Shane Schneider, County Engineer

Public Works and Transportation Committee

May 8, 2019

Lake County Division of Transportation
Proposed 2019 - 2024 Highway Improvement Program

OVERVIEW AND PROGRAM PRIORITIES

Presentation Schedule

PWTC 2019 Meeting Date   Presentation Topic

May 8 • **Overview and Program Priorities**

June 5 • Funding and Projects / Draft Program Document

Improving transportation a top strategic goal for Lake County and regional partners

Efficient Transportation Contributes To:

- Quality of life
- Environmental value
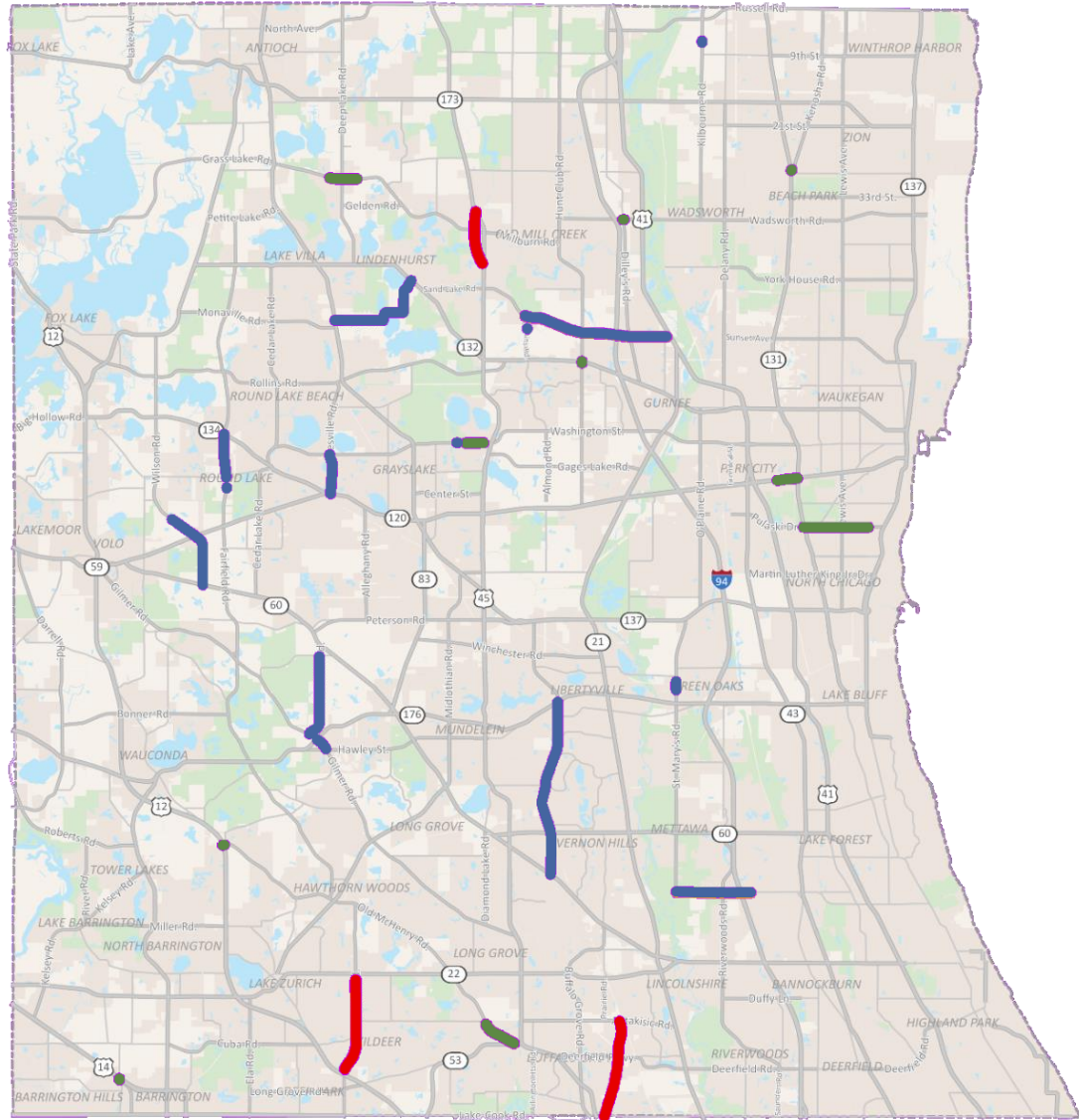- Economic growth
- Improved safety

2019 Construction Program

Continued from 2018

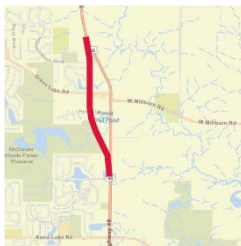Preservation

Modernization

Expansion

$59M continued from 2018

Quentin Rd
White Pine Rd to IL22
reconstruct and widen to 4 lanes

Old McHenry Rd
at downtown Long Grove
intersection improvement

Millburn Bypass of US Route 45
north of Grass Lake Rd to south of Millburn Rd
realign and reconstruct *(IDOT is lead agency)*

Resurfacing projects at
Stearns School Rd*, Everett Rd* and St. Mary's Rd*

* Includes adding bike-friendly shoulder
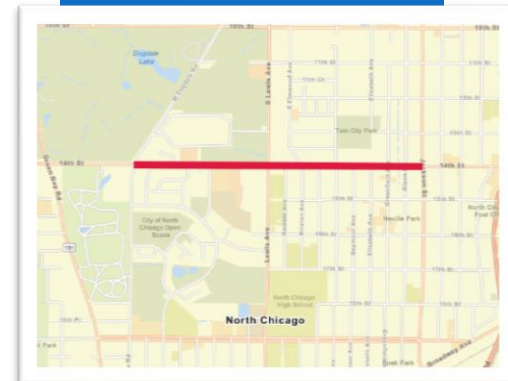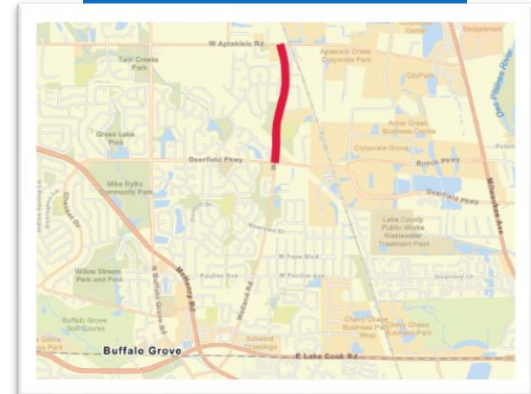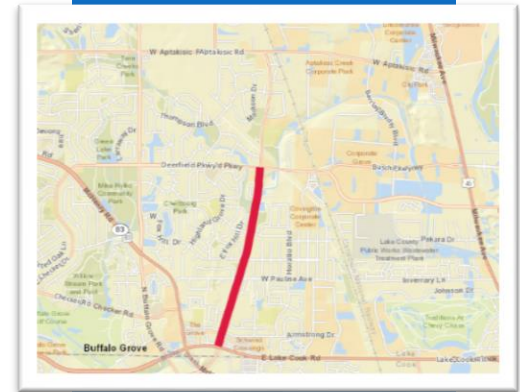
$78M in new projects

Weiland Rd, reconstruct and widen to four lanes from Lake Cook Rd to Deerfield Pkwy

Weiland Rd, reconstruct and widen to four lanes from Deerfield Pkwy to Aptakisic Rd

14th St, roundabout and road diet to 3 lanes, Dugdale to Jackson

Operational and Safety Improvements:
- Intersection improvements
- Traffic signal work
- Raised reflective pavement markers
- Street light upgrades to LED
- Expand PASSAGE coverage and signal interconnects through more corridors

$78M in new projects *(continued)*

Resurfacing Projects:

Butterfield Road
Engle Drive
Fairfield Road*
Fremont Center Road [3R]*
Gilmer Road*
Hainesville Road*
Wilson Road*

Non-motorized Travel Improvements:

Washington St Bike Path: Lancer Ln to Mainsail Dr
Grass Lake Rd west of Deep Lake Rd: Sidewalk gap improvements

Culvert, Drainage and/or Retaining Wall Projects:

Washington St at Mill Creek
Hutchins Rd at Mill Creek
Fairfield Rd at Squaw Creek
Kilbourne Rd at Des Plaines Tributary
St. Mary's Rd at Metra Railroad
Grass Lake Road at bridge retaining wall stabilization and repair
Rollins Road near Fairfield Rd culvert replacement
Gages Lake Road near Hunt Club Road concrete headwall
Millburn Road near Crawford Road culvert rehabilitation
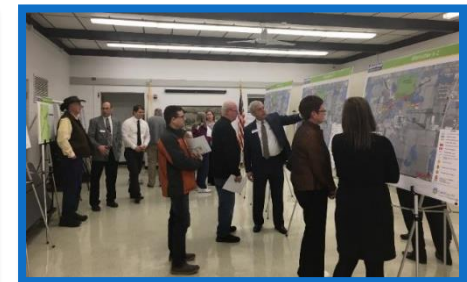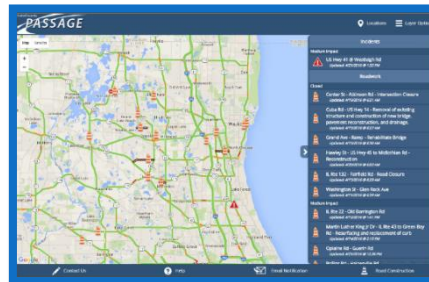

*project includes adding bike-friendly shoulder

Engagement Tools:

Connecting residents, system users and partners

- LCDOT website
- *PASSAGE* website
- Email updates
- Social Media
  - Facebook
  - Twitter
- Public Meetings
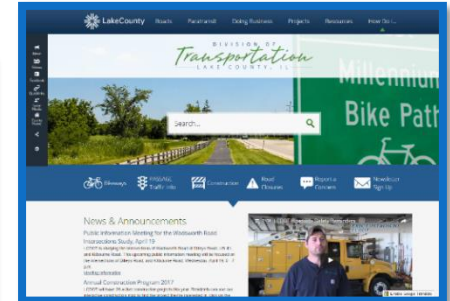
Safety Highlights

- Well-maintained pavement
- Bike-friendly and pedestrian accommodation
- Enhanced curve and educational signing
- Recessed pavement markers
- High-visibility signal backplates
- Enhanced intersection lighting

2019 - 2024 Five Year Highway Improvement Program

LCDOT's management philosophy sets system priorities:

1. **Preservation**
2. **Modernization**
3. **Expansion**

Priority One: Preservation

Preservation projects: approximately

25%

of program

Typically resurfacing, reconstruction, patching and drainage improvements, maintenance activities

- **Tools in the Toolbox:**
  - ARGUS pavement management software
  - Asset inventories
  - Unit cost information
  - Industry standards
  - Innovative techniques

ARGUS Pavement Management System

For data-driven, cost-effective decisions:

- **Where** repairs are needed

- **What** repair strategies to use

- **When** the repairs will be most effective

Using these program components:

- County highway database

- Automated pavement testing

- Repair strategies with costs

- Pavement aging prediction
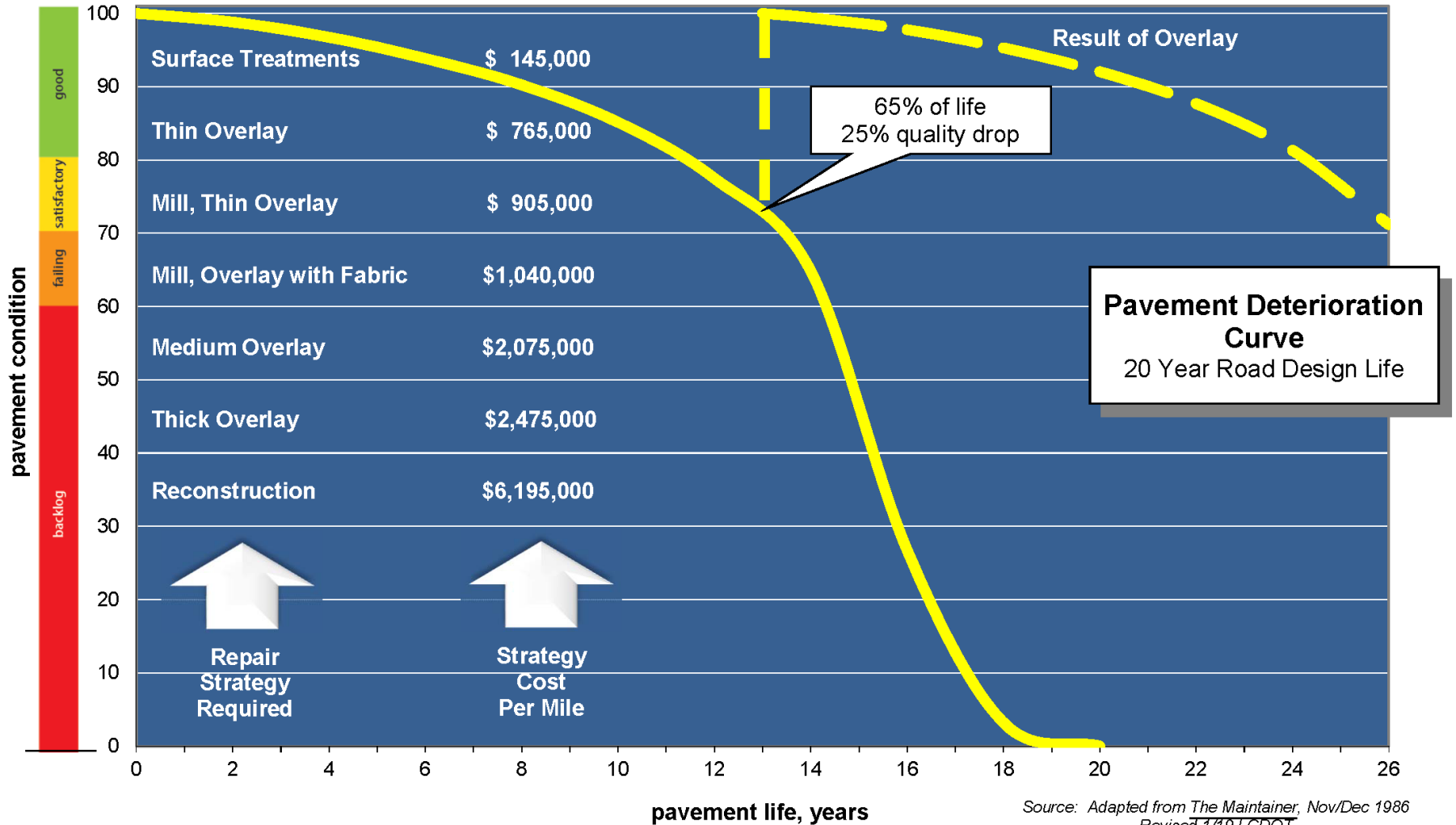
- Optimization program

Laser surface testing

Dynaflect

Pavement Aging Prediction Costs
Make Repairs at the Best Time *to Maximize Return*

pavement condition

| good | satisfactory | failing | backlog |

Pavement condition scale		
Surface Treatments	$ 145,000	
Thin Overlay	$ 765,000	
Mill, Thin Overlay	$ 905,000	
Mill, Overlay with Fabric	$1,040,000	
Medium Overlay	$2,075,000	
Thick Overlay	$2,475,000	
Reconstruction	$6,195,000	

Repair Strategy Required

Strategy Cost Per Mile

Result of Overlay

65% of life
25% quality drop

Pavement Deterioration Curve
20 Year Road Design Life

pavement life, years

LCDOT ARGUS results

- Implemented in 1986

- Condition rating has **improved from 68 to 84**

- Backlog/failing pavement area **reduced from 55% to 2%**

ARGUS System optimizes improvements

year (vertical axis): 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2001, 2000

rank by percent of total area (horizontal axis): 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%

Legend: ■ Backlog ■ Failing ■ Satisfactory ■ Good
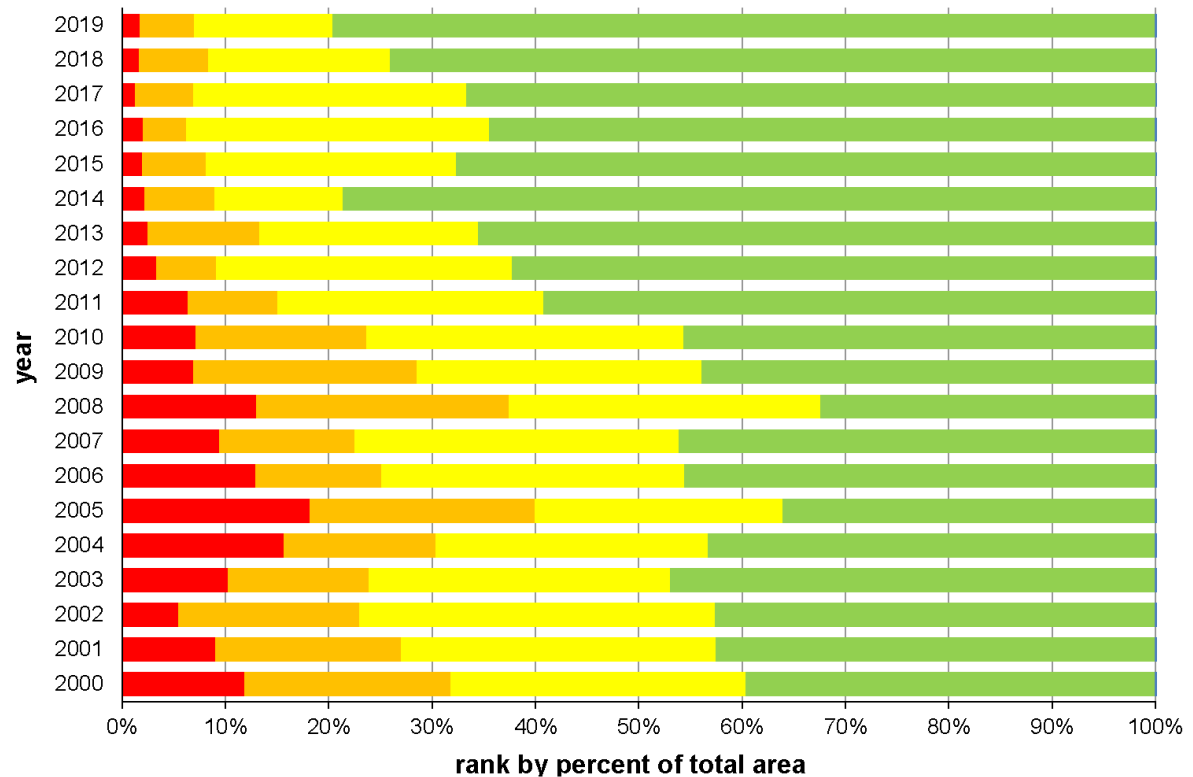
Note: Current year rankings are based on the previous year's testing.

