bennett	Perry
182	Davis	Perry	Jackson
199	Davis	Washington	Jefferson
201	Davis	Madison	Monroe
185	Davis	Pershing	McKinley
200	Davis	Jefferson	Madison
339	Davis Alley	Pershing	McKinley
340	Davis Alley	McKinley	Washington
251	Donnel	Bennett	Perry
252	Donnel	Perry	Jackson
253	Donnel	Jackson	Grant
254	Donnel	Grant	Pershing
352	Drainage	Daley	Spruce
353	Drainage	Highland Hills	0
351	Drainage	Daley	Spruce
125	Edinburgh	Inverness	Edinburgh Split
127	Edinburgh	Elbow Edinburgh Road	McTavish
126	Edinburgh	McTavish	Inverness
334	Edinburgh	Edinburgh	McTavish
14	El Rancho	Los Altos	La Paloma
12	El Rancho	Elm	El Rancho Curve
13	El Rancho	Los Altos	Sonora
131	Elk	Dead End	Sandra
10	Elm	21	23
9	Elm	El Rancho	21
8	Elm	Sonora	El Rancho
11	Elm	23	Western Hills CG
7	Elm	18	Sonora
301	Ferris Ct	Miller	Culdesac
287	Front	1	2
288	Front	Wyoming	1
290	Front	Utah	Colorado
286	Front	2	3
289	Front	Colorado	Wyoming
219	Front	State	Jackson
305	Front	9	8
343	Glenn Addition	Rogers	South Sinclair
170	Grant	Hugus	State
167	Grant	Donnel	Miller
171	Grant	State	Center
169	Grant	Davis	Hugus
168	Grant	Miller	Davis
302	Hackberry	State	Locust
134	Harshman	Alley	Murray
232	Hayes	Monroe	Water
311	Hayes	Across	Sugar Creek
350	Heath Alley	Arizona	Montana
77	High	11	12
79	High	8	9
78	High	9	11
291	Higley	Extension	0
239	Higley	State	Locust
190	Hugus	Jackson	Grant
187	Hugus	McKinley	Washington
188	Hugus	Pershing	McKinley
189	Hugus	Grant	Pershing

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
282	Hugus	Monroe	Madison
268	Hugus	Bennett	Perry
267	Hugus	Perry	Jackson
281	Hugus	Sage Hills	Monroe
337	Hugus Alley	Pershing	McKinley
257	Jackson	Davis	Hugus
255	Jackson	Donnel	Miller
256	Jackson	Miller	Davis
258	Jackson	Hugus	State
259	Jackson	State	Front
163	Jefferson	State	Center
162	Jefferson	Davis	State
164	Jefferson	Center	Water
165	Jefferson	Water	Railroad Street
346	Jones	Center	McClain
249	Juniper	Apple	Ash
140	Koontz	Daley	McMicken
139	Koontz	McMicken	Murray
17	La Paloma	El Rancho	La Paloma
18	La Paloma	La Paloma Curve	El Rancho Corner
19	La Paloma	El Rancho	Los Altos
20	La Paloma	Los Altos	North to Culdesac
262	Lee	State	Center
124	Lochtay	Inverness	Unknown
244	Locust	Olive (East)	Corral Area
242	Locust	Hackberry	Olive (West)
243	Locust	Olive (West)	Olive (East)
240	Locust	Higley	State
241	Locust	State	Hackberry
16	Los Altos	El Rancho	La Paloma
192	Madison	State	Center
191	Madison	Center	Water
283	Madison	Hugus	Davis
285	Madison	Water	Alley
354	Madison Alley	Davis	Monroe
161	Mahoney	Seiloff	Airport Road
160	Mahoney	Plaza	Seiloff
335	Mahoney	Illinois	Rodeo
315	Maple	13	14
344	Maple	15	16
324	Maple Alley	1	Wyoming
316	Maple Alley	Illinois	Rodeo
298	McKinley	Davis	Hugus
297	McKinley	Hugus	State
296	McKinley	State	Center
295	McKinley	Center	Water
110	McMicken	Rodeo	Illinois
109	McMicken	Illinois	Colorado
135	McMicken	Harshman	Stanford
136	McMicken	Stanford	Koontz
179	Miller	Grant	Pershing
180	Miller	Jackson	Grant
181	Miller	Sage Hills	Miller
266	Miller	Pershing	Dead End
276	Miller	Washington	Monroe
277	Miller	Monroe	Sage Hills
307	Miller	Bennett	Perry
308	Miller Alley	Washington	Monroe
299	Miller Ct	Miller	Culdesac
205	Monroe	State	Center

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
203	Monroe	Davis	Hugus
202	Monroe	Miller	Davis
206	Monroe	Center	Water
204	Monroe	Hugus	State
300	Monroe	Miller	Dead End
313	Mt View Alley	Mt View	High
35	Mt. View	High	13
148	Murray	Bonanza	Seiloff
149	Murray	Seiloff	Cessna
150	Murray	Cessna	Beechcraft
151	Murray	Beachcraft	Airport Road
147	Murray	Edinburgh	Bonanza
144	Murray	Terry	Stanford
142	Murray	Koontz	Withrow
143	Murray	Withrow	Terry
141	Murray	Higley	Koontz
145	Murray	Stanford	Harshman
306	No Street	Front	Bennett
329	No Street	Build Rite	Comfort Inn
330	No Street	Comfort Inn	0
342	No Street	Washington	Glenn Addition
303	Olive Circle	Locust	Locust
325	Olsen Road	Airport Road	North Golf Course
22	Park	Mt. View	Mt. View
309	Park Lot	23	Elm-Spruce
317	Park Lot	10	11
220	Perry	Donnel	Miller
222	Perry	Davis	Hugus
221	Perry	Miller	Davis
223	Perry	Hugus	State
176	Pershing	Hugus	State
175	Pershing	State	Center
174	Pershing	Davis	Hugus
172	Pershing	Donnel	Miller
173	Pershing	Miller	Davis
108	Pine	2	3
106	Pine	Wyoming	1
104	Pine	Utah	Colorado
105	Pine	Colorado	Wyoming
107	Pine	1	2
345	Railroad	Washington	Glenn Addition
224	Railroad	Washington	Jefferson
225	Railroad	Jefferson	East
97	Rodeo	Walnut	Mahoney
100	Rodeo	Alley	Daley
102	Rodeo	McMicken	Ryan
98	Rodeo	Mahoney	Alley
101	Rodeo	Daley	McMicken
103	Rodeo	Ryan	Murray
341	Rogers	Peterson	Underpass
130	Royal	Scarlet	End
112	Ryan	Rodeo	Illinois
111	Ryan	Illinois	Colorado
278	Sage Hills	Miller	Davis
279	Sage Hills	Davis	Hugus
280	Sage Hills	Hugus	State
336	Sage Hills Alley	Davis	State
132	Sandra	Elk	Harshman
293	Sandra	Elk	Antelope
129	Scarlet	Royal	End

PROJECT AREA LIST			
DESCRIPTION			
PID	STREET	FROM	TO
128	Scarlet	Higley	Royal
157	Seiloff	Daley	Mahoney
156	Seiloff	Murray	Daley
155	Seldomridge	Airport Road	Trucking Co.
263	Sherman	State	Center
15	Sonora	Elm	El Rancho
292	Spruce	Extension East	0
5	Spruce	23	I80 On Ramp
2	Spruce	16	18
3	Spruce	18	21
4	Spruce	21	23
137	Stanford	Daley	McMicken
138	Stanford	McMicken	Murray
195	State	Washington	Jefferson
194	State	Jefferson	Madison
177	State	Perry	Jackson
178	State	Bennett	Perry
198	State	Pershing	Adams
197	State	Adams	McKinley
196	State	McKinley	Washington
193	State	Madison	Monroe
234	State	Sage Hills	Higley
236	State	Ash	Apple
265	State	Sherman	Pershing
260	State	Jackson	Lee
264	State	Grant	Sherman
233	State	Monroe	Sage Hills
261	State	Lee	Grant
235	State	Higley	Ash
238	State	Hackberry	Locust
237	State	Apple	Hackberry
338	State Alley	Bennett	Jackson
123	Unknown	Lochtay	Higley
43	Walnut	15	14
44	Walnut	14	13
86	Walnut	8	9
87	Walnut	7	8
84	Walnut	11	12
85	Walnut	9	11
274	Washington	Center	Water
272	Washington	Hugus	State
271	Washington	Davis	Hugus
275	Washington	Water	Railroad
269	Washington	Locust	Miller
273	Washington	State	Center
270	Washington	Miller	Davis
211	Water	McKinley	Washington
210	Water	Adams	McKinley
214	Water	Madison	Monroe
212	Water	Washington	Jefferson
213	Water	Jefferson	Madison
284	Water Alley	Jefferson	Monroe

1.4.2 Combined Priority Map & Priority List

The Combined Priority Map displays the project areas prioritized based on information provided for the water, sanitary sewer, storm sewer and street utilities. The prioritization is broken down into three categories and color coded for display on the map. Project areas outlined in green represent the lowest priority, project areas outlined in blue are medium priority and project areas outlined in red are highest priority.

The Combined Priority List includes the same prioritization as the Combined Priority Map but the prioritization is not broken down into categories. The list displays the projects in order of highest priority to lowest priority.

COMBINED PRIORITY MAP

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
206	Monroe	Center	Water	17	1
22	Park	Mt. View	Mt. View	16	2
149	Murray	Seiloff	Cessna	16	3
52	9	Cherry	Birch	16	3
152	Airport Road	Murray	Daley	15	5
153	Airport Road	Daley	Mahoney	15	5
11	Elm	23	Western Hills CG	15	5
155	Seldomridge	Airport Road	Trucking Co.	15	5
48	7	Birch	Alder	15	9
16	Los Altos	El Rancho	La Paloma	15	9
36	12	Alder	High	14	11
151	Murray	Beachcraft	Airport Road	14	11
47	7	Cherry	Birch	14	13
150	Murray	Cessna	Beechcraft	14	13
72	8	Alder	High	14	13
56	12	Walnut	Maple	13	16
41	15	Gallup	Maple	13	16
205	Monroe	State	Center	13	16
55	12	Maple	Spruce	13	19
49	7	Alder	High	13	19
116	Colorado	Mahoney	Daley	13	19
195	State	Washington	Jefferson	13	22
10	Elm	21	23	13	23
37	11	Alder	High	13	23
61	Cherry	13	Alley	13	23
196	State	McKinley	Washington	12	26
179	Miller	Grant	Pershing	12	27
21	Coulson	Coulson	Dead End	12	27
57	12	Date	Walnut	12	27
184	Davis	Grant	Pershing	12	27
98	Rodeo	Mahoney	Alley	12	27
2	Spruce	16	18	12	27
89	12	Pine	Spruce	12	27
180	Miller	Jackson	Grant	12	34
59	12	Birch	Cherry	12	35
148	Murray	Bonanza	Seiloff	12	35
50	Birch	8	7	12	35
183	Davis	Jackson	Grant	11	38
187	Hugus	McKinley	Washington	11	38
250	Davis	Bennett	Perry	11	38
117	Colorado	Walnut	Mahoney	11	38
144	Murray	Terry	Stanford	11	38
164	Jefferson	Center	Water	11	43
298	McKinley	Davis	Hugus	11	43
288	Front	Wyoming	1	11	43
297	McKinley	Hugus	State	11	43
290	Front	Utah	Colorado	11	43
295	McKinley	Center	Water	11	43
147	Murray	Edinburgh	Bonanza	11	43
156	Seiloff	Murray	Daley	11	43
6	19	Spruce (North)	South (1 block)	11	43
67	9	Walnut	Date	11	43
42	15	Maple	Walnut	11	43
30	9	Front	Cedar	11	43
60	13	Spruce	Maple	11	43
31	8	Front	Cedar	11	56
63	Cherry	11	12	11	56
66	11	Birch	Alder	11	56
39	14	Court Place	Cherry	11	59
112	Ryan	Rodeo	Illinois	11	59

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
190	Hugus	Jackson	Grant	11	59
182	Davis	Perry	Jackson	11	59
188	Hugus	Pershing	McKinley	11	59
14	El Rancho	Los Altos	La Paloma	11	59
204	Monroe	Hugus	State	10	65
287	Front	1	2	10	65
70	8	Cherry	Birch	10	65
40	Court Place	13	14	10	68
166	Davis	Sage Hills	End	10	68
203	Monroe	Davis	Hugus	10	68
199	Davis	Washington	Jefferson	10	68
201	Davis	Madison	Monroe	10	68
58	12	Cherry	Date	10	68
119	Colorado	Spruce	Maple	10	68
154	Airport Road	Mahoney	Cedar	10	68
167	Grant	Donnel	Miller	10	68
177	State	Perry	Jackson	10	68
209	Adams	Center	Washington	10	68
169	Grant	Davis	Hugus	10	68
191	Madison	Center	Water	10	68
208	Adams	Center	Water	10	68
210	Water	Adams	McKinley	10	68
215	Bennett	Donnel	Miller	10	68
220	Perry	Donnel	Miller	10	68
222	Perry	Davis	Hugus	10	68
9	Elm	El Rancho	21	10	68
232	Hayes	Monroe	Water	10	68
266	Miller	Pershing	Dead End	10	68
17	La Paloma	El Rancho	La Paloma	10	68
71	8	Birch	Alder	10	68
54	11	Date	Cherry	10	68
163	Jefferson	State	Center	10	92
186	Davis	McKinley	Washington	10	92
99	Alley	Rodeo	Rodeo	10	92
33	8	Buffalo	Pine	10	92
69	8	Walnut	Cherry	10	92
202	Monroe	Miller	Davis	10	97
162	Jefferson	Davis	State	10	97
189	Hugus	Grant	Pershing	10	97
296	McKinley	State	Center	10	97
286	Front	2	3	10	97
142	Murray	Koontz	Withrow	10	97
143	Murray	Withrow	Terry	10	97
51	Birch	9	8	10	97
82	Cherry	Alley	14	10	97
170	Grant	Hugus	State	9	106
192	Madison	State	Center	9	106
171	Grant	State	Center	9	106
53	9	Cherry	Date	9	106
86	Walnut	8	9	9	106
32	8	Cedar	Buffalo	9	106
88	12	Birch	Alder	9	106
111	Ryan	Illinois	Colorado	9	113
185	Davis	Pershing	McKinley	9	113
200	Davis	Jefferson	Madison	9	113
122	Colorado	Cedar	Buffalo	9	113
100	Rodeo	Alley	Daley	9	113
120	Colorado	Pine	Spruce	9	113
24	Cedar	7	8	9	113
178	State	Bennett	Perry	9	113

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
198	State	Pershing	Adams	9	113
216	Bennett	Miller	Davis	9	113
214	Water	Madison	Monroe	9	113
219	Front	State	Jackson	9	113
135	McMicken	Harshman	Stanford	9	113
140	Koontz	Daley	McMicken	9	113
157	Seiloff	Daley	Mahoney	9	113
158	Daley	Higley	Seiloff	9	113
161	Mahoney	Seiloff	Airport Road	9	113
8	Elm	Sonora	El Rancho	9	113
91	13	Walnut	Date	9	113
239	Higley	State	Locust	9	113
262	Lee	State	Center	9	113
34	8	Pine	Spruce	9	113
29	9	Cedar	Buffalo	9	113
77	High	11	12	9	113
65	11	Cherry	Birch	9	113
90	13	Date	Cherry	9	113
224	Railroad	Washington	Jefferson	9	113
35	Mt. View	High	13	9	113
4	Spruce	21	23	9	113
133	Alton	Cedar	Dead End East	9	113
110	McMicken	Rodeo	Illinois	9	143
194	State	Jefferson	Madison	9	143
175	Pershing	State	Center	9	143
44	Walnut	14	13	9	143
118	Colorado	Maple	Walnut	9	147
104	Pine	Utah	Colorado	9	147
174	Pershing	Davis	Hugus	9	147
105	Pine	Colorado	Wyoming	9	147
207	Adams	State	Center	9	147
221	Perry	Miller	Davis	9	147
12	El Rancho	Elm	El Rancho Curve	9	147
93	14	Spruce	Gallup	9	147
27	9	Pine	Spruce	9	147
28	9	Buffalo	Pine	9	147
79	High	8	9	9	147
45	11	Pine	Park Lot	9	147
15	Sonora	Elm	El Rancho	9	147
20	La Paloma	Los Altos	North to Culdesac	9	147
62	Cherry	9	11	9	147
168	Grant	Miller	Davis	8	162
212	Water	Washington	Jefferson	8	162
218	Bennett	Hugus	State	8	162
223	Perry	Hugus	State	8	162
87	Walnut	7	8	8	162
84	Walnut	11	12	8	162
97	Rodeo	Walnut	Mahoney	8	168
23	Cedar	6	7	8	168
25	Cedar	8	9	8	168
121	Colorado	Buffalo	Pine	8	168
102	Rodeo	McMicken	Ryan	8	168
113	Colorado	Ryan	Murray	8	168
115	Colorado	Daley	McMicken	8	168
172	Pershing	Donnel	Miller	8	168
125	Edinburgh	Inverness	Edinburgh Split	8	168
193	State	Madison	Monroe	8	168
123	Unknown	Lochtay	Higley	8	168
131	Elk	Dead End	Sandra	8	168
132	Sandra	Elk	Harshman	8	168

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
136	McMicken	Stanford	Koontz	8	168
137	Stanford	Daley	McMicken	8	168
138	Stanford	McMicken	Murray	8	168
159	Daley	Seiloff	Airport Road	8	168
92	13	Maple	Walnut	8	168
246	Ash	Pinion	Juniper	8	168
248	Apple	Juniper	Locust	8	168
68	9	Birch	Alder	8	168
78	High	9	11	8	168
64	Cherry	12	13	8	168
134	Harshman	Alley	Murray	8	168
257	Jackson	Davis	Hugus	8	168
263	Sherman	State	Center	8	168
83	11	Walnut	Date	8	168
303	Olive Circle	Locust	Locust	8	168
251	Donnel	Bennett	Perry	8	168
252	Donnel	Perry	Jackson	8	168
253	Donnel	Jackson	Grant	8	168
254	Donnel	Grant	Pershing	8	168
255	Jackson	Donnel	Miller	8	168
256	Jackson	Miller	Davis	8	168
269	Washington	Locust	Miller	8	168
307	Miller	Bennett	Perry	8	168
26	Cedar	9	10	8	204
108	Pine	2	3	8	204
106	Pine	Wyoming	1	8	204
197	State	Adams	McKinley	8	204
46	7	Walnut	Cherry	8	204
18	La Paloma	La Paloma Curve	El Rancho Corner	8	204
19	La Paloma	El Rancho	Los Altos	8	204
85	Walnut	9	11	8	204
289	Front	Colorado	Wyoming	8	212
101	Rodeo	Daley	McMicken	8	212
127	Edinburgh	Elbow Edinburgh Road	McTavish	8	212
129	Scarlet	Royal	End	8	212
213	Water	Jefferson	Madison	8	212
80	Birch	12	13	8	212
265	State	Sherman	Pershing	8	212
103	Rodeo	Ryan	Murray	7	219
211	Water	McKinley	Washington	7	219
176	Pershing	Hugus	State	7	219
96	14	Walnut	Date	7	219
260	State	Jackson	Lee	7	219
165	Jefferson	Water	Railroad Street	7	224
109	McMicken	Illinois	Colorado	7	224
181	Miller	Sage Hills	Miller	7	224
43	Walnut	15	14	7	224
126	Edinburgh	McTavish	Inverness	7	224
128	Scarlet	Higley	Royal	7	224
130	Royal	Scarlet	End	7	224
160	Mahoney	Plaza	Seiloff	7	224
7	Elm	18	Sonora	7	224
3	Spruce	18	21	7	224
234	State	Sage Hills	Higley	7	224
81	Birch	13	14	7	224
95	14	Maple	Walnut	7	224
245	Ash	State	Pinion	7	224
247	Apple	State	Pinion	7	224
249	Juniper	Apple	Ash	7	224
329	No Street	Build Rite	Comfort Inn	7	224

