



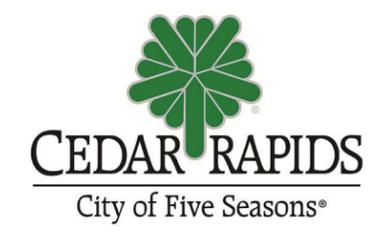
CEDAR RAPIDS CAPITAL IMPROVEMENT



10

YEAR PLAN

APRIL 2017



2017 Executive Summary

In 2013, the City of Cedar Rapids passed a 1-cent local option sales tax (LOST) as part of a campaign dubbed Paving for Progress (PFP). It also marked the first time the City received pavement condition data from the Iowa Pavement Management Program (IPMP). In order to better serve the public, the money generated for PFP was to be invested in a pavement management plan, driven by computer modelling and objective condition data from IPMP.

In 2014, the City approved the first Paving for Progress plan, detailing hundreds of proposed projects, millions of dollars of construction, and numerous roads to be improved. The plan was intended to be a **Living Document**, revised regularly when new data becomes available. PFP construction projects began in 2014 as part of the Quick-Start program and have now progressed into the first main phase.

2015 marked the second time Cedar Rapids received pavement condition data from IPMP. This was the first opportunity for the City to measure its progress and truly reevaluate the planning methods used.

The City has already seen a substantial amount of work completed. It has already spent **\$40 Million** on road construction activities and paved **24 Miles of roads**. Pavement condition is **improving** for the arterial roadway network, with the average Pavement Condition Index (PCI) up 4 points out of 100, **beating initial projections** by 2.5 PCI.

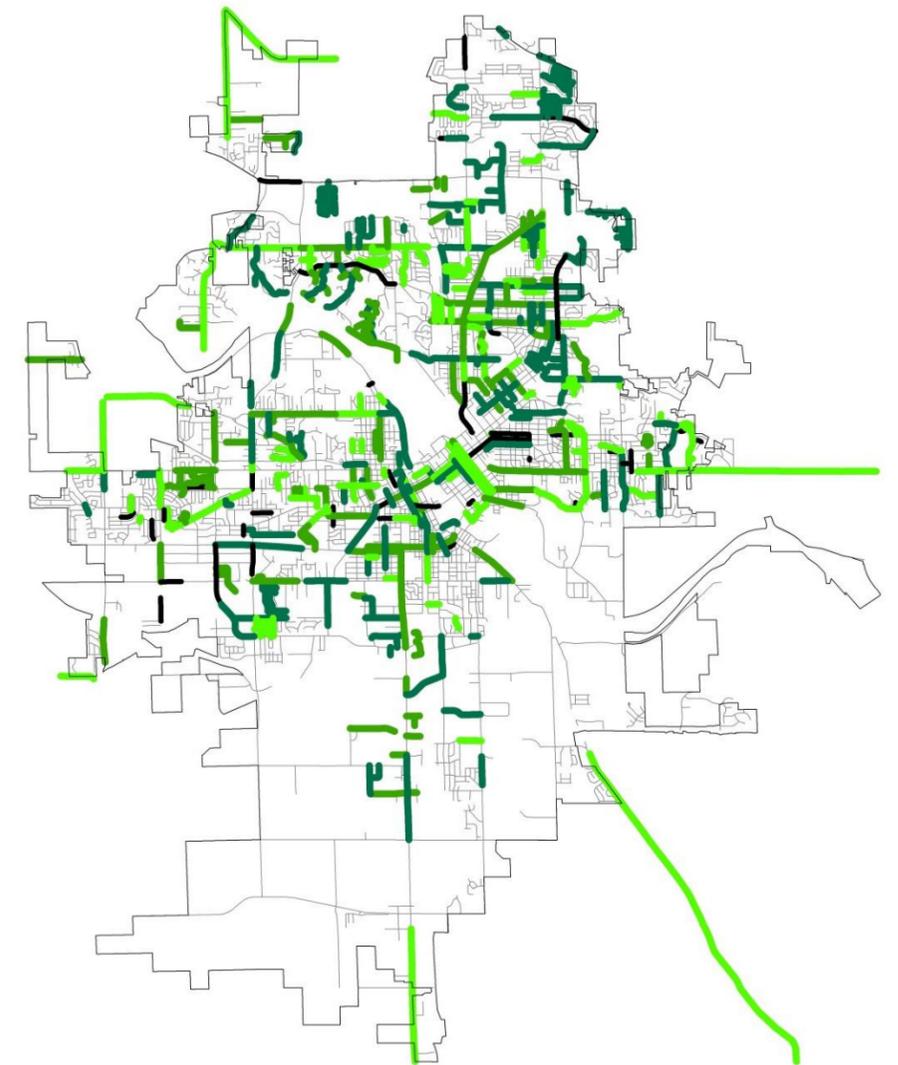
Based on the new data, the model and plan were revised for 2017. Changes were made to both the plan list as well as the process by which it was developed.

Improvements Include:

- Updated Pavement Condition Data
- Revised condition rating system to evaluate pavements
- Advanced projections for estimating future conditions
- Improved treatment effects and triggers to run the model
- Adjusted construction costs and budgets used in fiscal planning
- More emphasis on work to be done by City forces
- Increased cooperation with public utilities to coordinate construction and timing
- Modifications to project execution promoting additional flexibility

These developments to the methodology for Paving for Progress resulted in this revised Capital Improvement Plan. This plan includes a complete list of proposed projects by Phase with maps showing their locations.

As before, this plan is considered a **“Living Document.”** It will continue to be updated as new information and condition data becomes available



All Proposed PFP Projects; see Project List starting on Page 10



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Paving for Progress Status Update

How much Progress?

2017 is the **4th construction season** since the Paving for Progress program began. Since the Local Option Sales Tax was approved in 2013, the City has completed its Quick-Start program that tackled easier shovel-ready projects in 2014 and 2015, as well as finished the first year of the 2014 Cedar Rapids Capital Improvement 10 Year Plan's Phase I.

So far, the City has completed **79 different street improvement projects**, ranging from minor restorative treatments to complete reconstructions. As of October 2016, they have spent over **\$40 Million** to improve **24 Miles of roads**. More than 5% of all vehicle miles traveled in Cedar Rapids, each day, is now on Paving for Progress improved roads!

In 2015, the City received a second set of pavement condition data through the Iowa Pavement Management Program (IPMP) and the Iowa DOT. This data was useful in developing this 2017 Update, as well as tracking the performance of the program. Even though the data was collected only 1 year after the Quick-Start program began, and was during the 2015 construction season, it was apparent that the effects were being seen much faster than expected. The Average Pavement Condition Index for Arterial Roadways had increased by 4 index points, out of 100, **and beat projections by 2.5 points**. This was a wonderful surprise, since initial projections had shown the overall condition in Cedar Rapids to continue to decrease during the Quick-Start program, only increasing once the main part of the 10 Year plan was implemented.

With Phase I in full swing, one can hope to see continued improvements, not just in arterial roadways but the local roads as well. Using the new 2015 data, this revised plan seeks to iterate upon and improve the 2014 plan, leveraging the successes so far and the information now available to achieve the original Paving for Progress Goals.

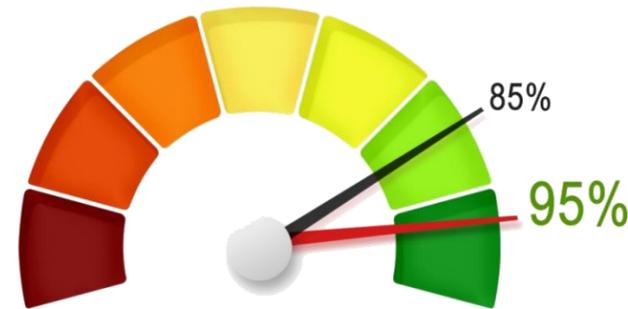
Measuring Goals

"Improve/maintain the network so the average road is in "Fair" or better condition."

Measure: PCI

Target: 95% of centerline miles are at or above threshold for "Fair" (30 for Locals, 35 for Arterials)

Progress:



"Follow through on promises to the citizens of Cedar Rapids who approved the tax."

Measure: Dollars Spent and Total Miles Improved.

Target: \$170 Million and 150 Miles

Progress:

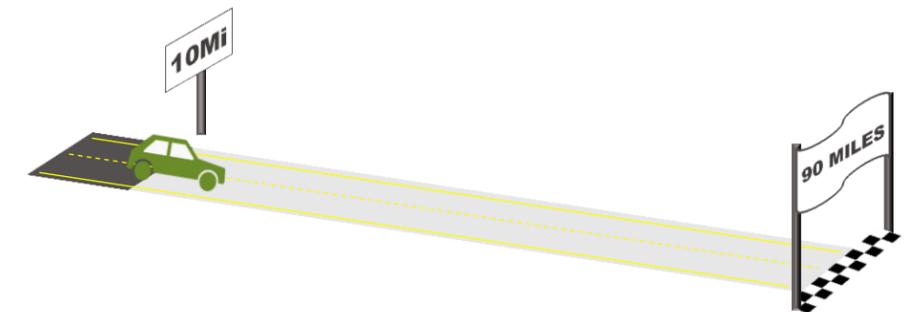


"Dedicate additional effort to the local street network."

Measure: Miles of Local Roads improved

Target: 60% of roadway miles (approximately 90 Miles)

Progress:

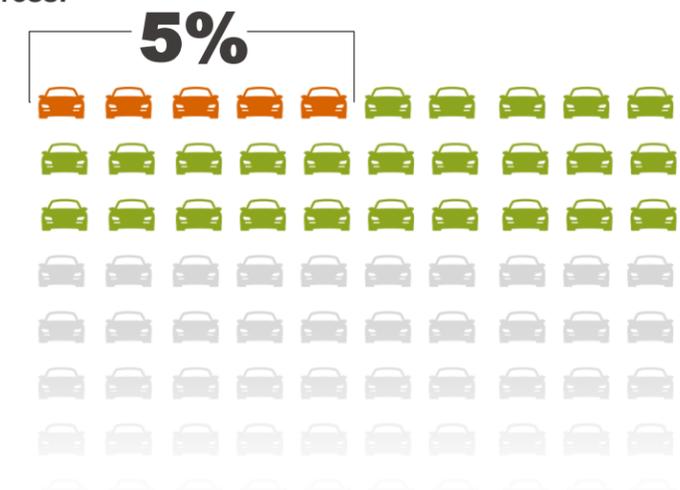


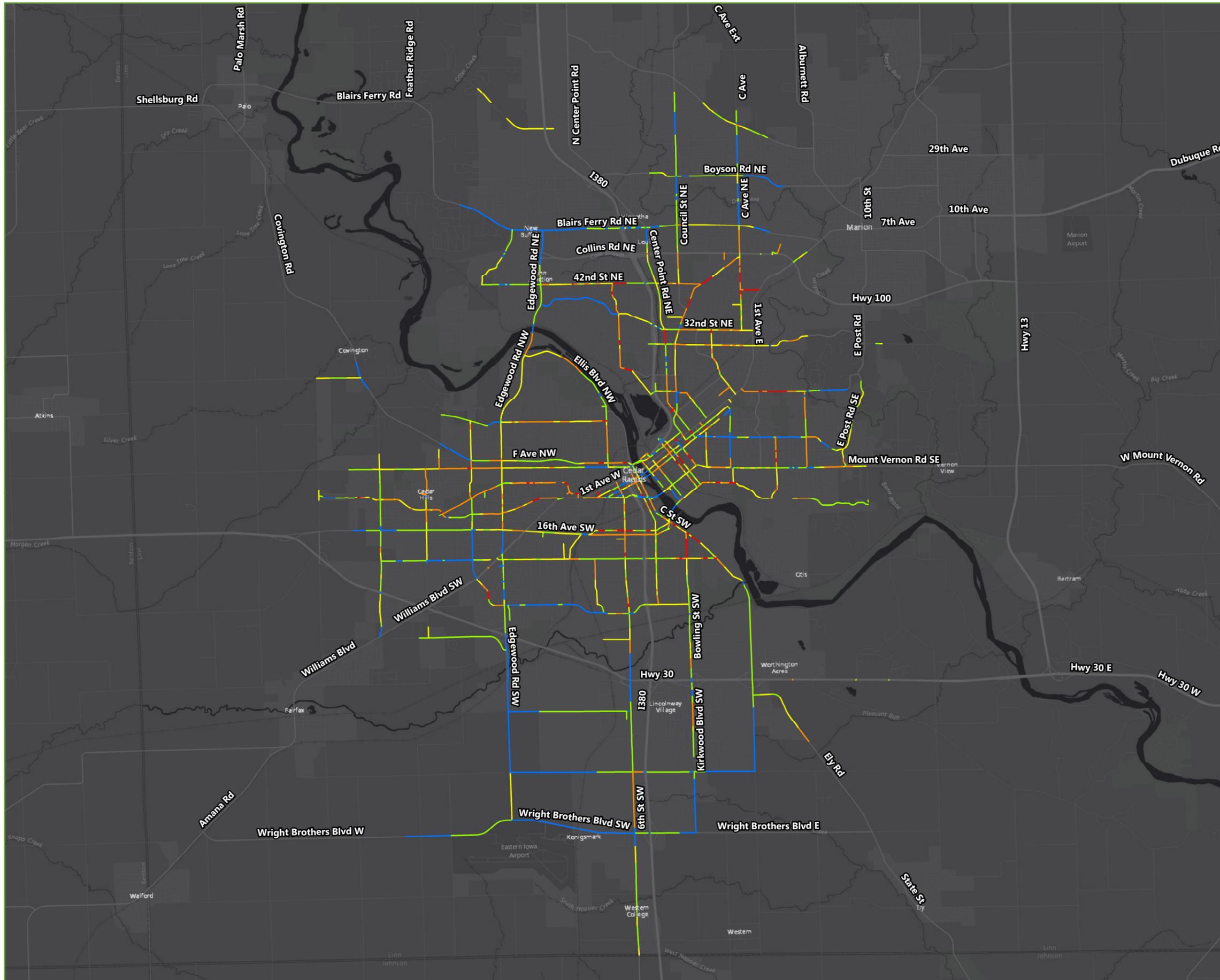
"Commit to spending the revenues wisely on behalf of the public through a strategic, data driven plan."

Measure: Percent Traffic on Paving for Progress Roads

Target: 30% of estimated Vehicle Miles Traveled, on PFP roads.

Progress:





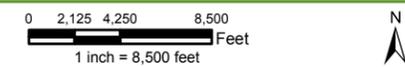
Legend

Arterials Roads

Conditions

- Very Poor
- Poor
- Fair
- Good
- Very Good

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 Esri, HERE, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



Paving For Progress Current Condition Data

Cedar Rapids

Map 1
Arterial Road Conditions



8710 Earhart Lane SW
Cedar Rapids, IA 52404
Phone: 319.841.4000

DATE: 5/18/2017

DRAWN BY: M.S.L.

HRG JOB NO: 10130179

APPROVED BY: J.R.K.

DESIGNED BY: J.R.K.

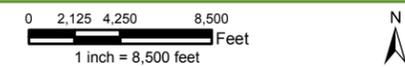


Legend

Local Roads Conditions

- Very Poor
- Poor
- Fair
- Good
- Very Good

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community
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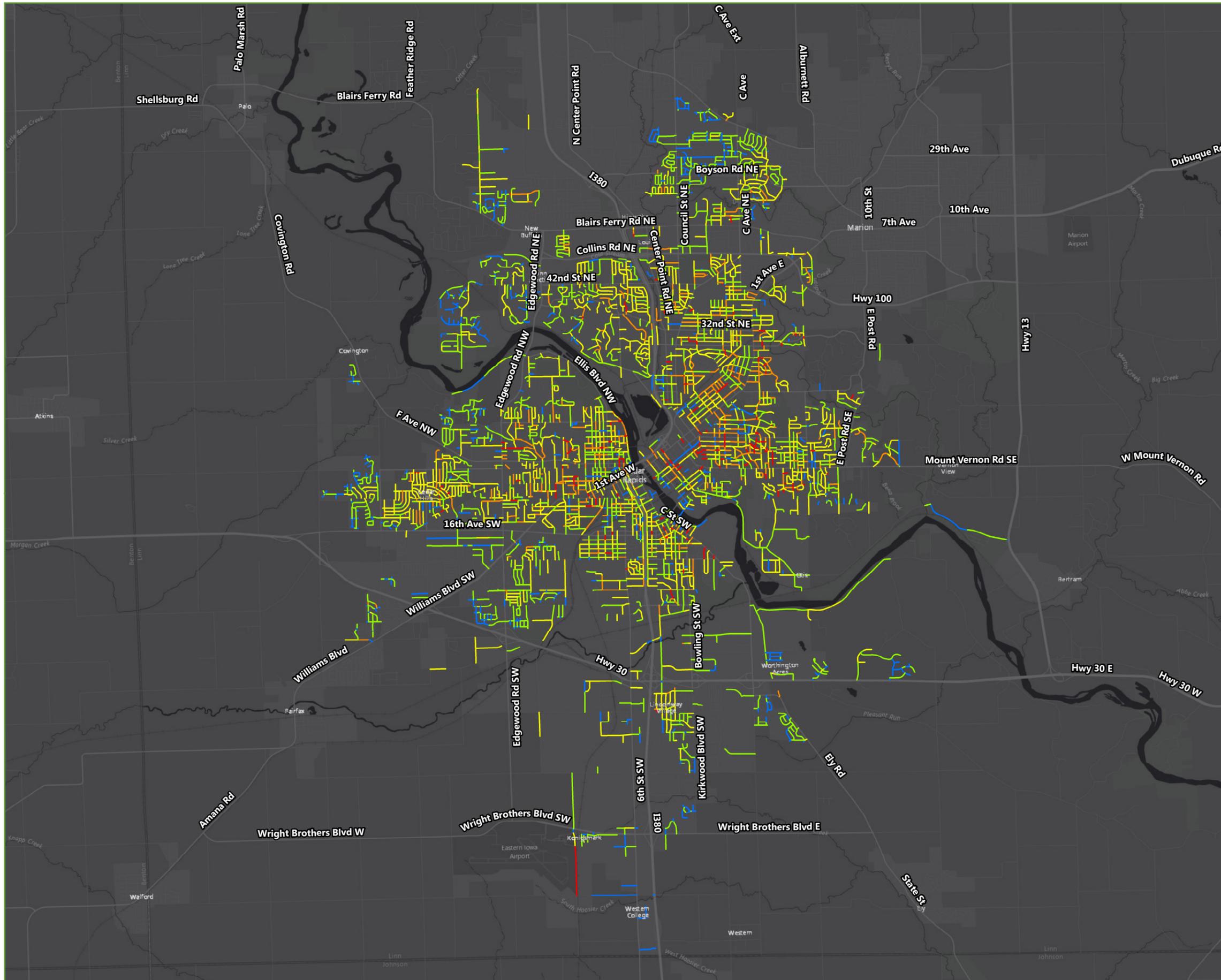


Paving For Progress Current Condition Data

Cedar Rapids

Map 2
 Local Road Conditions

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 5/18/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K



Changes to Paving for Progress

It was always the intention of Paving for Progress to produce a “Living Document” to drive the program. 2017 marks the first re-issuing of the PFP plan, but not its first update. Since its inception, it has been constantly adjusted and modified, as needed. When new information becomes available, the City has the flexibility to handle obstacles and better incorporate unexpected demands, while still maintaining the goal of spending funds wisely on behalf of the public.

This plan was developed with several key changes. The foremost enhancement is the addition of new data and improved modeling techniques to utilize it. Models like the one used for PFP can always benefit from more data. The other changes to the plan relate to how the model outputs are handled. By adjusting how the plan is implemented the City can apply better context-sensitive solutions that fit real-world conditions and needs.

Process Changes

New data, research, and experience from the previous iteration of Paving for Progress lead to several improvements to the optimization process used to select PFP projects. The research findings and increased experience in running the program lead to adjusting treatment selection criteria, changing projection methods, modifying project costs, and incorporating the needs and capabilities of other City departments.

Utilizing New Data

In 2016, the City received new pavement distress data from the Iowa Pavement Management Program. IPMP data is the primary tool by which PFP determines the right treatment for the right road, at the right time. The updated condition information was used to evaluate the current state of the network, analyze the effects of completed projects, and used by the dTIMS model to develop the 2017 updated plan.

In addition to the IPMP condition data, the modelling process was enhanced by examining statewide condition data for urban areas, reviewing of other pavement management programs, compiling current bid prices, and evaluating the performance of completed projects.

Improving Calculations

The new data was leveraged to not only recalculate the optimal pavement management program, but also to retool it so that it better reflects reality.

Using the statewide pavement condition data, the Pavement Condition Index (PCI) scoring system was adjusted to weigh the roadway conditions in Cedar Rapids against all of Iowa’s urban roadways. Previously, only Cedar Rapids data was used to compute the PCI. By incorporating this new process and larger data pool, the condition values can more closely match expected ratings based on field observations. The 2013 data was similarly adjusted, to ensure compatibility and accurate projections. (Figure 1)

The projection methods were improved, much like the PCI ratings (Figure 2). The prior version had only one data point, in time, for each roadway section from which to develop a projection. The newest version, however, looks at the 2015 data and the 2013 data, together, to determine how quickly it is actually deteriorating. The model then uses the that rate of decay to form a projection, which was previously impossible with only 1 year of data..

When analyzing the results of the aforementioned modifications, it became quickly apparent that the original model projected that the condition of roads in Cedar Rapids would decline much faster than it should have. This was because many roads in Cedar Rapids have PCI values in the low to middle ranges. PCI values of 40-60 were previously assumed to be in the phase of a pavement’s life where the drop is steepest. **Roadway condition is, in fact, performing better than initially projected.** What the 2015 data showed was that many of the roads in that range were actually quite stable and likely to remain in their current state for some time.

The increased data pool was also valuable in studying the relationship between certain distresses and other condition variables. Using regression analysis, gaps in data or outliers caused by collection errors were filled in or modified, respectively. (Figure 3) With another data point, further in time, it opened the possibility of projecting not just PCI values, but individual distresses such as cracking and rutting. Having a better idea of happens to a road, over time, allows for better treatment selection and predictions used in later Phases.

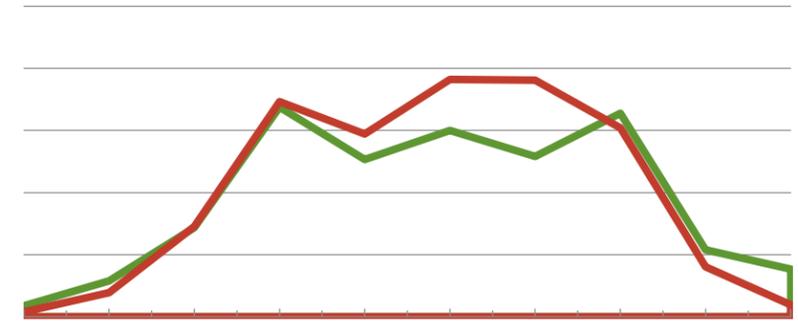


Figure 1: The adjusted condition distribution of CR, based on statewide data, reveals more streets performing higher than previously assumed.

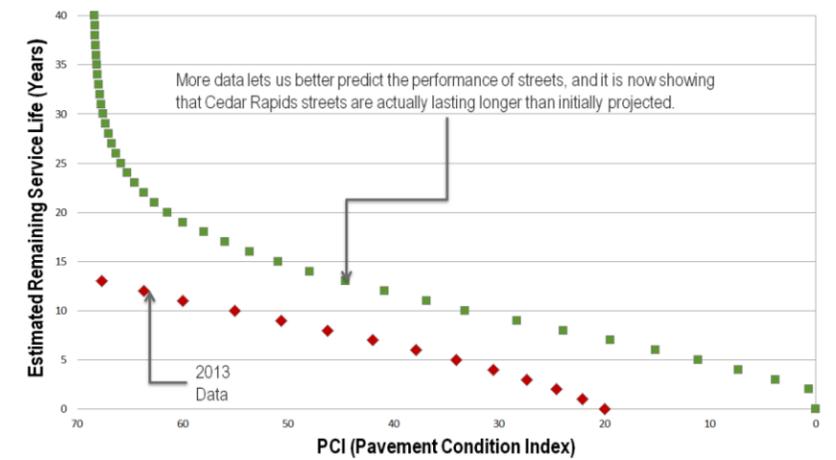


Figure 2: The effects of adjusting the condition projection methods, showing longer lasting pavements.

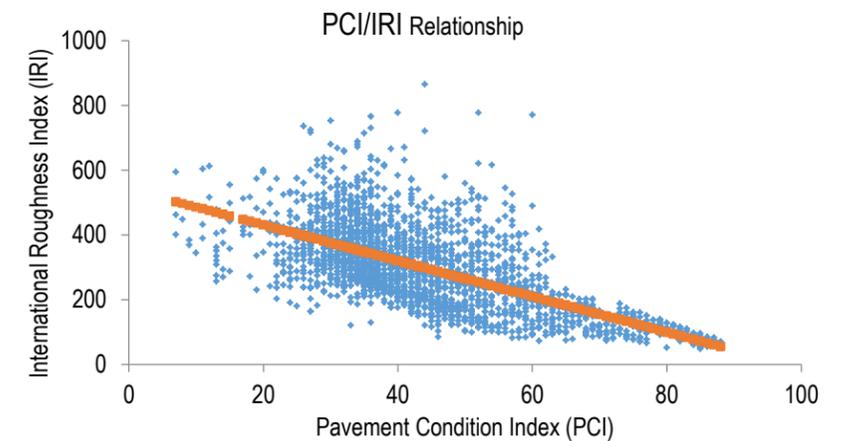


Figure 3: Linear Regression showing the relationship between roughness and condition, used in estimating IRI for pavements lacking IRI data.



The next alteration was adjusting the assumed costs for designing and constructing a PFP project (Table 1). With 3 construction seasons finished, the real cost of completing PFP projects has become much easier to estimate. By examining bid documents and expenditures on finished roadway improvements, new prices were developed and the budgets adjusted to accommodate design and construction expenditures that may not have previously been accounted for.

That history and experience from carrying out the plan, so far, also assisted in refining the treatment selection process. Projects completed during the 2014 construction season were prime candidates for closer examination in order to analyze the effects of the treatments used on them. The positive changes in distress values helped determine exactly how a road's condition is improved by a given treatment and to configure the dTIMS model to represent those improvements.

The sum of all of these adjustments resulted in an improved model that can be re-used and maintained, year after year. It also served as a test for changing the inputs for controlling variables like budgets, costs, and treatment triggers.

Table 1: Updated Treatment Costs

Treatment	Old Cost	New Cost
Thin Overlay	\$25/sy	\$30/sy
Thick Overlay	\$35/sy	\$40/sy
Mill and Fill	\$50/sy	\$60/sy

Leveraging City Forces

The City of Cedar Rapids has staff, equipment, and capabilities to perform not only routine maintenance but also rehabilitation work. The costs of providing construction services through the City, rather than a contractor, are substantially cheaper due to reduced labor costs and material prices. The 2014 plan considered this when programming projects but did not create firm targets for City work, nor did it effectively coordinate with the maintenance divisions.

This 2017 Update will better leverage City Forces in the plan. It now allocates a specific amount of work, constrained by both miles paved and the cost to complete. By providing a clearer vision for what City Forces should accomplish and understanding the potential volume of their work, it increases efficiency as well as allows PFP to accomplish projects that may otherwise not be feasible.

Projects of sufficient size, complexity, and costs still will be bid out and constructed by contractors, as typically required by law. However, there are many needs within Cedar Rapids for work on small local streets. These smaller projects are not typically desirable for contractors, and are ideal candidates for City work.

The work performed by City Forces will range from maintenance activities, like patching and crack sealing, all the way to Major Rehabilitations like Mill and Overlays. The City has begun to offer larger milling-contracts for outside contractors to provide the milling required on several smaller projects so the City can perform the asphalt work afterwards.

This flexibility in treatment options is a huge benefit to Cedar Rapids and PFP. By better leveraging City Forces, the 2017 PFP plan will generate enhanced network coverage and allow it to dedicate additional effort towards local streets projects.

Coordinating With Utilities

Many public utilities are located underneath, and alongside roads. Storm Sewer, Water Mains, and Sanitary Sewer facilities maintained by the City often cause road projects to be more complicated and expensive to execute. Working on underground utilities can also result in needing to completely reconstruct a street because of the amount of damage to the road replacing the sewer or water main would cause.

To accommodate the needs of other Public Works departments, the Paving for Progress plan now incorporates information about utility deficiencies; nonstandard manholes, intakes, pipes, valves, etc... It

even rates the street based on how likely adjacent properties are to be served by Orangeburg pipes (laminated wood pulp pipe, installed during war era shortages, that is highly prone to failure).

The utility issues related to a project will be reported to the relevant department, early-on, so that they can incorporate the Paving for Progress schedule into their own plans (Figure 4). This way, large utility repairs will not drive up the cost of a project unexpectedly, and the City will not need to damage newly paved streets to come back and repair a utility issue.



