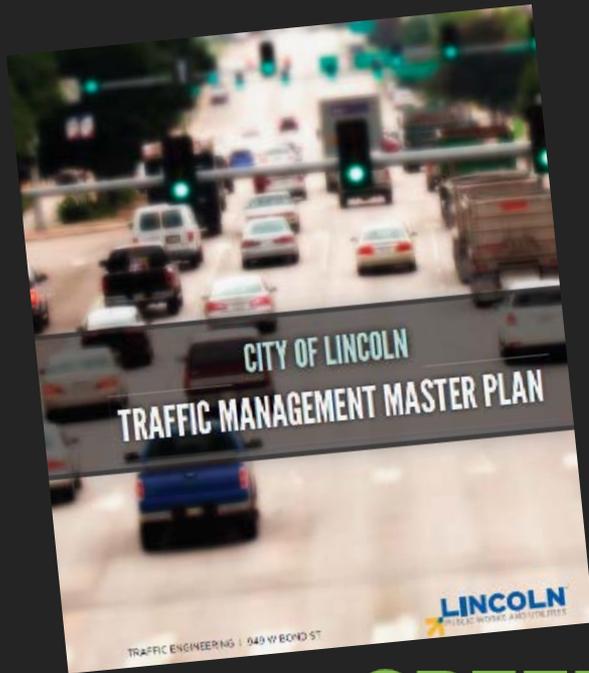


Planning Commission Briefing



Lonnie Burklund, PE, PTOE
Manager, Traffic Engineering

City of Lincoln, NE
Public Works Dept.

**GREEN LIGHT
LINCOLN™**
IT'S GO TIME

Agenda



- Traffic Management Master Plan
- Green Light Lincoln
- Smart Cities – Future Transportation

All Things Traffic



CITY OF LINCOLN NEBRASKA Traffic Engineering

[lincoln.ne.gov](#) > [Public Works and Utilities](#) > [Engineering Services](#) > [Traffic Engineering](#)

Traffic Engineering

Our mission is to provide the safe and efficient movement of all modes of traffic in the City of Lincoln



Green Light Lincoln



Roundabouts



Flashing Yellow Arrows



Rectangular Rapid Flashing Beacons



'N' Street Cycle Track



Traffic Management Master Plan

City of Lincoln
Public Works and Utilities
Engineering Services
Traffic Engineering
engserv@lincoln.ne.gov

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Traffic Engineer

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Lincoln, NE, 68521 USA

Tel: 402-441-7711

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Add to your address book

ACTION Center Service REQUEST

Latest News



News Articles

- [Smarter intersections coming to Lincoln](#) Journal Star (3/8/16)
- [Editorial, 2/4: Be realistic on traffic flow](#) Journal Star
- [Signs already appearing of Lincoln transportation's future](#) Journal Star (3/8/16)
- ["Green Light Lincoln" to Improve Traffic Safety and Flow](#) Mayor's Office (1/21/16)
- [Lincoln hopes to create mass transit system using driverless cars, vans](#) Journal Star (3/2/16)
- [Lincoln to have fewer, better-timed traffic lights](#) Journal Star (1/20/16)

More Information

- [Average Daily Traffic Volume](#)
- [PSA - Share the Road](#) (31)
- [Traffic Signals](#)
- [Neighborhood Traffic Mitigation Program](#)
- [School Traffic Information](#)
- [Traffic Signs](#)
- [Permits](#)
- [Sight Distance Standards](#)
- [Truck Routes](#)



The Master Plan



New Technologies
New Operations



The goal of the Traffic Management Master Plan is to document the improvements necessary to deploy a modern system that provides value, sustainability, and improved quality of life, for the Citizens of Lincoln.

Background

- What's the Issue?



- Nationally, agencies are NOT keeping up with prioritization and funding of signal systems - operation, staffing, management and replacement.



National Traffic Signal Report Card 2012

Management	D
Traffic Signal Operations	C
Signal Timing Practices	C
Traffic Monitoring and Data Collection	F
Maintenance	C
OVERALL	D+

Background

■ Nationally

Estimated Annual Expenditure and Value

- Number of traffic signals 311,000
- Value of traffic signal infrastructure assets \$82.7 billion
- Annual operating and maintenance program cost \$1.2 billion



Background



■ Nationally

- TTI Estimates: Americans within cities lost 5.5 billion hours stuck in traffic annually (1 week)
- Caused us to purchase an additional 2.9 billion gallons of fuel
- Cost of Delays and Fuel Alone – over \$120 billion annually

OVERALL

D+

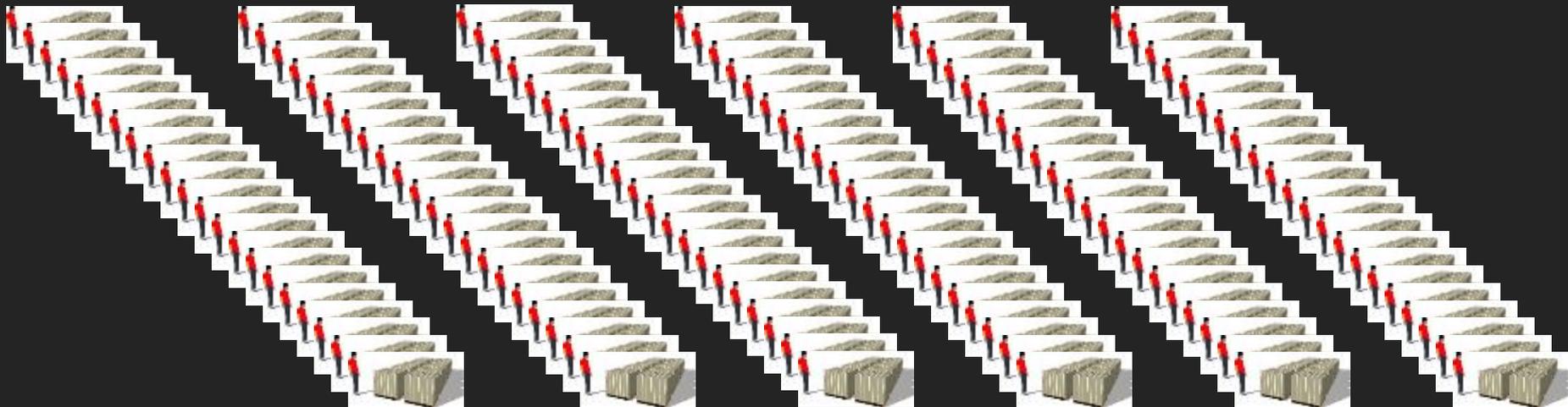
Background

- 5.5 Billion Hours



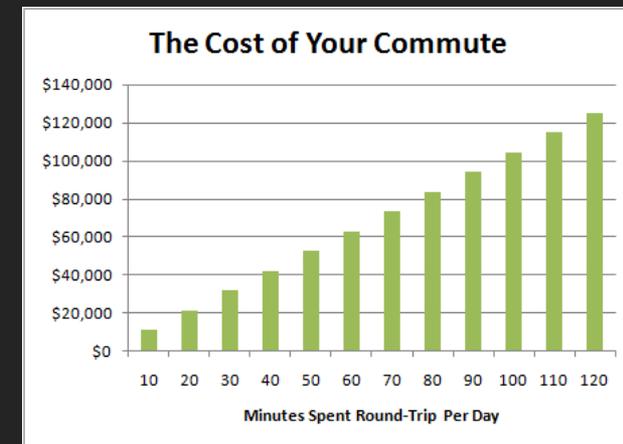
Background

- 120 Billion Dollars....



