

NACCTFO Conference

July 11-13, 2018
Nashville, TN

Joseph Gacioch

Smart Cities, Engaged Communities

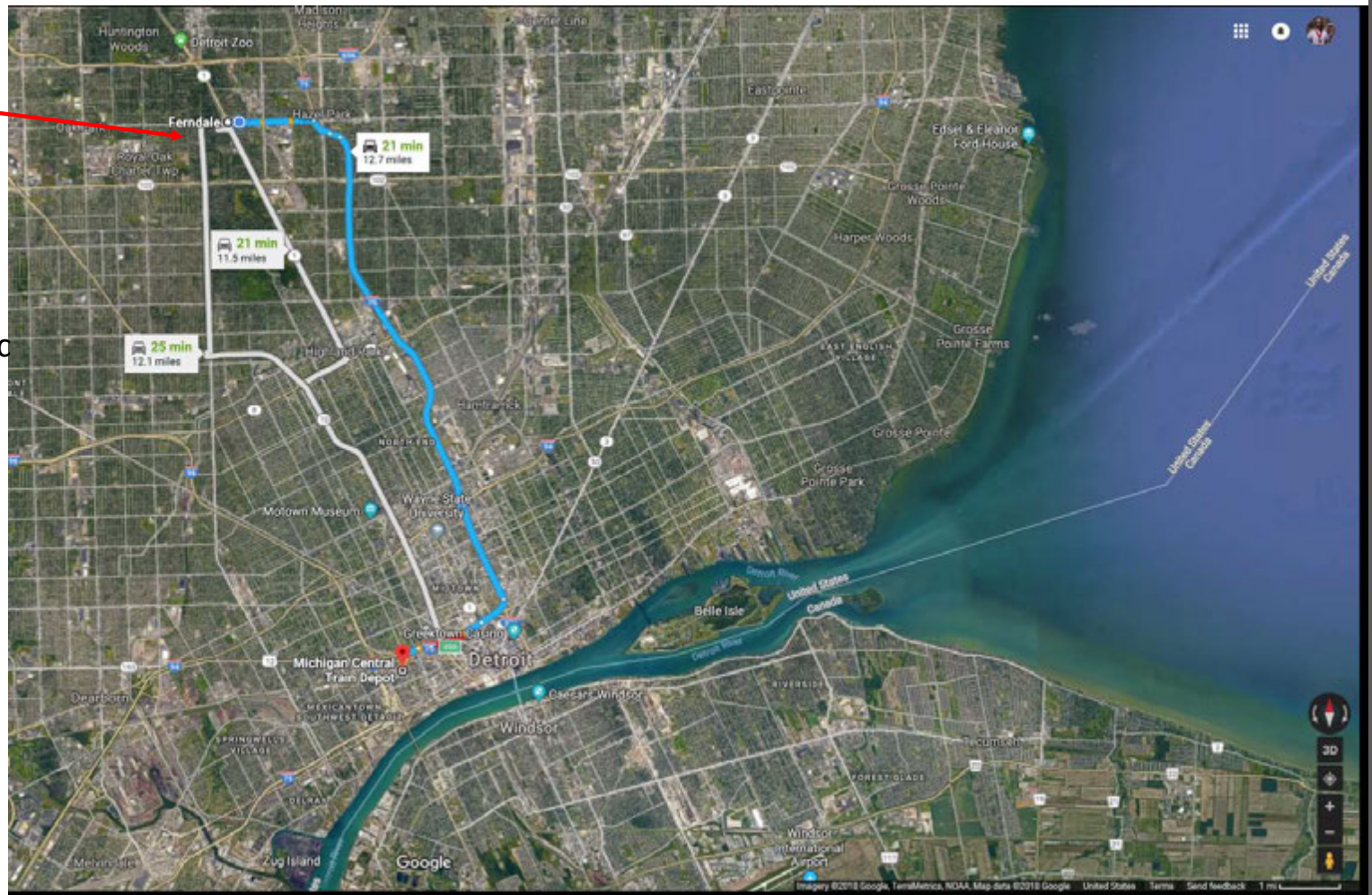
Assistant City Manager,
City of Ferndale, Michigan

July 12, 2018

Here We Are

Woodward Avenue:

- 1909: 1st concrete highway
- 1916: Detroit – Pontiac
- 1919 – 1st traffic light



