



Public Works Department

Pavement Management Program 3/18/2010

Pavement Management: Topics

- The City of Gainesville Pavement Management Program
- MicroPaver software
- Pavement Condition Index
- Maintenance planning
- Current situation and impact factors
- Projected condition
- Conclusion and questions





Inventory



Inspection

Branch Condition Report

Branch ID	Branch Name	Branch Type	Branch Address	Branch Value	Branch Width	Branch Depth	Branch Count	Branch Value	Branch Width
BRANCH_00000000	BRANCH_00000000	BRANCH_00000000	0x00000000	0x00000000	32	0	0	0	0
BRANCH_00000001	BRANCH_00000001	BRANCH_00000001	0x00000001	0x00000001	32	0	0	0	0
BRANCH_00000002	BRANCH_00000002	BRANCH_00000002	0x00000002	0x00000002	32	0	0	0	0
BRANCH_00000003	BRANCH_00000003	BRANCH_00000003	0x00000003	0x00000003	32	0	0	0	0
BRANCH_00000004	BRANCH_00000004	BRANCH_00000004	0x00000004	0x00000004	32	0	0	0	0
BRANCH_00000005	BRANCH_00000005	BRANCH_00000005	0x00000005	0x00000005	32	0	0	0	0
BRANCH_00000006	BRANCH_00000006	BRANCH_00000006	0x00000006	0x00000006	32	0	0	0	0
BRANCH_00000007	BRANCH_00000007	BRANCH_00000007	0x00000007	0x00000007	32	0	0	0	0
BRANCH_00000008	BRANCH_00000008	BRANCH_00000008	0x00000008	0x00000008	32	0	0	0	0
BRANCH_00000009	BRANCH_00000009	BRANCH_00000009	0x00000009	0x00000009	32	0	0	0	0

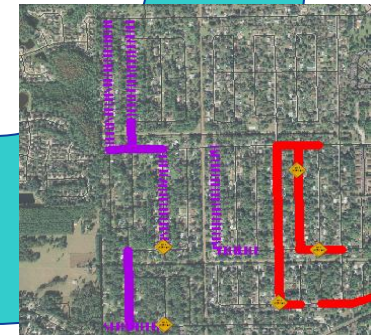
Reporting



Maintenance



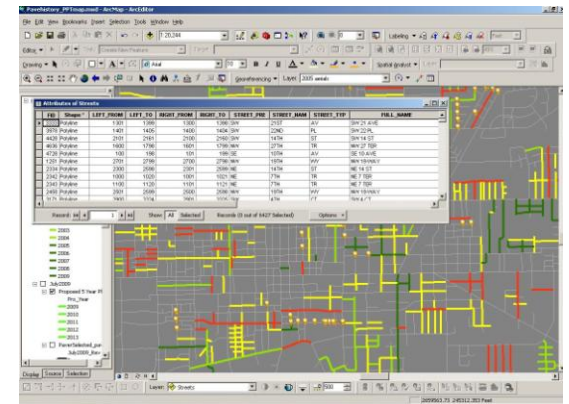
Planning



Modeling

Pavement Management: What is it?

- Plans, organizes & documents
- Helps make better decisions
- Provides support data for decisions
- Answers “what-if” scenarios
- Objectively prioritizes roadways
- Provide schedule of accountability
- Fact-based recommendations



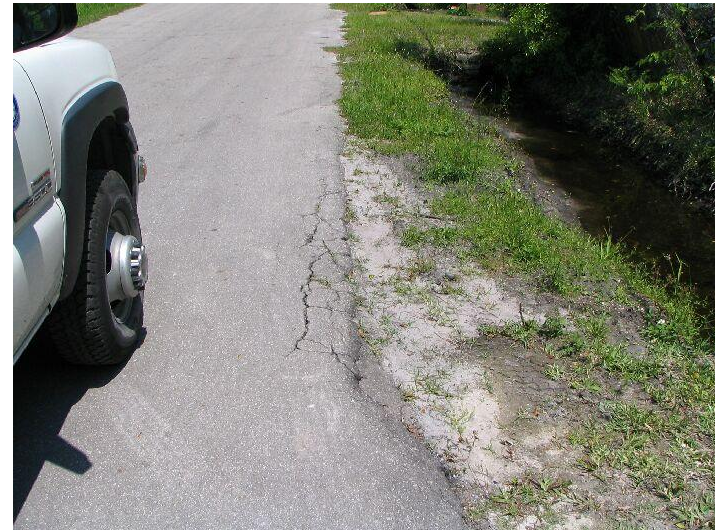
Pavement Management Inventory

- Street name (block - to & from)
- Length, width, area
- Type of pavement (asphalt, concrete, etc.)
- Road classification (arterial, collector, residential)
- Last maintenance date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Branch Name	Plan Year	Section ID	From	To	Section Rank	SURFACE	Last Inspection	Length (ft)	Width (ft)	Area (sqft)	True Area (sqft)	True Area (sqyd)	PCI	Treatment Type	Unit Cost (\$)	Total Cost (\$)	Inspection Observations / Recommendations
2	NE 18 PL	2009	2	NE 17 WY	WALDO RD	E	ST	5/12/2008	146	15	2190	2190	243	14	Overlay	0.72	\$1,577	Completed
3	NE 18 PL	2009	1	NE 16 WY	NE 17 WY	E	ST	5/12/2008	208	15	3120	3120	347	12	Overlay	0.72	\$2,246	Completed
4	NE 17 PL	2009	3	NE 17 WY	WALDO RD	E	ST	5/12/2008	219	15	3285	3285	365	21	Overlay	0.72	\$2,365	Completed
5	NE 17 PL	2009	2	NE 16 WY	NE 17 WY	E	AC	5/12/2008	240	15	3600	3600	400	36	Overlay	0.72	\$2,592	Completed
6	NE 21 PL	2009	4	NE 17 WY	WALDO RD	E	ST	5/13/2008	208	18	3744	3744	416	36	Overlay	0.72	\$2,696	Completed
7	NE 21 PL	2009	3	NE 16 WY	NE 17 WY	E	ST	5/20/2008	240	22	5280	5280	587	41	Overlay	0.72	\$3,802	Completed
8	NW 41 PL	2009	2	NW 36 TER	E DEAD END	E	AC	5/13/2009	134	24	3216	3216	357	14	Rebuild	1.22	\$3,924	Completed
9	NW 36 TER	2009	11	NW 41 PL	NW 41 LN	E	AC	5/13/2009	287	24	6888	6888	765	16	Rebuild	1.22	\$8,403	Completed
10	NW 41 PL	2009	1	W DEAD END	NW 36 TER	E	AC	5/13/2009	158	24	3792	3792	421	16	Rebuild	1.22	\$4,626	Completed
11	NW 36 TER	2009	10	NW 40 PL	NW 41 PL	E	AC	5/13/2009	294	24	7056	7056	784	17	Rebuild	1.22	\$8,608	Completed
12	NW 40 PL	2009	2	NW 36 TER	E DEAD END	E	AC	5/13/2009	129	24	3096	3096	344	17	Rebuild	1.22	\$3,777	Completed
13	NW 41 LN	2009	3	NW 36 TER	E DEAD END	E	AC	5/13/2009	119	24	2856	2856	317	20	Rebuild	1.22	\$3,484	Completed
14	NW 41 LN	2009	2	W DEAD END	NW 36 TER	E	AC	5/13/2009	120	24	2880	2880	320	23	Rebuild	1.22	\$3,514	Completed
15	NW 40 PL	2009	1	W DEAD END	NW 36 TER	E	AC	5/13/2009	154	24	3696	3696	411	23	Rebuild	1.22	\$4,509	Completed

Pavement Management Inspections

- Performed by trained inspectors
- ASTM (American Society for Testing and Materials) standard compliant
- Confirm street condition and prescribed maintenance.
- 1/3 of the streets are inspected each year
- Inspection data is input into MicroPaver



Pavement Management MicroPaver

MicroPaver Software:

- Developed by the Army Corps of Engineers; recommended by APWA
- Optimizes funds allocated for maintenance
- Assigns pavement rating: PCI
Pavement Condition Index

A screenshot of the MicroPaver software interface. The top menu bar includes options like Inventory, Work, PCI, Reports, Pred. Modeling, Cond. Analysis, M&R Plan, GIS/Tree Sel., List Sel., Visual Menu, and Help. The main window is titled "Inventory:IRP-IFARB-01" and is divided into three tabs: "1. Network", "2. Branch", and "3. Section". The "3. Section" tab is active, showing fields for Section ID (01), Surface Type (AAC), Length (1.387), Calc. Area (41,610), From (NEWTON DRIVE), Rank (T), Width (30), Area Adjustment (0), To (INTERSTATE DRIVE), Last Constr. Date (8/1/1990), True Area (41,610), Category (N), Shoulder, Zone, Street Type, Lanes/Spaces (0), and Grade (0). There are also checkboxes for "Calculate Area Adjustment" and "Calculate True Area". At the bottom, there are buttons for "Images (0)", "New", "Copy", "Delete", and "Close".

Pavement Condition Index

PCI

- A numerical index 0-100
- Used to indicate the condition of a roadway.
- MicroPAVER-generated

General Classification	PCI Range	Color
Good	86 - 100	
Satisfactory	71 - 85	
Fair	56 - 70	
Poor	41 - 55	
Very Poor	26 - 40	
Serious	11 - 25	
Failed	0-10	

Pavement Condition Index



PCI 88

100

Pavement Condition Index



Pavement Condition Index



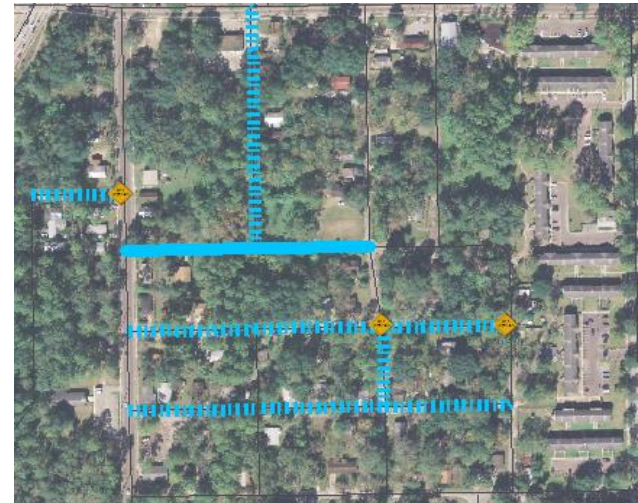
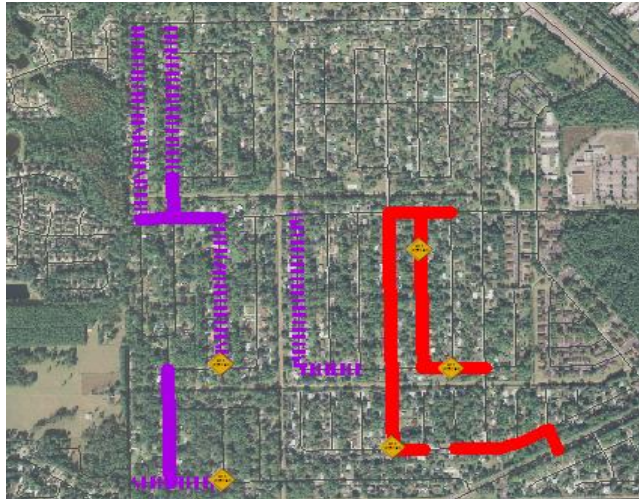
MicroPAVER Generates:

- Categorized inspection data into user-friendly format
- Reports on city street conditions, funding requirements, inspection data, work history etc.
- GIS data for in-depth analysis of pavement conditions, paving history, maintenance scenarios
- Recommended 3-5 year maintenance plan