Background

- Why is it Important?
 - Nearly ALL “Quality of Life”, “Best Places to Live” surveys have ONE thing in common:
 - ✓ Traffic commute index
 - ✓ Average travel commute
 - ✓ Traffic volumes/delays
 - ✓ Commercial vehicle travel times



Background

- Why Should Lincoln Care?
 - Because it's Low Hanging Fruit
 - ✓ Improve Safety
 - ✓ Improve Operations
 - ✓ Improve Quality of Life
 - ✓ Huge Benefit/Cost Ratios



In Lincoln...

- Improve Safety

- Over 7,000 Annual Crashes – Societal Cost of over \$279 million dollars (1 Year)

- ✓ Mere 10% improvement in safety = \$30M in savings annually



In Lincoln...

■ Improve Operations

- 430 Signals @ Optimization Costs of \$3,500 per each.
 - ✓ 15-20:1 Benefit Cost ratios, and USDOT documents at over 40:1
 - ✓ Using just 15:1 results in over \$22M in benefit



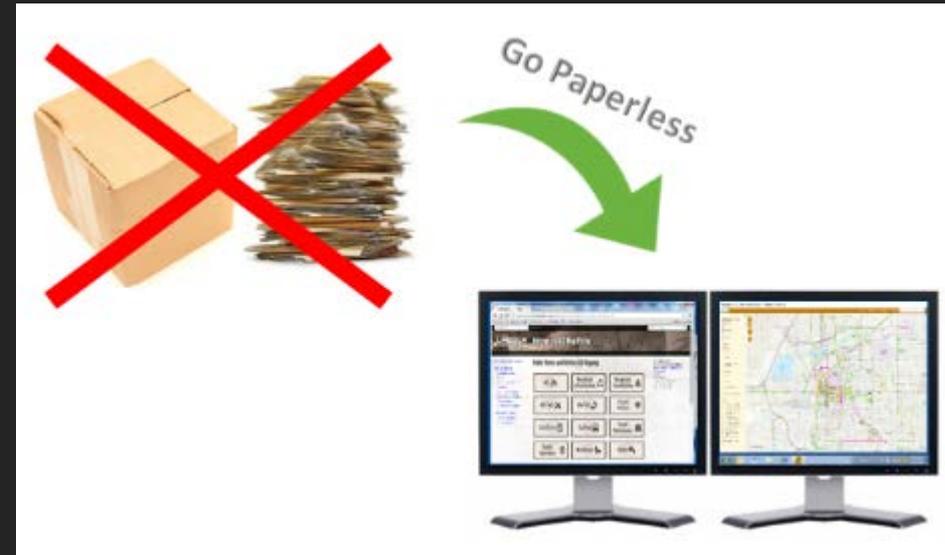
Master Plan

- Strategic Plan
- Should Be Doing
- Could Be Doing
- Implement Change



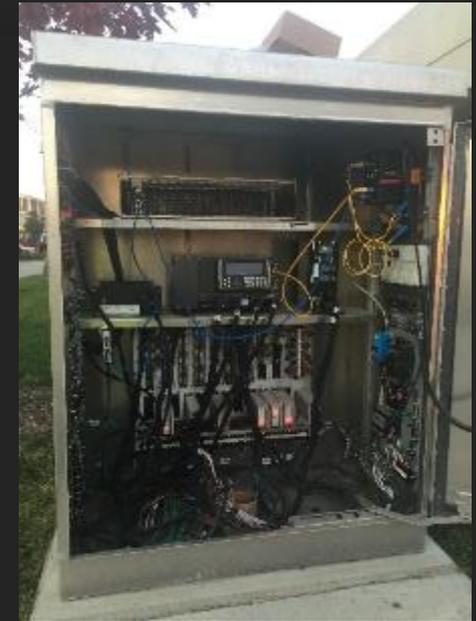
Asset Management

- Self-Assessment
- Inventory
- Paperless
- Sharing Information
- Data Driven - Smarter

