



PAVEMENT QUALITY FORECASTING

Using dTIMS to forecast pavement
conditions in the MPO

January 2015

Introduction

With the addition of performance measures to the long-range transportation planning process, the need to forecast pavement conditions in greater Des Moines has become necessary as infrastructure deteriorates and funding opportunities become limited. The Des Moines Area Metropolitan Planning Organization (MPO) purchased a pavement forecasting software to determine the funding needed to reach a target of maintaining existing conditions in the region. This report first summarizes the funding need for the entire MPO planning area, then goes into further detail on how each member city is performing based on their current maintenance budgets. This analysis used 2013 Pavement Condition Index data and Deighton Total Infrastructure Management System to forecast the quality of the region's pavement out to the year 2023.

Pavement Condition Index

Each year, the Institute for Transportation at Iowa State University (InTrans), collects pavement condition data for non-DOT roads in Iowa. As part of this data collection, InTrans records the Pavement Condition Index (PCI), which gives users the level of quality they should expect when driving on the roadways. The PCI ranges from zero to one hundred, with one hundred being the best possible score a roadway can receive. A breakdown of PCI classifications is as follows:

- Excellent (81-100)
- Good (61-80)
- Fair (41-60)
- Poor (21-40)
- Very Poor (0-20)

Deighton Total Infrastructure Management System

Deighton Total Infrastructure Management System (dTIMS™) is a pavement forecasting software that offers a set of tools for implementing custom databases and models to meet an agency's pavement and asset management needs. dTIMSTM allows the user to create budget scenarios to forecast their effect on pavement conditions into the future, helping jurisdictions determine the funding need to maintain pavement conditions at a certain level. Various budget scenarios were ran at the regional level, as well as the local level, to determine the amount of funding needed to reach a regional target.

dTIMSTM uses various pavement treatment types that are applied to roads for each year the analysis is run for. MPO staff chose general pavement treatment types that could represent as best as it can what is currently being done by member jurisdictions. These treatment types are as follows:

- Concrete Pavement Restoration
- Mill and Overlay for HMA and COM
- 3" Overlay for HMA and COM
- Replacement for PCC
- Crack Sealing

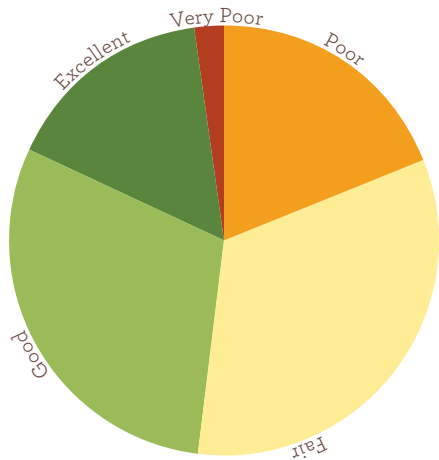
Pavement Treatment Types

COM Composite

HMA Hot Mix Asphalt

PCC Portland Cement Concrete

REGIONAL Pavement Quality

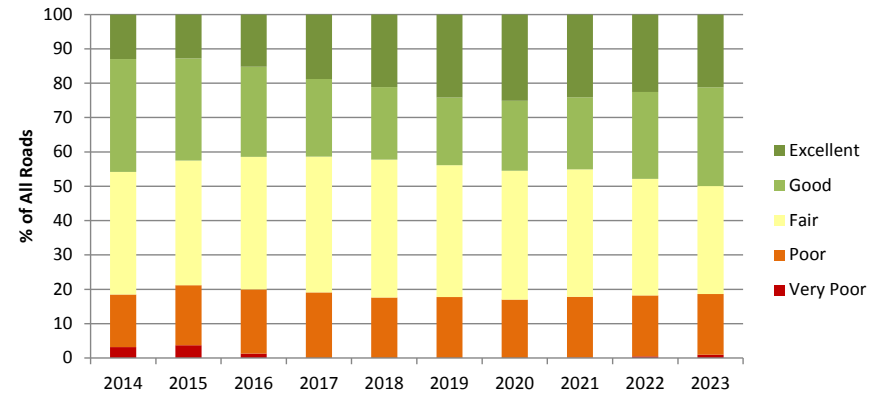


18 percent of roads in the MPO are classified as being in poor or very poor condition¹

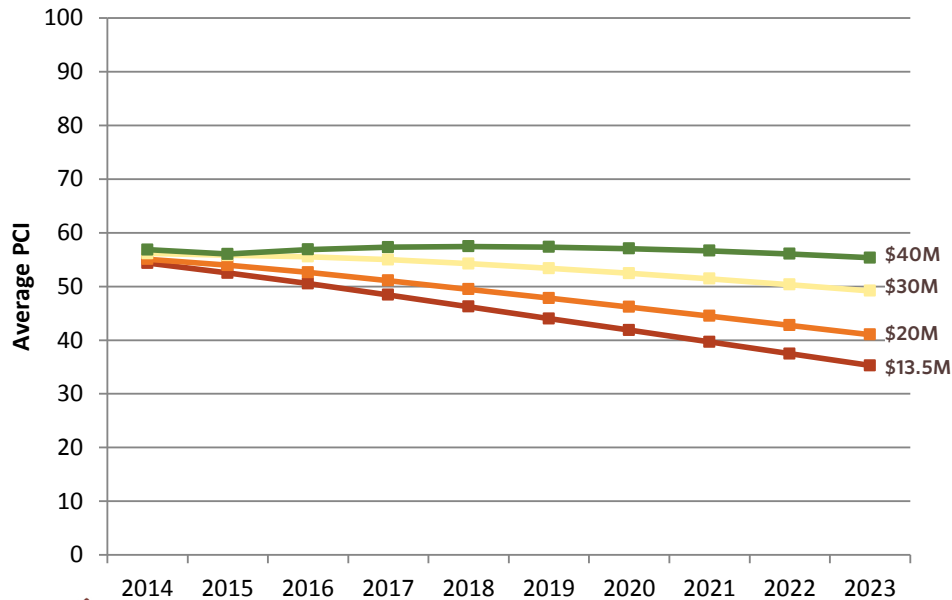
Average PCI for the region: **60**

**Numbers above represent all roads, including DOT roads*

2050 TARGET: MAINTAIN CURRENT PAVEMENT QUALITY



AVERAGE CONDITION (PCI) BY BUDGET SCENARIO

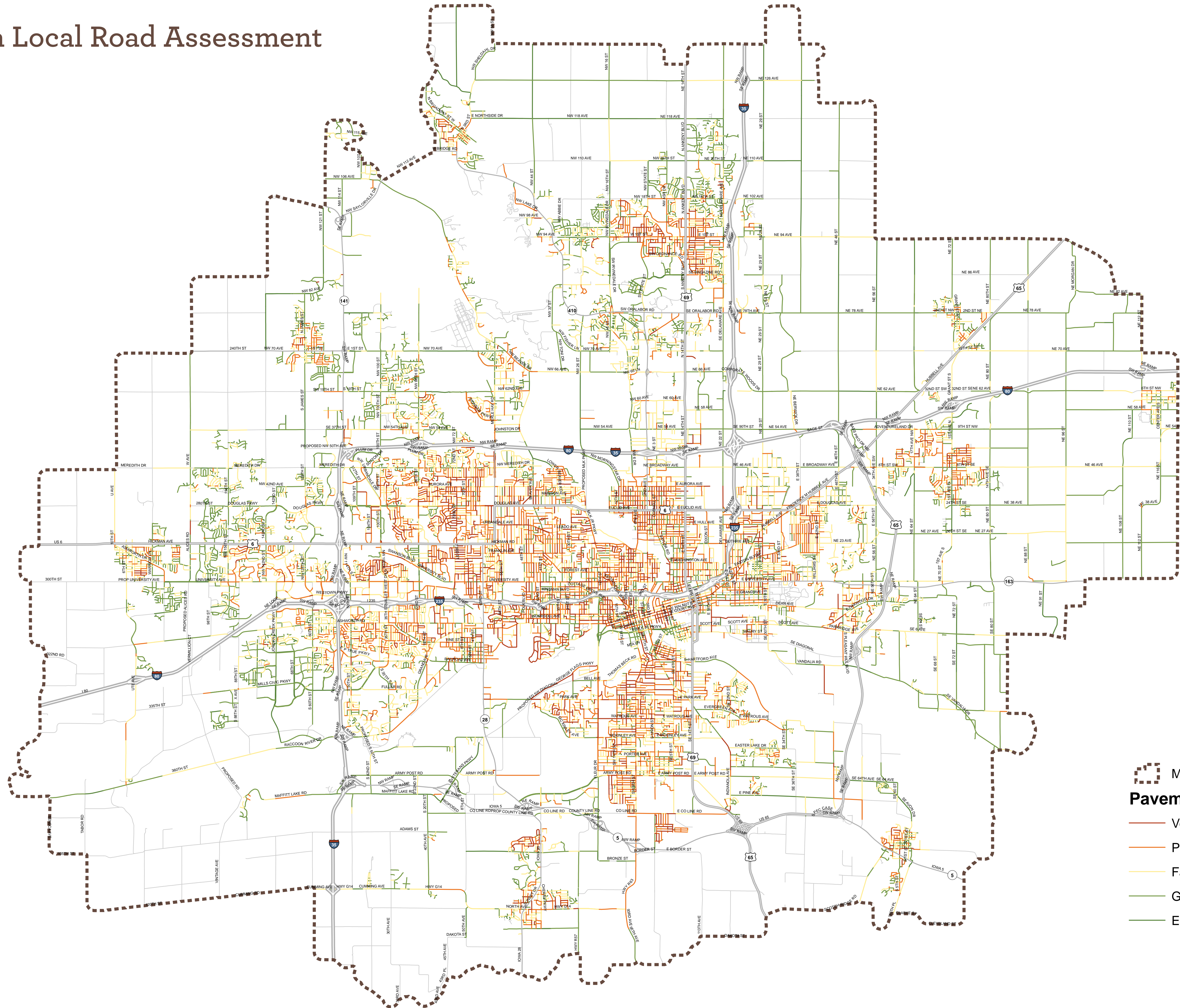


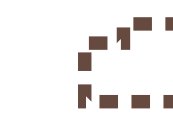





\$40 MILLION is the amount of funding needed each year to maintain current pavement conditions in the region

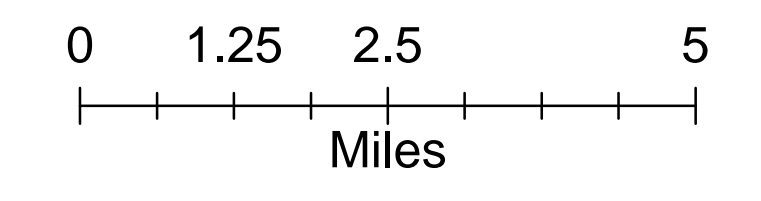
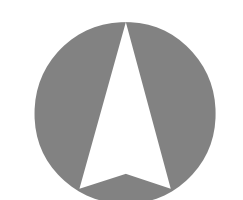
Currently, the region spends about **\$30 MILLION²**

Data Sources: 1. 2012 Iowa Pavement Management Program, Pavement Management Information System
2. Street Financial Reports, Iowa DOT

2013 Iowa Local Road Assessment



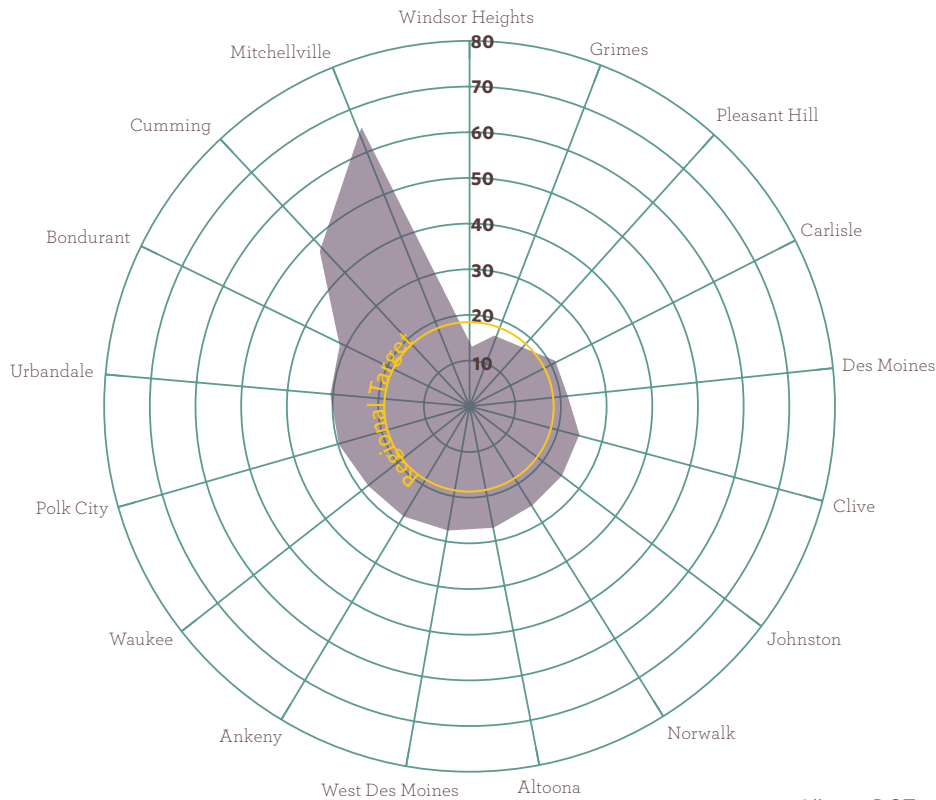
-  MPO Planning Area
- Pavement Condition (PCI)**
-  Very Poor 0 - 20
 -  Poor 21 - 40
 -  Fair 41 - 60
 -  Good 61 - 80
 -  Excellent 81 - 100



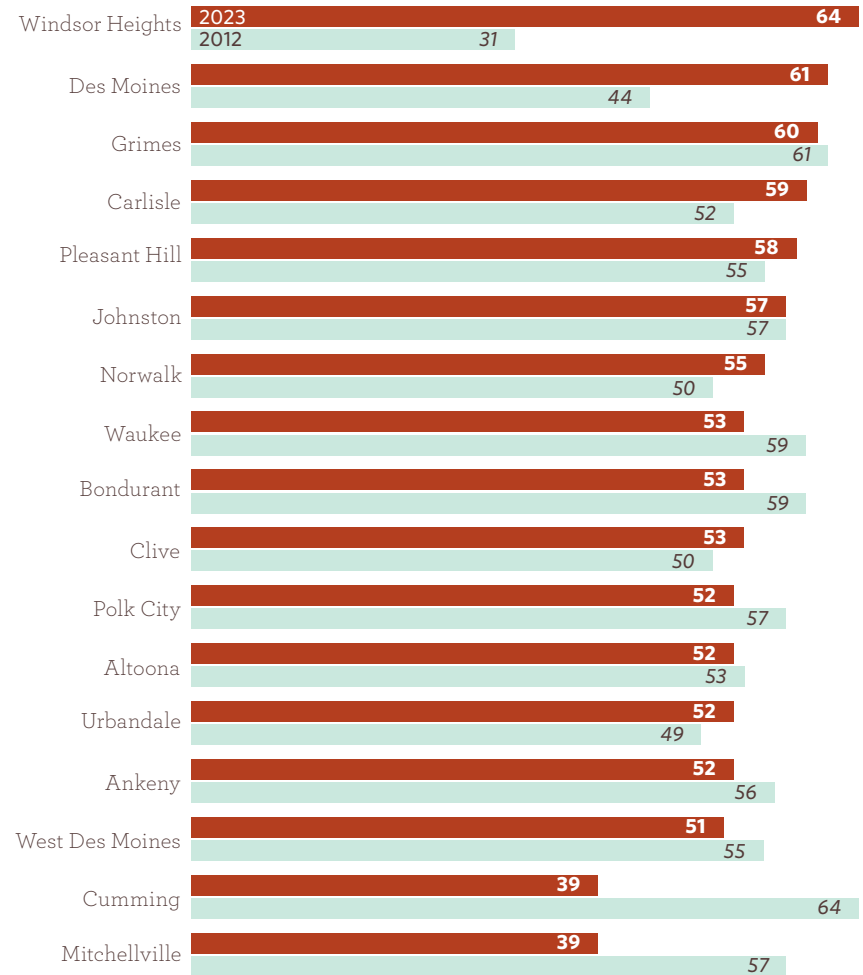
LOCAL Conditions

Using current funding levels, just **3** cities maintain their pavement conditions under the **regional target** through **2023**.

