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# Broadband for Economic and Community Development

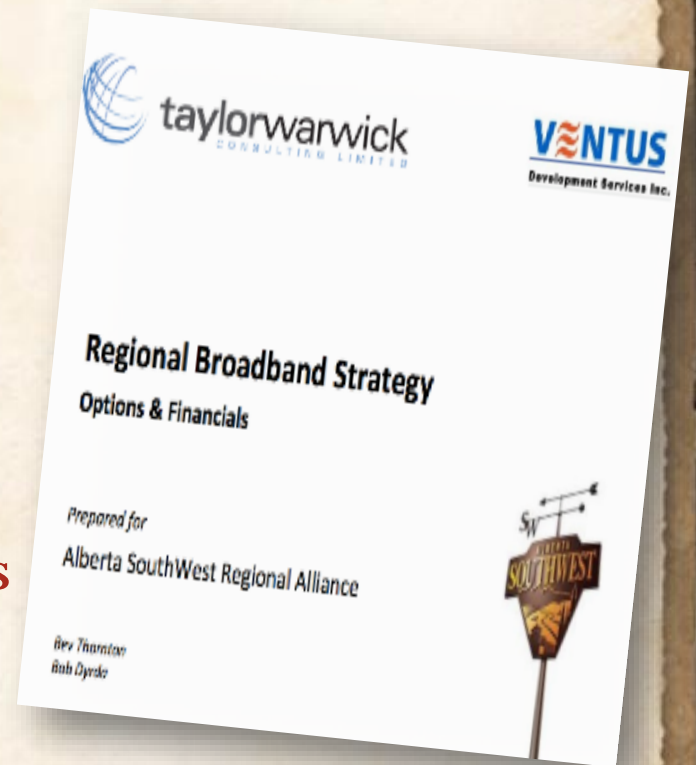
- ✱ What we've done
- ✱ What we've learned
- ✱ Solutions





# Research

- Project Terms of Reference
- Broadband Report commissioned; completed December 2014
  - Establish “current state” ... maps, service levels
  - Envision a “desired state”
  - Identify strategies forward
- Broadband Report results presented to councils and municipal staff at 3 events throughout the region
- Additional support for communities to engage consultant support
- Regional Broadband Committee





## More Research!

- Met with O-NET board
- Met with Cybera, Van Horne Institute
- Fiber to the Home (FTTH) Council membership
- Attended key Conferences
  - Austin Broadband Summit  
April 2015 & April 2016 (upcoming)
  - FTTH Conference - Minneapolis
  - Digital Futures  
March 2015 - Edmonton and  
October 2015 - Olds
- Met with CRTC Commissioner to define issues, message, process and logistics re: submissions
- Invested in telepresence robot!





## Policy Efforts

### Information-sharing ...

- Digital Futures (Edmonton and Olds)
- REDA Managers (EDA Conference)
- Calgary Regional Partnership (Okotoks and Cochrane)
- Palliser Economic Partnership (Medicine Hat)
- Accompany SouthGrow: meet with Service Alberta/Agriculture
- Support SouthGrow: draft resolution to AUMA (supported by 16 REDA communities) that AUMA form a Broadband Committee and work with and through the REDAs to inform and educate and bring this issue to the provincial forefront
- Upcoming submissions to CRTC
  - ✳ important!



More Learning ...

## Meetings with ISPs and WISPs ...

Bell

TELUS®

cci wireless

AXIA

ALBERTA  
SUPERNET

Tough Country  
COMMUNICATIONS  
Serving The Tough Country First

Shaw)



## Figuring it out ...

### Defining Broadband

We feel like “Digital Immigrants” ...

living in a new country learning a new language. *Source: Jay Slempp*

*Bytes, bits, KBs, MBs, GBs ... upload .... download ...*

- CRTC - 5 mbps down 1 mbps up
- U.S. FCC - 25 mbps down 3 mbps up
- Economic Developers - 100 mbps symmetrical
- High speed broadband is considered to be 25 mbps symmetrical, for the moment; power users need more
- The more we have, the more we will use!!



## Current State

### Wireless and Fibre

- Current providers use a combination of copper, coaxial cable and fibre
- The “gold” standard is “glass and light”: optical fibre  
How do we get this to every business and residence?
  - ❖ Determination .... vision, benefit, business case
  - ❖ Installation ..... logistics of underground, overhead or wireless
  - ❖ Regulation ..... CRTC, contracts, development and rights of way
- How wide is the “digital divide” between rural and urban?
- Rural towns and cities will not flourish without connectivity
- There is desire to maintain our WISPs and improve their business situation as opposed to detracting from it



# Business Models

## Achievable Business Models

Source: Magellan Advisors





## Case Studies-Alberta

- **Alberta SuperNet**
  - seen from outside the province as a leading example
- **Olds O-Net**
  - a leading example in Canada/USA
- **Waterton Community Broadband Network**
  - business district connected August 2015; O-Net is ISP
- **Axia FibreNet**
  - Vulcan, Nanton, Nobleford; other towns/villages in AlbertaSW and SouthGrow regions are considering this option
- **Overall ... Canada is lagging in gigabit communities...**