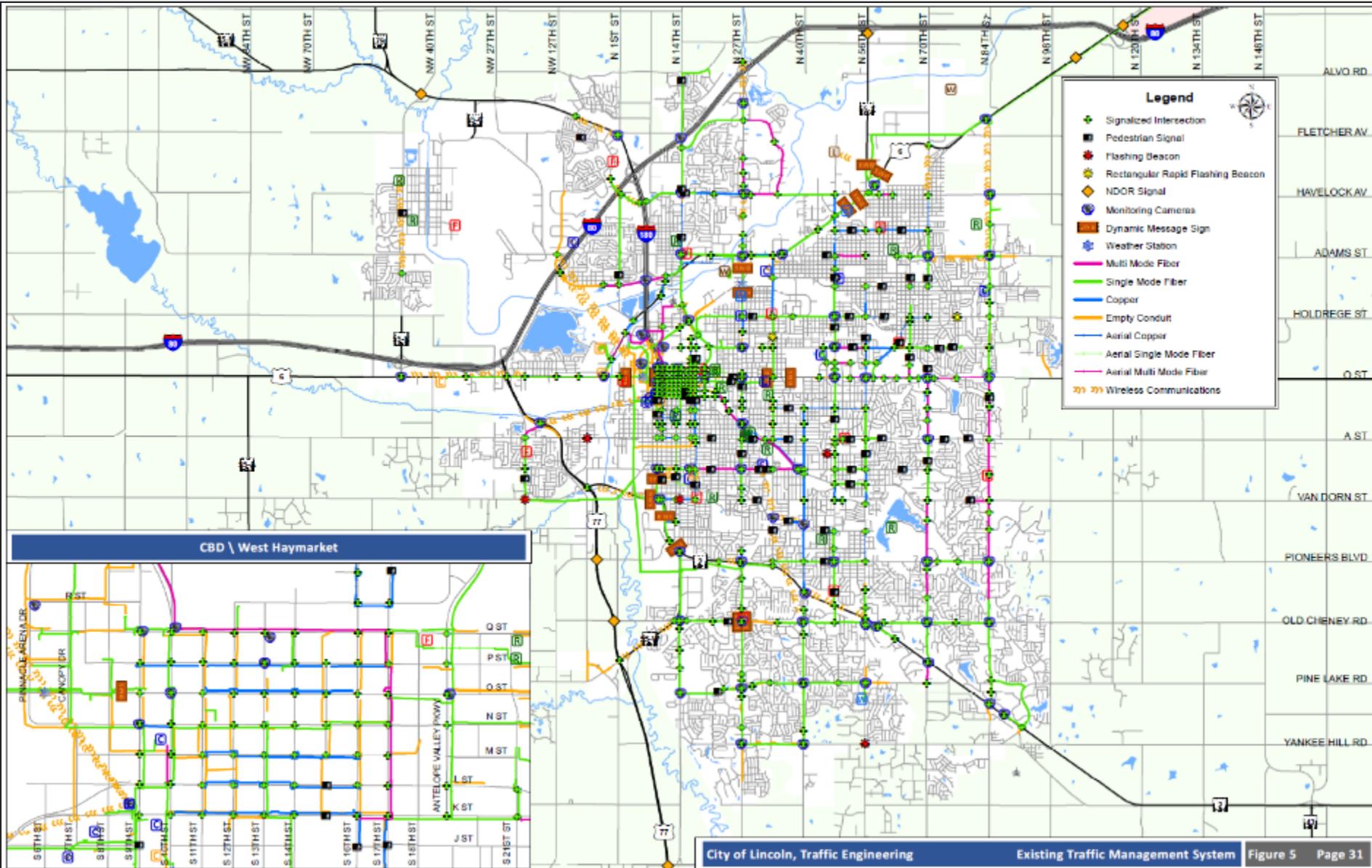


Asset Management

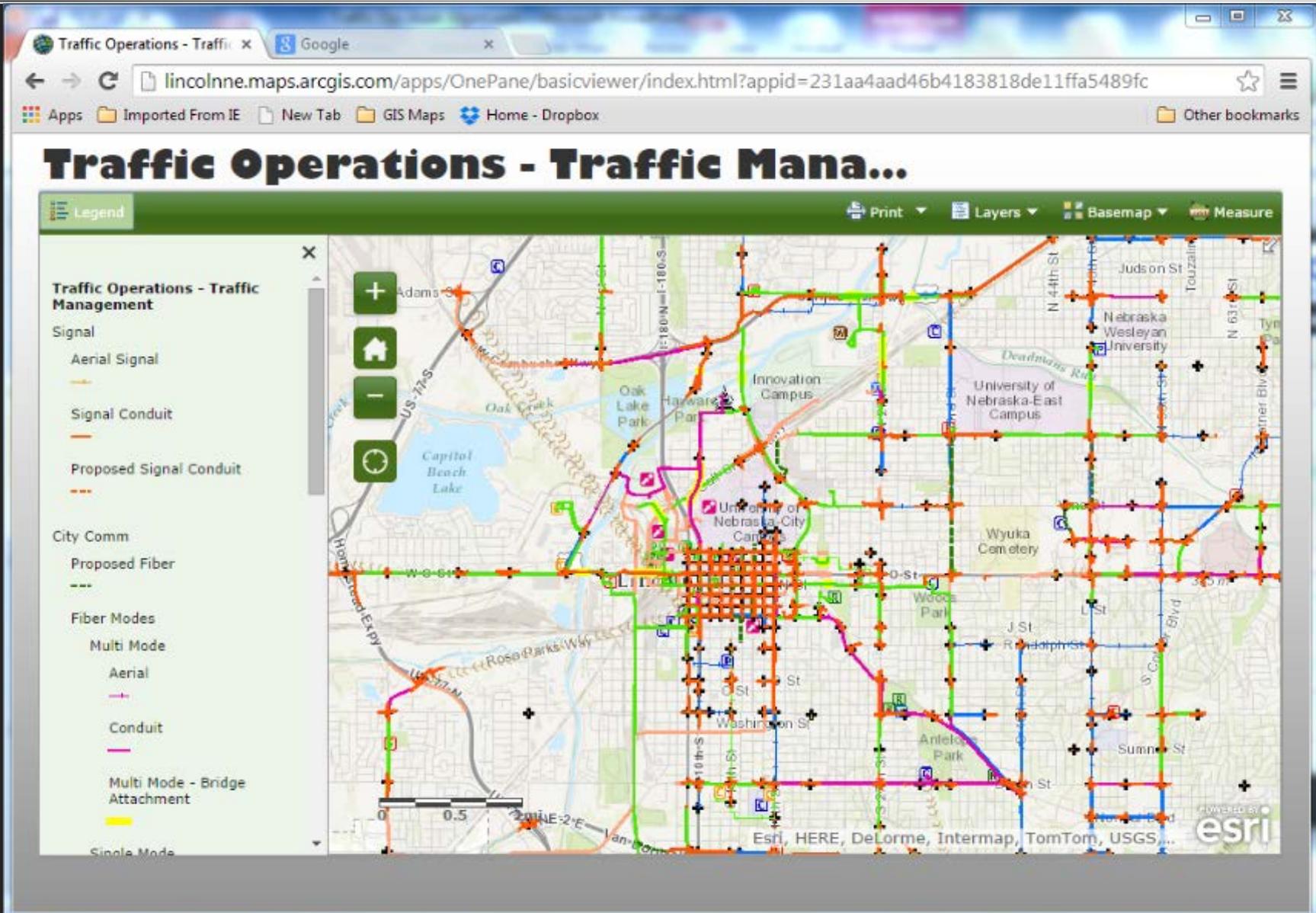
- Traffic Signals



Asset Management



Asset Management



Traffic Operations - Traffic Mana...

Legend Print Layers Basemap Measure

Traffic Operations - Traffic Management

Signal

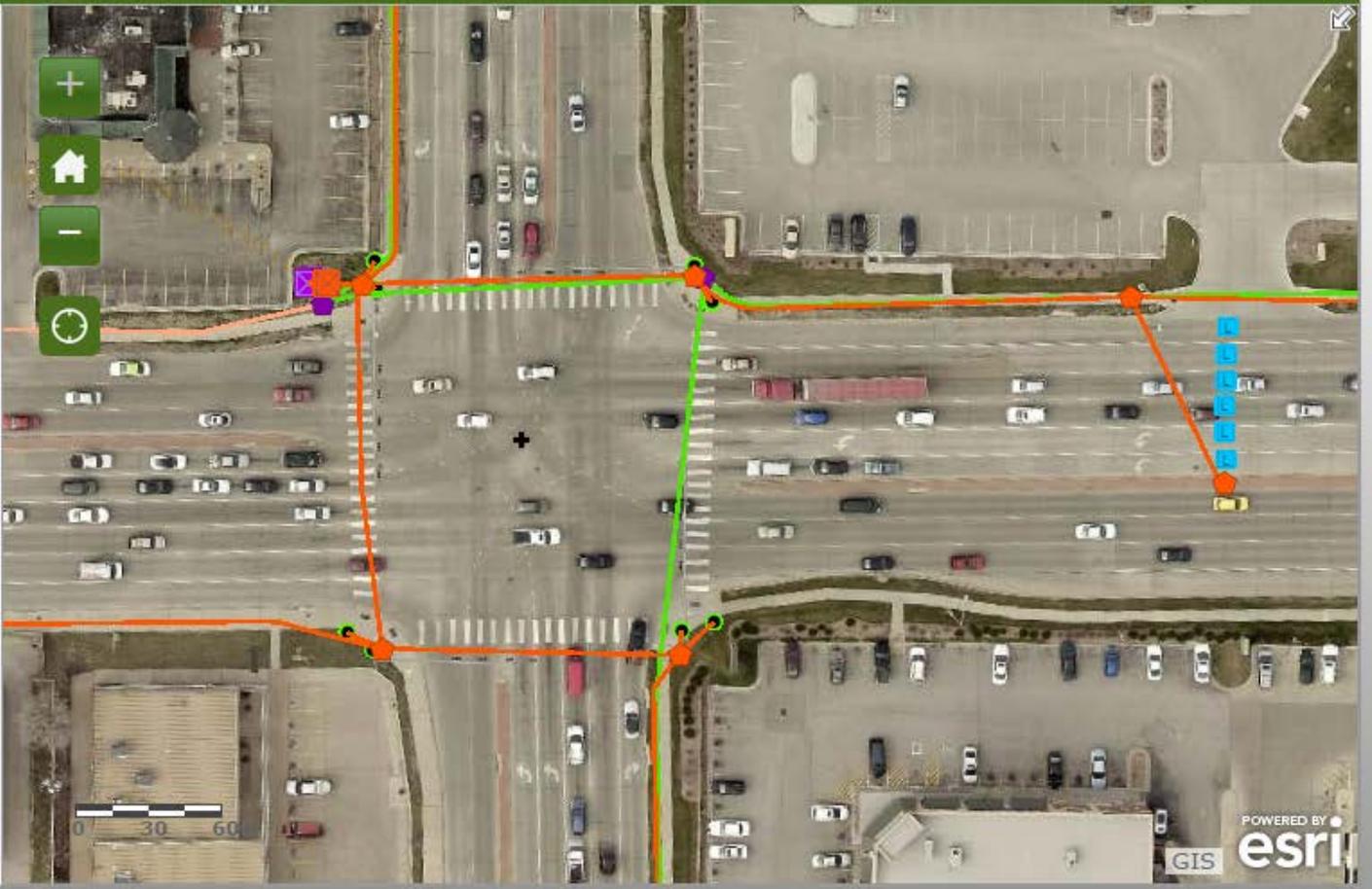
- Traffic Cabinet
- PullBox
- Aerial Signal
- Signal Conduit
- Proposed Signal Conduit