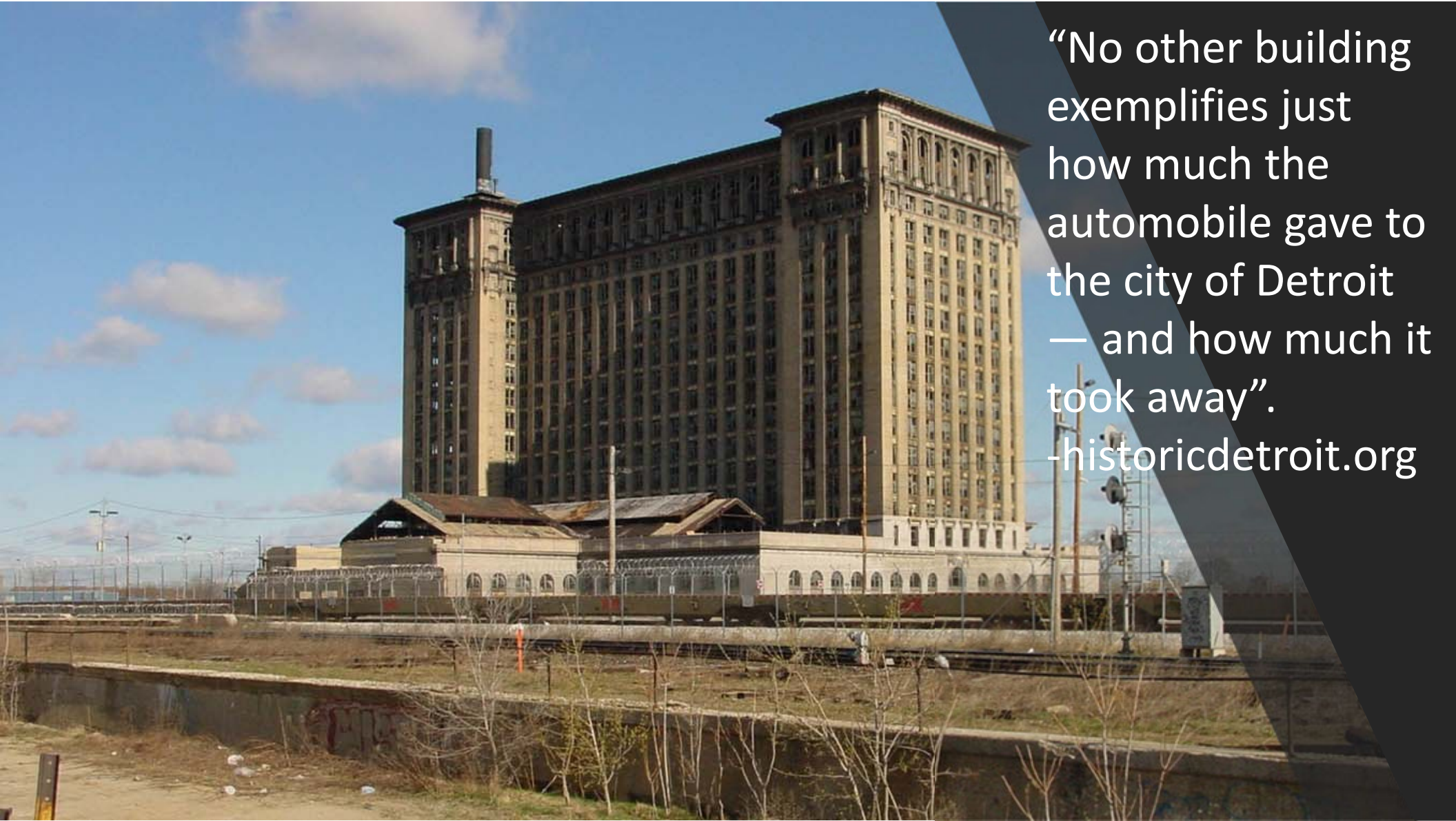
Michigan Central Station

Michigan Central Train Depot 1920s Rendering



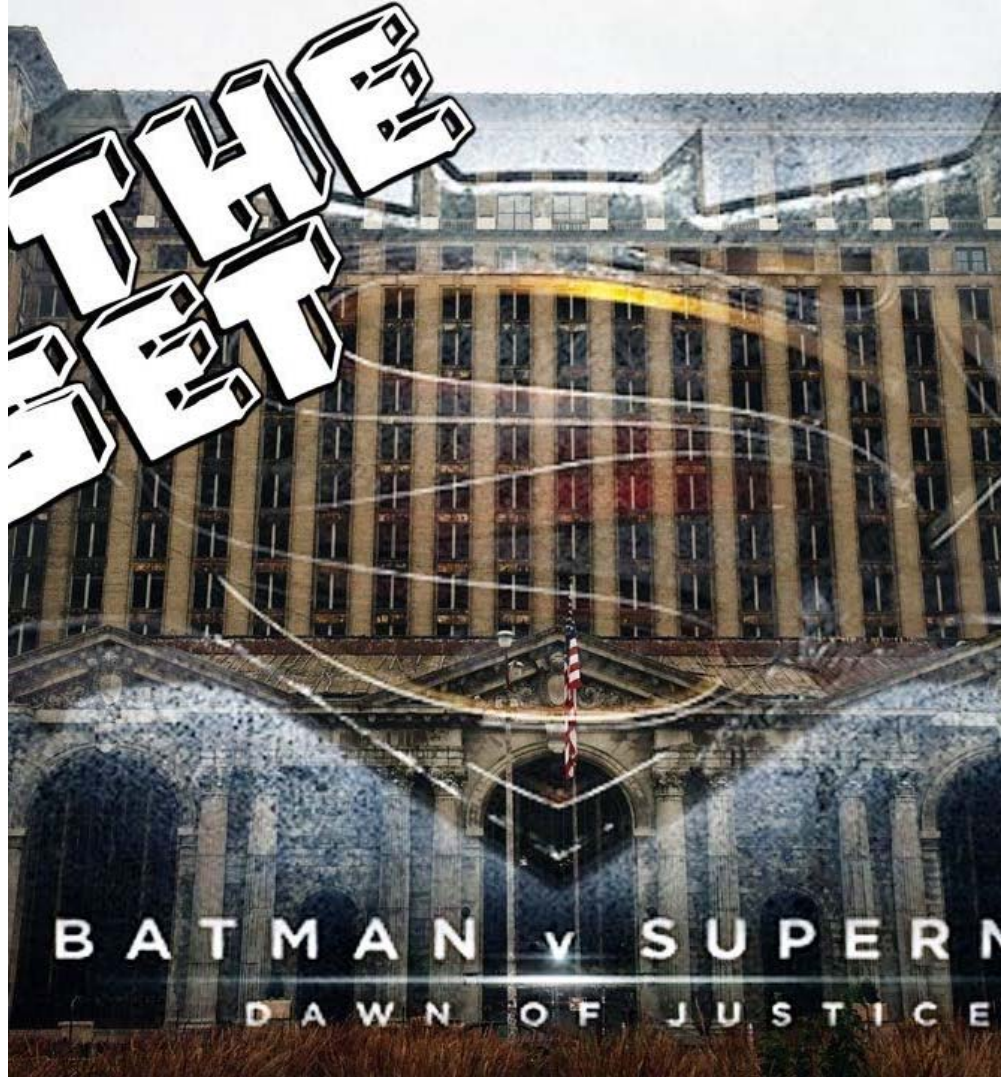
Quick Facts

- Inter Rail Depot: 1914-1988
- 230 feet
 - The tallest train station in the world at the time
- Owned by New York Central System
 - NY Central Station Architects



“No other building exemplifies just how much the automobile gave to the city of Detroit — and how much it took away”.
-historicdetroit.org





Forced Disruption



Automobiles

Rise of Passenger Airfare

Detroit's Population Decline



#Fordetroit

- Community engagement
- Pivot point/adaptation
- Re-envisioning
Ford as a mobility company

"What the Rouge was in the Industrial Age, Corktown will be to Ford in the Information Age"
-Bill Ford Jr.



Live polling
To join, text once:

JosephGacioc467
to 22333



Do you agree with Ford's decision to pivot resources toward technology and mobility?

Strongly agree - you can't trust millenials and those next gens - start planning!

A

Agree - Bold move, a feel good story, but it's never fun to be the first.

B

On the fence - eeek!!!

C

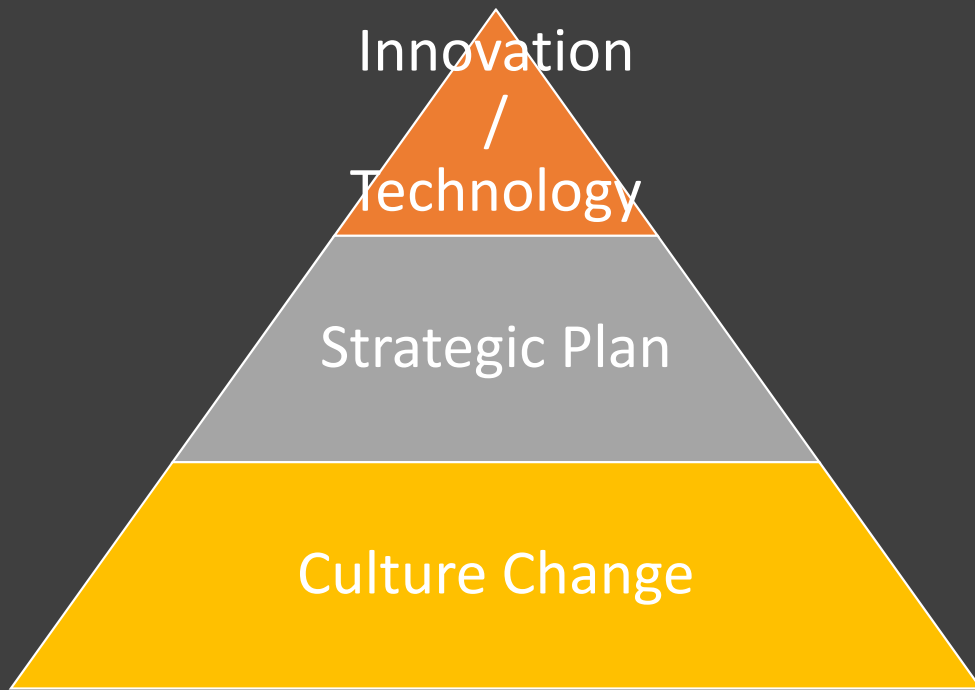
Disagree - Risky business, isolating customers and your workforce, sounds like a waste of time and money

D

Big Mistake - you're Ford Motor Company -stick with cars!

E

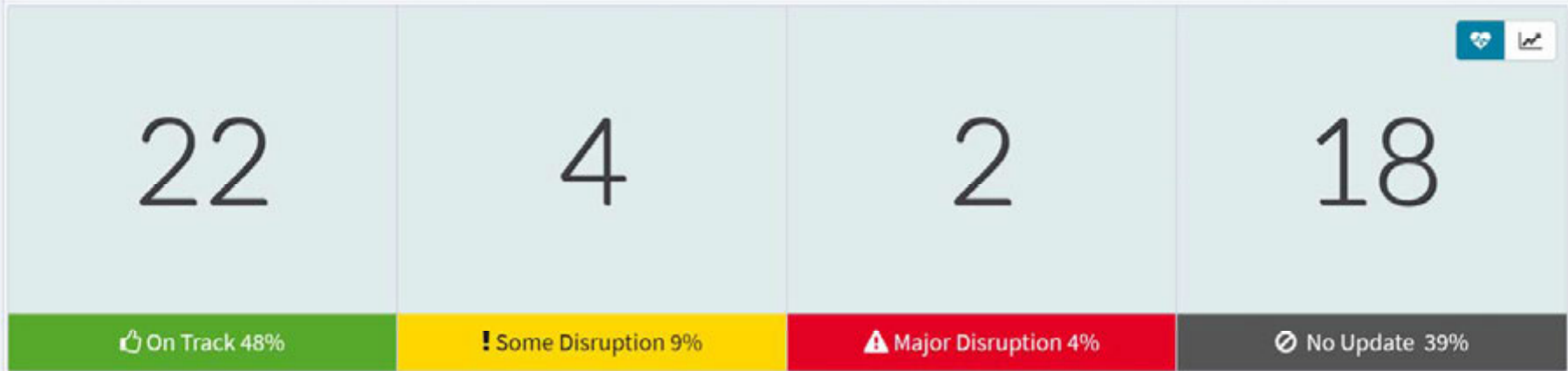
Who I Am
Chief Innovation Officer
Assistant City Executive
2012 - 2018



🔔 **Announcement** New Activity Stream launched! [Click here to learn more...](#)

📌 Action Report ▾

Employee: Joseph Gacioch 🖨️ 🔍



Action 1.6.1



OUR COMMUNITY VISION

Ferndale Community: The benchmark for a modern community that embraces the richness of diversity and brings inclusive hospitality to life.

OUR ORGANIZATIONAL MISSION

City: We are Stewards of progress, anticipating needs
Engaged with our community, serving with excellence.

The Focus

Smart Cities Overview

- Introduction to Smart Places
- County Show Ponies

IoT

- Internet of Things
- 5G & Small Cells
- Ferndale: SMART Planning

Blockchain Technology

- Introduction to the Blockchain
- Crypto Currency

What does it all mean?

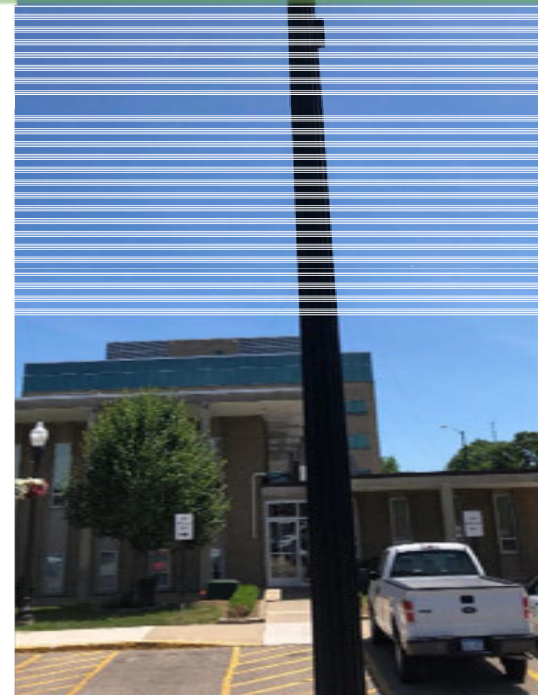
- Setting the Tone
- Smart Planning
- Resources



Smart Places & the things that make them smart



Dumb: “Not having the capability to process data” – Miriam Webster Dictionary



Common Area: Lighting

Dumb Lighting



No outage reporting, low light/high crime areas, energy costs/inefficiencies, municipal billing inaccuracies

Smart Lighting



Automated reporting, data dashboards, connected light controls, account billing reporting – energy transparency, efficiency

Common Area: Smart Parking

Dumb Parking



No real time data, tampering, inefficient

Smart Parking



Real time information, data dashboards, improved revenues
guided parking space availability, reduced emissions



Burgeoning Area: Traffic Control

Dumb Traffic Control



No real time data, susceptible to driver errors, signal times
Determined by static traffic movement studies

Smart Traffic Control



Automated reporting, data dashboards, connected lights to
street sensors & vehicle tech – troubleshoot driver errors

4 Pillars for Smart Places

SmartRegions.Org

Connectivity/ Engagement

The internet, device connections, data, and information communication are at the heart of Smart Cities. More connected devices equates to more opportunities for G2C engagement.