Prepared by LCDOT 3/19
Source: 2018 pavement testing

Current Pavement Rating is 84 *(Good)*

2023 without improvements 77

2023 with improvements 79

Current Pavement Condition 84

Pavement Condition Inventory

80% **Good (80-100)**
May require crack sealing or a thin overlay. These sections do not require immediate attention. Pavement in this category is generally less than 12 years old.

13% **Satisfactory (70-79)**
May require resurfacing or other rehabilitation in the near future. Pavement in generally 12-14 years old.
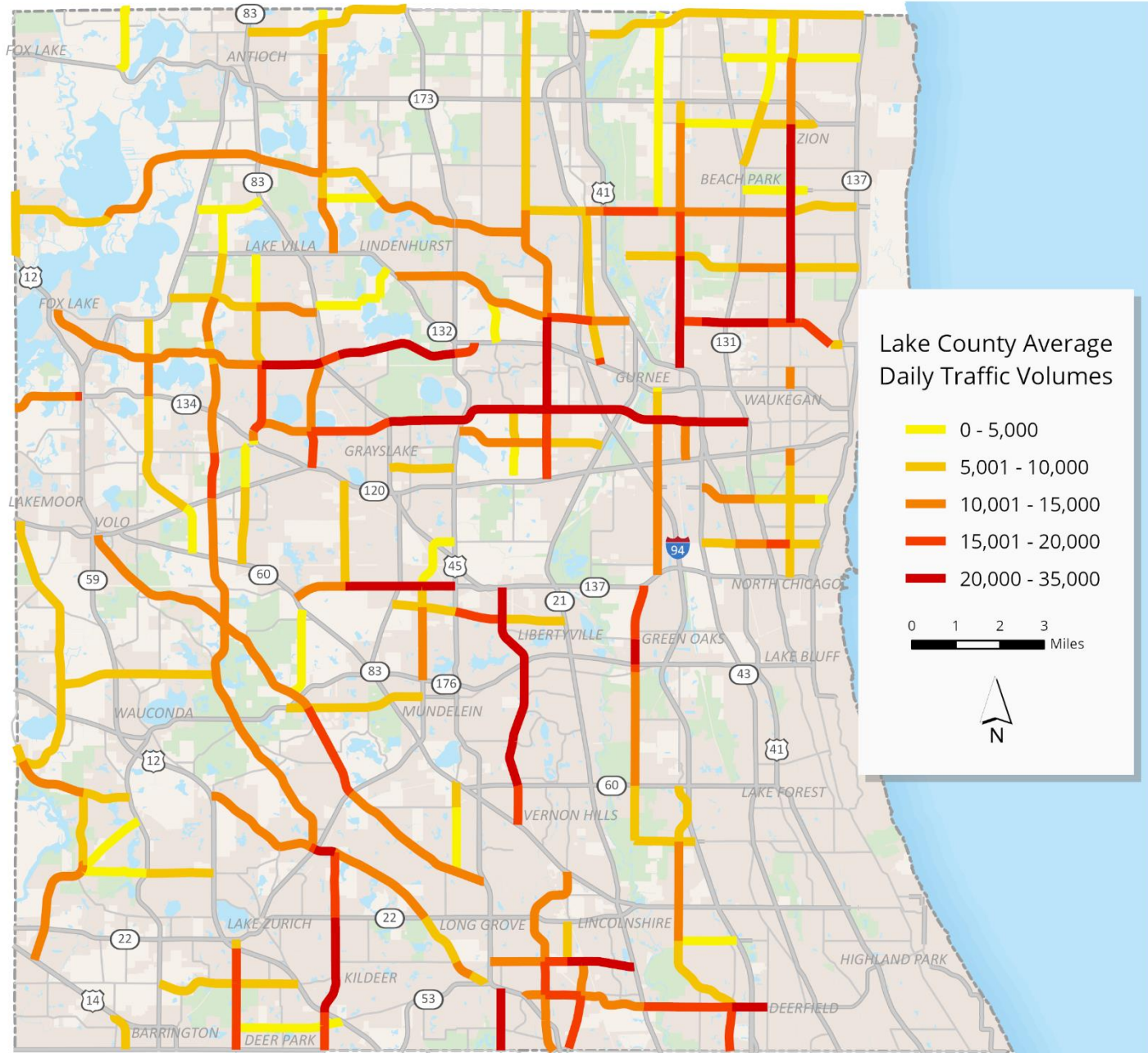
5% **Failing (60-69)**
Will require some type of improvement in the near future to preserve usability and avoid the need for reconstruction. This pavement is approaching the end of its useable life.

2% **Backlog (10-59)**
May require total reconstruction, including reconstruction of the subgrade. Pavement in this category is generally more than 15 years old.

Traffic Volumes

Lake County Average Daily Traffic Volumes

- 0 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- 15,001 - 20,000
- 20,000 - 35,000

Source: LCDOT Traffic Department 4/19/2019

ARGUS Summary

Pavement Management System **does**...

- Assess the present condition of the system

- Estimate future road conditions

- Identify and rank road projects

- Maximize the condition of the system within the given budget

Pavement Management System **does not**...

- Replace professional judgment

- Provide certain detailed project-specific information

- Evaluate storm sewer and other roadway assets

2020 – 2024

ARGUS System Preservation Projects

Projects By Construction Year
- 2020
- 2021
- 2022
- 2023
- 2024

Source: LCDOT Design Department 4/19/2019
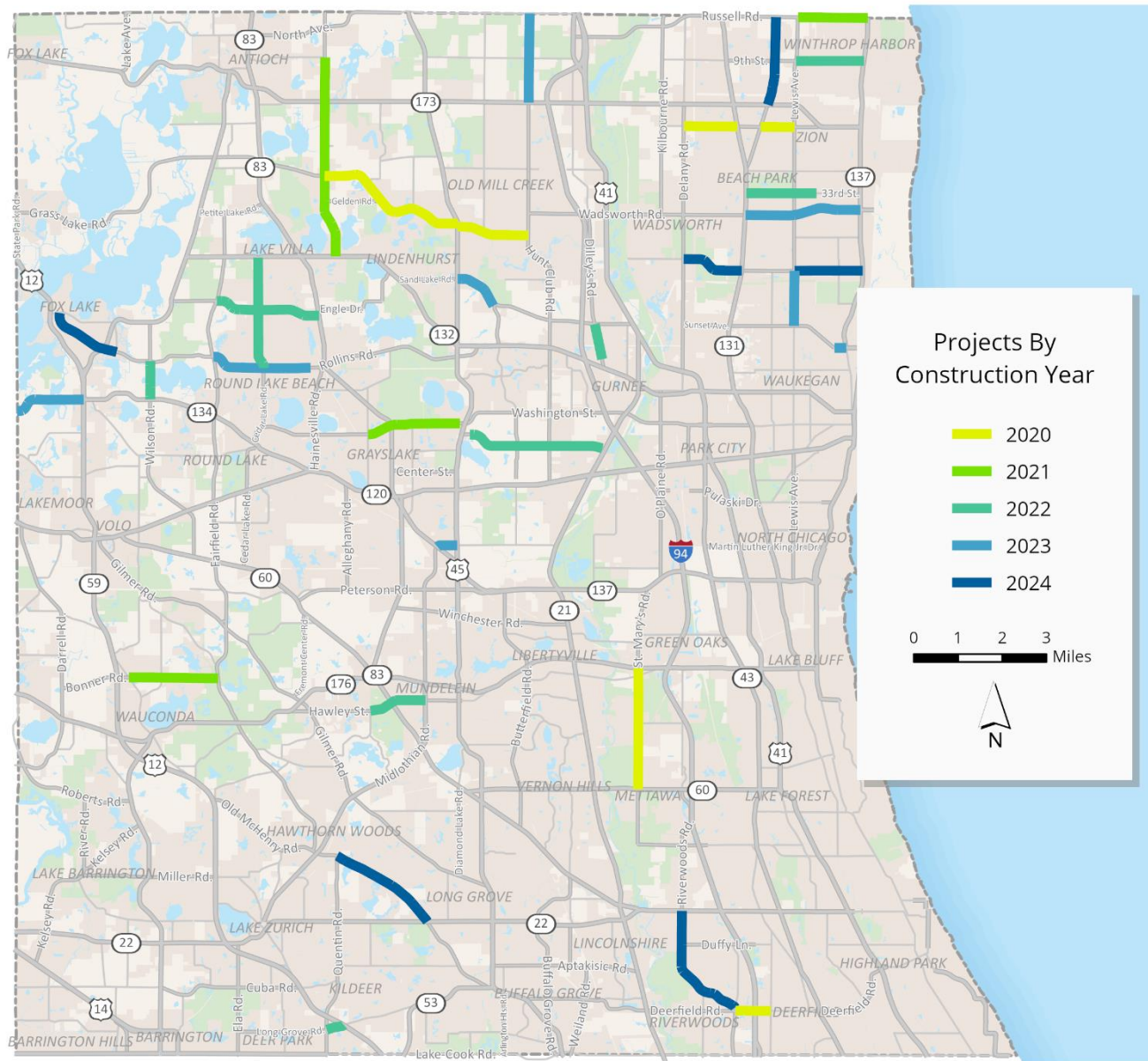
Keeping Tabs on the System:
Asset Inventories