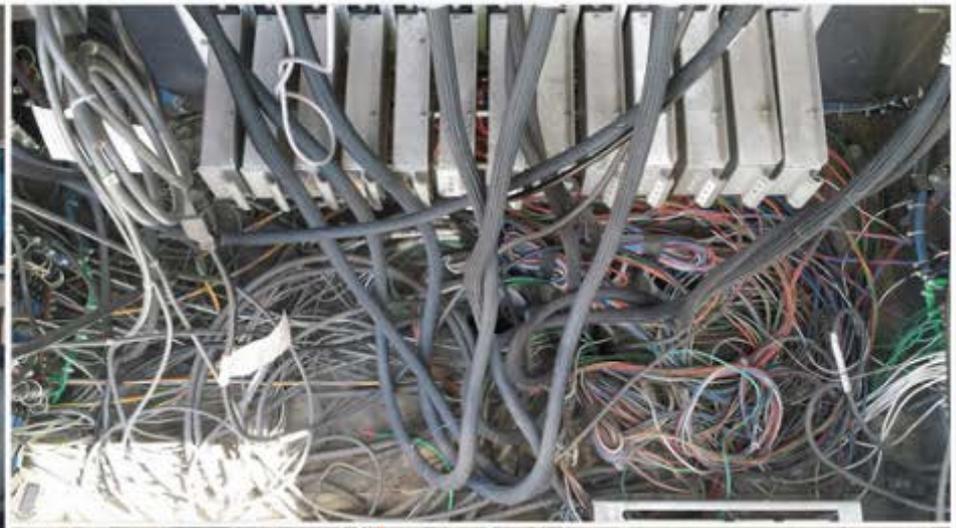
Detector

- Camera
- Loop
- Magnetic
- Microwave
- Wireless

City Comm

ITS Cabinet





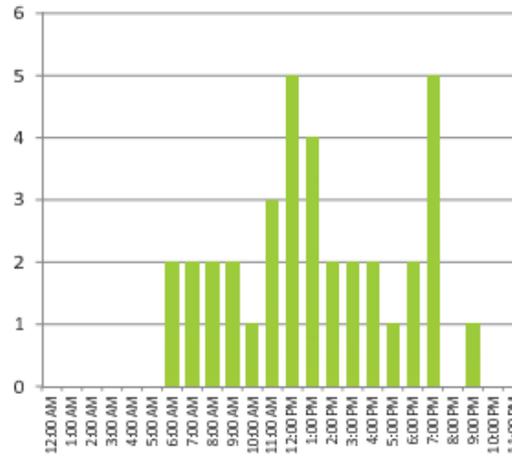
48th Street & O Street



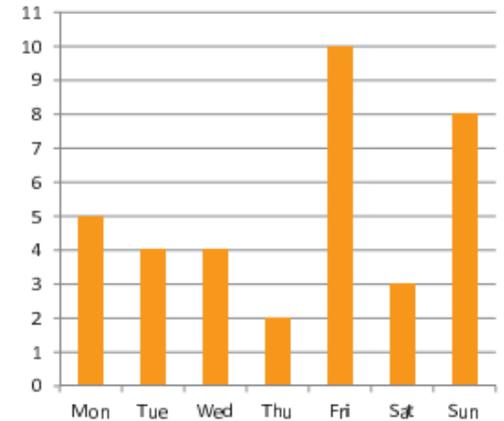
Crash Statistics

48th Street and "O" Street Crash Data	
Total Number of Crashes	36
Crash Rate (crashes/MEV)	1.59
EPDO Rate (EPDO crashes/MEV)	5.67
Intersection Ranking (Major/Major Traffic Signal)	
Total Number of Crashes	3 of 26
Crash Rate (crashes/MEV)	9 of 26
EPDO Rate (EPDO crashes/MEV)	17 of 26
Intersection Average (Major/Major Traffic Signal)	
Total Number of Crashes	10
Crash Rate (crashes/MEV)	0.85
EPDO Rate (EPDO crashes/MEV)	3.44

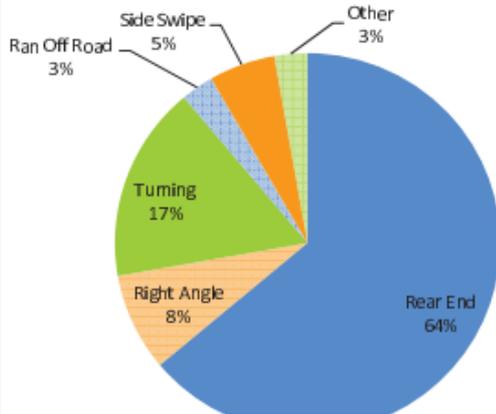
Crashes by Time of Day



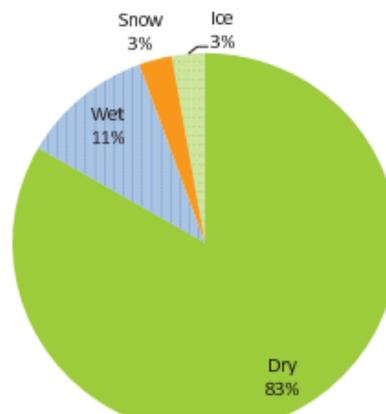
City of Lincoln, NE Crashes by Day of Week