Sustainability

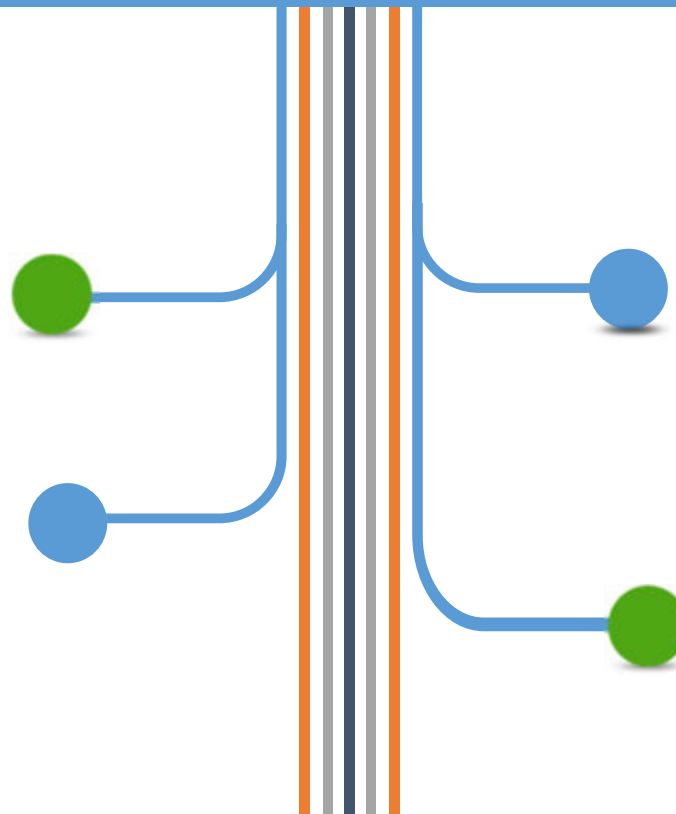
Smart devices improve business processes, efficiencies, and create new opportunities for **urban and rural areas alike.**

Mobility

Ensuring adequate accessible transportation infrastructure is in place to serve all community and business needs. Mobility is beyond Point A – B – it's about access: education, economy, family, community, health centers

Public Safety

Improved response times, better access to data, crime prevention, open data transparency and initiatives and increased open dialogue on privacy policy with more devices in public areas.



Welcome to
Jack's Smart
City

Can you guess
who sponsored
this video?

NACo Smart
County
Featured
Show Ponies

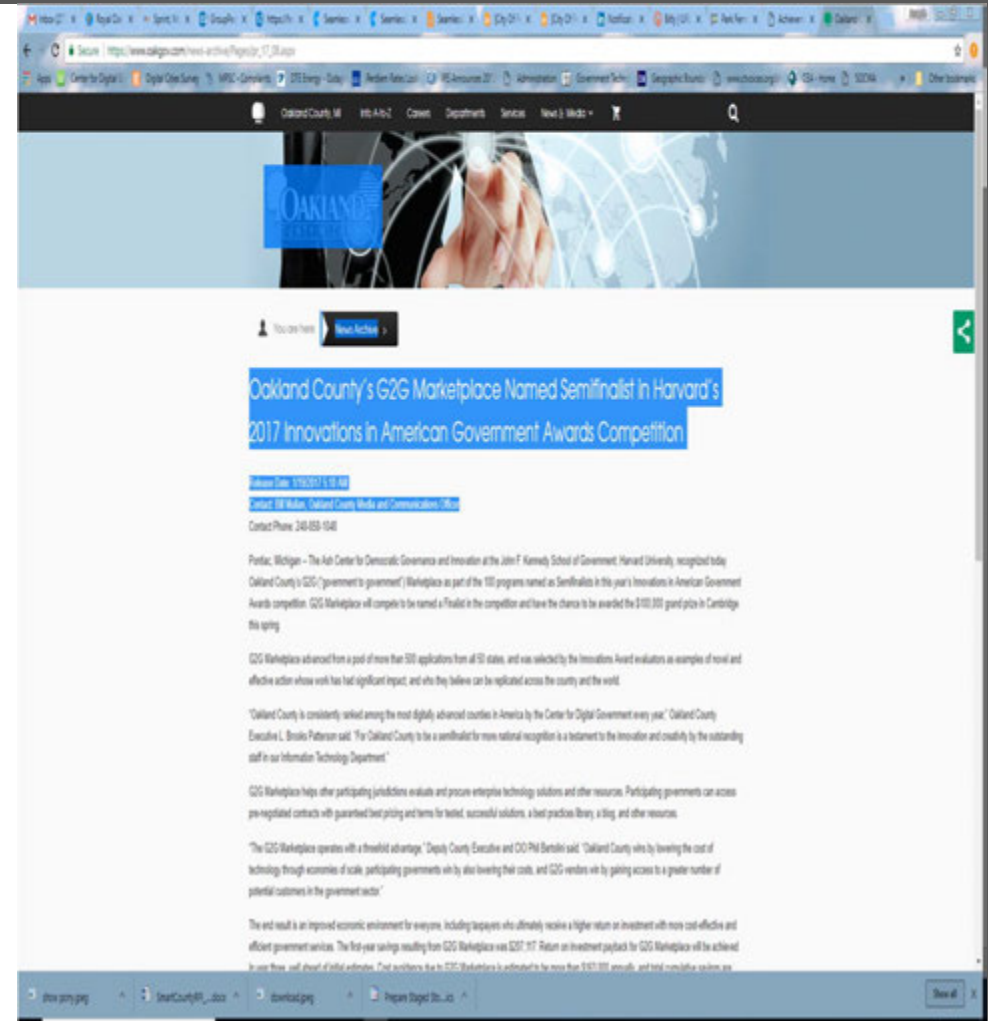


Oakland County, MI

- G2G Marketplace
- Tier 1 Objectives: Provide Software as a Service (SaaS)
 - Access to pre-negotiated contracts
 - Best Practices
 - Scaled Pricing

“The G2G Marketplace operates with a threefold advantage. Oakland County wins by lowering the cost of technology through economies of scale, participating governments win by also lowering their costs, and G2G vendors win by gaining access to a greater number of potential customers in the government sector.”

County CIO – Phil Bertolini



Kansas City, MO / Platte County

- RFP for Smart Partner –Mobility | public safety | quality of life
- Smart Transit line (10 miles)
 - 1,800 Wi-Fi access points
 - 900 traffic sensors
 - 90 information kiosks
- 10-30 year Smart Plan Development
- Smart water-metering/stormwater
- Public health alerts
- Gunshot detection

“Residents and visitors are using the Wi-Fi often enough that data on where and when they travel through the district can be tracked. Bennett referred to one street corner a large number of people walked by in the morning. Realizing there were no restaurants in the area, he informed the city's economic development council — which secured bids for a new restaurant”. *Bob Bennet – CINO, Kansas City, MO*

The screenshot shows a news article from a website. The main headline is "Kansas City, Mo., Issues RFP for Smart City Partner". Below the headline is a sub-headline: "The request for proposal aims to land the city a private-sector partner to help it become the 'smartest city in North America.'" The article is dated "BY SHIP DESCANT / JUNE 8, 2018". There is a large photograph of a city street with modern buildings. To the right of the article are two advertisements. The top one is for "Online Certificate in Cybersecurity and Information Privacy Compliance from Drexel University" by Thomas R. Kline. The bottom one is for "Big Data or Big Hype?" by public domain.

AUTOMATION

Kansas City, Mo., Issues RFP for Smart City Partner

The request for proposal aims to land the city a private-sector partner to help it become the "smartest city in North America."

BY SHIP DESCANT / JUNE 8, 2018

Those 54 smart city blocks in Kansas City, Mo., could grow to several hundred in five to 10 years, bringing connected technologies and linking parking meters, transit stops, intersections and more.

ADVERTISMENT

Online Certificate in Cybersecurity and Information Privacy Compliance from Drexel University

THOMAS R. KLINE
Drexel University

ADVERTISMENT

Big Data or Big Hype?

public domain

Smart Rural Places

Can you guess
who sponsored
this video?



Resources

- NTCA:
<https://www.ntca.org/>
- Foundation for Rural Services (FRS) -
<https://www.frs.org/>
- 2018 County Grant Winners:
 - Hocking County, Ohio
 - Brown County, Illinois
 - Allegany County, New York

Smart Rural
County
Featured
Show Ponies

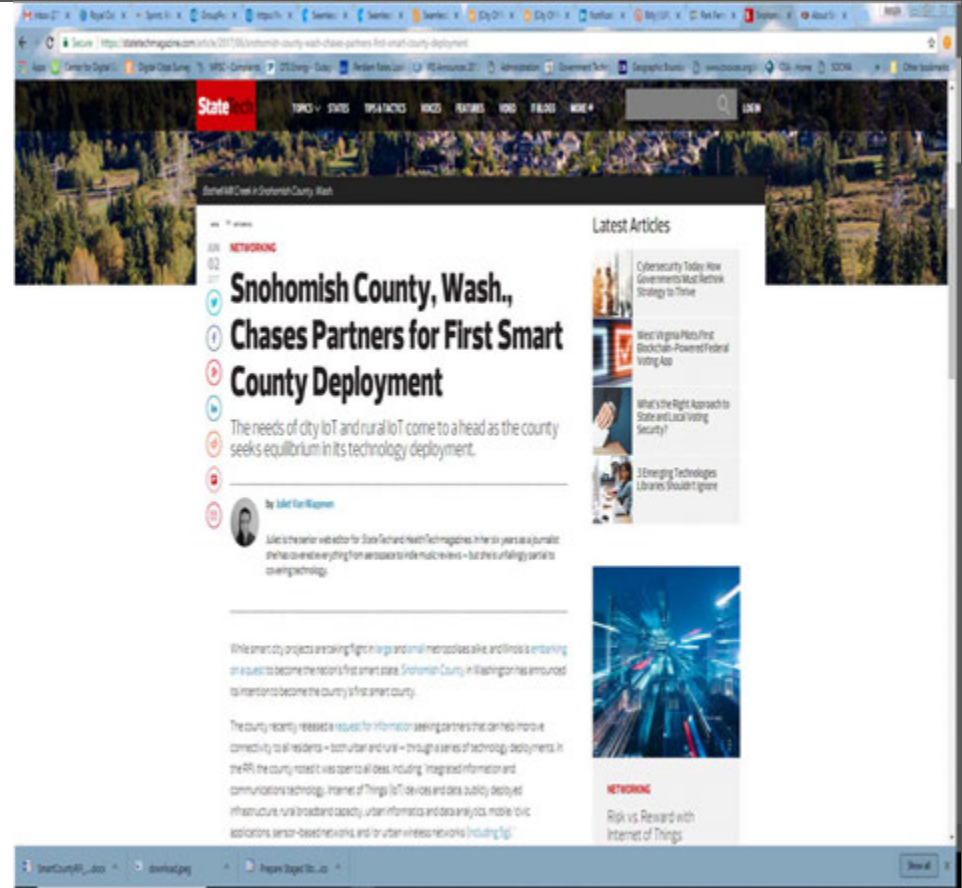


Snohomish County, Wa

- 5/2017: Released RFI – Smart County Development
- Tier 1 Objectives: Become nations 1st Smart County!
 - Broadband/wireless: rural and urban areas
 - Leverage roadways
 - IoT in traffic signals, signs