## Looking South ...



### U.S. has 163 gigabit communities ... what did they leverage?

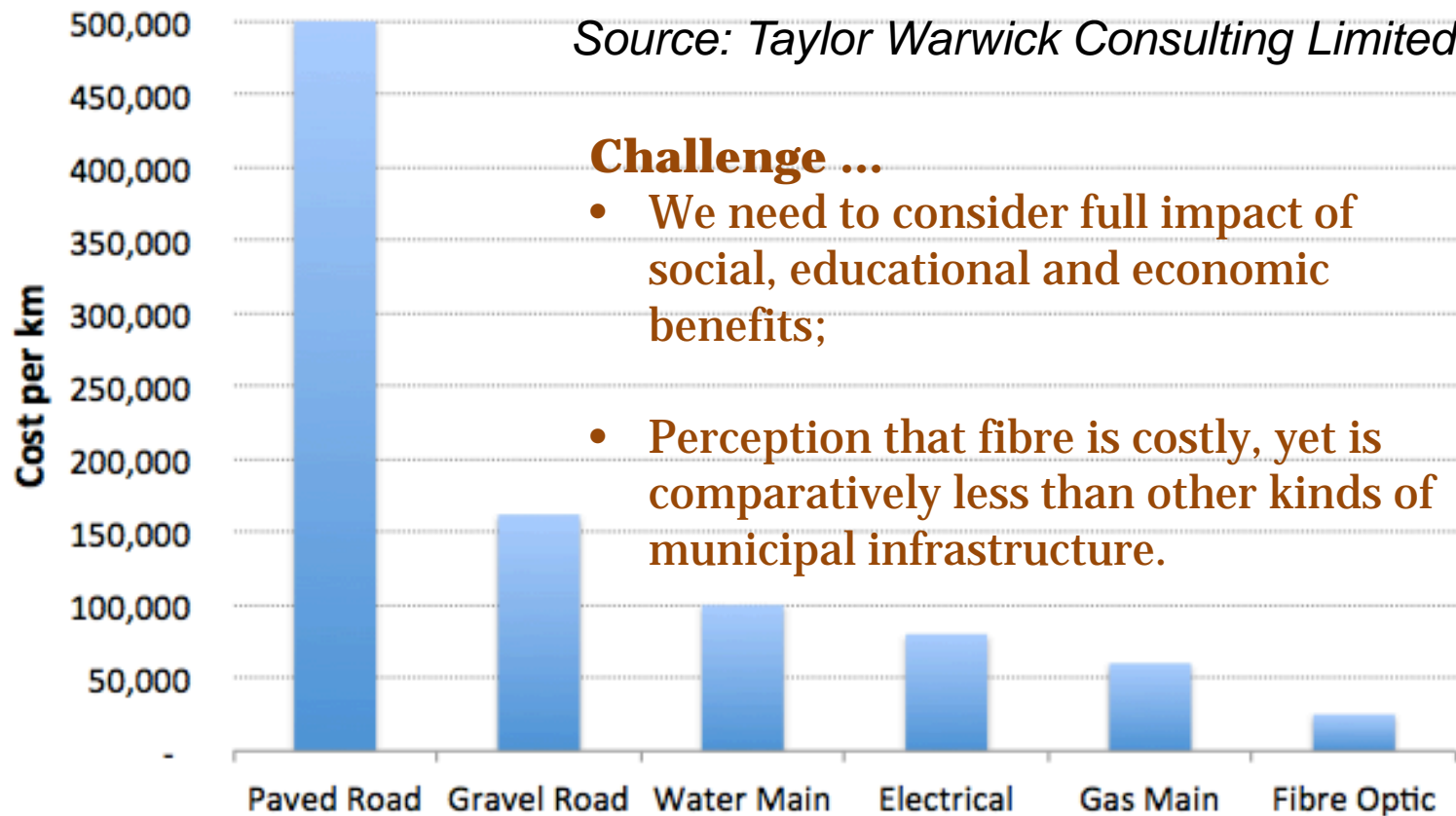
- ✓ Owned their own electrical utility
- ✓ There was an existing telephone co-op
- ✓ Large public works projects leveraged
- ✓ Existing business(s) threatened to leave town
- ✓ Anchor institutions pushed for improved service
- ✓ Incumbent utility company granted free access to poles
- ✓ A highly skilled person with IT background as leader/Mayor
- ✓ U.S. telecoms offered services on community owned fibre
- ✓ New small and mid-sized telecoms emerged to fill gaps
- ✓ **\*\*Large federal stimulus grants since 2007- latest was \$9 B Sept 2015!!!!**



## Broadband as a Utility

### Comparative Costs to Deploy Infrastructure in New Developments

*Source: Taylor Warwick Consulting Limited*



#### **Challenge ...**

- We need to consider full impact of social, educational and economic benefits;
- Perception that fibre is costly, yet is comparatively less than other kinds of municipal infrastructure.