Figure 4: Map of utility considerations reported to city.



Figure 5: West Post Rd reconstruction including utility work. Photo Credit Cliff Jette/The Gazette

Plan Changes

A *new list* of projects was developed, based on the aforementioned process changes and new data. It is broken down into three, 3-year phases and is currently in Phase I.

Originally, the planned project types were equally distributed over the three phases based on funding availability and street condition, but some shifting was required to allocate resources better in the future. This was done to not overwhelm contractors and City Forces with the volume of work.

Phases I and II will now focus more aggressively on reconstruction and major rehabilitation work, while Phase III will have less reconstruction and focus heavily on more widespread major and minor rehabilitation programs. This allows the City to have time to coordinate bundling several similar projects together for consultants to design and contractors to bid on. These groups of projects are important because, if each proposed project was separate, it could be problematic. It would be difficult to complete the 494 proposed projects in only 9 years' time. Strategic combination will be the key to execution, so these road projects were combined into 261 unique project groups.

Of the 494 projects in Phases I, II, and III, **75% of them overlap** with projects from the 2014 plan. Around 1/3rd of these also recommended the exact same treatment as before. It was not the intent of this plan to invalidate the 2014 version but improve upon it. With new information available and the shifting of priorities across Phases, it is inevitable that certain projects drop out and are replaced with ones that might be better investments for the community. Fortunately, using an objective computer model helps maintain the intent of the PFP program and keep it mostly intact, while still implementing small, incremental changes. The roads that were shifted out of the plan were typically in much more stable condition than initially assumed and new roads added into the plan were usually in worse condition than the 2013 data implied.

This plan update also recommends changes to the treatment selection process to increase flexibility. The treatments analyzed by the model remain the same, but the City has learned that they are best used as descriptive suggestions. The pavement data available is not exhaustive and does not include many other important factors used to determine precise treatment options. Without information on drainage conditions, curb type, and subsurface structural data, it

would be wrong to say the recommendations are always correct. Instead, the treatments should be taken as a recommendation on the magnitude of work and a reasonable estimate of cost.

A "Thick Overlay" might be recommended, using asphalt, but a contractor might prefer to use Portland Cement Concrete ("white-topping"). In both cases, however, the recommendation may need to be further amended if curb-heights will not accommodate the extra depth of an overlay. In that case, the City would have to decide to either use a thinner overlay, or to replace the curb. There is nothing more important to executing a project than field observation, survey, and pavement cores. This plan recognizes that fact, and encourages modification of recommendations to match the true needs of a project.

A number of projects completed prior to 2017 and the research performed for this update have found several alternative treatments to be good investments for the city to consider. Since, the driving factor of treatment selection is typically outside the ability of the IPMP data to predict, the model does not suggest these new treatments. Instead, the plan breaks each potential treatment into a category: Reconstruction, Major Rehabilitation, Minor Rehabilitation, and Restoration. Leeway is then given to select from similar treatments to the recommended one. See Table 2 for more details.

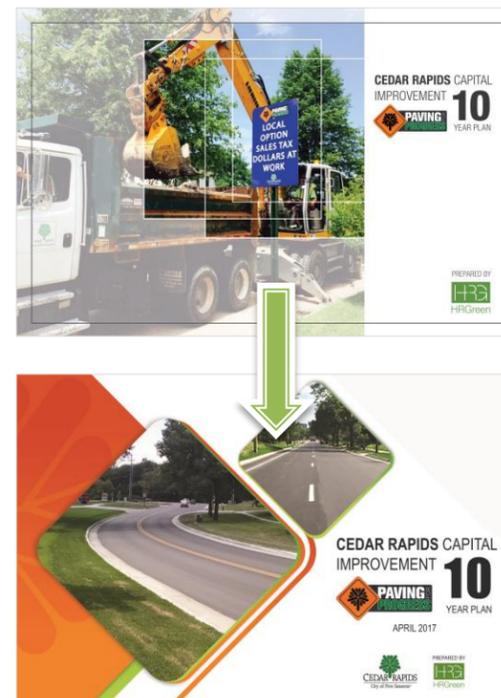


Table 2: Treatments by Category

Category	Treatment	Description	
Reconstruction	Reconstruction	The complete reconstruction of a roadway and all associated improvements. This assumes new PCC pavement, but full depth asphalt may be now considered based on relevant design criteria.	
	Major Rehabilitation	Mill and Overlay	1.5 to 3 inches of asphalt pavement is ground off and then replaced with new asphalt. Repairs surface issues and improves structural character.
		Thick Overlay	Sometimes called a "structural overlay." Adds enough thickness to increase the durability of the roadway, and provides a new wearing surface. Can be done with asphalt or PCC (black-topping/white topping) May require replacing curb and gutter.
Minor Rehabilitation	Crack and Seat	New to the 2017 plan. A form of asphalt overlay involving breaking up existing pavement and preparing it as a good structural base for a new asphalt surface.	
	Thin Overlay	A "non-structural overlay." Laid on top of existing pavement; typically 1.5 inches of asphalt. Improves smoothness and extends the life of roads in good to fair condition.	
	PCC Restoration	Portions of the street in bad repair are torn out and replaced. This may include patching, full panel replacement, and full depth repairs at joints.	
	Microsurfacing	New to the 2017 Plan. Thin asphalt polymer that seals the pavement from weather effects and corrects for minor irregularities. Typically used as a preventative, measure rather than a corrective one.	
Restoration	Chip Seal	Asphalt coated chips laid loose upon a pavement including any required preparations such as patching. Used to preserve existing asphalt pavements with little to no defects.	
	Diamond Grinding	Top ½ inch to 1 inch of PCC pavement is ground off and textured. This is only done on rough pavements with good structure to improve smoothness and traction.	
	Crack Sealing and Routing	Sealant on cracks and joints is used to prevent spreading and moisture from getting into the pavement structure. Deteriorated cracks may be routed or sawed out to provide better seal and bond.	
	Patching	Asphalt placed at spot locations. Used only on good pavements with minor failures, or as a stop-gap on poor pavements until a better, more permanent, solution is applied.	



Achieving Big Goals

Paving for Progress is a tremendous funding source and opportunity for the people of Cedar Rapids. By the end of the program, approximately **\$170 Million Dollars** will be spent on the construction of roadway improvements. It is estimated that if all the cracks and bumps to be smoothed out by PFP were combined, it would amount to over **2300' feet of roughness**. That means that if you drove every road in Cedar Rapids, your car would bounce up and down 2300 feet less than if you did so today. To put that in perspective, that is almost twice the height of the Empire State Building!

The program aims to fix 150 Miles of roads, **1/4th of the entire city**. That is a lot of roads. Laid end to end, they would reach Rockford, IL.

More importantly though, is the impact it has on the community. These transportation improvements will carry around **1/3rd of Cedar Rapids traffic** by 2024, and **over 80% of residential properties will be within walking distance** (less than a quarter-mile) to a street that was touched in some way by PFP.

This program is, and will continue to be, a monumental benefit to the community as a whole. This pavement management program is a progressive shift to a more sustainable way to drive street maintenance. From big projects, completely reshaping major corridors, to repairing your local street, expect to feel the difference when you drive.

Keep in Touch!

As always, this Living Document will be revised again in the future. New IPMP data is expected sometime in 2018, and conditions are always changing.

In the meantime, you can stay involved on the City website, where there is a copy of this plan, a complete project list, as well as a live map detailing all current and future Paving for Progress Projects. You can also subscribe to the City Newsletter, sign up for message alerts, or connect via Facebook and Twitter.



Figure 6: Drastic improvements to Oakland Road, completed 2016

Website:

www.cityofcr.com/pavingforprogress.

Newsletter:

http://www.cedar-rapids.org/discover_cedar_rapids/city_news/newsletters.php

Twitter:

[@CityofCRIowa](https://twitter.com/CityofCRIowa)

Facebook:

<https://www.facebook.com/CityofCRIowa/>



2017 Project Lists and Maps





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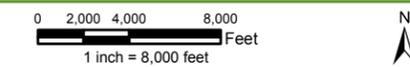
Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

City Limits

Quadrants

- NW
- NE
- SW
- SE

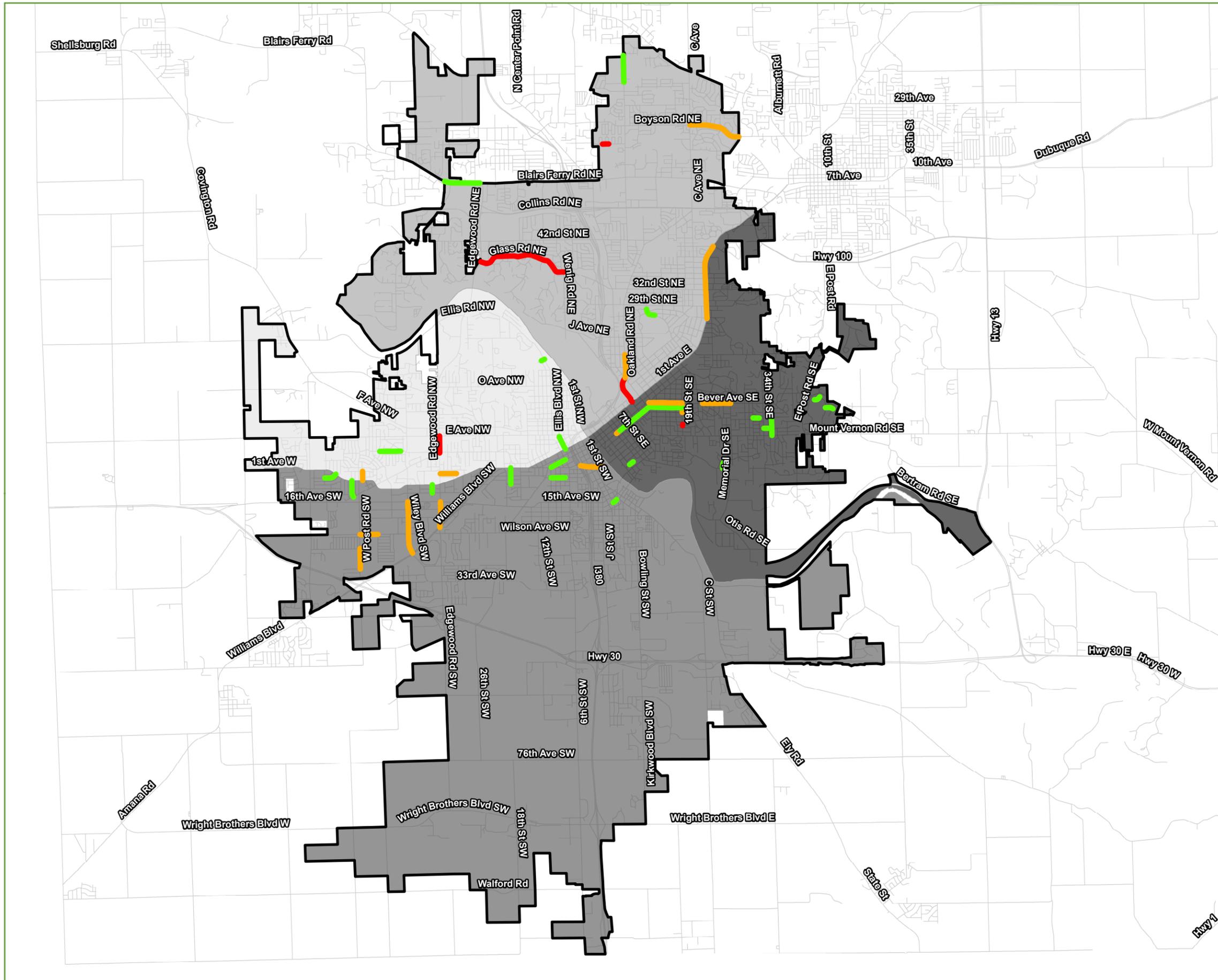


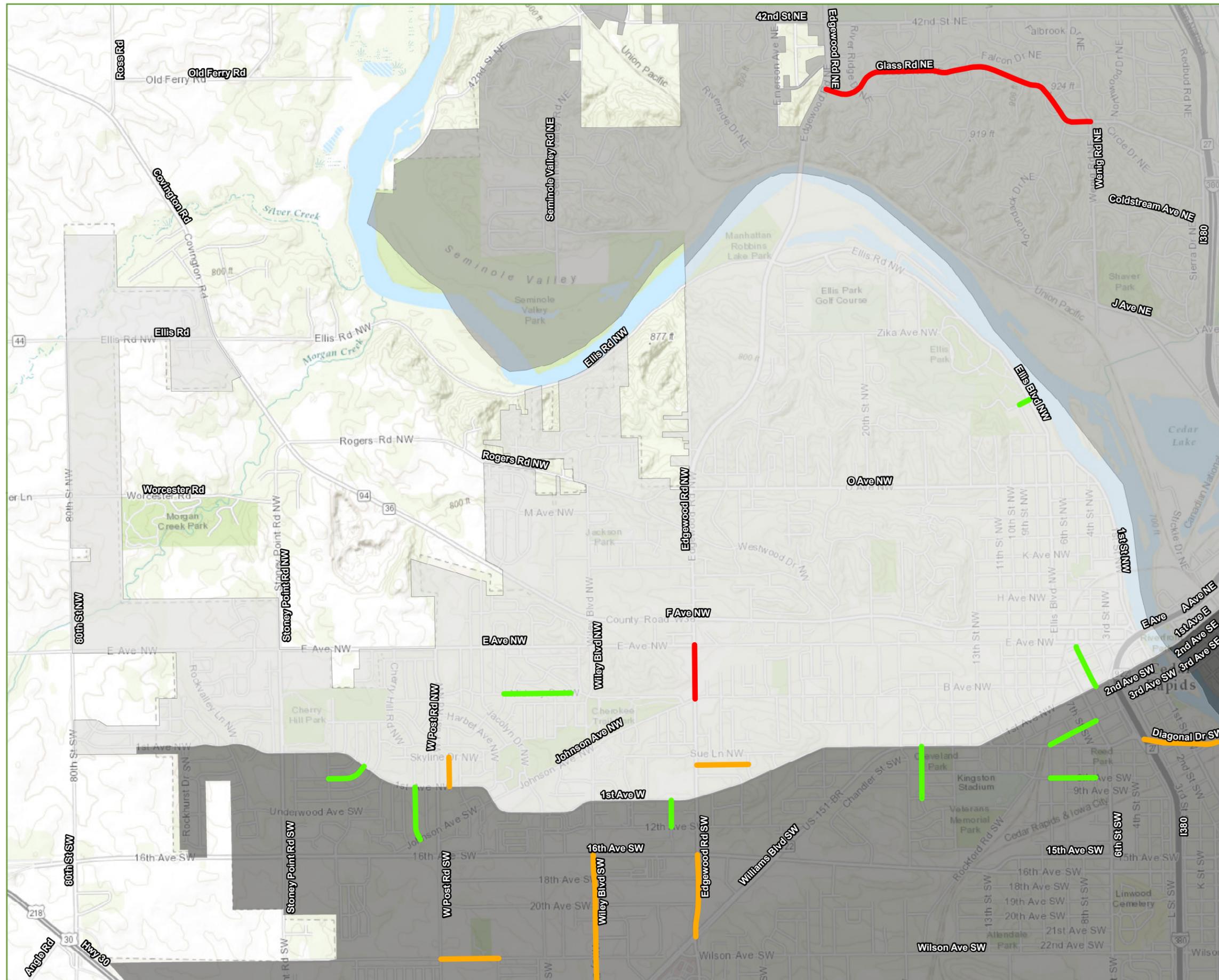
Quick Start (2014-2015) Paving For Progress Projects

Cedar Rapids - All Quadrants

MAP 3
Projects Completed During Quick Start Program (2014-2015)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: M.S.L.





Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

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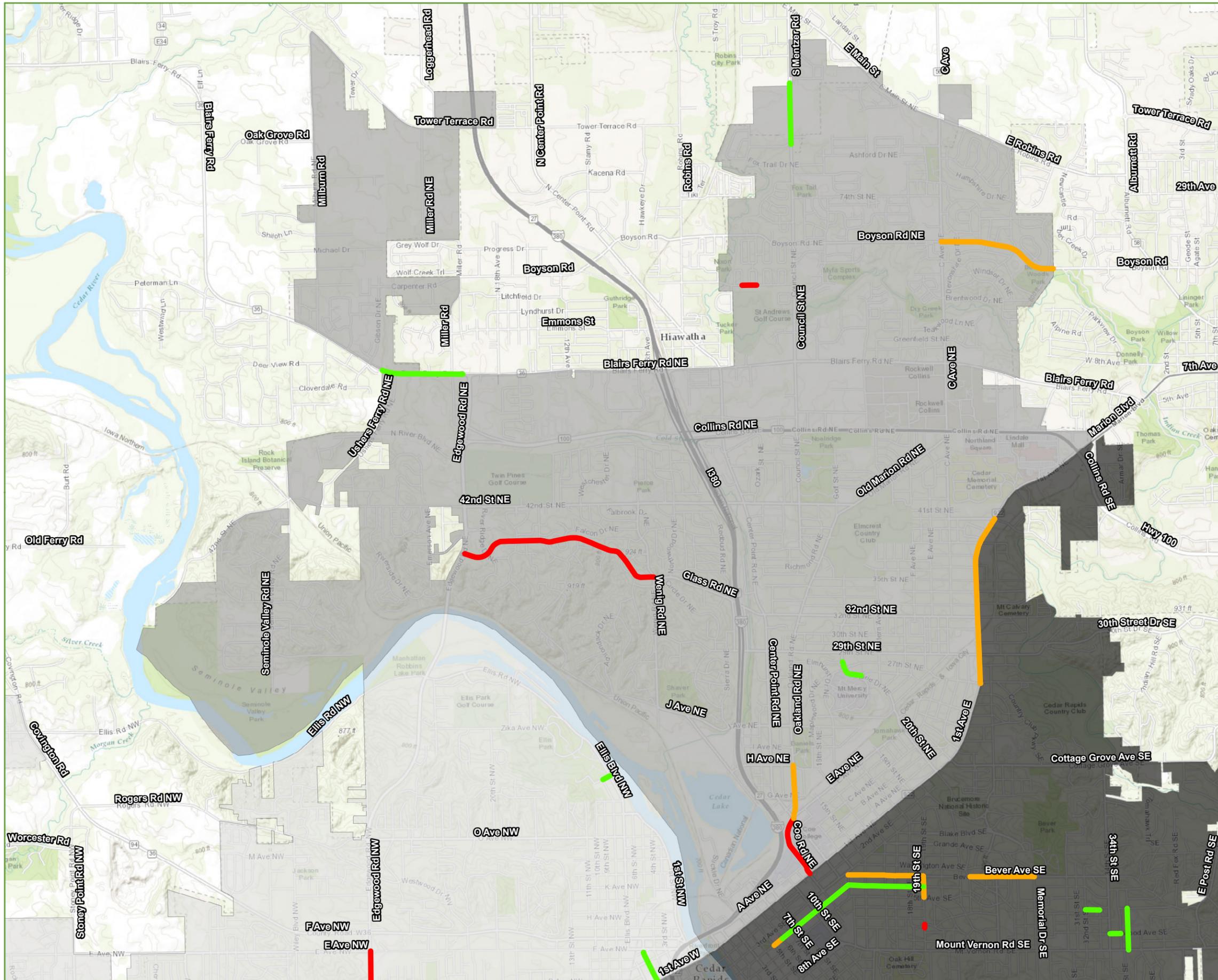
Quick Start (2014-2015) Paving For Progress Projects

Cedar Rapids - NW Quadrant

MAP 4

Projects Completed During Quick Start Program (2014-2015)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
		DRAWN BY: M.S.L.
HRG JOB NO: 10130179	APPROVED BY: J.R.K.	DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,



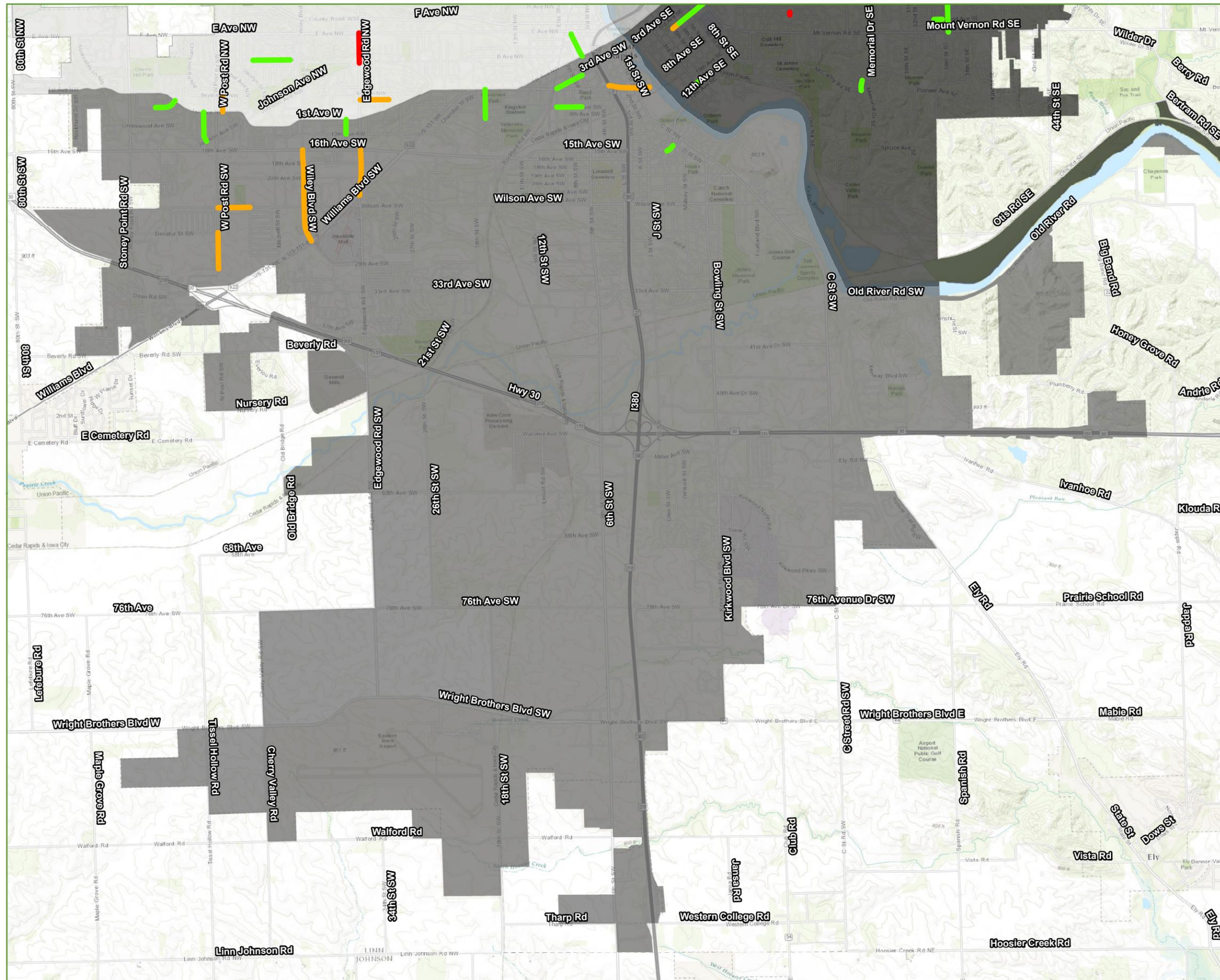
Quick Start (2014-2015) Paving For Progress Projects

Cedar Rapids - NE Quadrant

MAP 5

Projects Completed During Quick Start Program (2014-2015)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179 APPROVED BY: J.R.K.	DRAWN BY: M.S.L. DESIGNED BY: J.R.K.



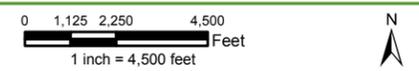
Legend

- Project Type**
- Maintenance
 - Minor Rehabilitation
 - Major Rehabilitation
 - Reconstruction

Quadrants

- NW
- NE
- SW
- SE

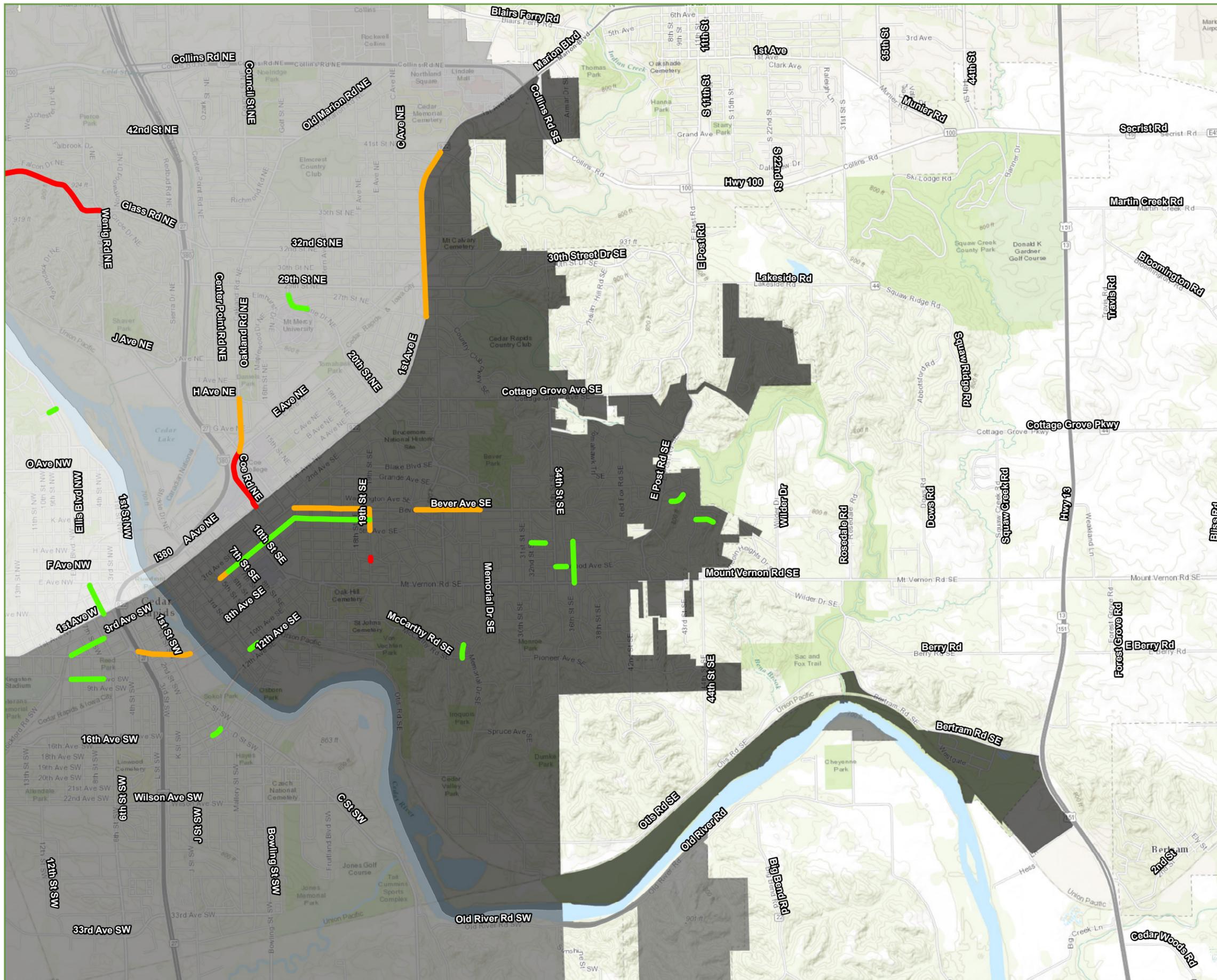
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Quick Start (2014-2015) Paving For Progress Projects

Cedar Rapids - SW Quadrant
MAP 6
Projects Completed During Quick Start Program (2014-2015)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

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Quick Start (2014-2015) Paving For Progress Projects

Cedar Rapids - SE Quadrant

MAP 7

Projects Completed During Quick Start Program (2014-2015)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.