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
355	Buffalo Alley	3	4	7	224
217	Bennett	Davis	Hugus	7	242
283	Madison	Hugus	Davis	7	242
273	Washington	State	Center	7	242
173	Pershing	Miller	Davis	7	245
141	Murray	Higley	Koontz	7	245
145	Murray	Stanford	Harshman	7	245
13	El Rancho	Los Altos	Sonora	7	245
94	14	Gallup	Maple	7	245
274	Washington	Center	Water	7	245
107	Pine	1	2	6	251
282	Hugus	Monroe	Madison	6	251
74	Alder	8	9	6	251
264	State	Grant	Sherman	6	251
114	Colorado	McMicken	Ryan	6	255
124	Lochtay	Inverness	Unknown	6	255
139	Koontz	McMicken	Murray	6	255
227	Center	Adams	McKinley	6	255
230	Center	Jefferson	Madison	6	255
244	Locust	Olive (East)	Corral Area	6	255
276	Miller	Washington	Monroe	6	255
277	Miller	Monroe	Sage Hills	6	255
301	Ferris Ct	Miller	Culdesac	6	255
73	Alder	7	8	6	255
268	Hugus	Bennett	Perry	6	255
76	Alder	11	12	6	255
226	Center	Pershing	Adams	6	255
233	State	Monroe	Sage Hills	6	255
258	Jackson	Hugus	State	6	255
267	Hugus	Perry	Jackson	6	255
284	Water Alley	Jefferson	Monroe	6	255
326	Daley Alley	Stanford	Koontz	6	255
336	Sage Hills Alley	Davis	State	6	255
1	21	Spruce	Elm	6	274
300	Monroe	Miller	Dead End	6	274
272	Washington	Hugus	State	6	274
146	Cedar	Sinclair Station	Last Motel Entrance	6	274
5	Spruce	23	I80 On Ramp	5	278
228	Center	McKinley	Washington	5	278
231	Center	Madison	Monroe	5	278
261	State	Lee	Grant	5	278
304	Colorado	Cedar	Railroad	5	278
331	Daley Alley	Colorado	Illinois	5	278
332	Daley Alley	Illinois	Rodeo	5	278
339	Davis Alley	Pershing	McKinley	5	278
236	State	Ash	Apple	5	286
242	Locust	Hackberry	Olive (West)	5	286
243	Locust	Olive (West)	Olive (East)	5	286
229	Center	Washington	Jefferson	5	286
271	Washington	Davis	Hugus	5	286
270	Washington	Miller	Davis	4	291
291	Higley	Extension	0	4	292
225	Railroad	Jefferson	East	4	292
235	State	Higley	Ash	4	292
238	State	Hackberry	Locust	4	292
278	Sage Hills	Miller	Davis	4	292
279	Sage Hills	Davis	Hugus	4	292
305	Front	9	8	4	292
352	Drainage	Daley	Spruce	4	292
353	Drainage	Highland Hills	0	4	292

COMBINED PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	COMBINED PRIORITY	PROJECT RANK
311	Hayes	Across	Sugar Creek	4	292
315	Maple	13	14	4	292
312	Darnley	Higley	Inverness	4	292
75	Alder	9	11	4	292
337	Hugus Alley	Pershing	McKinley	4	292
333	City Market	Park Lot	Park Lot	4	292
334	Edinburgh	Edinburgh	McTavish	4	292
340	Davis Alley	McKinley	Washington	4	292
341	Rogers	Peterson	Underpass	4	292
344	Maple	15	16	4	292
354	Madison Alley	Davis	Monroe	4	292
275	Washington	Water	Railroad	4	312
237	State	Apple	Hackberry	4	312
240	Locust	Higley	State	4	312
241	Locust	State	Hackberry	4	312
299	Miller Ct	Miller	Culdesac	4	312
306	No Street	Front	Bennett	3	317
351	Drainage	Daley	Spruce	3	317
285	Madison	Water	Alley	3	317
309	Park Lot	23	Elm-Spruce	3	317
314	9	Alder	High	3	317
324	Maple Alley	1	Wyoming	3	317
338	State Alley	Bennett	Jackson	3	317
317	Park Lot	10	11	3	317
318	9 Alley	Birch	Alder	3	317
323	13 Alley	Alder	Mt View	3	317
327	Daley Alley	Koontz	Higley	3	317
328	Daley Alley	Seiloff	Higley	3	317
330	No Street	Comfort Inn	0	3	317
350	Heath Alley	Arizona	Montana	3	317
280	Sage Hills	Hugus	State	3	331
281	Hugus	Sage Hills	Monroe	3	331
259	Jackson	State	Front	2	333
308	Miller Alley	Washington	Monroe	2	333
310	23	Elm	Spruce	2	333
302	Hackberry	State	Locust	2	333
316	Maple Alley	Illinois	Rodeo	2	333
319	15 Alley	Spruce	Gallup	2	333
320	15 Alley	Gallup	Maple	2	333
321	15 Alley	Maple	Walnut	2	333
322	15 Alley	Walnut	Date	2	333
335	Mahoney	Illinois	Rodeo	2	333
346	Jones	Center	McClain	2	333
347	Center	Jones	McClain	2	333
292	Spruce	Extension East	0	1	347
293	Sandra	Elk	Antelope	1	347
294	Antelope	Sandra	Dead End	1	347
345	Railroad	Washington	Glenn Addition	1	347
313	Mt View Alley	Mt View	High	1	347
325	Olsen Road	Airport Road	North Golf Course	1	347
342	No Street	Washington	Glenn Addition	1	347
343	Glenn Addition	Rogers	South Sinclair	1	347

1.4.3 Water Priority Map & Priority List

The Water Priority Map displays the project areas prioritized based on information provided for the water utilities. The prioritization is broken down into three categories and color coded for display on the map. Project areas outlined in green represent the lowest priority, project areas outlined in blue are medium priority and project areas outlined in red are highest priority.

The Water Priority List includes the same prioritization as the Water Priority Map but the prioritization is not broken down into categories. The list displays the projects in order of highest priority to lowest priority.

WATER PRIORITY MAP

WATER PROJECT PRIORITY LIST

DESCRIPTION					
PID	STREET	FROM	TO	WATER PRIORITY	WATER PROBLEMS
11	Elm	23	Western Hills CG	4	3
329	No Street	Build Rite	Comfort Inn	4	3
355	Buffalo Alley	3	4	4	3
22	Park	Mt. View	Mt. View	4	2
155	Seldomridge	Airport Road	Trucking Co.	4	1
331	Daley Alley	Colorado	Illinois	4	1
332	Daley Alley	Illinois	Rodeo	4	1
339	Davis Alley	Pershing	McKinley	4	1
117	Colorado	Walnut	Mahoney	4	0
116	Colorado	Mahoney	Daley	4	0
333	City Market	Park Lot	Park Lot	4	0
334	Edinburgh	Edinburgh	McTavish	4	0
340	Davis Alley	McKinley	Washington	4	0
341	Rogers	Peterson	Underpass	4	0
344	Maple	15	16	4	0
354	Madison Alley	Davis	Monroe	4	0
144	Murray	Terry	Stanford	3	3
326	Daley Alley	Stanford	Koontz	3	3
336	Sage Hills Alley	Davis	State	3	3
51	Birch	9	8	3	1
2	Spruce	16	18	3	1
61	Cherry	13	Alley	3	1
4	Spruce	21	23	3	1
337	Hugus Alley	Pershing	McKinley	3	1
41	15	Gallup	Maple	3	0
205	Monroe	State	Center	3	0
206	Monroe	Center	Water	3	0
50	Birch	8	7	3	0
142	Murray	Koontz	Withrow	3	0
143	Murray	Withrow	Terry	3	0
156	Seiloff	Murray	Daley	3	0
3	Spruce	18	21	3	0
52	9	Cherry	Birch	3	0
42	15	Maple	Walnut	3	0
63	Cherry	11	12	3	0
45	11	Pine	Park Lot	3	0
64	Cherry	12	13	3	0
35	Mt. View	High	13	3	0
146	Cedar	Sinclair Station	Last Motel Entrance	3	0
62	Cherry	9	11	3	0
304	Colorado	Cedar	Railroad	3	0
284	Water Alley	Jefferson	Monroe	3	0
317	Park Lot	10	11	3	0
318	9 Alley	Birch	Alder	3	0
323	13 Alley	Alder	Mt View	3	0
327	Daley Alley	Koontz	Higley	3	0
328	Daley Alley	Seiloff	Higley	3	0
330	No Street	Comfort Inn	0	3	0
350	Heath Alley	Arizona	Montana	3	0
98	Rodeo	Mahoney	Alley	2	2
14	El Rancho	Los Altos	La Paloma	2	1
17	La Paloma	El Rancho	La Paloma	2	1
324	Maple Alley	1	Wyoming	2	1
338	State Alley	Bennett	Jackson	2	1

WATER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	WATER PRIORITY	WATER PROBLEMS
10	Elm	21	23	2	0
148	Murray	Bonanza	Seiloff	2	0
149	Murray	Seiloff	Cessna	2	0
150	Murray	Cessna	Beechcraft	2	0
147	Murray	Edinburgh	Bonanza	2	0
99	Alley	Rodeo	Rodeo	2	0
9	Elm	El Rancho	21	2	0
12	El Rancho	Elm	El Rancho Curve	2	0
8	Elm	Sonora	El Rancho	2	0
13	El Rancho	Los Altos	Sonora	2	0
134	Harshman	Alley	Murray	2	0
18	La Paloma	La Paloma Curve	El Rancho Corner	2	0
19	La Paloma	El Rancho	Los Altos	2	0
16	Los Altos	El Rancho	La Paloma	2	0
15	Sonora	Elm	El Rancho	2	0
20	La Paloma	Los Altos	North to Culdesac	2	0
312	Darnley	Higley	Inverness	2	0
316	Maple Alley	Illinois	Rodeo	2	0
319	15 Alley	Spruce	Gallup	2	0
320	15 Alley	Gallup	Maple	2	0
321	15 Alley	Maple	Walnut	2	0
322	15 Alley	Walnut	Date	2	0
335	Mahoney	Illinois	Rodeo	2	0
346	Jones	Center	McClain	2	0
347	Center	Jones	McClain	2	0
161	Mahoney	Seiloff	Airport Road	1	0
6	19	Spruce (North)	South (1 block)	1	0
1	21	Spruce	Elm	1	0
302	Hackberry	State	Locust	1	0
325	Olsen Road	Airport Road	North Golf Course	1	0
342	No Street	Washington	Glenn Addition	1	0
343	Glenn Addition	Rogers	South Sinclair	1	0
303	Olive Circle	Locust	Locust	0	3
49	7	Alder	High	0	1
153	Airport Road	Daley	Mahoney	0	1
24	Cedar	7	8	0	1
127	Edinburgh	Elbow Edinburgh Road	McTavish	0	1
140	Koontz	Daley	McMicken	0	1
157	Seiloff	Daley	Mahoney	0	1
158	Daley	Higley	Seiloff	0	1
77	High	11	12	0	1
274	Washington	Center	Water	0	1
224	Railroad	Washington	Jefferson	0	1

1.4.4 Sanitary Sewer Priority Map & Priority List

The Sanitary Sewer Priority Map displays the project areas prioritized based on information provided for the sanitary sewer utilities. The prioritization is broken down into three categories and color coded for display on the map. Project areas outlined in green represent the lowest priority, project areas outlined in blue are medium priority and project areas outlined in red are highest priority.

The Sanitary Sewer Priority List includes the same prioritization as the Sanitary Sewer Priority Map but the prioritization is not broken down into categories. The list displays the projects in order of highest priority to lowest priority.

SANITARY SEWER PRIORITY MAP

SANITARY SEWER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	SANITARY SEWER PRIORITY	SANITARY SEWER PROBLEMS
72	8	Alder	High	4	4
89	12	Pine	Spruce	4	2
36	12	Alder	High	4	0
56	12	Walnut	Maple	4	0
55	12	Maple	Spruce	4	0
152	Airport Road	Murray	Daley	4	0
153	Airport Road	Daley	Mahoney	4	0
149	Murray	Seiloff	Cessna	4	0
150	Murray	Cessna	Beechcraft	4	0
151	Murray	Beachcraft	Airport Road	4	0
195	State	Washington	Jefferson	4	0
196	State	McKinley	Washington	4	0
71	8	Birch	Alder	4	0
69	8	Walnut	Cherry	4	0
70	8	Cherry	Birch	4	0
88	12	Birch	Alder	4	0
311	Hayes	Across	Sugar Creek	4	0
37	11	Alder	High	3	2
52	9	Cherry	Birch	3	2
60	13	Spruce	Maple	3	2
66	11	Birch	Alder	3	2
48	7	Birch	Alder	3	1
315	Maple	13	14	3	1
47	7	Cherry	Birch	3	0
206	Monroe	Center	Water	3	0
49	7	Alder	High	3	0
53	9	Cherry	Date	3	0
67	9	Walnut	Date	3	0
86	Walnut	8	9	3	0
87	Walnut	7	8	3	0
46	7	Walnut	Cherry	3	0
77	High	11	12	3	0
65	11	Cherry	Birch	3	0
54	11	Date	Cherry	3	0
68	9	Birch	Alder	3	0
79	High	8	9	3	0
78	High	9	11	3	0
84	Walnut	11	12	3	0
83	11	Walnut	Date	3	0
85	Walnut	9	11	3	0
284	Water Alley	Jefferson	Monroe	3	0
285	Madison	Water	Alley	3	0
309	Park Lot	23	Elm-Spruce	3	0
314	9	Alder	High	3	0
16	Los Altos	El Rancho	La Paloma	2	4
90	13	Date	Cherry	2	3
82	Cherry	Alley	14	2	2
91	13	Walnut	Date	2	1
59	12	Birch	Cherry	2	0

SANITARY SEWER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	SANITARY SEWER PRIORITY	SANITARY SEWER PROBLEMS
57	12	Date	Walnut	2	0
58	12	Cherry	Date	2	0
94	14	Gallup	Maple	2	0
93	14	Spruce	Gallup	2	0
92	13	Maple	Walnut	2	0
96	14	Walnut	Date	2	0
63	Cherry	11	12	2	0
61	Cherry	13	Alley	2	0
80	Birch	12	13	2	0
81	Birch	13	14	2	0
95	14	Maple	Walnut	2	0
259	Jackson	State	Front	2	0
312	Darnley	Higley	Inverness	2	0
308	Miller Alley	Washington	Monroe	2	0
310	23	Elm	Spruce	2	0
50	Birch	8	7	1	0
51	Birch	9	8	1	0
73	Alder	7	8	1	0
74	Alder	8	9	1	0
76	Alder	11	12	1	0
302	Hackberry	State	Locust	1	0
75	Alder	9	11	1	0
313	Mt View Alley	Mt View	High	1	0
2	Spruce	16	18	0	3
102	Rodeo	McMicken	Ryan	0	1
44	Walnut	14	13	0	1
135	McMicken	Harshman	Stanford	0	1
17	La Paloma	El Rancho	La Paloma	0	1
4	Spruce	21	23	0	1

1.4.5 Storm Sewer Priority Map & Priority List

The Storm Sewer Priority Map displays the project areas prioritized based on information provided for the storm sewer utilities. The prioritization is broken down into two categories and color coded for display on the map. Project areas outlined in blue represent the lowest priority and project areas outlined in red are highest priority.

The Storm Sewer Priority List includes the same prioritization as the Storm Sewer Priority Map but the prioritization is not broken down into categories. The list displays the projects in order of highest priority to lowest priority.

STORM SEWER PRIORITY MAP

STORM SEWER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STORM SEWER PRIORITY	STORM SEWER INLET PRIORITY
33	8	Buffalo	Pine	4	1
34	8	Pine	Spruce	4	1
31	8	Front	Cedar	4	0
32	8	Cedar	Buffalo	4	0
305	Front	9	8	4	0
352	Drainage	Daley	Spruce	4	0
353	Drainage	Highland Hills	0	4	0
27	9	Pine	Spruce	3	1
30	9	Front	Cedar	3	1
28	9	Buffalo	Pine	3	1
29	9	Cedar	Buffalo	3	0
306	No Street	Front	Bennett	3	0
351	Drainage	Daley	Spruce	3	0
304	Colorado	Cedar	Railroad	2	0
47	7	Cherry	Birch	0	2
122	Colorado	Cedar	Buffalo	0	2
118	Colorado	Maple	Walnut	0	2
46	7	Walnut	Cherry	0	2
26	Cedar	9	10	0	2
112	Ryan	Rodeo	Illinois	0	2
36	12	Alder	High	0	2
10	Elm	21	23	0	2
287	Front	1	2	0	2
289	Front	Colorado	Wyoming	0	2
119	Colorado	Spruce	Maple	0	2
23	Cedar	6	7	0	2
25	Cedar	8	9	0	2
195	State	Washington	Jefferson	0	2
170	Grant	Hugus	State	0	2
192	Madison	State	Center	0	2
193	State	Madison	Monroe	0	2
12	El Rancho	Elm	El Rancho Curve	0	2
91	13	Walnut	Date	0	2
94	14	Gallup	Maple	0	2
14	El Rancho	Los Altos	La Paloma	0	2
72	8	Alder	High	0	2
77	High	11	12	0	2
65	11	Cherry	Birch	0	2
17	La Paloma	El Rancho	La Paloma	0	2
56	12	Walnut	Maple	0	1
163	Jefferson	State	Center	0	1
211	Water	McKinley	Washington	0	1
221	Perry	Miller	Davis	0	1
71	8	Birch	Alder	0	1
54	11	Date	Cherry	0	1
40	Court Place	13	14	0	1
55	12	Maple	Spruce	0	1
41	15	Gallup	Maple	0	1
194	State	Jefferson	Madison	0	1
108	Pine	2	3	0	1

STORM SEWER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STORM SEWER PRIORITY	STORM SEWER INLET PRIORITY
176	Pershing	Hugus	State	0	1
37	11	Alder	High	0	1
89	12	Pine	Spruce	0	1
58	12	Cherry	Date	0	1
164	Jefferson	Center	Water	0	1
298	McKinley	Davis	Hugus	0	1
106	Pine	Wyoming	1	0	1
93	14	Spruce	Gallup	0	1
69	8	Walnut	Cherry	0	1
68	9	Birch	Alder	0	1
73	Alder	7	8	0	1
268	Hugus	Bennett	Perry	0	1
186	Davis	McKinley	Washington	0	1
60	13	Spruce	Maple	0	1
74	Alder	8	9	0	1
59	12	Birch	Cherry	0	1
205	Monroe	State	Center	0	1
190	Hugus	Jackson	Grant	0	1
203	Monroe	Davis	Hugus	0	1
202	Monroe	Miller	Davis	0	1
288	Front	Wyoming	1	0	1
297	McKinley	Hugus	State	0	1
296	McKinley	State	Center	0	1
22	Park	Mt. View	Mt. View	0	1
97	Rodeo	Walnut	Mahoney	0	1
117	Colorado	Walnut	Mahoney	0	1
120	Colorado	Pine	Spruce	0	1
121	Colorado	Buffalo	Pine	0	1
167	Grant	Donnel	Miller	0	1
177	State	Perry	Jackson	0	1
209	Adams	Center	Washington	0	1
171	Grant	State	Center	0	1
178	State	Bennett	Perry	0	1
175	Pershing	State	Center	0	1
104	Pine	Utah	Colorado	0	1
174	Pershing	Davis	Hugus	0	1
172	Pershing	Donnel	Miller	0	1
196	State	McKinley	Washington	0	1
216	Bennett	Miller	Davis	0	1
168	Grant	Miller	Davis	0	1
43	Walnut	15	14	0	1
217	Bennett	Davis	Hugus	0	1
173	Pershing	Miller	Davis	0	1
51	Birch	9	8	0	1
8	Elm	Sonora	El Rancho	0	1
13	El Rancho	Los Altos	Sonora	0	1
155	Seldomridge	Airport Road	Trucking Co.	0	1
79	High	8	9	0	1
78	High	9	11	0	1
63	Cherry	11	12	0	1

STORM SEWER PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STORM SEWER PRIORITY	STORM SEWER INLET PRIORITY
274	Washington	Center	Water	0	1
45	11	Pine	Park Lot	0	1
64	Cherry	12	13	0	1
134	Harshman	Alley	Murray	0	1
18	La Paloma	La Paloma Curve	El Rancho Corner	0	1
257	Jackson	Davis	Hugus	0	1
263	Sherman	State	Center	0	1
272	Washington	Hugus	State	0	1
229	Center	Washington	Jefferson	0	1
259	Jackson	State	Front	0	1
110	McMicken	Rodeo	Illinois	0	1
57	12	Date	Walnut	0	1
100	Rodeo	Alley	Daley	0	1
52	9	Cherry	Birch	0	1
271	Washington	Davis	Hugus	0	1
234	State	Sage Hills	Higley	0	1
5	Spruce	23	I80 On Ramp	0	1
48	7	Birch	Alder	0	1
6	19	Spruce (North)	South (1 block)	0	1
2	Spruce	16	18	0	1
3	Spruce	18	21	0	1
53	9	Cherry	Date	0	1
19	La Paloma	El Rancho	Los Altos	0	1
275	Washington	Water	Railroad	0	1
146	Cedar	Sinclair Station	Last Motel Entrance	0	1

1.4.6 Street Priority Map & Priority List

The Street Priority Map displays the project areas prioritized based on information provided for the street utilities. The prioritization is broken down into three categories and color coded for display on the map. Project areas outlined in green represent the lowest priority, project areas outlined in blue are medium priority and project areas outlined in red are highest priority.