Pavement Management Modeling

- MicroPAVER can be used for predictive modeling
- Parameters such as useful life, costs, etc. are input
- Ability to model future requirements based on user defined parameters and constraints
- Data can also be utilized in GIS for further analysis



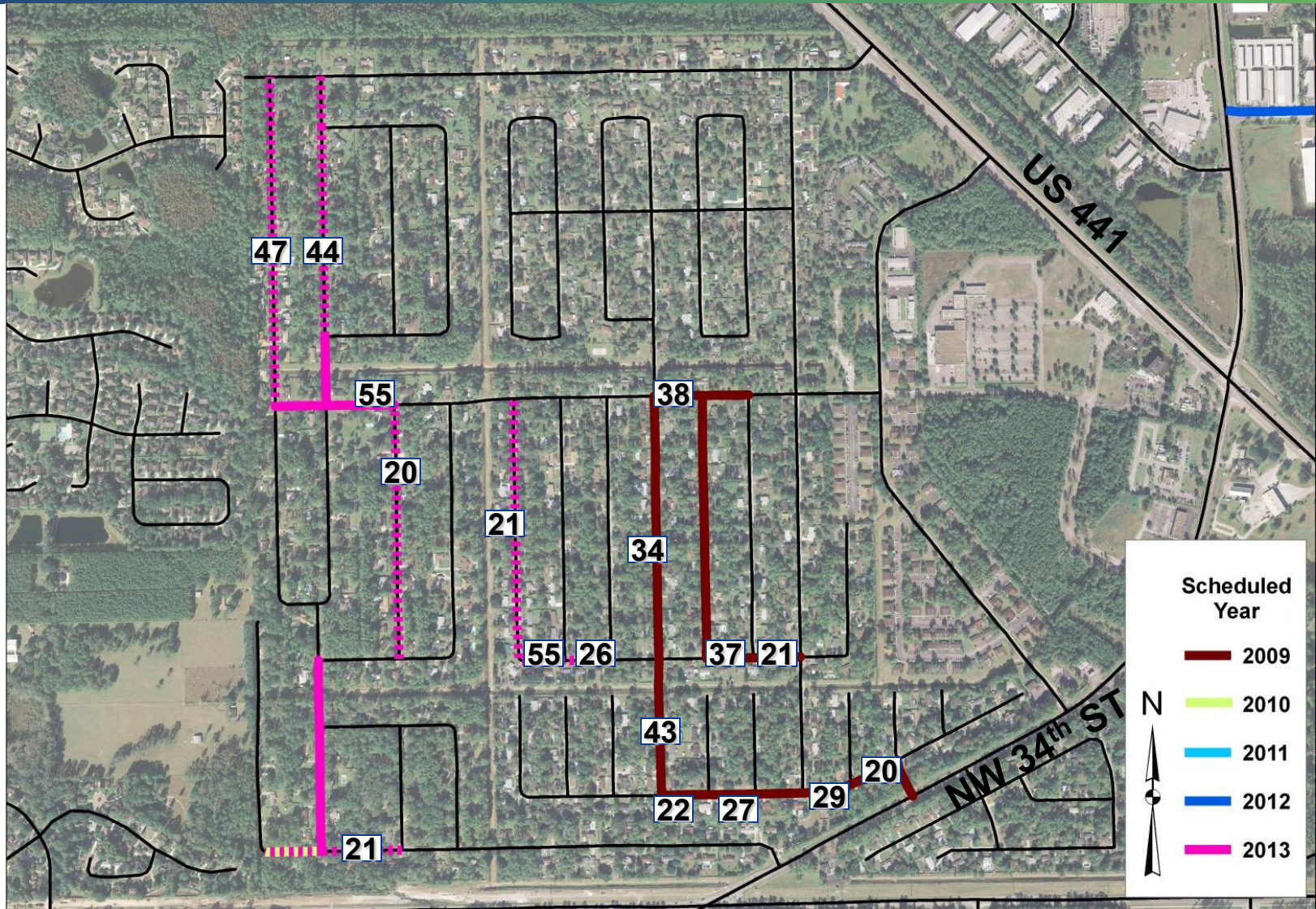
Pavement Management Maintenance Planning

Starting with MicroPaver generated maintenance plan, then finalized using:

- Re-inspection to confirm maintenance implementation
- Connectivity – If subject maintenance is appropriate adjacent segments are added.
- Previous Maintenance- Records of maintenance orders are input into GIS to examine previous road work in an area

Connectivity

Northwood



Pavement Management Maintenance Planning

Inter-Agency Coordination:

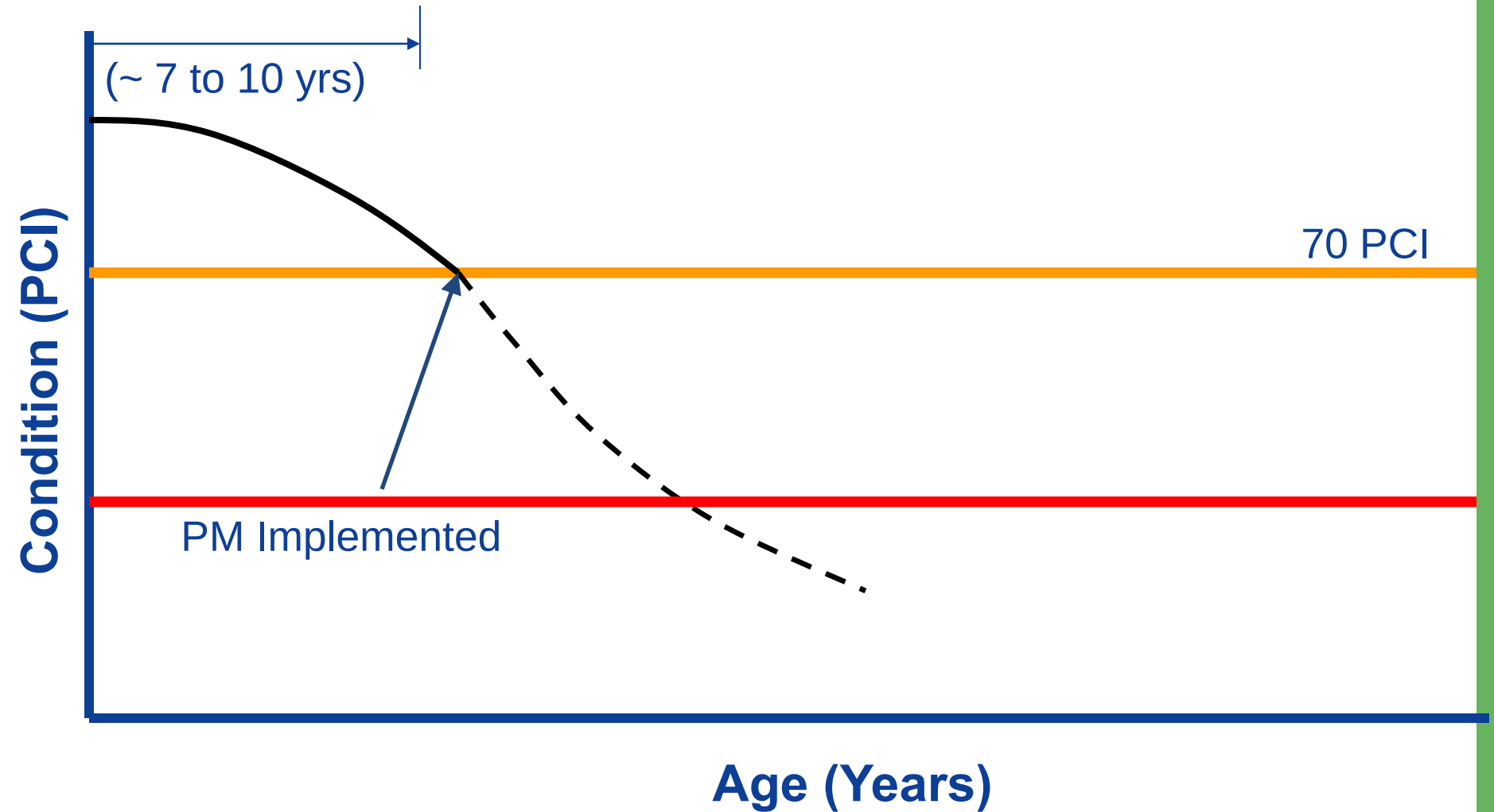
- City (includes GRU), County, and State projects mapped using GIS to identify conflicts or possible project coordination



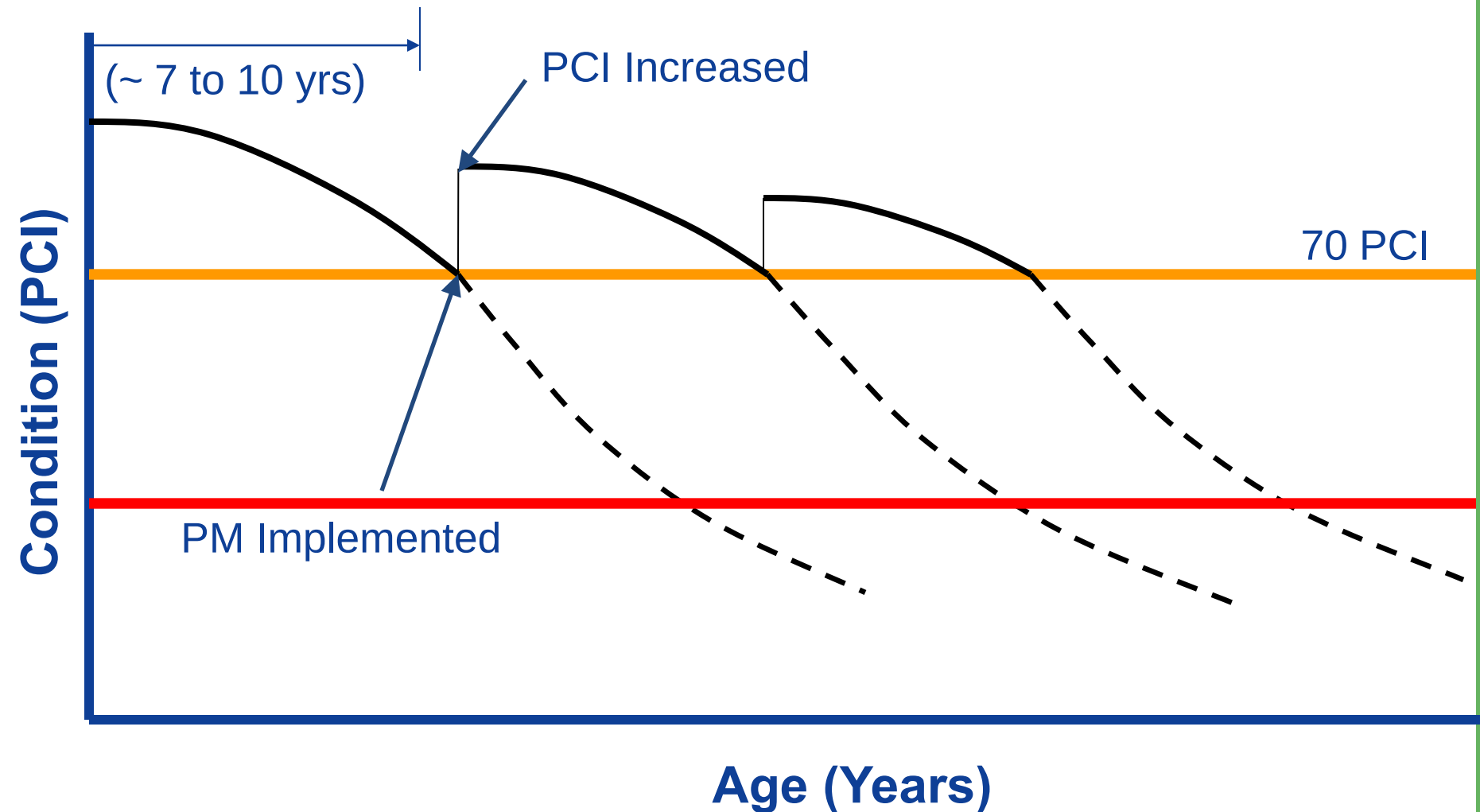
Pavement Management Maintenance Planning