- Pavement and bike facilities

- Guardrail, bridges, railroad crossings

- Signals and signs

- Drainage and stormwater facilities

- Fencing

- *More…*
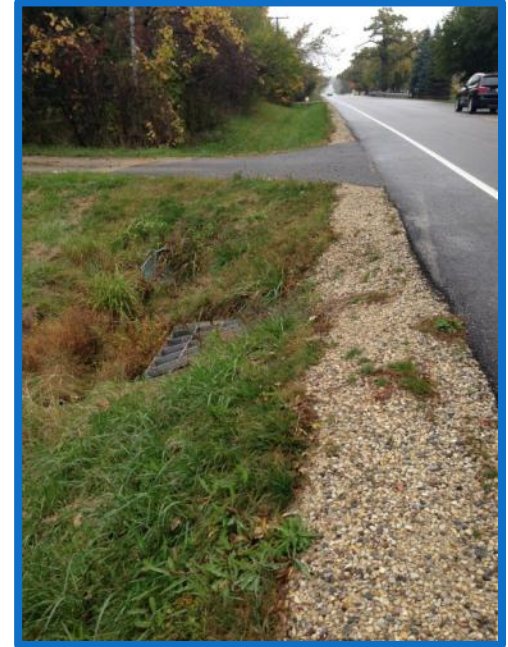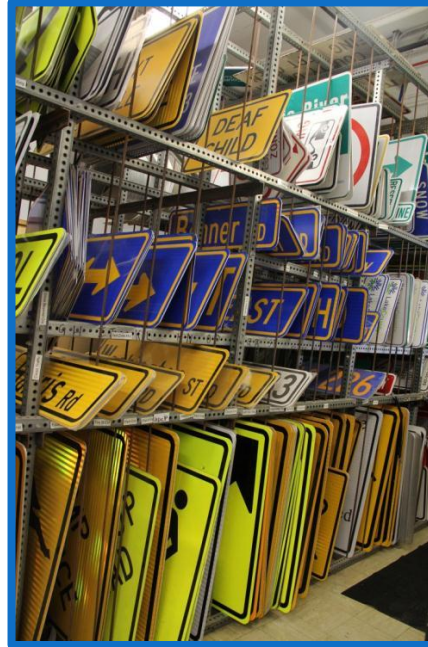
Pavement: Our most obvious asset

lane miles **902**

centerline miles **302**

miles paved shoulder **190**

average age of roadway **49**
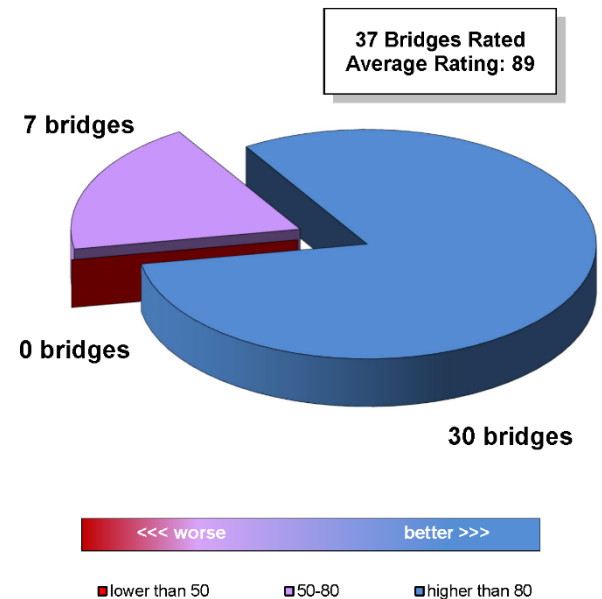
average age of surface **12**

Lake County's Bridges

Highway Bridges:

number of bridges **43**

average age [years] **28**

average deck age [years] **17**

Bike and Pedestrian Bridges:

number of bridges **15**

number of tunnels **15**

Sufficiency Ratings:
Lake County's Bridges

37 Bridges Rated
Average Rating: 89

7 bridges

0 bridges

30 bridges

<<< worse   better >>>

■ lower than 50   ■ 50-80   ■ higher than 80

Accommodating bikes and pedestrians

bike/pedestrian bridges 15

tunnels and underpasses 15

miles bike facilities 62

miles bike friendly shoulder 101

Culverts

- Variety of culvert materials:

  - Concrete
  - Corrugated metal pipe (CMP)
  - Composite
  - PVC

- Culverts are routinely inspected
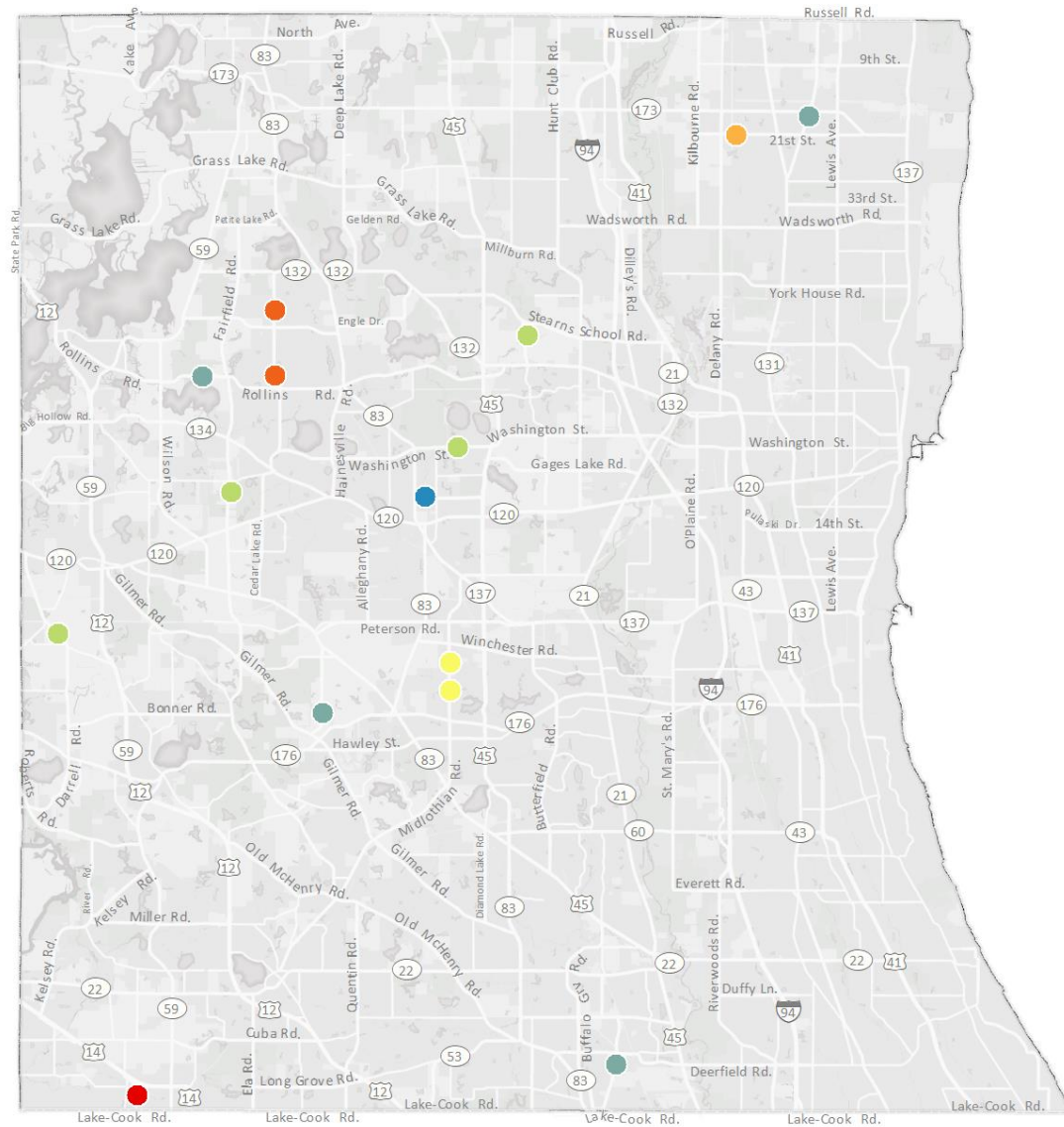
More than **49,200** feet in LCDOT inventory

Identifying High Risk Culverts

Project set of 15 culverts:
- Greater than 35 years old
- Corrugated metal pipe
- 36" or larger

Replacement schedule:
✓ 🔵 2017   🟠 2021
✓ 🟢 2018   🟠 2022
🟢 2019   🔴 2023
🟡 2020

Inventories: Non-Pavement Assets

17,204	Storm sewer structures
652	Culverts
192	Miles of storm sewer pipe
54	Stormwater basins
48,294	Feet of fencing
21,062	Feet of retaining wall
21	Miles of guardrail
35	Landscape areas (68 acres)