The Street Priority List includes the same prioritization as the Street Priority Map but the prioritization is not broken down into categories. The list displays the projects in order of highest priority to lowest priority.

STREET PRIORITY MAP

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
39	14	Court Place	Cherry	4	4
36	12	Alder	High	4	3
40	Court Place	13	14	4	3
179	Miller	Grant	Pershing	4	3
180	Miller	Jackson	Grant	4	3
166	Davis	Sage Hills	End	4	3
10	Elm	21	23	4	2
21	Coulson	Coulson	Dead End	4	2
291	Higley	Extension	0	4	0
47	7	Cherry	Birch	3	3
112	Ryan	Rodeo	Illinois	3	3
56	12	Walnut	Maple	3	3
163	Jefferson	State	Center	3	3
55	12	Maple	Spruce	3	3
41	15	Gallup	Maple	3	3
186	Davis	McKinley	Washington	3	3
59	12	Birch	Cherry	3	3
205	Monroe	State	Center	3	3
190	Hugus	Jackson	Grant	3	3
203	Monroe	Davis	Hugus	3	3
202	Monroe	Miller	Davis	3	3
57	12	Date	Walnut	3	3
48	7	Birch	Alder	3	3
206	Monroe	Center	Water	3	3
184	Davis	Grant	Pershing	3	3
183	Davis	Jackson	Grant	3	3
187	Hugus	McKinley	Washington	3	3
250	Davis	Bennett	Perry	3	3
182	Davis	Perry	Jackson	3	3
188	Hugus	Pershing	McKinley	3	3
204	Monroe	Hugus	State	3	3
199	Davis	Washington	Jefferson	3	3
201	Davis	Madison	Monroe	3	3
162	Jefferson	Davis	State	3	3
189	Hugus	Grant	Pershing	3	3
111	Ryan	Illinois	Colorado	3	3
185	Davis	Pershing	McKinley	3	3
200	Davis	Jefferson	Madison	3	3
287	Front	1	2	3	2
58	12	Cherry	Date	3	2
164	Jefferson	Center	Water	3	2
298	McKinley	Davis	Hugus	3	2
288	Front	Wyoming	1	3	2
297	McKinley	Hugus	State	3	2
296	McKinley	State	Center	3	2
49	7	Alder	High	3	2
290	Front	Utah	Colorado	3	2
295	McKinley	Center	Water	3	2
286	Front	2	3	3	2
165	Jefferson	Water	Railroad Street	3	1
289	Front	Colorado	Wyoming	3	0
122	Colorado	Cedar	Buffalo	2	3

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
118	Colorado	Maple	Walnut	2	3
119	Colorado	Spruce	Maple	2	3
22	Park	Mt. View	Mt. View	2	3
97	Rodeo	Walnut	Mahoney	2	3
110	McMicken	Rodeo	Illinois	2	3
100	Rodeo	Alley	Daley	2	3
152	Airport Road	Murray	Daley	2	3
148	Murray	Bonanza	Seiloff	2	3
26	Cedar	9	10	2	2
23	Cedar	6	7	2	2
25	Cedar	8	9	2	2
117	Colorado	Walnut	Mahoney	2	2
120	Colorado	Pine	Spruce	2	2
121	Colorado	Buffalo	Pine	2	2
153	Airport Road	Daley	Mahoney	2	2
149	Murray	Seiloff	Cessna	2	2
150	Murray	Cessna	Beechcraft	2	2
151	Murray	Beachcraft	Airport Road	2	2
102	Rodeo	McMicken	Ryan	2	2
98	Rodeo	Mahoney	Alley	2	2
24	Cedar	7	8	2	2
116	Colorado	Mahoney	Daley	2	2
147	Murray	Edinburgh	Bonanza	2	2
99	Alley	Rodeo	Rodeo	2	2
154	Airport Road	Mahoney	Cedar	2	2
113	Colorado	Ryan	Murray	2	2
115	Colorado	Daley	McMicken	2	2
101	Rodeo	Daley	McMicken	2	2
103	Rodeo	Ryan	Murray	2	2
109	McMicken	Illinois	Colorado	2	2
114	Colorado	McMicken	Ryan	2	0
195	State	Washington	Jefferson	1	3
170	Grant	Hugus	State	1	3
192	Madison	State	Center	1	3
211	Water	McKinley	Washington	1	3
194	State	Jefferson	Madison	1	3
108	Pine	2	3	1	3
176	Pershing	Hugus	State	1	3
106	Pine	Wyoming	1	1	3
167	Grant	Donnel	Miller	1	3
177	State	Perry	Jackson	1	3
209	Adams	Center	Washington	1	3
171	Grant	State	Center	1	3
178	State	Bennett	Perry	1	3
175	Pershing	State	Center	1	3
104	Pine	Utah	Colorado	1	3
174	Pershing	Davis	Hugus	1	3
172	Pershing	Donnel	Miller	1	3
169	Grant	Davis	Hugus	1	3
191	Madison	Center	Water	1	3
208	Adams	Center	Water	1	3
210	Water	Adams	McKinley	1	3

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
215	Bennett	Donnel	Miller	1	3
220	Perry	Donnel	Miller	1	3
222	Perry	Davis	Hugus	1	3
198	State	Pershing	Adams	1	3
105	Pine	Colorado	Wyoming	1	3
207	Adams	State	Center	1	3
125	Edinburgh	Inverness	Edinburgh Split	1	3
197	State	Adams	McKinley	1	3
181	Miller	Sage Hills	Miller	1	3
221	Perry	Miller	Davis	1	2
37	11	Alder	High	1	2
196	State	McKinley	Washington	1	2
216	Bennett	Miller	Davis	1	2
168	Grant	Miller	Davis	1	2
43	Walnut	15	14	1	2
217	Bennett	Davis	Hugus	1	2
173	Pershing	Miller	Davis	1	2
50	Birch	8	7	1	2
44	Walnut	14	13	1	2
144	Murray	Terry	Stanford	1	2
127	Edinburgh	Elbow Edinburgh Road	McTavish	1	2
142	Murray	Koontz	Withrow	1	2
143	Murray	Withrow	Terry	1	2
214	Water	Madison	Monroe	1	2
219	Front	State	Jackson	1	2
212	Water	Washington	Jefferson	1	2
218	Bennett	Hugus	State	1	2
223	Perry	Hugus	State	1	2
129	Scarlet	Royal	End	1	2
213	Water	Jefferson	Madison	1	2
126	Edinburgh	McTavish	Inverness	1	2
128	Scarlet	Higley	Royal	1	2
130	Royal	Scarlet	End	1	2
141	Murray	Higley	Koontz	1	2
145	Murray	Stanford	Harshman	1	2
107	Pine	1	2	1	2
124	Lochtay	Inverness	Unknown	1	2
193	State	Madison	Monroe	1	1
135	McMicken	Harshman	Stanford	1	1
140	Koontz	Daley	McMicken	1	1
157	Seiloff	Daley	Mahoney	1	1
158	Daley	Higley	Seiloff	1	1
156	Seiloff	Murray	Daley	1	1
161	Mahoney	Seiloff	Airport Road	1	1
123	Unknown	Lochtay	Higley	1	1
131	Elk	Dead End	Sandra	1	1
132	Sandra	Elk	Harshman	1	1
136	McMicken	Stanford	Koontz	1	1
137	Stanford	Daley	McMicken	1	1
138	Stanford	McMicken	Murray	1	1
159	Daley	Seiloff	Airport Road	1	1
160	Mahoney	Plaza	Seiloff	1	1

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
139	Koontz	McMicken	Murray	1	1
51	Birch	9	8	1	0
292	Spruce	Extension East	0	1	0
293	Sandra	Elk	Antelope	1	0
294	Antelope	Sandra	Dead End	1	0
345	Railroad	Washington	Glenn Addition	1	0
6	19	Spruce (North)	South (1 block)	0	4
155	Seldomridge	Airport Road	Trucking Co.	0	4
232	Hayes	Monroe	Water	0	4
266	Miller	Pershing	Dead End	0	4
9	Elm	El Rancho	21	0	3
31	8	Front	Cedar	0	3
91	13	Walnut	Date	0	3
94	14	Gallup	Maple	0	3
14	El Rancho	Los Altos	La Paloma	0	3
93	14	Spruce	Gallup	0	3
52	9	Cherry	Birch	0	3
234	State	Sage Hills	Higley	0	3
53	9	Cherry	Date	0	3
67	9	Walnut	Date	0	3
86	Walnut	8	9	0	3
87	Walnut	7	8	0	3
92	13	Maple	Walnut	0	3
96	14	Walnut	Date	0	3
42	15	Maple	Walnut	0	3
239	Higley	State	Locust	0	3
262	Lee	State	Center	0	3
246	Ash	Pinion	Juniper	0	3
248	Apple	Juniper	Locust	0	3
283	Madison	Hugus	Davis	0	3
282	Hugus	Monroe	Madison	0	3
227	Center	Adams	McKinley	0	3
230	Center	Jefferson	Madison	0	3
244	Locust	Olive (East)	Corral Area	0	3
276	Miller	Washington	Monroe	0	3
277	Miller	Monroe	Sage Hills	0	3
301	Ferris Ct	Miller	Culdesac	0	3
300	Monroe	Miller	Dead End	0	3
236	State	Ash	Apple	0	3
242	Locust	Hackberry	Olive (West)	0	3
243	Locust	Olive (West)	Olive (East)	0	3
12	El Rancho	Elm	El Rancho Curve	0	2
8	Elm	Sonora	El Rancho	0	2
13	El Rancho	Los Altos	Sonora	0	2
5	Spruce	23	I80 On Ramp	0	2
2	Spruce	16	18	0	2
11	Elm	23	Western Hills CG	0	2
7	Elm	18	Sonora	0	2
33	8	Buffalo	Pine	0	2
34	8	Pine	Spruce	0	2
32	8	Cedar	Buffalo	0	2
27	9	Pine	Spruce	0	2

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
30	9	Front	Cedar	0	2
28	9	Buffalo	Pine	0	2
29	9	Cedar	Buffalo	0	2
46	7	Walnut	Cherry	0	2
72	8	Alder	High	0	2
77	High	11	12	0	2
65	11	Cherry	Birch	0	2
17	La Paloma	El Rancho	La Paloma	0	2
71	8	Birch	Alder	0	2
54	11	Date	Cherry	0	2
89	12	Pine	Spruce	0	2
69	8	Walnut	Cherry	0	2
68	9	Birch	Alder	0	2
73	Alder	7	8	0	2
268	Hugus	Bennett	Perry	0	2
60	13	Spruce	Maple	0	2
74	Alder	8	9	0	2
79	High	8	9	0	2
78	High	9	11	0	2
63	Cherry	11	12	0	2
274	Washington	Center	Water	0	2
45	11	Pine	Park Lot	0	2
64	Cherry	12	13	0	2
134	Harshman	Alley	Murray	0	2
18	La Paloma	La Paloma Curve	El Rancho Corner	0	2
257	Jackson	Davis	Hugus	0	2
263	Sherman	State	Center	0	2
272	Washington	Hugus	State	0	2
229	Center	Washington	Jefferson	0	2
271	Washington	Davis	Hugus	0	2
19	La Paloma	El Rancho	Los Altos	0	2
275	Washington	Water	Railroad	0	2
70	8	Cherry	Birch	0	2
88	12	Birch	Alder	0	2
66	11	Birch	Alder	0	2
84	Walnut	11	12	0	2
83	11	Walnut	Date	0	2
85	Walnut	9	11	0	2
16	Los Altos	El Rancho	La Paloma	0	2
90	13	Date	Cherry	0	2
82	Cherry	Alley	14	0	2
61	Cherry	13	Alley	0	2
80	Birch	12	13	0	2
81	Birch	13	14	0	2
95	14	Maple	Walnut	0	2
76	Alder	11	12	0	2
303	Olive Circle	Locust	Locust	0	2
224	Railroad	Washington	Jefferson	0	2
35	Mt. View	High	13	0	2
15	Sonora	Elm	El Rancho	0	2
20	La Paloma	Los Altos	North to Culdesac	0	2
251	Donnel	Bennett	Perry	0	2

STREET PROJECT PRIORITY LIST					
DESCRIPTION					
PID	STREET	FROM	TO	STREET PRIORITY	STREET INSPECTION PRIORITY
252	Donnel	Perry	Jackson	0	2
253	Donnel	Jackson	Grant	0	2
254	Donnel	Grant	Pershing	0	2
255	Jackson	Donnel	Miller	0	2
256	Jackson	Miller	Davis	0	2
269	Washington	Locust	Miller	0	2
307	Miller	Bennett	Perry	0	2
265	State	Sherman	Pershing	0	2
260	State	Jackson	Lee	0	2
245	Ash	State	Pinion	0	2
247	Apple	State	Pinion	0	2
249	Juniper	Apple	Ash	0	2
273	Washington	State	Center	0	2
264	State	Grant	Sherman	0	2
226	Center	Pershing	Adams	0	2
233	State	Monroe	Sage Hills	0	2
258	Jackson	Hugus	State	0	2
267	Hugus	Perry	Jackson	0	2
228	Center	McKinley	Washington	0	2
231	Center	Madison	Monroe	0	2
261	State	Lee	Grant	0	2
270	Washington	Miller	Davis	0	2
225	Railroad	Jefferson	East	0	2
235	State	Higley	Ash	0	2
238	State	Hackberry	Locust	0	2
237	State	Apple	Hackberry	0	2
240	Locust	Higley	State	0	2
241	Locust	State	Hackberry	0	2
299	Miller Ct	Miller	Culdesac	0	2
3	Spruce	18	21	0	1
146	Cedar	Sinclair Station	Last Motel Entrance	0	1
4	Spruce	21	23	0	1
62	Cherry	9	11	0	1
133	Alton	Cedar	Dead End East	0	1
278	Sage Hills	Miller	Davis	0	1
279	Sage Hills	Davis	Hugus	0	1
280	Sage Hills	Hugus	State	0	1
281	Hugus	Sage Hills	Monroe	0	1

2 INFORMATION SOURCES

2.1 Department of Public Works (DPW)

The DPW provided information that defined the improvements needed for the water system, sanitary sewer system, storm sewer system and streets. Locations of improvement projects completed over the last 20 years were also provided for each utility type.

Along with the list of proposed improvement projects, the DPW also provided maintenance logs for the water system and the sanitary sewer system. Unscheduled maintenance information from these logs was included in the database (See Section 3.4.2.2).

2.2 Community Development Department

The Community Development Department provided GIS files that were used for project area analysis. These files provided information about existing utilities, land owners and other various items. A visual inspection of the project areas was performed by city staff. Information on utility condition was recorded on standardized evaluation forms. The visual inspection evaluated sidewalk, curb and gutter, storm drains and street surfacing. The visual inspection provided important information for evaluating and prioritizing improvement areas.

2.3 Wyoming Water Development Commission (WWDC)

GIS files provided by the Wyoming Water Development Commission were also used on this project. The files consisted of aerial photographs that have been adjusted to a coordinate system. The files assisted in visual evaluation of project areas and will be provided to the City in digital format for GIS applications.

3 PROJECT DATABASE

The project database consists of two main components; a Geographical Information System (GIS) component and a spreadsheet component.

3.1 Definition of a Project

Throughout this document, the term project is mentioned in regard to individual areas of need. In order to evaluate the utilities (water, sanitary sewer, storm sewer, and streets) in a useable format, a shapefile in the GIS program ArcMap was created which outlines these areas of interest. This layer is named **Projects**. Normally, a project is defined as a one block section of street. In the GIS **Projects** layer, each project is given a project identification number (PID). This number corresponds to the numbering system for the information stored in the Excel spreadsheet named **Database**. Using this system of project numbering, the information pertaining to each area is stored in a usable and understandable format.

3.2 Off Street Projects

Several of the project areas do not lie within city streets. Examples of these project areas include alleys, open ground and future utility extensions outside the city limits. None of these projects would require curb & gutter, asphalt paving or sidewalk and as such these items have not been included in the project quantities and costs. A list of these projects by PID number is listed below in Section 3.2.1 Alley Projects and Section 3.2.2 Miscellaneous Projects.

3.2.1 Alley Projects

PID	
284	327
308	328
313	331
316	332
318	336
319	337
320	338
321	339
322	340
323	350
324	354
326	

3.2.2 Miscellaneous Projects

PID	
306	342
309	343
311	345
317	351
329	352
330	353
333	

3.3 GIS

Geographic Information System is defined as an information system that combines tabular information with graphic data for efficient collection, storage, retrieval, analysis and display of data. A large portion of the information in the GIS component of the database was provided by the City of Rawlins and consists of information and mapping of existing utilities, streets, landowners, lots and other miscellaneous items.

All GIS work was performed using the program ArcMap. Layers defining the project boundary, project priority and maintenance information were added to the existing GIS data. Project boundaries are polygon shapes drawn in ArcMap on the **Projects** layer by utilizing aerial photography (See Section 2.3). These boundaries vary in size, but most commonly consist of one block of street. The project priority layer (**PRIORITY**) is based on the project boundary layer and has an associated color defining the priorities of the projects. Maintenance information included in ArcMap is unscheduled maintenance from the last few years, for example water main breaks and sanitary sewer blockages. The maintenance information is displayed in the mapping as a blue icon for the water system (**Water Problems)** and a green icon for the sanitary sewer system (**Sewer Problems)**.

3.4 Spreadsheet

The spreadsheet component of the database consists of the description, prioritization, quantities and costs for each project. Any new data or data changes will be entered into the spreadsheet named **Database**. Each column in the spreadsheet has a logical abbreviated name to reduce the overall width of the **Database**. The definition for each column is provided in this section and in the spreadsheet named **Column Description**.