- The resulting Maintenance Plan includes:
 - Preventive maintenance for upper range PCI
 - Routine maintenance for mid range PCI
 - Rebuild and Repaving for severely deteriorated streets

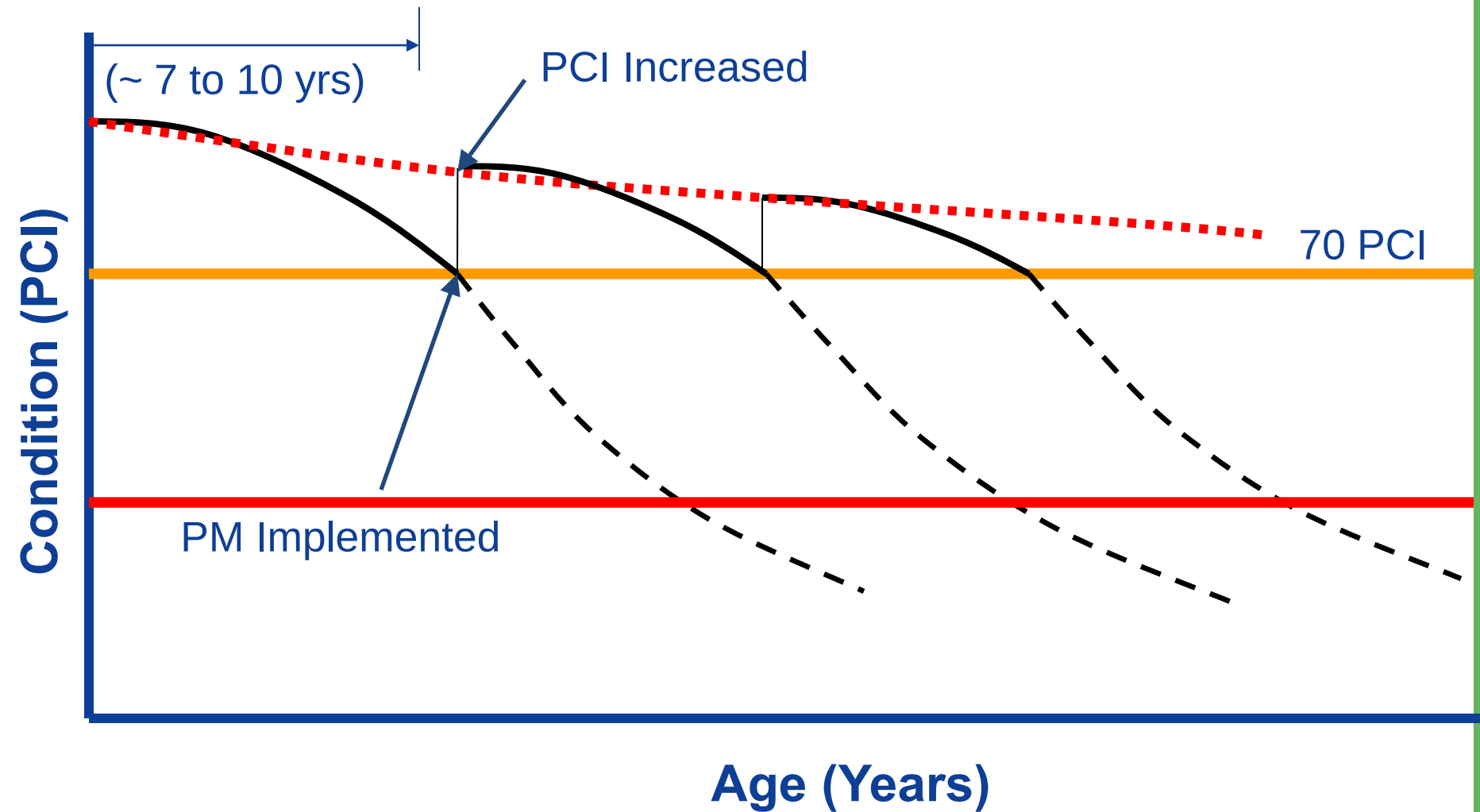
Preventive Maintenance



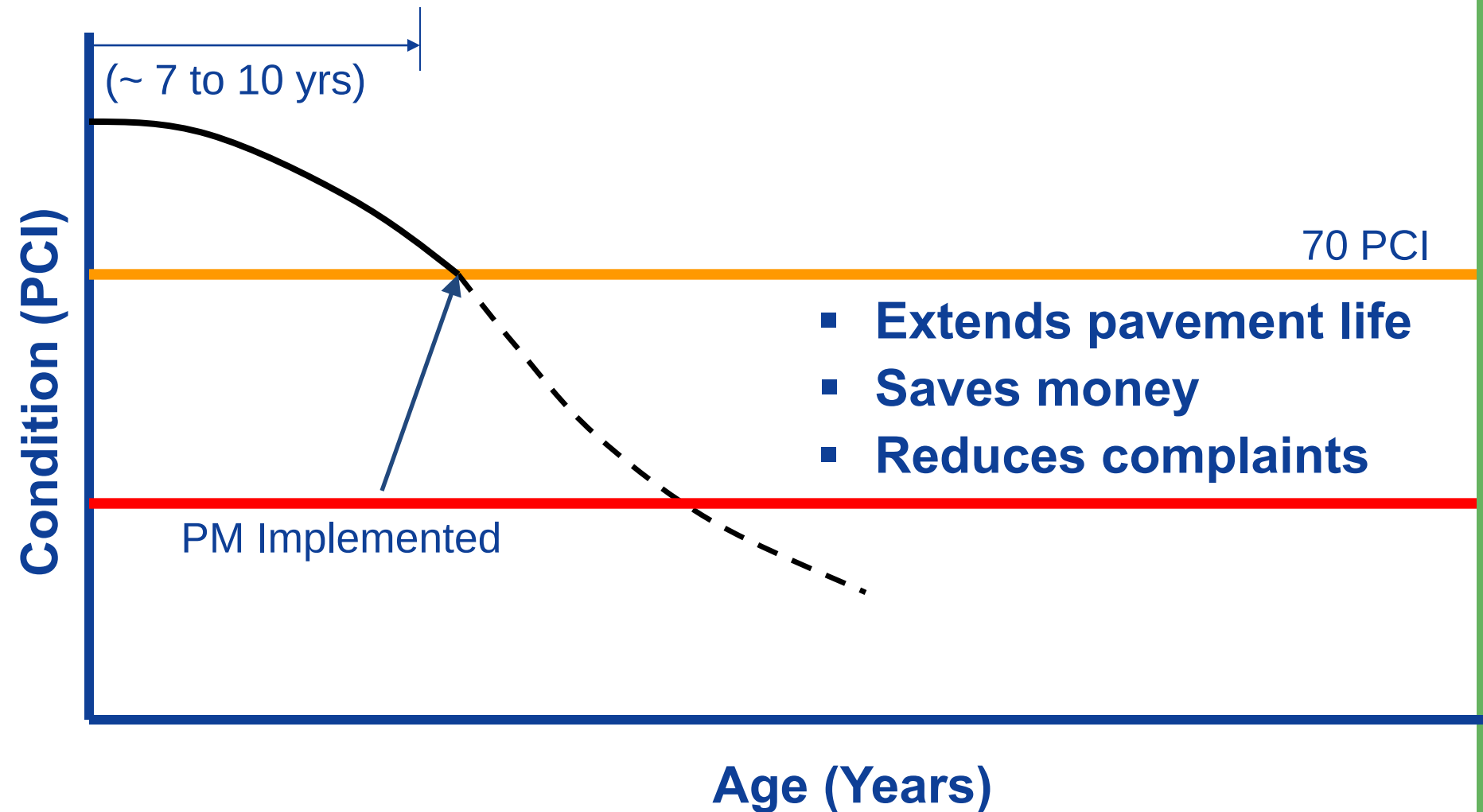
Preventive Maintenance



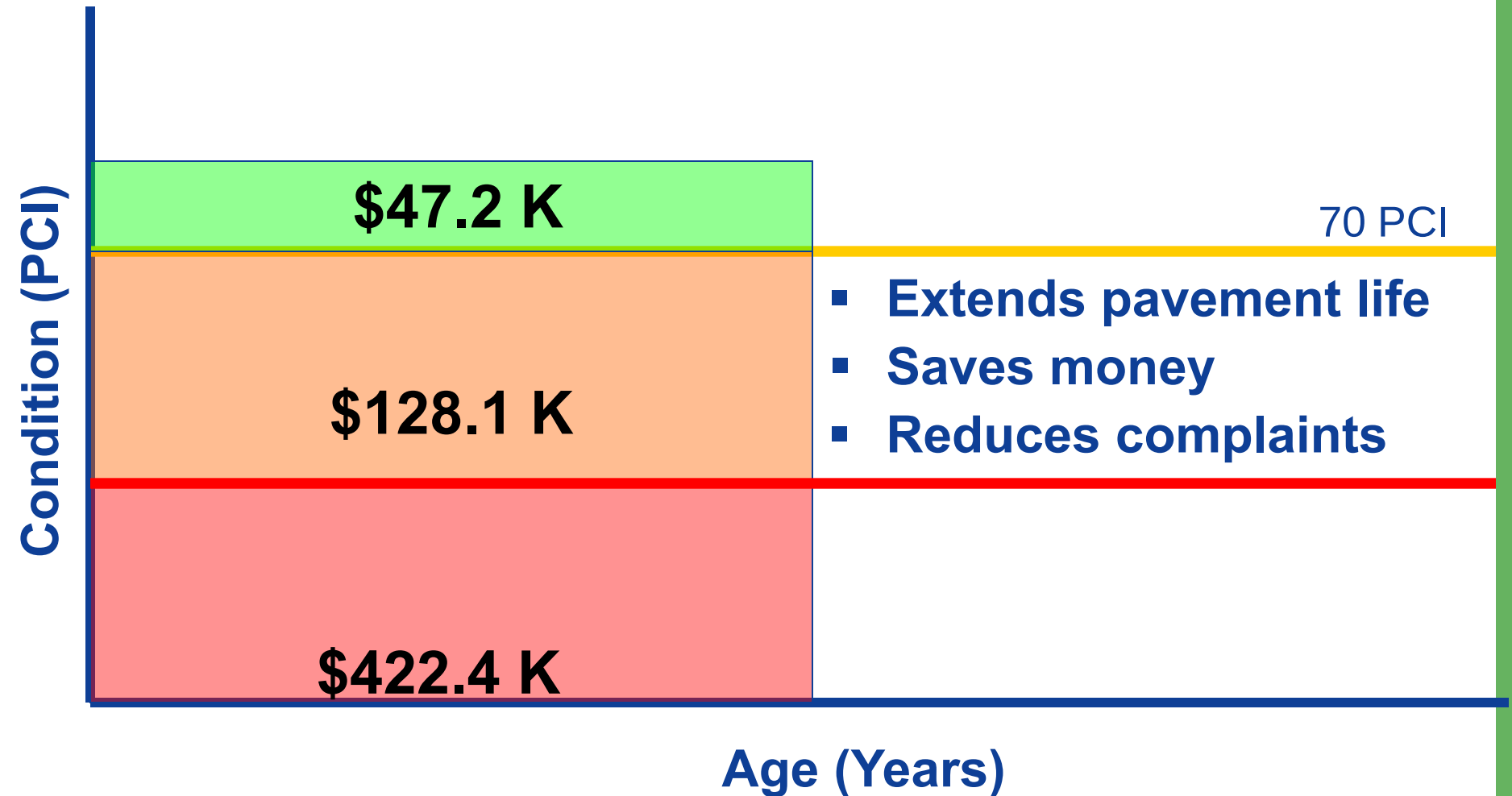
Preventive Maintenance