"If you start thinking about the things that we see coming on the horizon five to ten years out, like self-driving cars, and those things that come with it, we think about the road infrastructure that's needed for that"

-County CIO – Trevor Esko



Goodhue County/ Red Wing, MN

- 46,000 population – state banner for gigabit fiber!
- Objectives:
 - Workforce development,
 - Tech youth skills training @ 7 school districts
 - Economic Development
 - 36 startups recruited
 - Angel investment fund for startups established county wide
 - Public Health
 - Wells and Septic Tank Tracking using GIS/GPS – info shared across agencies

March 15, 2018

Red Wing Ignite to lead state

News Contributor

Red Wing Ignite kicked off a new chapter in its five-year history by branding a new outreach effort called "Ignite Minnesota" on Feb. 27.

After recently being named a Smart Gigabit Community by US Ignite, and becoming the first rural community to join this international network, Red Wing Ignite has spun that energy into the Ignite Minnesota effort.

[Click Here to read the full article](#)

🗨 Comment ❤️ 0 Likes ➦ Share

January 31, 2018

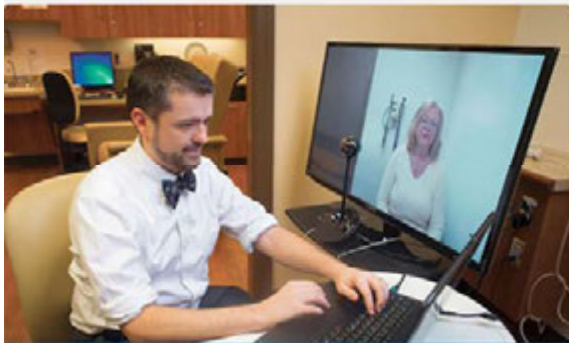
February 01, 2018

Grant to add 19 new Alabama telehealth locations

Written by Holly Gainer



Print | Email



Many patients who live in rural areas will not have to travel as far to see their doctors thanks to a new grant from the U.S. Department of Agriculture. The federal agency granted the University of Alabama at Birmingham \$495,877 to grow its telehealth network.

Access to health care is limited in many of the state's rural counties. Death rates from cardiovascular and oncologic illnesses, and diabetes are significantly higher for rural



UAE

EDIC

Tw

UAE

@U

UAB Telemedicine

- 2015: UAB begins with 4 Counties
- 2018: 30 Counties!

2018 Funding:
\$500,000 in USDA Grants

“Wallace, a UAB School of Medicine nephrologist, was the first U.S. physician to use telehealth to replace a comprehensive face-to-face visit for home dialysis patients. He uses a high-definition camera and a Bluetooth-enabled stethoscope to examine a patient on dialysis”



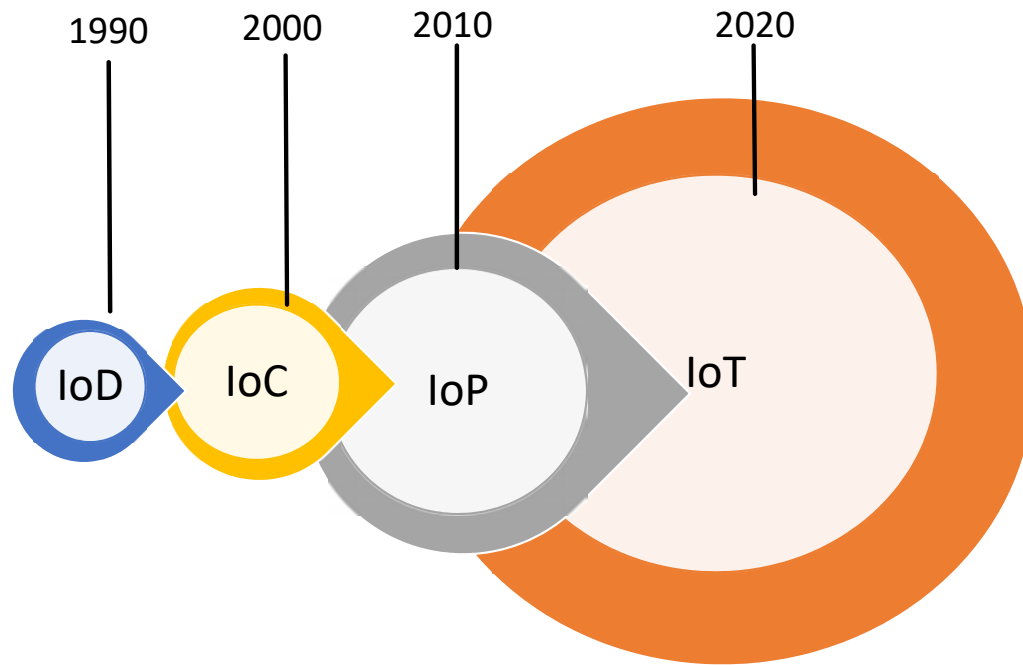
Resources

USDA Rural Development Grant

- Boring YouTube Orientation Video
 - <https://www.youtube.com/watch?v=pupjyYON6E&feature=youtu.be>
- Application Information Website:
 - <https://www.rd.usda.gov/programs-services/distance-learning-telemedicine-grants>



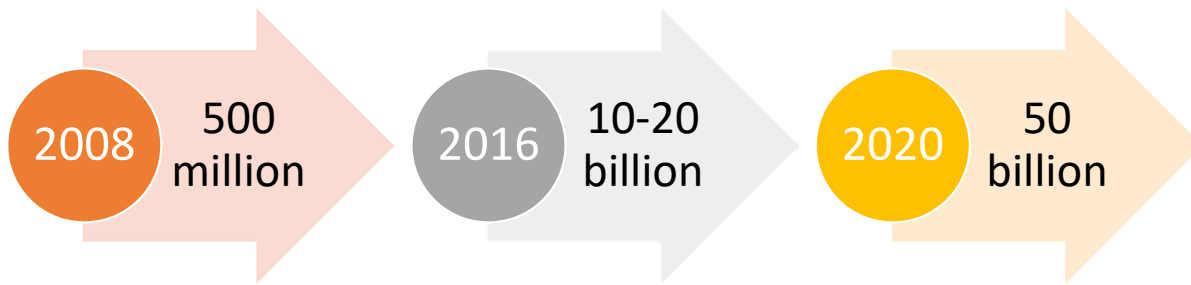
- 70% of wide-area IoT devices will use cellular technology in 2022
- In 2018, mobile phones are expected to be surpassed in numbers by IoT devices



- Documents
- Commerce
- People
- Things

Evolution of Connection

Connected Devices World Wide



Regional and organizational competitive advantage will be dependent upon:

- How they manage data unleashed by IoT objects.

In some form, every organization will have to become data-centric in its approach and outlook.

“The New Age of Data Will Transform the Way We Work, Live, and Communicate.”

- Dr. Shawn DuBravac,
Author of the Digital
Destiny

Ford Mobility Group

Scaling to market through aggressive acquisitions

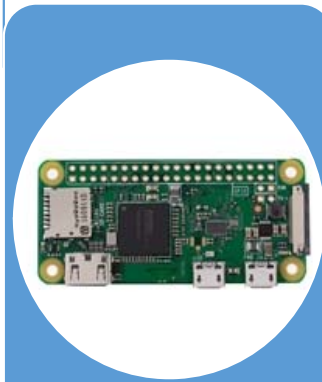
Chariot • Transit • Ride Sharing (Ferndale in September, 2018) • Trans Loc • Big Data/AI based analytics • Ford can help cities/transit operators predict transit costs, usability • Autonomic – Cloud based Operating System

The image is a collage of three distinct visual elements. On the left, a screenshot of the TransLōc website shows a white background with the company logo and a call to action to download a whitepaper. In the center, a dark blue mobile application interface displays a 'How to Ride' section with three numbered steps: '1. Download', '2. Book', and '3. Ride'. On the right, an aerial view of a city street is overlaid with a network of white lines and nodes, with a central cloud icon containing the letters 'tmc'. A text box is overlaid on this image.

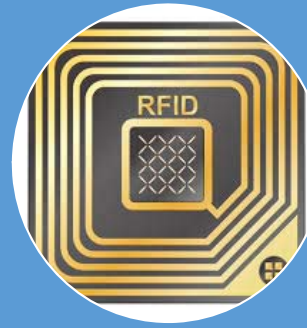
The first open cloud-based platform that connects and empowers tomorrow's mobility systems

Dumb things: add these components

(Fridges, thermostats, watches, coffee makers, trash cans, compactors)



Micro
Computer



Sensors /
Actuators



Internet
Connection



Digital
Identity (IP
Address,
device
name, etc.)