PERCENT POOR OR WORSE WITH CURRENT FUNDING LEVELS, 2023



AVERAGE PCI WITH CURRENT FUNDING LEVELS



All non-DOT roads were used when forecasting future conditions



LOCAL Conditions

PCI RATING: PERCENT OF TOTAL MILES



ENVIRONMENTAL JUSTICE Areas

AVERAGE PCI

Environmental Justice Area

43

Non-Environmental Justice Area

53

POOR OR WORSE ROADS (%)

Environmental Justice Area

44

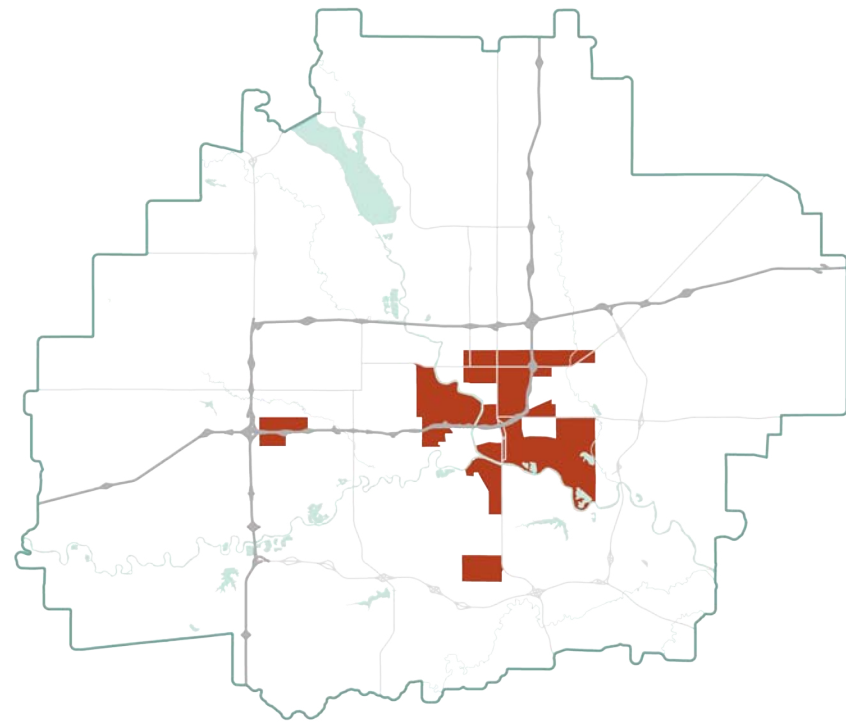
Non-Environmental Justice Area

26

About **14%** of local roads in the region lie within EJ areas.

All non-DOT roads were used for Environmental Justice comparisons

ENVIRONMENTAL JUSTICE AREAS



ENVIRONMENTAL JUSTICE AREA

Concentrated area of traditionally underserved populations. Groups used to define EJ areas include:

- Limited English Proficiency (LEP)
- Non-White Population
- Persons in Poverty
- Carless Households
- Single Heads of Households with Children
- Persons Over 65
- Persons with a Disability

The MPO receives federal funding and may not discriminate against anyone on the basis of race, color, or national origin, according to Title VI of the Civil Rights Act of 1964.

Local Investments

To maintain the regional average of 18 percent of roads in poor or worse condition, each jurisdiction will need to invest in their local system to meet the regional goal. To determine if cities are currently on the right track to do so, dTIMS™ was used to run scenarios based on current annual maintenance budgets. Street Financial Reports (SFR) were used to determine annual maintenance budgets for each member, based on a 6-year average for the amount spent on maintenance needs. Results from those scenarios determined which cities have a need to increase their maintenance budgets in order to reach the regional goal. The **Annual Maintenance** chart shows the additional funds needed for those cities that are not currently reaching the regional goal.

City Reports

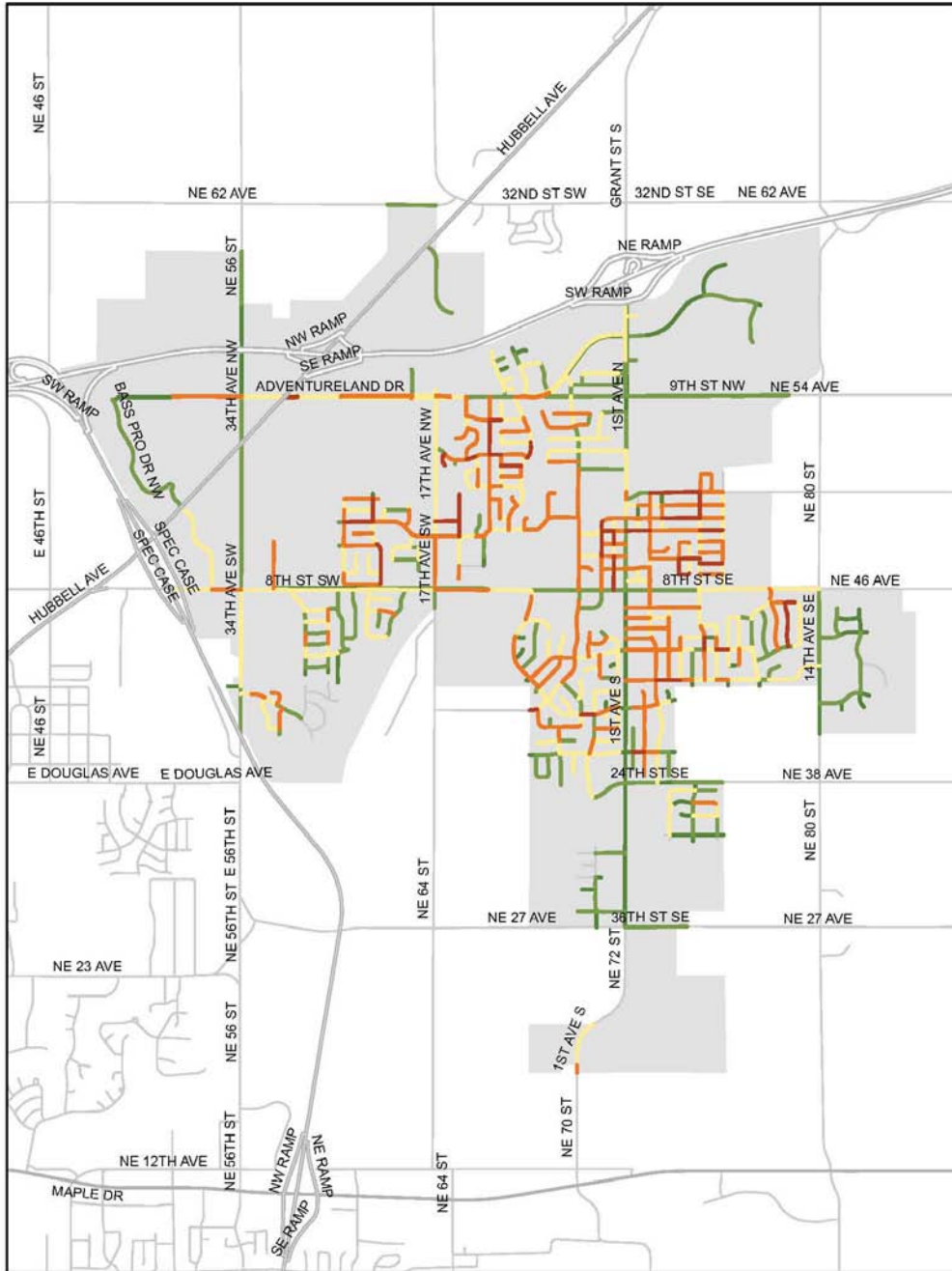
The remaining pages of this report go into further detail on each member city of the MPO. Included on each page is a map of the 2013 Local Road Assessment, the annual maintenance budget used for the analysis, total miles of roadway measured for pavement quality, and multiple charts forecasting future pavement conditions within each city. The **Pavement Quality** and **Average Condition (PCI)** charts provide a detailed breakdown of the city's future conditions if they were to continue spending the current amount on maintenance needs.

ANNUAL MAINTENANCE

City	Current Annual Funding	Total Annual Funding Needed	Additional Funding Needed
Altoona	\$696,106	\$1,500,000	\$803,894
Ankeny	\$1,544,627	\$5,000,000	\$3,455,373
Bondurant	\$256,328	\$400,000	\$143,672
Carlisle	\$343,530	\$450,000	\$106,470
Clive	\$1,662,341	\$2,500,000	\$837,659
Cumming	\$27,451	\$175,000	\$147,549
Des Moines	\$15,551,818	\$16,500,000	\$948,182
Grimes	\$913,603	-	-
Johnston	\$1,218,221	\$3,000,000	\$1,781,779
Mitchellville	\$58,568	\$275,000	\$216,432
Norwalk	\$679,457	\$1,300,000	\$620,543
Pleasant Hill	\$579,915	-	-
Polk City	\$253,022	\$400,000	\$146,978
Urbandale	\$2,042,375	\$4,000,000	\$1,957,625
Waukee	\$559,356	\$1,500,000	\$940,644
West Des Moines	\$2,237,219	\$4,000,000	\$1,762,781
Windsor Heights	\$498,948	-	-
Total	\$29,122,885	\$41,000,000	\$11,877,115

*Cities with a '-' currently achieve the regional average with their maintenance budgets. Therefore, no additional funding is needed.

2013 LOCAL ROAD ASSESSMENT

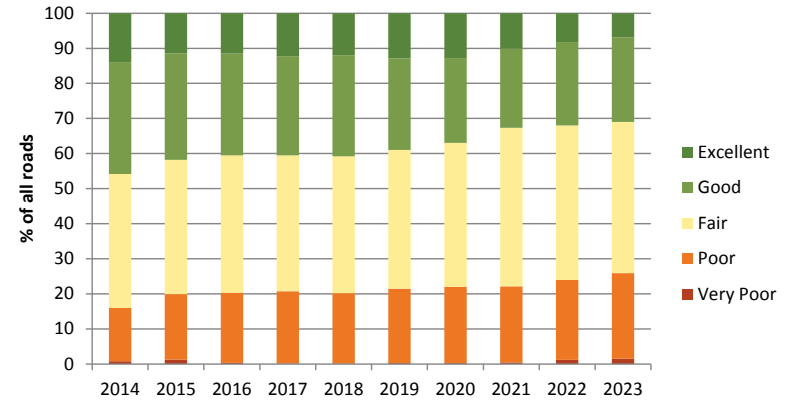


CITY OF ALTOONA

Annual Maintenance (6-Year Average): \$696,106

Miles of Road Measured: 71

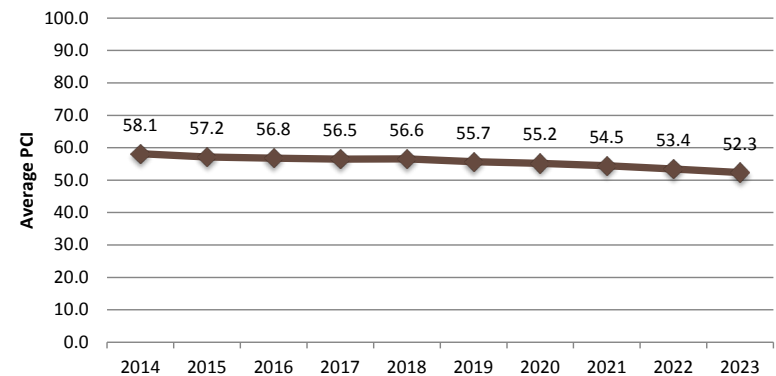
PAVEMENT QUALITY



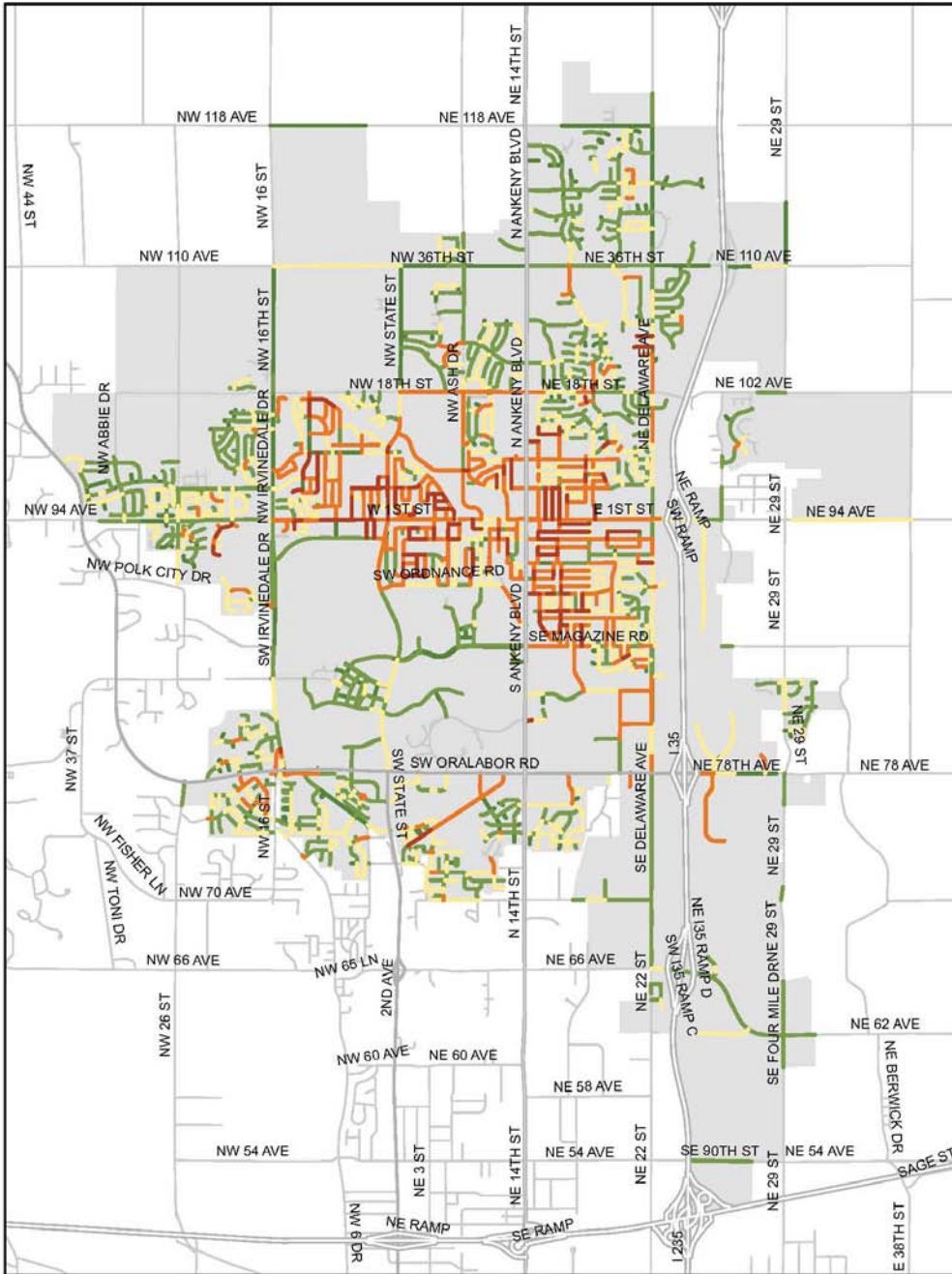
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
15.9	19.9	20.3	20.7	20.2	21.4	22.0	22.1	23.9	25.9