Quick-Start Program (2014-2015)

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
26TH ST SE	MCCARTHY RD SE	PARKWOOD DR SE	0.09		
BROADVIEW DR SE	LAWNDALE DR SE	GREEN VALLEY TER SE	0.12	Minor Rehabilitation	
GREEN VALLEY DR SE	W TO DEAD END	GREEN VALLEY TER SE	0.10	Minor Rehabilitation	
DAIRYDALE CT SE	KNOLL ST SE	32ND ST SE	0.10		
AUBURN DR SW	1ST AVE W	12TH AVE SW	0.13		
RAVENWOOD TER NW	29TH ST NW	EDGEWOOD RD NW	0.25	Major Rehabilitation	
CHERRY HILL RD SW	1ST AVE W	JOHNSON AVE SW	0.26	Minor Rehabilitation	
MEADOWLARK LN NW	SKYLINE DR NW	1ST AVE W	0.14	Major Rehabilitation	
CRESTRIDGE AVE SW	1ST AVE W	BROADMORE RD SW	0.19		
36TH ST SE	CLARK RD SE	MOUNT VERNON RD SE	0.28		
17TH ST SW	8TH AVE SW	10TH AVE SW	0.13		
ELLIS LN NW	ELLIS BLVD NW	8TH ST NW	0.05		
NORTHBROOK DR NE	LAUREL LN NE	BOXWOOD LN NE	0.10	Reconstruction	
PRAIRIE DR NE	ROBINWOOD LN NE	25TH ST NE	0.18	Minor Rehabilitation	
17TH ST SW	1ST AVE W	8TH AVE SW	0.12		
DALEWOOD AVE SE	35TH ST SE	34TH ST SE	0.07		
WEST POST RD SW	RUHD ST SW	DECATUR ST SW	0.32	Minor Rehabilitation	
MIDWAY DR NW	ALMA DR NW	PEACE AVE NW	0.25		
4TH AVE SE	5TH ST SE	6TH ST SE	0.07	Major Rehabilitation	
5TH ST NW	1ST AVE W	C AVE NW	0.22	Minor Rehabilitation	
4TH AVE SE	6TH ST SE	19TH ST SE	1.09	Minor Rehabilitation	
19TH ST SE	5TH AVE SE	BEVER AVE SE	0.14	Major Rehabilitation	
11TH AVE SE	3RD ST SE	4TH ST SE	0.07		
BEVER AVE SE	22ND ST SE	16TH ST SE	0.94	Major Rehabilitation	
BLAIRS FERRY RD NE	USHERS FERRY RD NE	PROP EDGEWOOD RD	0.55	Minor Rehabilitation	
BOYSON RD NE	BOYSON RD	C AVE NE	0.81	Major Rehabilitation	
DIAGONAL DR SW	I 380	8TH AVE SW	0.36	Major Rehabilitation	
EDGEWOOD RD SW	16TH AVE SW	WILLIAMS BLVD	0.40	Major Rehabilitation	
WILEY BLVD SW	WILLIAMS BLVD	16TH AVE SW	0.81	Major Rehabilitation	
3RD AVE SW	6TH ST SW	10TH ST SW	0.25	Minor Rehabilitation	
8TH AVE SW	10TH ST SW	7TH ST SW	0.22	Minor Rehabilitation	
MIDWAY DR NW	BEZDEK DR NW	ALMA DR NW	0.08		
OAKLAND RD NE	COE RD NE	H AVE NE	0.36	Major Rehabilitation	
1ST AVE NE	27TH ST NE	40TH ST NE	1.15	Minor Rehabilitation	
COUNCIL ST NE	WOODCREST ST NE	S MENTZER RD	0.41	Minor Rehabilitation	
EDGEWOOD RD NW	JOHNSON AVE NW	E AVE NW	0.26	Reconstruction	
12TH AVE SW	16TH AVE SW	HAMILTON ST SW	0.07	Minor Rehabilitation	
19TH ST SE	8TH AVE SE	GLENWAY DR SE	0.02	Reconstruction	
WILSON AVE SW	WEST POST RD SW	WEST POST RD SW	0.28	Major Rehabilitation	
COE RD NE	CENTER POINT RD NE	1ST AVE E	0.43	Reconstruction	
GLASS RD NE	WENIG RD NE	EDGEWOOD RD NE	1.43	Reconstruction	

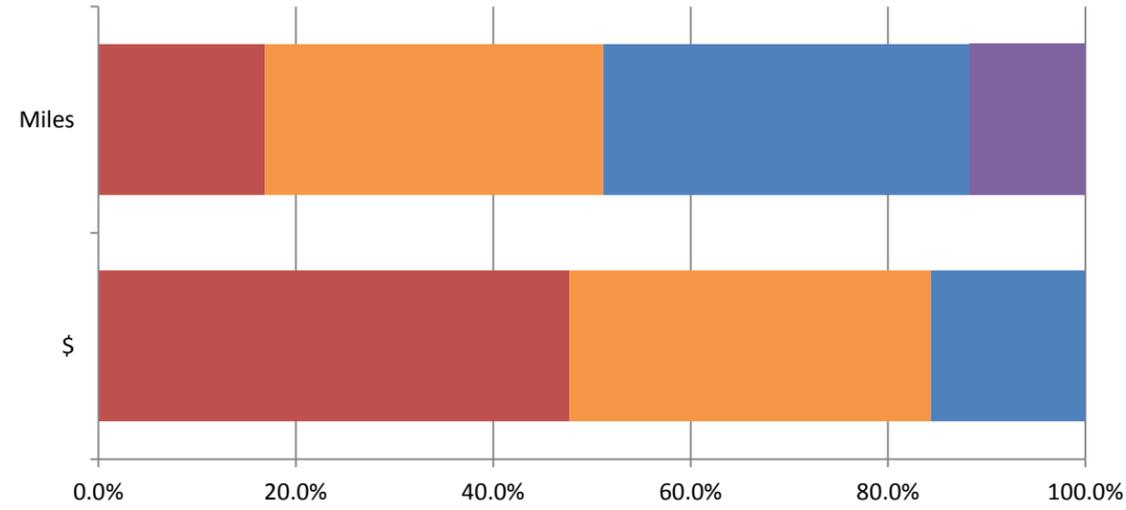
Quick-Start Program (2014-2015)

Road Name **Start Intersection** **End Intersection** **MILES** **Treatment Type** **Comments/Notes**

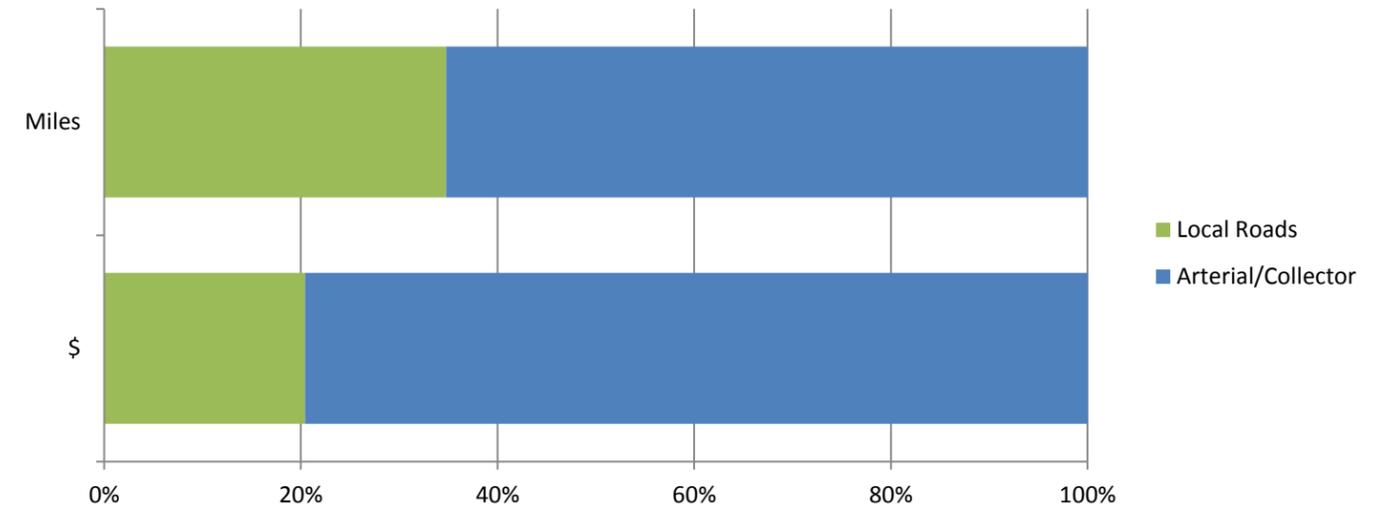
Totals

41 Projects

13.3 Mi



- Reconstruction
- Major Rehab
- Minor Rehab
- Restoration



- Local Roads
- Arterial/Collector



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

City Limits

Quadrants

- NW
- NE
- SW
- SE

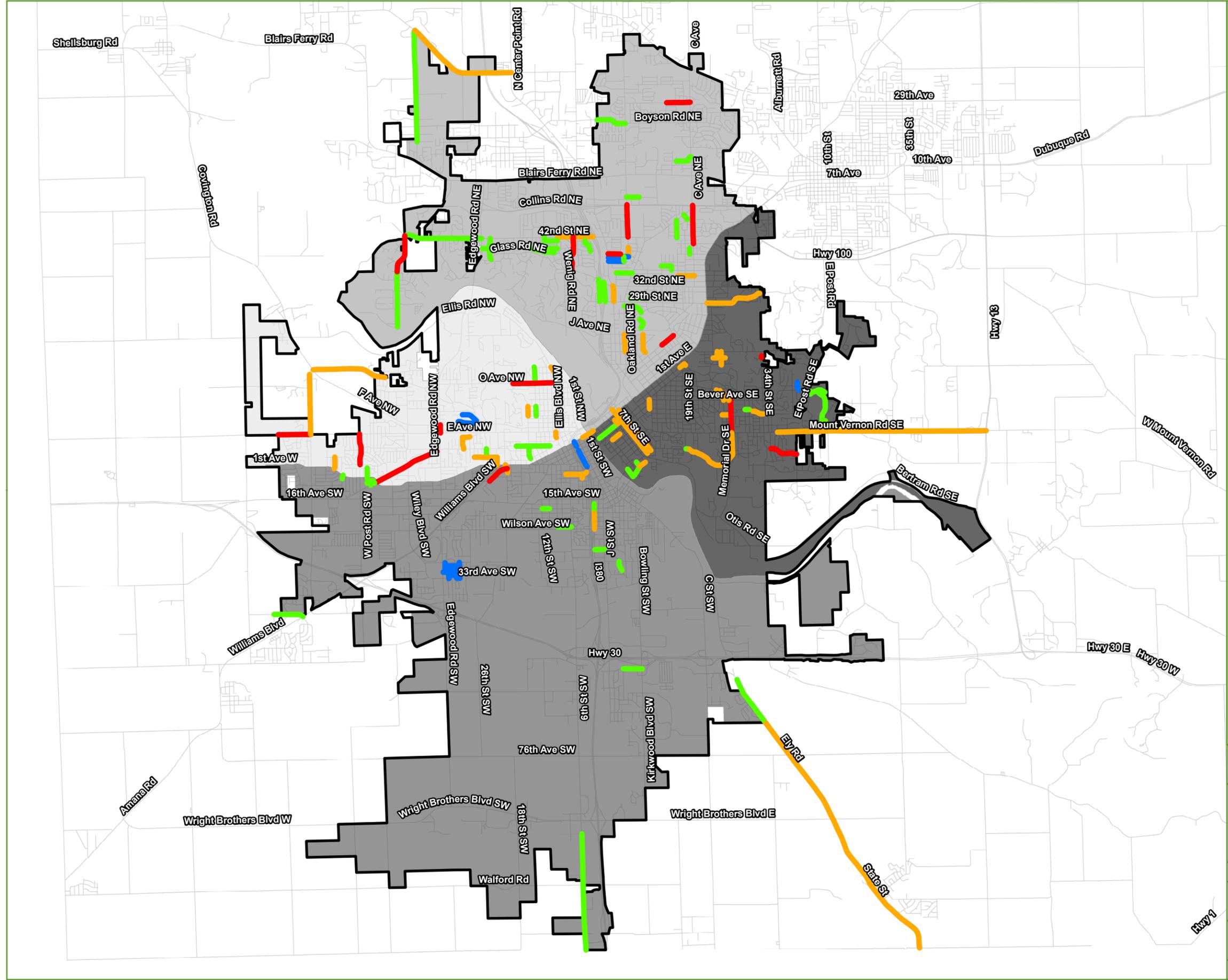


Phase 1 (2016, 2017, 2018) Paving For Progress Projects

Cedar Rapids - All Quadrants

MAP 13
Phase 1 Projects (Completed and Proposed)

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.





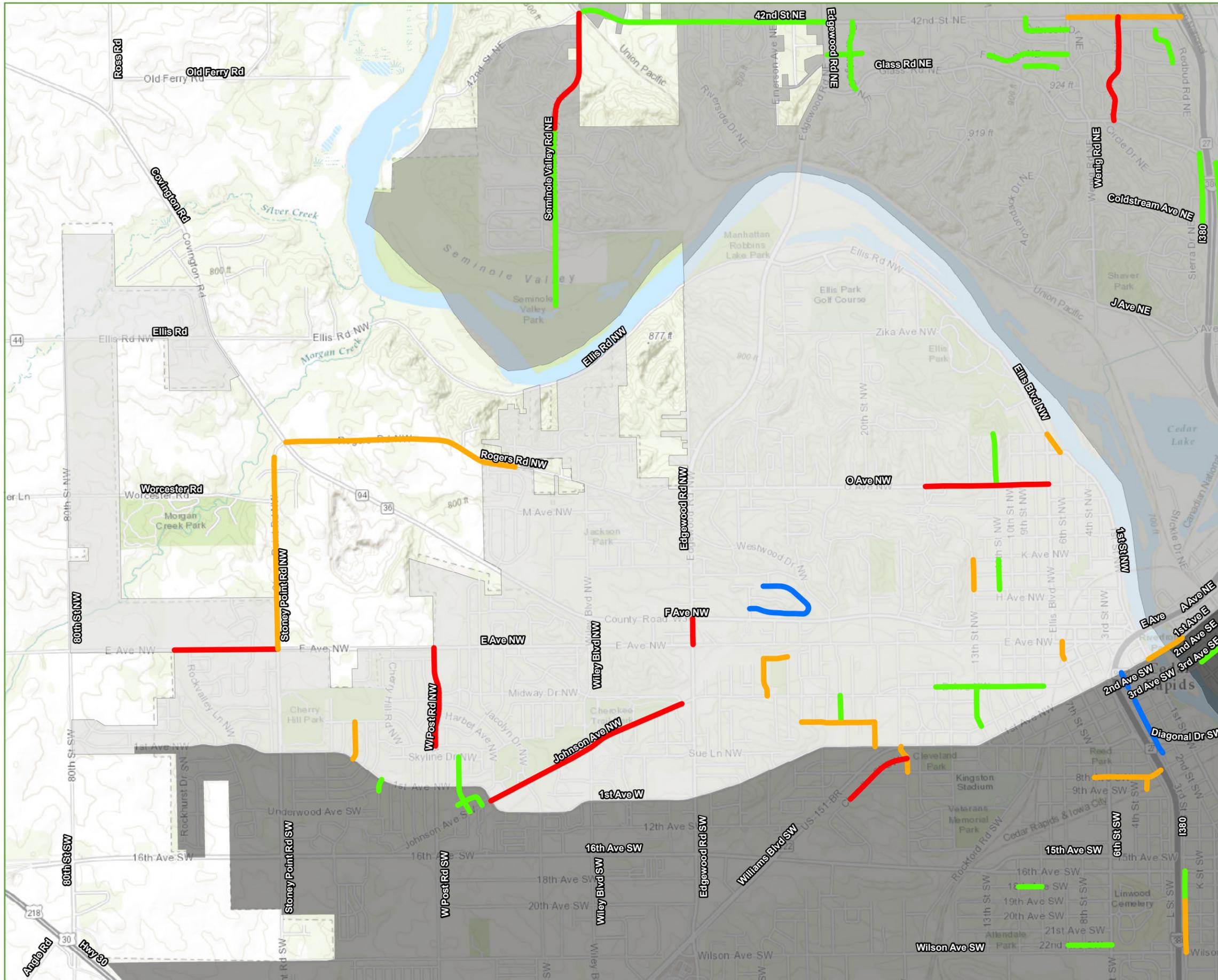
Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

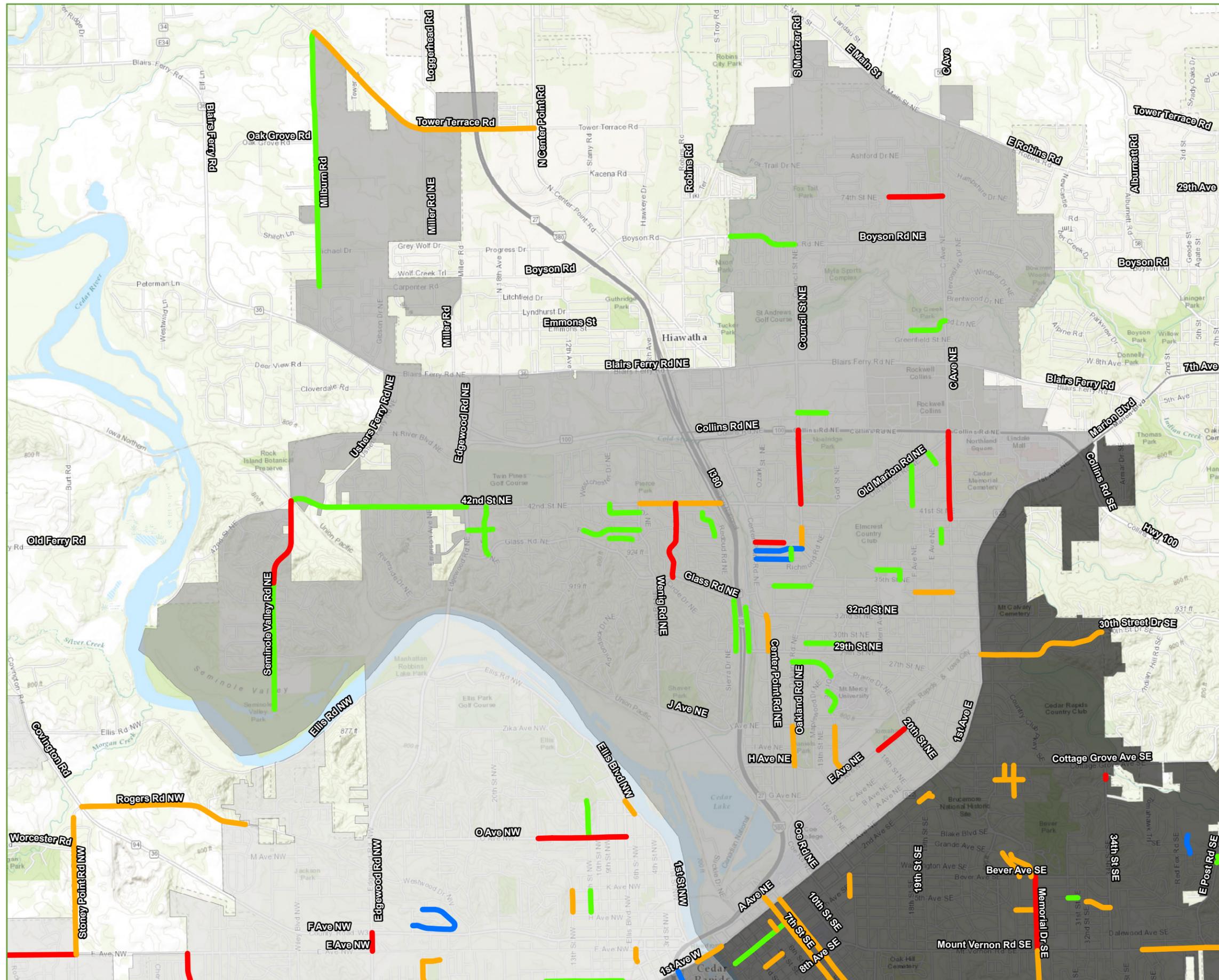


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Phase 1 (2016, 2017, 2018) Paving For Progress Projects

Cedar Rapids - NW Quadrant		
MAP 9 Phase 1 Projects		
	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017 DRAWN BY: M.S.L.
HRG JOB NO: 10130179	APPROVED BY: J.R.K	DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,

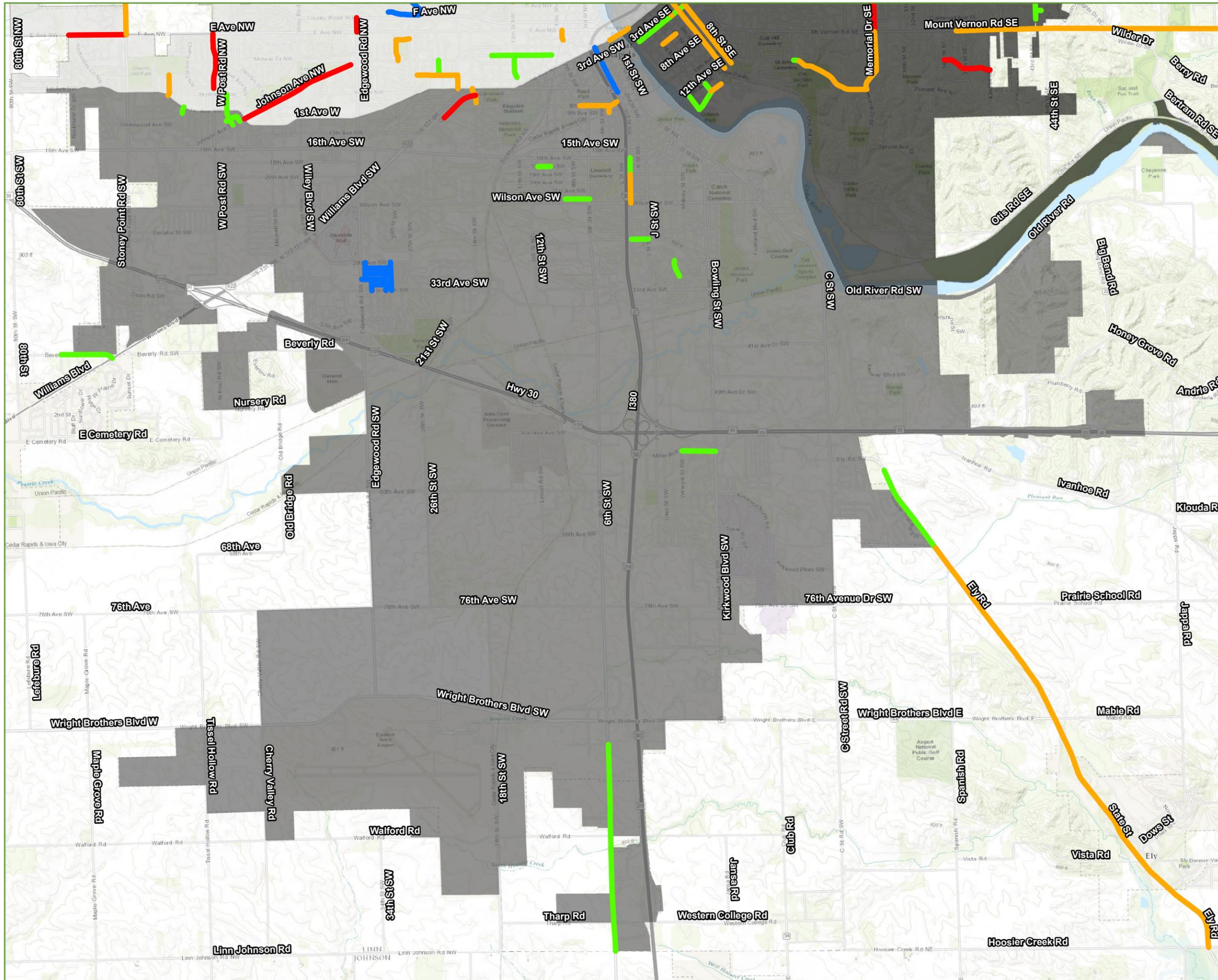


Phase 1 (2016, 2017, 2018) Paving For Progress Projects

Cedar Rapids - NE Quadrant

MAP 10
Phase 1 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,

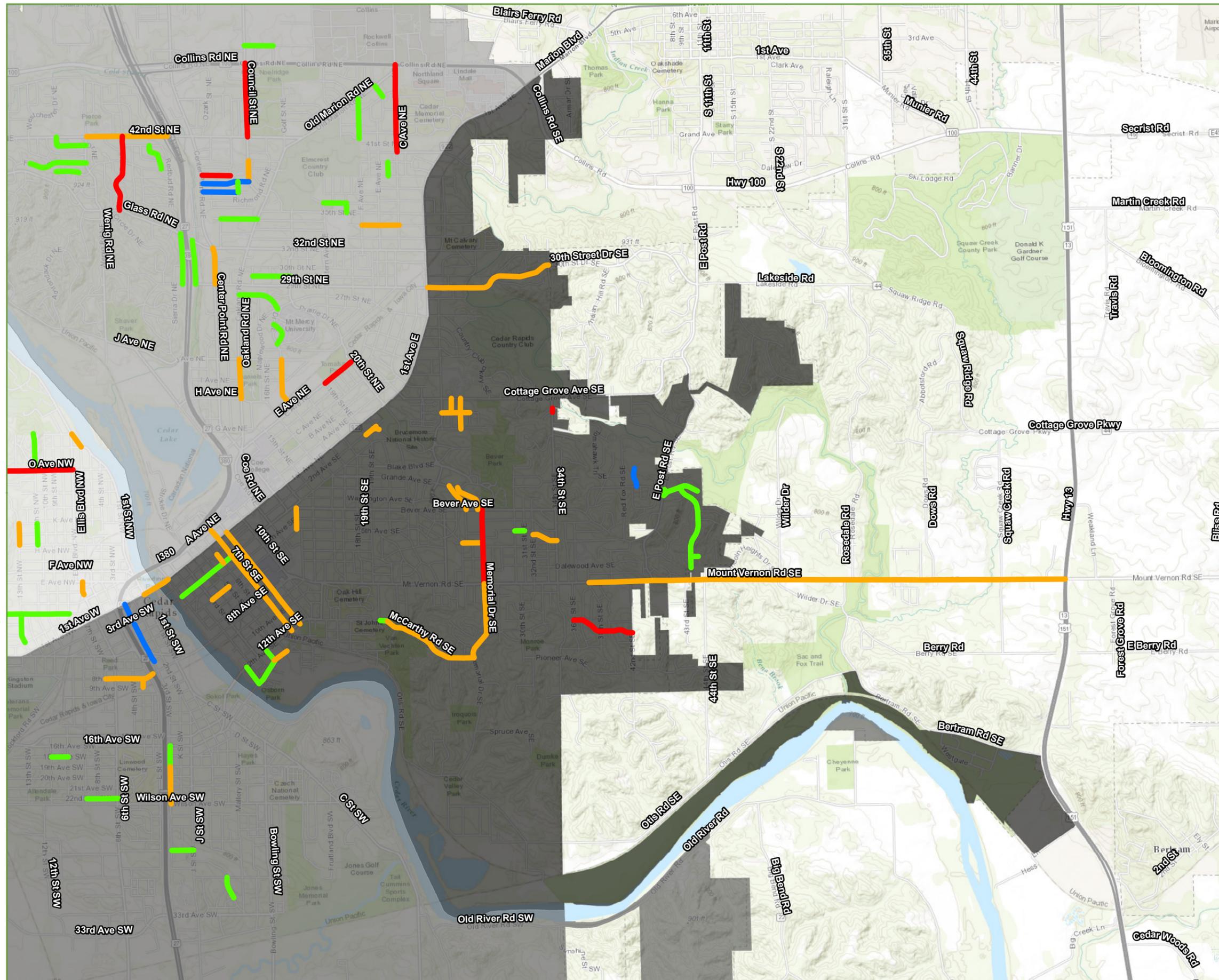


Phase 1 (2016, 2017, 2018) Paving For Progress Projects

Cedar Rapids - SW Quadrant

MAP 11
Phase 1 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,



Phase 1 (2016, 2017, 2018) Paving For Progress Projects

Cedar Rapids - SE Quadrant

MAP 12
Phase 1 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K
		DESIGNED BY: J.R.K.