Smart Device Cocktail

Group
Exercise:

Let's talk
trash

Downtown Waste Improvement Project

PROBLEM AREAS

- Illegal dumping (businesses/residents)
- Can overflows
- Vermin sightings
- Downtown cleanliness
- Recycling treated like trash – waste stream use unknown
- Capital budget – reactive not proactive
- No performance metrics – not outcome oriented



Describe how
Smart Tech can
solve Ferndale's
waste problems –
5 minutes

Work with your groups at your
tables

Identify as many ways as
possible that smart solutions
can solve my problem.

In what ways might I explore
using a smart device besides
waste collection?

Example Solution

Measurable Sustainability

Total Waste Containment

- Compacted units – higher efficiencies

Cloud connected waste management

- Communicate real time fill status
- Vermin or movement detection alerts
- Illegal dumping/unusual volume alerts



IoT Conclusion

Surge Causes

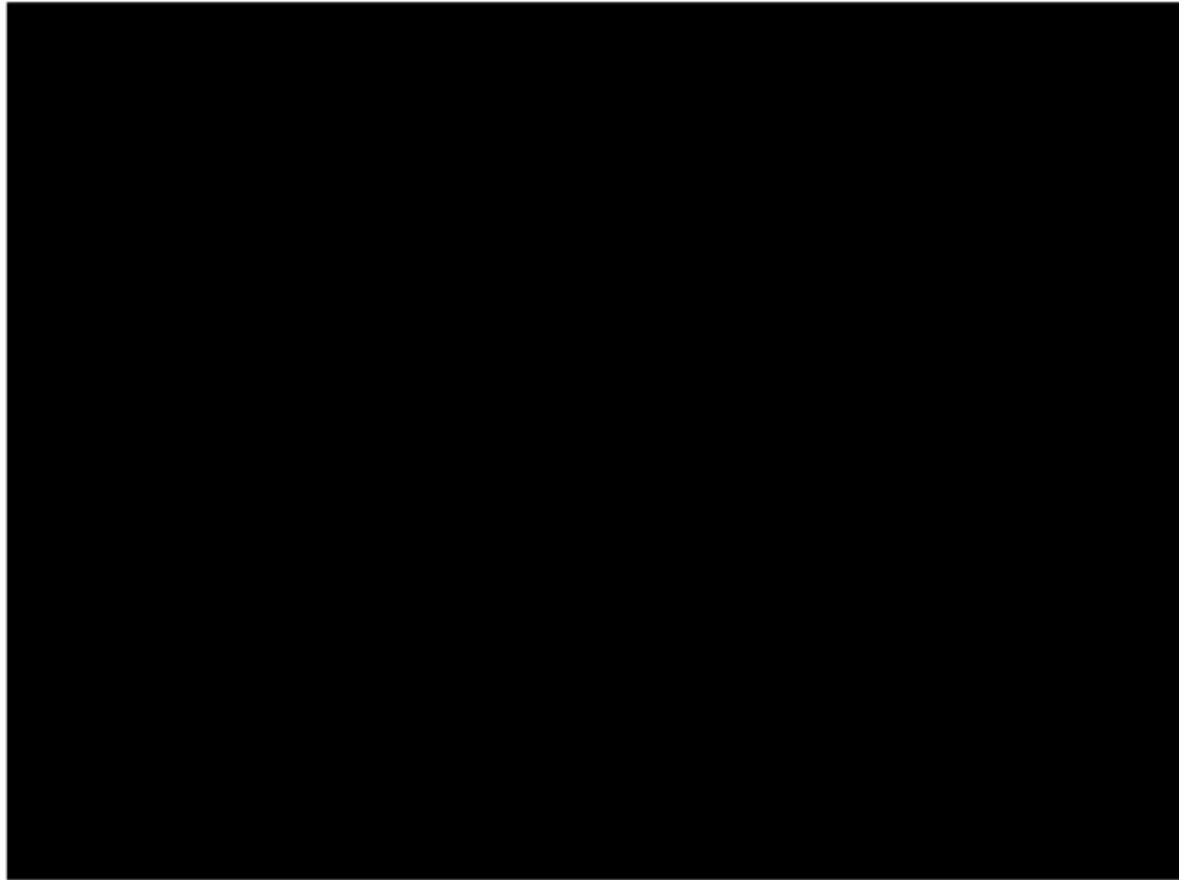
- Price of sensors have dropped 50% over past decade – Goldman Sachs
- Processing costs have dropped 60% - spurring widespread adoption of mobile technology

Near – Term Predictions

- Freight companies – assisted driving/automated driving – communicating smart routes
- Utilities: more properties, construction industry, and utilities join on a smart grid
- Property: private and public property maintenance can move from corrective to preventative with the use of intelligent sensors.

PyeongChang
2018 Winter Olympics

Intel & S. Korea
show the world 5G
capability



Wireless Technology Generations (G)

1G – Analog Cellular –

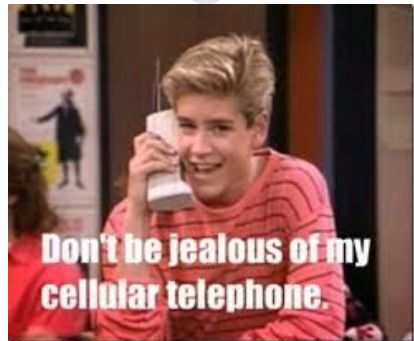
2G – Digital Cellular,

4G/LTE – 500 mbps – 1gb

5G – gigabit speeds, lower latency

3G – improves wireless speeds up to 200 kbps – iPhone 2 released CDMA, GSM

**IoT devices
Automated Driving
Connected World**



5G relies upon small cell site communications

Quick Facts:

Sites typically located – 500 feet apart

Typical locations: utility poles, traffic lights, bus shelters, train stations, public infrastructure

	Latency	Self-driving vehicles
4G / LTE	53.1 milliseconds	☹️
5G	1 millisecond	😊

5G Cell Service Is Coming. Who Decides Where It Goes?



A concept design, left, and two other designs showing how streetlights and utility poles can be modified with equipment, often accompanied by a container on the ground that can be disguised as a mailbox, to deliver 5G cellular signals.

From left: Crown Castle International; Scientists for Wired Technology; City of Lincoln, Neb.

By Allan Holmes

March 2, 2018



WASHINGTON — The future of cellular service is coming to a neighborhood near you.

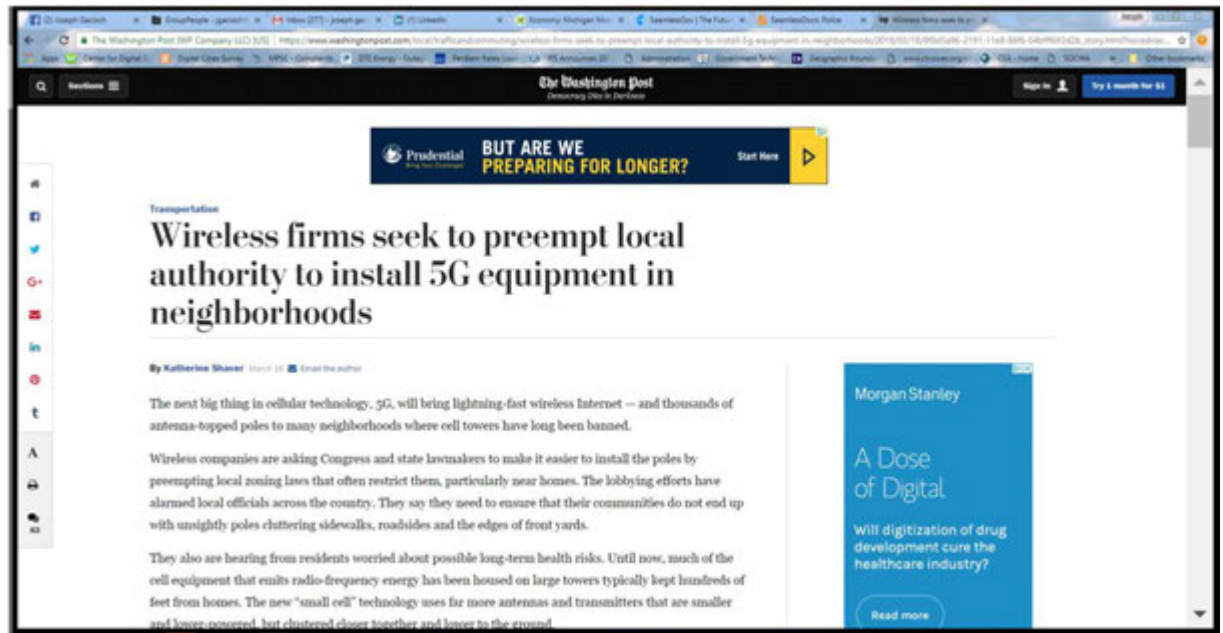
But who gets to decide when, where and how it gets delivered is still a heated fight.

The new technology, known as 5G, delivers wireless internet at far faster speeds than existing cellular connections. But it also requires different hardware to deliver the signals.