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

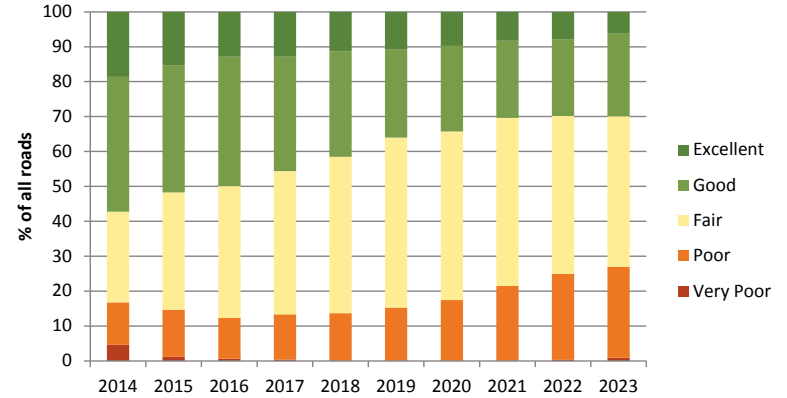


CITY OF ANKENY

Annual Maintenance (6-Year Average): \$1,544,627

Miles of Road Measured: 207

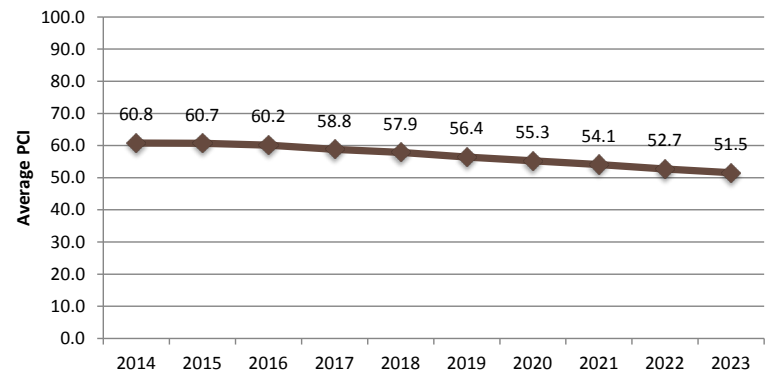
PAVEMENT QUALITY



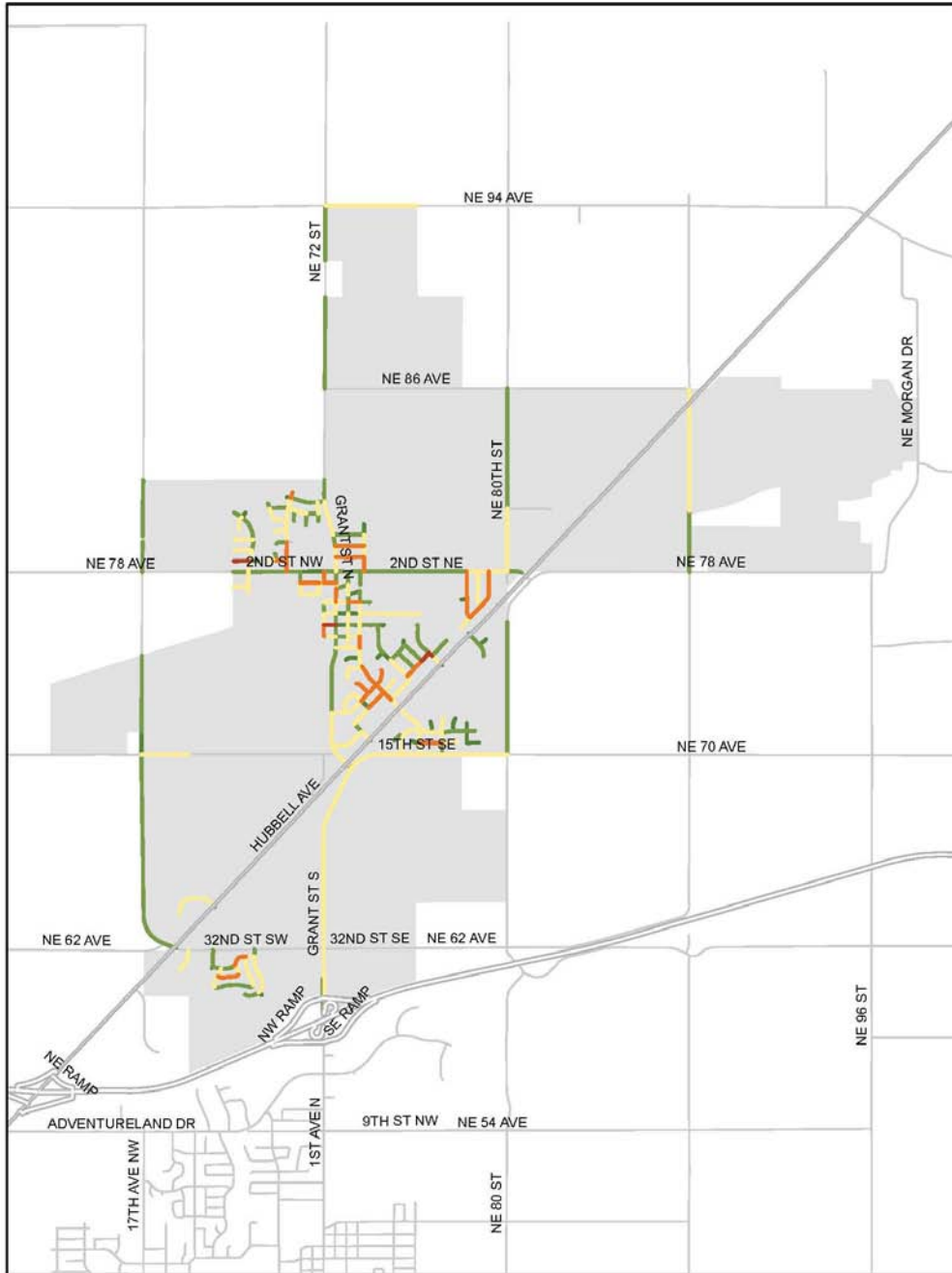
Percent of Roads in Poor or Worse Condition

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Percent	16.7	14.6	12.3	13.4	13.7	15.3	17.4	21.5	24.9	26.9

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

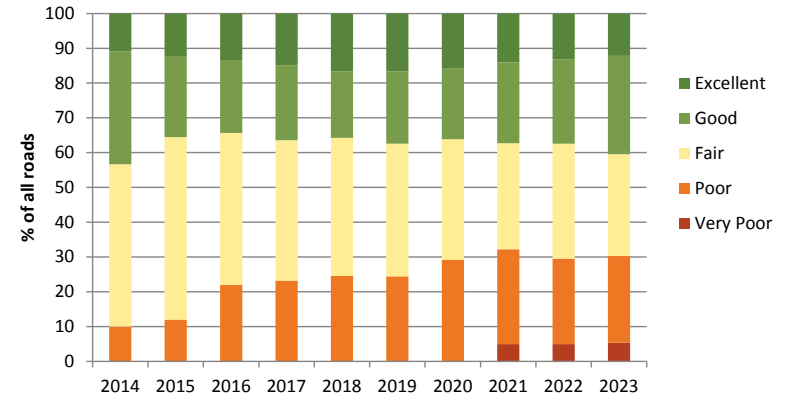


CITY OF BONDURANT

Annual Maintenance (6-Year Average): \$256,328

Miles of Road Measured: 26

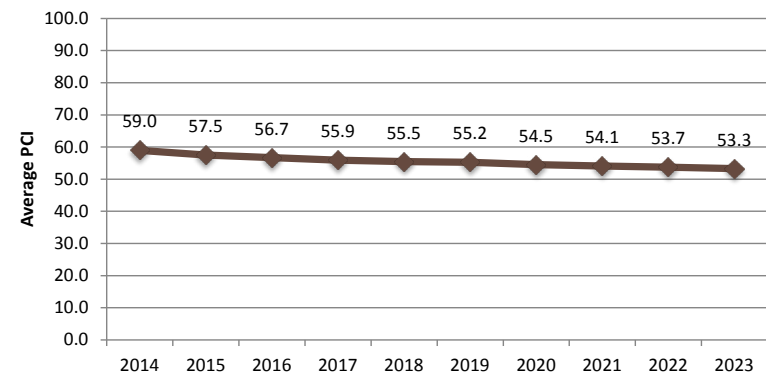
PAVEMENT QUALITY



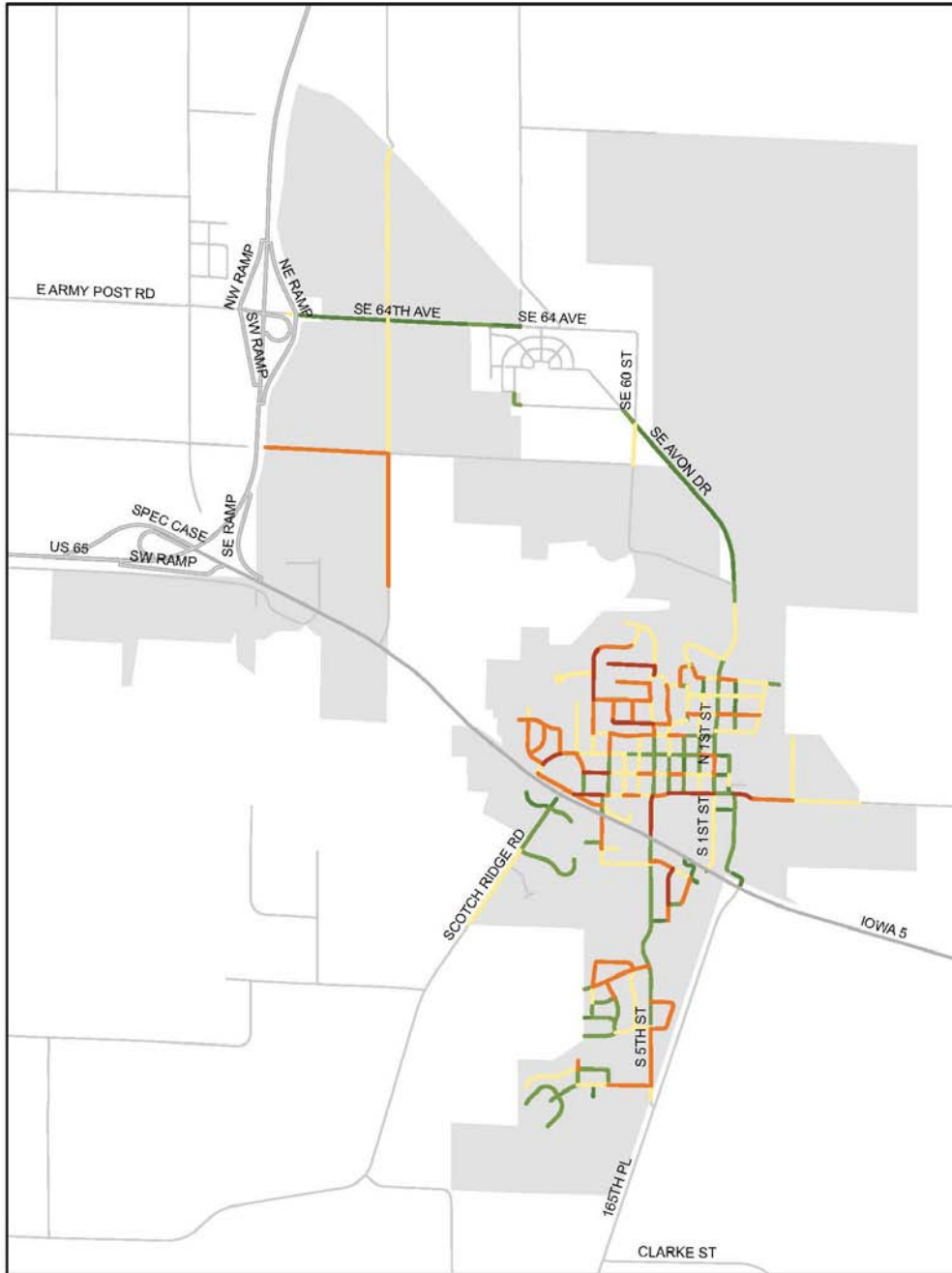
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
10.0	12.0	22.0	23.2	24.5	24.4	29.2	32.2	29.5	30.3

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

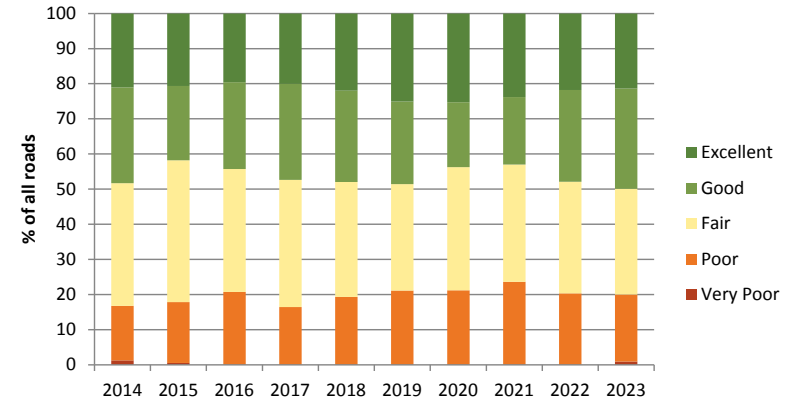


CITY OF CARLISLE

Annual Maintenance (6-Year Average): \$343,530

Miles of Road Measured: 23

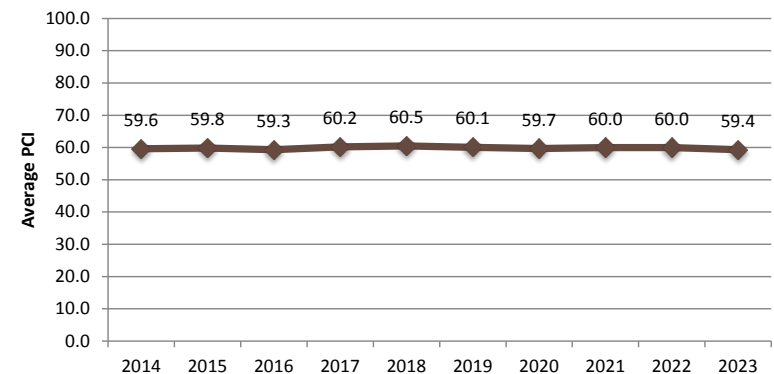
PAVEMENT QUALITY



Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
16.8	17.8	20.7	16.4	19.3	21.1	21.2	23.6	20.3	20.0

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

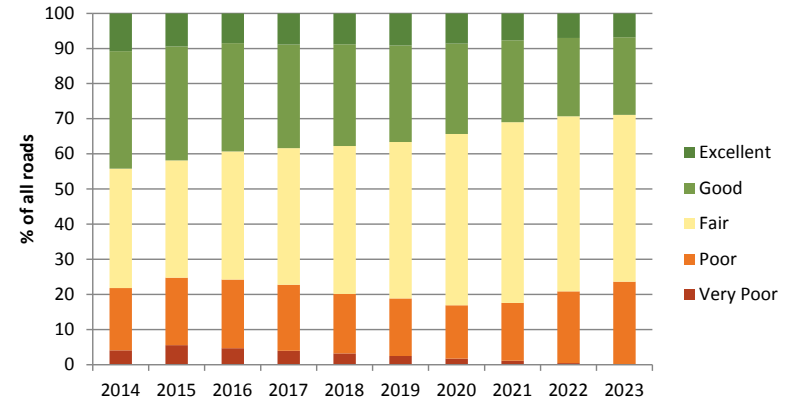


CITY OF CLIVE

Annual Maintenance (6-Year Average): \$1,662,341

Miles of Road Measured: 78

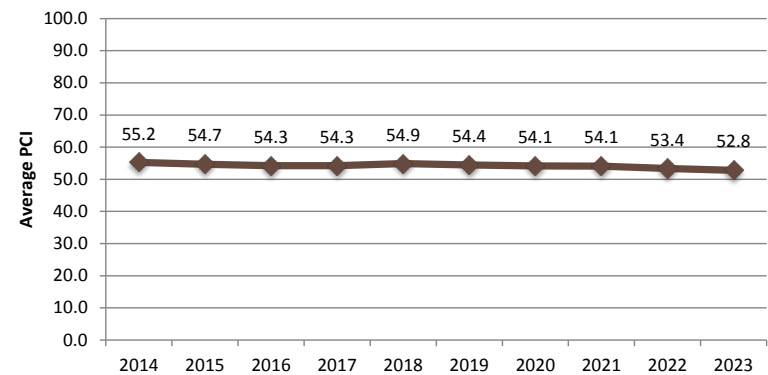
PAVEMENT QUALITY



Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
21.8	24.7	24.2	22.7	20.1	18.8	16.9	17.5	20.8	23.6