3.4.1 Description

The description of the project occurs in the first five columns of data in the spreadsheet.

- Column A is the Feature Identification number (FID). Each project shape drawn into the GIS mapping is automatically given an FID number. This number is selected by the GIS program and the first FID number is always zero.

- Column B is the Project Identification number (PID). The PID numbers begin at one and currently end at three hundred and fifty-four. These numbers are user defined and provide the link between the spreadsheet and ArcMap.
- Column C (STREET) is the street the project is on.
- Column D (FROM) is the street intersection where the project begins.
- Column E (TO) is the street intersection where the project ends.

3.4.2 Prioritization

The prioritization of the projects occurs in columns F through AR. Combined priorities are based on information provided by the DPW, maintenance information and a visual inspection of the projects.

The DPW defined areas of needed improvement for the water system, storm sewer system, sanitary sewer system, and the city streets. Additionally, the department heads also gave each defined area a priority on a scale from 1 to 4, 4 being the highest priority. Some projects have no priority from the DPW. However, many projects include priorities from more than one department within the DPW (example: priority of 2 for the water system and 4 for the street).

3.4.2.1 Department of Public Works

Columns F through J store priority information provided by the DPW:

- Column F (DPW_WTR) is the water system priority.
- Column G (DPW_SS) is the sanitary sewer system priority.
- Column H (DPW_ST) is the storm sewer system priority.
- Column I (DPW_STREET) is the street priority.
- Column J (DPW_TOTAL) is the sum of columns F through I.

Additional information was provided by the DPW in the form of maps of completed projects for the last 20 years on the water system, sanitary sewer system, storm sewer system and streets. This information is stored in columns K through P. RC stands for reconstruction and OL stands for overlay (OL only pertains to the street projects). This information was not included in the formulation of the project prioritizations; rather it is for informational purposes only. The user should evaluate the prioritization of the project with this data. Projects completed over the last 20 years are listed below:

- Column K (DPW_WTR_PRJ) is the water projects completed.
- Column L (DPW_SS_PRJ) is the sanitary sewer projects completed.
- Column M (DPW_ST_PRJ) is the storm sewer projects completed.
- Column N (DPW_STREET_PRJ) is the street projects completed.
- Column O (DPW_STREET_PRJ_YEAR) is the recorded year for the street project completion.
- Column P (DPW_PRJ_NOTES) displays the notes associated with the DPW projects completed.

3.4.2.2 Maintenance Records

Maintenance records for the water system (2004 – 2005) and sanitary sewer system (2001- 2005) were incorporated into the combined priority for the project. The records included were unscheduled water and sanitary sewer maintenance.

- Column Q (WTR_PRB) is the total number of water system occurrences.
- Column R (SS_PRB) is the total number of sanitary sewer system occurrences.
- Column S (PRB_TOTAL) is the sum of columns Q and R.

3.4.2.3 Visual Inspection

City personnel performed a visual inspection of all of the project areas. Each of the inspected utilities was prioritized on a scale from 1 to 4, 4 being the worst condition and/or highest priority. The curb and gutter and sidewalk were given a priority for each side of the street. The storm inlets and street surface were prioritized. All of these components were combined to give a total priority for the visual inspection.

Some elements in the visual inspection were weighted differently in the prioritization of the projects. The priority given to the street was included for each project. In order to not overweight the priority given to the street, the priorities given to the curb and gutter and storm inlets were averaged for each project. Additionally, the priorities for the sidewalk were averaged and divided by two for each project.

3.4.2.3.1 Curb and Gutter

- Column T (C&G_EAST) is the priority for the curb and gutter on the east side of the street (for streets running north and south).
- Column U (C&G_WEST) is the priority for the curb and gutter on the west side of the street (for streets running north and south).
- Column V (C&G_NORTH) is the priority for the curb and gutter on the north side of the street (for streets running east and west).
- Column W (C&G_SOUTH) is the priority for the curb and gutter on the south side of the street (for streets running east and west).
- Column X (C&G_PRRTY) is the sum of columns T through W divided by 2. This is the average curb and gutter priority for the project (example: [1+3] / 2 = 2).

3.4.2.3.2 Sidewalk

- Column Y (SW_EAST) is the priority for the sidewalk on the east side of the street (for streets running north and south).
- Column Z (SW_WEST) is the priority for the sidewalk on the west side of the street (for streets running north and south).
- Column AA (SW_NORTH) is the priority for the sidewalk on the north side of the street (for streets running east and west).
- Column AB (SW_SOUTH) is the priority for the sidewalk on the south side of the street (for streets running east and west).

- Column AC (SW_PRRTY) is the sum of columns Y through AB divided by 4. This is half of the average of the sidewalk priorities for the project.

3.4.2.3.3 Storm Inlets

- Column AD (STI1) is the priority for the first storm inlet inspected.
- Column AE (STI2) is the priority for the second storm inlet inspected.
- Column AF (STI3) is the priority for the third storm inlet inspected.
- Column AG (STI4) is the priority for the forth storm inlet inspected.
- Column AH (STI5) is the priority for the fifth storm inlet inspected.
- Column AI (STI6) is the priority for the sixth storm inlet inspected.
- Column AJ (STI7) is the priority for the seventh storm inlet inspected.
- Column AK (STI8) is the priority for the eighth storm inlet inspected.
- Column AL (STI_SUM) is the sum of columns AD through AK.
- Column AM (STI_NUM) is the total number of inlets in the project.
- Column AN (STI_PRRTY) is the product of the division of column AL by column AM, divided by 2.

3.4.2.3.4 Streets

- Column AO (STREET_PRRTY) is the priority for the street.

3.4.2.3.5 Visual Inspection Total

- Column AP (SURV_PRRTY) is the sum of the priorities for the curb and gutter, sidewalk, storm inlets, and the street. This is the total priority for the visual inspection.

The last two columns in the prioritization combine all of the aforementioned priority information to produce the combined priority and the project rank.

- Column AQ (NEEDS_PRRTY) sums the priorities from the DPW, the maintenance information, and the visual inspection to produce a combined overall priority for the project.
- Column AR (PRJ_RANK) is the rank of the project in comparison to all of the other projects. The highest priority has a rank of 1. In this ranking system, projects with the same priority receive the same rank and the presence of duplicate priorities affects the ranking of subsequent priorities.

3.4.3 Quantities & Costs

The quantities and costs for the projects are provided for each construction unit. Lengths of the water main, sanitary sewer main, storm sewer main, curb and gutter and sidewalk are taken from the GIS mapping using the measure tool in the ArcMap program. The number of gate valves, manholes, service connections and drop inlets are also counted for each project using the GIS mapping. Additionally, the ArcMap program calculates the area of pavement in the projects. All quantities are multiplied by a unit cost defined in a separate spreadsheet named **Unit Cost** (See Section 4).

The database default is structured to provide quantities and costs for replacement of all existing utilities for the analyzed project areas. Extracting this information is described in Section 7. If new development areas are constructed the quantities for the project should be entered into the applicable spreadsheet columns described in this section. The GIS should also be updated as described in Section 6.

If unit items for a new project area are not included in the columns described in this section they can be added. Performing this procedure is not outlined in this document but includes inserting the necessary columns and copying equations between columns.

3.4.3.1 Water System

3.4.3.1.1 Water Main

- Column AS (6”L) is the length of 6 inch water main in the project.
- Column AT (6”_TOTAL) is the total cost for the 6 inch water main in the project. Column AT is the product of the multiplication of AS by the unit cost for 6 inch water main.
- Column AU (8”L) is the length of 8 inch water main in the project.
- Column AV (8”_TOTAL) is the total cost for the 8 inch water main in the project. Column AV is the product of the multiplication of AU by the unit cost for 8 inch water main.
- Column AW (10”L) is the length of 10 inch water main in the project.
- Column AX (10”_TOTAL) is the total cost for the 10 inch water main in the project. Column AX is the product of the multiplication of AW by the unit cost for 10 inch water main.
- Column AY (12”L) is the length of 12 inch water main in the project.
- Column AZ (12”_TOTAL) is the total cost for the 12 inch water main in the project. Column AZ is the product of the multiplication of AY by the unit cost for 12 inch water main.
- Column BA (16”L) is the length of 16 inch water main in the project.
- Column BB (16”_TOTAL) is the total cost for the 16 inch water main in the project. Column BB is the product of the multiplication of BA by the unit cost for 16 inch water main.
- Column BC (20”L) is the length of 20 inch water main in the project.
- Column BD (20”_TOTAL) is the total cost for the 20 inch water main in the project. Column BD is the product of the multiplication of BC by the unit cost for 20 inch water main.

- Column BE (MAIN_TOTAL) is the sum of total costs for the various sizes of water main.

3.4.3.1.2 Water Valves

- Column BF (#6"_GV) is the number of 6 inch gate valves in the project.
- Column BG (6"GV_TOTAL) is the total cost for the 6 inch gate valves in the project. Column BG is the product of the multiplication of BF by the unit cost for 6 inch gate valves.
- Column BH (#8"_GV) is the number of 8 inch gate valves in the project.
- Column BI (8"GV_TOTAL) is the total cost for the 8 inch gate valves in the project. Column BI is the product of the multiplication of BH by the unit cost for 8 inch gate valves.
- Column BJ (#10"_GV) is the number of 10 inch gate valves in the project.
- Column BK (10"GV_TTL) is the total cost for the 10 inch gate valves in the project. Column BK is the product of the multiplication of BJ by the unit cost for 10 inch gate valves.
- Column BL (#12"_GV) is the number of 12 inch gate valves in the project.
- Column BM (12"GV_TTL) is the total cost for the 12 inch gate valves in the project. Column BM is the product of the multiplication of BL by the unit cost for the 12 inch gate valves.
- Column BN (16"GV) is the number of 16 inch gate valves in the project.
- Column BO (16"GV_TTL) is the total cost for the 16 inch gate valves in the project. Column BO is the product of the multiplication of BN by the unit cost for the 16 inch gate valves.
- Column BP (#20"_GV) is the number of 20 inch gate valves in the project.
- Column BQ (20"GV_TTL) is the total cost for the 20 inch gate valves in the project. Column BQ is the product of the multiplication of BP by the unit cost for the 20 inch gate valves.
- Column BR (TTL_#_GV) is the total number of gate valves in the project.
- Column BS (GV_TOTAL) is the sum of the total costs for the various sizes of gate valves.

3.4.3.1.3 Fire Hydrants

- Column BT (#FH) is the total number of fire hydrants in the project.
- Column BU (FH_TOTAL) is the total cost for the fire hydrants in the project. Column BU is the product of the multiplication of BT by the unit cost for fire hydrants.

3.4.3.1.4 Water Services

- Column BV (#_SERVICES) is the total number of water services in the project. This number was estimated by counting the number of addresses on the adjacent lots in ArcMap.
- Column BW (AVG_SVC_LEN) is the estimated average water service length.
- Column BX (TOTAL_SVC_LEN) is the product of the multiplication of BW and BV.

- Column BY (SERV_TTL) is the total cost for the water services in the project. This column is the sum of BV multiplied by the unit cost for service connections plus the multiplication of BX by the unit cost per foot of water service line. The unit cost for this item includes labor for the connection, tapping saddle, corporation stop and curb stop with box. No meters, meter pits or backflow prevention devices are included in the unit cost.

3.4.3.1.5 Fittings

- Column BZ (#_FITTINGS) is the total number of fittings counted in the project using ArcMap. Fittings include water main crosses, tees and bends.
- Column CA (FIT_TOTAL) is the product of the multiplication of BZ by the unit cost for fittings.

3.4.3.1.6 Total

- Column CB (WATER_TOTAL) is the sum of the various components of the water system which is the total cost for reconstruction of the water system in the project.

3.4.3.2 Storm Sewer System

3.4.3.2.1 Storm Sewer Pipe

- Column CC (ST_18"_L) is the total length of 18 inch storm sewer piping in the project.
- Column CD (ST_18"_TTL) is the total cost for 18 inch storm sewer pipe in the project. Column CD is the product of the multiplication of CC by the unit cost for 18 inch storm sewer pipe.
- Column CE (ST_24"_L) is the total length of 24 inch storm sewer piping in the project.
- Column CF (ST_24"_TTL) is the total cost for 24 inch storm sewer pipe in the project. Column CF is the product of the multiplication of CE by the unit cost for 24 inch storm sewer pipe.
- Column CG (ST_27"_L) is the total length of 27 inch storm sewer piping in the project.
- Column CH (ST_27"_TTL) is the total cost for 27 inch storm sewer pipe in the project. Column CH is the product of the multiplication of CG by the unit cost for 27 inch storm sewer pipe.
- Column CI (ST_30"_L) is the total length of 30 inch storm sewer piping in the project.
- Column CJ (ST_30"_TTL) is the total cost for 30 inch storm sewer pipe in the project. Column CJ is the product of the multiplication of CI by the unit cost for 30 inch storm sewer pipe.
- Column CK (ST_33"_L) is the total length of 33 inch storm sewer piping in the project.
- Column CL (ST_33"_TTL) is the total cost for 33 inch storm sewer pipe in the project. Column CL is the product of the multiplication of CK by the unit cost for 33 inch storm sewer pipe.
- Column CM (ST_36"_L) is the total length of 36 inch storm sewer piping in the project.

- Column CN (ST_36"_TTL) is the total cost for 36 inch storm sewer pipe in the project. Column CN is the product of the multiplication of CM by the unit cost for 36 inch storm sewer pipe.
- Column CO (ST_48"_L) is the total length of 48 inch storm sewer piping in the project.
- Column CP (ST_48"_TTL) is the total cost for 48 inch storm sewer pipe in the project. Column CP is the product of the multiplication of CO by the unit cost for 48 inch storm sewer pipe.
- Column CQ (ST_54"_L) is the total length of 54 inch storm sewer piping in the project.
- Column CR (ST_54"_TTL) is the total cost for 54 inch storm sewer pipe in the project. Column CR is the product of the multiplication of CQ by the unit cost for 54 inch storm sewer pipe.
- Column CS (ST_PIPE_TOTAL) is the sum of the costs for the various sizes of pipe in the project.

3.4.3.2.2 Storm Sewer Manholes

Storm sewer manholes were assumed to be standard five foot depth. Further analysis and field surveys will be necessary during design of the project to determine additional depth requirements.

- Column CT (#_ST_MH) is the total number of storm sewer manholes in the project.
- Column CU (ST_MH_TTL) is the total cost for storm sewer manholes in the project. Column CU is the product of the multiplication of CT by the unit cost for storm sewer manholes.

3.4.3.2.3 Storm Sewer Inlets

For estimating purposes precast concrete inlet boxes (2'W X 3'L X 3'D) and Neenah R3409 Type C grates were assumed.

- Column CV (#_ST_IN) is the total number of storm sewer inlets in the project.
- Column CW (ST_IN_TTL) is the total cost for storm sewer inlets in the project. Column CW is the product of the multiplication of CV by the unit cost for storm sewer inlets.

3.4.3.2.4 Storm Sewer Total

- Column CX (STORM_TOTAL) is the sum of the various components of the storm sewer system which is also the total cost for reconstruction of the storm sewer system in the project.
- The information for the storm sewer system is taken from the existing elements. A drainage analysis should be performed prior to reconstruction of the storm system.

3.4.3.3 Sanitary Sewer System

3.4.3.3.1 Sanitary Sewer Main

- Column CY (SS_6"_L) is the total length of 6 inch sanitary sewer main in the project.

- Column CZ (SS_6”_TTL) is the total cost for 6 inch sanitary sewer main in the project. Column CZ is the product of the multiplication of CY by the unit cost for 6 inch sanitary sewer main.
- Column DA (SS_8”_L) is the total length of 8 inch sanitary sewer main in the project.
- Column DB (SS_8”_TTL) is the total cost for 8 inch sanitary sewer main in the project. Column DB is the product of the multiplication of DA by the unit cost for 8 inch sanitary sewer main.
- Column DC (SS_10”_L) is the total length of 10 inch sanitary sewer main in the project.
- Column DD (SS_10”_TTL) is the total cost for 10 inch sanitary sewer main in the project. Column DD is the product of the multiplication of DC by the unit cost for 10 inch sanitary sewer main.
- Column DE (SS_12”_L) is the total length of 12 inch sanitary sewer main in the project.
- Column DF (SS_12”_TTL) is the total cost for 12 inch sanitary sewer main in the project. Column DF is the product of the multiplication of DE by the unit cost for 12 inch sanitary sewer main.
- Column DG (SS_15”_L) is the total length of 15 inch sanitary sewer main in the project.
- Column DH (SS_15”_TTL) is the total cost for 15 inch sanitary sewer main in the project. Column DH is the product of the multiplication of DG by the unit cost for 15 inch sanitary sewer main.
- Column DI (SS_18”_L) is the total length of 18 inch sanitary sewer main in the project.
- Column DJ (SS_18”_TTL) is the total cost for 18 inch sanitary sewer main in the project. Column DJ is the product of the multiplication of DI by the unit cost for 18 inch sanitary sewer main.
- Column DK (SS_24”_L) is the total length of 24 inch sanitary sewer main in the project.
- Column DL (SS_24”_TTL) is the total cost for 24 inch sanitary sewer main in the project. Column DL is the product of the multiplication of DK by the unit cost for 24 inch sanitary sewer main.
- Column DM (SS_MAIN_TTL) is the sum of the costs for the various sizes of sanitary sewer main in the project.

3.4.3.3.2 Sanitary Sewer Manholes

Sanitary sewer manholes were assumed to be eight foot depth. Further analysis and field surveys will be necessary during design of the project to determine additional depth requirements.

- Column DN (#_SS_MH_CONN) is the number of sanitary sewer manhole connections in the project. A manhole connection is a sanitary sewer main that runs into or out of a manhole.
- Column DO (#_SS_MH) is the number of sanitary sewer manholes in the project.
- Column DP (SS_MH_TTL) is the total costs for sanitary sewer manholes in the project. This is a sum of the multiplication of the number of manhole connections

by the unit cost for manhole connections plus the number of manholes multiplied by the unit cost for manholes.

3.4.3.3.3 Sanitary Sewer Services

- Column DQ (#_SS_SERV) is the total number of sanitary sewer service connections in the project. This number was estimated by counting the number of addresses on the adjacent lots in ArcMap.
- Column DR (AVG_SS_SERV_L) is the estimated average sanitary sewer service length.
- Column DS (SS_SRV_TTL_LNGTH) is the product of the multiplication of DQ and DR.
- Column DT (SS_SRV_TTL) is the total cost for the sanitary sewer services in the project. This column is the sum of DQ multiplied by the unit cost for service connections plus the multiplication of DS by the unit cost per foot of sanitary sewer service line.

3.4.3.3.4 Sanitary Sewer Total

- Column DU (SS_TOTAL) is the sum of the various components of the sanitary sewer system which is also the total cost for reconstruction of the sanitary sewer system in the project.

3.4.3.4 Streets

3.4.3.4.1 Paving

For estimating purposes 8” of grade W road base and 4” of asphalt pavement were assumed. Further traffic analysis will be necessary during design of the project to determine road base and asphalt depth requirements.

- Column DV (STRT_AREA) is the area calculated in ArcMap from the project polygon. This area is in square yards.
- Column DW (PAVING_TTL) is the total cost for paving the project. Column DW is the product of the multiplication of DV by the unit cost for pavement.

3.4.3.4.2 Approaches

- Column DX (#_APP) is the total number of approaches in the project. This number is based off of the total number of addresses in the adjacent lots.
- Column DY (APP_TOTAL) is the total cost for approaches in the project. Column DY multiplies DX by the unit cost for approaches.

3.4.3.4.3 Curb and Gutter

For estimating purposes a 7’ radius at the corner of each intersection was assumed.