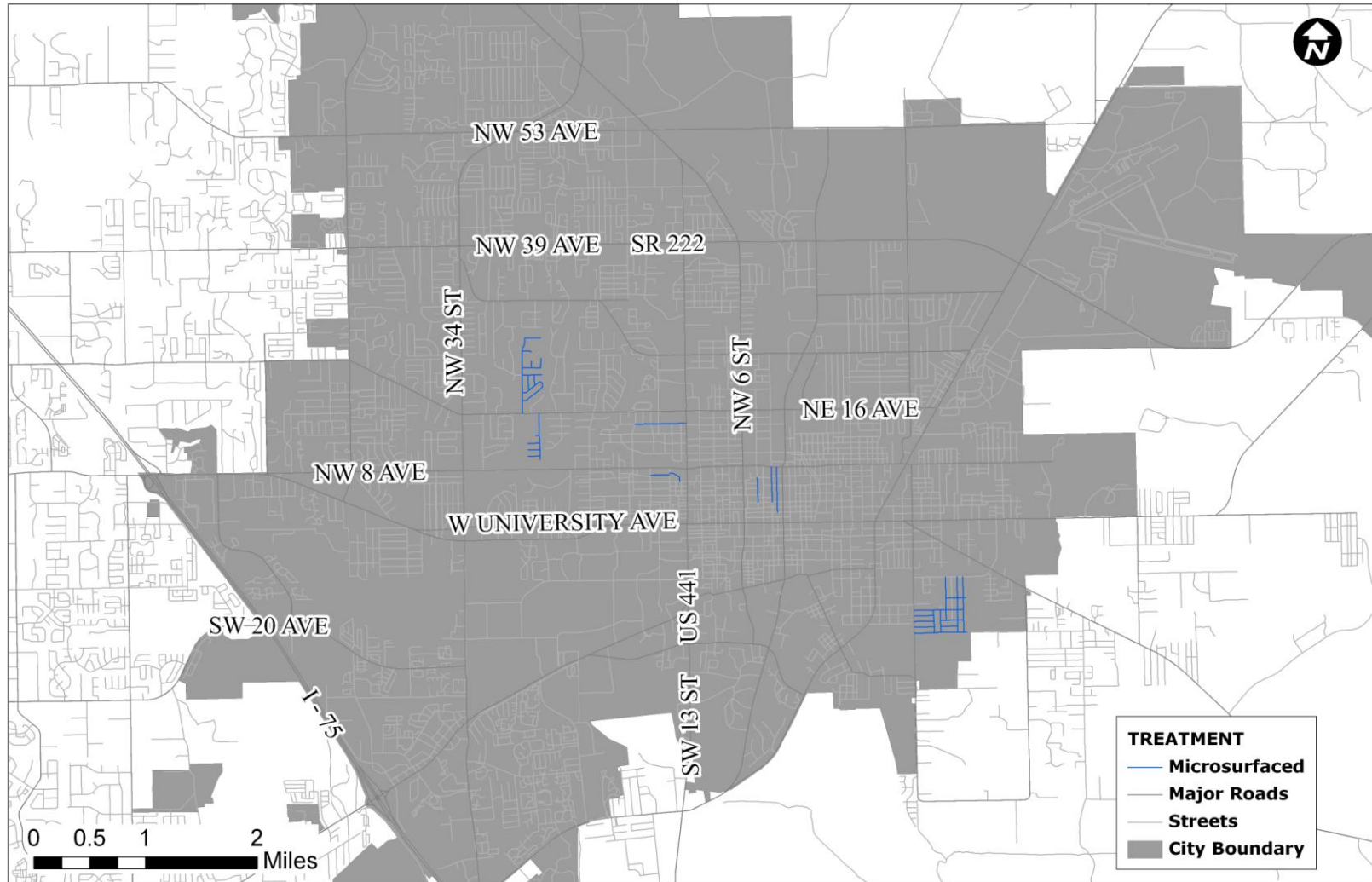
Preventive Maintenance



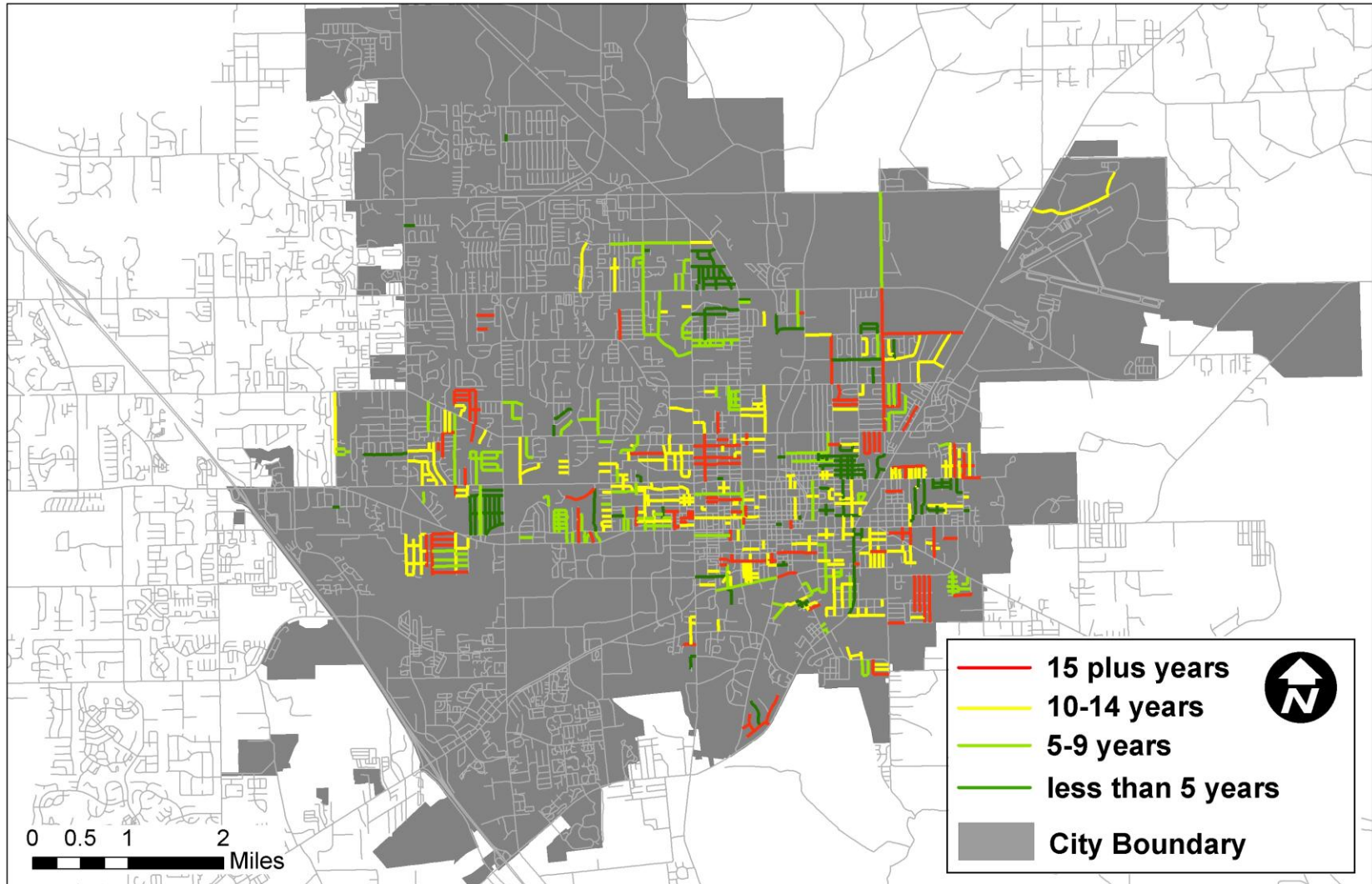
Preventive Maintenance



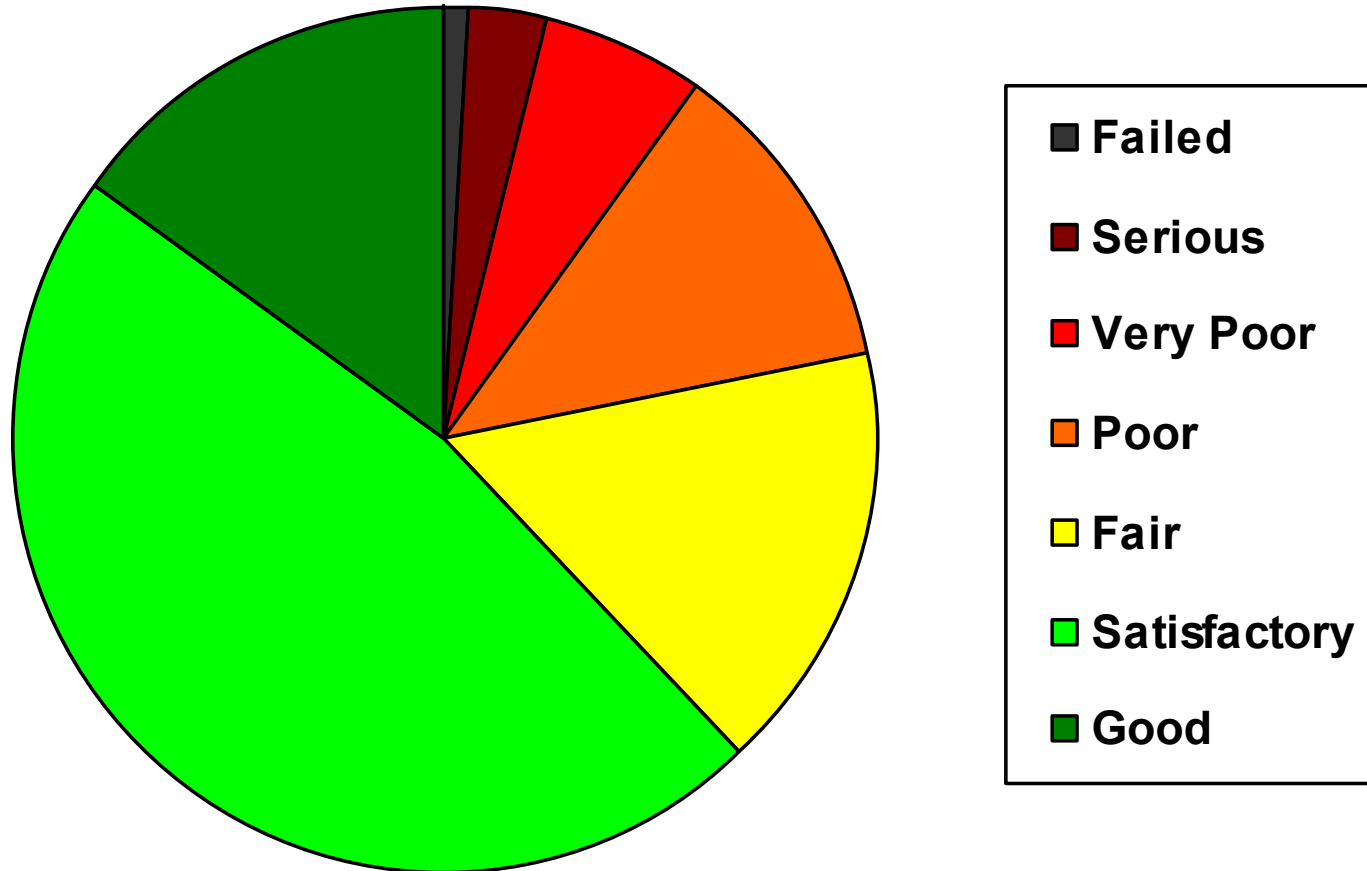
2009 Preventive Maintenance



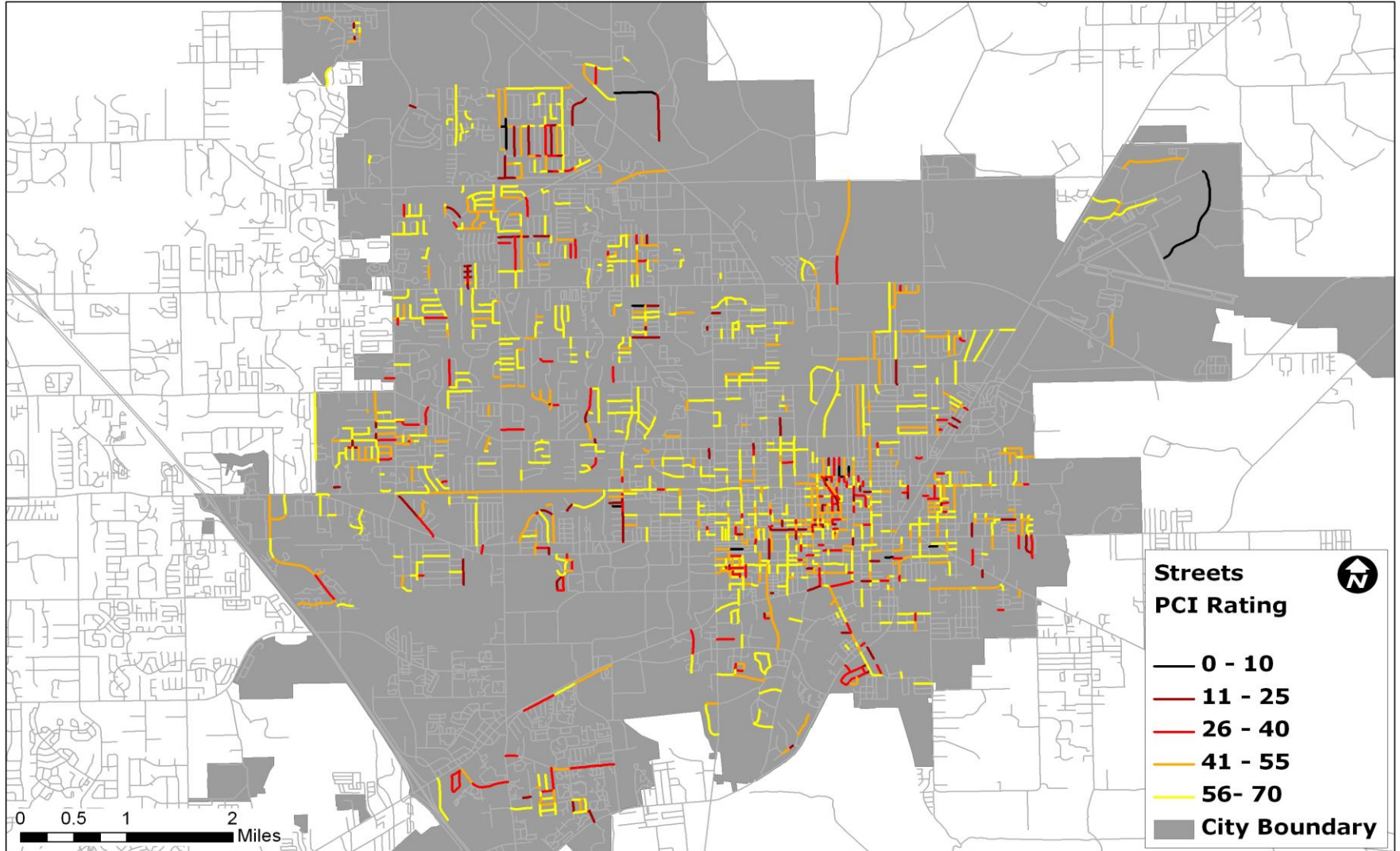
Historical Paving



City of Gainesville Situation 2009 Pavement Condition

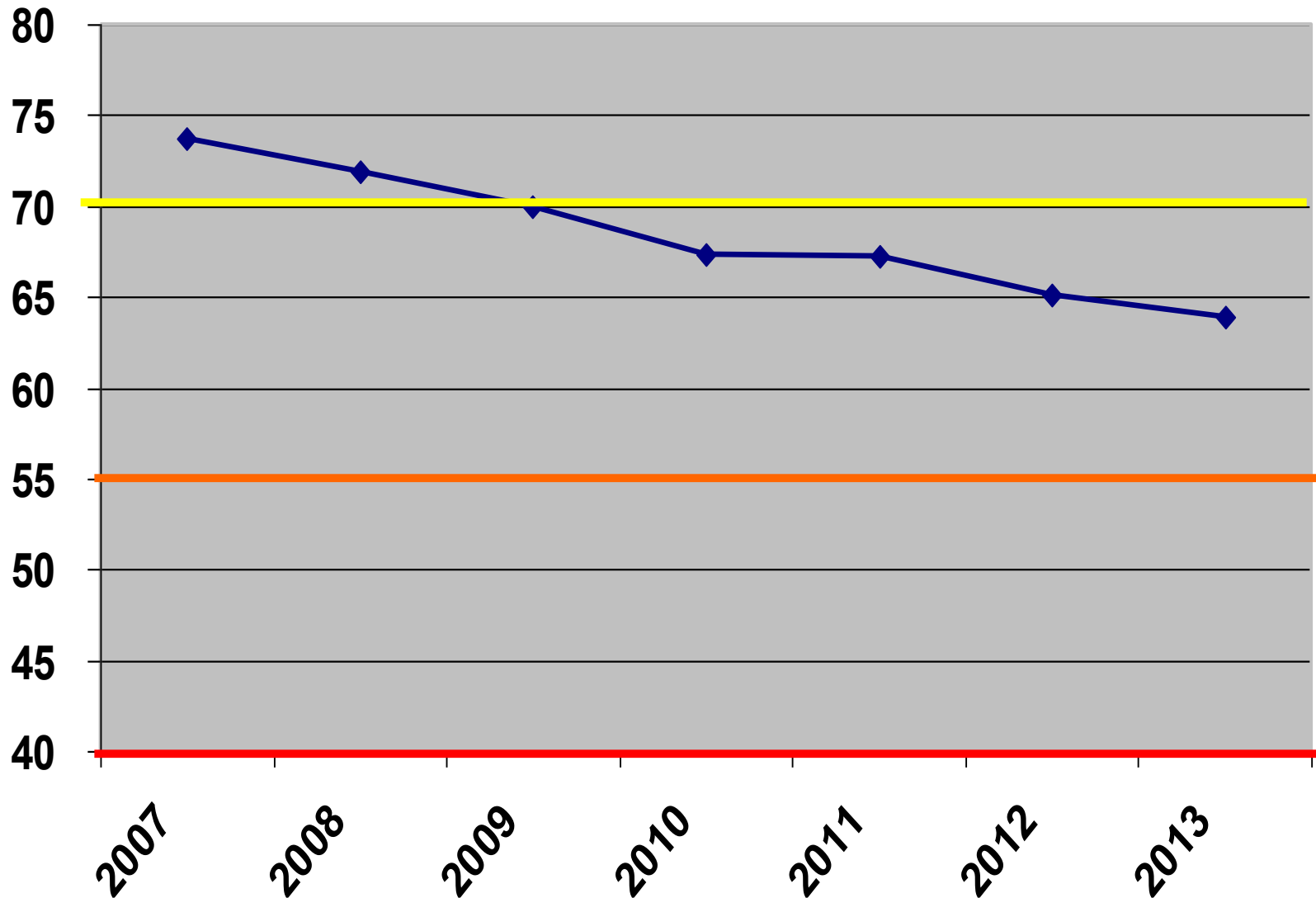