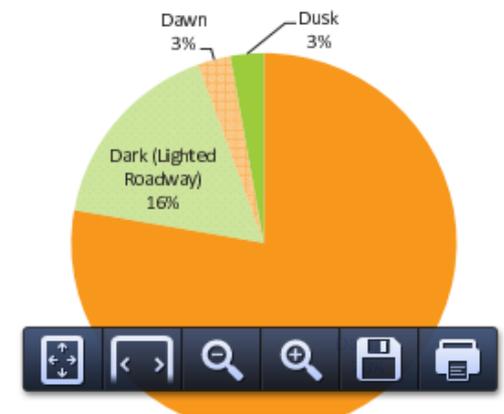
Crashes by Type



Crashes by Pavement Condition



Crashes by Lighting Condition



Self Reflection

- The Components

- Hardware
- Software
- Communications
- Staffing – Engineering/Maintenance



Hardware

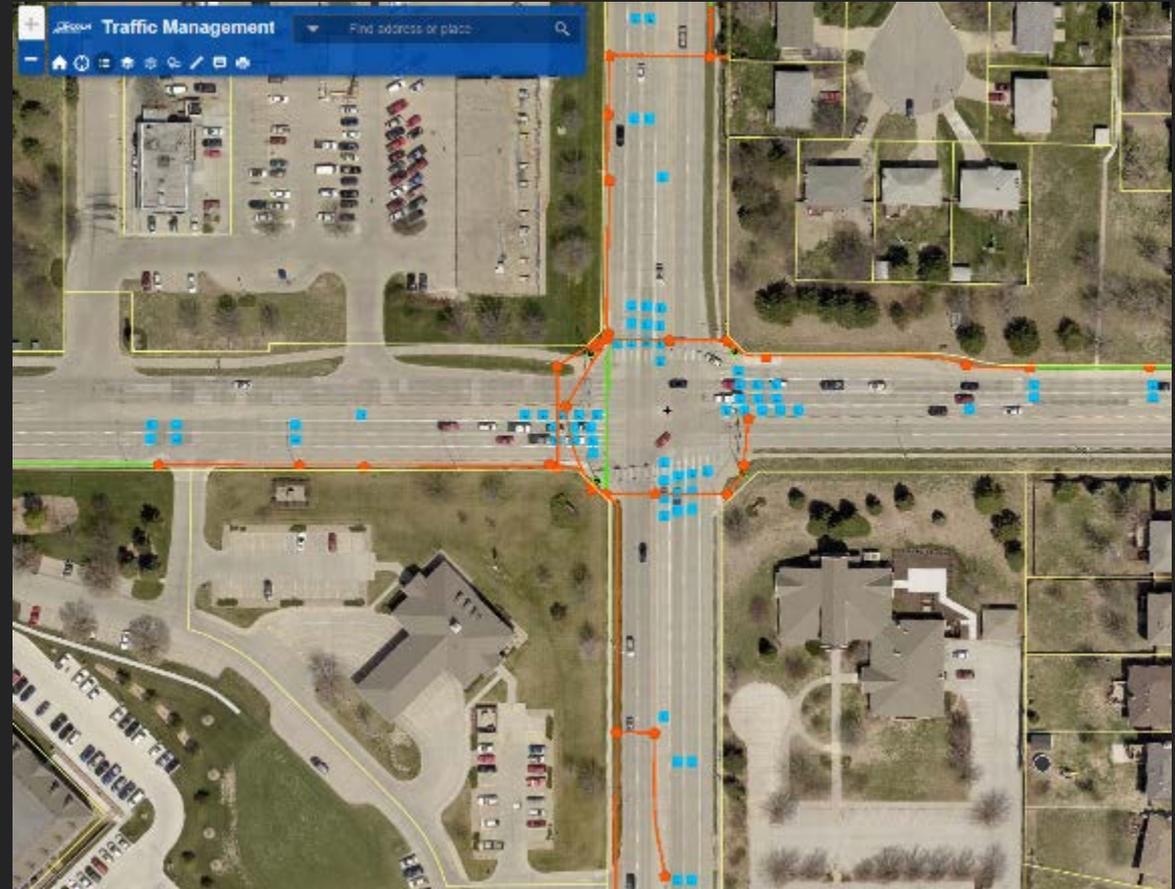
- Modernize
 - Cabinets
 - Controllers
 - Displays
 - Detection