- Column DZ (C&G_L) is the total length of curb and gutter in the project as measured using ArcMap.
- Column EA (C&G_TOTAL) is the total cost of curb and gutter in the project. Column EA multiplies DZ by the unit cost for curb and gutter.

3.4.3.4.4 Sidewalk

For estimating purposes a concrete sidewalk width of 5’ and depth of 4” was assumed.

- Column EB (SW_LENGTH) is the total length of sidewalk in the project.
- Column EC (SW_TOTAL) is the total cost for sidewalk in the project. Column EC is the product of the multiplication of EB by the unit cost for sidewalk.

3.4.3.4.5 Street Total

- Column ED is the sum of the various components of the streets which is also the total cost for reconstruction of the street in the project.

3.4.3.5 Miscellaneous

3.4.3.5.1 Project Length

- Column EE (PROJ_LENGTH) is the total length of the project from one end to the other. This length is measured in ArcMap.
- Column EF (BLOCKS) is the length of the project in blocks. All of the miscellaneous costs are based on unit prices by the block. One block is considered to be 300 feet long. Therefore, EF is the quotient of the division of EE by 300.

Utility Locates

- Column EG (LOCATES) is the total estimated price for locates in the project. EG is the product of the multiplication of column EF by the unit price for locates.

3.4.3.5.2 Removals

- Column EH (REMOVALS) is the total estimated price for removals in the project. Removals include the removal of existing surfacing, curb and gutter, sidewalk, manholes, inlets and other miscellaneous items. Column EH is the product of the multiplication of EF by the unit price for removals.

3.4.3.5.3 Traffic Control

- Column EI (TRF_CNTRL) is the total estimated price for traffic control on the project. EI is the product of the multiplication of EF by the unit cost for traffic control.

3.4.3.5.4 Seeding

- Column EJ (SEEDING) is the total estimated price for seeding and revegetation on the project. Column EJ is the product of the multiplication of EF by the unit cost for seeding.

3.4.3.5.5 Miscellaneous Total

- Column EK (MISC_TOTAL) is the sum of utility locates, removals, traffic control and seeding for the project.
-

3.4.3.5.6 Subtotal 1

- Column EL (SUBTOTAL_1) is the sum of all of the costs from the water system, storm sewer system, sanitary sewer system, streets and miscellaneous costs up to this point.

3.4.3.5.7 Mobilization

- Column EM (MOBIL) is the total estimated cost for a contractor to mobilize to the project. This value is 10% of Subtotal 1.

3.4.3.5.8 Subtotal 2

- Column EN (SUBTOTAL_2) is the sum of Subtotal 1 and the mobilization cost for the project.

3.4.3.5.9 Design and Construction Engineering

- Column EO (D&C_ENGINEERING) is the estimated engineering costs for the design and construction of the project, (20% of construction costs column EN).

3.4.3.5.10 Legal Fees

- Column EP (LEGAL_FEES) is the estimated legal fees, (5% of column EN). This includes legal counsel on contracts, bonding and advertisement.

3.4.3.6 Total

3.4.3.6.1 Total Project Cost

- Column EQ (TOTAL) is the estimated total cost for reconstruction of the entire project. EQ is the sum of columns EN, EO and EP.

3.4.3.7 Prioritization Summaries

The last five columns included in the database are for sorting the database by different priorities. The database can be sorted by the overall priority, or by priorities for the individual utilities. See Section 6.8 for information on sorting in Excel.

3.4.3.7.1 Combined Priority

- Column ER (COMBINED_PRIORITY_RPT) is the same as column AQ. This is the sum of the priorities given to the project from the DPW, from unscheduled maintenance and from the visual inspection.

3.4.3.7.2 Water Priority

- Column ES (WATER_PRIORITY_RPT) is the sum of the priorities given to the project from the DPW for the water system and the unscheduled maintenance for the sanitary sewer system.

3.4.3.7.3 Sanitary Priority

- Column ET (SANITARY_PRIORITY_RPT) is the sum of the priorities given to the project from the DPW for the sanitary sewer system and the unscheduled maintenance for the sanitary sewer system.

3.4.3.7.4 Storm Priority

- Column EU (STORM_PRIORITY_RPT) is the sum of the priority given to the project from the DPW for the storm sewer system and the priority from the visual inspection of the storm inlets.

3.4.3.7.5 Street Priority

- Column EV (STREET_PRIORITY_RPT) is the sum of the priority given to the project from the DPW for the streets and the priority from the visual inspection of the street.

4 UNIT COSTS

A spreadsheet containing unit costs is included in the spreadsheet. The **Unit Cost** spreadsheet is used for calculating estimated costs for the various items in the **Database** spreadsheet. This spreadsheet is password protected. All items are listed for the Water System, Sanitary Sewer System, Storm Sewer System, Streets and Miscellaneous Items. The costs are estimated for 2008 construction. For future projects, the item costs can be adjusted to reflect future construction costs.

All of the cells used for item costs are named for use in the **Database** spreadsheet. Naming cells makes building equations more convenient because the user can better understand the equations being built. For example, the equation used to determine the cost for 6 inch water main in the **Database** spreadsheet for project number 1 (PID number 1) is: "=L.6w*w.6" where L.6w is the cell name for the length of 6 inch water line in the project and w.6 is the cell name for the cost of the 6 inch water main as defined in the spreadsheet **Unit Cost**.

5 PROJECT LIST

The **Project List** spreadsheet gives a description of all the projects in the database. Each description includes the project identification number (PID), the street the project is on, the street intersection where the project begins and the street where the project ends. This spreadsheet is linked to **Database** so any changes or additions made in **Database** will automatically be updated in the **Project List** spreadsheet.

6 DATABASE OPERATIONS and MAINTENANCE

The information stored in the database files is only as accurate as the information available. As new areas of interest are defined or construction is performed, the database must be updated. Updates and maintenance of the GIS layers and **Database** spreadsheet is critical to preserving usefulness of this tool to the city.

6.1 Adding Projects to the GIS Mapping

1. Open the GIS program ArcMap. Open the file "06-0912Mapping.mxd". This can be done two ways:
    a. If the file has recently been opened on the computer, the pop-up menu can be used by selecting the button next to "An existing Map" and then selecting the filename from the list given in the menu.

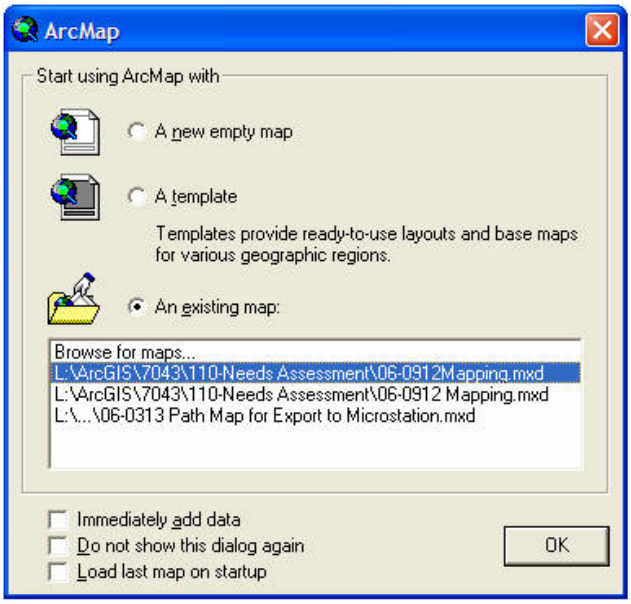


Figure 1 - Opening an Existing Map in ArcMap

If the file is not listed under "Browse for maps…." close the pop-up menu. Select **File**, **Open**. Browse for the file. When the file is found, highlight it and click the **Open** button as shown in Figure 2.

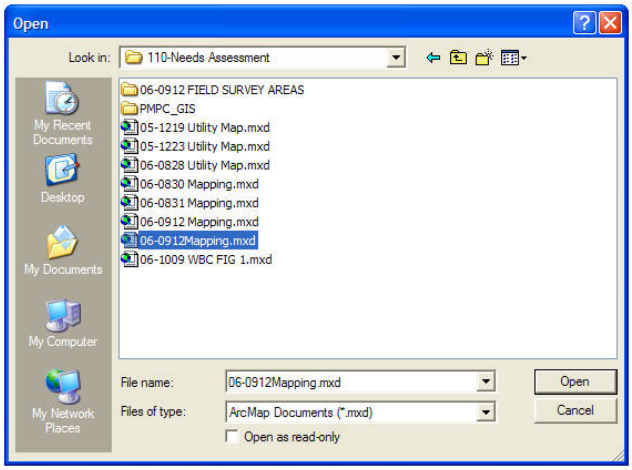


Figure 2 - Browsing for the Map

2. Select the white hand icon which is used for panning the map. If the toolbar shown in Figure 3 is not already in ArcMap, right-click on any of the toolbars at the top of the screen and select **Tools**. Then move the **Tools** toolbar to the top of the screen.

Figure 3 - Pan Icon

With the panning tool selected, use the left mouse button to grab the map. While pressing the left mouse button, drag the map using the mouse. Locate the project area.

3. Zoom into the project area using the + and – magnifying glass icons.

Figure 4 - Zoom Tools

Select an area to zoom in on by clicking and dragging from the top left to the bottom right of the area.

4. Click the **Editor** drop down arrow and select **Start Editing**. If the editor toolbar is not already in ArcMap, right-click on any of the toolbars at the top of the screen and select **Editor**. Then move the **Editor** toolbar to the top of the screen.

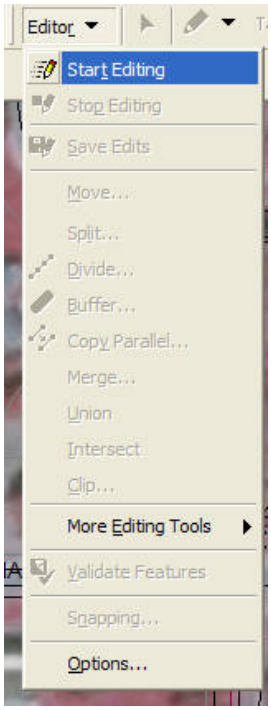


Figure 5 - Editor Menu

5. Select the source that shows **Projects** in the list of layers available for editing.

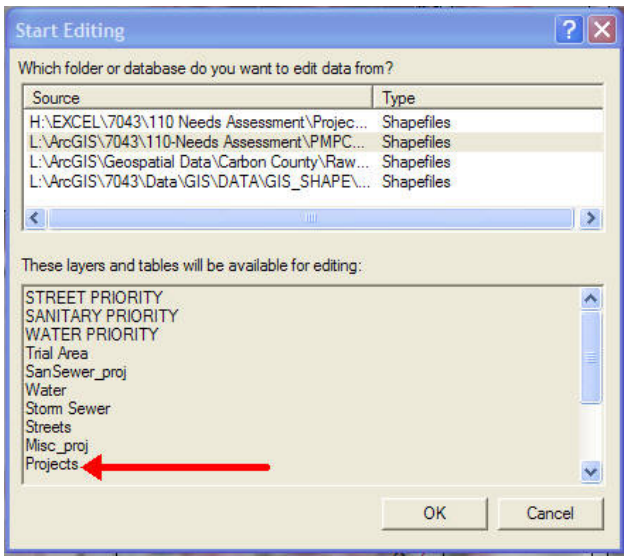


Figure 6 - Start Editing Window

Click **OK**

6. On the drop down menu for **Target**, select the layer **Projects**

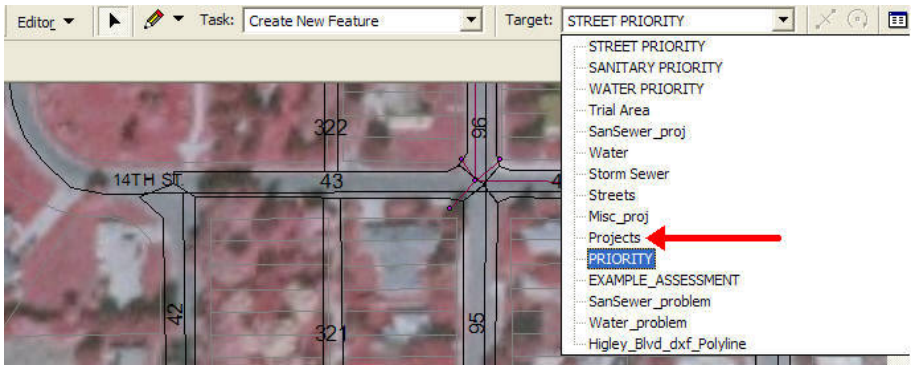


Figure 7 - Target Drop-Down Menu

Also, Make sure **Task** is set to **Create New Feature** and the pencil icon is selected.

7. Use the mouse and the left mouse button to draw in the project area. To snap to the vertices of adjacent projects, move the mouse near the vertex and then press the **Ctrl** and **F6** keys at the same time.

   If the line snaps to the wrong object, use the back arrow at the top of the screen (or **Ctrl** and **Z**) to undo the last segment. Turn off any unneeded layers in the layer list on the left side of the screen, and try again.

   The projects should be drawn along the edge of pavement and take an equal portion of the adjacent intersection(s). It is important to draw these areas as accurately as possible from the aerial photography in order to get good estimates for the pavement quantities. The street area is calculated from the project area as it is drawn in ArcMap (See Section 6.2).

8. When the project area boundary is complete, press the F2 key to finish the drawing. The project boundary should look similar to the image shown below.

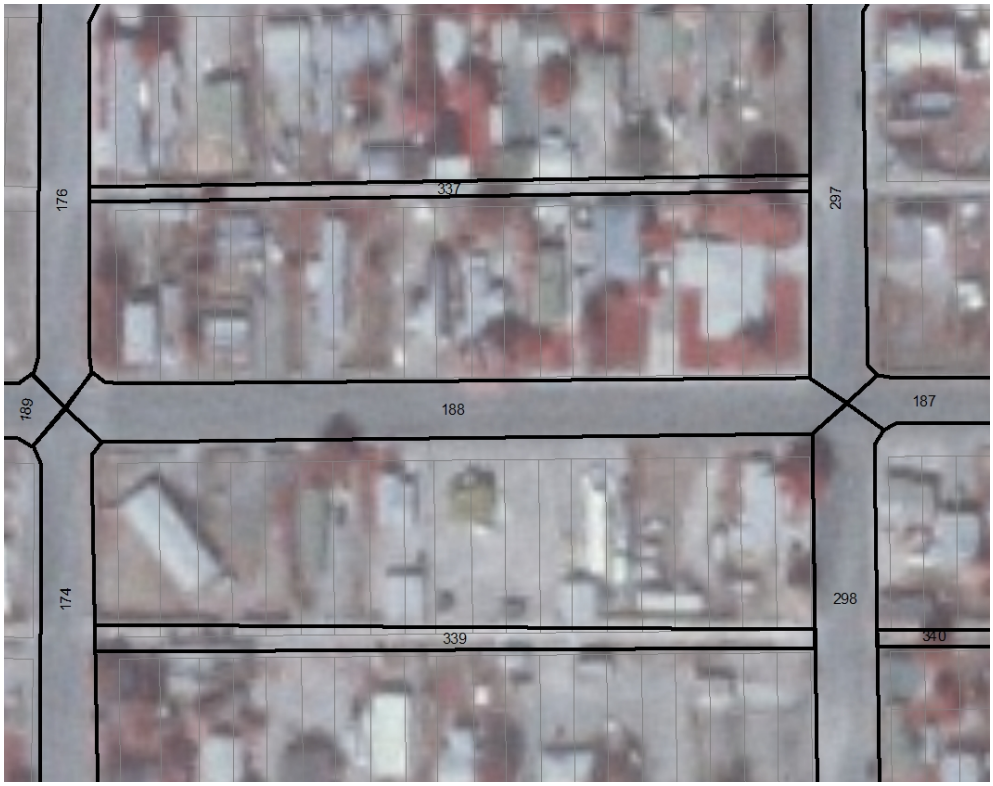


Figure 8 - Finished Project Boundary

9. Right-click on the **Projects** layer in the layer list on the left side of the screen. Left-click **Open Attribute Table**.

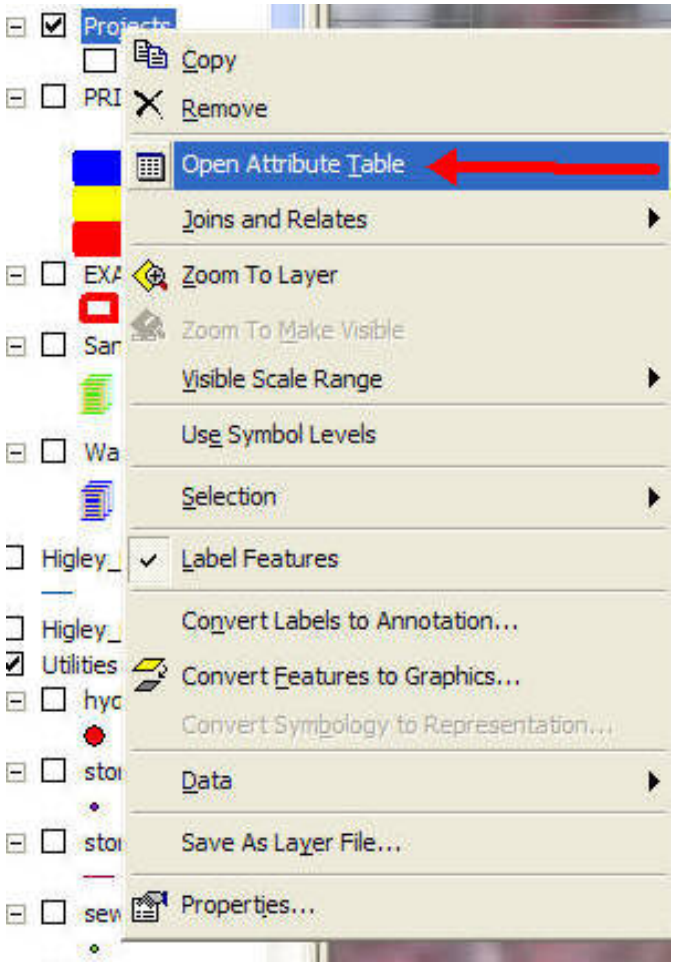


Figure 9 - Open Attribute Table

10. The attribute table for the Projects layer will appear on the screen. Scroll down the screen until you get to the project you just created. The new project should be at the bottom of the list. To be sure you are on the right project, use the black arrow icon in ArcMap to select the project just created. Once the area is selected in the mapping view, the row associated with the area will be highlighted in blue in the attribute table. Under the column **PID** in the attribute table, enter in the project number for the new project (this is usually the next sequential number).

11. Draw in any additional areas following steps 7 through 10. When finished, select **Save Edits** from the **Editor** drop down menu. Then select **Stop Editing** from the **Editor** drop down menu. You have just added a new project to ArcMap!

6.2 Calculate the Project Areas for Paving in ArcMap

When new projects have been added to ArcMap, the pavement areas need to be calculated. This calculation is easily done using the **Field Calculator** in the attribute table for the projects. The **Field Calculator** computes the area of the pavement in square yards which is the unit used in the estimate for unit costs. To calculate the pavement area in square yards, follow these steps:

1. In ArcMap, right click the layer **Projects** in the layer list at the left side of the screen. Left-click **Open Attribute Table**.