PHASE 1: 2016-2018

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
11TH ST NW	K AVE NW	I AVE NW	0.14	Minor Rehabilitation	
11TH ST NW	O AVE NW	N TO DEAD END	0.25	Minor Rehabilitation	
12TH AVE SE	19TH ST SE	19TH ST SE	0.05	Minor Rehabilitation	To be bid as part of Group 6662
13TH ST NW	B AVE NW	A AVE NW	0.20	Minor Rehabilitation	
13TH ST NW	K AVE NW	I AVE NW	0.15	Major Rehabilitation	
14TH AVE SE	1ST ST SE	4TH ST SE	0.19	Minor Rehabilitation	
14TH AVE SE	42ND ST SE	36TH ST SE	0.43	Reconstruction	
14TH ST SE	BEVER AVE SE	5TH AVE SE	0.14	Major Rehabilitation	
16TH AVE SE	4TH ST SE	5TH ST SE	0.11	Minor Rehabilitation	To be bid as part of Group 9
17TH ST NE	F AVE NE	J AVE NE	0.29	Major Rehabilitation	To be bid as part of Group 324
18TH AVE SW	11TH ST SW	12TH ST SW	0.11	Minor Rehabilitation	
18TH ST SW	8TH AVE SW	18TH ST NW	0.14	Major Rehabilitation	
19TH ST NW	BURCH AVE NW	1ST AVE W	0.12	Major Rehabilitation	
1ST AVE BRG	1ST ST NW	1ST ST SE	0.19	Minor Rehabilitation	
1ST ST SE	14TH AVE SE	12TH AVE SW	0.14	Minor Rehabilitation	
21ST ST NW	JOHNSON AVE NW	BURCH AVE NW	0.13	Minor Rehabilitation	
22ND AVE SW	6TH ST SW	9TH ST SW	0.21	Minor Rehabilitation	
27TH AVE SW	3RD ST SW	J ST SW	0.15	Minor Rehabilitation	
28TH ST NW	D AVE NW	JOHNSON AVE NW	0.18	Major Rehabilitation	
29TH ST DR SE	1ST AVE E	30TH ST DR SE	0.47	Major Rehabilitation	
2ND AVE SE	19TH ST SE	CRESCENT ST SE	0.13	Major Rehabilitation	
30TH ST DR SE	NEEDLES RD SE	TAMA ST SE	0.40	Major Rehabilitation	
34TH ST NE	C AVE NE	F AVE NE	0.25	Major Rehabilitation	
34TH ST NE	CARLISLE ST NE	OAKLAND RD NE	0.25	Minor Rehabilitation	
34TH ST SE BRG	34TH ST SE	34TH ST SE	0.03	Reconstruction	
36TH ST NE	ZACH JOHNSON DR NE	G AVE NE	0.15	Minor Rehabilitation	
3RD AVE SE	1ST ST SE	8TH ST SE	0.51	Minor Rehabilitation	
3RD ST SW	19TH AVE SW	16TH AVE SW	0.14	Minor Rehabilitation	
3RD ST SW	7TH AVE SW	1ST AVE	0.37	Restoration	
3RD ST SW	WILSON AVE SW	19TH AVE SW	0.25	Major Rehabilitation	
42ND ST NE	PRESERVE LN NE	EDGEWOOD RD NE	1.19	Minor Rehabilitation	
42ND ST NE	WENIG RD NE	I 380	0.55	Major Rehabilitation	
4TH ST SE	12TH AVE SE	14TH AVE SE	0.09	Minor Rehabilitation	
5TH AVE SE	3RD ST SE	5TH ST SE	0.14	Major Rehabilitation	
6TH ST NW	E AVE NW	E TO DEAD END	0.09	Minor Rehabilitation	
6TH ST SE	3RD AVE SE	2ND AVE SE	0.07	Major Rehabilitation	
6TH ST SW	CAPITOL DR SW	COUNTY LINE	1.80	Minor Rehabilitation	
74TH ST NE	WHITE IVY PL NE	C AVE NE	0.36	Reconstruction	
7TH ST NE	A AVE NE	1ST AVE E	0.08	Major Rehabilitation	
7TH ST SE	12TH AVE SE	1ST AVE E	0.80	Major Rehabilitation	
8TH AVE SW	7TH ST SW	L ST SW	0.30	Major Rehabilitation	
8TH AVE SW	L ST SW	I 380	0.03	Major Rehabilitation	To be bid as part of Group 371

PHASE 1: 2016-2018

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
8TH ST SE	12TH AVE SE	1ST AVE E	0.80	Major Rehabilitation	
ANDOVER LN SE	TRAILRIDGE RD SE	N TO DEAD END	0.13	Restoration	
ARIZONA AVE NE	CENTER POINT RD NE	LAWRENCE ST NE	0.24	Restoration	
B AVE NW	8TH ST NW	HIGHLAND DR NW	0.52	Minor Rehabilitation	
BAYBERRY DR SW	CAMEO LN SW	EDGEWOOD RD SW	0.21	Restoration	
BEVER AVE SE	EAST POST RD SE	E TO DEAD END	0.25	Minor Rehabilitation	
BEVERLY RD	WILLIAMS BLVD	WILLIAMS BLVD	0.16		To be bid as part of Group 9
BEVERLY RD SW	BEVERLY RD	BEVERLY RD	0.53		To be bid as part of Group 9
BOYSON RD NE	BOYSON RD	COUNCIL ST NE	0.45	Minor Rehabilitation	
BRAMBLE RD SW	29TH AVE SW	33RD AVE SW	0.25	Restoration	
BROOKLAND DR NE	TANAGER DR NE	W TO DEAD END	0.16	Minor Rehabilitation	
BURCH AVE NW	19TH ST NW	24TH ST NW	0.35	Major Rehabilitation	
C AVE NE	40TH ST NE	OLD MARION RD NE	0.56	Reconstruction	
C AVE NE	COLLINS AVE NE	OLD MARION RD NE	0.03	Reconstruction	
CAMELOT AVE NW	29TH ST NW	IRIS AVE NW	0.31	Restoration	
CAMEO LN SW	PEBBLE LN SW	33RD AVE SW	0.15	Restoration	
CARRIAGE DR SW	BRAMBLE RD SW	CHAPEL DR SW	0.22	Restoration	
CENTER POINT RD NE	29TH ST NE	32ND ST NE	0.25	Major Rehabilitation	
CHANDLER ST SW	18TH ST SW	10TH AVE SW	0.35	Reconstruction	
CHAPEL DR SW	29TH AVE SW	BAYBERRY DR SW	0.15	Restoration	
CORAL LN SW	CAMEO LN SW	EDEN LN SW	0.12	Restoration	
COUNCIL ST NE	42ND ST NE	48TH ST NE	0.34	Reconstruction	
COUNCIL ST NE	48TH ST NE	COLLINS AVE NE	0.16	Reconstruction	
COUNCIL ST NE	HOLLYWOOD BLVD NE	GOLFVIEW DR NE	0.07	Major Rehabilitation	
D AVE NE	38TH ST NE	39TH ST NE	0.09	Minor Rehabilitation	
D AVE NW	26TH ST NW	28TH ST NW	0.12	Major Rehabilitation	
DREXEL DR SW	LANGDON AVE SW	1ST AVE W	0.06	Minor Rehabilitation	
E AVE NE	19TH ST NE	20TH ST NE	0.23	Reconstruction	
E AVE NE	NILSEN RD NE	OLD MARION RD NE	0.09	Minor Rehabilitation	
E AVE NW	STONE POINT RD NW	ROCK VALLEY LN NW	0.50	Reconstruction	
EASTERN BLVD SE	SINCLAIR AVE SE	COTTAGE GROVE AVE SE	0.21	Major Rehabilitation	
EDEN LN SW	BAYBERRY DR SW	33RD AVE SW	0.10	Restoration	
EDGEWOOD RD NW	E AVE NW	F AVE NW	0.12	Reconstruction	
ELLIS RD NW	Q AVE NW	6TH ST NW	0.11	Minor Rehabilitation	
ELMHURST DR NE	OAKLAND RD NE	MAPLEWOOD DR NE	0.30	Minor Rehabilitation	
ELY RD	BIDERMANN LN	HOOVER TRAIL CIR SW	0.19	Minor Rehabilitation	
ELY RD	LINN COUNTY LINE	CEDAR RAPIDS CITY LIMITS	4.28	Minor Rehabilitation	
ELY RD SW	HOOVER TRAIL CIR SW	ELY RD	1.12	Minor Rehabilitation	
F AVE NE	ESTROY DR NE	OLD MARION RD NE	0.27	Minor Rehabilitation	
FALBROOK DR NE	WENIG RD NE	42ND ST NE	0.26	Minor Rehabilitation	
FALCON DR NE	EAGLE CT NE	WENIG RD NE	0.39	Minor Rehabilitation	
G AVE NE	35TH ST NE	36TH ST NE	0.06	Minor Rehabilitation	

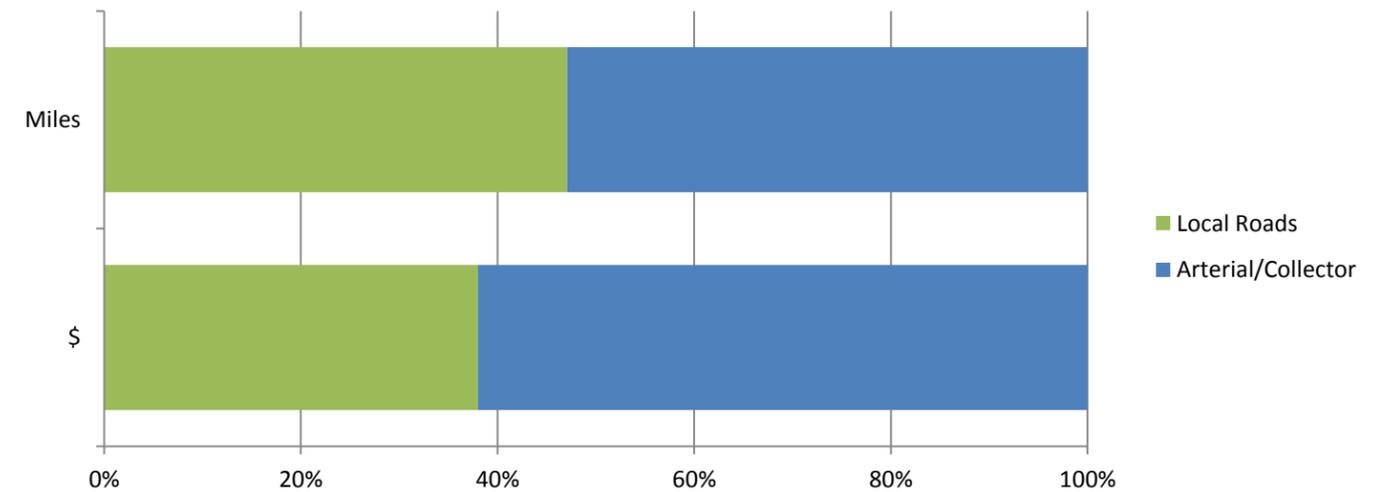
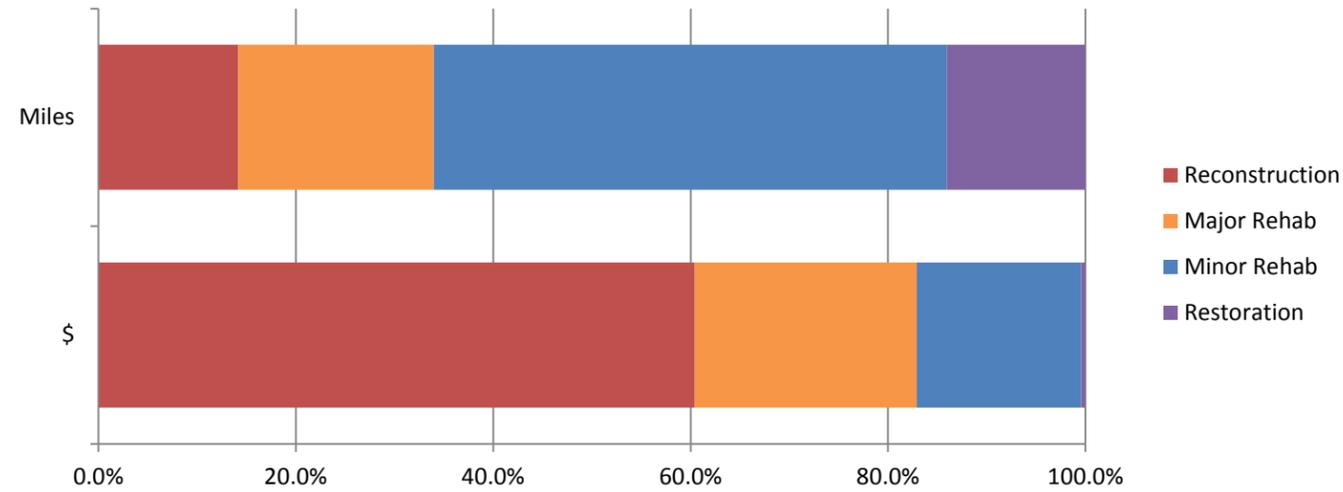
PHASE 1: 2016-2018

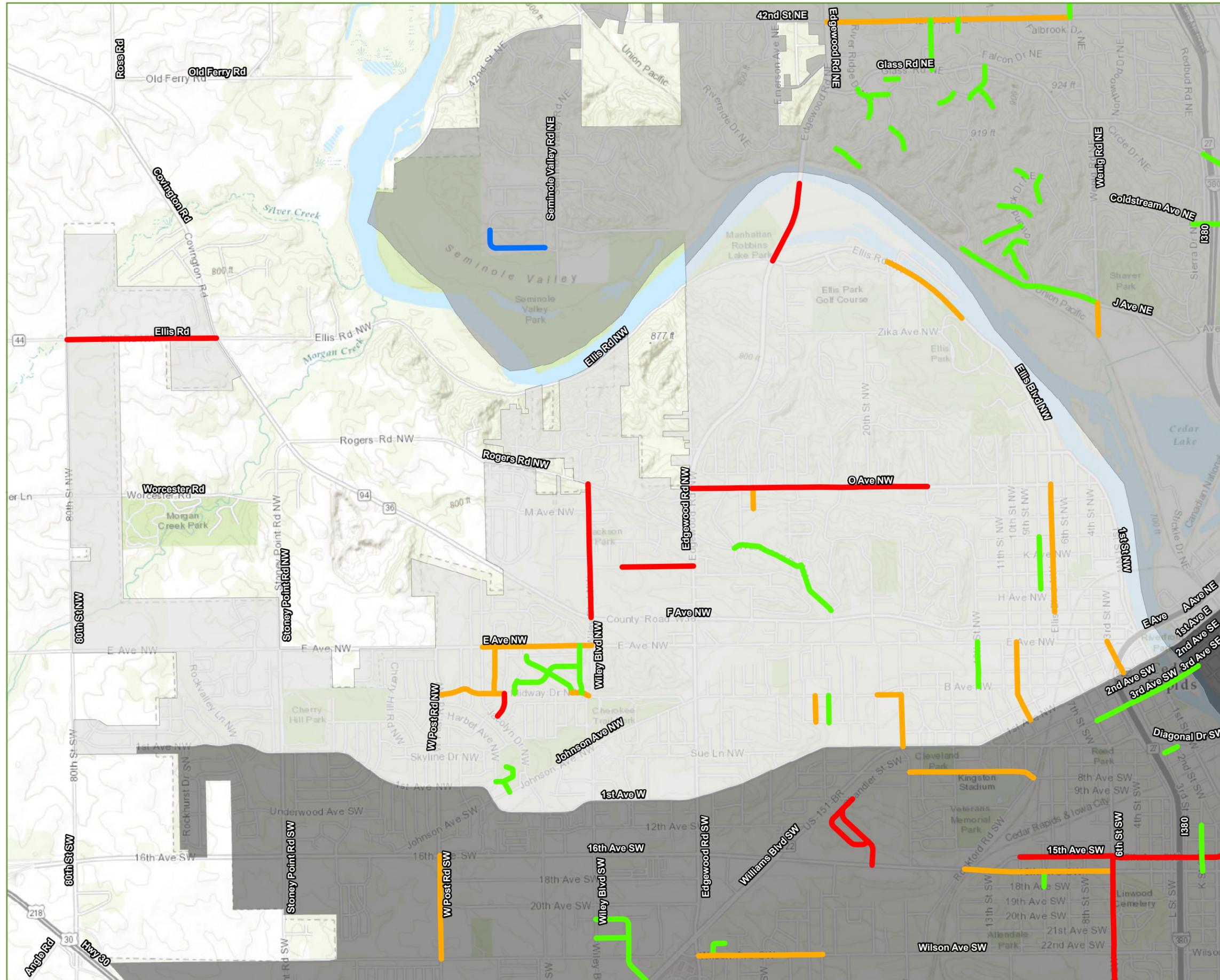
Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
GREEN VALLEY PL SE	GREEN VALLEY TER SE	E TO DEAD END	0.05	Minor Rehabilitation	
GREEN VALLEY TER SE	BEVER AVE SE	S TO DEAD END	0.55	Minor Rehabilitation	
GREEN VALLEY TER SE	BROADVIEW DR SE	BROADLAWN DR SE	0.06	Minor Rehabilitation	
HAZEL DR NE	ELMHURST DR NE	ELMHURST DR NE	0.16	Minor Rehabilitation	
HOLLYWOOD BLVD NE	CENTER POINT RD NE	COUNCIL ST NE	0.31	Restoration	
HOLLYWOOD BLVD NE	COUNCIL ST NE	COUNCIL ST NE	0.07	Major Rehabilitation	
IRIS AVE NW	CAMELOT AVE NW	W TO DEAD END	0.26	Restoration	
JOHNSON AVE NW	MIDWAY DR NW	1ST AVE W	1.04	Reconstruction	
JUHL DR NE	COLDSTREAM AVE NE	GLASS RD NE	0.34	Minor Rehabilitation	
LAWRENCE ST NE	ARIZONA AVE NE	HOLLYWOOD BLVD NE	0.07	Minor Rehabilitation	
LEROY ST NW	SKYLINE DR NW	1ST AVE W	0.14	Minor Rehabilitation	
LEROY ST SW	JOHNSON AVE SW	1ST AVE W	0.14	Minor Rehabilitation	
LIBERTY DR SE	FOREST DR SE	MARKERT BLVD SE	0.19	Major Rehabilitation	
LINN BLVD SE	LIBERTY DR SE	COTTAGE GROVE AVE SE	0.10	Major Rehabilitation	
MADISON ST NE	COLDSTREAM AVE NE	GLASS RD NE	0.30	Minor Rehabilitation	
MANSFIELD AVE SE	31ST ST SE	30TH ST SE	0.07	Minor Rehabilitation	
MANSFIELD AVE SE	34TH ST SE	32ND ST SE	0.17	Major Rehabilitation	
MCCARTHY RD SE	19TH ST SE	PROP PIONEER AVE	0.67	Major Rehabilitation	To be bid as part of Group 6662
MEADOWBROOK DR SE	26TH ST SE	26TH ST SE	0.03	Major Rehabilitation	
MEADOWBROOK DR SE	26TH ST SE	MEMORIAL DR SE	0.11	Major Rehabilitation	
MEMORIAL DR SE	MCCARTHY RD SE	MOUNT VERNON RD SE	0.53	Major Rehabilitation	
MEMORIAL DR SE	MOUNT VERNON RD SE	BEVER AVE SE	0.50	Reconstruction	
MILBURN RD NE	COUNTRY LN NE	MILBURN RD	3.25		
MILLER AVE SW	VERMONT ST SW	KIRKWOOD BLVD SW	0.29	Minor Rehabilitation	
MOUNT VERNON RD SE	38TH ST SE	40TH ST SE	0.16	Major Rehabilitation	
MOUNT VERNON RD SE	40TH ST SE	EAST POST RD SE	0.28	Major Rehabilitation	To be bid as part of Group 6069
MOUNT VERNON RD SE	43RD ST SE	44TH ST SE	0.10	Major Rehabilitation	
MOUNT VERNON RD SE	EAST POST RD SE	43RD ST SE	0.23	Major Rehabilitation	
MT VERNON RD SE	CEDAR RAPIDS CITY LIMITS	HWY 13	2.48	Minor Rehabilitation	
N ST SW	8TH AVE SW	S TO DEAD END	0.06	Major Rehabilitation	
NANCY JANE LN NE	BROOKLAND DR NE	EVERGREEN ST NE	0.20	Minor Rehabilitation	
NORTHWOOD DR NE	BROOKLAND DR NE	42ND ST NE	0.18	Reconstruction	
NORTHWOOD DR NE	GLASS RD NE	BROOKLAND DR NE	0.35	Reconstruction	To be bid as part of Group 9075
O AVE NW	16TH ST NW	ELLIS BLVD NW	0.59	Reconstruction	
OAKLAND RD NE	H AVE NE	J AVE NE	0.27	Major Rehabilitation	
OUTLOOK DR SW	29TH AVE SW	CLOVER DR SW	0.15	Minor Rehabilitation	
PARK PL NE	COUNCIL ST NE	PARK PLACE LN NE	0.20	Minor Rehabilitation	
PARK TER SE	GRANDE AVE SE	BEVER AVE SE	0.22	Major Rehabilitation	
PEBBLE DR SW	CHAPEL DR SW	BRAMBLE RD SW	0.22	Restoration	
RIVER CENTER CT NE	EDGEWOOD RD NE	E TO DEAD END	0.17	Minor Rehabilitation	
RIVER RIDGE DR NE	42ND ST NE	GLASS RD NE	0.33	Minor Rehabilitation	
ROGERS RD NW	COVINGTON RD NW	GARDNER DR NW	1.14	Minor Rehabilitation	

PHASE 1: 2016-2018

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
SEMINOLE VALLEY RD NE	42ND ST	N TO DEAD END	0.60	Reconstruction	
SEMINOLE VALLEY RD NE	N TO DEAD END	S TO DEAD END	0.86	Minor Rehabilitation	
SPENCER DR SW	JOHNSON AVE SW	W TO DEAD END	0.15	Minor Rehabilitation	
STAUB CT NE	PRAIRIE DR NE	WILDWOOD CT NE	0.25	Minor Rehabilitation	
STONE POINT RD NW	E AVE NW	540' S OF COVINGTON RD NW	0.93	Minor Rehabilitation	
TEAKWOOD LN NE	PURPLE DR NE	C AVE NE	0.27	Minor Rehabilitation	
TEXAS AVE NE	CENTER POINT RD NE	SHERMAN ST NE	0.19	Reconstruction	
TOWER TERRACE RD NE	MILBURN RD NE	N CENTER POINT RD	1.76	Minor Rehabilitation	
TRAILRIDGE RD SE	BEVER AVE SE	EAST POST RD SE	0.03	Minor Rehabilitation	
WEST POST RD NW	E AVE NW	GORDON AVE NW	0.48	Reconstruction	
WESTVIEW DR NW	SHARON LN NW	1ST AVE W	0.18	Major Rehabilitation	
WOODLAND DR SE	BEVER AVE SE	GRANDE AVE SE	0.20	Major Rehabilitation	