Detection

- Types

- Loops
- Cameras
- Radar
- Pucks

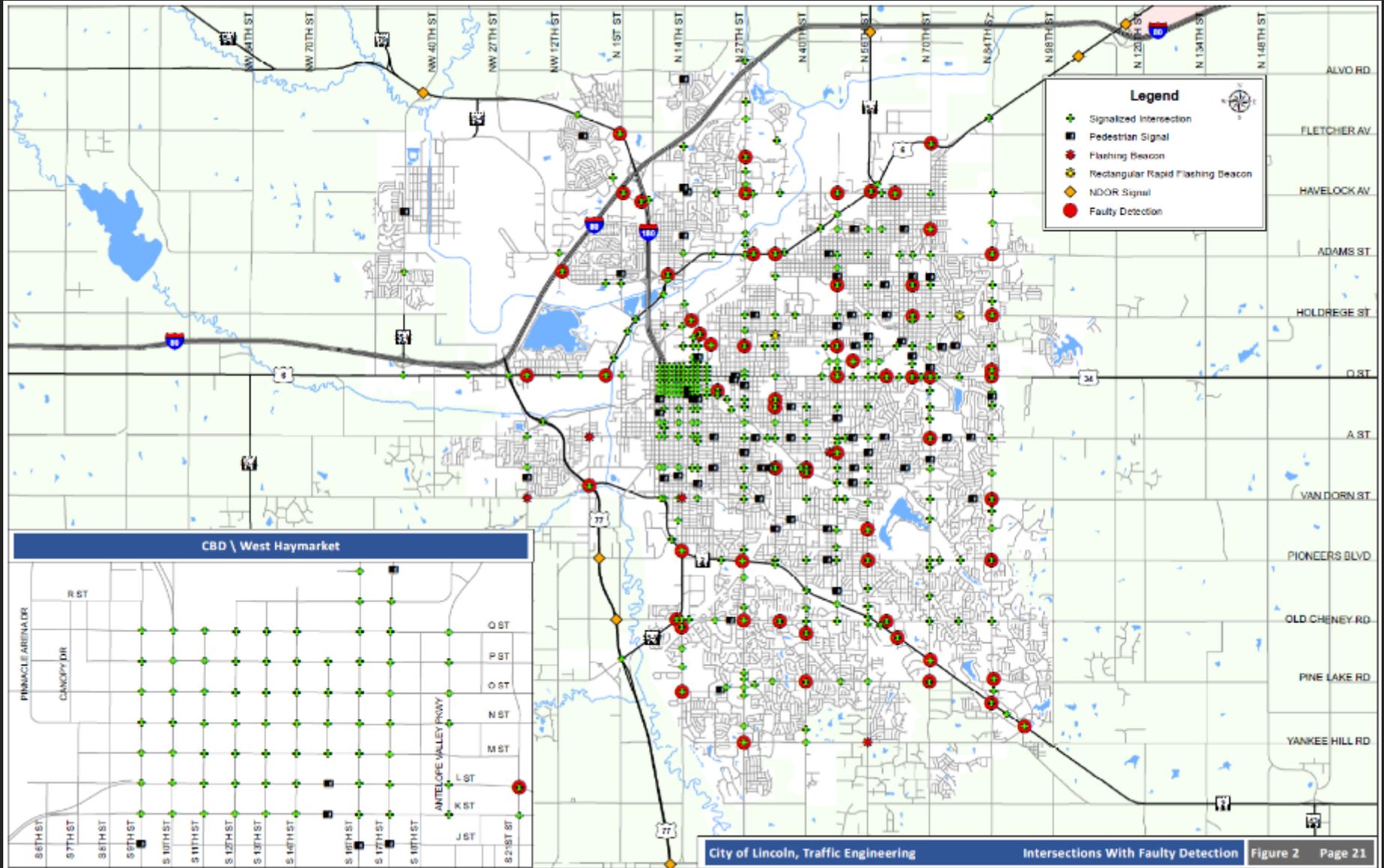


Detection

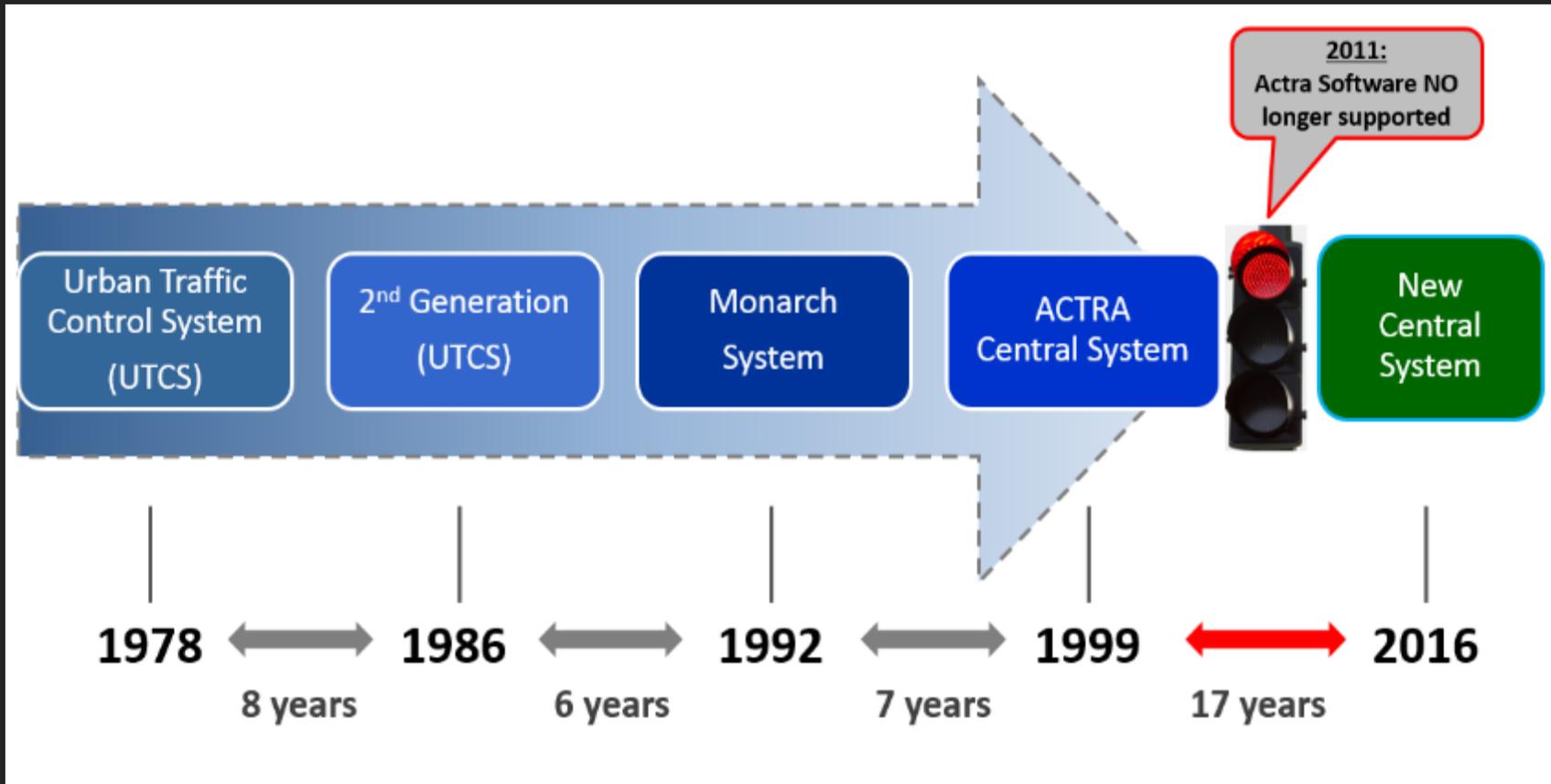
- Saw Cut Loops



Detection



Software



Software

- Operational Limits
- Public Response



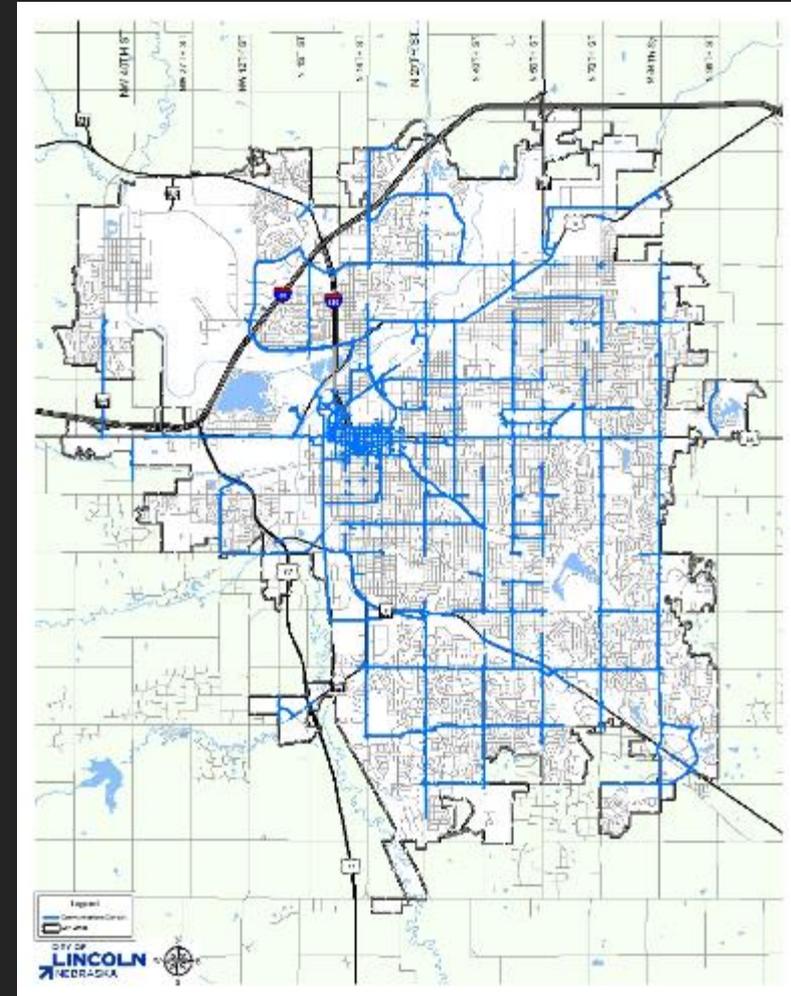
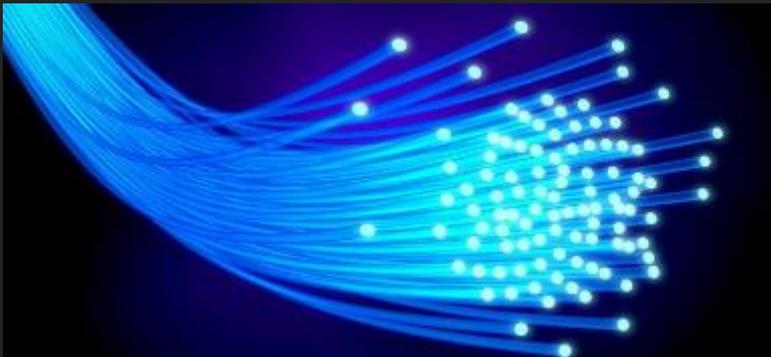
Software

- Modernize
 - Access - Remote
 - Notifications
 - Flexible - Settings
 - Interface, maps, devices