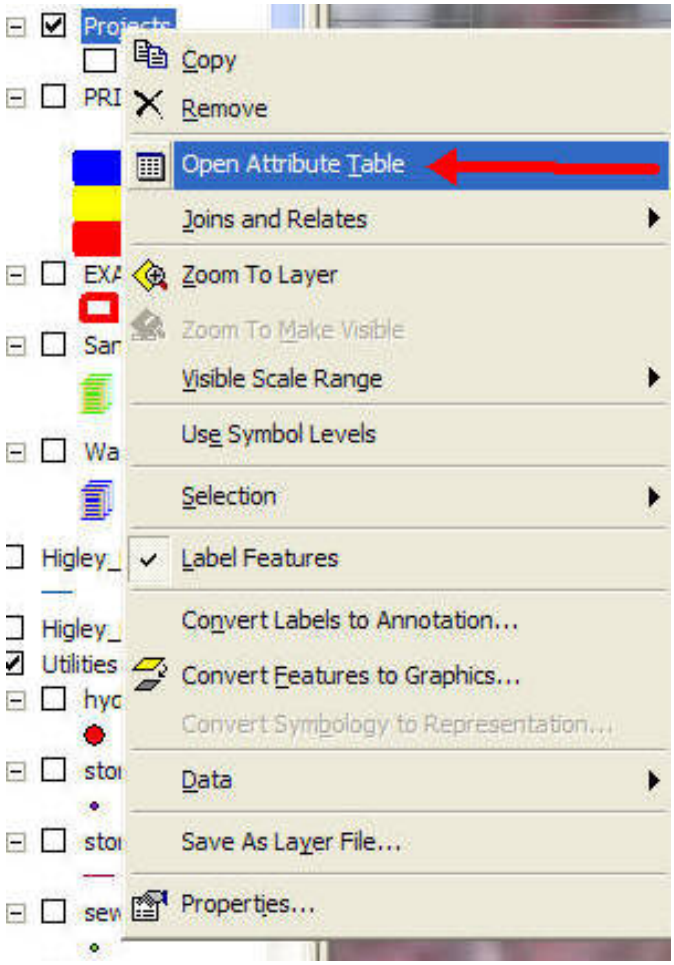


Figure 10 - Open Attribute Table

2. The attribute table for the **Projects** layer will appear on the screen. On the right side of the attribute table is a column named **AREA** which holds the area calculations for all of the projects. Right-click on the column heading **AREA** and a drop down list of options will appear. Left-click **Field Calculator**. If a warning window appears, select **Yes**.

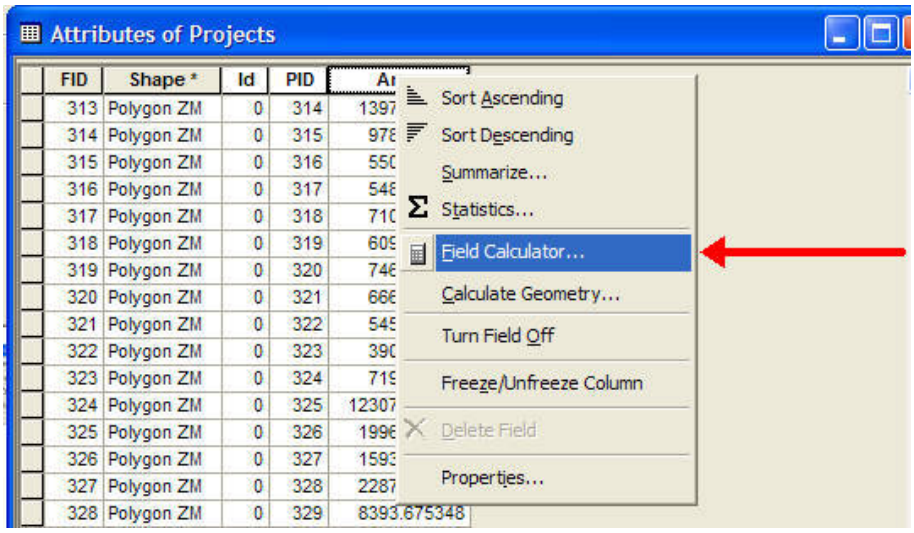


Figure 11 - Field Calculator

3. From the new window there are two ways to run the area calculation. Options a and b follow:
    a. Select **Load** in the **Field Calculator** window.

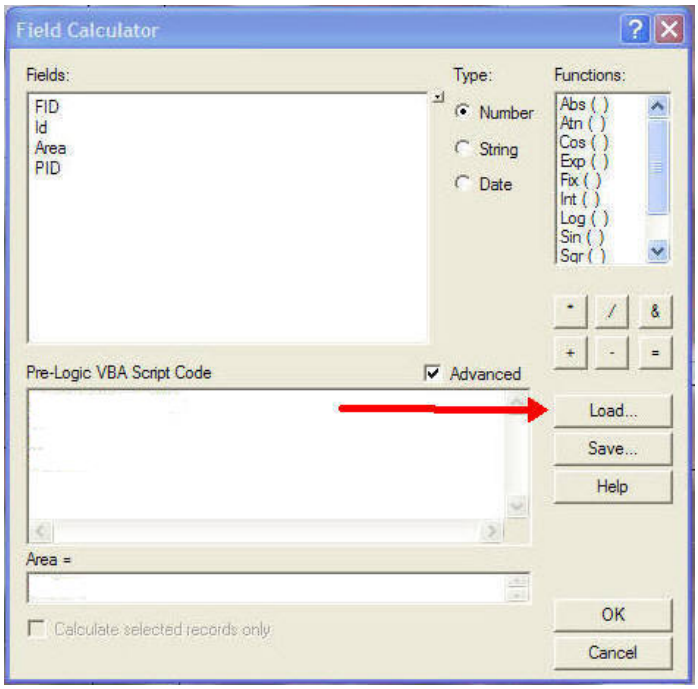


Figure 12 - Load Script

Another window will open giving you options of available scripts to run different types of calculations. To calculate the area in square yards select the script **Area_SQ_YD.cal** and select **Open**. If there are no scripts available for use move on to **Option b**.

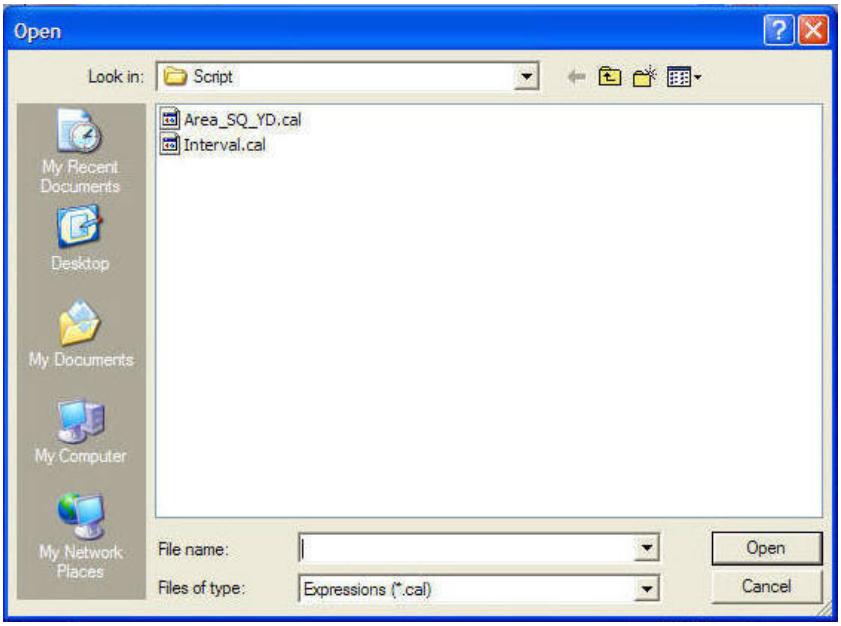


Figure 13 - Script Open Menu

Now, the Field Calculator will have all of the Script Code filled in as shown in Figure 14.

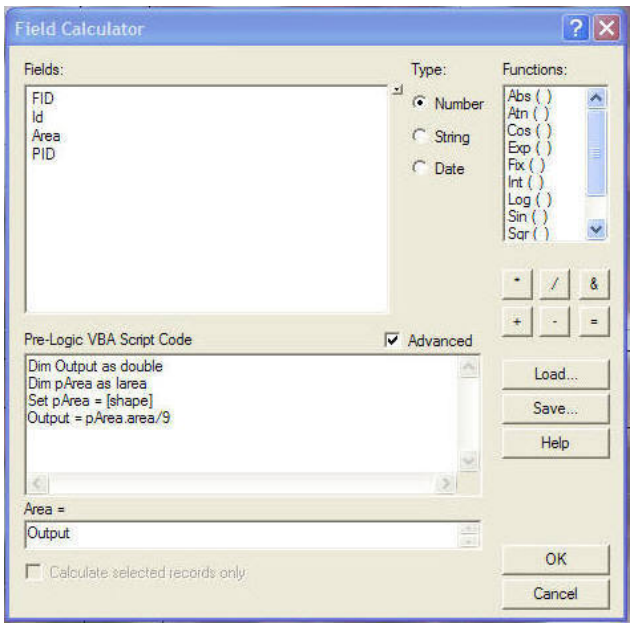


Figure 14 - Field Calculator with Script Loaded

Select **OK** and the areas will be calculated for the entire column. If there are any rows selected in the attribute table, the calculation will only run for those rows. To force the field calculator to do all of the rows in the column, click the **Selection** menu at the top of the ArcMap window and then select **Clear Selected Features**. Now the calculator will run for all of the projects.

b. In this option, the script must be written into the **Field Calculator**. Under **Pre-Logic VBA Script Code** type this in exactly as follows:

Dim Output as double
Dim pArea as Iarea
Set pArea = [shape]
Output = pArea.area/9

Under **Area =** type in **Output**

Before clicking **OK**, click **Save** and save the script for future use as **Area_SQ_YD.cal** . The next time project areas need calculated, the first option (option a) can be run instead of typing in the script.

Now click **OK** and the areas will be calculated for the entire column. If there are any rows selected in the attribute table, the calculation will only run for those rows. To force the field calculator to do all of the rows, click the **Selection** menu at the top of the ArcMap window and then select **Clear Selected Features**. Now the calculator will run for all of the projects. **IMPORTANT: Check to make sure the script is running correctly by measuring a project's boundary with the measure tool in ArcMap for measuring areas**. **See Section 6.3 for instructions on measuring areas.**

6.3 Measure Items Using the Measure Tool in ArcMap

Once new projects have been created in ArcMap, the quantities for the water system, storm sewer system, sanitary system, and the street components need measured and/or counted in order to enter the information into the spreadsheet portion of the database. Measurements for the various spreadsheet entries can be easily taken using the **Measure** tool in ArcMap. To use the **Measure** tool, follow these steps:

1. Select the **Measure** tool icon at the top of the screen.

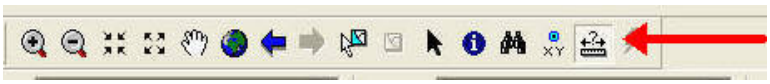


Figure 15 - Measure Tool Icon

2. A new window will open as shown below. To measure distance in feet, select the jagged line at the left side of the **Measure** window.

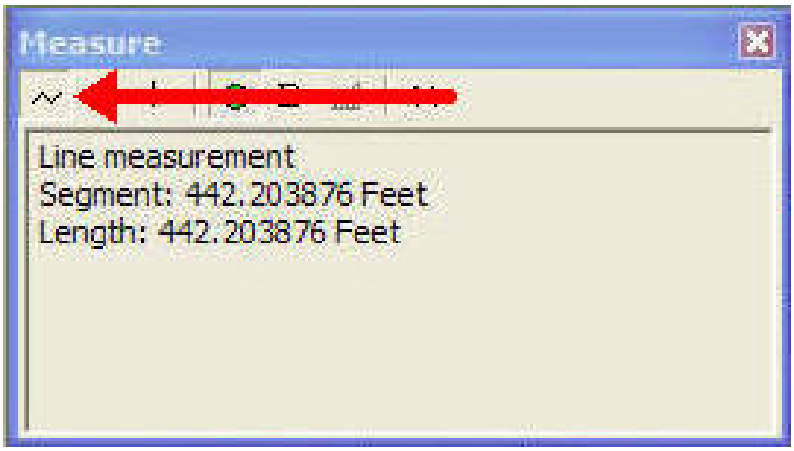


Figure 16 - Measure Menu

3. To measure an object's length, left click at the starting point of the measurement. As the measurement cursor is moved, two measurements will show in the **Measure** window. **Segment** is the distance measured from the last point entered. **Length** is the distance of all of the segments included in the measurement. To start a new measurement either double-click on the screen or hit the **Esc** key.

4. There is an option to snap to objects when using the measure tool. To turn on the snap function, click the green dot as shown in Figure 17.

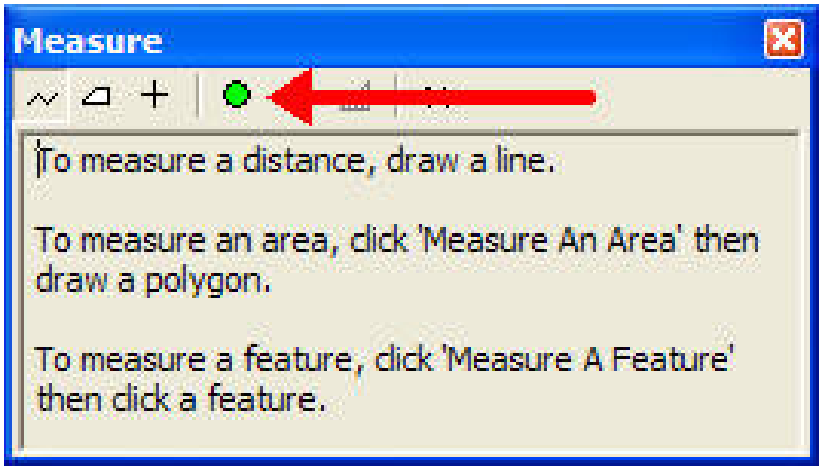


Figure 17 - Measure Tool Snap Feature

With the snap selected, the cursor will lock on vertices, and endpoints of objects in the map. Start the measurements in the same way as explained in step 3.

5. If the area of a project needs measured, select the white polygon icon in the **Measure** window.

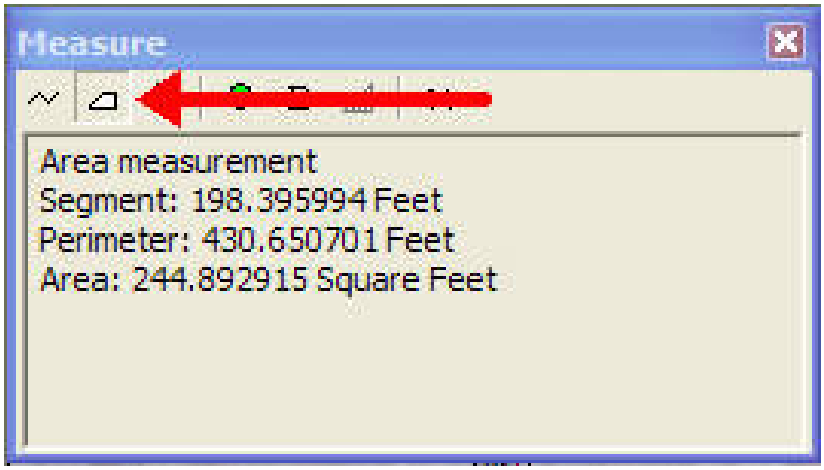


Figure 18 - Measure Area

6. The units for the area measurements as well as the linear measurements can be found in the drop down menu below the black arrow. If the area for paving needs to be measured, the units should be in square yards as shown in Figure 19.

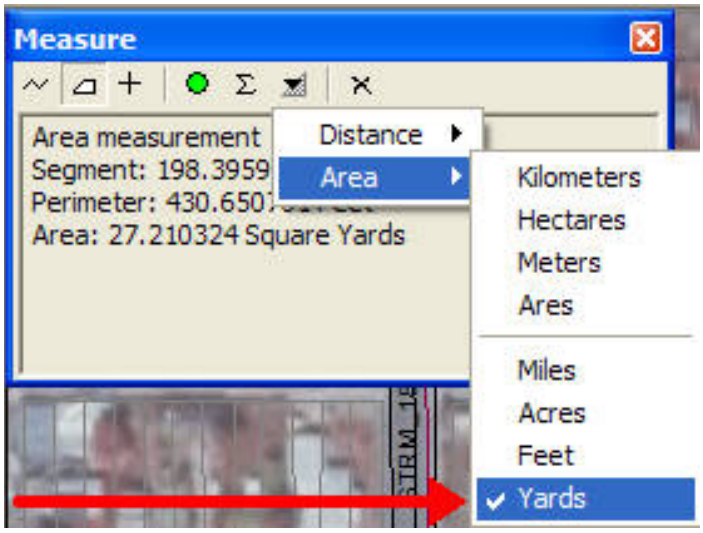


Figure 19 - Measure Area in Square Yards

6.4 Use the Identify Tool in ArcMap

At times, visually identifying points in ArcMap is difficult. For example, the same point is used in the **storm_pt** layer to identify storm inlets and storm manholes. To identify unknown objects in a utility layer, use the **Identify** tool. To use the **Identify** tool, follow these steps:

1. Select the **Identify** tool icon on the **Tools** toolbar at the top of the ArcMap window.

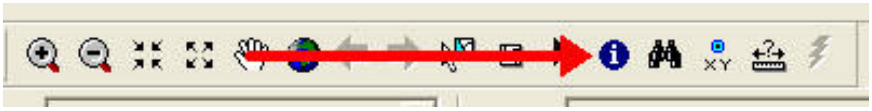


Figure 20 - Identify Tool Icon

2. In the **Identify from:** drop down window, select the layer the objects will be identified from. For example, if a point was to be identified for the storm sewer system, select the **storm_pt** layer in the drop down list under **Utilities** as shown in Figure 21.

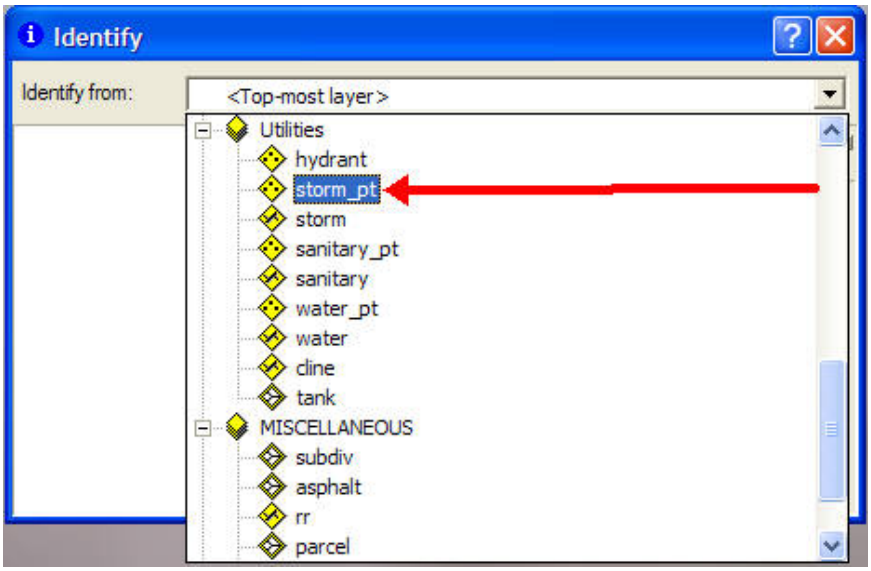


Figure 21 - Selecting the Layer of Interest

3. Use the mouse arrow to select the object of interest. This can be done with the mouse by either left clicking on the object, or using a click and drag to create a box around the object.

4. When an object is successfully selected, the object's information will appear in the **Identify** tool window. The identity of the object appears in the two places shown in Figure 22.