Totals 135 Projects 49.6 Mi





Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,

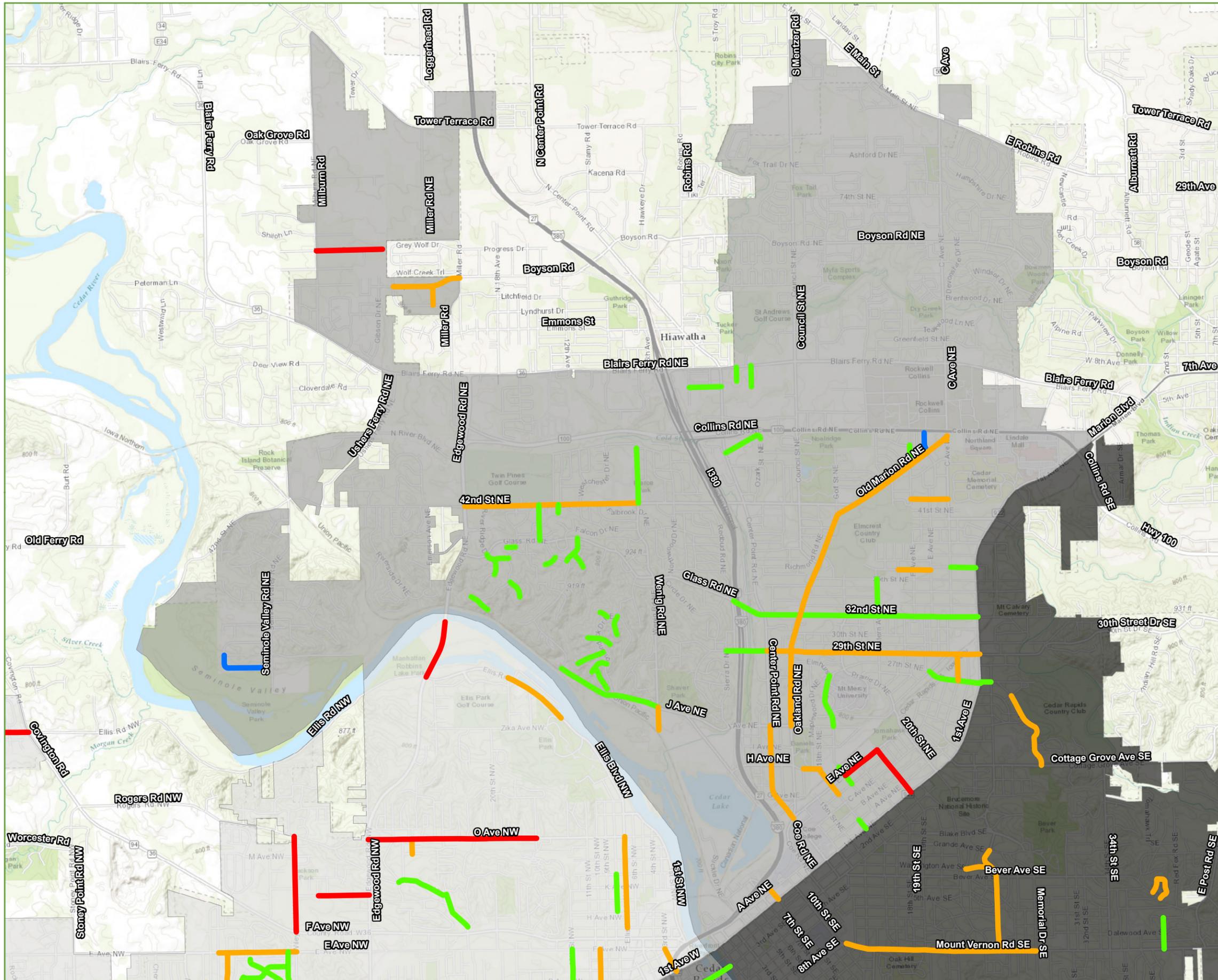


Phase 2 (2019, 2020, 2021) Paving For Progress Projects

Cedar Rapids - NW Quadrant

MAP 14
Phase 2 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,

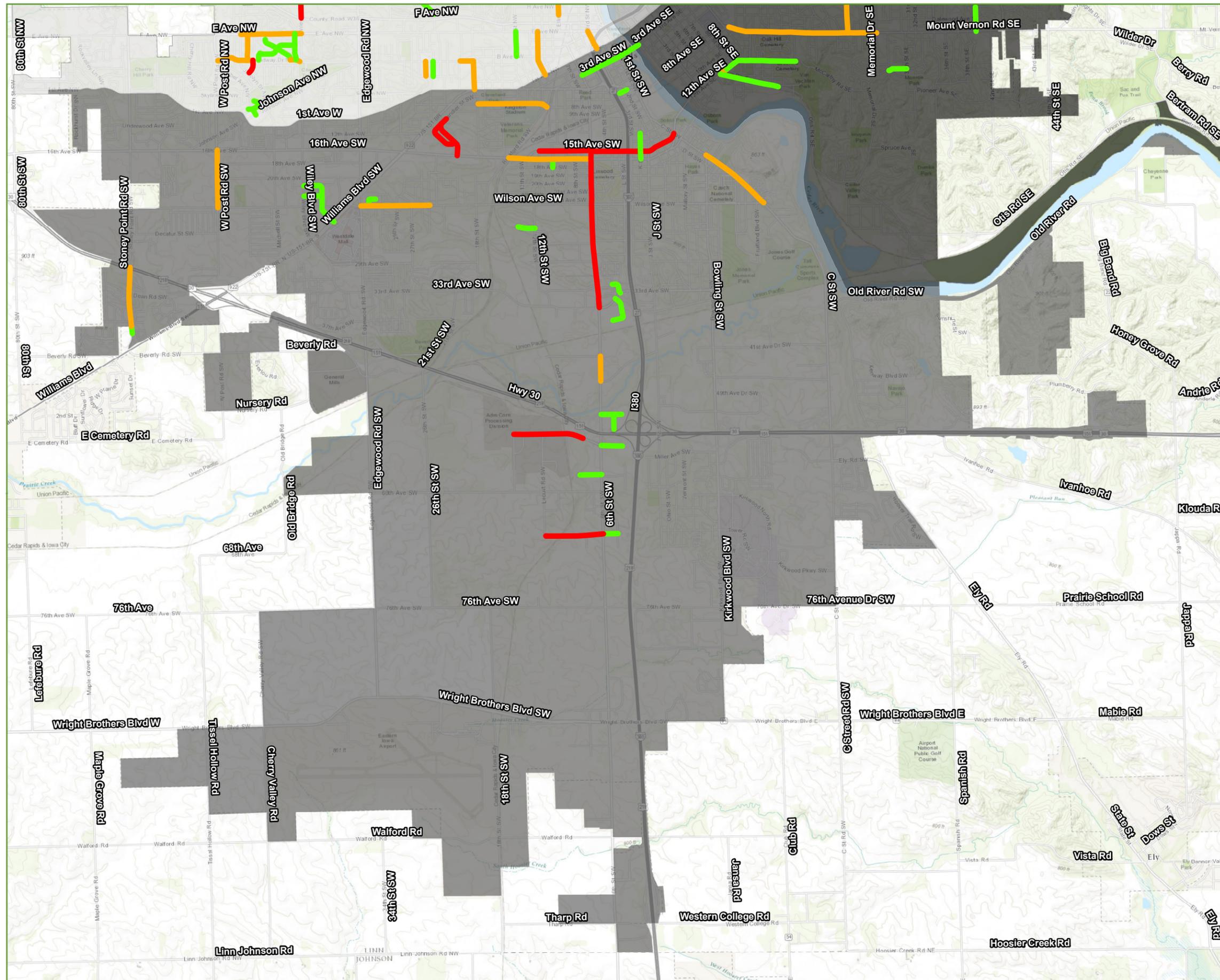


Phase 2 (2019, 2020, 2021) Paving For Progress Projects

Cedar Rapids - NE Quadrant

MAP 15
Phase 2 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,



Phase 2 (2019, 2020, 2021) Paving For Progress Projects

Cedar Rapids - SW Quadrant

MAP 16
Phase 2 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

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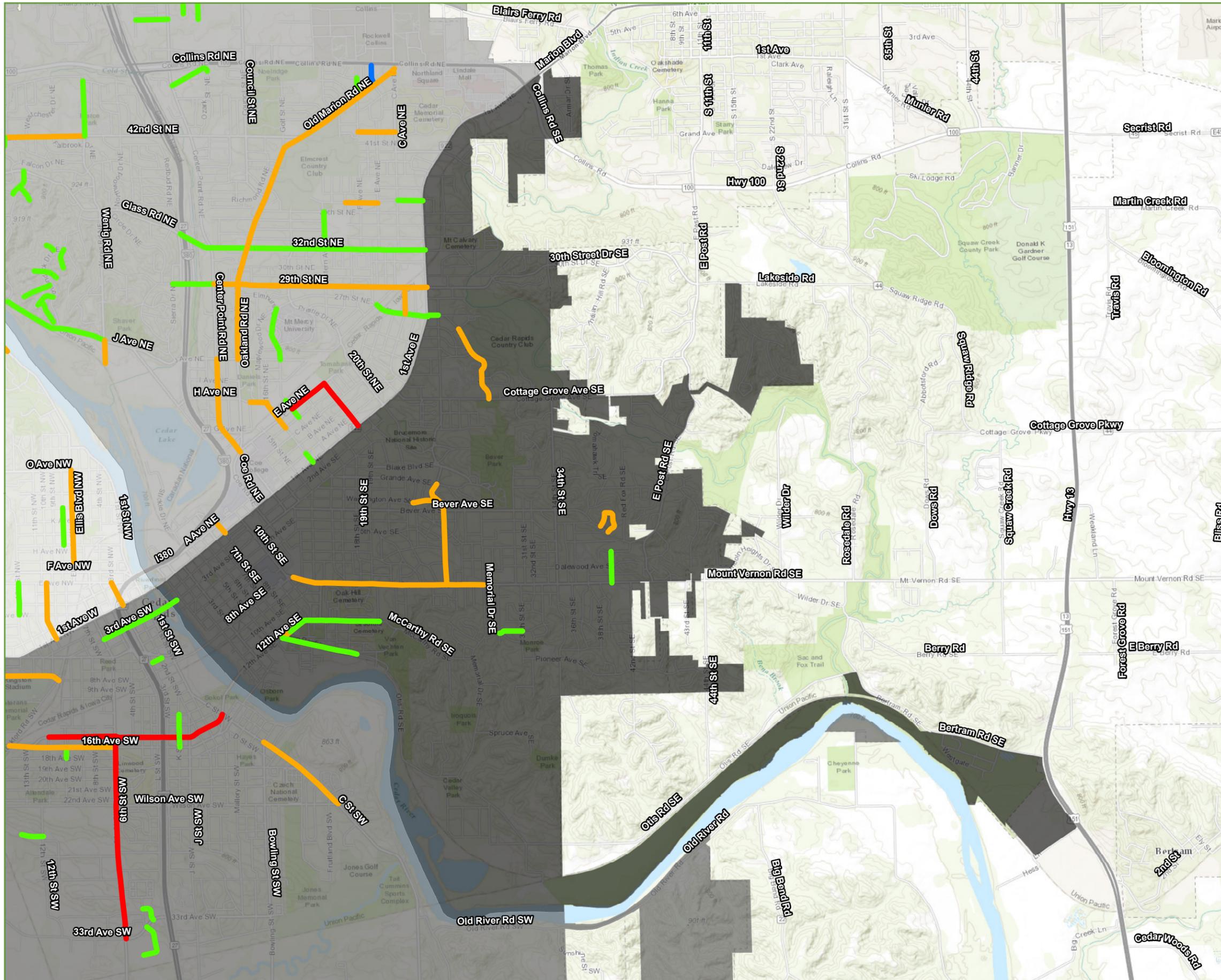


Phase 2 (2019, 2020, 2021) Paving For Progress Projects

Cedar Rapids - SE Quadrant

MAP 17
Phase 2 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



PHASE 2: 2019-2021

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
4TH ST SW	50TH AVE CT SW	S TO DEAD END	0.13	Minor Rehabilitation	
50TH AVE CT SW	6TH ST SW	E TO DEAD END	0.18	Minor Rehabilitation	
58TH AVE CT SW	6TH ST SW	W TO DEAD END	0.19	Minor Rehabilitation	
WACONIA CT SW	6TH ST SW	E TO DEAD END	0.19	Minor Rehabilitation	
66TH AVE SW	6TH ST SW	4TH ST SW	0.13	Minor Rehabilitation	
RICH MAR CT NW	HARBET AVE NW	N TO DEAD END	0.16	Minor Rehabilitation	
SHORT ST NW	JOHNSON AVE NW	RICHMAR CT NW	0.06	Minor Rehabilitation	
WENIG RD NE	42ND ST NE	TOWNE HOUSE DR NE	0.37	Minor Rehabilitation	
17TH ST NE	D AVE NE	F AVE NE	0.14	Minor Rehabilitation	
27TH ST DR SE	1ST AVE E	2ND AVE SE	0.07	Minor Rehabilitation	
WASHINGTON AVE SE	22ND ST SE	FOREST DR SE	0.22	Major Rehabilitation	
11TH ST SW	16TH AVE SW	18TH AVE SW	0.07	Minor Rehabilitation	
27TH ST NE	FRANKLIN AVE NE	1ST AVE E	0.36	Minor Rehabilitation	
JOHNSON AVE NW	18TH ST NW	19TH ST NW	0.12	Major Rehabilitation	
E AVE NE	OLD MARION RD NE	N TO DEAD END	0.14	Restoration	
18TH ST NW	MAPLE DR NW	JOHNSON AVE NW	0.18	Major Rehabilitation	
40TH ST SE	SOUTTER AVE CT SE	MOUNT VERNON RD SE	0.21	Minor Rehabilitation	
WACONIA AVE SW	WILLOW CREEK DR SW	E TO DEAD END	0.61	Reconstruction	
SOUTH RIDGE DR SW	SOUTHGATE PL SW	33RD AVE SW	0.12	Minor Rehabilitation	To be bid as part of Group 31
36TH ST NE	G AVE NE	E AVE NE	0.22	Major Rehabilitation	To be bid as part of Group 170
23RD ST NW	JOHNSON AVE NW	BURCH AVE NW	0.13	Major Rehabilitation	To be bid as part of Group 200
20TH ST SW	16TH AVE SW	CHANDLER ST SW (S)	0.34	Reconstruction	To be bid as part of Group 215
CHANDLER ST SW	10TH AVE SW	20TH ST SW	0.38	Reconstruction	To be bid as part of Group 215
42ND ST NE	F AVE NE	C AVE NE	0.25	Major Rehabilitation	To be bid as part of Group 274
8TH ST NW	L AVE NW	I AVE NW	0.25	Minor Rehabilitation	
10TH ST NW	E AVE NW	10TH ST SW	0.39	Major Rehabilitation	
3RD ST NW	1ST AVE	E AVE NW	0.17	Major Rehabilitation	To be bid as part of Group 472
18TH ST NW	WILLIAMS BLVD	MAPLE DR NW	0.07	Major Rehabilitation	To be bid as part of Group 496
K ST SW	13TH AVE SW	16TH AVE SW	0.22	Minor Rehabilitation	
3RD AVE SW	6TH ST SW	1ST ST SW	0.36	Minor Rehabilitation	To be bid as part of Group 3366
16TH ST NE	D AVE NE	H AVE NE	0.22	Major Rehabilitation	To be bid as part of Group 3416
H AVE NE	14TH ST NE	16TH ST NE	0.11	Major Rehabilitation	To be bid as part of Group 3416
8TH ST NE	1ST AVE E	A AVE NE	0.08	Major Rehabilitation	To be bid as part of Group 6015
ELLIS BLVD NW	K AVE NW	I AVE NW	0.17	Major Rehabilitation	
B AVE NE	27TH ST NE	29TH ST NE	0.18	Major Rehabilitation	
66TH AVE SW	LOCUST RD SW	6TH ST SW	0.51	Reconstruction	
O AVE NW	24TH ST NW	16TH ST NW	0.52	Reconstruction	
MOUNT VERNON RD SE	10TH ST SE	MEMORIAL DR SE	1.30	Major Rehabilitation	
WEST POST RD SW	16TH AVE SW	WILSON AVE SW	0.50	Major Rehabilitation	
O AVE NW	EDGEWOOD RD NW	24TH ST NW	0.62	Reconstruction	
ELLIS BLVD NW	O AVE NW	K AVE NW	0.34	Major Rehabilitation	
GLASS RD NE	JUHL DR NE	32ND ST NE	0.24	Minor Rehabilitation	

PHASE 2: 2019-2021

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
29TH ST NE	COLDSTREAM AVE NE	29TH ST NE	0.22	Minor Rehabilitation	To be bid as part of Group 74514
COLDSTREAM AVE NE	SIERRA DR NE	JUHL DR NE	0.06	Minor Rehabilitation	To be bid as part of Group 74514
C ST SW	21ST AVE SW	WILSON AVE SW	0.66	Major Rehabilitation	
42ND ST NE	EDGEWOOD RD NE	WENIG RD NE	1.18	Major Rehabilitation	
6TH ST SW	15TH AVE SW	33RD AVE SW	1.40	Reconstruction	
22ND ST NW	BURCH AVE NW	JOHNSON AVE NW	0.13	Minor Rehabilitation	
BLANCHE DR NW	O AVE NW	SCHULTZ DR NW	0.10	Major Rehabilitation	
BEZDEK DR NW	TOPAZ AVE NW	MIDWAY DR NW	0.30	Minor Rehabilitation	
FLORAL DR NW	MIDWAY DR NW	PEARL AVE NW	0.06	Minor Rehabilitation	
PEARL AVE NW	FLORAL DR NW	SHETLAND DR NW	0.34	Minor Rehabilitation	
SHETLAND DR NW	MIDWAY DR NW	E AVE NW	0.23	Minor Rehabilitation	
BLUE JAY DR NE	GLASS RD NE	42ND ST NE	0.24	Minor Rehabilitation	
GRANITE CT NE	WASATCH CT NE	S TO DEAD END	0.17	Minor Rehabilitation	
MCKINSIE CT NE	ADIRONDACK DR NE	W TO DEAD END	0.19	Minor Rehabilitation	
RAINIER CT NE	E TO DEAD END	W TO DEAD END	0.16	Minor Rehabilitation	
WASATCH CT NE	ADIRONDACK DR NE	W TO DEAD END	0.13	Minor Rehabilitation	
WHITNEY DR NE	ADIRONDACK DR NE	W TO DEAD END	0.06	Minor Rehabilitation	
LARK CT NE	42ND ST NE	S TO DEAD END	0.06	Minor Rehabilitation	
7TH AVE SW	3RD ST SW	2ND ST SW	0.07	Minor Rehabilitation	
BLUE RIDGE CT NE	ADIRONDACK DR NE	S TO DEAD END	0.13	Minor Rehabilitation	
26TH AVE CT SW	12TH ST SW	W TO DEAD END	0.15	Minor Rehabilitation	
13TH ST NW	E AVE NW	B AVE NW	0.22	Minor Rehabilitation	
KENRICH DR SW	WILSON AVE SW	E TO DEAD END	0.11	Minor Rehabilitation	
STONE POINT RD SW	STONE POINT RD NW	PALMETTO CIR SW	0.13		
DODGE RD NE	OZARK ST NE	CENTER POINT RD NE	0.28	Minor Rehabilitation	To be bid as part of Group 272
INDIAN DR NE	RIVER VIEW RD NE	CARPENTER RD NE	0.13	Major Rehabilitation	To be bid as part of Group 291
J AVE NE	LONG BLUFF RD NE	WENIG RD NE	0.72	Minor Rehabilitation	To be bid as part of Group 316
WENIG RD NE	J AVE NE	S TO DEAD END	0.16	Major Rehabilitation	To be bid as part of Group 316
EASTERN AVE NE	35TH ST NE	32ND ST NE	0.25	Minor Rehabilitation	
PEACE AVE NW	MIDWAY DR NW	JACOLYN DR NW	0.12	Reconstruction	To be bid as part of Group 343
EDGEWOOD RD NW	ELLIS RD NW	EDGEWOOD RD NE	0.40	Reconstruction	
19TH ST NE	1ST AVE E	E AVE NE	0.37	Reconstruction	
OTIS RD SE	12TH AVE SE	15TH AVE SE	0.52	Minor Rehabilitation	
8TH AVE SW	18TH ST SW	ROCKFORD RD SW	0.61	Major Rehabilitation	
MIDWAY DR NW	PEACE AVE NW	WEST POST RD NW	0.32	Major Rehabilitation	
3RD AVE BRG	1ST ST SW	1ST ST SE	0.17	Minor Rehabilitation	To be bid as part of Group 3366
3RD AVE SW	1ST ST SW	1ST ST SW	0.03	Minor Rehabilitation	To be bid as part of Group 3366
MIDWAY DR NW	WILEY BLVD NW	BEZDEK DR NW	0.09	Major Rehabilitation	To be bid as part of Group 8065
ZELDA DR NW	E AVE NW	MIDWAY DR NW	0.23	Major Rehabilitation	To be bid as part of Group 8065
12TH AVE SE	OTIS RD SE	7TH ST SE	0.07	Major Rehabilitation	
E AVE NW	JACOLYN DR NW	WILEY BLVD NW	0.53	Major Rehabilitation	
16TH ST NE	1ST AVE E	A AVE NE	0.08	Minor Rehabilitation	

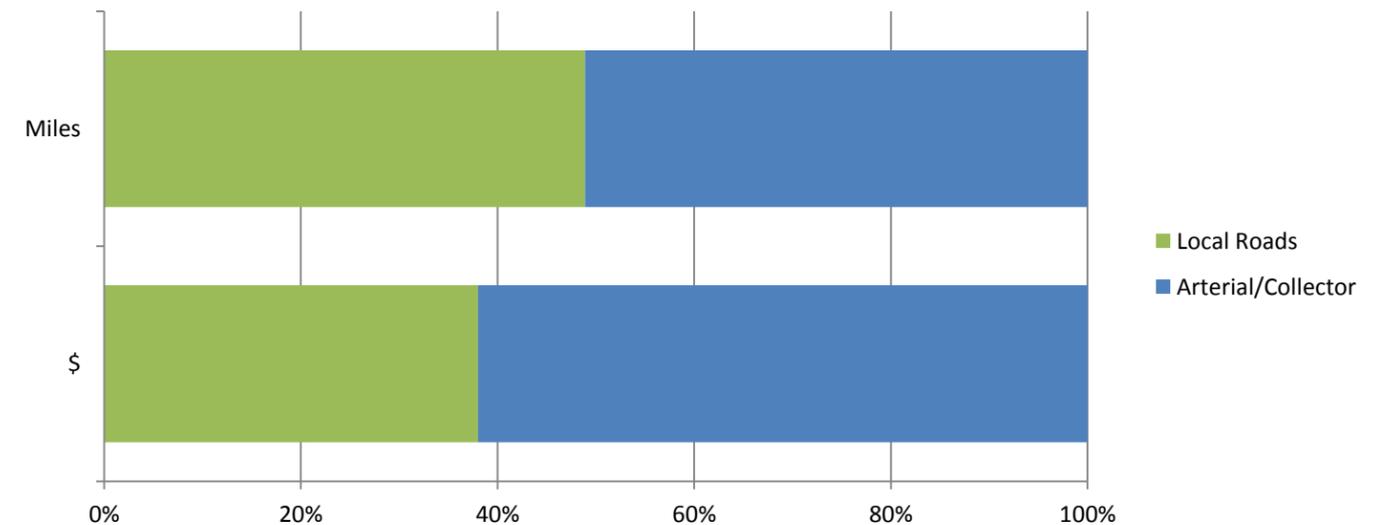
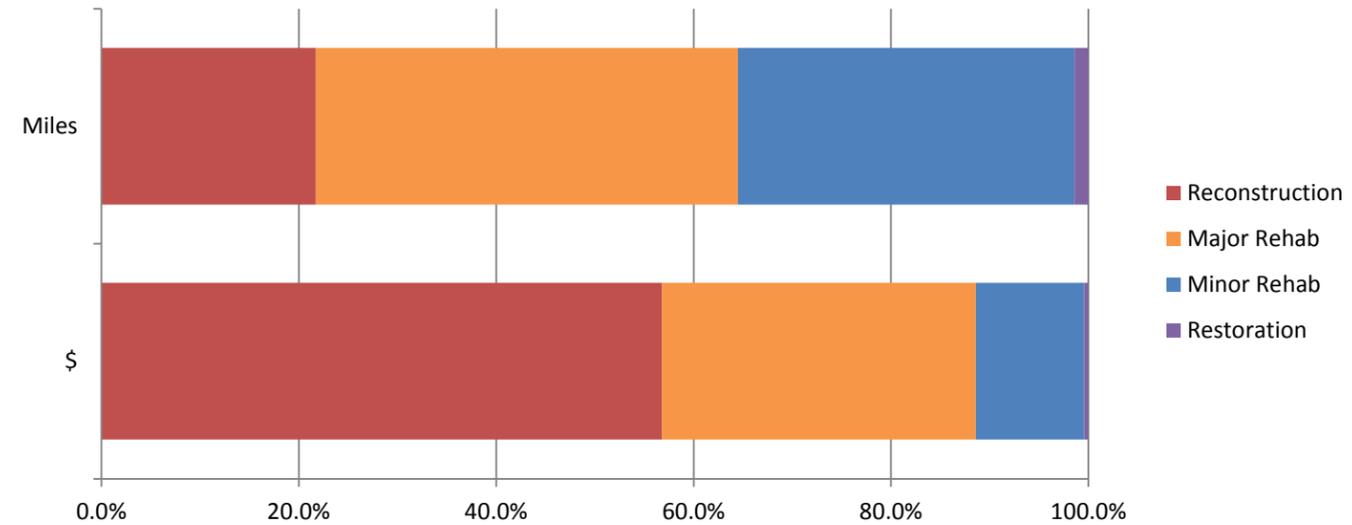
PHASE 2: 2019-2021

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
STONE POINT RD SW	US 30	STONE POINT RD NW	0.52	Major Rehabilitation	
12TH AVE SE	7TH ST SE	19TH ST SE	0.63	Minor Rehabilitation	
32ND ST NE	GLASS RD NE	1ST AVE E	1.45	Minor Rehabilitation	
29TH ST NE	PRAIRIE DR NE	PRAIRIE DR NE	1.58	Major Rehabilitation	
CENTER POINT RD NE	J AVE NE	COE RD NE	0.68	Major Rehabilitation	
WESTWOOD DR NW	BELMONT PKWY NW	HILLSIDE DR NW	0.62	Minor Rehabilitation	
E AVE NE	17TH ST NE	19TH ST NE	0.28	Reconstruction	To be bid as part of Group 385385
21ST AVE SW	WILEY BLVD SW	WESTDALE DR SW	0.15	Minor Rehabilitation	
22ND AVE SW	WILEY BLVD SW	WESTDALE DR SW	0.16	Minor Rehabilitation	
WESTDALE DR SW	WILLIAMS BLVD	21ST AVE SW	0.36	Minor Rehabilitation	
NORTH TOWNE LN NE	TOWNE PL NE	CENTER POINT RD NE	0.22	Minor Rehabilitation	
36TH ST NE	C AVE NE	1ST AVE E	0.17	Minor Rehabilitation	
COPPERMILL RD NE	OLD ORCHARD RD NE	GLASS RD NE	0.18	Minor Rehabilitation	
SILVERTHORNE RD NE	COPPERMILL RD NE	S TO DEAD END	0.11	Minor Rehabilitation	
WINTERWOOD CT NE	OLD ORCHARD RD NE	W TO DEAD END	0.09	Minor Rehabilitation	
F AVE NE	OLD MARION RD NE	GATEWAY ST NE	0.14	Minor Rehabilitation	
ELMHURST DR NE	MAPLEWOOD DR NE	J AVE NE	0.36	Minor Rehabilitation	
CRANE LN NE	BLAIRS FERRY RD NE	S TO DEAD END	0.14	Minor Rehabilitation	
MILDRED LN NE	BLAIRS FERRY RD NE	S TO DEAD END	0.09	Minor Rehabilitation	
BELDEN CT NE	TIMBERLINE DR NE	W TO DEAD END	0.06	Minor Rehabilitation	
CEDAR RIDGE DR NE	W TO DEAD END	E TO DEAD END	0.14	Minor Rehabilitation	
RED CEDAR DR NE	TIMBERLINE DR NE	RIVER RIDGE DR NE	0.10	Minor Rehabilitation	
RIVER RIDGE DR NE	GLASS RD NE	RIVER RIDGE CT NE	0.17	Minor Rehabilitation	
TIMBERLINE DR NE	WYNDHAM DR NE	S TO DEAD END	0.13	Minor Rehabilitation	
6TH ST SW	INGLESIDE DR SW	HAWKEYE DOWNS RD SW	0.22	Major Rehabilitation	
OAKLAND RD NE	32ND ST NE	32ND ST NE	0.06	Major Rehabilitation	
SOUTHGATE CT SW	33RD AVE SW	S TO DEAD END	0.28	Minor Rehabilitation	To be bid as part of Group 31
KIOWA TRL NE	DEER HORN TRL NE	CHIPPEWA TRL NE	0.34	Restoration	
LOST VALLEY RD SE	BEVER AVE SE	BEVER AVE SE	0.29	Major Rehabilitation	
14TH AVE SE	28TH ST SE	30TH ST SE	0.16	Minor Rehabilitation	
CARPENTER RD NE	WOLF CREEK TRL NE	MILLER RD	0.46	Major Rehabilitation	To be bid as part of Group 291
COUNTRY CLUB PKWY SE	FAIRWAY TER SE	COTTAGE GROVE AVE SE	0.56	Major Rehabilitation	
FOREST DR SE	MOUNT VERNON RD SE	WASHINGTON AVE SE CONN	0.76	Major Rehabilitation	
MICHAEL DR NE	MICHAEL DR	E TO DEAD END	0.45	Reconstruction	
CRESTWOOD DR NW	EDGEWOOD RD NW	38TH ST NW	0.35	Reconstruction	
ELLIS BLVD NW	I AVE NW	G AVE NW	0.11	Major Rehabilitation	
ELLIS BLVD NW	18TH ST NW	ELLIS PARK RD NW	0.46	Major Rehabilitation	
ELLIS RD NW	COVINGTON RD	80TH ST NW	0.97	Reconstruction	
16TH AVE SW	15TH AVE SW	15TH AVE SW	0.71	Major Rehabilitation	
OLD MARION RD NE	FORK	C AVE NE	0.04	Major Rehabilitation	
WILSON AVE SW	LORI DR SW	EDGEWOOD RD SW	0.60	Major Rehabilitation	
15TH AVE SW	12TH ST SW	C ST SW	1.23	Reconstruction	

PHASE 2: 2019-2021

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
OAKLAND RD NE	J AVE NE	GOLF ST NE	1.41	Major Rehabilitation	To be bid as part of Group 69027
OLD MARION RD NE	GOLF ST NE	C AVE NE	0.92	Major Rehabilitation	To be bid as part of Group 69027
WILEY BLVD NW	ROGERS RD NW	F AVE NW	0.65	Reconstruction	

Totals 119 Projects 42.3 Mi





Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

City Limits

Quadrants

- NW
- NE
- SW
- SE

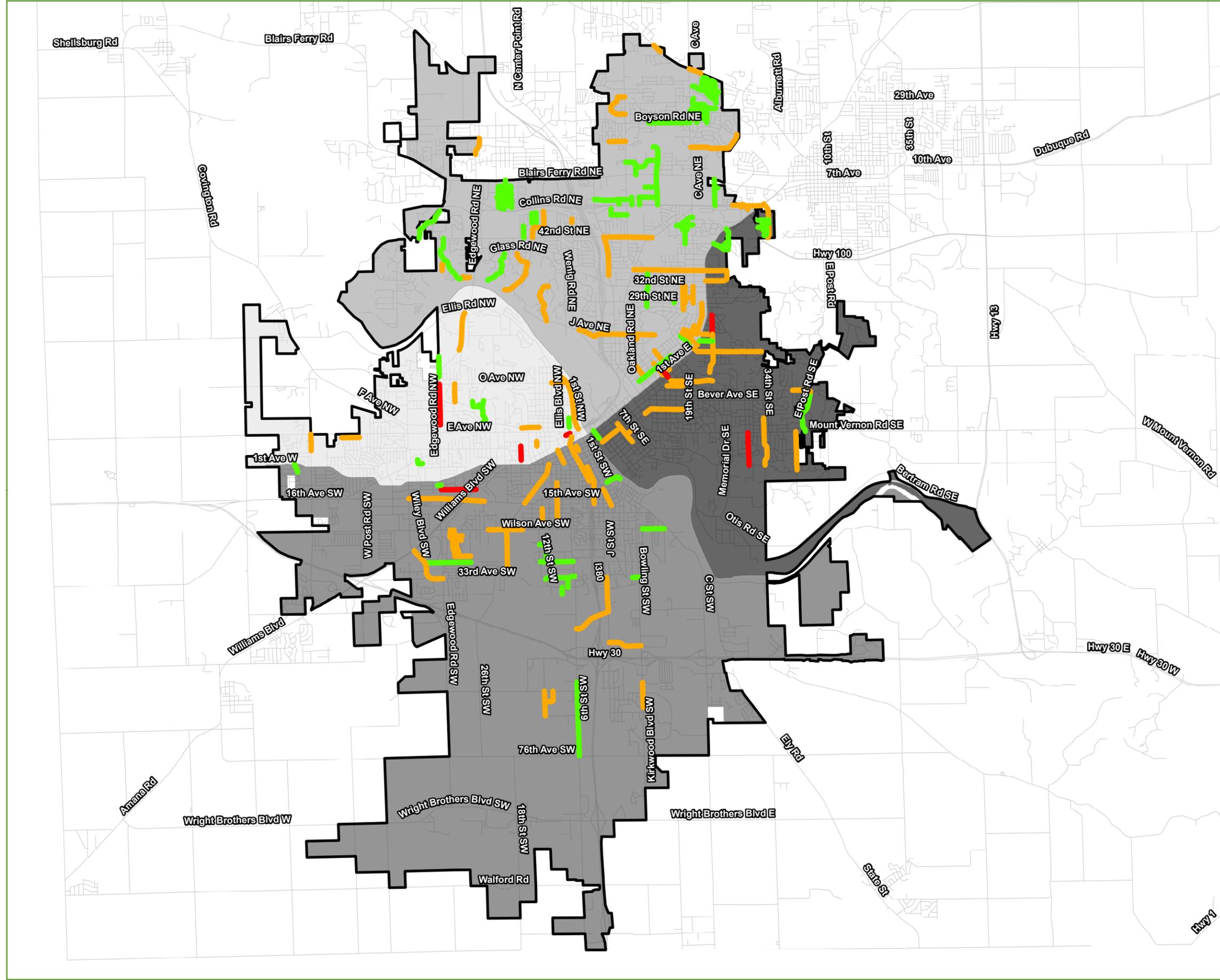


Phase 3 (2022, 2023, 2024) Paving For Progress Projects

Cedar Rapids - All Quadrants

MAP 22
Phase 3 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.