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

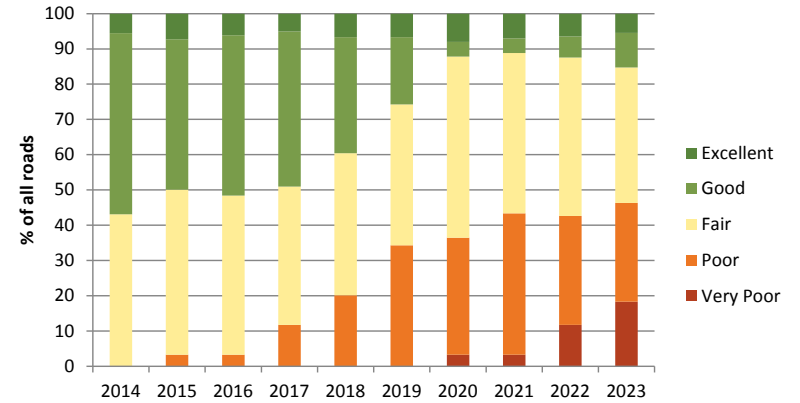


CITY OF CUMMING

Annual Maintenance (6-Year Average): \$27,451

Miles of Road Measured: 4

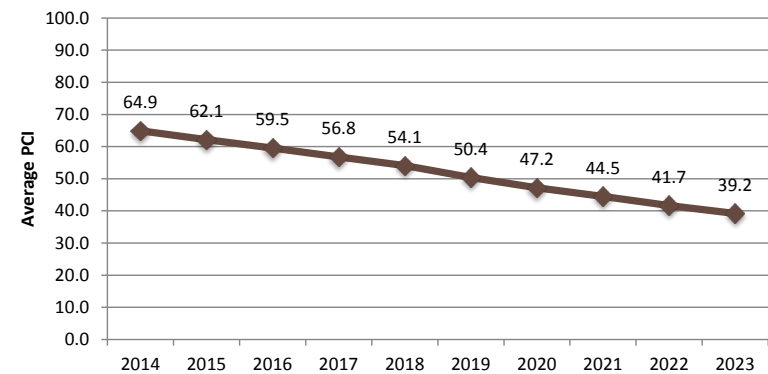
PAVEMENT QUALITY



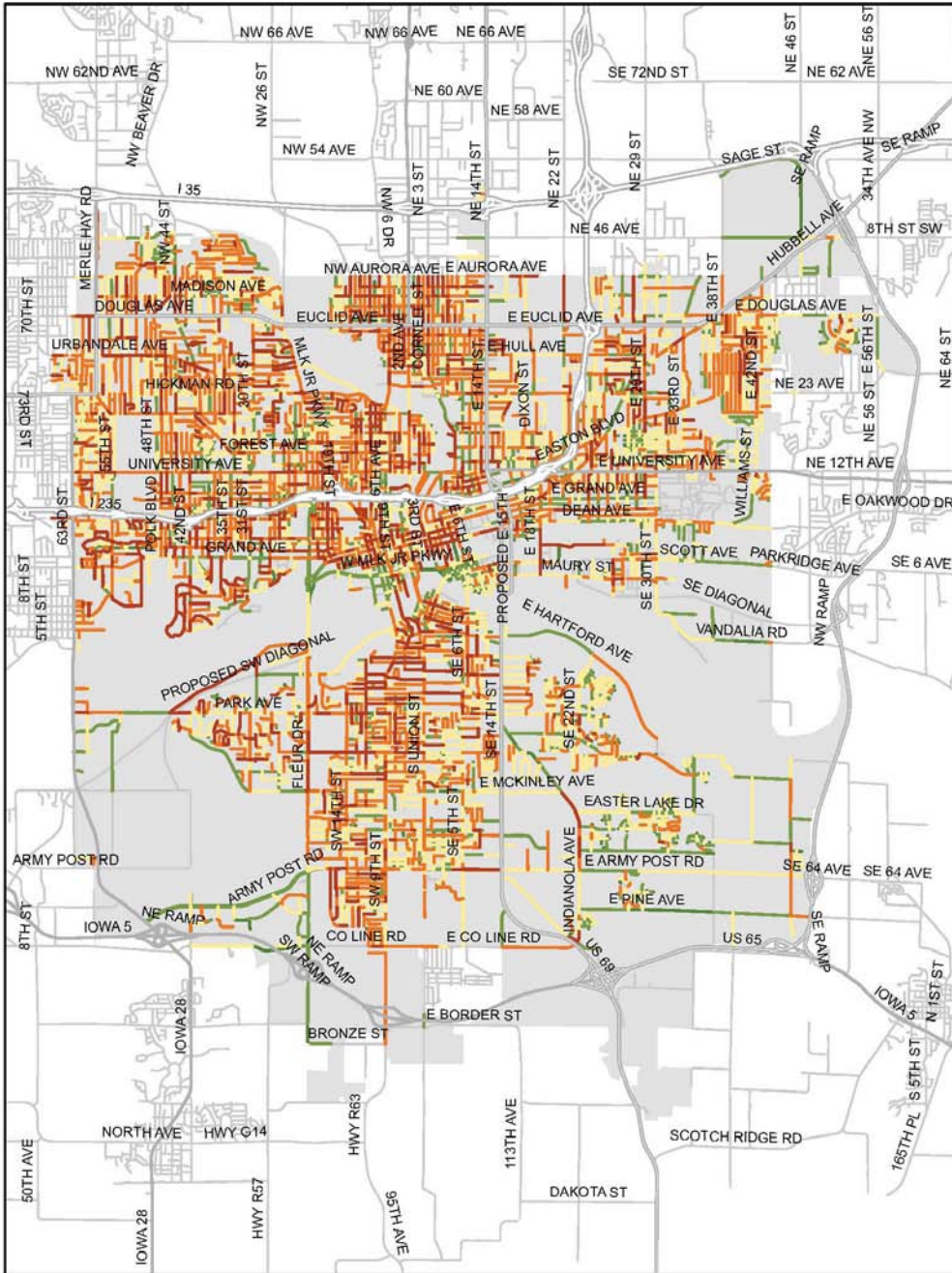
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0.0	3.2	3.2	11.8	20.1	34.3	36.4	43.4	42.6	46.3

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

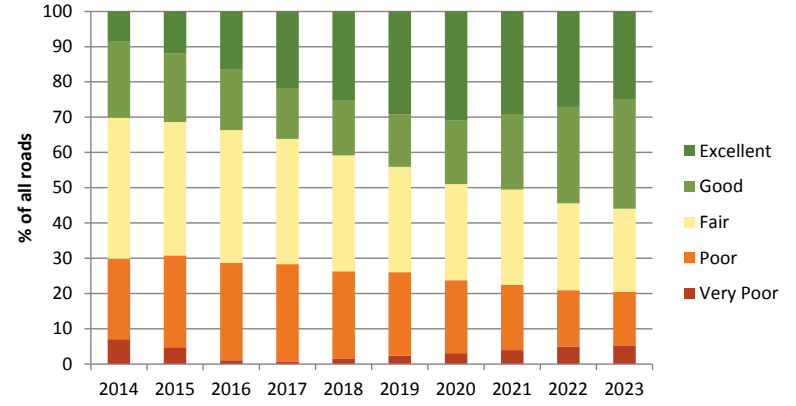


CITY OF DES MOINES

Annual Maintenance (6-Year Average): \$15,551,818

Miles of Road Measured: 852

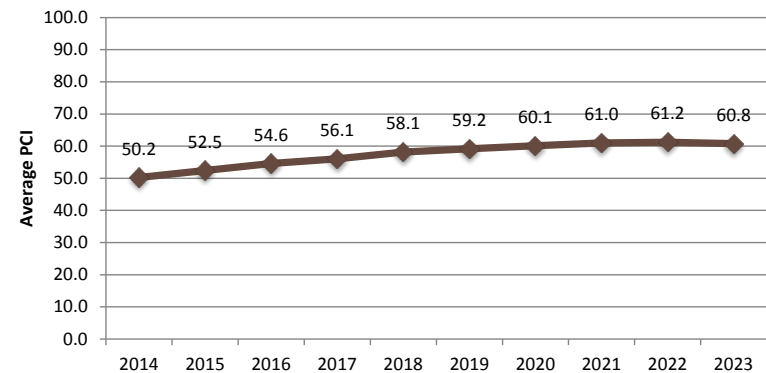
PAVEMENT QUALITY



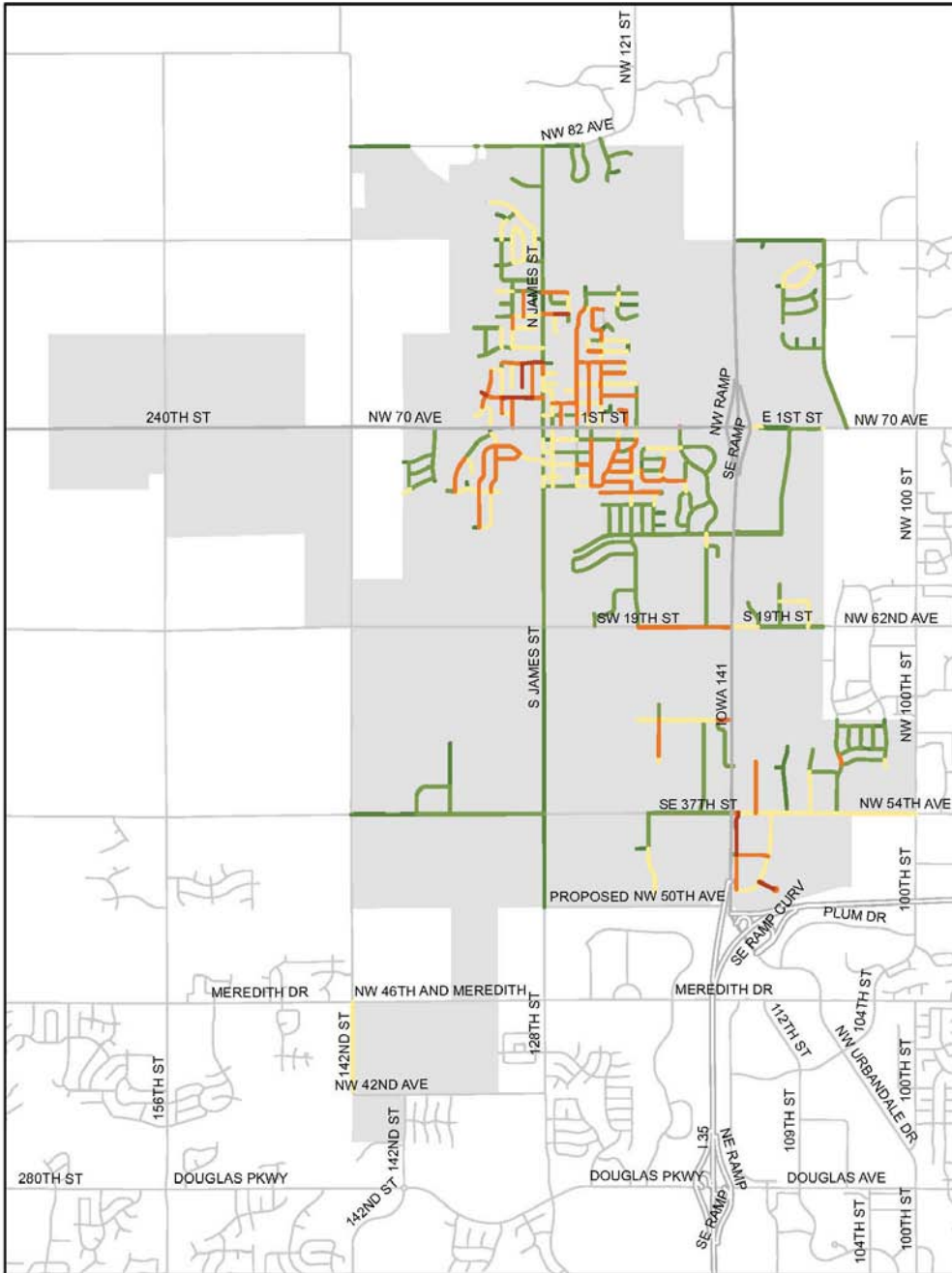
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
29.8	30.8	28.7	28.3	26.3	26.0	23.8	22.4	20.9	20.4