Instead of relying on large towers placed far apart, the new signals will come from smaller equipment placed an average of 500 feet apart in neighborhoods and business districts. Much of the equipment will be on streetlights or utility poles, often accompanied by containers the size of

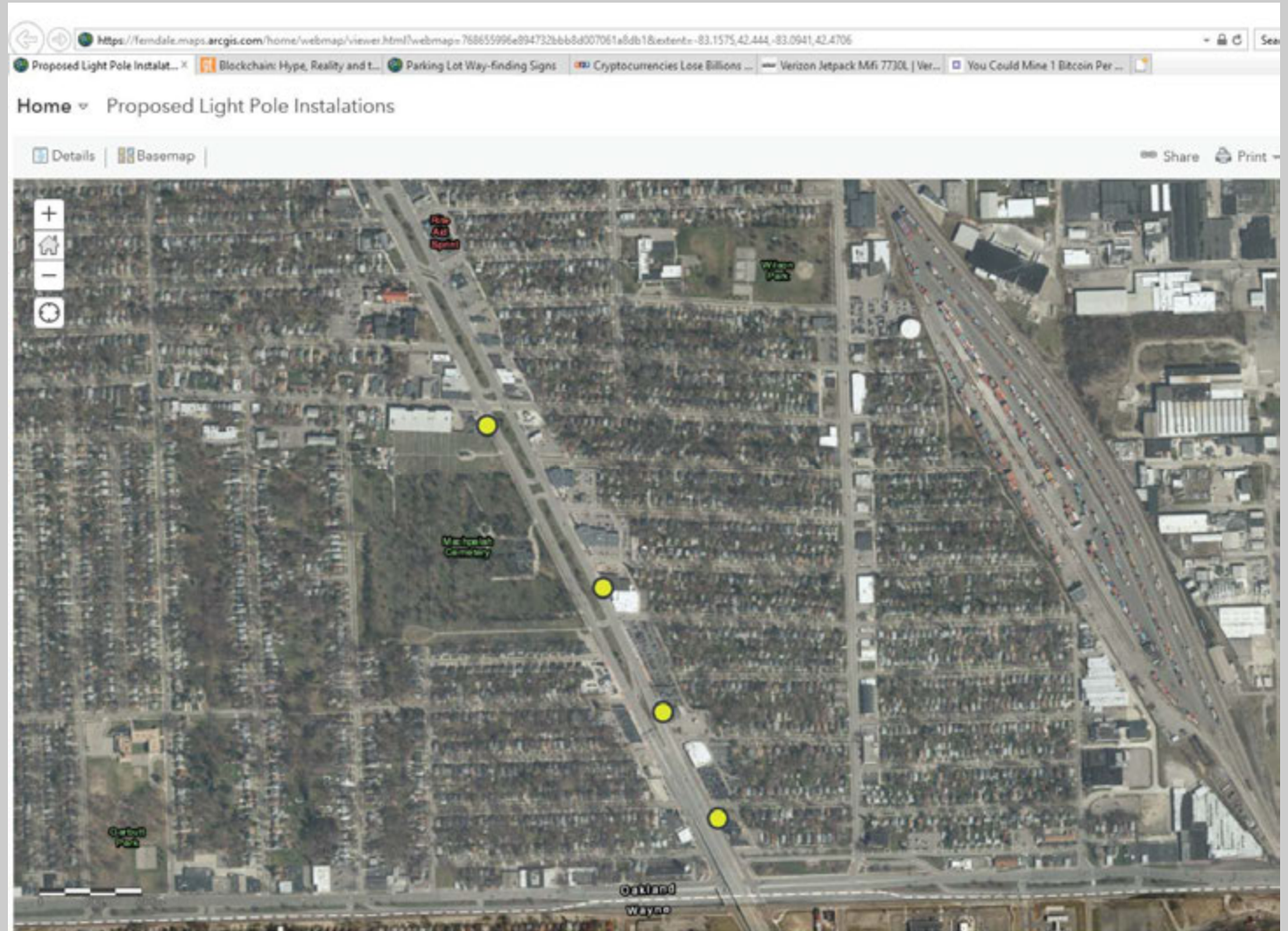
Constituents' Voices

- Health Concerns
- Zoning Preemption
- Visual Pollution
- Fee Exemption



2018: 1st Agreement with AT&T

- 4 pole locations
- City owned light poles
- \$1,000 per year/pole



5G Cell Site Summary

Major American Market Players

- Mobilitie
- AT&T / Cingular Wireless / Bell Companies
- Verizon Communications – Plans to launch 5G to 30 million American households in 2019-20.
- Qualcomm
- Cisco

Group
Discussion:

Concerns
with 5G?

How would you rank your biggest concerns around 5G and IoT technology?

Rapidity of change, it's difficult to keep up! **A**

Privacy? **B**

Preemption of local control **C**

Liability? - What happens when technology fails - who is at fault? **D**

Unknown concerns, this technology will not impact our community **E**

Plan Smart

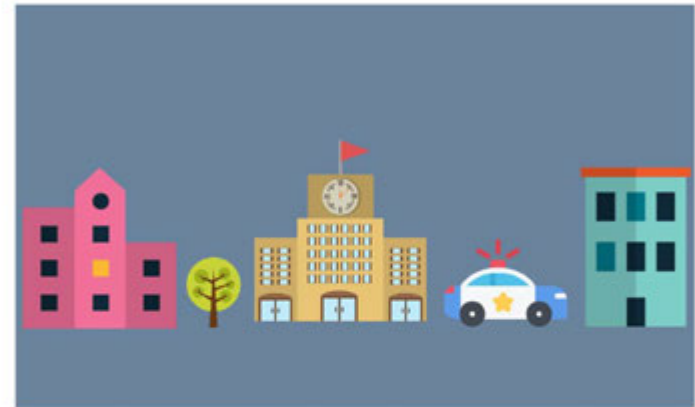
Sensor?

Measure?

Analysis?

Relevant?