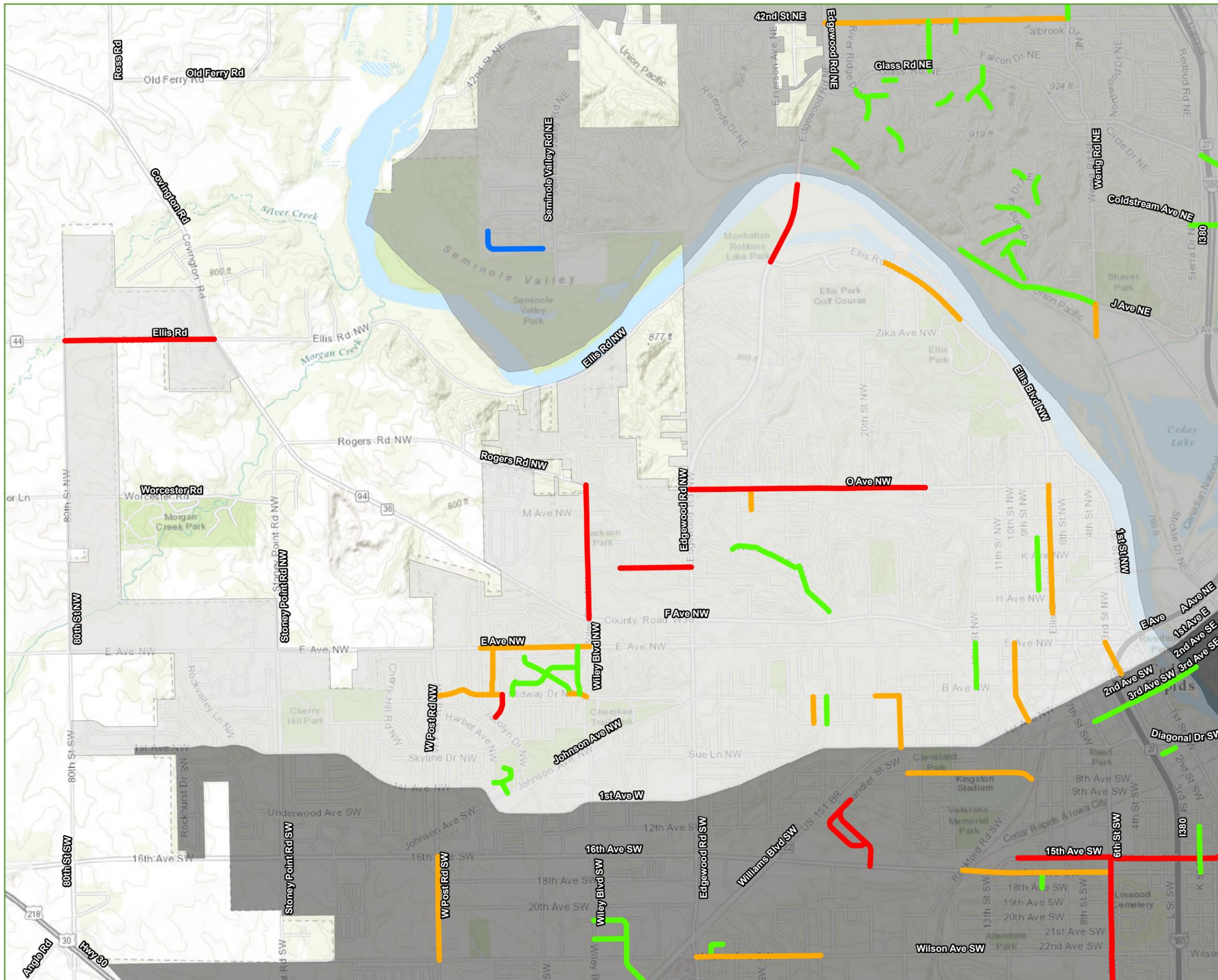
Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

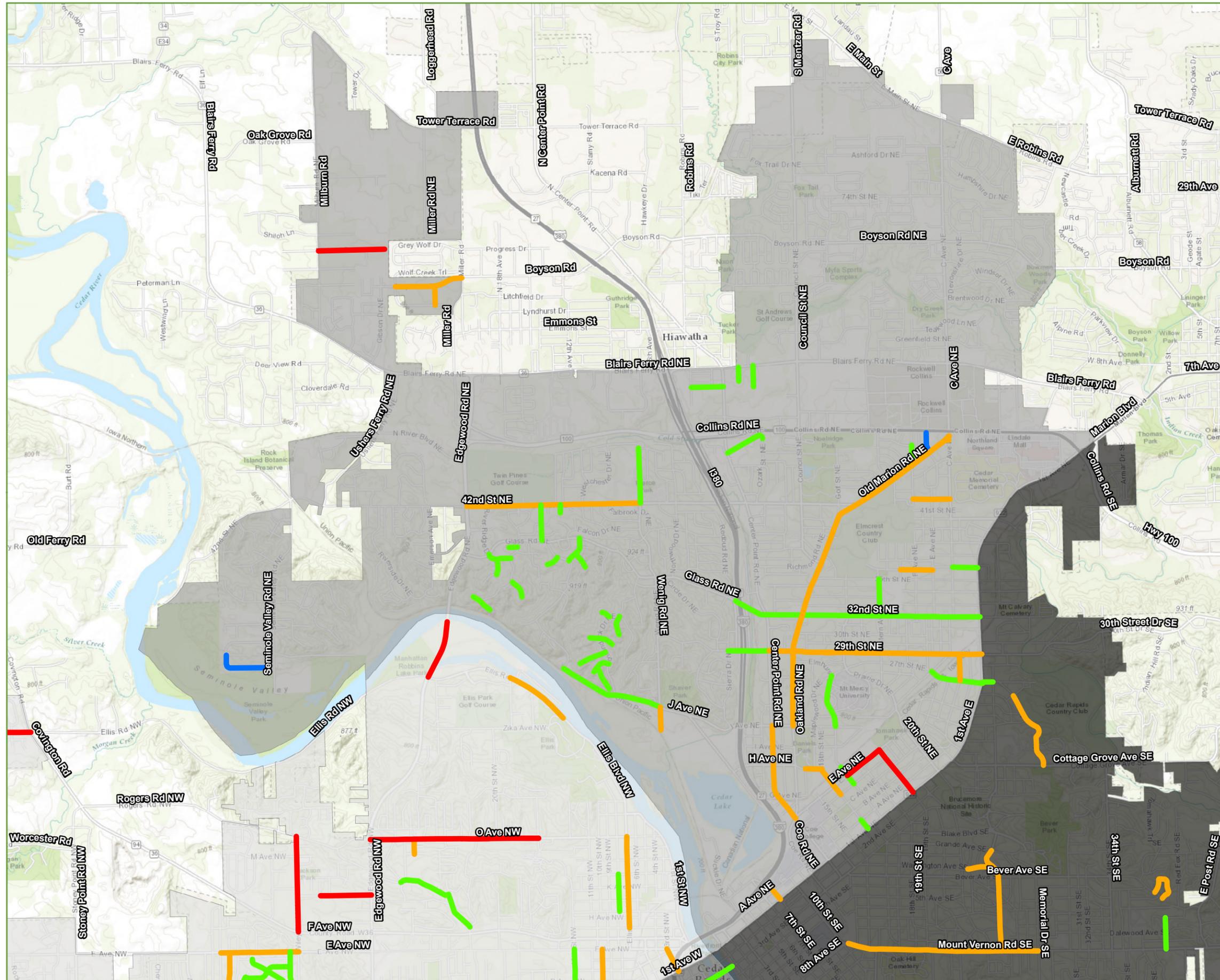


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Phase 3 (2022, 2023, 2024) Paving For Progress Projects

Cedar Rapids - NW Quadrant		
MAP 19 Phase 3 Projects		
 HRGreen	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017 DRAWN BY: M.S.L.
HRG JOB NO: 10130179	APPROVED BY: J.R.K.	DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,



Phase 3 (2022, 2023, 2024) Paving For Progress Projects

Cedar Rapids - NE Quadrant

MAP 20
Phase 3 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



Legend

Project Type

- Maintenance
- Minor Rehabilitation
- Major Rehabilitation
- Reconstruction

Quadrants

- NW
- NE
- SW
- SE

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors,

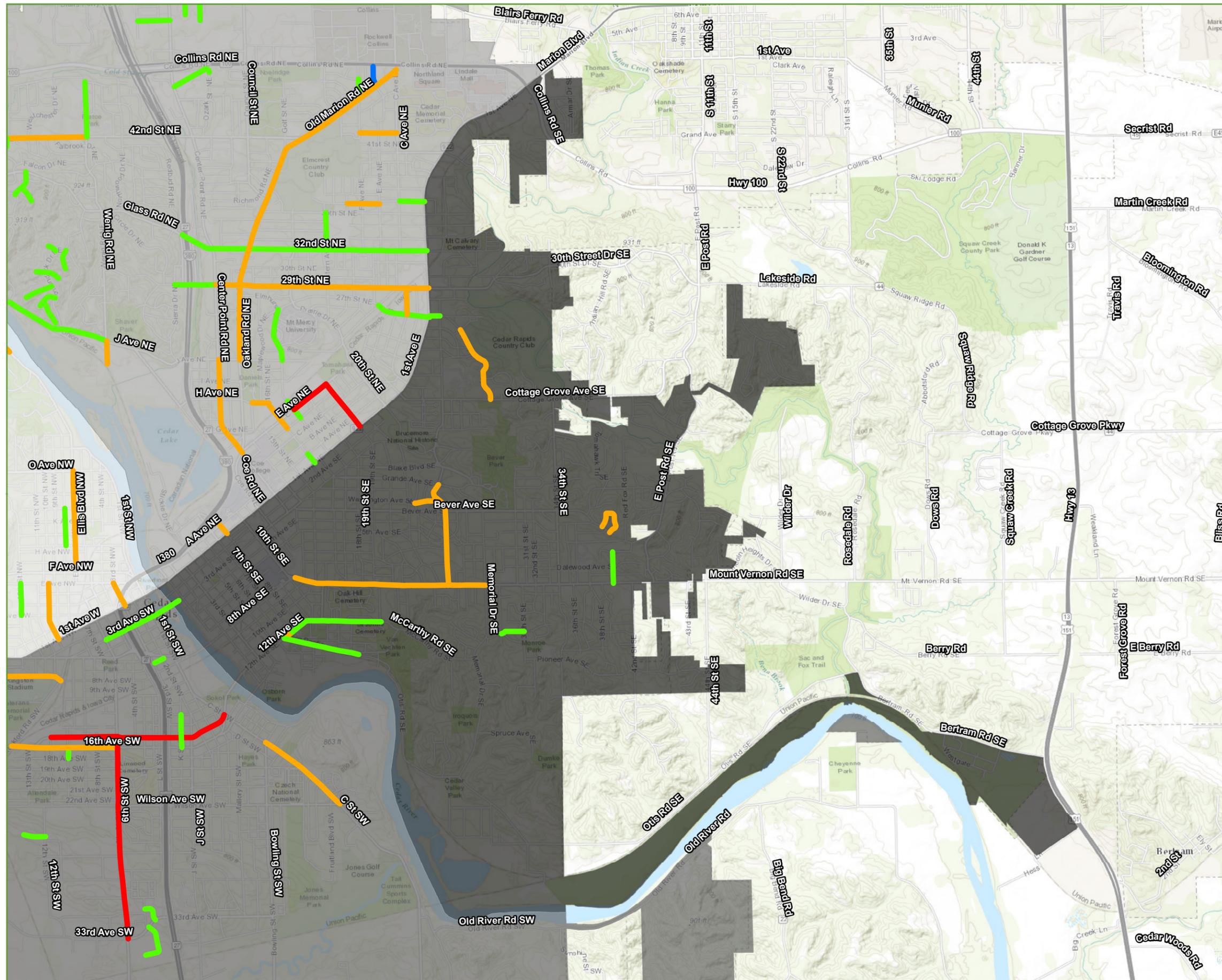


Phase 3 (2022, 2023, 2024) Paving For Progress Projects

Cedar Rapids - SE Quadrant

MAP 22
Phase 3 Projects

	8710 Earhart Lane SW Cedar Rapids, IA 52404 Phone: 319.841.4000	DATE: 4/21/2017
	HRG JOB NO: 10130179	APPROVED BY: J.R.K.
		DESIGNED BY: J.R.K.



PHASE 3: 2022-2024

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
11TH ST NW	C AVE NW	B AVE NW	0.07	Major Rehabilitation	
11TH ST SW	29TH AVE SW	26TH AVE SW	0.25	Minor Rehabilitation	To be bid as part of Group 715
11TH ST SW	63RD AVE SW	60TH AVE SW	0.15	Major Rehabilitation	To be bid as part of Group 25
12TH AVE SW	WILLIAMS BLVD	EDGEWOOD RD SW	0.54	Reconstruction	
12TH ST SW	18TH AVE SW	21ST AVE SW	0.22	Major Rehabilitation	
15TH ST NE	B AVE NE	E AVE NE	0.22	Major Rehabilitation	
15TH ST NW	A AVE NW	B AVE NW	0.22	Reconstruction	
16TH AVE SW	WILEY BLVD SW	23RD ST SW	1.17	Major Rehabilitation	
16TH ST NE	GREENE AVE NE	J AVE NE	0.07	Major Rehabilitation	
17TH ST NE	1ST AVE E	C AVE NE	0.22	Major Rehabilitation	
17TH ST SE	2ND AVE SE	1ST AVE E	0.08	Reconstruction	
18TH ST NE	1ST AVE E	E AVE NE	0.37	Major Rehabilitation	
18TH ST SW	WILSON AVE SW	29TH AVE SW	0.61	Major Rehabilitation	
1ST ST NW	PENN AVE NW	F AVE NW	0.96	Major Rehabilitation	
1ST ST SE	1ST ST NE	3RD AVE SE	0.15	Minor Rehabilitation	
21ST ST NE	D AVE NE	B AVE NE	0.18	Minor Rehabilitation	
22ND ST NE	D AVE NE	1ST AVE E	0.30	Major Rehabilitation	To be bid as part of Group 382
23RD ST DR SE	1ST AVE E	FOREST DR SE	0.16	Major Rehabilitation	To be bid as part of Group 158
23RD ST NE	D AVE NE	A AVE NE	0.22	Major Rehabilitation	To be bid as part of Group 381
26TH AVE SW	12TH ST SW	11TH ST SW	0.11	Minor Rehabilitation	To be bid as part of Group 715
28TH AVE SW	27TH ST SW	31ST ST SW	0.25	Major Rehabilitation	To be bid as part of Group 177
29TH AVE SW	12TH ST SW	6TH ST SW	0.51	Minor Rehabilitation	To be bid as part of Group 715
29TH AVE SW	WILEY BLVD SW	27TH ST SW	0.71	Minor Rehabilitation	
2ND AVE SE	23RD ST DR SE	27TH ST DR SE	0.30	Reconstruction	To be bid as part of Group 720
2ND ST SW	17TH AVE SW	13TH AVE SW	0.28	Major Rehabilitation	
30TH ST NE	D AVE NE	C AVE NE	0.06	Major Rehabilitation	To be bid as part of Group 642
30TH ST SE	MOUNT VERNON RD SE	PIONEER AVE SE	0.50	Reconstruction	
30TH ST SW	VAN BUREN DR SW	28TH AVE SW	0.26	Major Rehabilitation	To be bid as part of Group 177
31ST ST SW	28TH AVE SW	VAN BUREN DR SW	0.41	Major Rehabilitation	To be bid as part of Group 177
32ND AVE SW	6TH ST SW	12TH ST SW	0.46	Minor Rehabilitation	To be bid as part of Group 154
33RD AVE SW	EDGEWOOD RD SW	WILEY BLVD SW	0.23	Major Rehabilitation	To be bid as part of Group 97
33RD AVE SW	SOUTHLAND ST SW	BOWLING ST SW	0.10	Minor Rehabilitation	
33RD ST DR SE	3RD AVE SE	1ST AVE E	0.34	Major Rehabilitation	To be bid as part of Group 159
34TH ST SE	SOUTTER AVE SE	PIONEER AVE SE	0.75	Major Rehabilitation	
35TH ST DR SE	1ST AVE NE	3RD AVE SE	0.33	Major Rehabilitation	To be bid as part of Group 705
35TH ST NE	OAKLAND RD NE	1ST AVE NE	1.11	Major Rehabilitation	To be bid as part of Group 705
3RD AVE SE	35TH ST DR SE	33RD ST DR SE	0.13	Major Rehabilitation	To be bid as part of Group 159
3RD ST NW	F AVE NW	H AVE NW	0.14	Minor Rehabilitation	
3RD ST SW	16TH AVE SW	7TH AVE SW	0.59	Major Rehabilitation	To be bid as part of Group 49637
3RD ST SW	3RD AVE SW	2ND AVE SW	0.07	Major Rehabilitation	To be bid as part of Group 49637
40TH ST DR SE	1ST AVE E	GLENBROOK DR	0.25	Minor Rehabilitation	To be bid as part of Group 106
42ND ST NE	OZARK ST NE	OLD MARION RD NE	0.68	Major Rehabilitation	

PHASE 3: 2022-2024

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
42ND ST SE	MOUNT VERNON RD SE	PIONEER TRAIL SE	0.59	Major Rehabilitation	
44TH ST NE	E AVE NE	C AVE NE	0.08	Minor Rehabilitation	To be bid as part of Group 586
48TH ST NE	OZARK ST NE	COUNCIL ST NE	0.25	Minor Rehabilitation	
4TH AVE SE	1ST ST SE	5TH ST SE	0.29	Major Rehabilitation	
50TH AVE SW	J ST SW	BOWLING ST SW	0.51	Major Rehabilitation	
51ST ST NE	SYLVIA ST NE	COUNCIL ST NE	0.50	Minor Rehabilitation	To be bid as part of Group 117
5TH AVE SE	12TH ST SE	19TH ST SE	0.60	Major Rehabilitation	
60TH ST NE	COUNCIL ST NE	DRY CREEK LN NE	0.14	Minor Rehabilitation	To be bid as part of Group 141
63RD AVE SW	LOCUST RD SW	11TH ST SW	0.13	Major Rehabilitation	To be bid as part of Group 25
6TH AVE SE	6TH ST SE	7TH ST SE	0.08	Major Rehabilitation	To be bid as part of Group 425
6TH ST SE	8TH AVE SE	3RD AVE SE	0.36	Major Rehabilitation	To be bid as part of Group 425
6TH ST SW	58TH AVE SW	76TH AVE SW	1.14	Minor Rehabilitation	
71ST ST NE	C AVE NE	WILTON DR NE	0.04	Minor Rehabilitation	
7TH ST SW	1ST AVE W	4TH AVE SW	0.22	Major Rehabilitation	
7TH STR PL SW	32ND AVE SW	33RD AVE SW	0.15	Minor Rehabilitation	To be bid as part of Group 154
9TH ST SW	20TH AVE SW	10TH AVE SW	0.55	Major Rehabilitation	
A AVE NE	23RD ST NE	29TH ST NE	0.49	Major Rehabilitation	To be bid as part of Group 381
A ST SW	C ST SW	12TH AVE SW	0.23	Minor Rehabilitation	
ADELINE CT SW	EDGEWOOD RD SW	W TO DEAD END	0.06	Minor Rehabilitation	
ADIRONDACK DR NE	J AVE NE	ALLEGHANY DR NE	0.65	Major Rehabilitation	To be bid as part of Group 263
ARMAR DR	MARION BLVD	TOWN LINE	0.14	Major Rehabilitation	To be bid as part of Group 82
ARMAR DR SE	BRIDGIT LN SE	S TO DEAD END	0.45	Major Rehabilitation	
B AVE NE	14TH ST NE	19TH ST NE	0.63	Minor Rehabilitation	
B AVE NE	22ND ST NE	24TH ST NE	0.21	Major Rehabilitation	To be bid as part of Group 382
B AVE NW	3RD ST NW	4TH ST NW	0.07	Reconstruction	To be bid as part of Group 472
BELMONT PKWY NW	WESTWOOD DR NW	HIGHWOOD DR NW	0.37	Minor Rehabilitation	To be bid as part of Group 295
BENT TREE CT NE	BENT TREE RD NE	S TO DEAD END	0.17	Major Rehabilitation	To be bid as part of Group 261
BERKSHIRE DR NE	NORMANDY DR NE	HAMPSHIRE DR NE	0.43	Minor Rehabilitation	
BLAKE BLVD SE	FOREST DR SE	17TH ST SE	0.65	Major Rehabilitation	
BLUE MOUND DR NE	PINE GROVE DR NE	TWIN MOUND DR NE	0.20	Minor Rehabilitation	To be bid as part of Group 33
BOYSON RD NE	DOUBLETREE RD NE	C AVE NE	0.64	Minor Rehabilitation	
BRENTWOOD DR NE	ASHTON PL NE	BOYSON RD NE	0.84	Major Rehabilitation	
BRIDGIT LN SE	ARMAR DR SE	TAMA ST SE	0.17	Minor Rehabilitation	
BROOKDALE LN NE	IDLEDALE RD NE	COUNCIL ST NE	0.27	Major Rehabilitation	To be bid as part of Group 110
C AVE NE	29TH ST NE	32ND ST NE	0.25	Major Rehabilitation	To be bid as part of Group 642
CANDLEWICK DR NE	WILTON DR NE	STONEHAVEN LN NE	0.15	Minor Rehabilitation	
CENTER POINT RD NE	MCCLOUD PL NE	42ND ST NE	0.61	Major Rehabilitation	
CHELSEA DR NE	BOYSON RD NE	REVERE DR NE	0.45	Minor Rehabilitation	
CIMMIE AVE NE	DRY CREEK LN NE	ROCKWELL DR NE	0.39	Minor Rehabilitation	To be bid as part of Group 141
CONTINENTAL PL NE	ROCKWELL DR NE	W TO DEAD END	0.18	Minor Rehabilitation	
COTTAGE GROVE AVE SE	34TH ST SE	1ST AVE E	1.06	Major Rehabilitation	
COVENTRY LN NE	LANCASTER DR NE	TOWNE HOUSE DR NE	0.15	Minor Rehabilitation	

PHASE 3: 2022-2024

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
D AVE NW	WEST POST RD NW	W TO DEAD END	0.28	Major Rehabilitation	
DEVONSHIRE DR NE	BOYSON RD NE	WILTON DR NE	0.07	Minor Rehabilitation	
DRY CREEK LN NE	60TH ST NE	BLAIRS FERRY RD NE	0.19	Minor Rehabilitation	To be bid as part of Group 141
DUFFY DR NE	PARK PL NE	COLLINS AVE NE	0.12	Minor Rehabilitation	
E AVE NE	29TH ST NE	32ND ST NE	0.25	Major Rehabilitation	To be bid as part of Group 642
E AVE NE	40TH ST NE	WOODFIELD LN NE	0.22	Minor Rehabilitation	
E AVE NE	WOODFIELD LN NE	NILSEN RD NE	0.19	Minor Rehabilitation	To be bid as part of Group 586
EAST MAIN ST NE	E MAIN ST	AMELIA DR NE	0.14	Major Rehabilitation	
EAST POST RD SE	BEVER AVE SE	MOUNT VERNON RD SE	0.63	Minor Rehabilitation	
EAST ROBINS RD NE	C AVE EXT	EAST ROBINS RD	0.19	Major Rehabilitation	
EDGEWOOD DR NW	S TO DEAD END	N TO DEAD END	0.32	Minor Rehabilitation	
EDGEWOOD RD NW	29TH ST NW	ELLIS RD NW	0.58	Major Rehabilitation	
EDGEWOOD RD NW	F AVE NW	O AVE NW	0.63	Reconstruction	To be bid as part of Group 12864
EDWARD CT SE	EDWARD CT NE	W TO DEAD END	0.05	Minor Rehabilitation	
EMERSON AVE NE	RIVERBEND DR NE	RIVERSIDE CT NE	0.06	Major Rehabilitation	To be bid as part of Group 261
F AVE NW	15TH ST NW	10TH ST NW	0.27	Major Rehabilitation	
FIR TREE DR NE	TWIN MOUND DR NE	N PINE DR NE	0.08	Minor Rehabilitation	To be bid as part of Group 33
FOREST DR SE	COTTAGE GROVE AVE SE	23RD ST DR SE	0.27	Major Rehabilitation	To be bid as part of Group 720
FOREST DR SE	LINDEN DR SE	COTTAGE GROVE AVE SE	0.33	Major Rehabilitation	To be bid as part of Group 720
G AVE NE	29TH ST NE	STAUB CT NE	0.06	Minor Rehabilitation	
GLENBROOK DR SE	1ST AVE E	40TH ST DR SE	0.33	Minor Rehabilitation	To be bid as part of Group 106
GLENWOOD DR NW	WOODLAND CT NW	BELMONT PKWY NW	0.19	Minor Rehabilitation	To be bid as part of Group 295
GRANDE AVE SE	16TH ST SE	19TH ST SE	0.24	Major Rehabilitation	To be bid as part of Group 396
HALL CT NE	51ST ST NE	S TO DEAD END	0.07	Minor Rehabilitation	To be bid as part of Group 117
HAWKEYE DOWNS RD SW	J ST SW	6TH ST SW	0.58	Major Rehabilitation	
HILLMER DR SW	31ST ST SW	29TH ST SW	0.12	Major Rehabilitation	To be bid as part of Group 177
IDLEDALE RD NE	BROOKDALE LN NE	COUNCIL ST NE	0.33	Major Rehabilitation	To be bid as part of Group 110
J AVE NE	SHAVER RD NE	I AVE NE	1.20	Major Rehabilitation	
J ST SW	33RD AVE SW	37TH AVE SW	0.42	Major Rehabilitation	
J ST SW	37TH AVE SW	HAWKEYE DOWNS RD SW	0.11	Major Rehabilitation	
JOMAR CT SW	WILSON AVE SW	S TO DEAD END	0.11	Major Rehabilitation	To be bid as part of Group 177
KERRY LN SE	TAMA ST SE	ARMAR DR SE	0.18	Minor Rehabilitation	
KIRKWOOD BLVD SW	KIRKWOOD CT SW	OKLAHOMA AVE SW	0.38	Major Rehabilitation	
L ST NW	1ST AVE NW	3RD ST NW	0.12	Major Rehabilitation	To be bid as part of Group 518
L ST SW	10TH AVE SW	L ST NW	0.64	Major Rehabilitation	To be bid as part of Group 518
LAKESIDE DR NE	TWIXT TOWN RD	S TO DEAD END	0.05	Major Rehabilitation	To be bid as part of Group 83
LANCASTER DR NE	TOWNE HOUSE DR NE	COVENTRY LN NE	0.22	Minor Rehabilitation	
LINDALE AVE NE	27TH ST NE	32ND ST NE	0.36	Major Rehabilitation	To be bid as part of Group 642
LOCUST RD SW	60TH AVE SW	66TH AVE SW	0.38	Major Rehabilitation	To be bid as part of Group 25
MAUREEN CT SE	EDWARD CT NE	W TO DEAD END	0.11	Minor Rehabilitation	
MAUREEN DR SE	BRIDGIT LN SE	EDWARD CT NE	0.18	Minor Rehabilitation	
MILLER RD NE	BLAIRS FERRY XING	CARPENTER RD NE	0.26	Major Rehabilitation	To be bid as part of Group 291

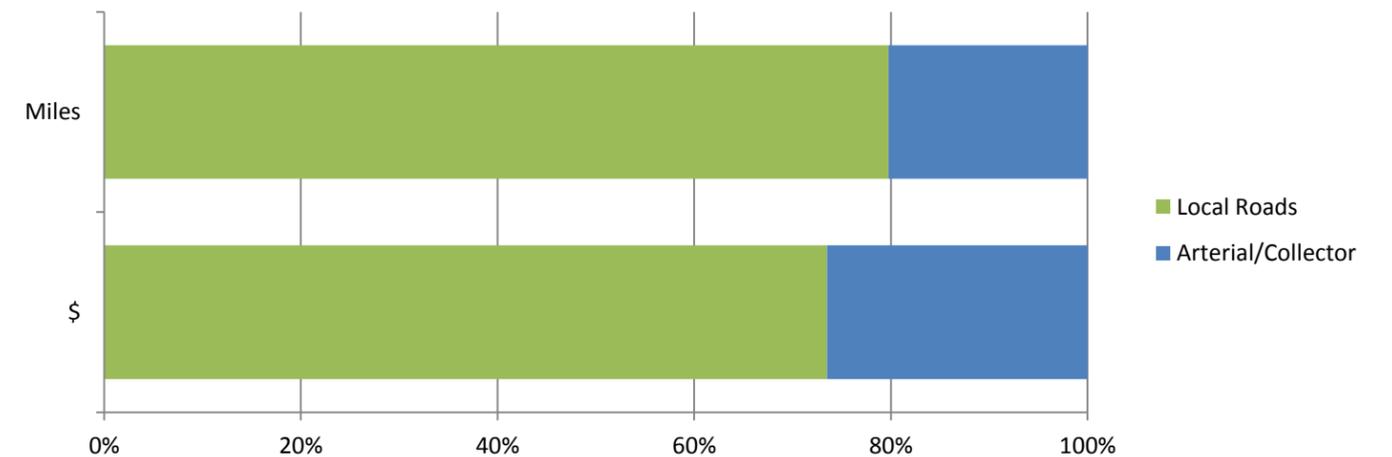
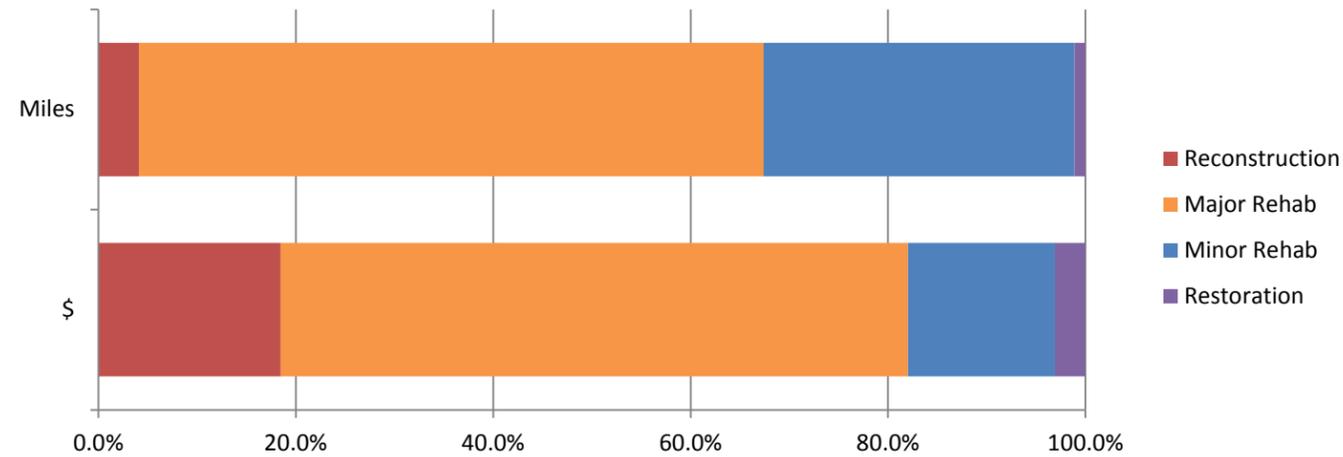
PHASE 3: 2022-2024

Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
NILSEN RD NE	F AVE NE	C AVE NE	0.29	Minor Rehabilitation	To be bid as part of Group 586
NORMANDY DR NE	HAMPSHIRE DR NE	BECKETT DR NE	0.18	Minor Rehabilitation	
NORTH PINE DR NE	BLAIRS FERRY RD	N PINE DR NE	0.40	Minor Rehabilitation	To be bid as part of Group 33
NORTHBROOK DR NE	BOXWOOD LN NE	COUNCIL ST NE	0.25	Major Rehabilitation	
NORTHLAND AVE NE	COLLINS AVE	BLAIRS FERRY RD NE	0.41	Minor Rehabilitation	To be bid as part of Group 85
NORTHLAND CT NE	NORTHLAND AVE NE	E TO DEAD END	0.05	Minor Rehabilitation	To be bid as part of Group 85
NORTHWOOD DR NE	DAVID CT NE	FAIRLANE DR NE	0.05	Major Rehabilitation	
O AVE NW	ELLIS BLVD NW	1ST ST NW	0.23	Major Rehabilitation	
OLD ORCHARD CT NE	OLD ORCHARD RD NE	W TO DEAD END	0.12	Major Rehabilitation	To be bid as part of Group 262
OLD ORCHARD RD NE	OLD ORCHARD CT NE	GLASS RD NE	0.72	Major Rehabilitation	To be bid as part of Group 262
OZARK ST NE	48TH ST NE	DODGE RD NE	0.09	Minor Rehabilitation	
PARK PL NE	PARK PLACE LN NE	ROCKWELL DR NE	0.28	Minor Rehabilitation	
PARK PLACE LN NE	COLLINS AVE NE	PARK PL NE	0.12	Minor Rehabilitation	
PINE GROVE CT NE	PINE GROVE DR NE	E TO DEAD END	0.09	Minor Rehabilitation	To be bid as part of Group 33
PINE GROVE DR NE	SILVER SPRING DR NE	PINE TREE DR NE	0.27	Minor Rehabilitation	To be bid as part of Group 33
PINE TREE DR NE	N PINE DR NE	W TO DEAD END	0.14	Minor Rehabilitation	To be bid as part of Group 33
PINE VIEW DR NE	42ND ST NE	SUGAR PINE DR NE	0.18	Minor Rehabilitation	
PINE WOOD DR NE	YELLOW PINE DR NE	PINE GROVE DR NE	0.21	Minor Rehabilitation	To be bid as part of Group 33
PRAIRIE DR NE	ROBINWOOD LN NE	34TH ST NE	0.51	Minor Rehabilitation	To be bid as part of Group 2600
PRINCETON DR NE	BERKSHIRE DR NE	WESTBURY DR NE	0.22	Minor Rehabilitation	
REVERE DR NE	REVERE CT NE	CHELSEA DR NE	0.13	Minor Rehabilitation	
RIVERSIDE CT NE	EMERSON AVE NE	E TO DEAD END	0.10	Major Rehabilitation	To be bid as part of Group 261
RIVERSIDE DR NE	42ND ST NE	RIVERBEND DR NE	0.77	Minor Rehabilitation	To be bid as part of Group 261
ROCKFORD RD SW	3RD AVE SW	16TH AVE SW	0.72	Major Rehabilitation	
ROCKVALLEY DR SW	1ST AVE W	ROCK VALLEY DR SW	0.13	Minor Rehabilitation	
ROCKWELL DR NE	BLAIRS FERRY RD NE	N TO DEAD END	0.48	Minor Rehabilitation	To be bid as part of Group 311
ROCKWELL DR NE	COLLINS AVE NE	BLAIRS FERRY RD NE	0.46	Minor Rehabilitation	
ROLLINGWOOD DR NW	JOHNSON AVE NW	WELLESLEY CT NW	0.13	Minor Rehabilitation	
SILVER SPRING DR NE	N PINE DR NE	PINE GROVE DR NE	0.12	Minor Rehabilitation	To be bid as part of Group 33
SPRUCE WOOD CT NE	N PINE DR NE	W TO DEAD END	0.07	Minor Rehabilitation	To be bid as part of Group 33
SPRUCE WOOD DR NE	SPRUCEWOOD DR NE	N PINE DR NE	0.10	Minor Rehabilitation	To be bid as part of Group 33
SQUARE D DR SW	33RD AVE SW	S TO DEAD END	0.10	Minor Rehabilitation	
STONEHAVEN LN NE	WATERBURY LN NE	CHELSEA DR NE	0.18	Minor Rehabilitation	
STONEY POINT RD NW	E AVE NW	STONY POINT RD NW	0.25	Major Rehabilitation	
THOMPSON DR SE	1ST AVE E	FOREST DR SE	0.20	Minor Rehabilitation	To be bid as part of Group 158
THORNDALE DR NE	BERKSHIRE DR NE	WINSTON DR NE	0.23	Minor Rehabilitation	
TIMBERLINE DR NE	GLASS RD NE	WYNDHAM DR NE	0.31	Minor Rehabilitation	To be bid as part of Group 584
TRAILRIDGE RD SE	EAST POST RD SE	RED FOX RD SE	0.28	Major Rehabilitation	
TWIN MOUND DR NE	FIR TREE DR NE	S TO DEAD END	0.14	Minor Rehabilitation	To be bid as part of Group 33
TWIXT TOWN RD NE	COLLINS AVE	LINDALE DR	0.49	Major Rehabilitation	To be bid as part of Group 83
USHERS FERRY RD NE	42ND ST NE	CHESTNUT VALLEY RD NE	0.59	Minor Rehabilitation	
VAN BUREN DR SW	29TH ST SW	31ST ST SW	0.13	Major Rehabilitation	To be bid as part of Group 177
WATERBURY LN NE	STONEHAVEN LN NE	CANDLEWICK DR NE	0.12	Minor Rehabilitation	
WESTBURY DR NE	BERKSHIRE DR NE	PRINCETON DR NE	0.30	Minor Rehabilitation	
WESTCHESTER DR NE	42ND ST NE	TOWNE HOUSE DR NE	0.55	Major Rehabilitation	To be bid as part of Group 259
WESTERN PINE DR NE	N PINE DR NE	SPRUCEWOOD DR NE	0.10	Minor Rehabilitation	To be bid as part of Group 33

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Road Name	Start Intersection	End Intersection	MILES	Treatment Type	Comments/Notes
WESTOVER RD SE	40TH ST SE	GLENBROOK DR	0.15	Minor Rehabilitation	To be bid as part of Group 106
WILEY BLVD SW	33RD AVE SW	WILLIAMS BLVD	0.48	Major Rehabilitation	To be bid as part of Group 97
WILLSHIRE CT NE	CHELSEA DR NE	E TO DEAD END	0.14	Minor Rehabilitation	
WILSON AVE DR SW	TERESA DR SW	FRUITLAND BLVD SW	0.34	Minor Rehabilitation	
WILSON AVE SW	14TH ST SW	NEWPORT DR SW	0.53	Major Rehabilitation	
WILTON CT NE	WILTON DR NE	W TO DEAD END	0.03	Minor Rehabilitation	
WILTON DR NE	CHELSEA DR NE	CHELSEA DR NE	0.39	Minor Rehabilitation	
WINSTON DR NE	BERKSHIRE DR NE	THORNDALE DR NE	0.23	Minor Rehabilitation	
WOODFIELD LN NE	NILSEN RD NE	E AVE NE	0.13	Minor Rehabilitation	To be bid as part of Group 586
WOODLAND CT NW	GLENWOOD DR NW	N TO DEAD END	0.08	Minor Rehabilitation	To be bid as part of Group 295
WOODSIDE DR NW	O AVE NW	WESTWOOD DR NW	0.28	Major Rehabilitation	To be bid as part of Group 228
WYNDHAM DR NE	TIMBERLINE DR NE	CEDAR RIDGE DR NE	0.26	Minor Rehabilitation	To be bid as part of Group 584
YELLOW PINE CT NE	N PINE DR NE	W TO DEAD END	0.07	Minor Rehabilitation	To be bid as part of Group 33
YELLOW PINE DR NE	N PINE DR NE	PINE WOOD DR NE	0.10	Minor Rehabilitation	To be bid as part of Group 33

Totals 132 Projects 57.0 Mi





Appendix A: 2014 Plan



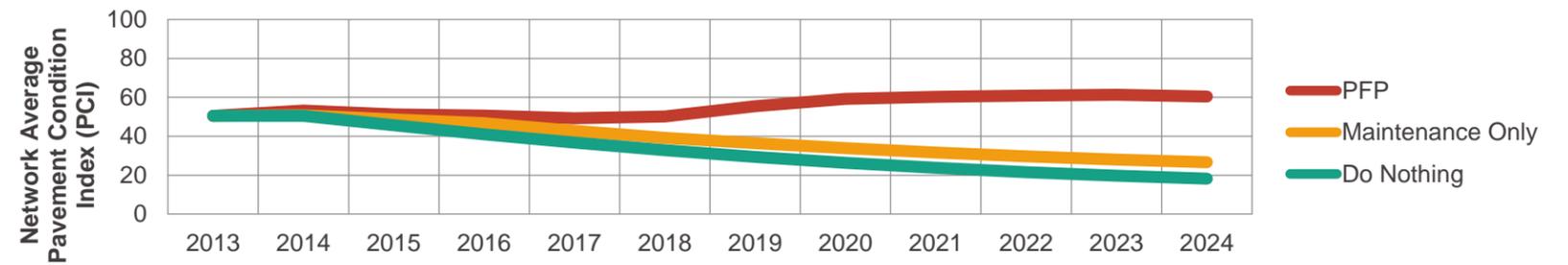
2014 Executive Summary

The objective of “Paving for Progress” (PFP) is to improve the neighborhoods of Cedar Rapids, making them more comfortable, convenient and desirable places to live, play and work. In support of this objective, Cedar Rapids voters approved a one-cent Local Option Sales Tax (LOST), in November of 2013, to fund street improvements over the next 10 years. Approval of the LOST coincided with the first delivery of the Iowa Pavement Management Program’s (IPMP) pavement condition data from Iowa State University. In order to determine the best way to spend the PFP funds, the City retained the services of HR Green, Inc. to develop a comprehensive and impartial pavement management program. This program compiles information from a number of sources and uses computer modelling techniques to help in evaluating the entirety of Cedar Rapids’ 600 miles of roadways. The IPMP data, in combination with field inspections performed by City staff and HR Green, served as the basis for the analysis of current pavement conditions and projecting future performance of the road network. The resulting plan provides guidance on the most effective maintenance practices, rehabilitation treatments, and reconstruction activities.

Condition scores were developed, and treatment types selected for use in the plan. The average road in the City has a Pavement Condition Score of 55/100, which represents the very top of the “Fair” category. The majority of roads in Cedar Rapids are quite old. Approximately 90% will need some form of work within the next 10-12 years. Currently, the roadways ranked in “Good” condition carry less than 13% of traffic in Cedar Rapids. These low volume roads will see less damage annually, so they will not need much work, and fewer people will derive benefits from any repair done. The greatest impact to the travelling public, and most efficient use of PFP, will be from maintaining and improving the higher traffic “Fair” and “Poor” conditioned roads.

The collection of LOST funds started July 1, 2014. To put the collected revenue to immediate use, “Quickstart” projects were selected for completion in the 2014 and 2015 construction seasons. Starting in 2016, road projects will be selected from the evaluations of this plan. Each project location and treatment type recommendation was determined through the use of modelling software and GIS analyses.

Paving For Progress: A Critical Road Investment



APPROXIMATELY
36%

OF ALL LANE-MILES IN THE CEDAR RAPIDS
WILL UNDERGO TREATMENT

MORE THAN **50%**
OF ALL VEHICLE MILES

DRIVEN IN CEDAR RAPIDS WILL BE ON ROADS
REPAIRED THROUGH THE PFP FUNDING

AT LEAST **60%**
OF ALL CITIZENS

WILL BE WITHIN WALKING
DISTANCE OF A PROJECT

IN EXCESS OF \$150 MILLION OF
CONSTRUCTION WILL OCCUR BY
THE END OF THE PROGRAM

\$150
MILLION

IF THAT MUCH MONEY IN \$10
BILLS WERE STACKED ON TOP
OF EACH OTHER, THEY WOULD
REACH OVER A MILE HIGH



Introduction

What is “Paving for Progress?”

Paving for Progress is a *program* that carries out an important City *policy*. The policy objective is to improve not only street conditions, but the curb appeal of neighborhoods throughout Cedar Rapids. The City recognizes that street conditions are holding some neighborhoods back from reaching their potential. Therefore the City has launched a program to improve neighborhoods, and help them become more comfortable, convenient and desirable places. This program was branded *Paving for Progress*. In November of 2013, Cedar Rapids approved a one-cent Local Option Sales Tax (LOST) specifically for maintenance, repair, construction and reconstruction of roads within Cedar Rapids. The LOST had already existed since 2008, when it was initially passed to help Cedar Rapids recover from a devastating flood. The 2013 ballot initiative simply continued that existing LOST, and redirected its revenues to a new and timely purpose. In order to make the best use of this money, Cedar Rapids worked with HR Green – a 102-year-old Cedar Rapids engineering firm – to develop an impartial, data-based, system of determining the best projects to include in a proposed 10-year pavement improvement program.

Using Pavement Management methodology, HR Green developed recommendations using the right pavement treatment, at the right time, on the right road. Large amounts of pavement condition data were collected and analyzed with complex computer models, to determine the best use of the LOST revenues and improve the overall condition of the public road network in Cedar Rapids. This report is the culmination of those efforts and includes a 10-year plan of recommended projects that capitalizes on \$18 million in new annual revenue, set aside solely for the maintenance, rehabilitation, and reconstruction of public streets.

Program Goals

- Improve/maintain the network so the average road is in “Fair” or better condition.
- Follow through on promises to the citizens of Cedar Rapids who approved the tax.
- Dedicate additional effort to the local street network.
- Commit to spending the revenues wisely on behalf of the public through a strategic, data driven plan

Analysis & Methods

Data Collection

Roadway pavement condition data were collected by a *Fugro Roadware Automatic Road Analyzer (ARAN)*. This is a van outfitted with an array of sensors and cameras that automatically collect data about the road. These data include, but are not limited to, cracking, potholes, faulting, spalling, rutting, etc. The data was then processed and divided up using the existing City of Cedar Rapids’ road segmentation for use in ArcGIS (a mapping and data analytics software) by Iowa State University’s Institute for Transportation, which is the agency currently supporting Iowa DOT’s pavement management data collection.

Along with the ARAN data collection, City of Cedar Rapids Staff provided manual inspection services for many roads. This inventory was based on the University of Wisconsin- Madison’s Pavement Surface Evaluation and Rating (PASER) System. The PASER inventory recorded information similar to the data collected by the ARAN, using a tablet computer. Additionally, information on sidewalks, curb ramps, storm inlets and more were collected. This “on-the-ground” field data was used to verify the ARAN collected data, and to supplement information that could not be collected by the ARAN, such as pavement history and curb/gutter



Figure 1: Automatic Road Analyzer (ARAN) - The van is outfitted with an array of sensors and cameras that automatically collect data about the road.

condition. Each of the roads was then placed into a condition category ranging from “Very Poor” to “Very Good.” All of the data was then appended with information regarding traffic, functional class, number of lanes and the like, then stored within both GIS and dTIMS databases so that it could be analyzed.

Pavement Life Cycles

The reason pavement management techniques are important is that pavements do not decay at a constant rate over time. Time is a crucial factor in how much investment it takes to repair a road back to a serviceable status. A new pavement will not change drastically over the early years of its life, but once it starts to go, it can go very quickly. If left too long, the pavement may even reach failing status.

When these problems are caught early, however, a small investment at the right time can drastically improve the life of a pavement. Rehabilitating a pavement in “Fair” condition will usually cost less than 25% of what it takes to reconstruct a failing pavement.

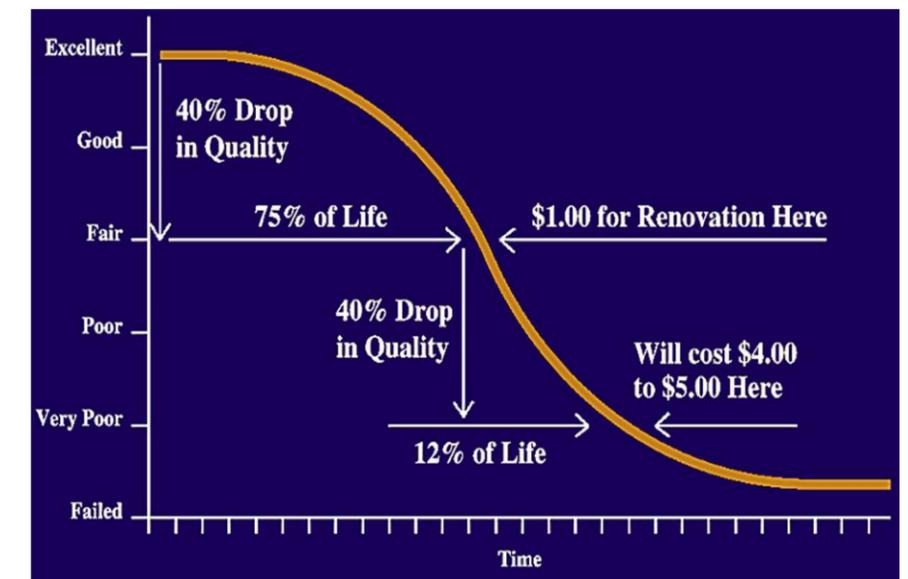


Figure 2: Renovating a pavement in fair condition will usually cost less than 25% of what it takes to reconstruct a failing pavement.



Therefore, it is important to invest wisely and early. Paving for Progress sets Cedar Rapids on a course toward this ideal practice of early and wise investment.

However, before an ideal road network can be reached, many of the worst roadways will need to be reconstructed. Pavements in the “Poor” condition category will, in most cases, be deferred or given light maintenance with the intent of reconstructing before reaching “Very Poor” condition. This effectively saves money and squeezes the most life out of the network, while still giving the opportunity to practice Pavement Management elsewhere in the City.

Different types of pavement behave differently, and different classes of road have different stressors. To accommodate these factors, a pavement life cycle curve was developed for Asphalt and Concrete pavement types and separated further into local and arterial classifications. These curves were calibrated to follow the general assumption that a pavement reaches “Fair” condition at 75% of its design life, and “Very Poor” condition at the end of its design life. Existing pavement ages were not available in all cases, so they were assumed using back calculations of the pavement life-cycle curve to determine their approximate functional stage. These curves do not represent the traditional design life-cycle curve; instead they address the performance of the pavement and how much longer we can realistically expect it to last without having to determine the structural characteristics and history for every street in the City.

The automated data collection process delivered a detailed output of 0.10-mile sections of roadway that were then aggregated to city-block sized summary sections matching the aforementioned segmentation from the City. Each type of distress was then assessed for severity and quantity and combined to form an overall condition index for each section. This pavement condition index (PCI) was used as the primary assessment variable in determining if a pavement needed some form of treatment. Specific distresses also were used as trigger conditions and helped to determine which type of treatment should be used in each project.

In order to model the different behaviors of different types of pavement, life cycle curves were created using the expected life and the condition thresholds for ACC and PCC pavements for both arterial and local streets, respectively. The equation and curve represent how a typical pavement will perform as pavement age increases. A separate curve was developed for each pavement type and functional class.

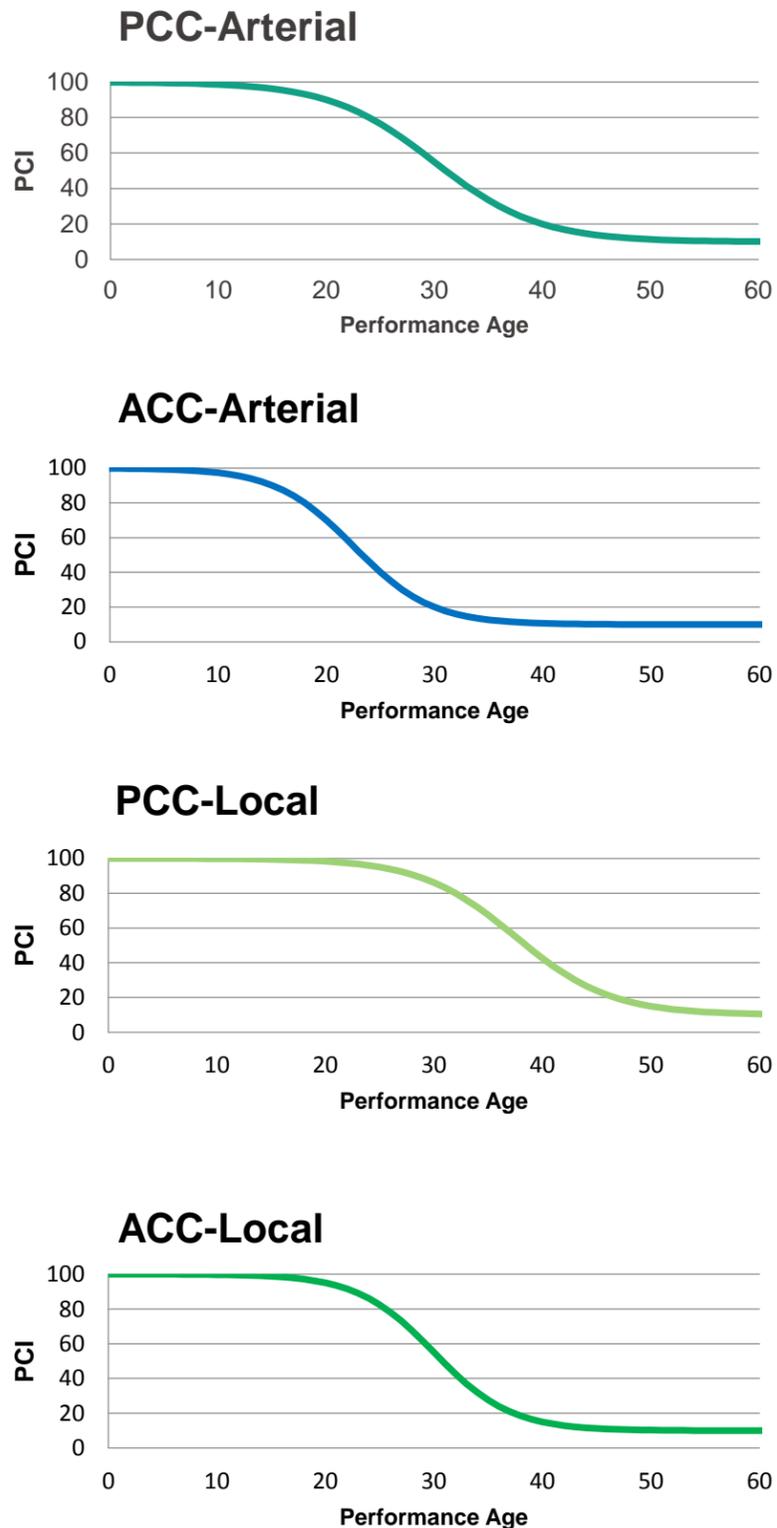


Figure 4: Example Pavement Performance Curves

Condition Thresholds

Initial condition thresholds were created after careful research of similar pavement management programs, condition rating systems, and analysis of the IPMP data. These are used to determine when roads should be repaired and what target condition level the Cedar Rapids Road Network ought to maintain. The threshold values were then taken before a steering committee of Cedar Rapids Maintenance, Construction, and Public Works staff for final guidance on the selection of condition criteria.

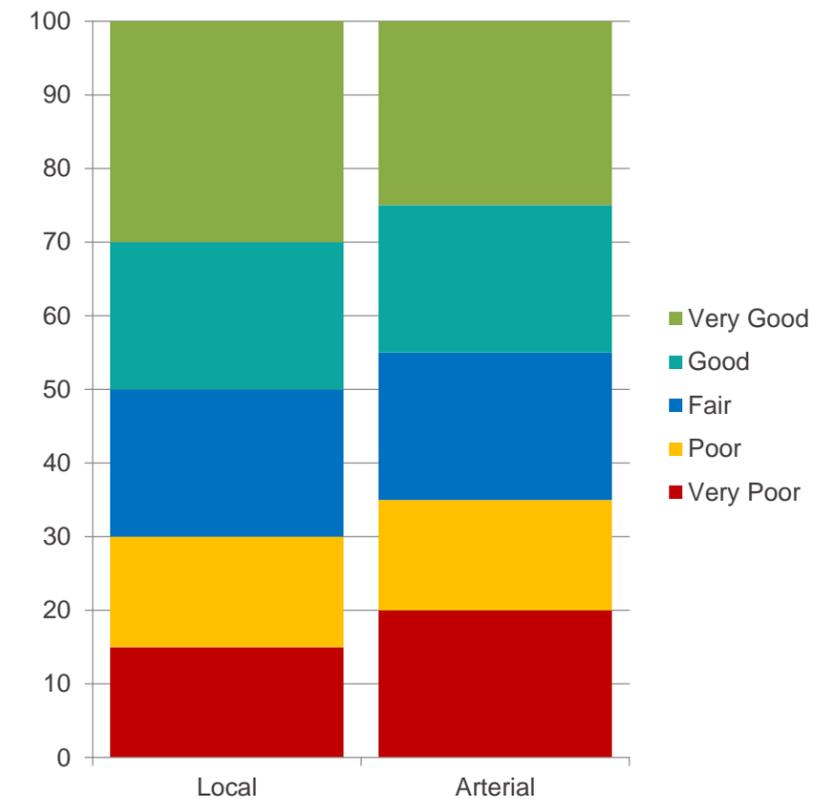


Figure 5: Paving For Progress Condition Thresholds

Local and Arterial streets have different PCI thresholds because Arterial street usage requires a higher standard of performance. Arterial streets receive much higher volumes of traffic than Local streets, and are typically traveled at higher speeds. Small distresses become a larger nuisance when driven at higher speeds, so what might be acceptable on a Local street would not, in many cases, be acceptable on an Arterial route. This plan categorizes all roads not classified as a Local road as Arterial, for modelling purposes.



Figure 6: These roads had the highest overall ratings for both Roughness and PCI; both were in the 80's and freshly resurfaced.



Figure 7: Example of Fair road condition.



Figure8: Example of Poor road condition.



Figure9: Perhaps the worst location in the City, an entire intersection with PCI < 10.

Network Conditions (Lane Miles)

■ Fair ■ Poor ■ Good or Better

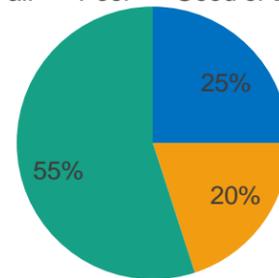


Figure 10: Existing Network Condition

Network Summary

On a total mileage basis, it may appear the Cedar Rapids road network is in excellent condition. More than half of the lane miles in the City are in “Good” or “Very Good” condition. However, less than 13% of the public’s vehicle miles annually are traveled on those roads! The vast majority of traffic occurs on roads in “Fair” condition. Moreover, the average PCI rating across the City is just 55, which is considered “Fair,” and the highest PCI ratings observed in the City are only in the 80’s.