LCDOT GIS / April 2019

Inventory: Signs

Sign Inventory*

Regulatory	8312
Guide/Destination	10,658
Warning	4608
Information/Object Marker	3393
School	532
Total	**27,503**

signs installed and maintained by LCDOT

Source: LCDOT sign inventory, April 2019

Priority Two: Modernization

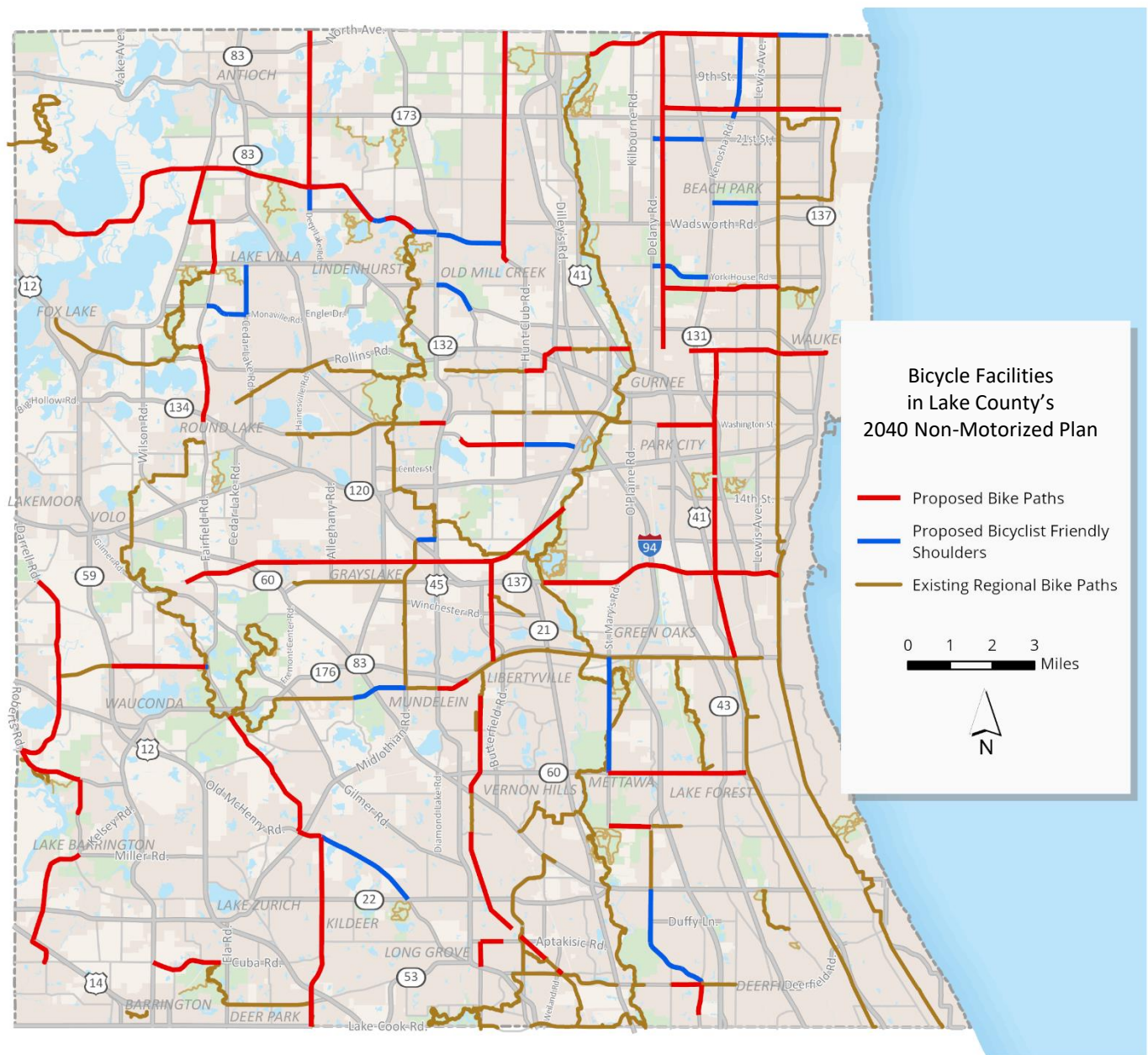**Modernization projects: approximately**

30%

of program

Typically intersection and safety improvements, bike and pedestrian accommodations

- **Tools in the Toolbox:**
  - Traffic analysis
  - Level of Service data
  - Non-motorized policy
  - 2040 bike and pedestrian priorities
  - Project scoring matrix
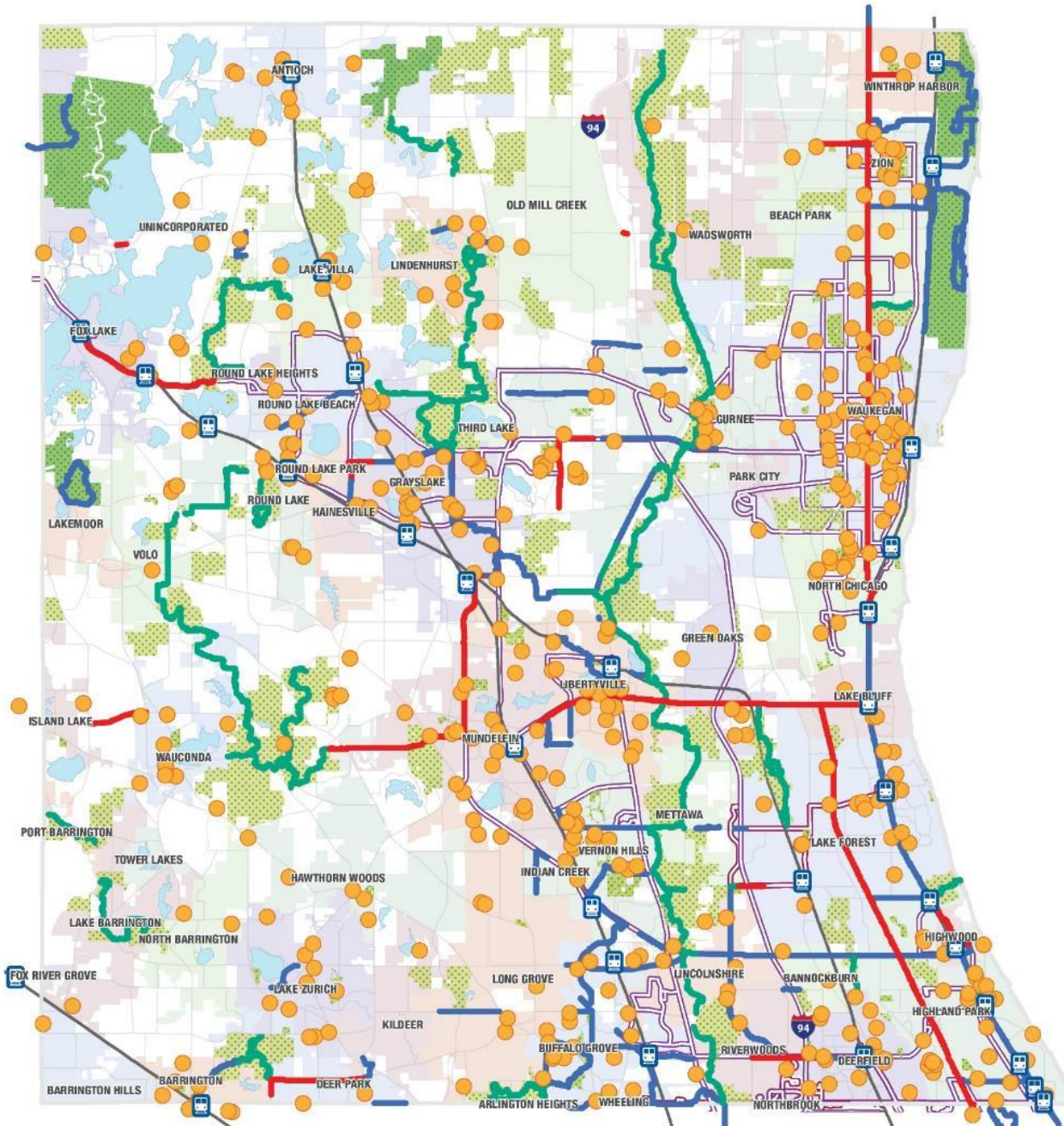
Bike and Pedestrian Priorities

Lake County's 2040 Non-motorized Plan

Bicycle Facilities
in Lake County's
2040 Non-Motorized Plan

— Proposed Bike Paths

— Proposed Bicyclist Friendly Shoulders

— Existing Regional Bike Paths
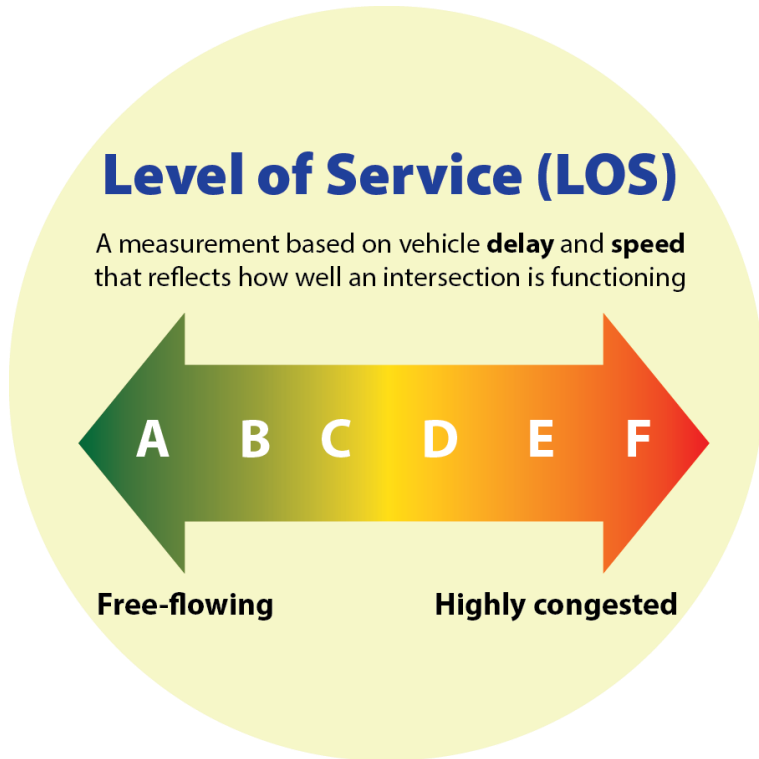
0 1 2 3 Miles

N

GAP ANALYSIS

LEGEND

GAP ANALYSIS
- School Site
- Metra Stations
- Metra Lines

EXISTING BIKEWAYS
- Lake County DOT
- Lake County Forest Preserve
- Other Jurisdiction

EXISTING ATTRACTIONS
- State Park
- Lake County Forest Preserve
- Other Parks

EXISTING TRANSIT FEATURES
- Existing Metra Stations
- Metra Lines
- Pace Fixed Routes
- Pace Shuttle Bug Routes