City Streets in Fair to Failed Range



City of Gainesville Situation

Average PCI for City of Gainesville

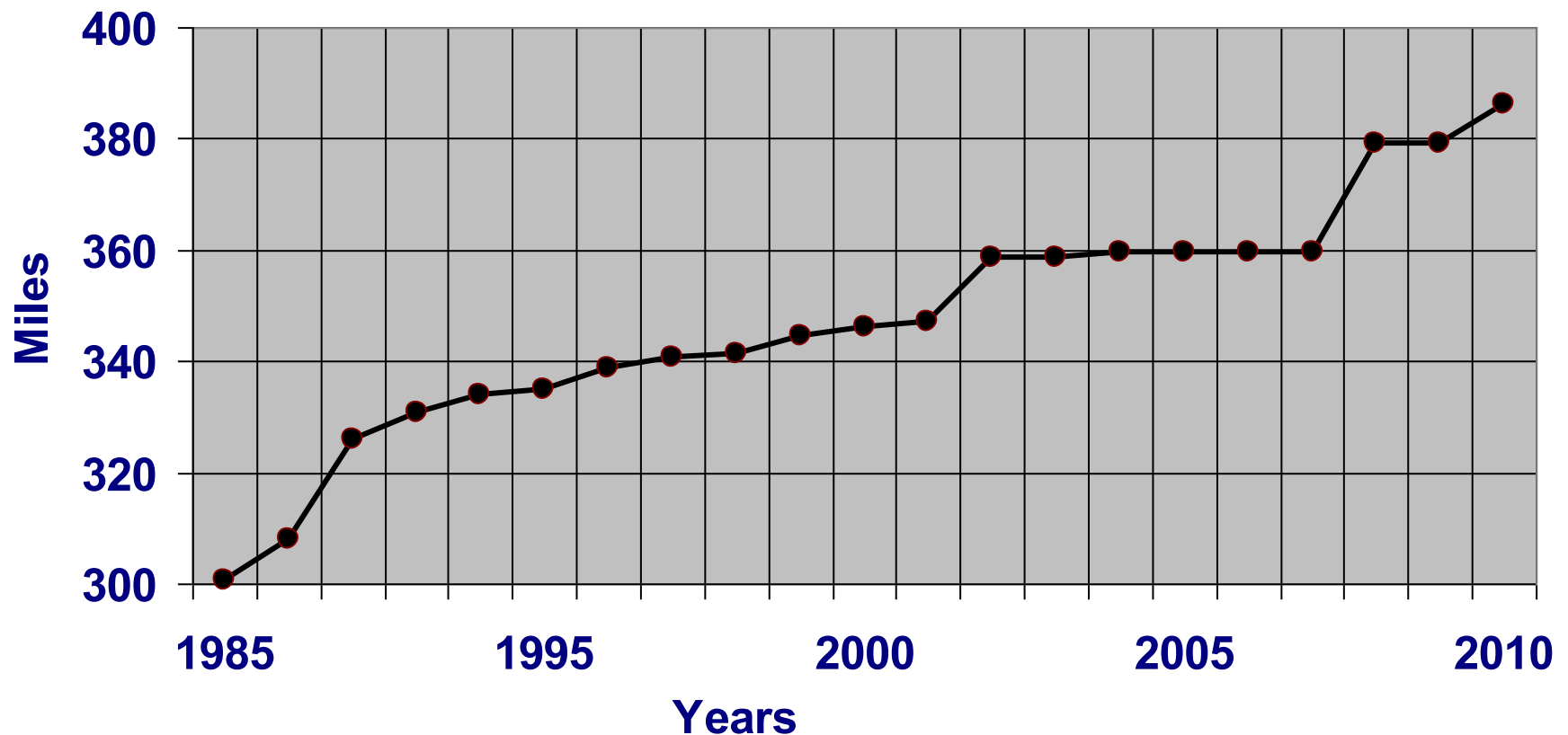


City of Gainesville Situation

- **More streets to maintain**
- **Deteriorating Pavements**
 - More traffic, trucks, buses
 - Useful life of materials shorter
- **Budget Constraints**
 - Funding levels remain constant
 - Road materials are more costly