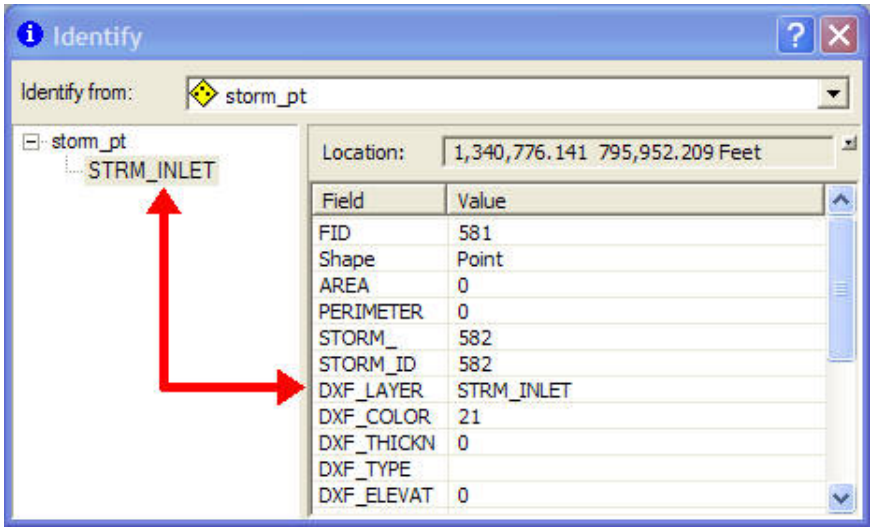


Figure 22 - Object Information in the Identify Tool Window

5. Select other unknown objects using steps 2 through 4.

6.5 Input Items into the Database Spreadsheet

When new projects are created, the information for reconstruction needs to be entered into the **Database** spreadsheet. Each project is evaluated separately in order to get accurate information for input into the database. Measurements are taken directly from the GIS mapping in ArcMap. In **Database**, each project is allotted a row to store all of its associated information. Projects are organized by their project identification number (PID) and include a description, a priority, quantities and costs for reconstruction.

To obtain the quantities for each project, ArcMap is utilized. All of the available utility information is stored on separate layers in ArcMap. Therefore, quantities related to each utility can be evaluated for every project. This is a long and arduous process in which attention to detail is of utmost importance. Unless the computer being used has multiple monitors, allowing both Excel and ArcMap to be viewed simultaneously, it is advisable that the measurements and quantities for each project first be recorded on a separate sheet of paper (See **Project Quantity Worksheet** in Appendix B) and then input into the spreadsheet at a later time. A general description of the process follows:

1. In ArcMap, zoom into the project to be analyzed.

2. Turn on level **cline** at the left side of the window. If the streets are not labeled, right-click on **cline** and select **label**. If an attribute other than the street name is labeled, right click on **cline**, select **properties**. In the properties window, select the **Label Features** tab and then select **STNAME** from the drop down menu.

3. Each project should have a corresponding PID number in ArcMap. Right-click on the **Projects** layer and then click on **Open Attribute Table**. Find the project in the attribute table. Record the **FID** number, the **PID** number and the **AREA** from the attribute table.

4. Turn on the utility layers containing the information for the water system (water, water_pt, hydrants). Right-click on the **water** layer in the layer list and select **label** if it is not already selected. By labeling the water layer, the size of the water main can be seen on the screen. Use the **Measure** tool (refer to *Measure Items Using the Measure Tool in ArcMap*) to measure the lengths of the various sizes of water main in the project and record the lengths for each individual size. If the existing sizes are different than what would be installed, record the length for the size to be installed.

5. Count (visually) the number of gate valves to be installed for the various sizes of water main.

6. Count the number of fire hydrants in the project.

7. Turn on the GIS layer **pcl_03** in ArcMap. If the lots are not labeled with the address, select the **Address** attribute as the label. Count the number of addresses adjacent to the water main. This is the number of service connections for both the water and the sewer (if both water and sewer are in the project). Record the number of water service connections. Use your best judgment on the number of service connections. Sometimes, water services are connected to water main in the alleys instead of the streets.

8. Use the **Measure** tool to measure the average length for water services. Normally, this is considered to be the width of the street plus 10 feet divided by 2 ([street width +10]/2).

9. Count the number of fittings on the various sizes of water main for the project. A fitting is considered a tee, cross, or bend. Once this step is complete, the water system quantities are complete. Turn off the layers containing the water system information and turn on the layers containing the storm sewer information (storm, storm_pt).

10. Make sure the **storm** layer is labeled the same as in step 4. Measure and record the lengths for the various sizes of storm sewer pipe. The minimum size of storm sewer pipe considered for reconstruction is 18 inch. Any storm sewer pipe smaller than 18 inch should be counted as 18 inch.

11. Count and record the number of storm sewer manholes in the project.

12. Count and record the number of storm inlets in the project. To verify whether a point is a manhole or drop inlet, use the **Identify Tool**. Once this step is complete, the storm sewer system quantities are complete. Turn off the layers containing the storm sewer system information and turn on the layers containing the sanitary sewer information (sanitary, sanitary_pt).

13. Make sure the **sanitary** layer is labeled the same as in step 4. Measure and record the lengths for the various sizes of storm sewer main.

14. Count and record the number of manholes and manhole connections. A manhole connection is considered any main running into or out of a manhole.

15. Count and record the number of sanitary sewer services. This is normally the same number as in step 7. Use the number of addresses to come up with this count. Again, use your best judgment on the number of service connections. Sometimes, sewer services are connected to sewer main in the alleys instead of the streets.

16. Count and record the number of approaches to the street. This number is normally the same as in step 7. Remember to include approaches from any adjacent alleys.

17. Use the **Measure** tool to determine the length of curb and gutter for the project.

18. Use the **Measure** tool to determine the length of sidewalk for the project. Remember to add in additional lengths for handicap ramps. Usually, this number is close to the same as the curb and gutter length with the addition of 7 feet for every handicap ramp. See the detail included in the Appendix E for sidewalk and handicap ramp.

19. Use the **Measure** tool to record the length of the project from one end to the other as it is drawn in ArcMap.

20. Open the spreadsheet **Database.** Enter the recorded data into the spreadsheet in the appropriate columns for the project. Refer to section *3.2.3* for information on appropriate columns. Along with information taken from ArcMap, record any prioritization information from the DPW and field inspection into the spreadsheet.

6.6 Joining the Spreadsheet Database to the GIS

After the **Database** spreadsheet has been updated with new projects or maintenance has been performed, the spreadsheet will need to be joined to the **PRIORITY** attribute table in ArcMap. By joining the **Database** spreadsheet to the **PRIORITY** attribute table, the project priorities can be shown in the mapping with a color scale. To join the **Database** spreadsheet to the **PRIORITY** attribute table, follow these steps:

1. In ArcMap, right click on the **PRIORITY** layer name in the **Layers** list on the left side of the ArcMap window.

2. Select **Joins and Relates** from the list that appears. Then select **Remove Join(s)**. Select **Remove all Joins**.

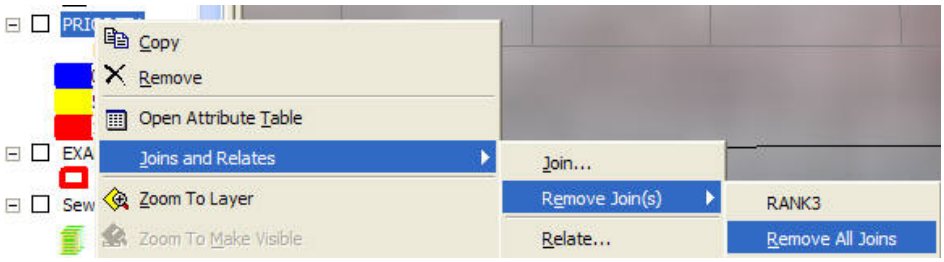


Figure 23 - Remove Join(s)

3. Open the Excel file that stores the **Database** spreadsheet. In the **Database** spreadsheet, select **File / Save As**.

4. In the **Save As** window, browse to a folder location of your choice. Under **Save as type:** select **DBF 4 (dBaseIV) (*.dbf)**. In **File name:** enter the date followed by the word **Priorities**. Select the **Save** button.

5. Two warning windows will appear. Select **OK** in the first warning window, then select **Yes** in the second warning window.

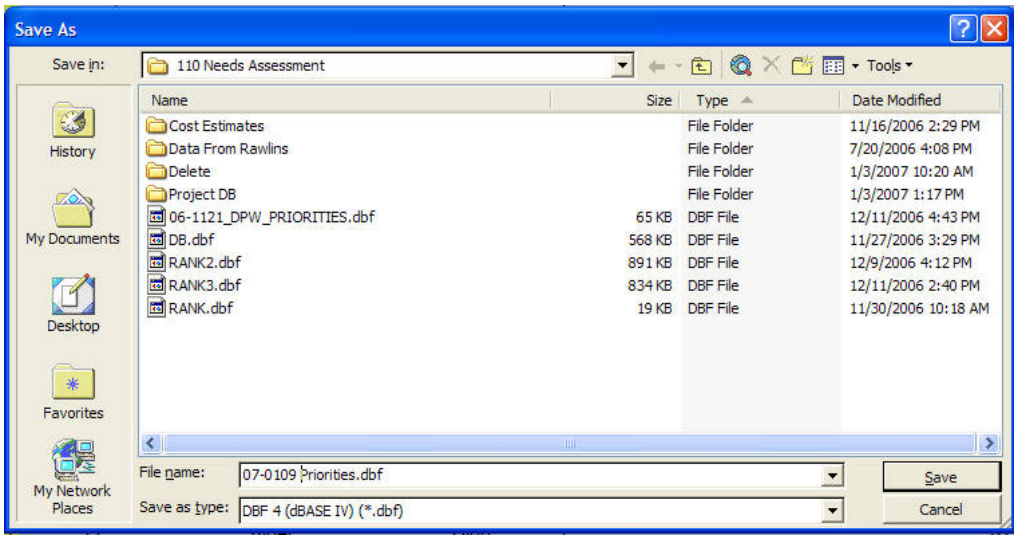


Figure 24 - Save As Window

6. Close out of the spreadsheet **Database** and return to the ArcMap file. Repeat steps 1 and 2, except this time select **Join…**

7. A **Join Data** window will open. Enter the values in the window as shown in Figure 25. Use the folder icon in the window to find the file you saved in steps 4 and 5. It is very important that items 1 and 3 in the window are set to **PID** because **PID** is the link between the mapping and the **Database** spreadsheet. Select the **OK** button.

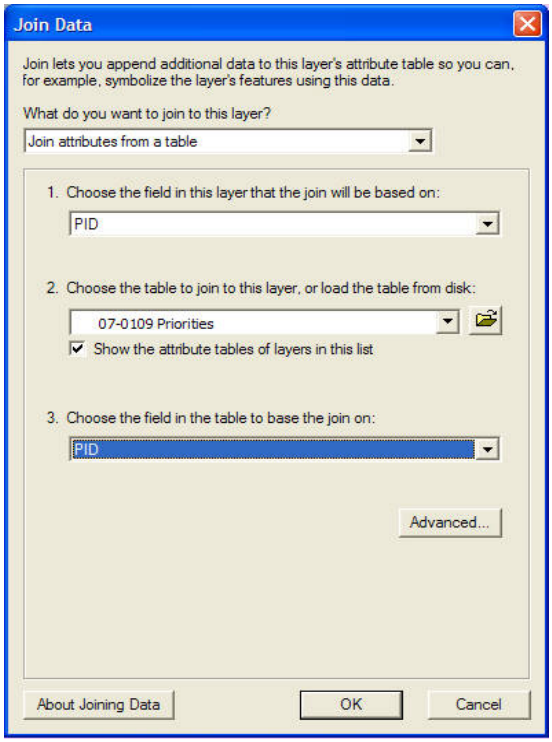


Figure 25 - Join Data Window

8. A **Create Index** window will open. Select **Yes.**

9. You have now joined the **Database** spreadsheet to the attribute table for the **PRIORITY** layer in ArcMap.

10. Right-click on the **PRIORITY** layer. Select **Properties…**

11. In the **Layer Properties** window select the **Symbology** tab.

12. On the left side of the **Symbology** tab, select **Quantities / Graduated colors**.

13. In the **Value:** field, select the **NEEDS_PRRTY** from the list. This name will start with the file name given to the .dbf file in step 4. Then there will be a period followed by **NEEDS_PRRTY**. For example it may look like: **07-0109 Priorities.NEEDS_PRRTY**.

14. Set the **Classes:** to 3.

15. In the **Color Ramp:** selection, choose the ramp that starts in green and ends in red. At this point, the **Symbology** tab should look like Figure 26.

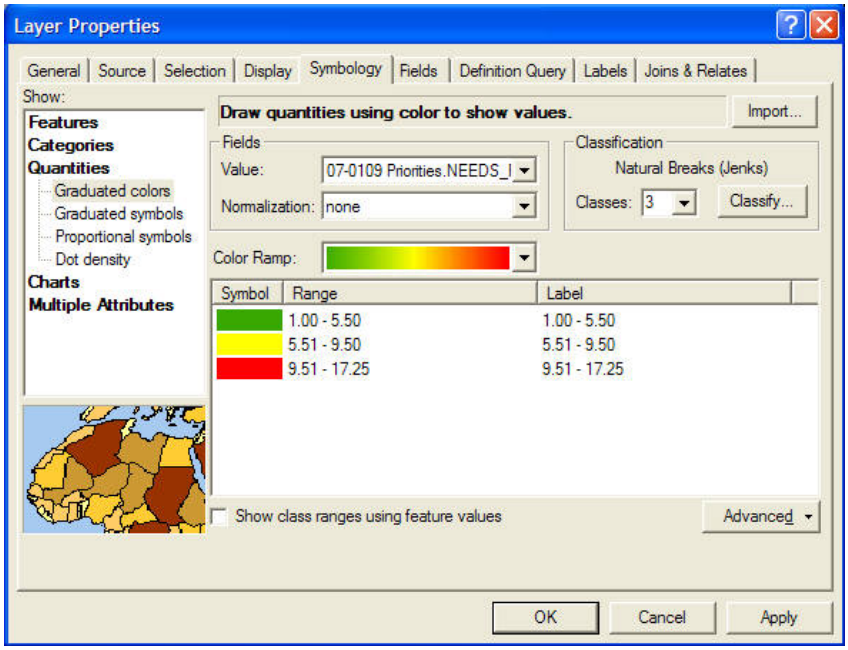


Figure 26 - Symbology Tab

16. In order to see an outline of the priorities around the areas, double-click the green box under **Symbol** below the color ramp.

17. A window named **Symbol Selector** will open. Select an **Outline Color** to match the **Fill Color**. In this case, you would select a green color from the color palette. Change the **Outline Width** to 3. Now, select **No Color** for the **Fill Color**. The **Symbol Selector** window should now appear the same as Figure 27.

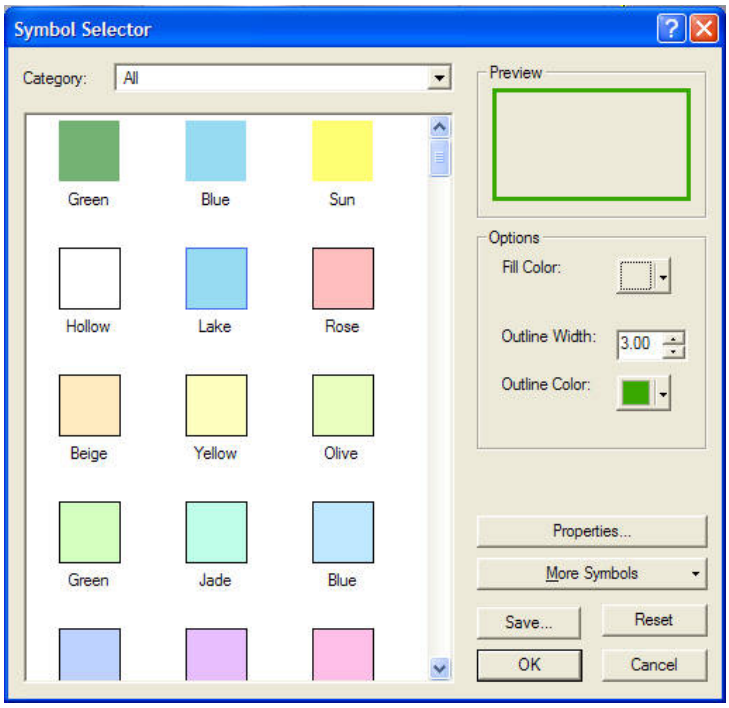


Figure 27 - Symbol Selector

18. Select **OK**. Repeat steps 16 and 17 for the yellow and green colors.

19. All of the projects in the database should now have a priority color associated with them. The highest priorities should be outlined in red, while the lowest priorities are outlined in green.

20. The symbology for the **PRIORITY** layer can be set up in many other ways. By changing the **Value** field in the **Symbology** tab, other attributes from the **Database** file can be categorized by color.

21. Whenever, the **Database** file is updated, this process should be completed to give a visual representation of the changes in ArcMap.

6.7 Update the Unit Costs Spreadsheet

The **Unit Cost** spreadsheet holds all of the estimated construction costs utilized in the **Database** spreadsheet. The spreadsheet is organized in 5 columns: Item, Unit, 2007 Cost, Source, and 2008 Cost. There is also a separate column (Column H) which contains the construction cost inflation multiplier being utilized in the equations for the calculations.

A brief description of the columns follows:

- Item – is a description of the item for the utility. Separate items are listed for each utility.
- Unit – is the unit of measure used for the item listed.
- 2007 Cost – is the cost or cost estimate for 2007 construction.
- Source – is where the cost estimate information was taken from.
- 2008 cost – is the estimated cost for 2008 construction.

Currently, the unit costs in the **Unit Cost** spreadsheet are for 2008 construction. For the past few years, construction costs have inflated at approximately 20% per year. This is the assumption used in the creation of the **Unit Cost** estimates. Periodically inflation rates should be evaluated based on current bid tabs received on local improvement projects. The cost multiplier should be adjusted to reflect the new rate. The 20% inflation rate can be seen in the **Unit Cost** spreadsheet as a multiplier factor of 1.2. The 2008 Cost column is the product of the multiplication of the 2007 Cost column by the multiplier (1.2). If the multiplier is to be changed, change the yellow highlighted cell value below the column heading named **Multiplier**.

To simplify the equations and updates to the spreadsheet, the cells containing the 2008 cost estimates are named. Naming cells allows the user to better understand the equations built into the spreadsheets. To see the name given to the cells, select the cell and look at the cell name in the upper left hand corner of the window as shown in Figure 10 (w.6 is the cell name for 6 inch PVC Water Main).

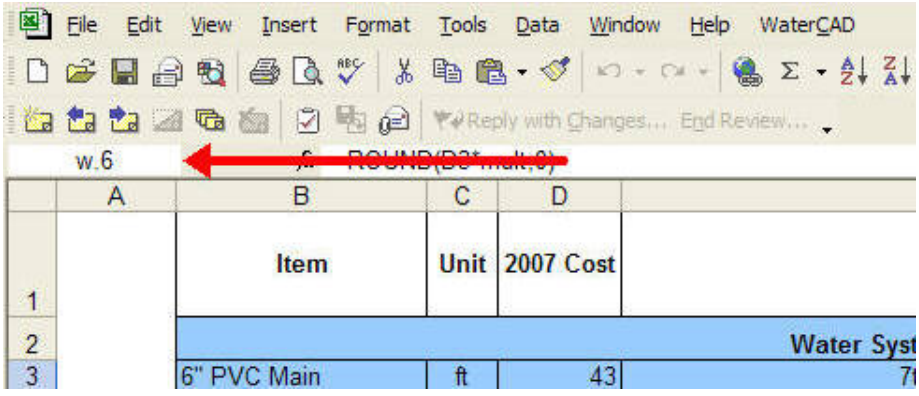


Figure 28 - Cell Naming

If new items are to be added to the Unit Cost spreadsheet, the cells containing their estimated item cost should be named.

To name a cell:

- Select the cell to be named.
- Enter the desired name for the cell in the location shown in Figure 28.
- Hit the **Enter** key on the keyboard.