SCALE IN MILES

Level of Service Data:
County-involved, signalized intersections and roundabouts

Level of Service (LOS)

A measurement based on vehicle **delay** and **speed** that reflects how well an intersection is functioning

A B C D E F

Free-flowing   **Highly congested**

- LCDOT uses *Synchro* traffic analysis software to evaluate intersection operations and performance

- **Roundabouts (5 total)**

	Level of Service	AM Peak Hour	PM Peak Hour
(best)	A	2	1
	B	3	2
	C	0	2
	D	0	0
	E	0	0
(worst)	F	0	0

- **Signalized intersections (313 total)**

	Level of Service	AM Peak Hour	PM Peak Hour
(best)	A	100	67
	B	72	71
	C	87	79
	D	30	57
	E	9	22
(worst)	F	15	17

Source: LCDOT Traffic Department 2/2019

Historical Perspective: Crash Data

5 year averages	2006-2010	2007-2011	2008-2012	2009-2013	2010-2014	2011-2015	2012-2016
Number of crashes	4236	3994	3704	3485	3530	3673	3796
Fatality	8	8	8	7	8	8	10
Crash with injury	942	931	952	974	978	1004	1046
Property damage only	3286	3147	2744	2504	2544	2662	2741

Data Source: MS2 Traffic Crash Location System Report, June 2018

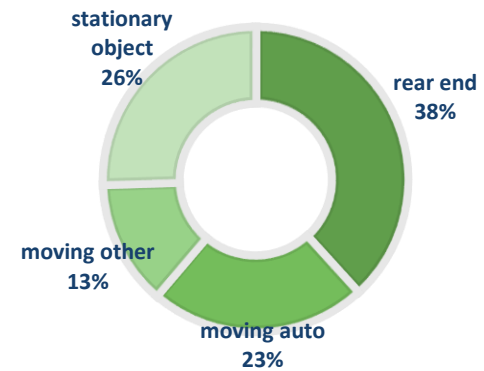# Crash Summary *(2016 TCLS Report)*

CRASHES AT INTERSECTIONS
TOTAL: 3666 (91%)

stationary object
9%

moving other
3%

rear end
44%

moving auto
44%
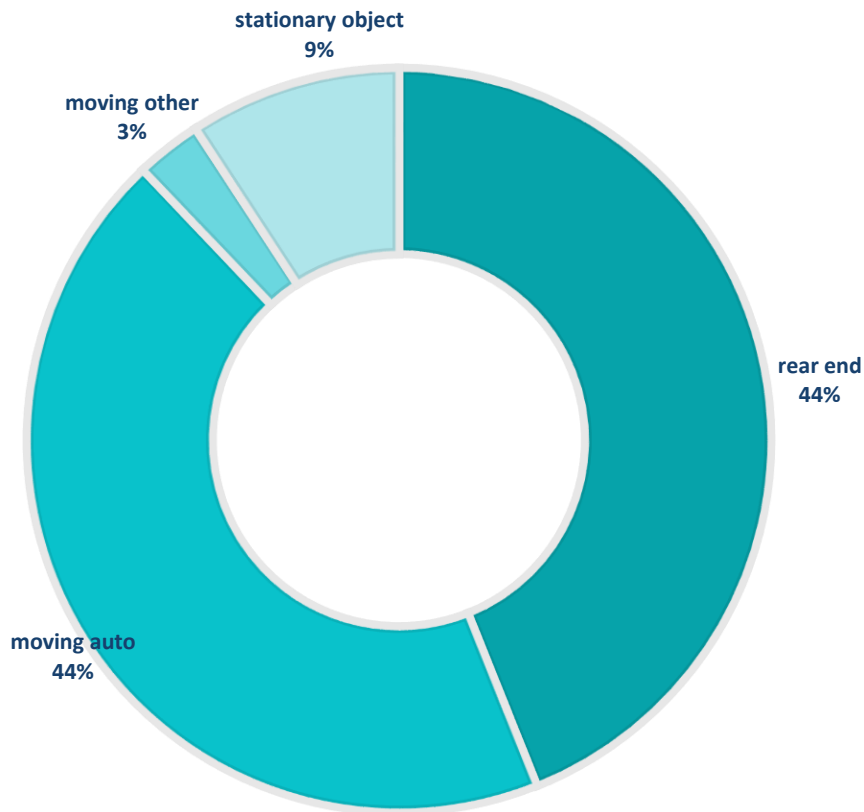
CRASHES ON ROADWAY SECTIONS
TOTAL: 361 (9%)
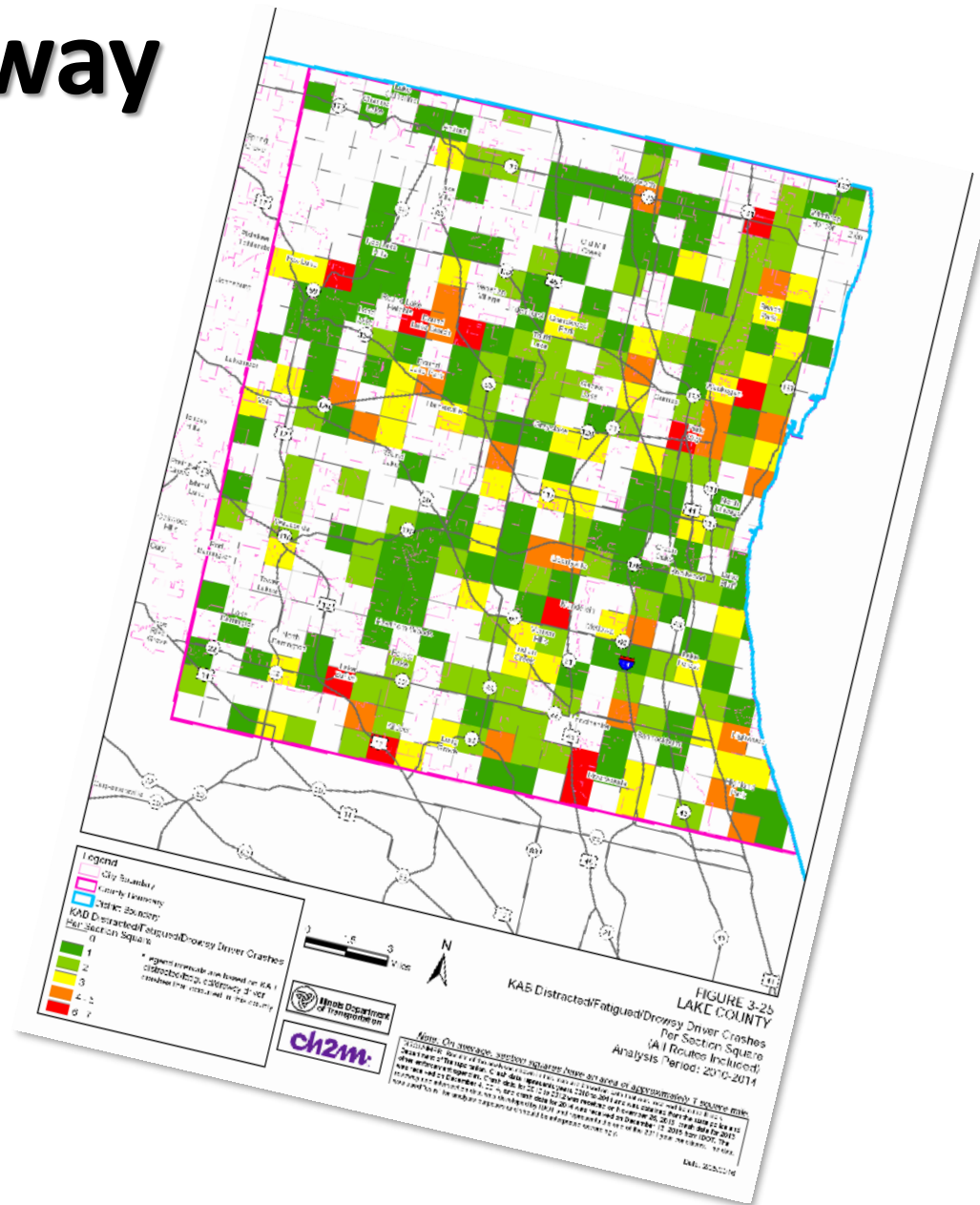
stationary object
26%

rear end
38%

moving other
13%

moving auto
23%

Strategic Highway Safety Plan

- Statewide effort to achieve **zero fatalities** on Illinois roadways

- Data-driven plan to reduce severe crashes by:
  - Documenting at-risk locations
  - Identifying effective safety improvement strategies
  - Better positioning counties to compete for available safety funds
  - Effectively partnering with agencies and communities