Miles of City Maintained Roadway



City Street System – 386.21 Centerline Miles

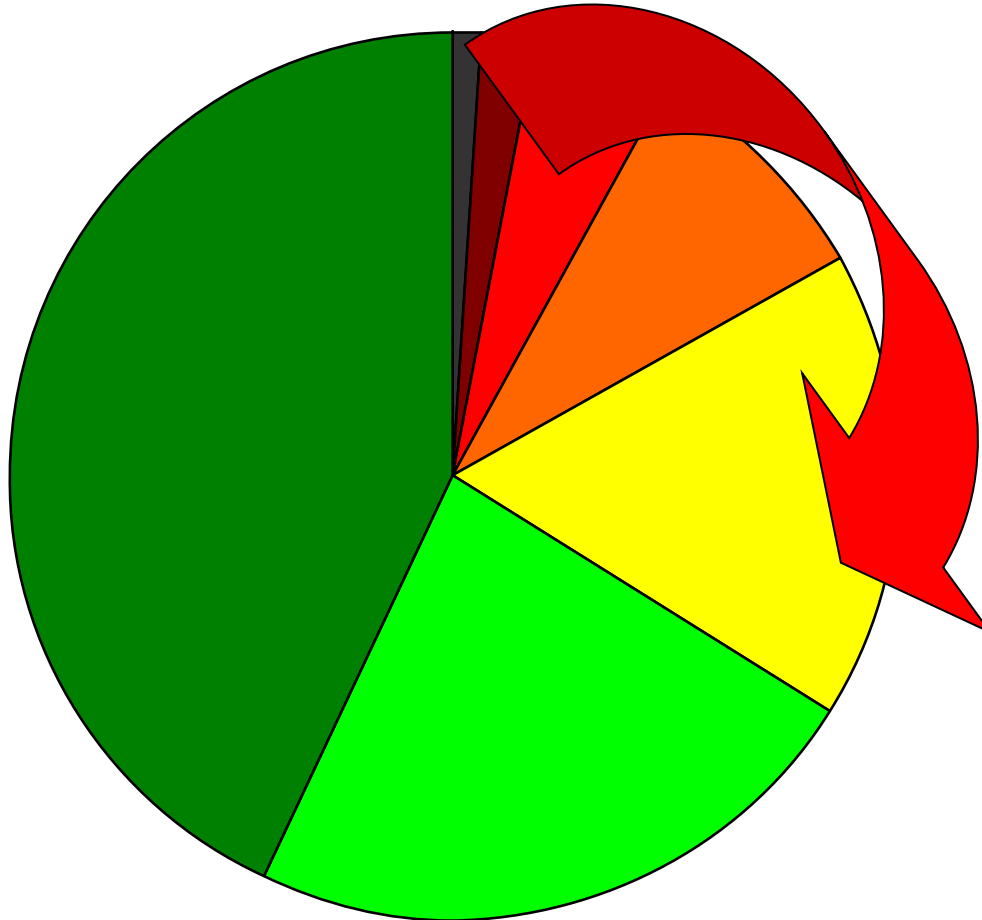
Pavement Condition Index

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2007 Pavement Condition

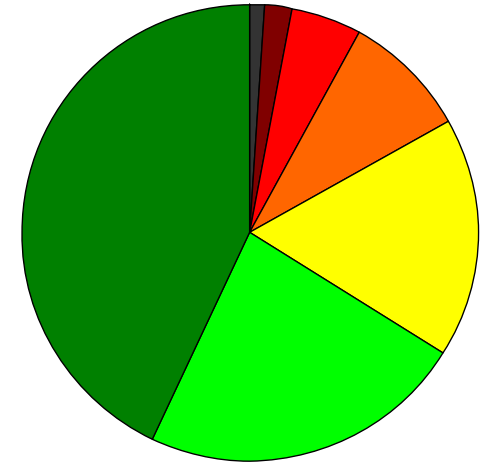
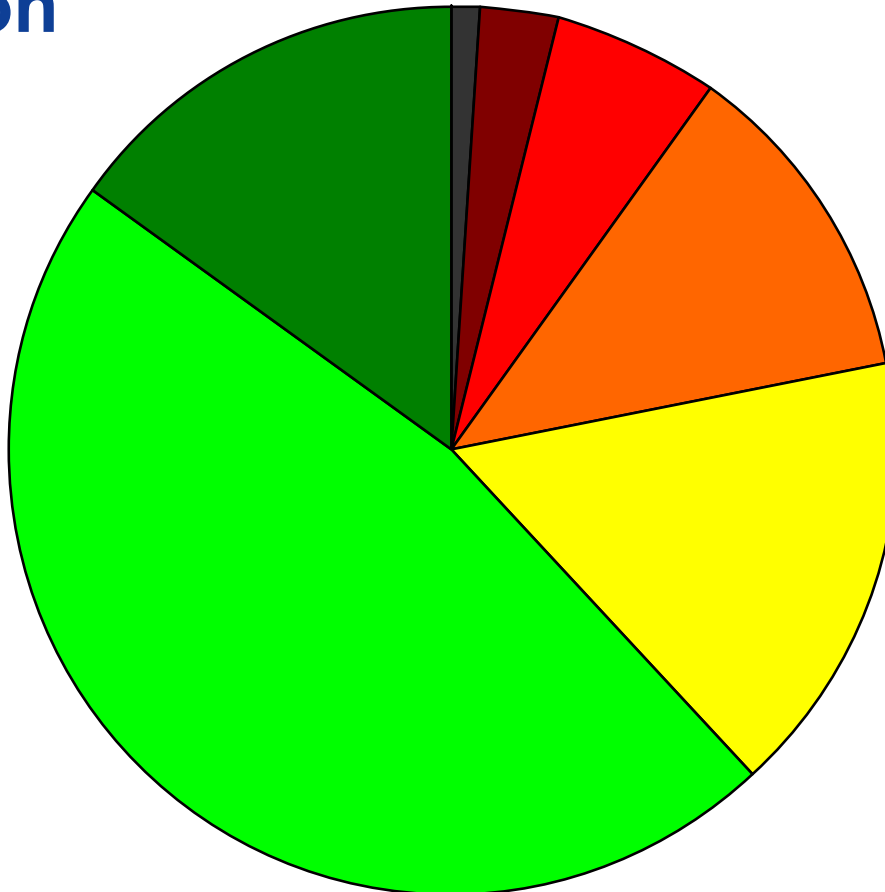
43% are “Good” condition

34% Fair or Worse



2009 Pavement Condition

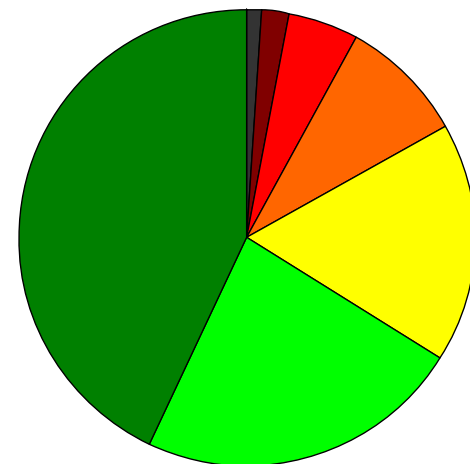
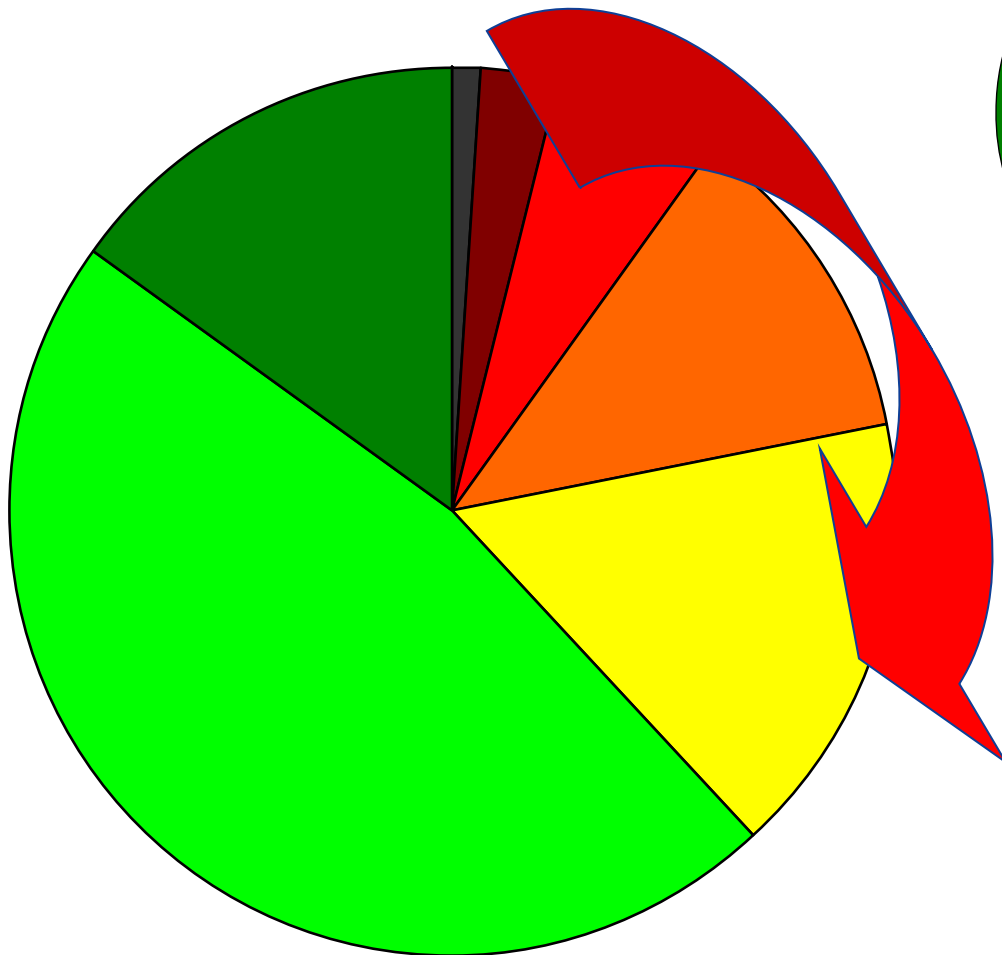
15% in Good Condition