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

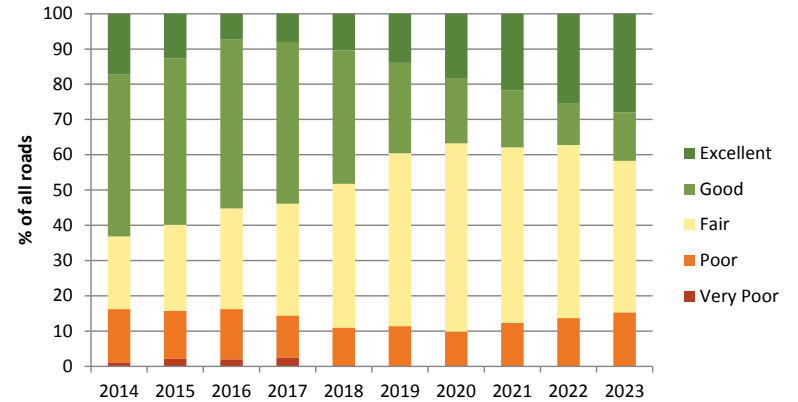


CITY OF GRIMES

Annual Maintenance (6-Year Average): \$913,603

Miles of Road Measured: 49

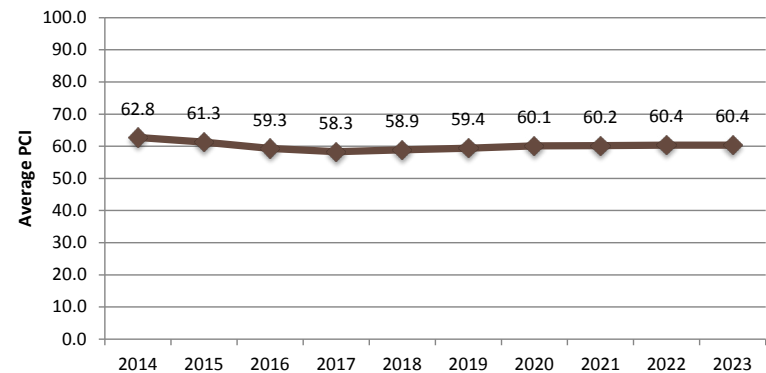
PAVEMENT QUALITY



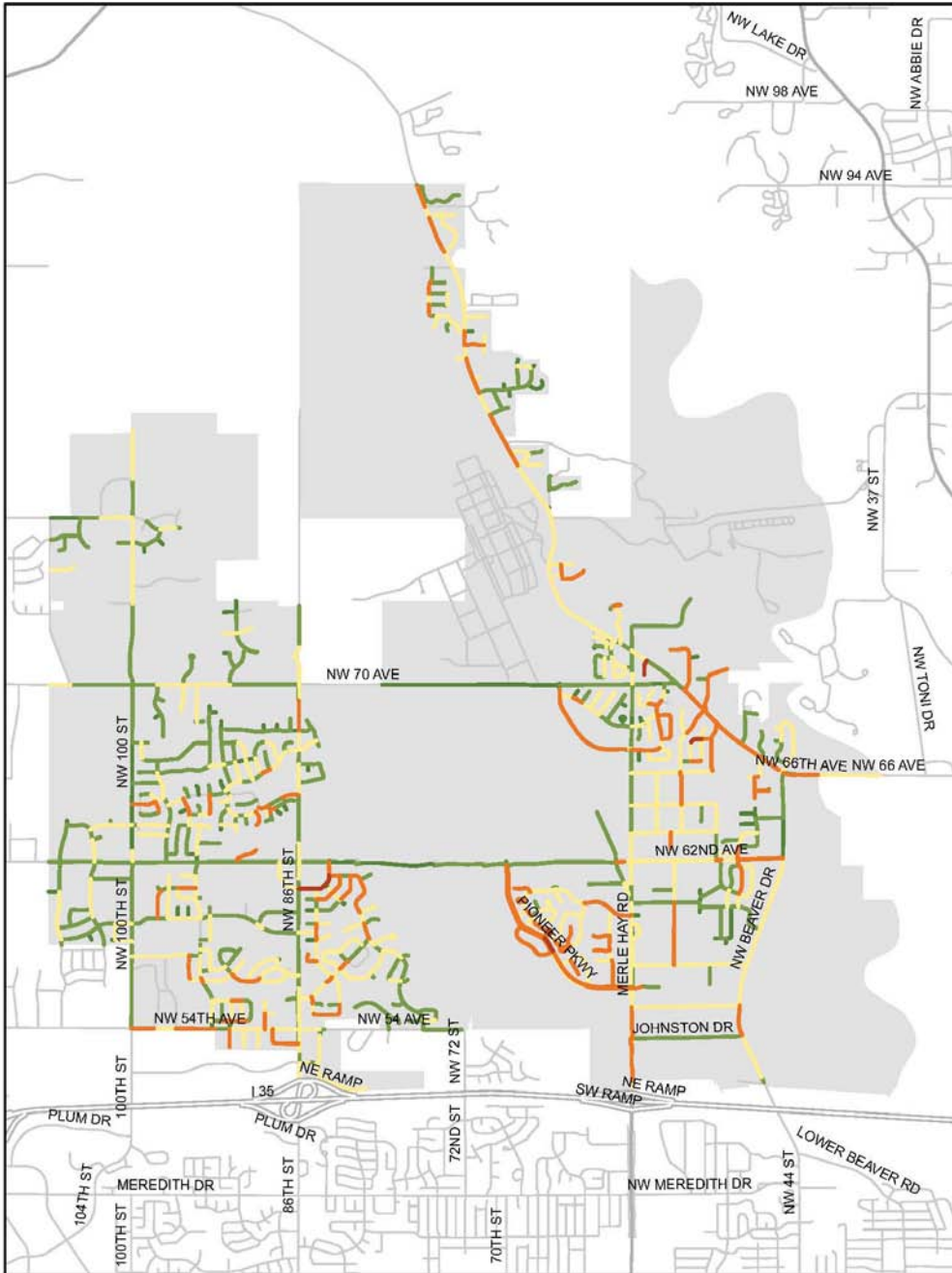
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
16.2	15.7	16.2	14.4	11.0	11.4	9.8	12.3	13.7	15.2

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

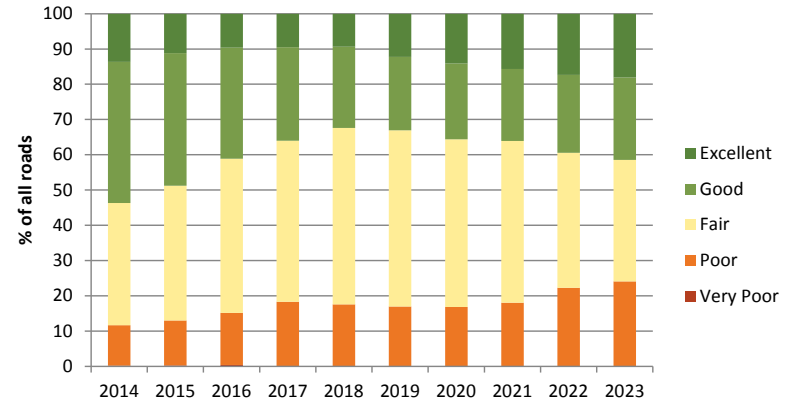


CITY OF JOHNSTON

Annual Maintenance (6-Year Average): \$1,218,221

Miles of Road Measured: 97

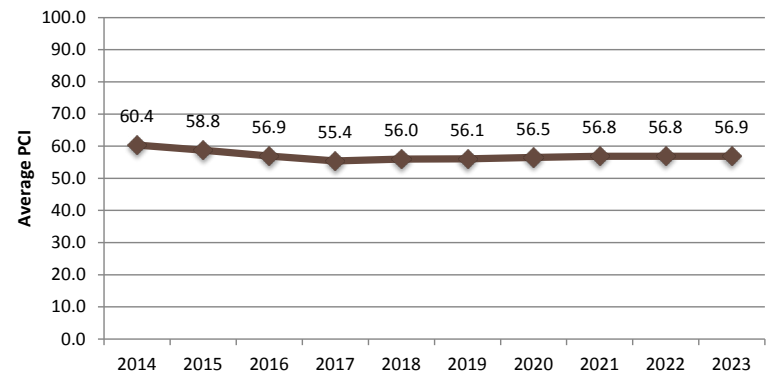
PAVEMENT QUALITY



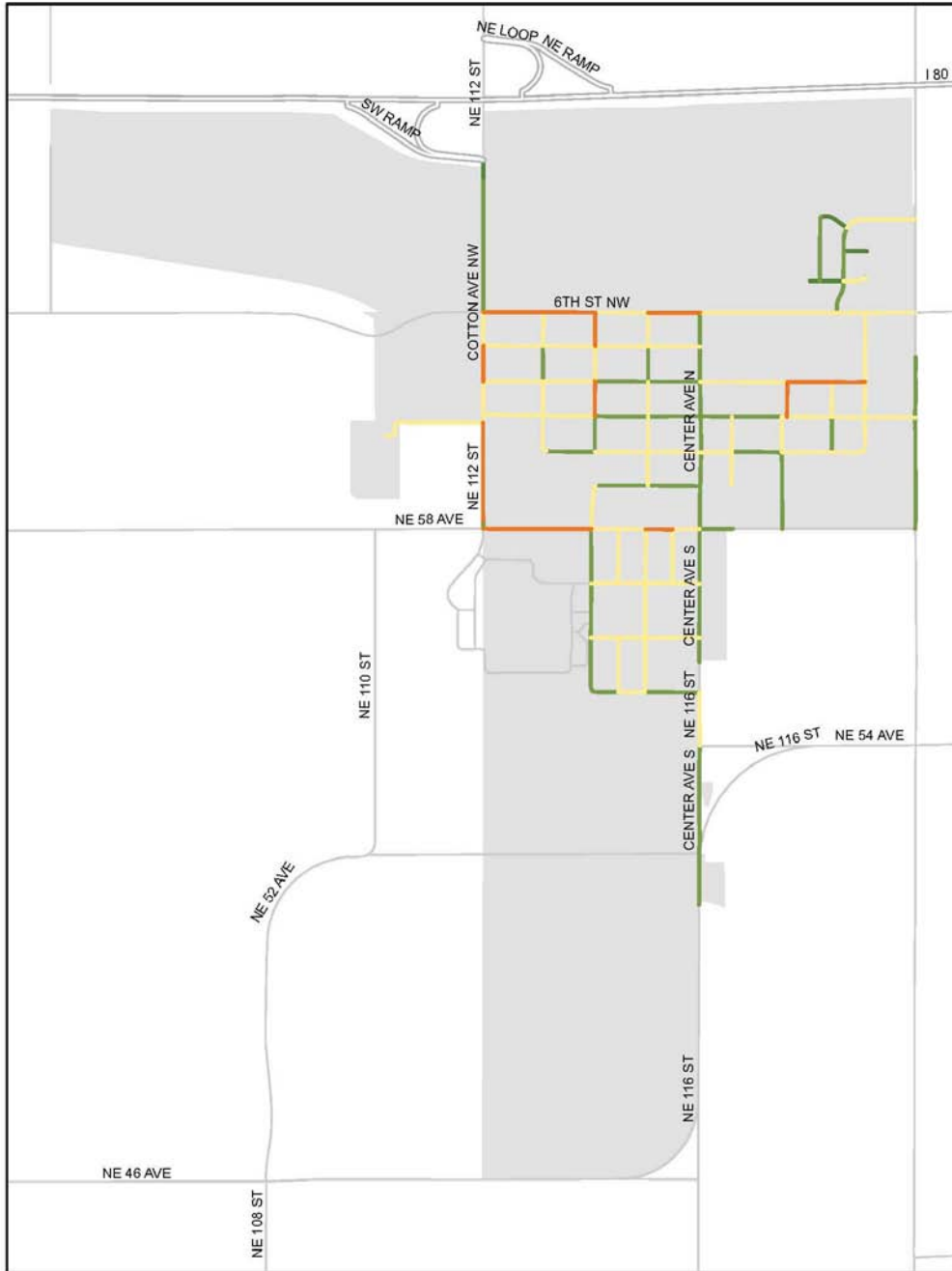
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
11.7	13.0	15.2	18.3	17.6	17.0	16.8	18.0	22.3	24.1

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

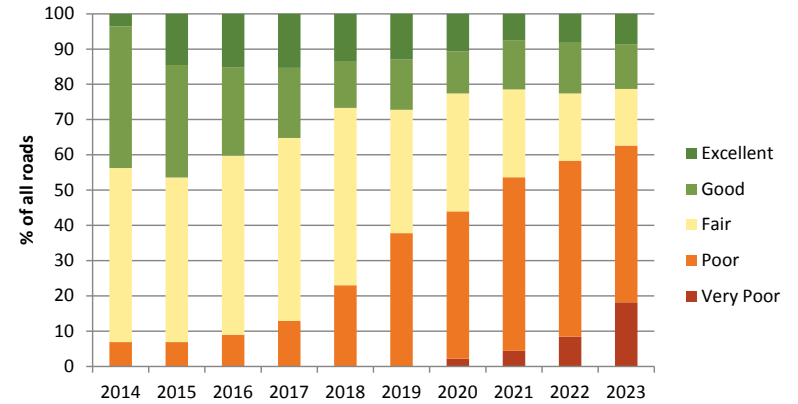


CITY OF MITCHELLVILLE

Annual Maintenance (6-Year Average): \$58,568

Miles of Road Measured: 13

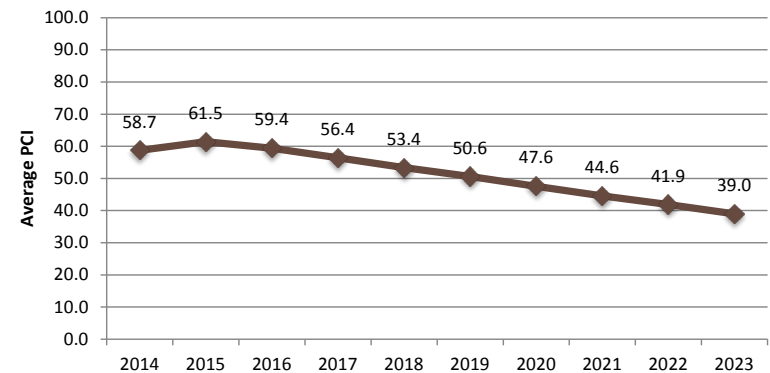
PAVEMENT QUALITY



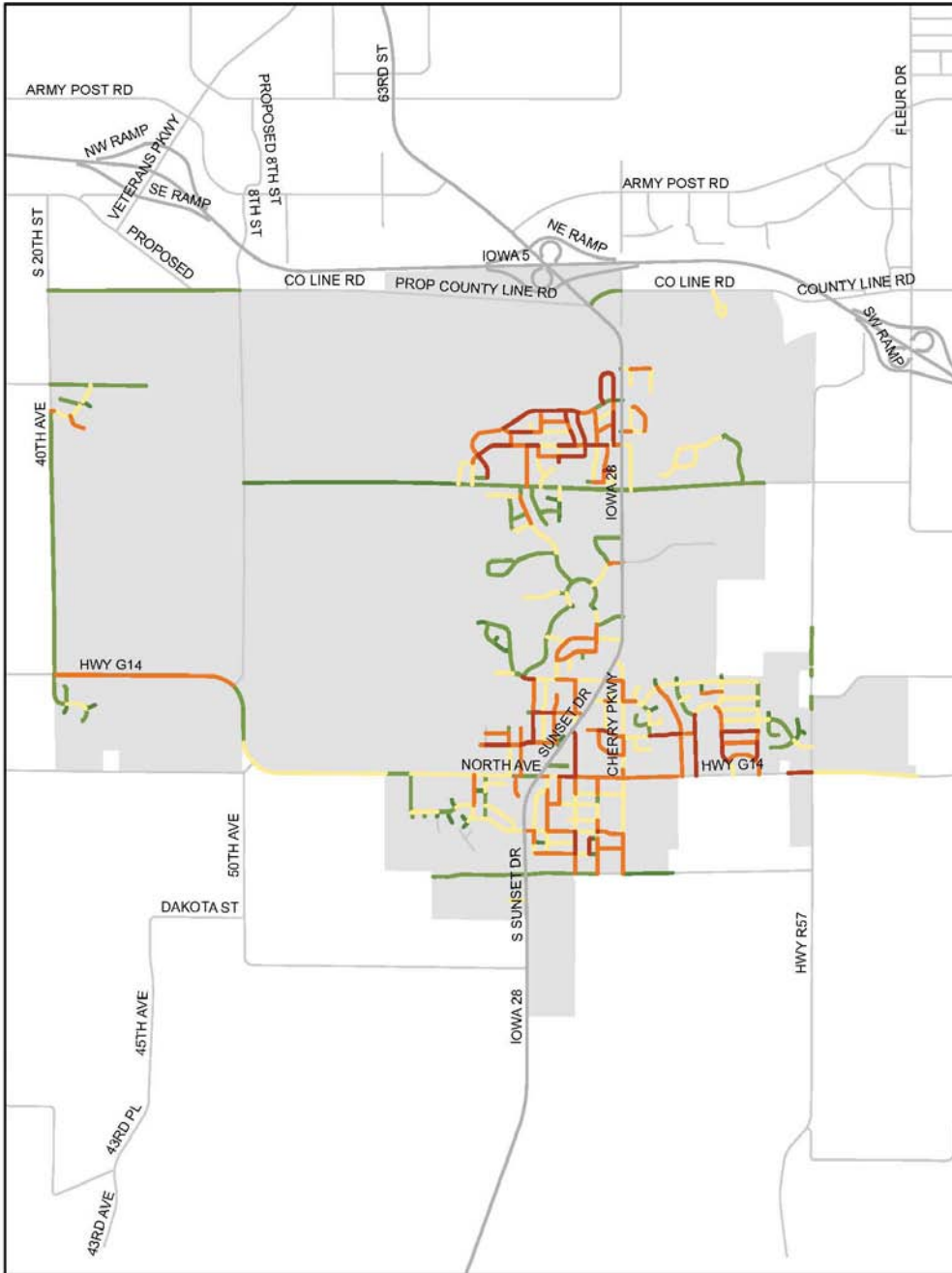
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
6.9	6.9	9.0	12.9	23.0	37.8	44.0	53.7	58.3	62.6