This plan aims to reduce the number of “Poor” conditioned roads, but more importantly, it is intended to maintain the heavily travelled “Fair” condition roads by extending their service life with restorative maintenance and optimal rehabilitations. Ten years is a long time in the life of a road, which typically lasts 30-40 years. If no maintenance occurred within Cedar Rapids, we would expect the road conditions to worsen and quite quickly in many cases. In fact, 90% of the Cedar Rapids Network will need some form of preventative maintenance in the next 10 years to keep everything from falling below the “Poor” condition threshold.

Condition Distribution (No work)

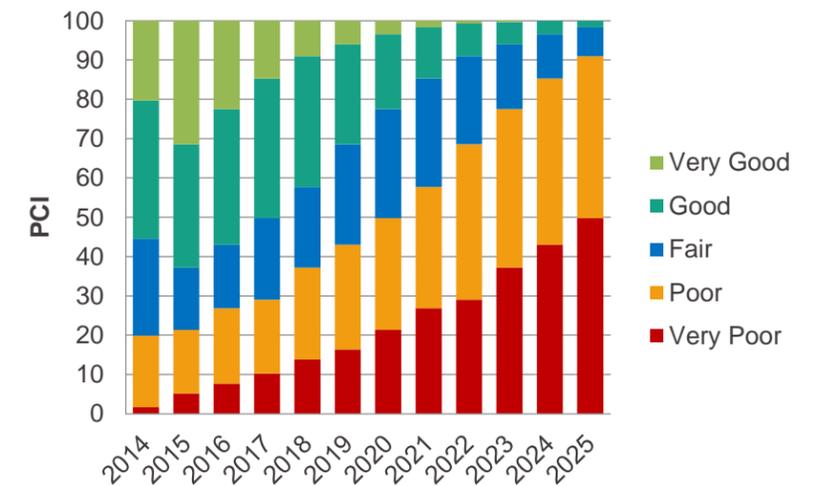


Figure 11: Initial improvements to the network as shown in the graph are from the Quickstart program.



Network Summary Maps





Treatments

While there are many ways to repair or build a road, for the scope of this plan and the sheer volume of data, the final model needed to select from a limited menu of treatments as opposed to every treatment method available. A list of many categories of treatments was provided to the City and City staff selected what they felt were most likely to be used in Cedar Rapids. These selected treatments were then separated into three categories: maintenance, rehabilitation, and reconstruction. Each treatment was given a price, a unique trigger condition, and an improvement effect.

The triggers determine when the various treatments are used for a given road based on its unique condition. Some treatments pertain only to Portland Cement Concrete (PCC) roads, while others pertain only to Asphalt Cement Concrete (ACC) roads. Others pertain to both pavement types and are based on information such as the amount of cracks in the pavement or the amount of patches already done on the road. Once a treatment is selected from the “toolbox,” the improvement effect is applied. Some effects include resetting the cracking to a value of “0” or increasing the PCI rating by a certain percentage. In Figure 12, the green line represents the change applied to a road after a thick overlay, while the red line is the projected decay if nothing was done to the road at all. The difference between the two curves is one of the key variables (the others are cost and traffic) in determining which treatment is best. The treatment effect (green) will be different between treatments but also depend on which year it is treated.

Seal Coat, Brick, and Gravel roads were not considered as a part of the analysis. The methods and treatment types in this study do not apply to such roads. Since these roads represent a small fraction of the overall road network in Cedar Rapids, they will be handled on a case by case basis. It is recommended that these roads continue to be monitored closely over the life of this plan.

In this planning phase, and in addition to the budgeting and treatments, pavement performance curves were created to model the life-cycle of a road’s pavement. Considering the time-span of this project, it is imperative the final model be able to make rational estimates and projections about conditions years from now. Where pavement age was not available, it was estimated based on current conditions and life-span behaviors of similar pavements. Each year, the whole road network’s condition will decay based on estimated

age and road characteristics (including traffic volume). Together with the trigger conditions, this helps schedule the right treatment for the right road at the right time. The final model optimizes the project selection and timing based on the benefits provided to City residents.

Treatment types fall into three general categories: **Reconstruction**, **Rehabilitation** and **Maintenance**. Reconstruction involves complete demolition and rebuilding of the roadway. **Rehabilitation** refers to large-scale repairs to a street such as resurfacing, panel replacements, or other heavy maintenance work. **Maintenance** work improves ride quality without substantially changing the structure of the street such as crack sealing and pothole patching.

Reconstruction of a roadway is typically the most expensive treatment method in terms of initial costs; despite this, it is sometimes the most cost-effective treatment for a deteriorated road, in the long run. The trick is identifying when a smart application of other treatment types can extend the life more effectively, per dollar spent, than a reconstruction. When Maintenance is applied appropriately, it can keep a street in “Good” condition much longer, helping to maximize the benefits to the community without breaking the bank. Half of the roads identified as “Poor” at the beginning of this plan are slated to be reconstructed. The lion’s share of the work, however, will actually be performed on roads presently on the lower edge of “Good” condition to prevent further deterioration.

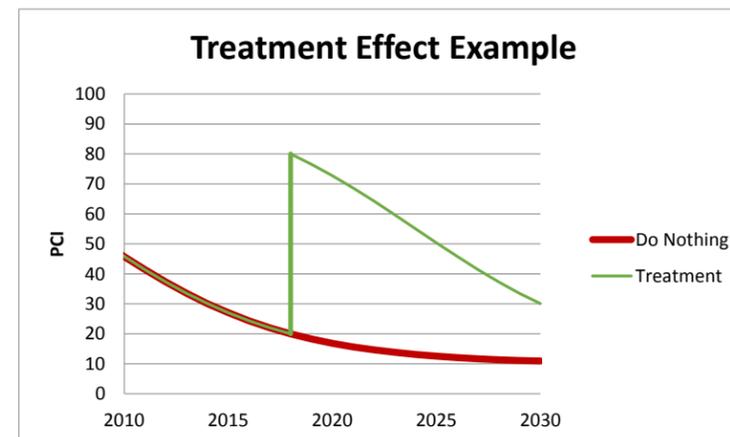


Figure 12: This figure represents what happens in the model when a treatment is applied.

PAVEMENT TREATMENTS	
Chip Seal	
Description	Asphalt coated chips laid loose upon a pavement including any required preparations such as patching.
Cost	\$3/SY
Application	Structurally sound pavements with minor surface distresses, typically Poor pavements with Longitudinal and Alligator Cracking.
Crack Filling/Sealing	
Description	Routine maintenance using sealant to cover and fill cracks, potentially including the cost of sawing/routing the cracks as well.
Cost	\$200/ Station for 12' of width (1 station = 100 ft.)
Application	Good and Very Good Pavements with any amount of cracking are the targets.
Diamond Grinding	
Description	Removal of a thin layer of PCC pavement to deal with minor surface distresses and ride quality issues. Includes minor patching, crack filling/sealing, and profiling.
Cost	\$5/SY
Application	Structurally sound PCC pavements with surface defects and severe roughness. Typically Fair and Poor Pavements are targets.
Mill and Fill	
Description	3" of Pavement Removal and replacement with ACC. Includes Tack and Patch.
Cost	\$50/SY
Application	ACC and combination pavements with severe roughness, and surface defects. Typically Poor and Very Poor Pavements are targets.
PCC Restoration	
Description	Reparative practices combined for a holistic improvement to PCC pavements. Including but not limited to Full Depth Patching, crack filling/sealing and profiling.
Cost	\$19/SY
Application	Fair or Better Pavements with isolated defects and no catastrophic structural deficiencies.
Thick ACC Overlay	
Description	3" of ACC over the existing pavement and structural preparation treatments, including but not limited to hole patching, crack filling, profiling, and Crack Filling/Sealing.
Cost	\$35/SY
Application	Poor or Very Poor Pavements without major structural deficiencies such as D-Cracking. Block Cracked pavements are good targets.
Thin ACC Overlay	
Description	1.5" of ACC including tack and patch.
Cost	\$17/SY
Application	Structurally sound pavements with surface distresses.
Reconstruction	
Description	The complete removal and replacement of a pavement section
Cost	\$150 per Square Yard (SY)
Application	Pavement beyond regular serviceability. Very Poor pavements are the usual targets

Funding Allocation

Funding will be split between Arterial and Local streets, with 60% of all LOST dollars going to Local street work and the rest to Arterial roads. This was identified as a primary goal early on in the plan, so citizens see as much work close to home as possible while still giving the Arterial network the attention it requires. No proportion of the funding was specifically set aside for Reconstruction, but ideally, it would be around 50%.

Not every aspect of a Reconstruction project will be funded by LOST. Upgrades to certain facilities may be warranted by the project, and determined for LOST eligibility on a case-by-case basis. These may include driveway and sidewalk replacements, changes to roadway markings, and repairing existing, non-ADA-compliant sidewalks and curb ramps. For reference, please see Figure 13: PFP Project Funding Eligibility. The costs shown for a project are for the roadway treatments only. In addition, 20% of the projected \$18 Million per year in LOST revenue will be set aside specifically for design costs, construction observation, program management, and sidewalk upgrades. Safety improvements and complete streets policies will be enforced as required by City Code and Policies. This does not mean bike lanes will be a part of every road project. Only roads already identified as essential bicycle corridors will have those measures taken during construction.

The various City departments will also work with each other, along with private utilities, so newly improved road projects will not be torn up right away for utility or sewer work. Work already identified for such things will be delayed, when possible, to coincide with Reconstruction and Rehabilitation work recommended within this plan. That work, however, may not be eligible to receive LOST funds and will be costs additional to those in this plan.



Figure 13: Paving for Progress Projects Funding Eligibility Figure

dTIMS Modeling

dTIMS (Deighton's Total Infrastructure Asset Management Software) is a computer program developed by Deighton Associates Limited for use in storing infrastructure asset data, developing projections of infrastructure asset performance, estimating remaining life in various infrastructure assets, determining when they need to be replaced or repaired, and estimating how much the treatment will cost. It allows for any and all asset data to be entered, there is no limit to what information can be stored within the program and considered during the modelling process. However, in Version 8 (The version sold by IPMP to Cedar Rapids), the user must manually program how all of the data relates to each other, assign costs, develop the treatment triggers and effects, create funding pools that each treatment will pull from, and develop their own life-cycle curves for the infrastructure assets. Once this is accomplished, dTIMS' primary feature goes to work; it runs a heuristic algorithm (a series of tests using general rules and guessing approaches for determining optimal solutions) to identify an optimal "Strategy" for maintenance and replacement of the infrastructure assets in question, given the budget, treatments, and life-cycle information supplied by the user.

Some manipulation through GIS was required to combine the IPMP data with outside data sources from the City and State before it could be imported into dTIMS. The compiled data was used to create the condition scoring system for the network and estimate remaining service lives. These two tasks were done by comparing all of the roads in Cedar Rapids in regards to each of the distress types to create a well-balanced system that considered a variety of factors regarding pavement quality. Once all the data were compiled in GIS, it was imported to dTIMS and the model was run. The outputs were analyzed to determine optimal ways to combine nearby projects of complimentary treatment types, and programmed to achieve the optimal treatment timing. Arterial roads were each considered independently and combined solely within the same corridor. The Local roads, however, were combined into neighborhoods, isolated projects, and zones based on connectivity and traffic levels. Each of these groupings of Local roads was analyzed as if they were a single road segment; all of the same analyses were applied including treatment triggers and cost estimates.

The model was set to keep all of the proposed work within the assigned budget, while maximizing the "Benefit" provided to the public. Benefit was determined as the difference between the

conditions of the road network if nothing was done and the selected treatment effect. This method is standard practice when determining optimal treatment. The model used in this plan also factors in the amount of traffic (AADT) on the affected roads. The final result represents both the number of people who will receive the benefit of driving on a newly reconstructed road and the magnitude of the improvement. Both the costs and the benefits were adjusted for inflation and discount rates over the 10 years of the proposed plan.

Work was then assigned to City Forces and Private Contractors based on the size, traffic impacts, and complexity of the project; also to ensure the work allocated is within the City's means.

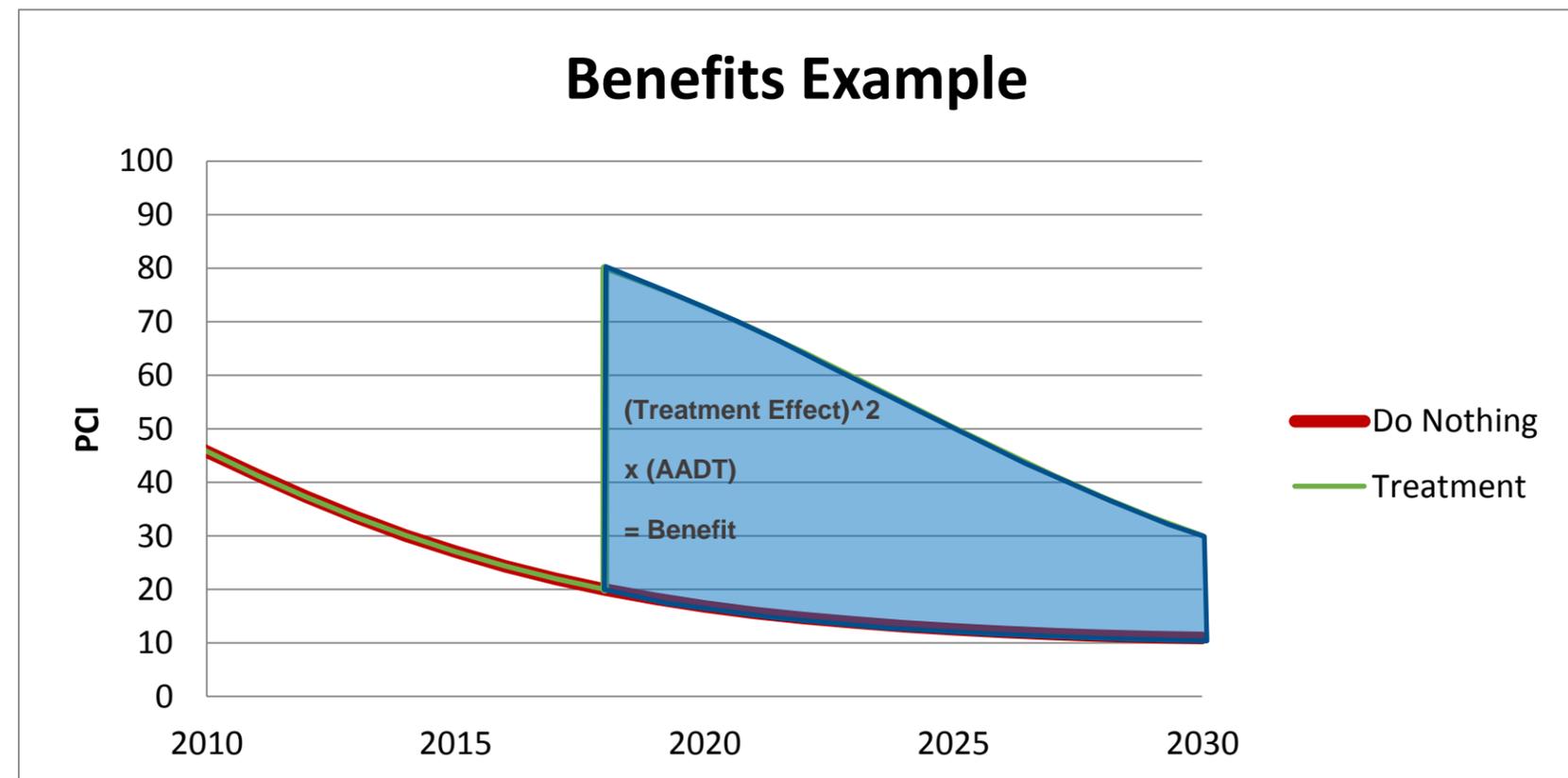


Figure 14: Picture demonstrating what the benefits calculation looks like

Result: 10 Year Plan

A timely strategy means spending “smart” by making investments needed to keep roadways in good repair, rather than paying more money later to address greater deterioration. By performing appropriate maintenance in a timely manner, the life of the pavement can be extended (retaining serviceability and performance), thereby, delaying the need for costly rehabilitation or reconstruction.

Initially, 2014 and 2015 projects were selected by City staff as part of the Quickstart program; these include projects such as Diagonal Drive from Interstate 380 to 8th Ave SW, and Wiley Blvd SW from Williams to 16th Ave. A handful of long-term projects outside of the 2014/15 Quickstart program were also included in the initial selection to begin planning and design, so they may be constructed as soon as possible. All other projects were programmed via the model.

The plan will perform work on over 50% of the “Poor” roads and commit over 60% of funding to the Local street network. Not only will the plan maintain the existing network, projections indicate it will increase overall network pavement condition by nearly 20%! Figure 16 compares the PFP plan against a maintenance-only strategy (no heavy rehabilitation or reconstruction), and a strategy in which no work whatsoever is done, demonstrating what PFP can accomplish. PFP increases the network quality and is significantly more cost efficient than simple reactive maintenance.

Quadrant maps and detailed comprehensive lists may be found in the appendix. Information includes type of suggested work and estimated completion timeframe. All of this information will also be available on the City’s Paving for Progress website (CityofCR.com/PavingforProgress) as well.

This plan intends to be a living document. Iowa DOT and the Iowa Pavement Management Program will be delivering new data every two years. The data will be used to validate and update the model, verify progress, and report on changes. Bi-annual reviews and updates to this plan will ensure this amazing data resource is made the most of. Quarterly reports about the work completed through PFP will be delivered to City Staff and used to track success and efficiency of the proposed program.



Figure 15: Reconstruction work from 2014 Quickstart program

Paving For Progress: A Critical Road Investment

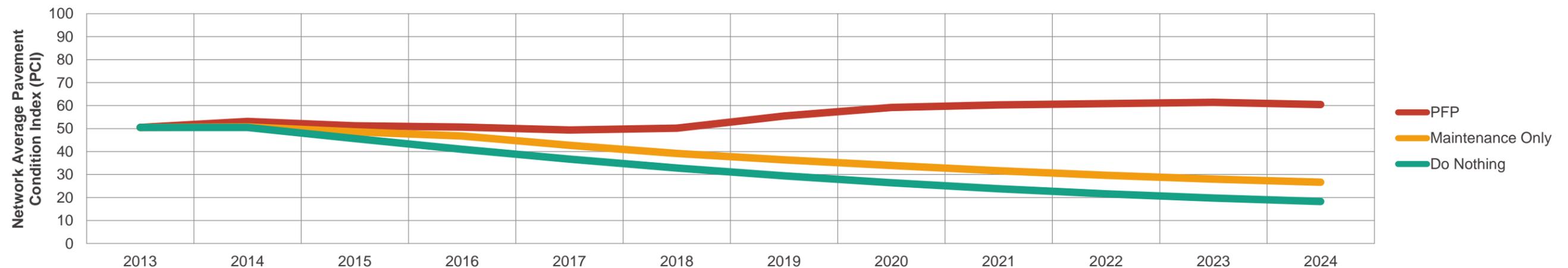
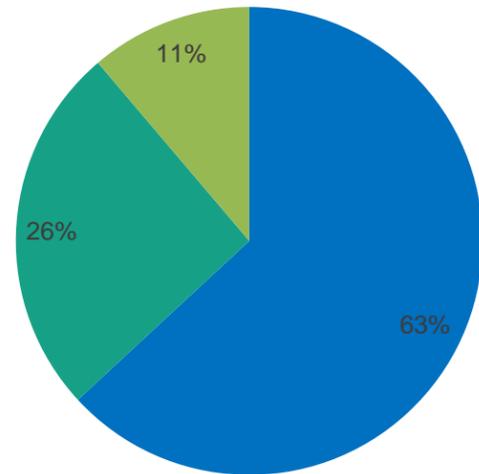


Figure 16: This figure represents what will happen to the street network given 3 different scenarios, if no work is done, only maintenance work, and the PFP plan



Treatment Types

■ Reconstruction ■ Rehabilitation ■ Maintenance



Annual PFP Budget

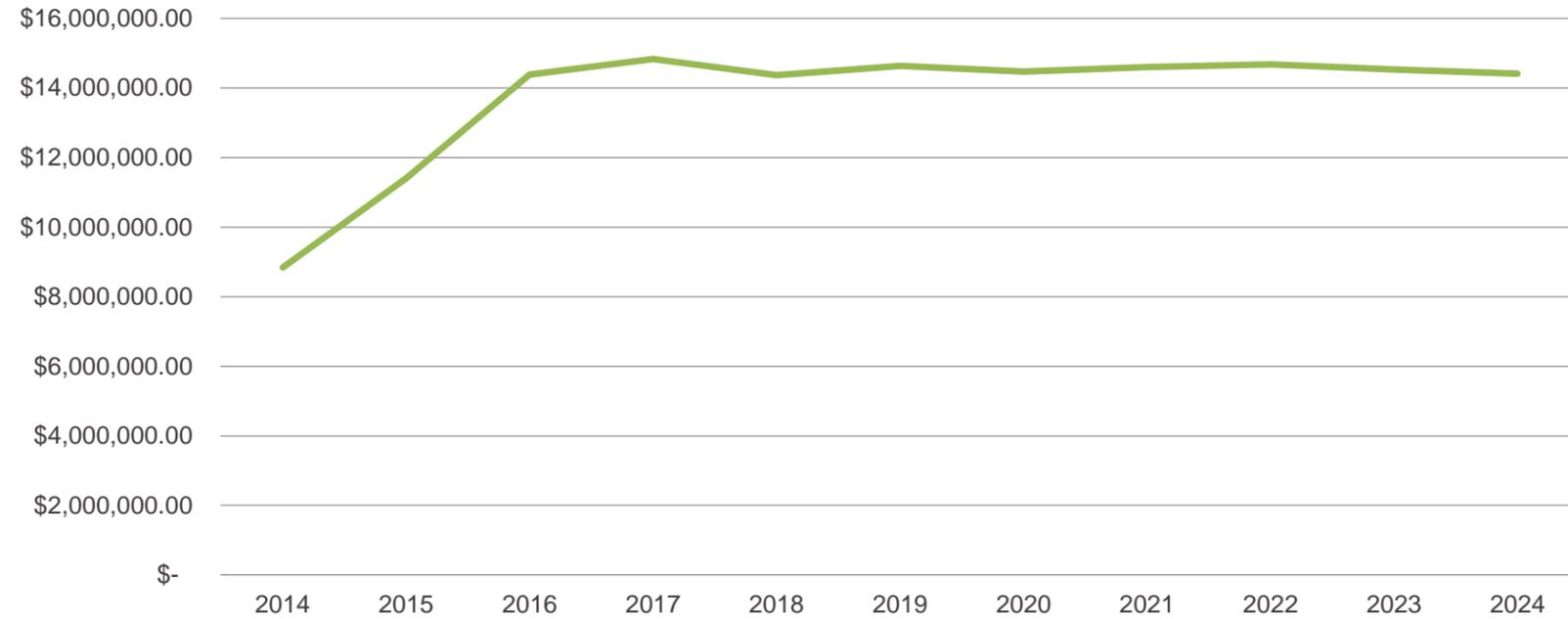


Figure 19: PFP Budget

Treatment Types Dollars Split

■ Reconstruction ■ Rehabilitation ■ Maintenance

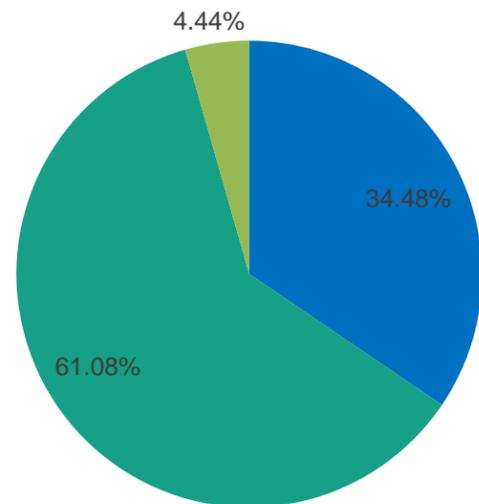


Figure 18: Treatment types, budget and dollars

The PFP budget (Figure 19), after scaling up during the Quickstart Program, remains relatively constant, and keeps a fair balance of the three pavement management categories. The cost of Maintenance and Reconstructions are both at extreme ends of the cost spectrum so there is dramatic shift in the data when moving from project scale in size to scale in dollars (Figure 18). This conforms to the expectation that about 50% of the PFP money should go into Reconstruction work. The budget figure represents only the construction budget, 20% of the projected \$18 Million in revenue each year is set aside for other costs such as design, and the remaining balance will be about \$14.4 Million for just construction costs. Of the LOST funds expected to be spent by PFP, the goal to maintain 60/40 split between Local and Arterial streets has been met, each receiving their share of the projected \$150 Million total planned for the next 10 years (Figure 20).

Funding Share

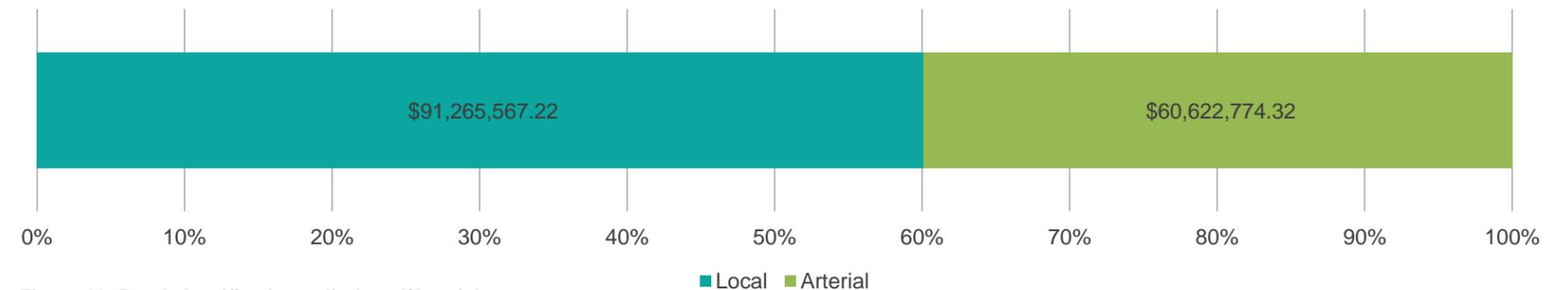
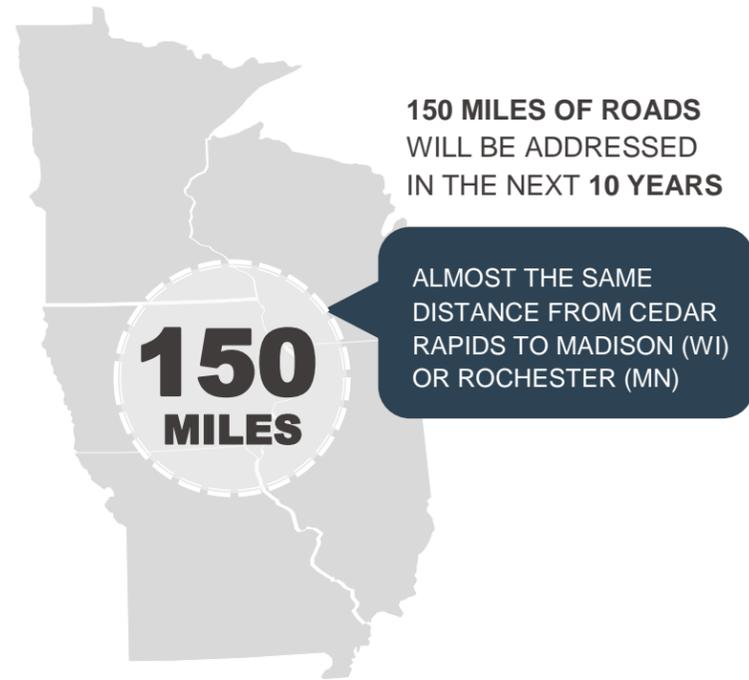


Figure 20: Road classification split- Local/Arterial



Road Condition Impacts



Paving for Progress' impacts are not subtle; in fact, it will be hard to miss all of the **\$150 Million** of **construction work** that is going to be done in Cedar Rapids. With over **150 miles** expected to receive treatment in the next 10 years, 1/4th of the entire road network will be revitalized, and when factoring in numbers of lanes, that number stretches to **36%!** These many miles of road are the most vital in Cedar Rapids, carrying over half of the **vehicle miles travelled** annually. **60%** of the population will very likely be within **walking distance** to a project (defined as a 1/4th mile by the American Disabilities Act), that is less than a **minute's drive** away! 4500ft of roughness (measured as the variation in road height due to cracks and potholes) will be smoothed out, and about 50 miles of road will actually be **completely reconstructed**; that would be the same as paving a brand new road all the way from downtown Cedar Rapids to Waterloo! Expect to see a whole bunch of blue signs showing what is shaping up to be some amazing **Progress** these next few years!



Figure 17: Local Option Sales Tax Dollars at Work signage.

You may have already seen a few around from the 2014 Quickstart projects. PFP construction projects will all be identified using these custom signs showing that the tax dollars are hard at work!