FIGURE 3-25
LAKE COUNTY
KAB Distracted/Fatigued/Drowsy Driver Crashes
Per Section Square
(All Routes Included)
Analysis Period: 2010-2014
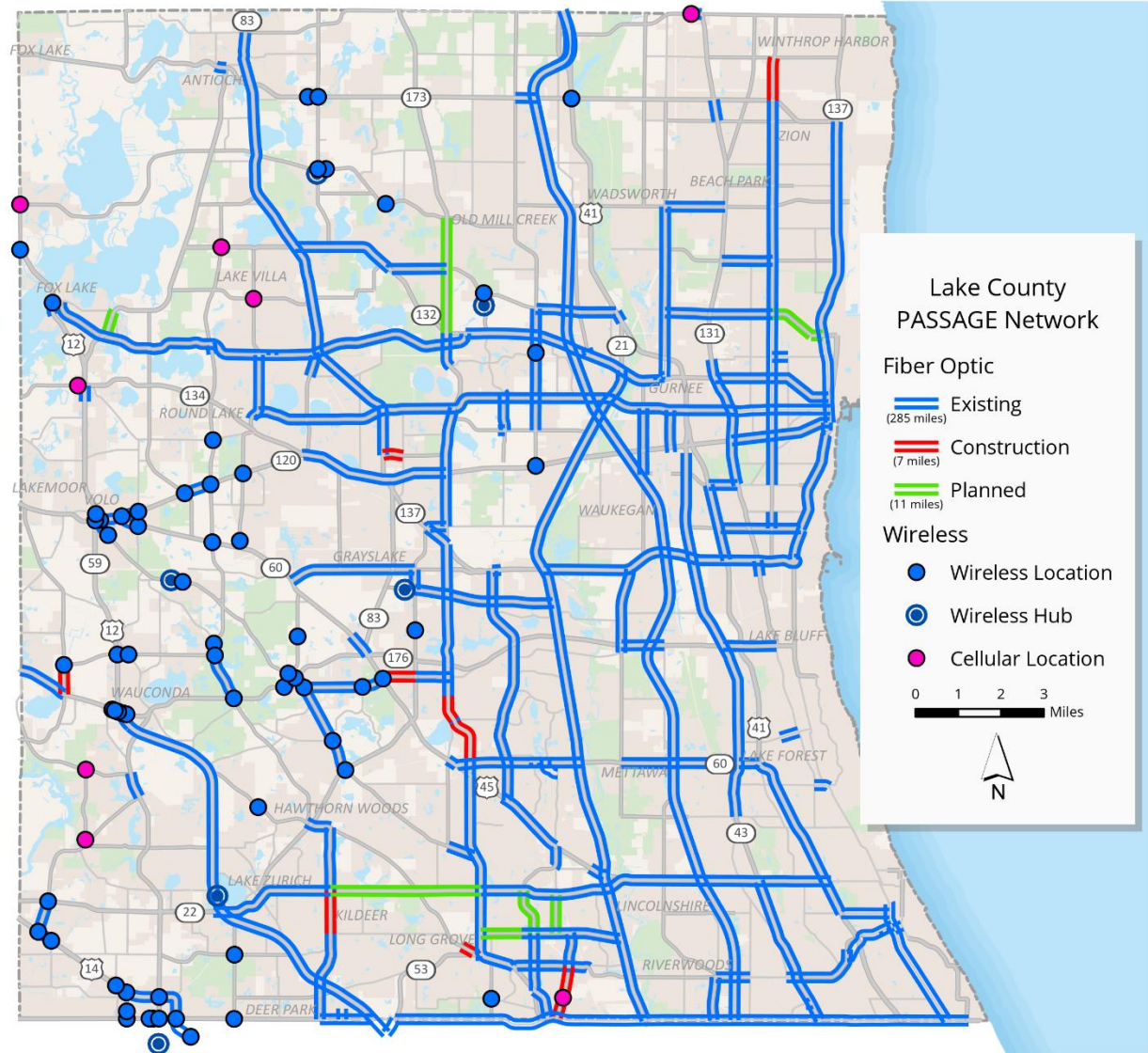
Expanding Computer Aided Dispatch (CAD) Coverage
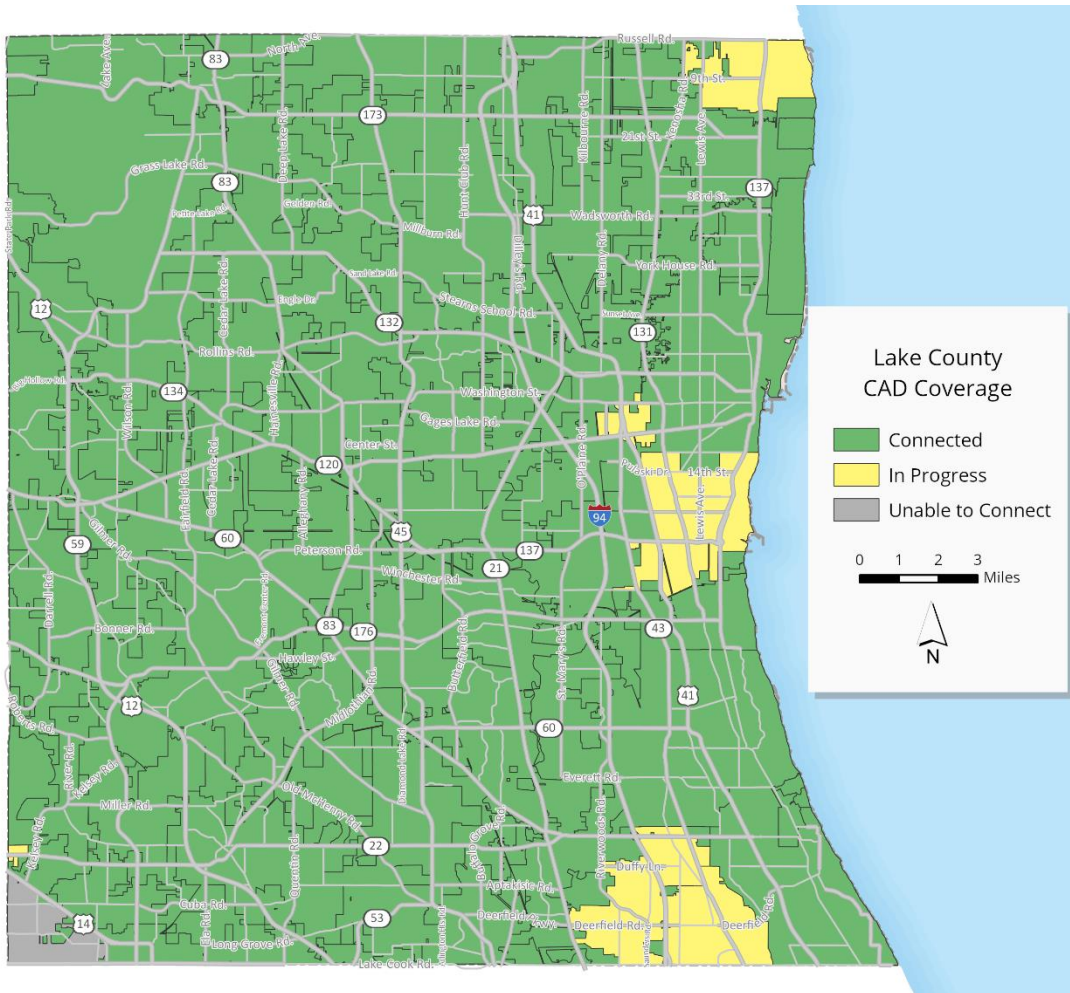
14 connected dispatch centers [via FATPOT]