2007

2009 Pavement Condition

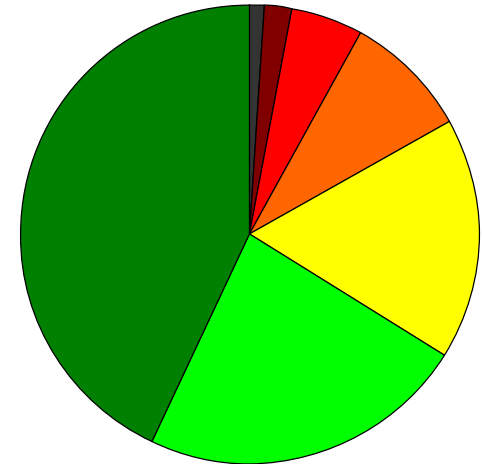
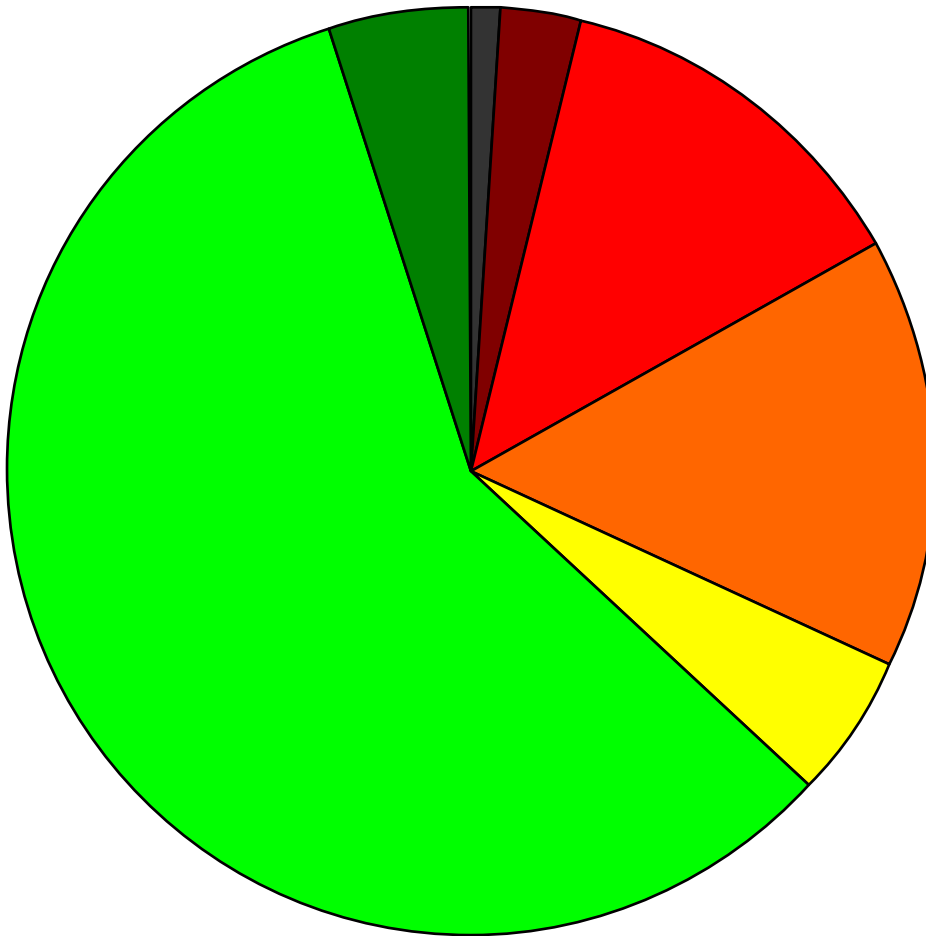
38% Fair or Worse



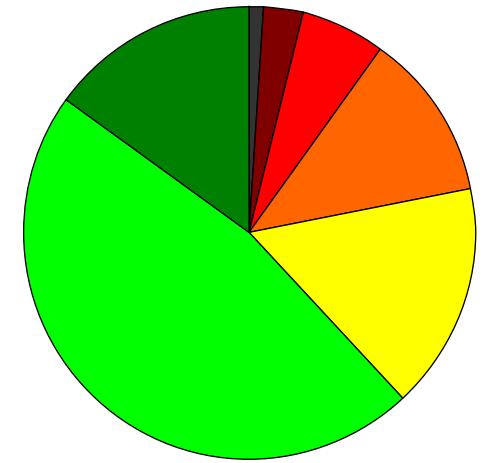
2007

2013 Projected Pavement Condition (with current funding scenario)

Only 5% in Good Condition



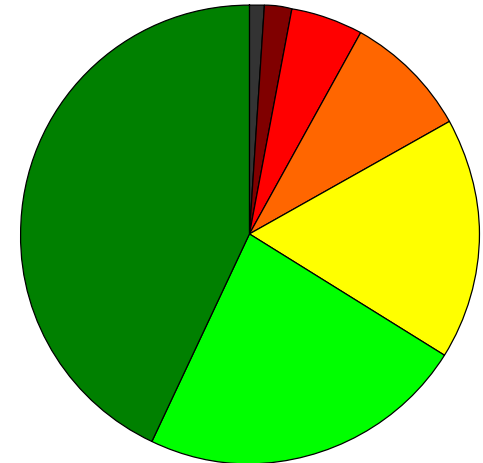
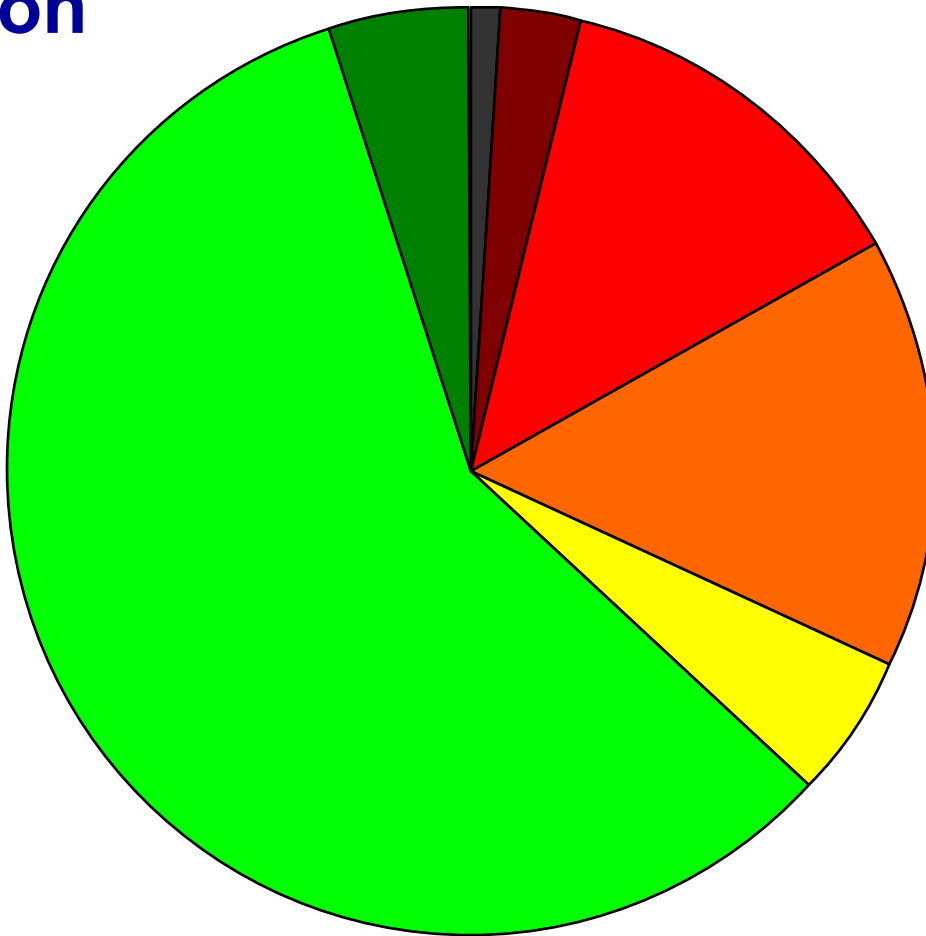
2007



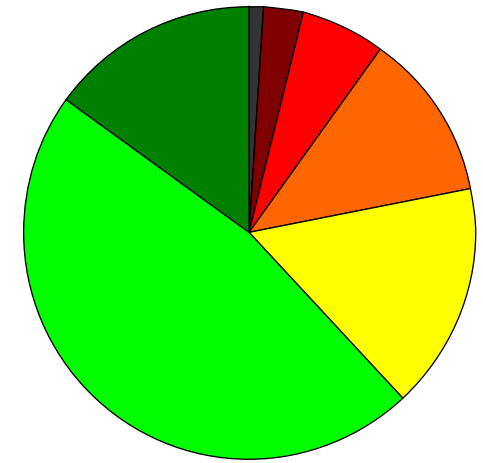
2009

2013 Projected Pavement Condition (with current funding scenario)

37% will be in Fair or Worse condition



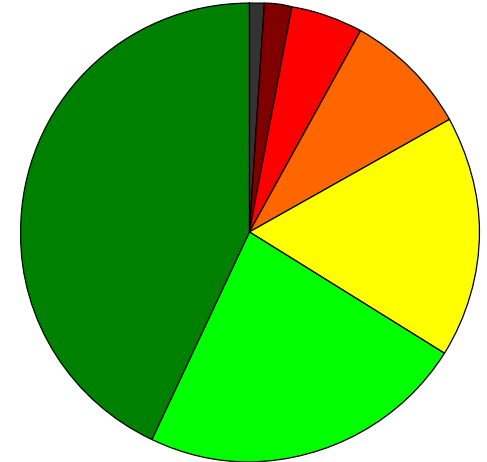
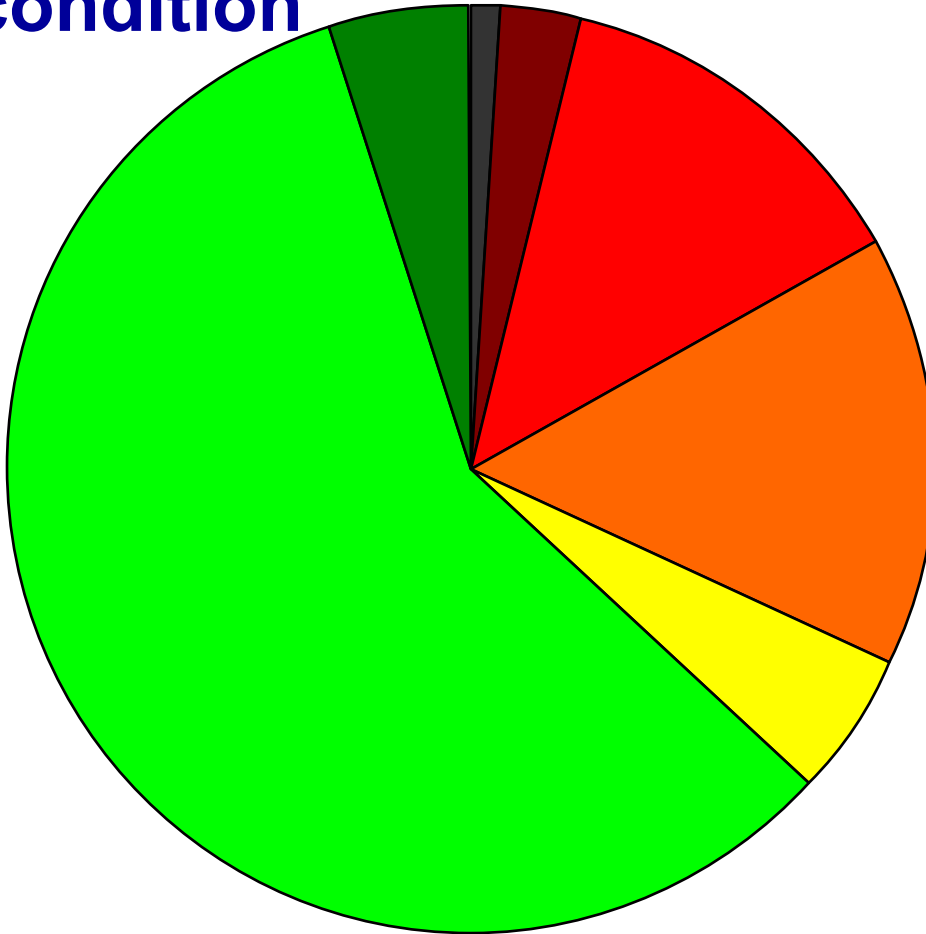
2007