To delete an existing cell name:

- Select the **Insert** menu at the top of the Excel Window.
- Select **Name** / **Define**.
- From the **Define** window, select the cell name to be removed.
- Select the **Delete** button.
- The name selected will be deleted from the list.

The Unit Cost spreadsheet should be kept up to date in order to maintain accuracy. When projects are estimated for construction after 2008, the spreadsheet should be changed to reflect the new construction costs.

To update the **Unit Cost** spreadsheet:

- Enter the year the construction costs are taken from in column D (i.e. change the column heading 2007 Cost to 20## Cost, where the ## reflect the year the costs are taken from). For a project to be constructed in 2009, construction costs would probably be taken from a 2008 project, or the most recent project with available bid information.
- Enter the description for the data Source (Column E). Usually, the source utilized is a contractor's bid for a nearby project of similar size and scope.
- Change the column heading in column F to the year the project(s) will be constructed.
- Update the multiplier as local improvement project bid tabs are available. Remember the multiplier is for inflation over one year. If costs are to be inflated over multiple years, the multiplier for example, should be 1.2^n, where n is the number of years between the year the costs are taken from and the year of construction. For example, if 2007 costs are to be inflated for construction in 2010 and the inflation rate stays constant, the multiplier would be $1.2^3 = 1.73$ because there are three years between 2007 and 2010. It should be noted that as n increases, the cost estimates will become less accurate due to the variability in the economy from year to year. Therefore, use the latest information on construction prices available.
- Manually checking the output costs should be performed following any adjustments to the multiplier.

When the previous steps are completed, the calculations in the **Unit Cost** spreadsheet and the **Database** will automatically update. However, if new bid items are added and named, the **Database** will need to be updated to reflect the additions (i.e. new columns will need inserted into **Database** and the equations written to reflect the new cell names).

6.8 Sorting Projects in the Spreadsheet

Project List is a useful spreadsheet which displays a list of the projects in the database. The list includes the PID, STREET, FROM and TO for each project. This is a valuable link between the GIS and the **Database** spreadsheet. Currently, the information in the **Project List** spreadsheet is listed by the PID number. However, the user may need the information listed by STREET. If the need arises to sort the information by STREET, the sort tool can be used in Excel to accomplish this action. The steps to sort the projects by the STREET column are listed below:

1. Open the **Project List** spreadsheet.
2. Highlight all of the rows with project information by clicking on the row heading 1 and dragging the mouse arrow down to the last row with project information. The selected rows should be highlighted in blue.
3. Click the **Data** menu at the top of the window.
4. Select the **Sort…** command as shown below.

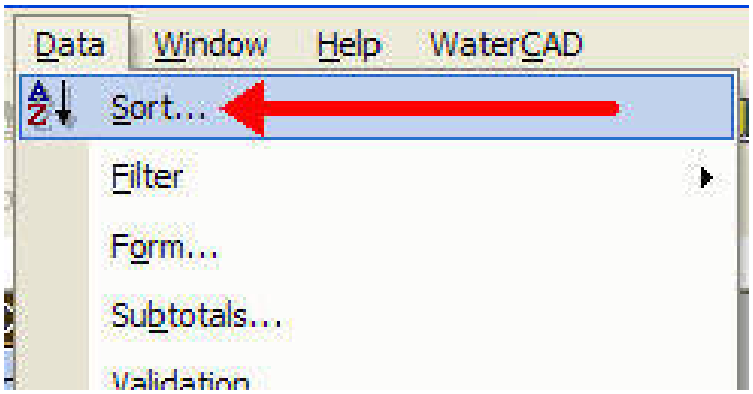


Figure 29 - Sort Command

5. In the Sort menu, select the **Header row** button under **My list has**.

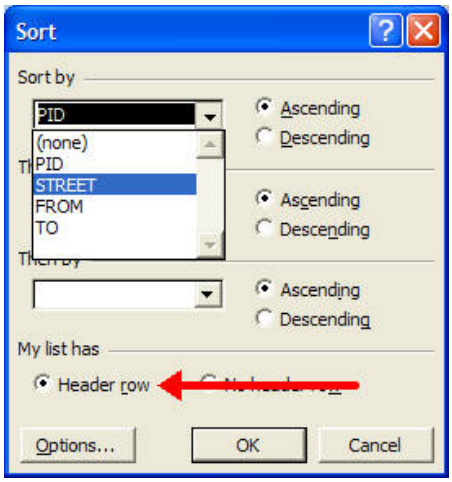


Figure 30 - Header Row Option

6. In the **Sort by** drop down menu, select **STREET**.

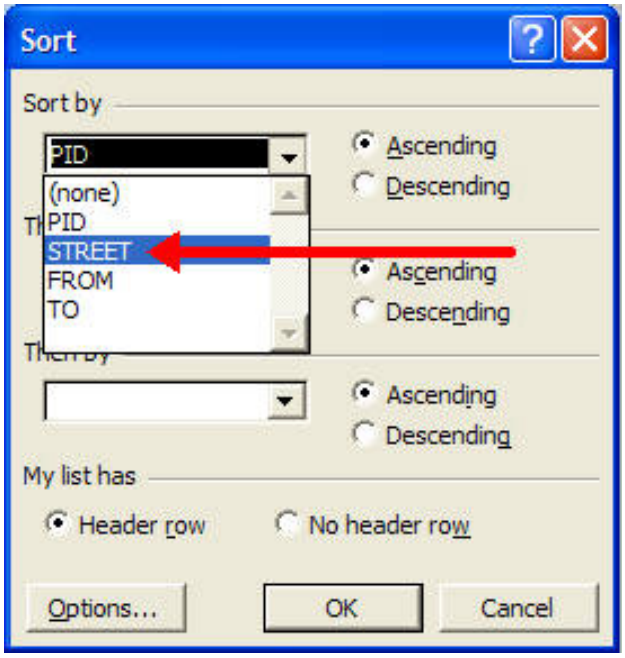


Figure 31 - Sort by Street

7. Select **OK**.
8. Now you have a sorted list of the projects by street name! The projects with numbered streets will appear first, the rest of the projects will appear alphabetically.

The last five columns included in the **Database** spreadsheet are prioritizations of the projects by a combined priority and by individual utility. Sorting the projects by any of these columns can be helpful in determining the projects in greatest need overall, or for each of the utilities. For example, if a list of the highest priority water projects is needed, the database can be sorted by column ES. Follow steps 1 through 5 above, but perform the sort in the **Database** spreadsheet. Select **Descending** instead of **Ascending.** In step 6, select **WATER_PRIOIRITY_RPT** in the **Sort by** drop down menu. Then select **OK**.

A list of the columns in the **Database** spreadsheet to sort by for the various utility priorities follows:

- Combined priority – sort by column ER (**COMBINED_PRIORITY_RPT**).
- Water priority – sort by column ES (**WATER_PRIORITY_RPT**).
- Sanitary sewer priority – sort by column ET (**SANITARY_PRIORITY_RPT**).
- Storm sewer priority – sort by column EU (**STORM_PRIORITY_RPT**).
- Street priority – sort by column EV (**STREET_PRIORITY_RPT**

7 TOOLS

7.1 Project Cost Estimate

Project Cost Estimate is a tool created for use in estimating the combined costs for up to eight projects. If a project will not be completely reconstructed, this tool can be used to select only the items to be included in the reconstruction. The user can select the project of interest from the drop-down menu below **Project ID**. When the project is selected, a description of the project is displayed in columns C through E. Next, the user can select the items to be included in the project for the water system, sanitary sewer system, storm system and the streets. This is done by selecting either **yes** or **no** from the drop down menus for each item. When **yes** is selected, the associated cost for the item in the project is displayed. All the selected item costs are totaled on the right side of the spreadsheet. At the bottom right of the spreadsheet, the costs for the selected projects (up to eight projects) are totaled. This tool is useful for determining cost estimates for multiple projects or an improvement district. Along with this tool, **Project Quantity Output** was created to output the quantities for the selected projects.

7.2 Project Quantity Output

Project Quantity Output is a tool for estimating the quantities and costs of the individual items for up to eight projects. The quantities and costs for the projects selected in **Project Cost Estimate** are automatically displayed in this spreadsheet. Any items selected as **no** in the **Project Cost Estimate** will be displayed as a zero quantity and cost in this spreadsheet. In addition, this spreadsheet allows the user the opportunity to omit water transmission lines (12 inch, 16 inch and 20 inch transmission lines not used for distribution). If any transmission lines are omitted, the total used for the cost estimate of the selected projects should be taken from the **Project Quantity Output.**

8 SECURITY

8.1 Password Protection of Sheets

The spreadsheets in this file are password protected to keep the information stored in the files from unintentional manipulation. The information in the spreadsheets can still be read, but not manipulated until the password is entered. The **Project Cost Estimate** and the **Project Quantity Output** tools can be used in the protected state (i.e. the drop down menus and selection boxes are active). This allows use of the files and tools without a loss of security.

APPENDIX A
CELL NAME KEY

Spreadsheet **Database**

Database Column	Database Cell Name
Water	
6”L (AS)	L.6w
8”L (AU)	L.8w
10”L (AW)	L.10w
12”L (AY)	L.12w
16”L (BA)	L.16w
20”L (BC)	L.20w
#6”_GV (BF)	No.6gv
#8”_GV (BH)	No.8gv
#10”_GV (BJ)	No.10gv
#12”_GV (BL)	No.12gv
#16”_GV (BN)	No.16gv
#20”_GV (BP)	No.20gv
#FH (BT)	No.FH
#_SERVICES (BV)	No.conn.w
AVG_SVC_LEN (BW)	No.ins.w
#_FITTINGS (BZ)	No.fit
Storm Sewer	
ST_18”_L (CC)	L.18st
ST_24”_L (CE)	L.24st
ST_27”_L (CG)	L.27st
ST_30”_L (CI)	L.30st
ST_33”_L (CK)	L.33st
ST_36”_L (CM)	L.36st
ST_48”_L (CO)	L.48st
ST_54”_L (CQ)	L.54st
#_ST_MH (CT)	No.manhl
#_ST_IN (CV)	No.inlet
Sanitary Sewer	
SS_6”_L (CY)	L.6ss
SS_8”_L (DA)	L.8ss
SS_10”_L (DC)	L.10ss
SS_12”_L (DE)	L.12ss
SS_15”_L (DG)	L.15ss
SS_18”_L (DI)	L.18ss

Database Column	Database Cell Name
Sanitary Sewer cont'd	
SS_24"_L (DL)	L.24ss
#_SS_MH_CONN (DN)	No.mnhl.conn
#_SS_MH (DO)	No.mnhl.inst
#_SS_SERV (DQ)	No.ss.conn
AVG_SS_SERV_L (DR)	No.ss.inst
Concrete & Paving	
STRT_AREA (DV)	street
#_APP (DX)	No.app
C&G_L (DZ)	L.cg
SW_LENGTH (EB)	L.sdwlk
Miscellaneous	
PROJ_LENGTH (EE)	L.project
BLOCKS (EF)	blocks
LOCATES (EG)	locate
REMOVALS (EH)	remove
TRF_CNTRL (EI)	traffic
SEEDING (EJ)	seed

Spreadsheet **Unit Cost**

Unit Cost Item	Unit Cost Cell Name
Water	
6 inch PVC Main	w.6
8 inch PVC Main	w.8
10 inch PVC Main	w.10
12 inch PVC Main	w.12
16 inch PVC Main	w.16
20 inch PVC Main	w.20
6 inch Gate Valves	gv.6
8 inch Gate Valves	gv.8
10 inch Gate Valves	gv.10
12 inch Gate Valves	gv.12
16 inch Gate Valves	gv.16
20 inch Gate Valves	gv.20
Fire Hydrants	hyd
Service Connections	srv.conn.w
Service Installations	srv.ins.w
Fittings	fittings

Unit Cost Item	Unit Cost Cell Name
Storm Sewer	
18 inch Storm Pipe	st.18
24 inch Storm Pipe	st.24
27 inch Storm Pipe	st.27
30 inch Storm Pipe	st.30
33 inch Storm Pipe	st.33
36 inch Storm Pipe	st.36
48 inch Storm Pipe	st.48
54 inch Storm Pipe	st.54
Manholes	manhl
Inlets	inlet
Sanitary Sewer	
6 inch Sewer Main	ss.6
8 inch Sewer Main	ss.8
10 inch Sewer Main	ss.10
12 inch Sewer Main	ss.12
15 inch Sewer Main	ss.15
18 inch Sewer Main	ss.18
24 inch Sewer Main	ss.24
Manhole Connections	mh.conn
Manhole Installations	mh.inst
Sanitary Sewer Connections	srv.conn.ss
Sanitary Sewer Installations	srv.ins.ss
Concrete & Paving	
Street Area	paving
Approach	apprch
Curb & Gutter	curb
Sidewalk	sdwlk

APPENDIX B
PROJECT QUANTITY WORKSHEET

Project Quantity Worksheet

PID #

Street	From	To

Water System		
Item	**Unit**	**Quantity**
6" PVC Main	ft	
8" PVC Main	ft	
10" PVC Main	ft	
12" PVC Main	ft	
16" PVC Main	ft	
20" PVC Main	ft	
6" Gate Valves	ea	
8" Gate Valves	ea	
10" Gate Valves	ea	
12" Gate Valves	ea	
16" Gate Valves	ea	
20" Gate Valves	ea	
Fittings	ea	
Fire Hydrants	ea	
Service Connections	ea	
Average Service Length	ft	

Sanitary Sewer System		
6" Sewer Main	ft	
8" Sewer Main	ft	
10" Sewer Main	ft	
12" Sewer Main	ft	
15" Sewer Main	ft	
18" Sewer Main	ft	
24" Sewer Main	ft	
Service Connections	ea	
Average Service Length	ft	
Manhole Installation	ea	
Manhole Connections	ea	

Storm Sewer System		
Item	**Unit**	**Quantity**
18" Storm Pipe	ft	
24" Storm Pipe	ft	
27" Storm Pipe	ft	
30" Storm Pipe	ft	
33" Storm Pipe	ft	
36" Storm Pipe	ft	
48" Storm Pipe	ft	
54" Storm Pipe	ft	
Inlets	ea	
Manholes	ea	

Concrete & Paving		
Paving	sy	
Approaches	ea	
Curb & Gutter	ft	
Sidewalk	ft	

Length	ft	

APPENDIX C
FIELD SURVEY FORM

Rawlins Needs Assessment - Field Inspection Form

Date:

Inspected By:

Checked By:

Job No.

Location

1	**Street Name**	
2	**Street location by block and direction of survey? Example: From Hugus Street to State Street**	

Street Condition - Circle Most Applicable Number

					Comments
3	**Street surface material** - Circle Type				
	1. Asphalt	2. Brick	3. Concrete	4. Dirt/Unpaved	
4	**Street surface condition** -Circle Condition				
	1. Good Clean, no cracks, potholes or weeds , good	2. Fair Few small cracks, weeds	3. Poor Large cracks, few potholes, weeds, slight rutting or settlement	4. Unservicable or Unpaved Many potholes, sections with missing surface, severe rutting or settlement	

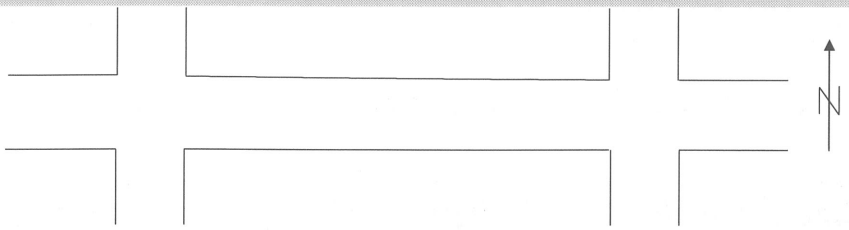
Sidewalk Condition - Circle most applicable Number

					Comments
5	**Right sidewalk material** -Circle Type				
	1. Asphalt	2. Brick	3. Concrete	4. Dirt / No Sidewalk	
6	**Right sidewalk condition** -Circle Condition				
	1. Good Clean, level, no cracks or weeds.	2. Fair Few small cracks and weeds, level	3. Poor Large cracks. few missing sections, weeds	4. Unservicable or No Sidewalk Many missing sections, overgrown with weeds, difficult to traverse	
7	**Left sidewalk material** - Circle Type				
	1. Asphalt	2. Brick	3. Concrete	4. Dirt / No Sidewalk	
8	**Left sidewalk condition** -Circle Condition				
	1. Good Clean, level, no cracks or weeds.	2. Fair Few small cracks and weeds, level	3. Poor Large cracks. few missing sections, weeds	4. Unservicable or No Sidewalk Many missing sections, overgrown with weeds, difficult to traverse	

Storm Sewer Condition - Circle Most Applicable Number

Curb & Gutter Condition

					Comments
9	**Right curb material** -Circle Type				
	1. Asphalt	2. Brick	3. Concrete	4. No Curb & Gutter	
10	**Right curb condition** -Circle Condition				
	1. Good Clean, level, no cracks or weeds.	2. Fair Few small cracks and weeds	3. Poor Large cracks. few missing sections, slight heaving from frost or roots, weeds	4. Unservicable or No Curb & Gutter Many missing sections, overgrown with weeds, severe heaving from frost or roots	
11	**Left curb material** - Circle Type				
	1. Asphalt	2. Brick	3. Concrete	4. No Curb & Gutter	
12	**Left curb condition** -Circle Condition				
	1. Good Clean, level, no cracks or weeds.	2. Fair Few small cracks and weeds	3. Poor Large cracks, few missing sections, slight heaving from frost or roots, weeds	4. Unservicable or No Curb & Gutter Many missing sections, overgrown with weeds, severe heaving from frost or roots	

Inlet Box Condition					Comments
13	Location of **inlet boxes** Intersection of _____ Street and _____ Street Other - Please Specify_____ Number of Storm Drains at Intersection _____ Drains Please Draw and Number the Existing Storm Drains and Street Names on Template Below				
					
14	**Inlet box** Condition - Circle Condition				
Inspection Legend	1. Good Clean, no sediment or debris, unobstructed outlet	2. Fair Some sediment and debris, servicable grate, unobstructed outlet	3. Poor Moderate sediment and debris, damaged grate, partially obstructed outlet	4. Unservicable Severe sediment and debris, unservicable or missing grate, obstructed outlet	
Inlet # 1	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 2	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 3	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 4	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 5	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 6	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 7	1. Good	2. Fair	3. Poor	4. Unservicable	
Inlet # 8	1. Good	2. Fair	3. Poor	4. Unservicable	

Follow Up Items: _____

Remarks: _____

APPENDIX D
DATABASE MAINTENANCE FORM

DATABASE MAINTENANCE FORM

Date: _____

Completed By: _____

1). Area of Interest:

(Select all that apply -- Priority 1-4, 4=Highest, Worst Condition)

Location:

☐ Water

Project Description: _____

_____

☐ Sewer

Project Description: _____

_____

☐ Storm ☐ Construction or ☐ Drainage Study

Project Description: _____

_____

☐ Street ☐ Reconstruction or ☐ Overlay

Project Description: _____

_____

☐ Other

Project Description: _____

_____

Project Location: _____

Street: _____

From: _____ To: _____

Outside City - Describe Location: _____

DATABASE MAINTENANCE FORM

Date: _____

Completed By: _____

2). Completed Construction Project:

Project Type (Select all that apply) Date Project Completed: _____

☐ Water

Project Description: _____

_____

☐ Sewer

Project Description: _____

_____

☐ Storm

Project Description: _____

_____

☐ Street ☐ Reconstruction or ☐ Overlay

Project Description: _____

_____

☐ Other

Project Description: _____

_____

Project Location:

Street: _____

From: _____ To: _____

Map/Drawings Attached ☐ Yes ☐ No