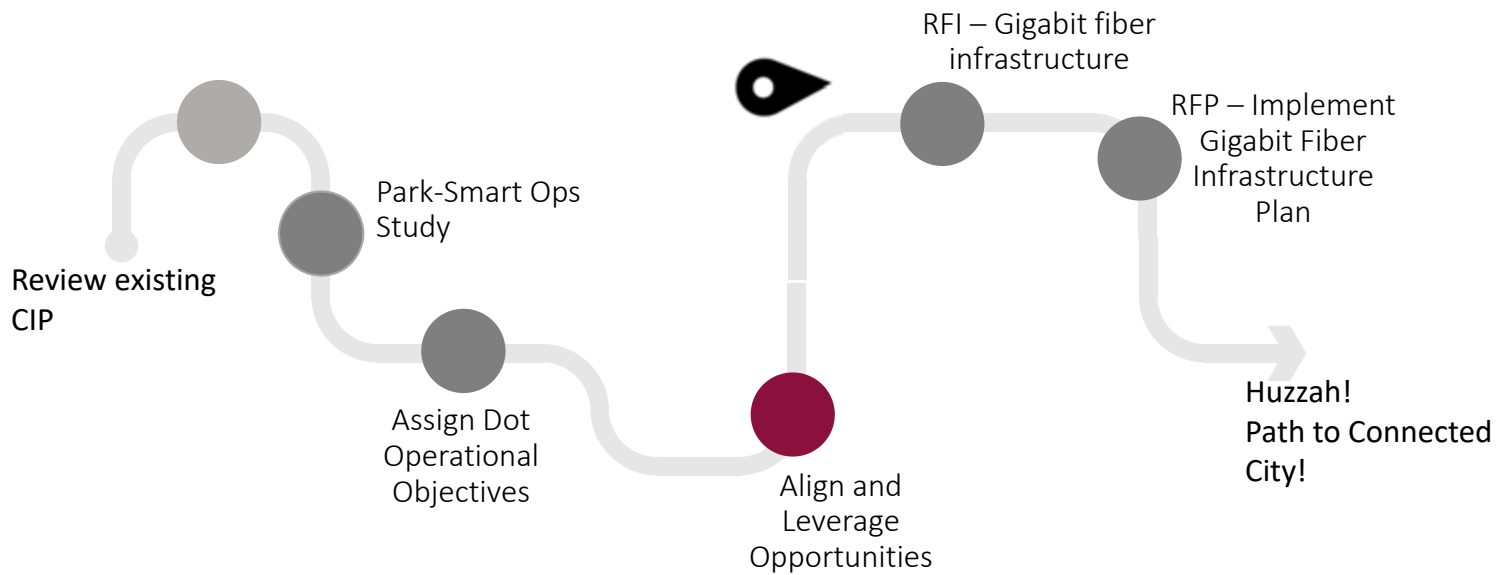
Time



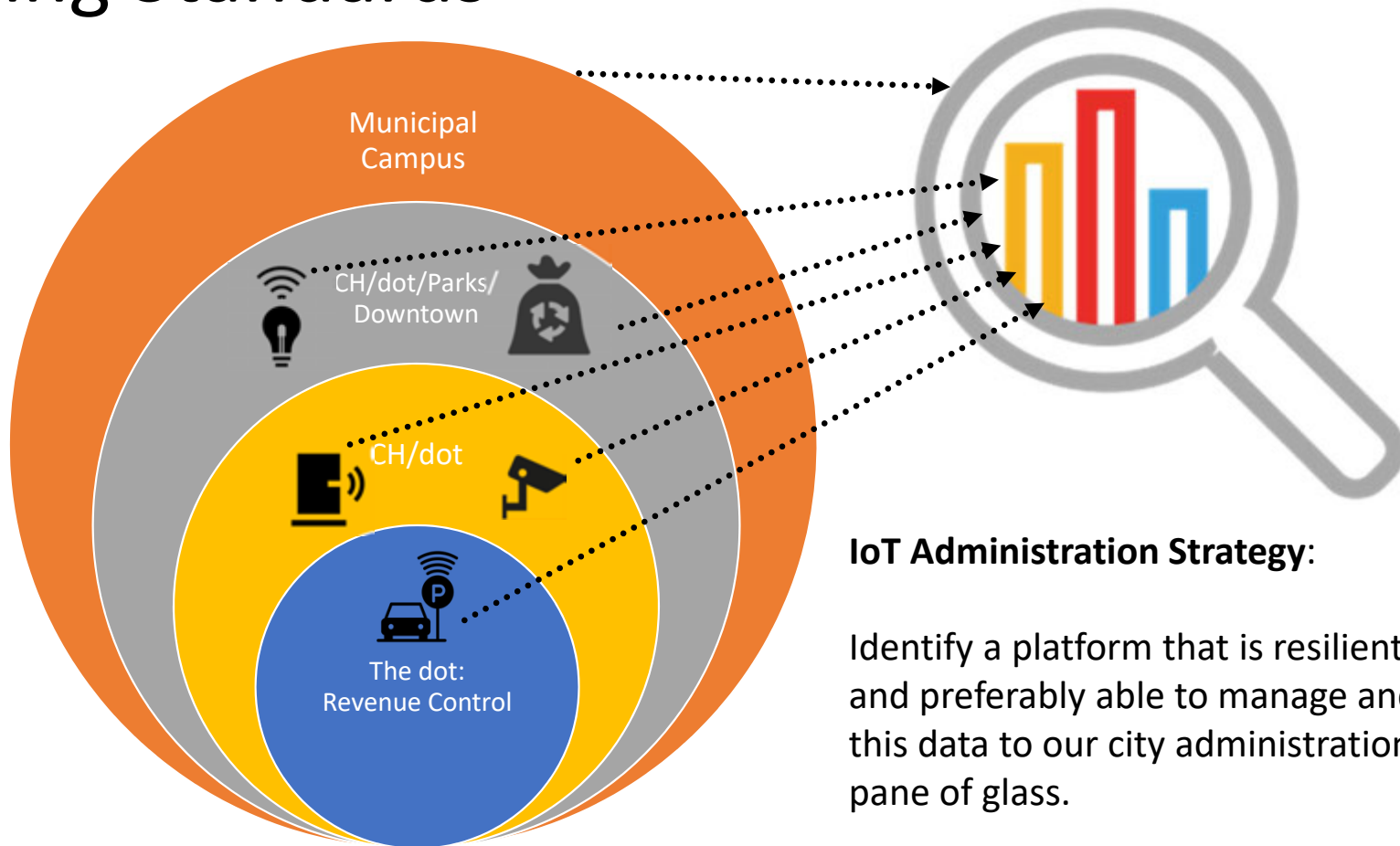
CAPITAL IMPROVEMENT PLAN

CITY OF FERNDALE
FISCAL YEARS
2017–2021

Ferndale Downtown Development (The dot) Catalyzes Smart Cities Roadmap



Aligning Standards



IoT Administration Strategy:

Identify a platform that is resilient, accessible, and preferably able to manage and deliver this data to our city administration as a single pane of glass.



Ethereum



Bit Coin



Maya



Block Chain

Blockchain Technology

& Maya

What feelings or words come to mind when you hear Blockchain or Bitcoin?



Blockchain - what is it?

In the Know:

1. Decentralized Ledger

- Peer to Peer transfer of assets
- Immutable public Record of transaction

2 Blockchain Categories

1

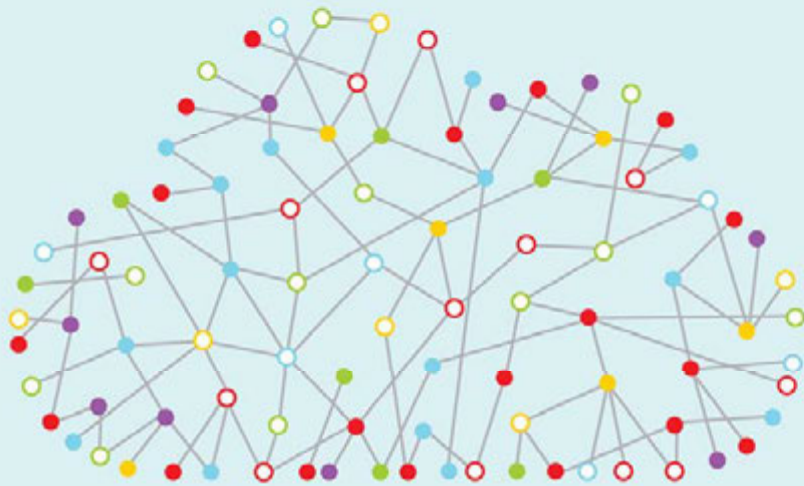
Permission Blockchains

- Read/write permissions controlled on the blockchain.
- Examples:
 - Microsoft, Ripple, Bank of America, Intel are all exploring Ethereum Blockchain

2

Public Blockchains

- Decentralized and open, anyone can join, read/write data as long as they follow protocol.
- Bitcoin is the most prominent example of a public blockchain.



Blockchain Potential

Information Security

Remove Intermediaries

Records Redundancy / High Availability

Democratization of Information

Permission Blockchain

Enterprise Ethereum Alliance
(EEA)

Microsoft

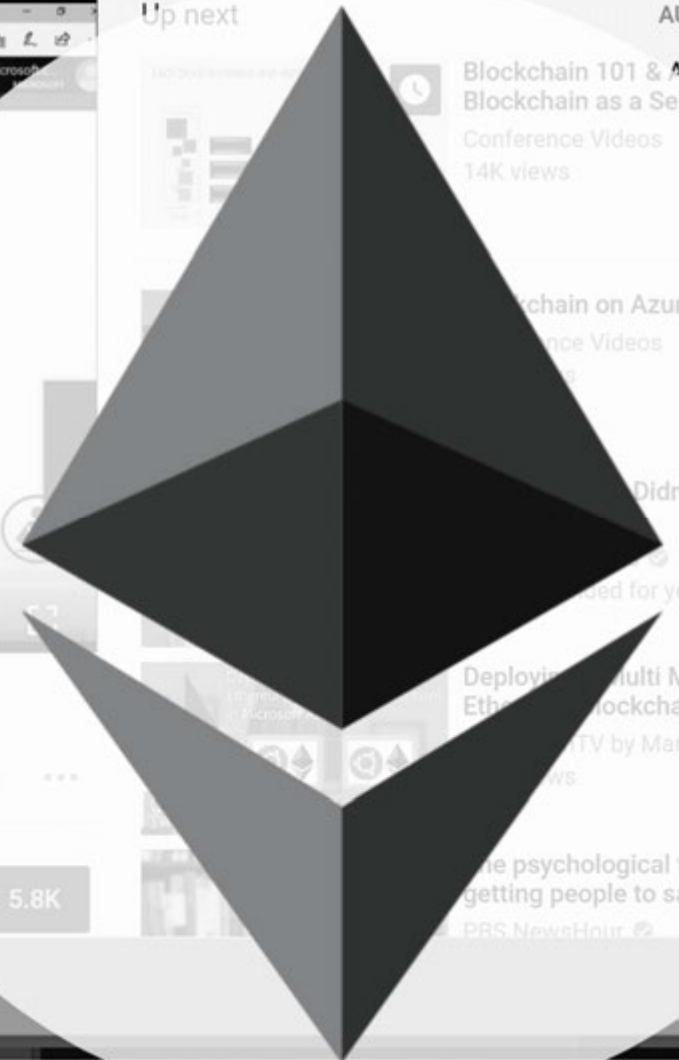
Intel

JP Morgan & Chase

Thomas Reuters

Objectives:

Connect Fortune 500s, academics,
and leading tech with Ethereum
experts to learn from and develop
the Microsoft Smart Contract
blockchain.



Cook County Land Records Project:

2000 properties recorded as digital abstracts using Blockchain – presented on websites

Results/Early Feedback

- Property information available
- Property conveyance could be tracked using cryptography
- Property scammers targeted/stunted
- Complicated - Costly to scale statewide

If scaled- title insurance could potentially be eliminated – saving millions for tax payers

Blockchain Initiative

State Pollution Control Board

4 State Departments

Cook County Recorder of Deeds

Velox.RE

Ragnar Lifthrasir –
founder of Velox.RE and
IBREA: International Blockchain
Real Estate Association

- #Proptech
- Blockchain Real estate
Consultant – Chicago
- Permissionless title
conveyance

Federal Government

- Smart Contracts
- Anti-money laundering/Terrorism
- Supply chain modeling

Implication: Do you participate in -

- CDBG, Hud, other pass through funds?
- Federal contracts?

If so – Blockchain is part of your future.

Federal Blockchain

Dept. Experiments

GSA

Secretary
of State

Treasury



Early Challenges

A Developing Technology:

- Public blockchain is still inefficient at processing transactions between peers.
- Private Blockchains require intermediaries, are beating public to market



6/6/18 – 7/1/18

Observations:

- No regulation means no solid direction / trust barriers
- Highly volatile value: Bitcoin value dropped 25% in one day and stabilized after.
- Unclear on other coin investments, only a handful were known to me through research.



BitCoin –
My personal experiment

Process

Reddit – Digital
Currency
Exchange

CoinBase
Digital Currency
Exchange

\$25 – BitCoin
Investment

GDAX for
Trades

How would you describe your organization's interest in the blockchain?

We are actively planning - more videos and electronic music - let's dance with Ragnar!

We are seeking to understand the Blockchain and Cryptocurrency- good information to have

Blockchain makes me feel like Maya learning how to eat - slow and messy, but we'll get there