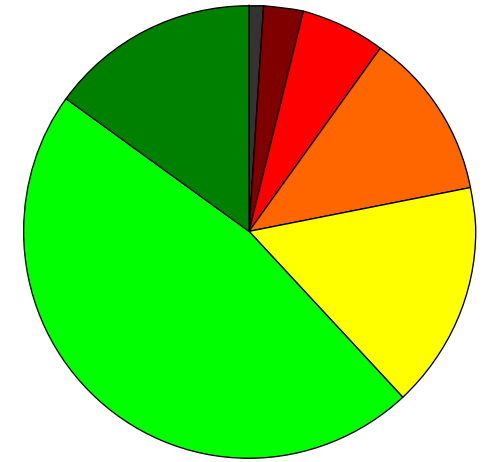
2009

2013 Projected Pavement Condition (with current funding scenario)

32% will be in Poor or Worse condition

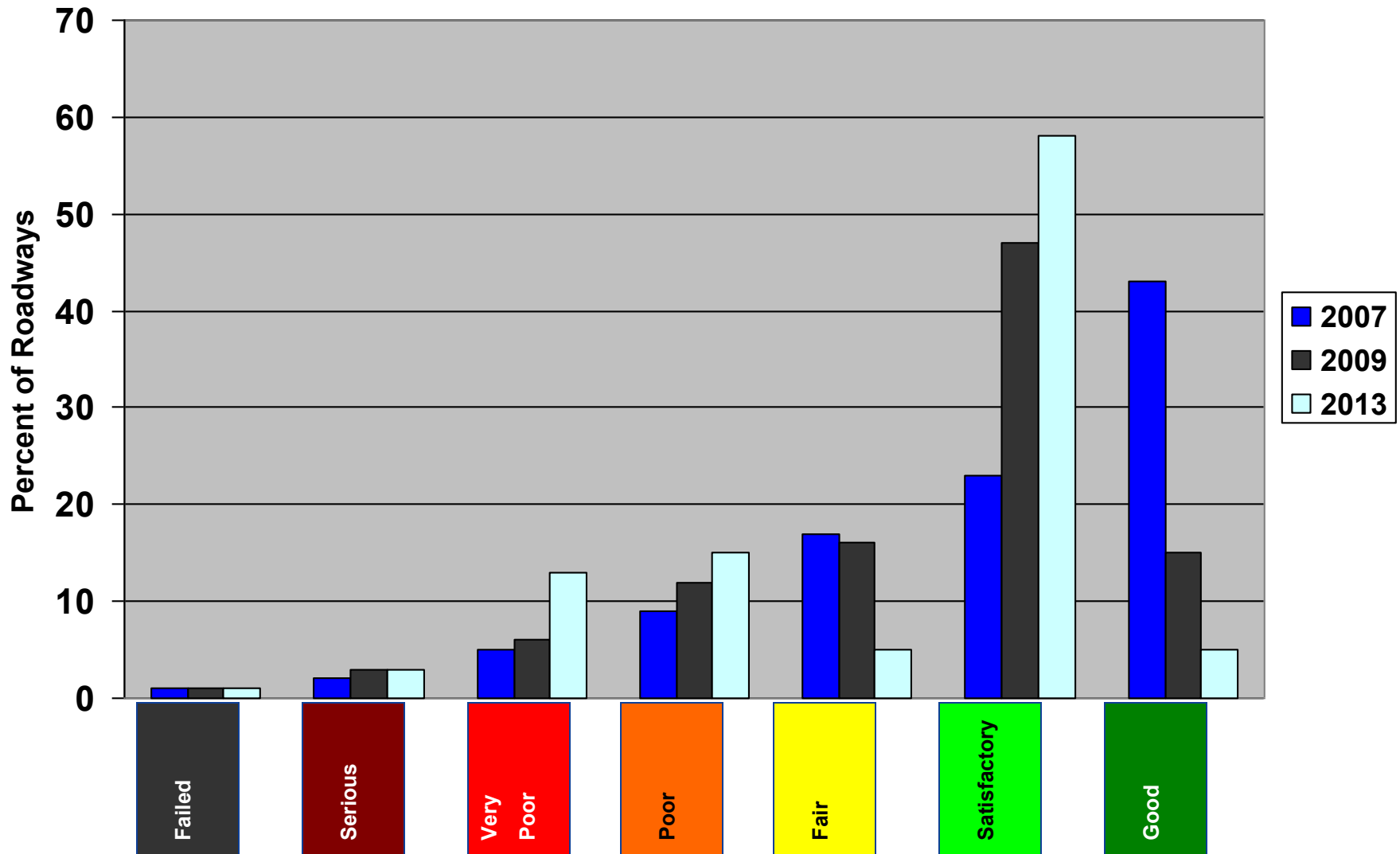


2007



2009

Pavement Condition



2013 Pavement Condition

PCI = 40



PCI = 50



Balancing act over the last five years

Maintenance Type	Recommended	Actual Expenditure	Actual Percentage
Preventive	15 %	\$ 510,300	12.0 %
Routine	40 %	\$ 2,980,420	71.0 %
Rebuild	45 %	\$ 710,690	17.0 %

When Funding is short

- Right maintenance - Right street - Right time
- Maintain roads with preventive maintenance
- Proactive public education
- Explore additional maintenance options



Future Budget Information

Year	Budget		Amount required to maintain PCI		Budget Shortfall	
	Maintenance	CIP	Maintenance	CIP	Maintenance	CIP
2009	540,000	2,095,400	1,790,000	2,095,400	1,250,000	0
2010	340,000	630,000	1,790,000	630,000	1,450,000	0
2011	300,000	3,640,000	1,790,000	3,640,000	1,490,000	0
2012	300,000	0	1,790,000	0	1,490,000	0
2013	300,000	0	1,790,000	0	1,490,000	0

Pavement Management Municipal Expenditures

Agency	Centerline Road Miles	Annual Budget	Approx. Dollars/Mile
Gainesville, FL	386	\$300,000.00	\$777.00
Titusville, FL	200	\$800,000.00	\$4,000.00
Brevard County, FL	980	\$4,500,000.00	\$4,592.00
Putnam County, FL	485	\$2,000,000.00	\$4,124.00
Orange County, FL	2630	\$18,000,000.00	\$6,844.00
Lake Mary, FL	54	\$300,000.00	\$5,556.00
Sun N Lakes, FL	78	\$400,000.00	\$5,128.00

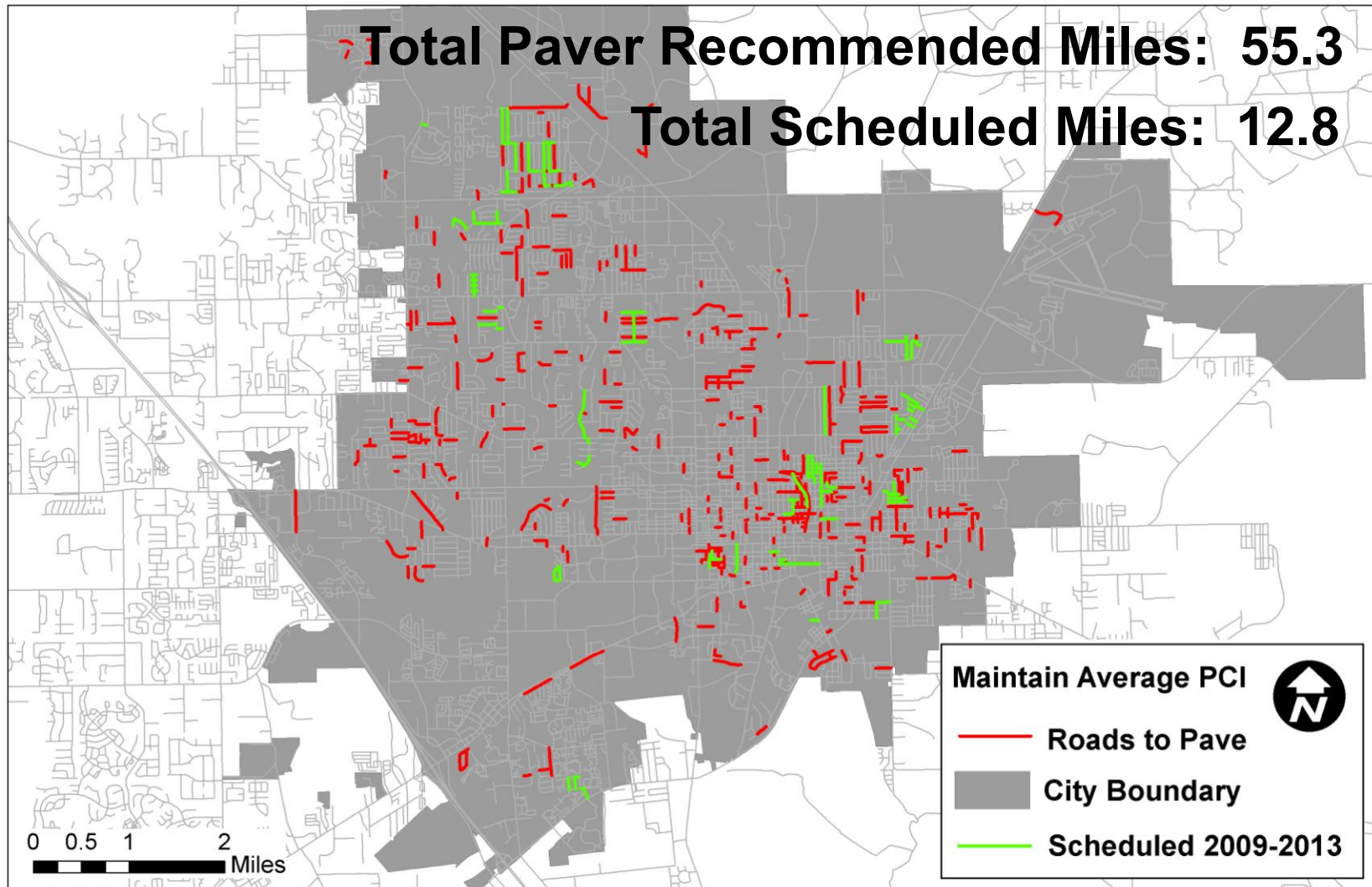
Pavement Management Municipal Expenditures- cont.

Agency	Centerline Road Miles	Annual Budget	Approx. Dollars/Mile
Dunedin, FL	120	\$400,000.00	\$3,333.33
Polk County, FL	2670	\$12,000,000.00	\$4,494.38
Manatee County, FL	1396	\$7,000,000.00	\$5,014.00
Kissimmee, FL	134	\$400,000.00	\$2,985.07
Zephyrhills, FL	66	\$300,000.00	\$4,545.45
Seminole, FL	33	\$100,000.00	\$3,030.30
Davenport, FL	23	\$80,000.00	\$3,478.26
Winter Haven, FL	140	\$1,500,000.00	\$10,714.29

Pavement Management Annual Cost to Maintain Current PCI

- Cost of Paver Recommended Plan ~ \$1,790,000*
 - Cost of the Balanced Program ~ \$3,200,000**
- * Paver focuses on treating the better roads
- ** Percentage cost allocation for maintenance options as per consultant's recommendation.

Five Year Plan Required to Maintain Average PCI of 70



QUESTIONS?

Thank You