Communications

- FTTH Initiative
 - Fiber to All Cabinets
 - Robust
 - Network Mgmt



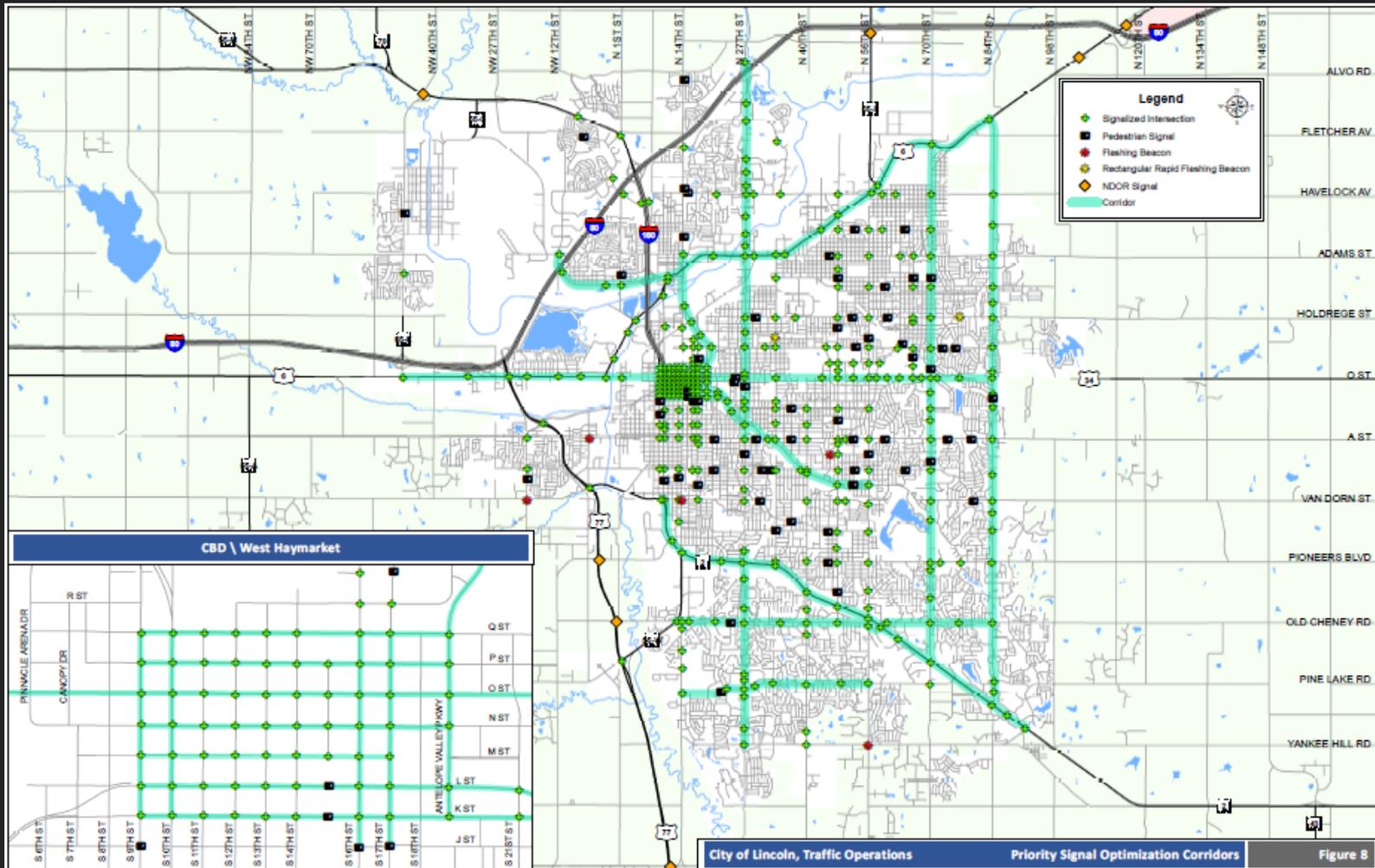
Improvements

- Total System Strategy
- Leads to Signal Optimization
 - Reduced delays, stops, travel time
 - Less fuel used, pollutants
 - Quality of life
 - Delay Capacity Projects



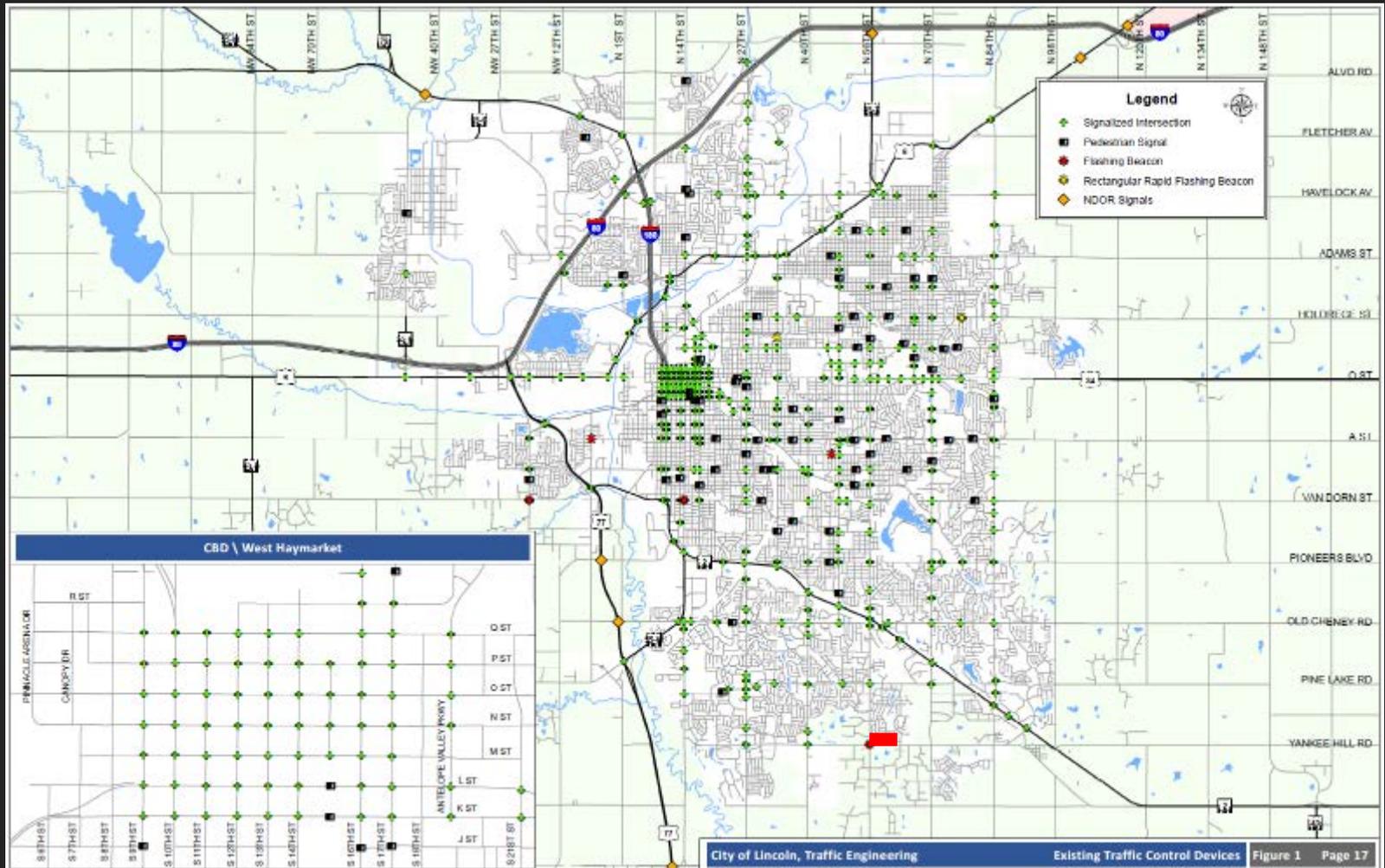
Improvements

■ Priority Corridors



Benefit / Costs

■ Construction Comparison?



Selling Itself



GREEN LIGHT LINCOLN™ IT'S GO TIME

- New signal system management software and hardware
- New intersection detection systems
- New traffic signal displays and signal phasing alternatives
- Deployment of Intelligent Transportation Systems
- Formal signal optimization (re-timing) program, corridor wide
- Improved traffic monitoring and incident management capabilities
- Reduced travel times, delays, and stops
- Reduced vehicle emissions, and pollutants
- Less fuel used, and savings at the pump
- Reduction in number and severity of crashes
- Smoother traffic flow, and less driver frustration
- Delaying the need for major capacity improvement project expenditures

Smart Cities

- What is the Future of Transportation?



Smart Cities



Path is Broken

Transportation Investment

Improving the condition and performance of the transportation system will cost



\$120 billion for highways and bridges between 2015 and 2020. Current annual spending at all levels of government—federal, state and local—is just **\$83.1 billion**.



\$43 billion for public transportation. Meanwhile, annual capital spending is just **\$17.1 billion**.

To compete in the global economy, the U.S. needs a world-class transportation system. Some of our most critical transportation infrastructure is crumbling.