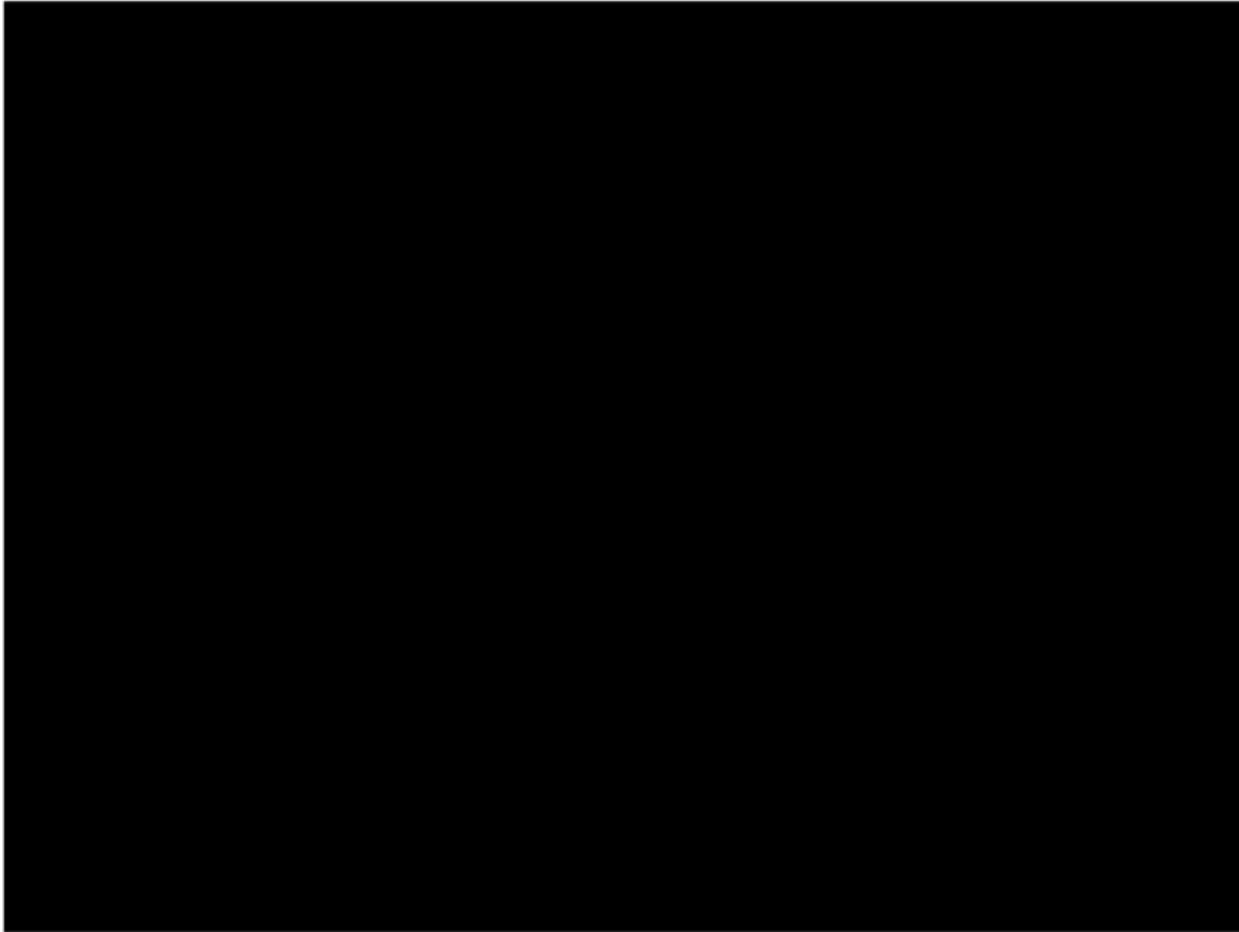
Cash and coin - no digital currency for me, thank you very much.



New Kids on the Blockchain

Group
Discussion:

West Hollywood #Wehosmartcity



Smart Places Strategic Plan

- Sustainability
- Mobility
- Access to government
- Resiliency
- Transparency

Resources & Funding Opportunities

Federal

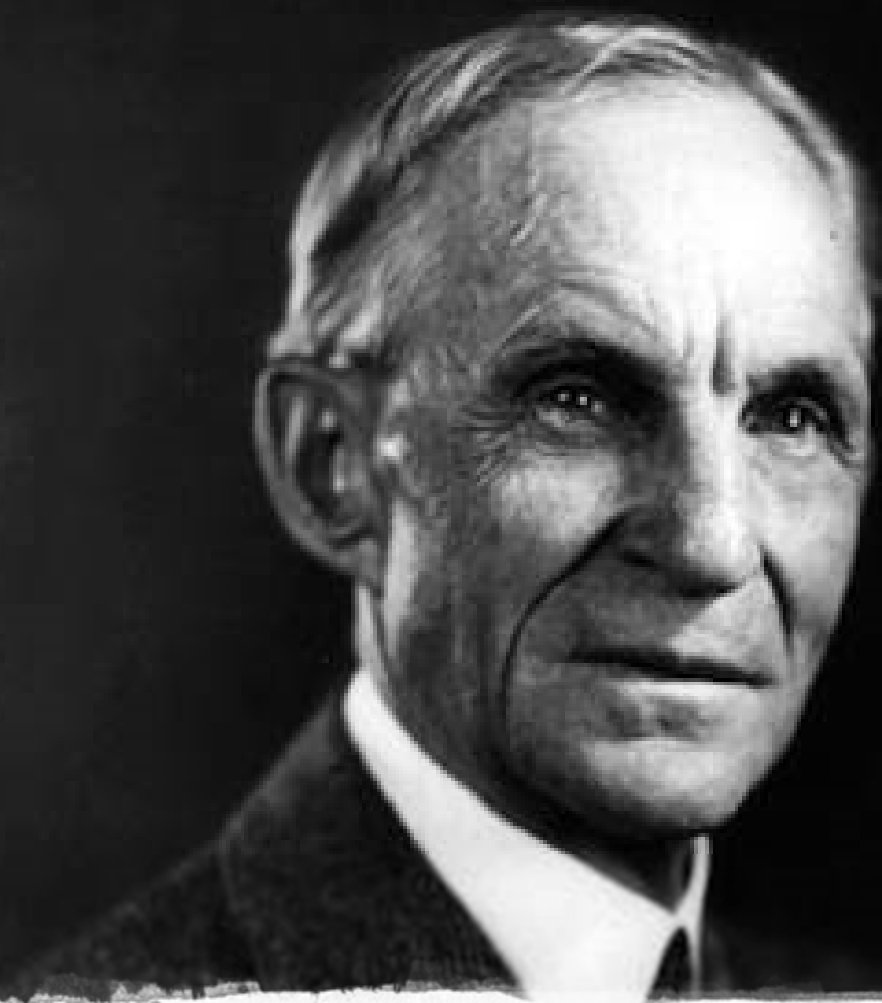
- Networking & Information Tech R&D Program: <https://www.nitrd.gov/apps/smartcity/index.aspx>
- General Services Administration: <https://www.gsa.gov/technology/government-it-initiatives/emerging-citizen-technology/blockchain>

Associations

- Smart Cities Council: <https://www.nitrd.gov/apps/smartcity/index.aspx>
- Rural Broadband Association: <https://www.ntca.org/>
- NACo: Resilient Counties Initiative: <http://www.naco.org/resources/signature-projects/resilient-counties-initiative>

Media

- IoT: Sensing the Next Wave, AIG and the NY Times Future Places Report -<https://paidpost.nytimes.com/aig/sensing-the-next-wave.html>
- Blockchain: www.blockgeeks.com – Get an introduction to Blockchain, learn about industry disruptions, register for classes!



**“If I had asked people
what they wanted,
they would have said
faster horses.”**

—Henry Ford

1/2018:

Bill Ford Jr. –Wall St.
Journal

Prior to Ford's
purchase of the
Detroit Train Depot
and Ford's mobility
strategy shift

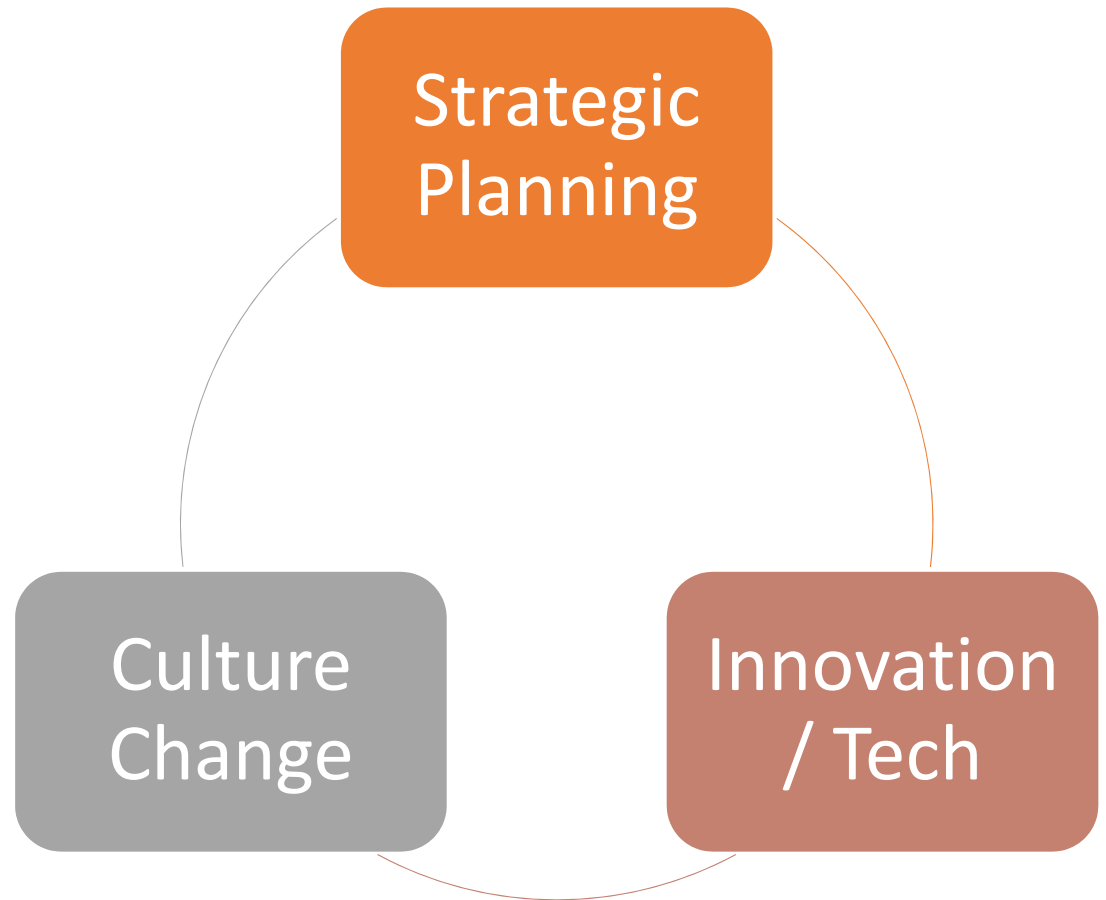


What does this all mean?

Culture Change:
Ford Mobility vs Ford Motor

Planning:
Market research, talent, & acquisitions

Innovation / Tech:
Train Station Mobility Campus, transit, mobility, and IoT tech



Living in an age of Disruption



Better to choose
to disrupt yourself



Than to forcibly
be disrupted

Thank you!

 Joseph Gacioch

 jgacioch@ferndalemi.gov

 @JosephGacioch