93% of the county is covered

7% in progress

Lake County CAD Coverage

- Connected
- In Progress
- Unable to Connect

0 1 2 3 Miles

N

Source: LCDOT Traffic Department 4/19/2019

Priority Three: Expansion

Expansion projects: approximately

36%

of program

Typically add lanes, grade separations, new or extended roads

- **Tools in the Toolbox:**
  - 2040 plan
  - State Consensus list
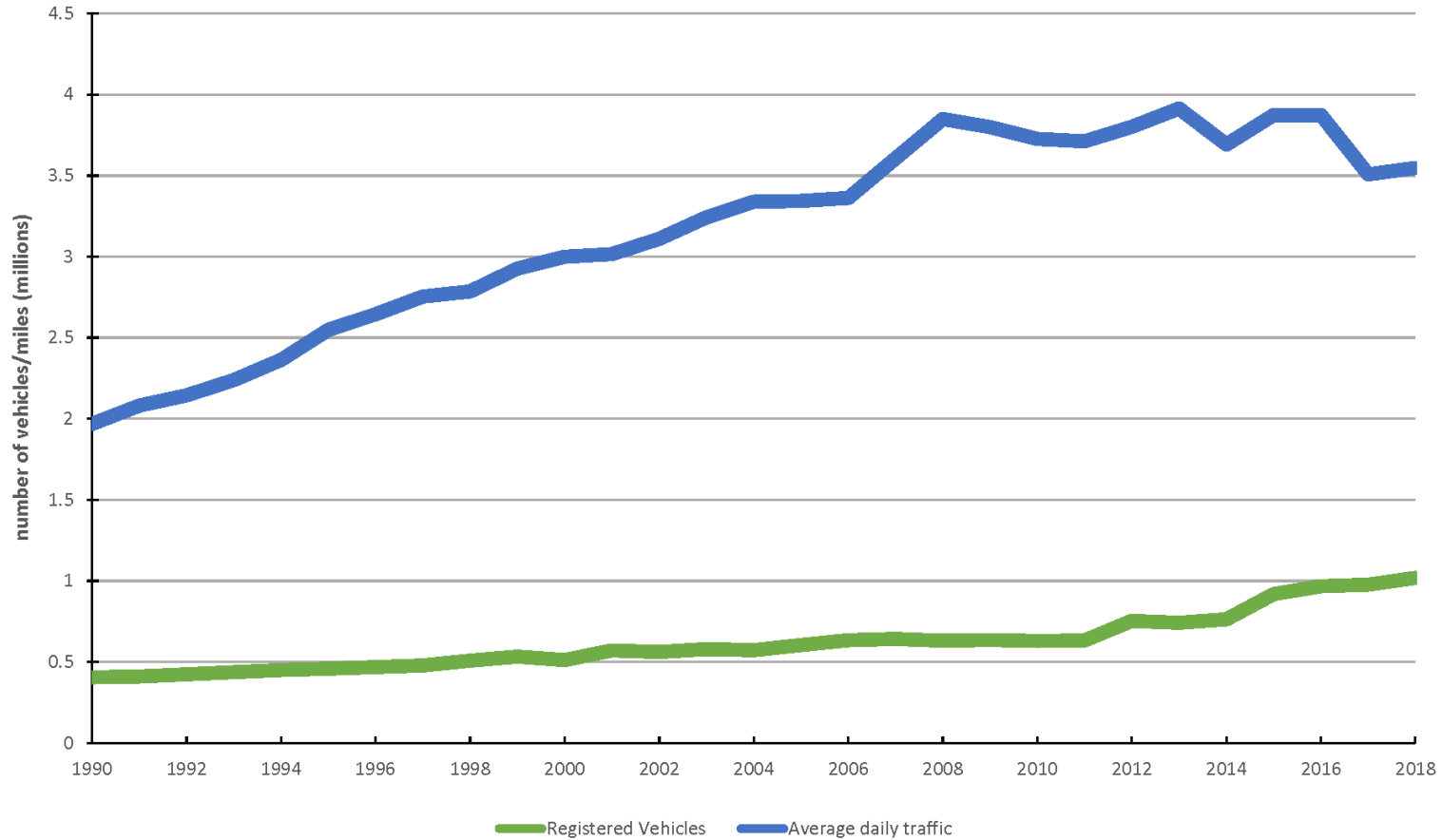 - Project scoring matrix
  - Demographic trends
  - Traffic data
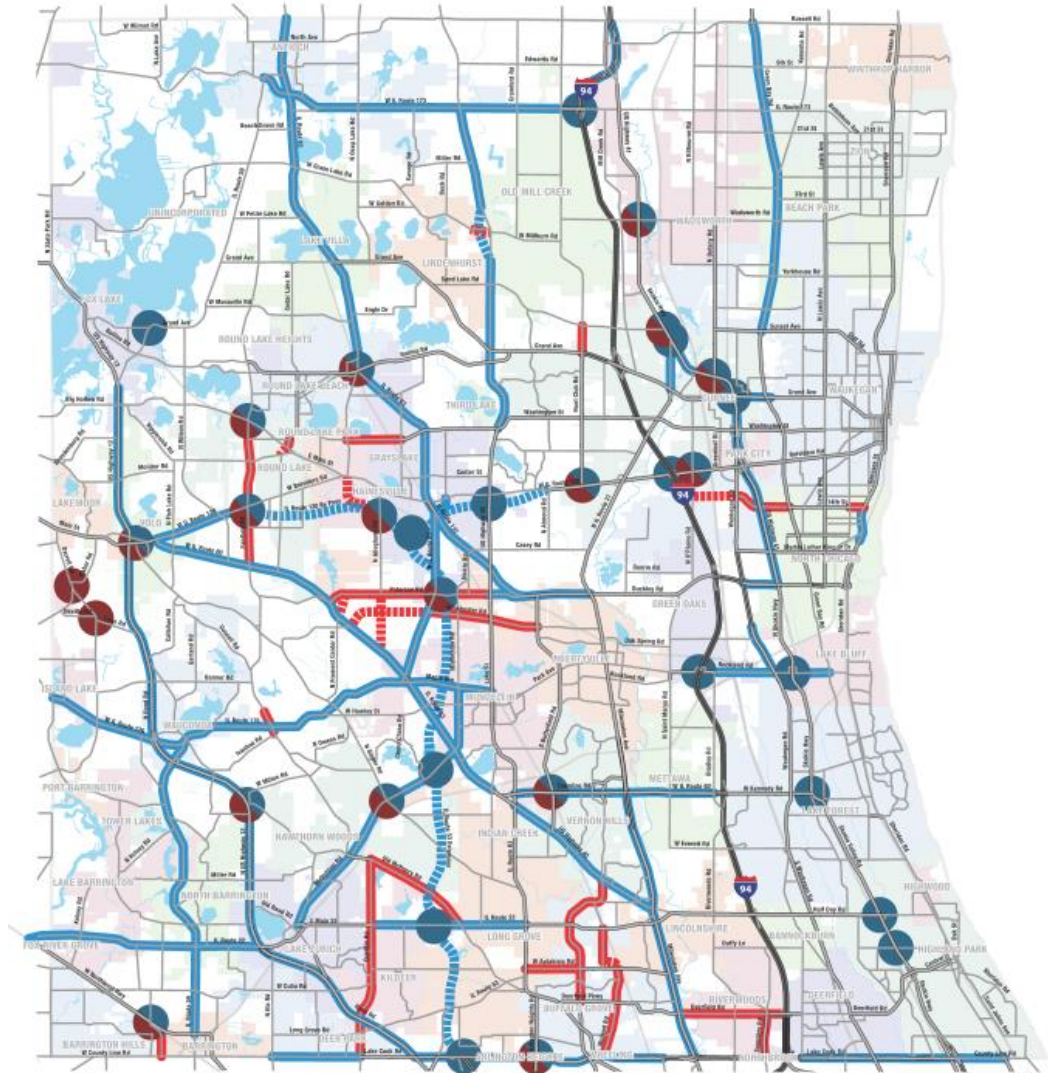
Are County-owned roads keeping up with growth?

Lane Mile Growth		Growth in Average Daily Traffic	
1990	634	1990	1,801,717
2019	902	2019	3,547,279

History: Daily Vehicle Miles

2040 Roadway Priorities

- Peak period trips estimated to increase by **36%** between 2010 and 2040

- **212** miles of roadway Improvements recommended
  - **7** interchange
  - **9** intersection
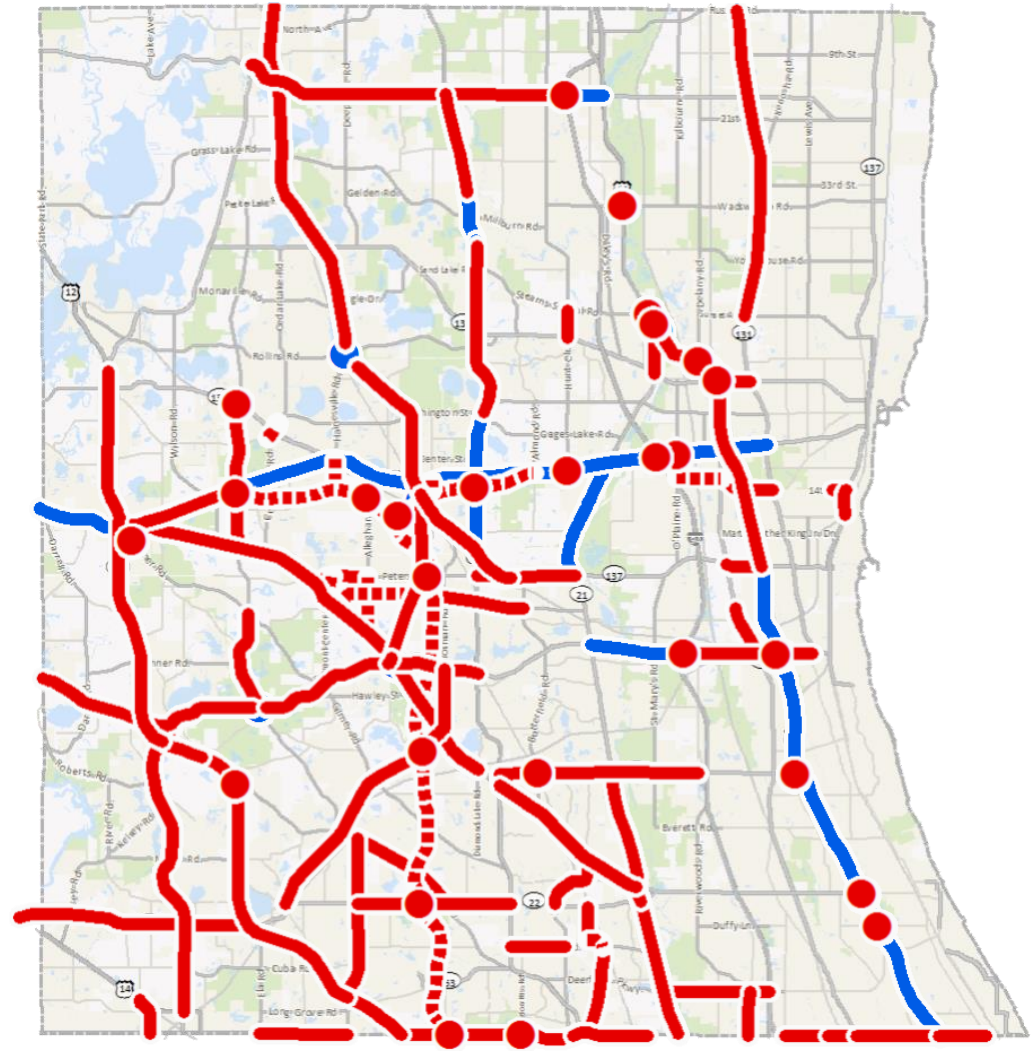 - **65** corridor

LEGEND

PROPOSED ROADWAY IMPROVEMENTS

- LCDOT Route Widening
- Other Jurisdiction Widening
- LCDOT Route Extension
- Other Jurisdiction Route Extension

- LCDOT - Interchange/Intersection Improvement
- Other Jurisdiction - Interchange/Intersection Improvement
- Shared Jurisdiction - Interchange/Intersection Improvement

* Potential railroad grade separations are noted in the Appendix.

2040 Roadway Improvements

- Consensus projects
- 2040 projects
- Both LCDOT and IDOT projects
- LCDOT has projects in preliminary phases now that can't be programmed for construction due to lack of funding.
- **$1.2 billion** still needed to fund remaining projects in the Consensus Plan

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