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

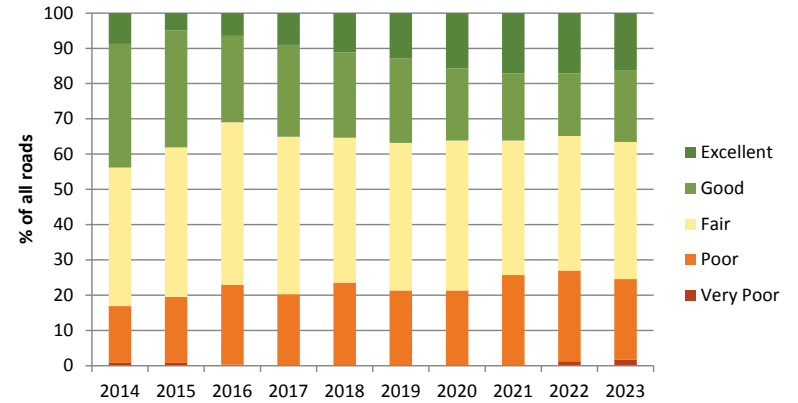


CITY OF NORWALK

Annual Maintenance (6-Year Average): \$679,457

Miles of Road Measured: 44

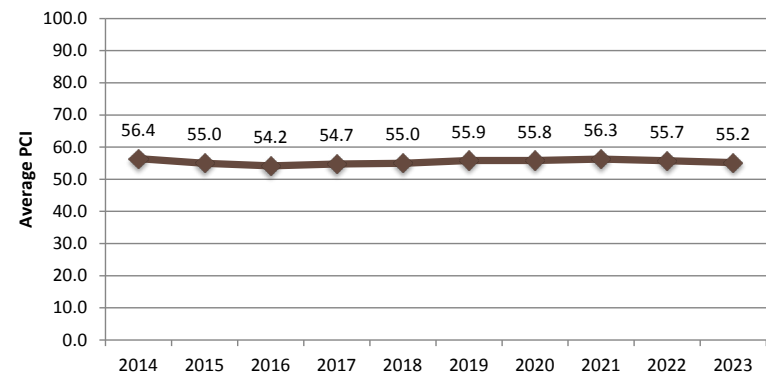
PAVEMENT QUALITY



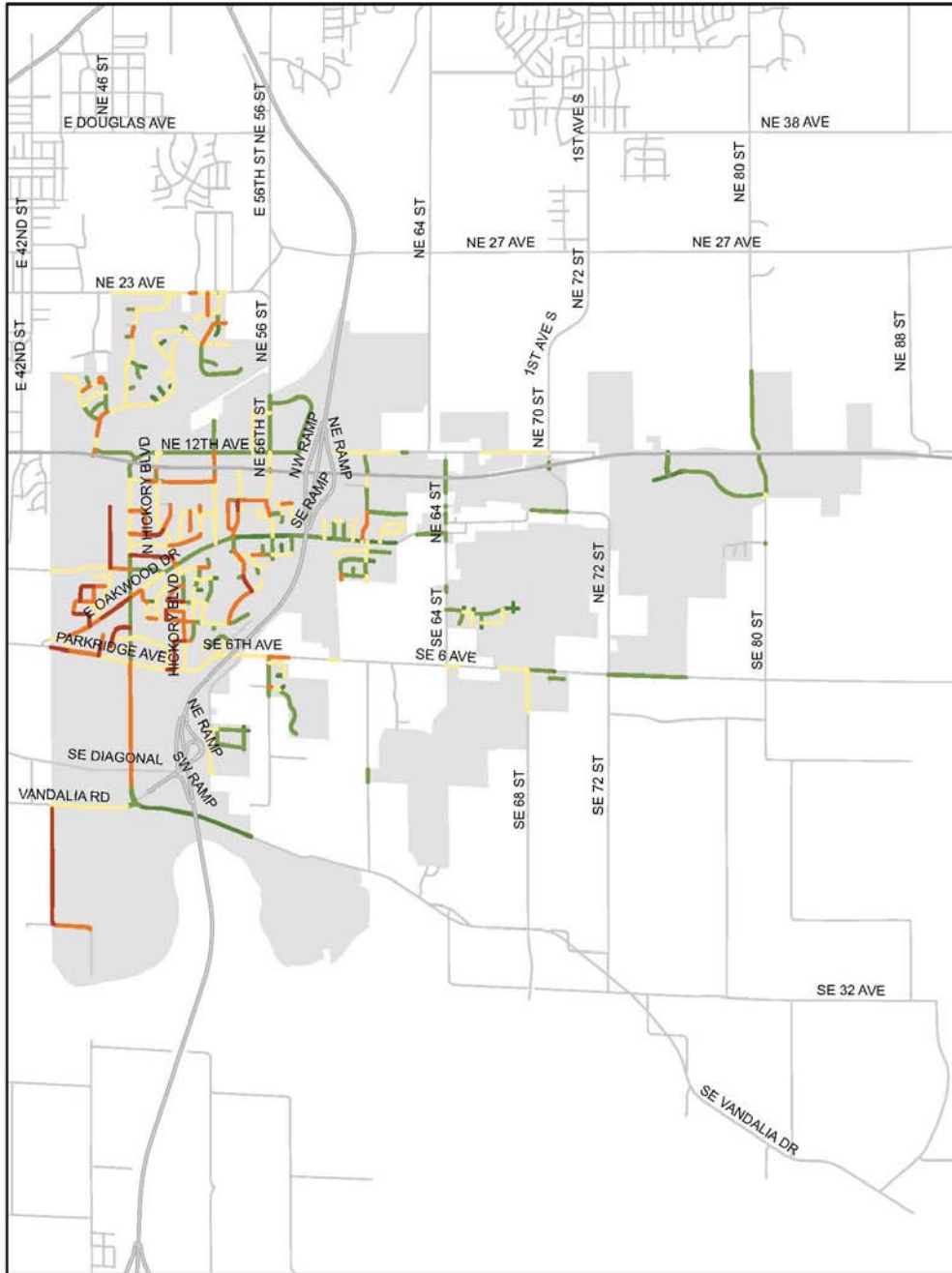
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
16.9	19.5	22.9	20.2	23.5	21.3	21.3	25.7	27.0	24.5

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

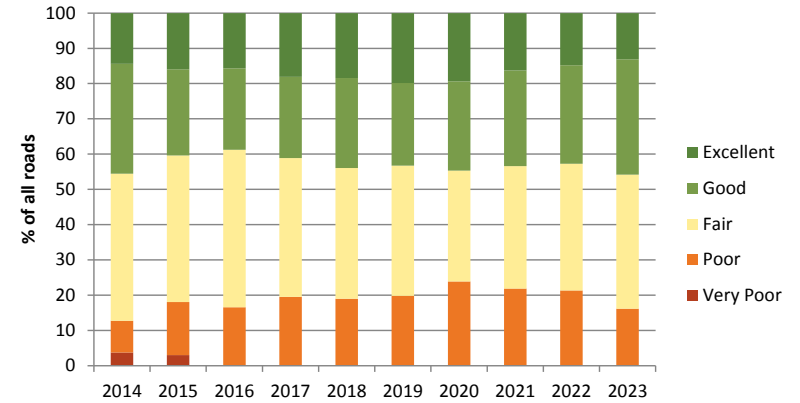


CITY OF PLEASANT HILL

Annual Maintenance (6-Year Average): \$579,915

Miles of Road Measured: 46

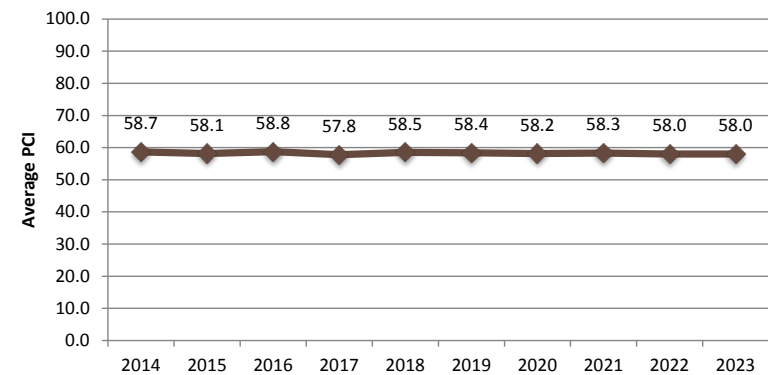
PAVEMENT QUALITY



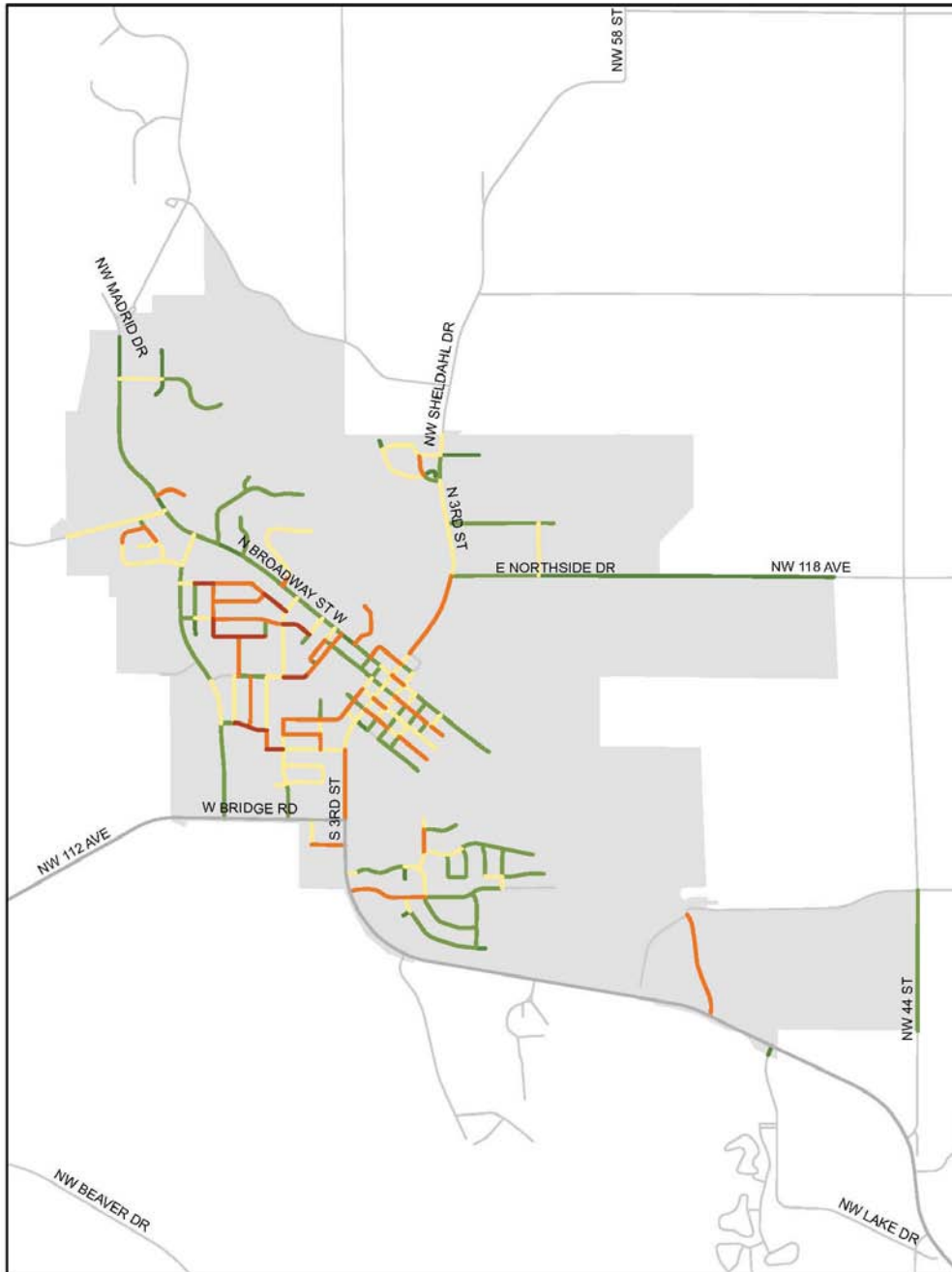
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
12.7	18.1	16.5	19.5	19.0	19.8	23.9	21.9	21.3	16.1

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

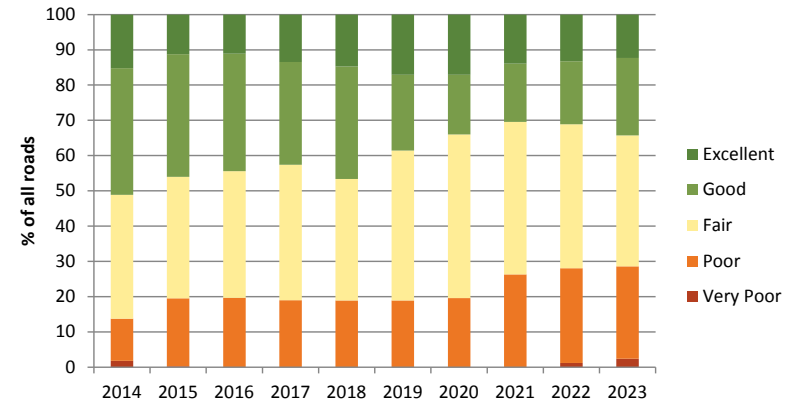


CITY OF POLK CITY

Annual Maintenance (6-Year Average): \$253,022

Miles of Road Measured: 22

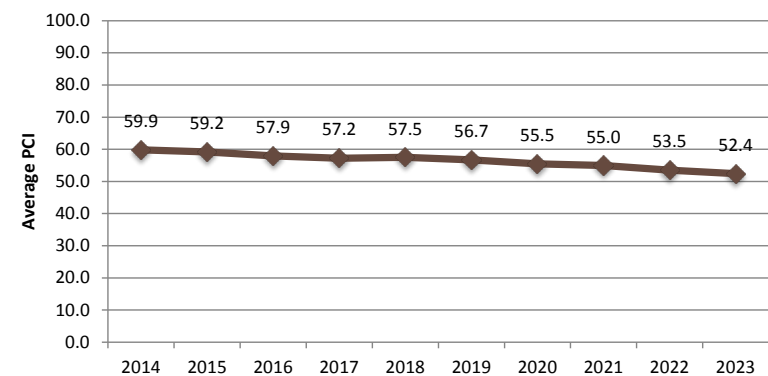
PAVEMENT QUALITY



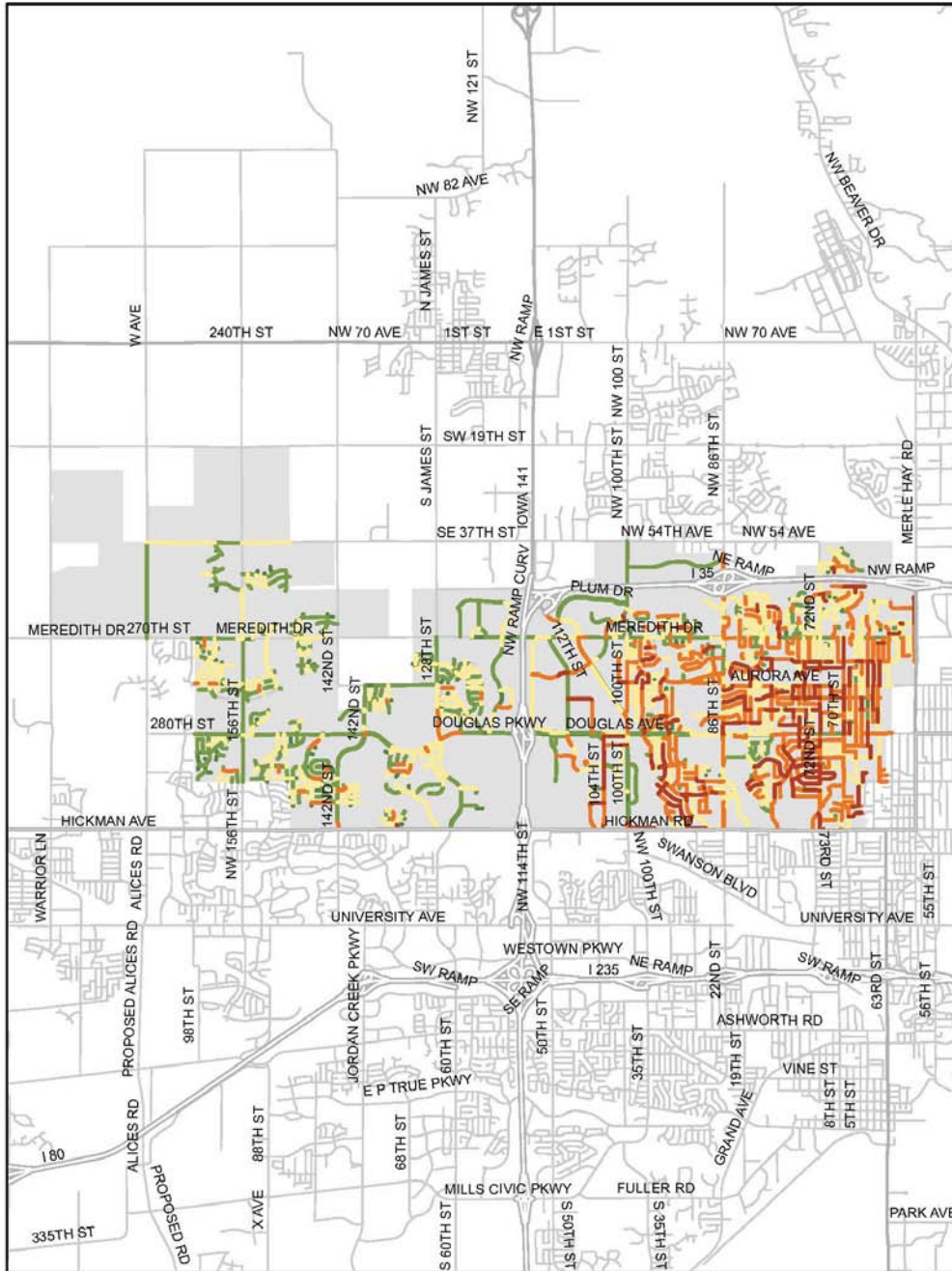
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
13.7	19.5	19.7	19.0	18.9	18.9	19.6	26.3	28.1	28.6