65% of U.S. roads are in **less than good condition**



25% of U.S. bridges **need significant repair** or can't handle today's traffic



50% of locks and chambers are **more than 50 years old**



Overall U.S. Infrastructure Grade

D+

Our World Standing

Quality of roads 2008 = **8th**

Quality of roads 2014 = **16th**

Transportation Spending is in Decline

Our highway and mass transit accounts are trending toward the red. The Federal gas tax is no longer enough to address our transportation needs.

The Federal gas tax has not increased for over 20 years ...



18.4
¢/gal

1993

18.4
¢/gal

2015

... and the value of the dollar has declined.

Transportation Trust Fund projected annual shortfall



-\$4 billion

Transit

-\$12 billion

Highway

Oregon Pilots Road User Charges

Oregon is one of many States seeking new revenues to make up for transportation budget shortfalls.



30
¢/gal

During a recent pilot program in Oregon, participants paid **1.56 cents per mile driven** rather than a state tax of **30 cents per gallon of gasoline**.

1.56¢



MILE
1

Over the next decade higher fuel economy standards will result in more than **\$50 billion** in lost gas tax revenues.

What we Used to Do

- Create Capacity, and Fill it Back up



Future Vision

Technology convergence will revolutionize transportation, dramatically improving safety and mobility while reducing costs and environmental impacts

Connected Vehicles

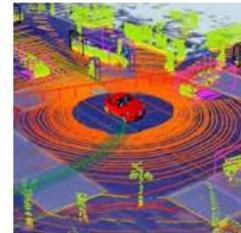
Vehicle Automation

Internet of Things

Machine Learning

Big Data

Mobility on Demand



Connected-Automated Vehicles



Benefits

- Order of magnitude safety improvements
- Reduced congestion
- Reduced emissions and use of fossil fuels
- Improved access to jobs and services
- Reduced transportation costs for gov't and users
- Improved accessibility and mobility

Lincoln's Vision?



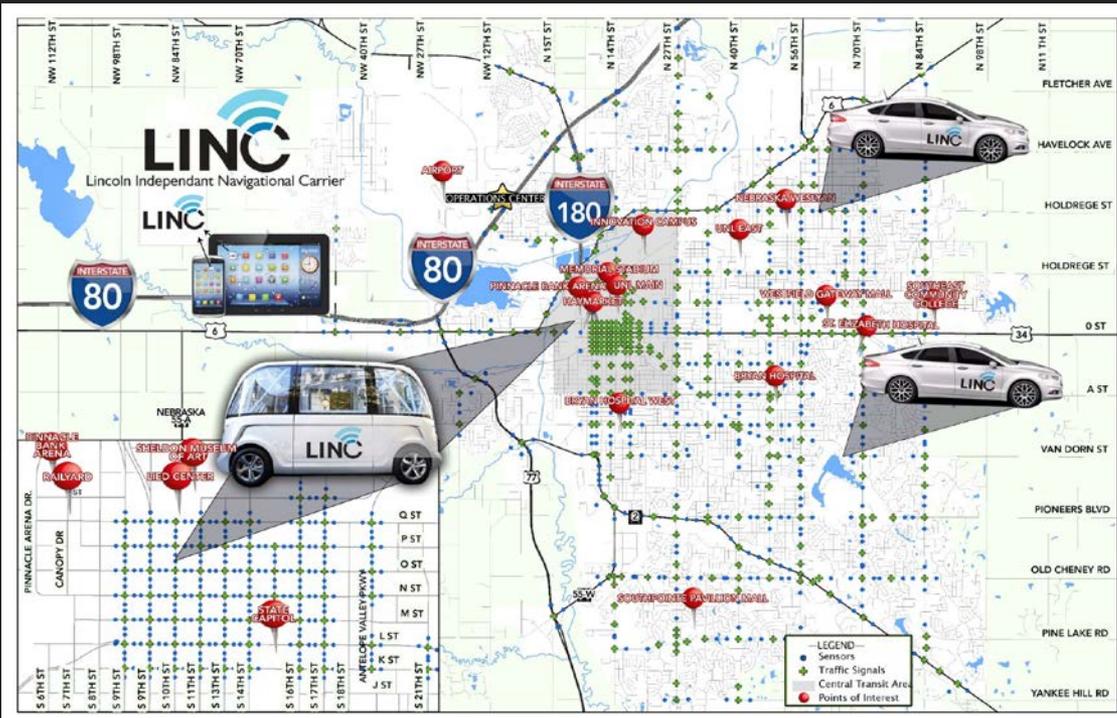
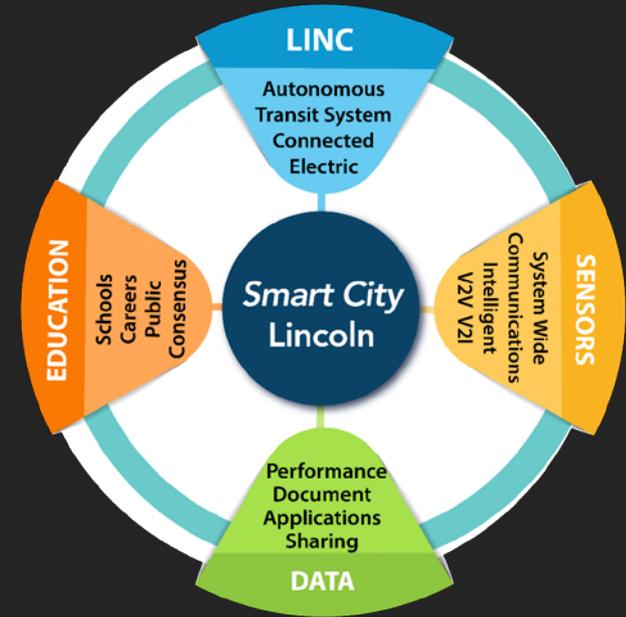
IMPROVING SAFETY



ENHANCING MOBILITY



ADDRESSING CLIMATE CHANGE

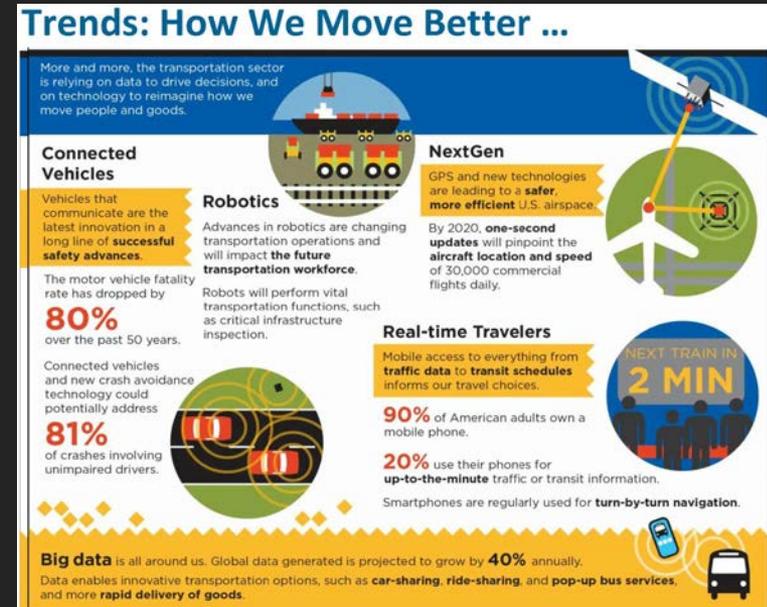


Future Connectivity



Coming Soon

- Connected Vehicles
 - To Each Other
 - To Infrastructure
- More Alternative Fuels?
 - Electrification
- TSM&O – More Focus on Operations
- Open Source Data – Applications
 - Public / Private



Questions