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

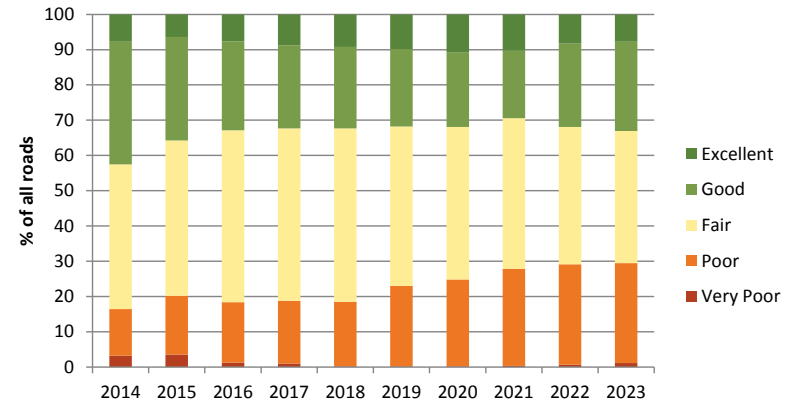


CITY OF URBANDALE

Annual Maintenance (6-Year Average): \$2,042,375

Miles of Road Measured: 190

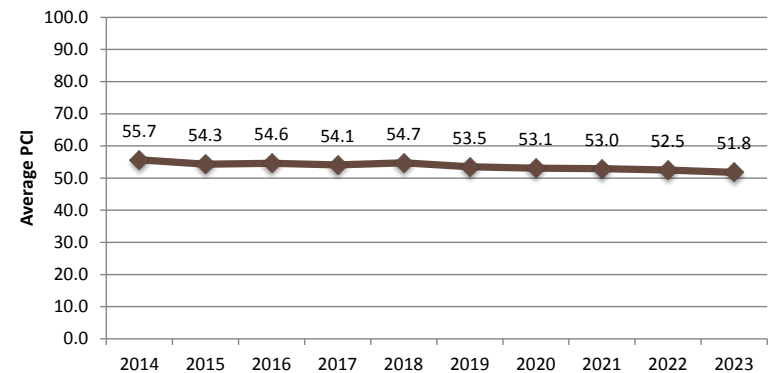
PAVEMENT QUALITY



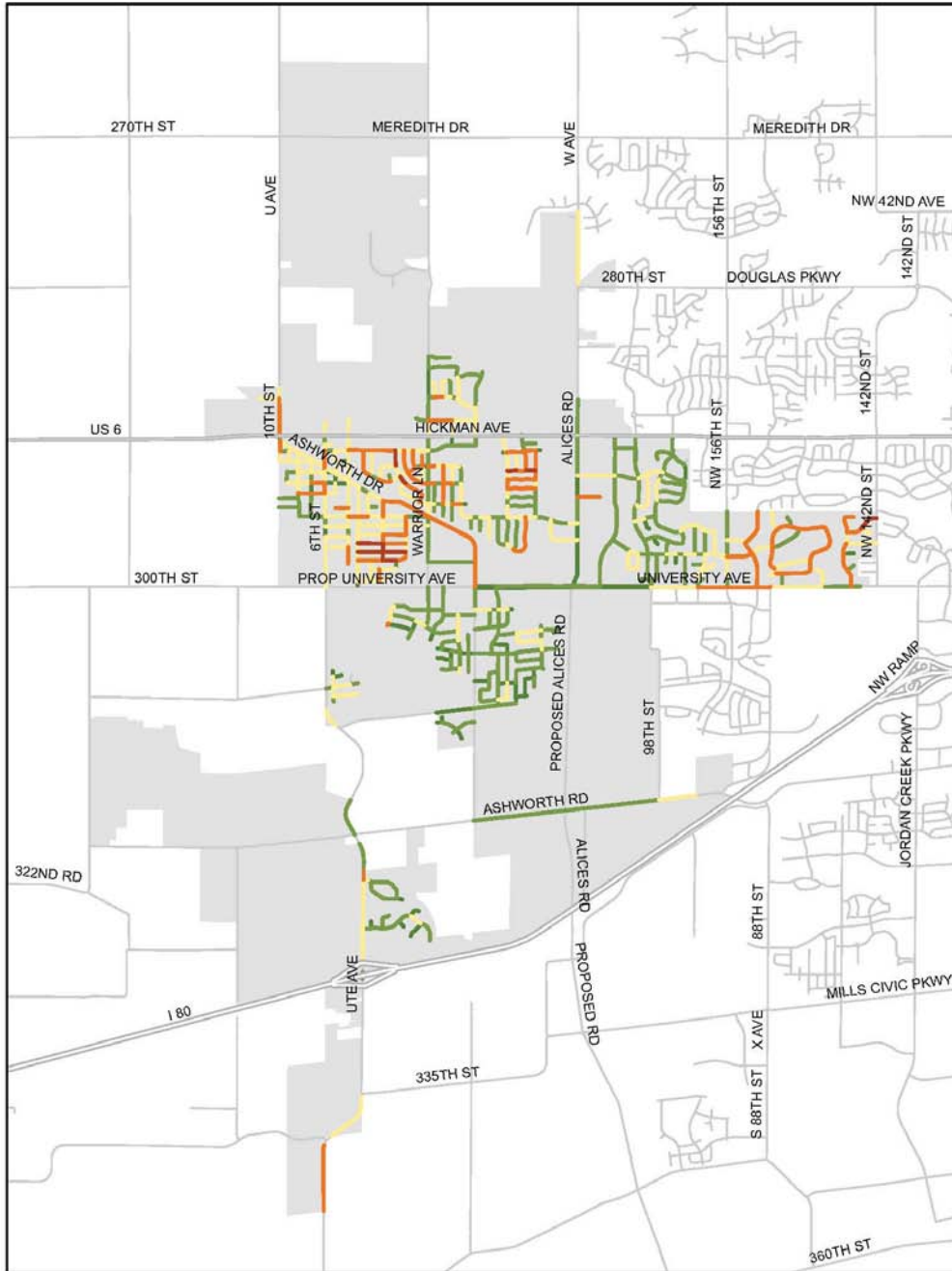
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
16.4	20.2	18.4	18.8	18.5	23.0	24.8	27.8	29.1	29.4

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

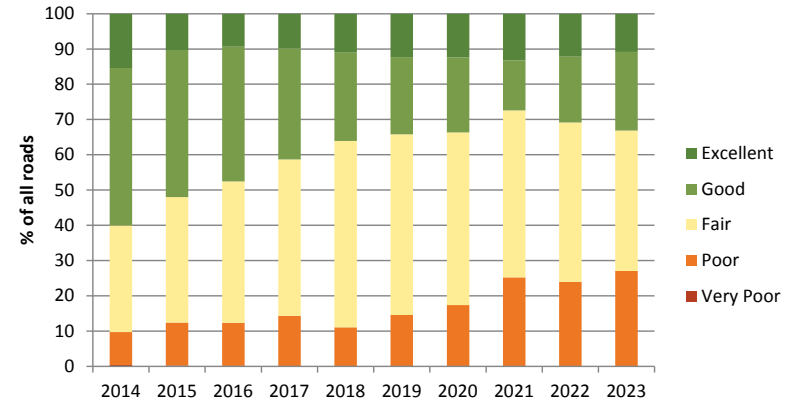


CITY OF WAUKEE

Annual Maintenance (6-Year Average): \$559,356

Miles of Road Measured: 62

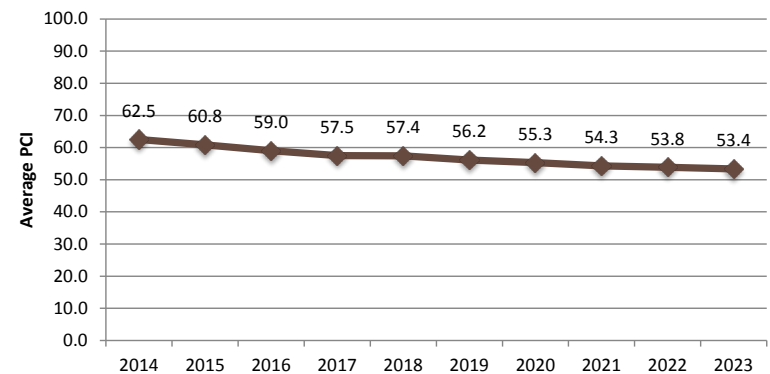
PAVEMENT QUALITY



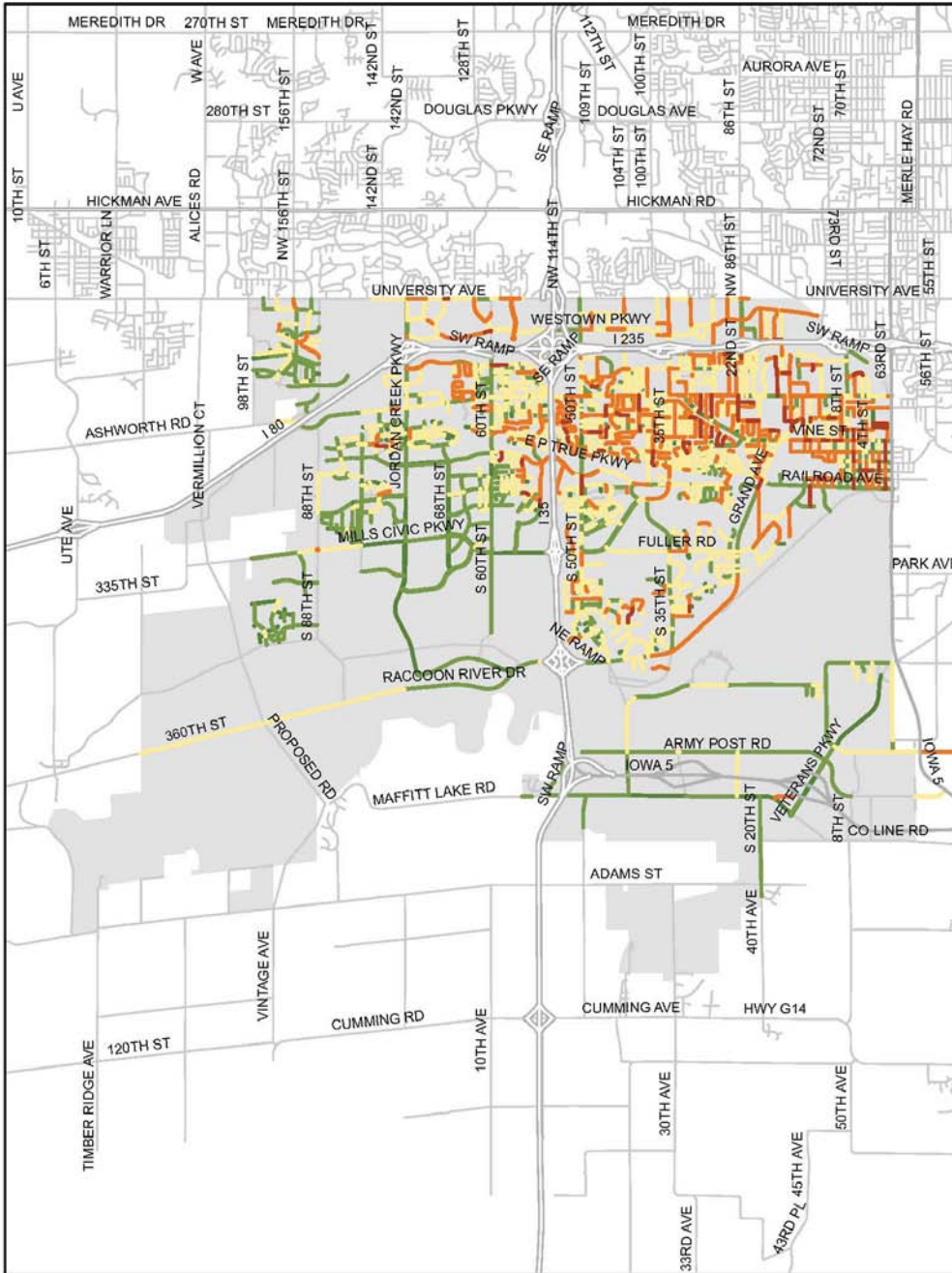
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
9.7	12.4	12.3	14.3	11.0	14.5	17.4	25.2	23.9	27.0

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

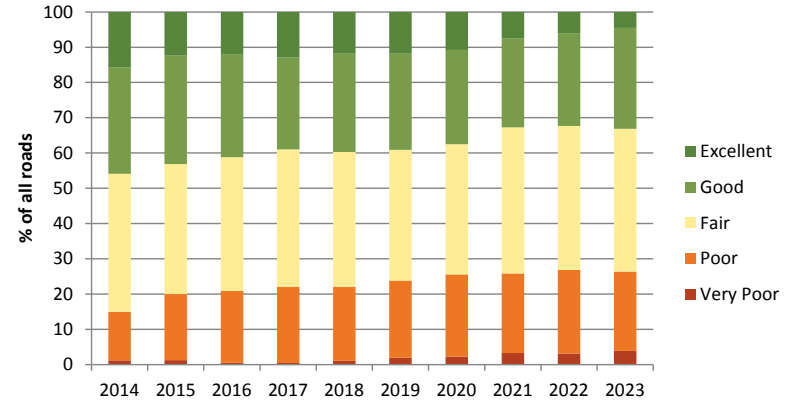


CITY OF WEST DES MOINES

Annual Maintenance (6-Year Average): \$2,237,219

Miles of Road Measured: 275

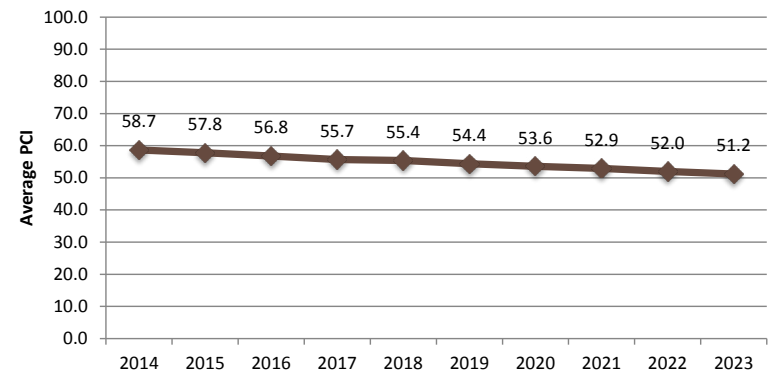
PAVEMENT QUALITY



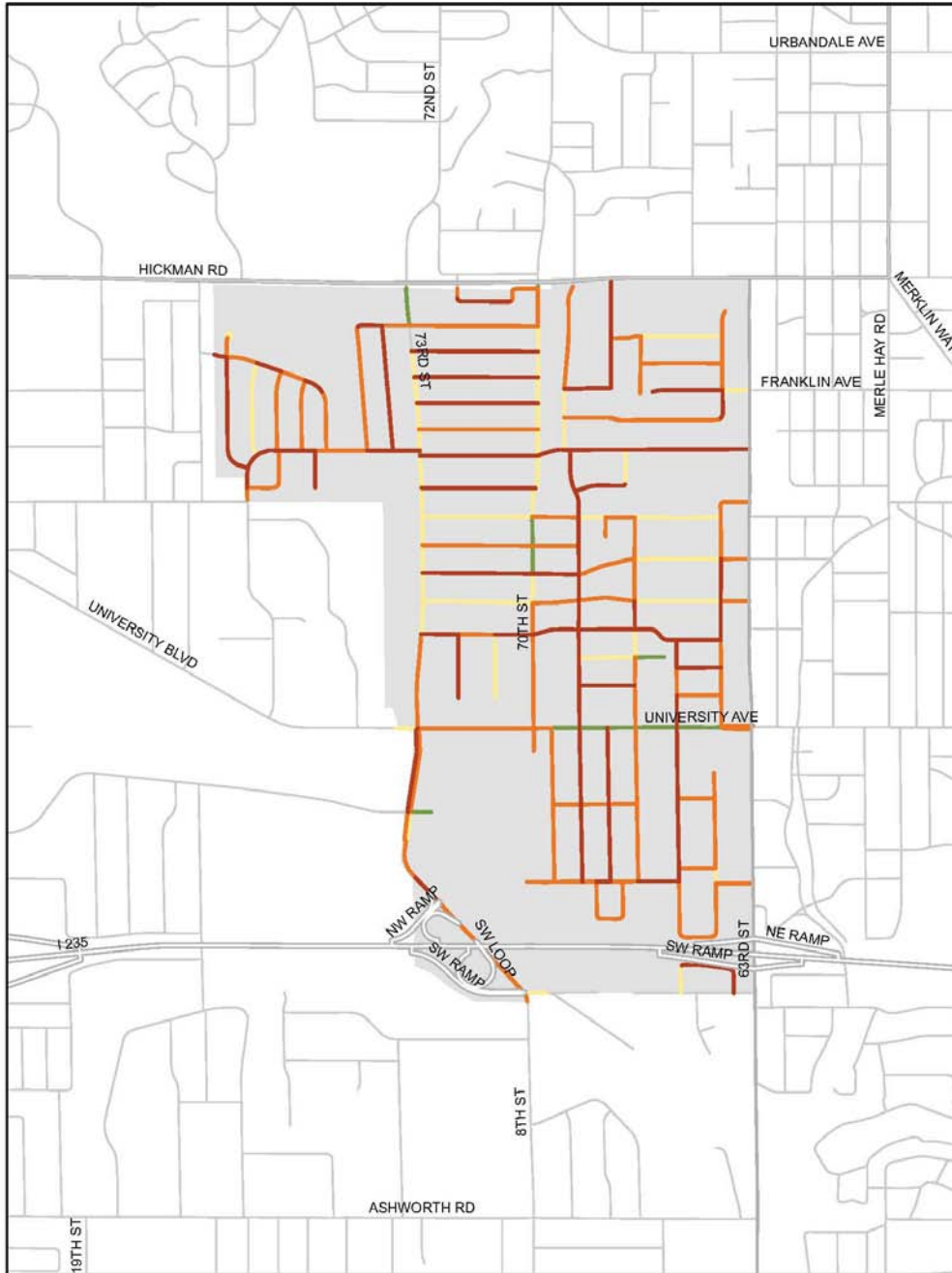
Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
14.9	20.0	20.9	22.1	22.1	23.8	25.6	25.8	26.8	26.4

AVERAGE CONDITION (PCI)



2013 LOCAL ROAD ASSESSMENT

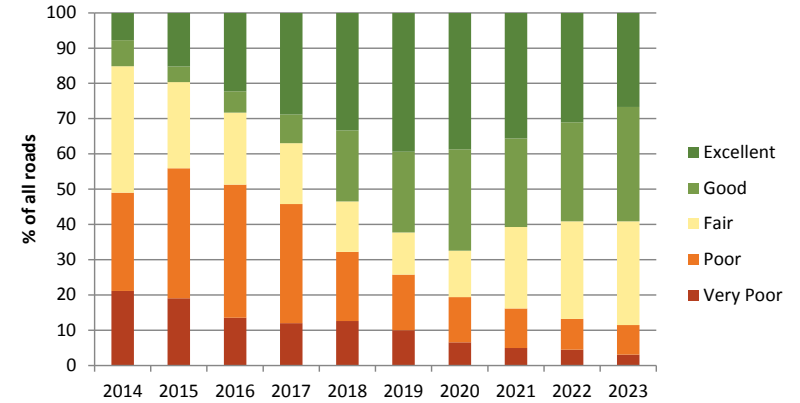


CITY OF WINDSOR HEIGHTS

Annual Maintenance (6-Year Average): \$498,948

Miles of Road Measured: 22

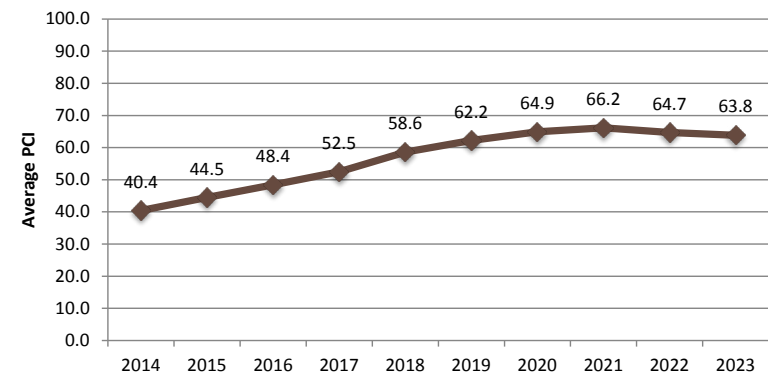
PAVEMENT QUALITY



Percent of Roads in Poor or Worse Condition

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
49.0	55.9	51.3	45.7	32.2	25.8	19.4	16.2	13.2	11.5

AVERAGE CONDITION (PCI)



TABLES BY JURISDICTION

The following tables break down pavement conditions for each member community by year and condition using current maintenance budgets. Numbers in the chart represent the percent of all roads within the community.

ALTOONA (\$696,106)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.8	15.2	38.2	31.9	13.9
2015	1.3	18.6	38.3	30.3	11.5
2016	0.3	20.0	39.2	29.0	11.5
2017	0.1	20.6	38.8	28.3	12.2
2018	0.1	20.1	39.0	28.8	12.0
2019	0.3	21.2	39.6	26.1	12.8
2020	0.3	21.7	41.1	24.2	12.8
2021	0.5	21.7	45.2	22.7	10.0
2022	1.2	22.7	44.0	23.8	8.2
2023	1.5	24.3	43.1	24.1	6.9

ANKENY (\$1,544,627)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	4.6	12.2	26.0	38.6	18.6
2015	1.2	13.4	33.6	36.5	15.3
2016	0.6	11.7	37.7	37.1	12.8
2017	0.3	13.0	41.0	32.7	12.9
2018	0.1	13.6	44.8	30.2	11.3
2019	0.0	15.3	48.7	25.1	10.9
2020	0.0	17.4	48.3	24.5	9.7
2021	0.0	21.4	48.2	22.1	8.3
2022	0.3	24.6	45.3	22.0	7.8
2023	0.9	26.0	43.2	23.7	6.3

BONDURANT (\$256,328)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.0	10.0	46.7	32.4	10.9
2015	0.0	12.0	52.4	23.1	12.5
2016	0.0	22.0	43.7	20.9	13.4
2017	0.0	23.2	40.4	21.6	14.9
2018	0.0	24.5	39.8	19.1	16.6
2019	0.0	24.4	38.2	20.8	16.6
2020	0.0	29.2	34.7	20.3	15.9
2021	5.0	27.2	30.5	23.2	14.1
2022	5.0	24.6	33.0	24.2	13.2
2023	5.4	24.9	29.3	28.3	12.2

CARLISLE (\$343,530)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	1.2	15.6	34.9	27.3	21.0
2015	0.5	17.3	40.3	21.2	20.6
2016	0.0	20.7	35.0	24.7	19.6
2017	0.0	16.4	36.2	27.3	20.0
2018	0.0	19.3	32.7	25.9	22.0
2019	0.0	21.1	30.3	23.5	25.1
2020	0.0	21.2	35.1	18.4	25.3
2021	0.0	23.6	33.4	19.2	23.8
2022	0.0	20.3	31.8	26.2	21.8
2023	0.9	19.1	30.0	28.6	21.4

CLIVE (\$1,662,341)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	4.1	17.7	34.0	33.5	10.8
2015	5.5	19.2	33.4	32.4	9.4
2016	4.7	19.5	36.5	30.8	8.5
2017	3.9	18.8	38.9	29.5	8.9
2018	3.2	17.0	42.1	29.0	8.8
2019	2.4	16.4	44.5	27.5	9.2
2020	1.7	15.2	48.8	25.7	8.6
2021	1.1	16.4	51.5	23.3	7.7
2022	0.5	20.4	49.9	22.3	7.0
2023	0.0	23.6	47.5	22.1	6.8

CUMMING (\$27,451)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.0	0.0	43.1	51.3	5.6
2015	0.0	3.2	46.9	42.6	7.3
2016	0.0	3.2	45.1	45.5	6.1
2017	0.0	11.8	39.2	43.9	5.1
2018	0.0	20.1	40.3	32.9	6.7
2019	0.0	34.3	40.0	19.1	6.7
2020	3.2	33.2	51.3	4.2	8.0
2021	3.2	40.1	45.5	4.2	7.0
2022	11.8	30.8	45.0	6.0	6.4
2023	18.3	28.0	38.4	9.8	5.5

DES MOINES (\$15,551,818)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	7.0	22.8	40.0	21.7	8.4
2015	4.7	26.1	37.8	19.4	12.0
2016	1.0	27.7	37.7	17.1	16.6
2017	0.7	27.7	35.5	14.5	21.7
2018	1.6	24.7	32.8	15.7	25.1
2019	2.3	23.7	29.9	14.9	29.1
2020	3.1	20.7	27.2	18.2	30.9
2021	4.0	18.5	27.1	21.4	29.1
2022	4.9	16.0	24.7	27.3	27.1
2023	5.3	15.1	23.6	30.9	25.1

GRIMES (\$913,603)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	1.1	15.2	20.6	45.9	17.3
2015	2.1	13.6	24.4	47.1	12.7
2016	2.0	14.2	28.6	47.9	7.3
2017	2.5	11.9	31.8	45.8	8.0
2018	0.3	10.7	40.8	37.8	10.4
2019	0.0	11.4	49.0	25.6	14.0
2020	0.0	9.8	53.4	18.3	18.4
2021	0.0	12.3	49.7	16.2	21.8
2022	0.0	13.7	49.1	11.8	25.4
2023	0.0	15.2	43.0	13.7	28.0

JOHNSTON (\$1,218,221)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.1	11.5	34.6	40.1	13.6
2015	0.2	12.8	38.2	37.6	11.2
2016	0.4	14.8	43.7	31.6	9.6
2017	0.0	18.3	45.7	26.5	9.5
2018	0.0	17.6	50.0	23.0	9.4
2019	0.0	17.0	50.0	20.8	12.3
2020	0.0	16.8	47.5	21.5	14.1
2021	0.0	18.0	45.9	20.4	15.6
2022	0.0	22.3	38.3	22.1	17.4
2023	0.0	24.1	34.4	23.4	18.1

TABLES BY JURISDICTION (CONT'D)

MITCHELLVILLE (\$58,568)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.0	6.9	49.3	40.2	3.6
2015	0.0	6.9	46.7	31.8	14.6
2016	0.0	9.0	50.8	25.0	15.2
2017	0.0	12.9	51.9	19.9	15.3
2018	0.0	23.0	50.3	13.3	13.4
2019	0.0	37.8	35.0	14.2	13.0
2020	2.2	41.8	33.4	11.9	10.7
2021	4.4	49.3	24.9	14.0	7.5
2022	8.5	49.9	19.1	14.3	8.2
2023	18.2	44.4	16.0	12.7	8.6

NORWALK (\$679,457)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.8	16.1	39.3	35.0	8.8
2015	0.8	18.7	42.4	33.1	4.9
2016	0.3	22.6	46.1	24.5	6.5
2017	0.0	20.2	44.7	26.0	9.0
2018	0.0	23.5	41.1	24.2	11.2
2019	0.0	21.3	41.9	23.9	12.9
2020	0.0	21.3	42.5	20.5	15.7
2021	0.0	25.7	38.1	19.1	17.1
2022	1.3	25.7	38.2	17.8	17.1
2023	1.7	22.9	38.9	20.2	16.4

PLEASANT HILL (\$579,915)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	3.7	9.0	41.7	31.2	14.4
2015	3.0	15.1	41.5	24.5	15.9
2016	0.0	16.5	44.7	23.1	15.7
2017	0.0	19.5	39.4	23.0	18.1
2018	0.0	19.0	37.1	25.6	18.4
2019	0.0	19.8	37.0	23.5	19.8
2020	0.0	23.9	31.4	25.3	19.4
2021	0.0	21.9	34.8	27.1	16.3
2022	0.0	21.3	36.0	28.0	14.8
2023	0.0	16.1	38.1	32.7	13.1

POLK CITY (\$253,022)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	1.8	11.9	35.1	35.9	15.2
2015	0.3	19.3	34.4	34.8	11.3
2016	0.0	19.7	35.9	33.3	11.1
2017	0.0	19.0	38.4	29.2	13.5
2018	0.0	18.9	34.4	32.0	14.7
2019	0.0	18.9	42.5	21.5	17.1
2020	0.0	19.6	46.4	16.9	17.1
2021	0.0	26.3	43.2	16.5	13.9
2022	1.2	26.9	40.8	17.9	13.3
2023	2.4	26.2	37.2	21.9	12.3

URBANDALE (\$2,042,375)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	3.2	13.3	41.0	34.8	7.7
2015	3.5	16.7	44.1	29.4	6.4
2016	1.3	17.1	48.8	25.1	7.7
2017	1.0	17.8	48.9	23.6	8.7
2018	0.2	18.4	49.2	23.1	9.2
2019	0.2	22.9	45.2	22.0	9.8
2020	0.2	24.6	43.3	21.2	10.7
2021	0.3	27.5	42.7	19.2	10.3
2022	0.7	28.5	38.9	23.7	8.3
2023	1.1	28.3	37.5	25.4	7.7

WAUKEE (\$559,356)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	0.4	9.3	30.3	44.6	15.4
2015	0.2	12.2	35.6	41.7	10.3
2016	0.1	12.2	40.1	38.2	9.4
2017	0.0	14.3	44.4	31.5	9.8
2018	0.0	11.0	52.9	25.0	11.1
2019	0.0	14.5	51.3	21.9	12.3
2020	0.0	17.4	48.9	21.3	12.4
2021	0.0	25.2	47.4	14.2	13.2
2022	0.0	23.9	45.2	18.7	12.2
2023	0.0	27.0	39.9	22.3	10.8

WEST DES MOINES (\$2,237,219)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	1.2	13.8	39.2	30.2	15.7
2015	1.2	18.7	36.8	30.8	12.4
2016	0.5	20.5	37.9	29.1	12.1
2017	0.4	21.6	38.9	26.1	12.9
2018	1.0	21.0	38.3	27.9	11.8
2019	1.9	21.9	37.0	27.3	11.8
2020	2.3	23.3	36.9	26.7	10.8
2021	3.3	22.6	41.4	25.2	7.5
2022	3.1	23.7	40.9	26.3	6.0
2023	3.9	22.5	40.5	28.6	4.5

WINDSOR HEIGHTS (\$498,948)

Year	Very Poor	Poor	Fair	Good	Excellent
2014	21.1	27.8	35.9	7.4	7.7
2015	19.0	36.9	24.5	4.4	15.2
2016	13.6	37.7	20.4	6.0	22.3
2017	12.0	33.7	17.3	8.1	28.8
2018	12.6	19.6	14.3	20.2	33.3
2019	10.0	15.8	11.9	22.9	39.4
2020	6.6	12.8	13.2	28.7	38.7
2021	5.0	11.2	23.0	25.1	35.6
2022	4.5	8.8	27.7	28.1	31.0
2023	3.0	8.4	29.4	32.5	26.7