## Perspective

### Why Fibre?

- Scalable ... a key advantage
- Durable ...  
30-50 year life expectancy
- “Future proofs” a community

### Why Now?

- Build out will take years not months
- Current services already straining capacity; technology development is “exponential”





## Accelerated Change

- Internet is a “disruptive technology”
- Usage is moving beyond convenience to necessity .... internet of things, connected homes ...
- Usage increasing rapidly- 25% -100% every year
- Broadband increasingly seen as a utility and as important infrastructure
- Realtors report connectivity is the 2<sup>nd</sup> question a family asks and the 1<sup>st</sup> question for commercial
- ✳ Note: access to fibre adds 3%-5% to home value



## What Next?

### **What can our communities do today?**

- Start early - a fibre build is unique to each community and may take 3+ years for total build out
- Leverage electrical utility - large advantage
- Combine with other public works opportunities
- Have a shovel ready broadband plan - no one size fits all
- Change bylaws to prepare for future development
- Identify community champions
- Understand that this is a conversation about the future



## Key Takeaway

# What have we learned?

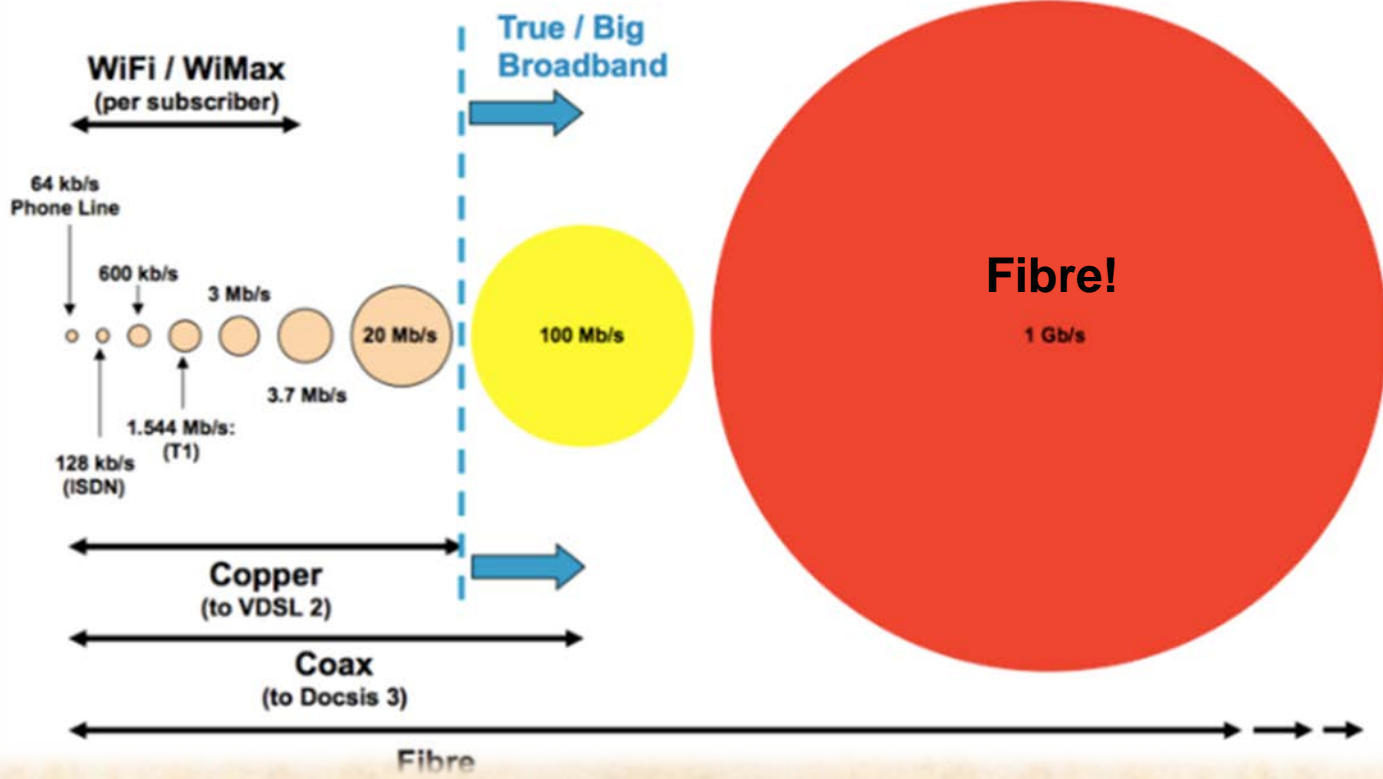
*There is no such thing as a short conversation on Broadband*



# Future Proof!

## Comparisons

Source: Taylor Warwick Consulting  
Limited/Ventus Developments





**What is Trending?**

**Internet of Things**

**Industrial Internet**

**Internet of Everything**

What exactly is the

# "INTERNET *of* THINGS"?

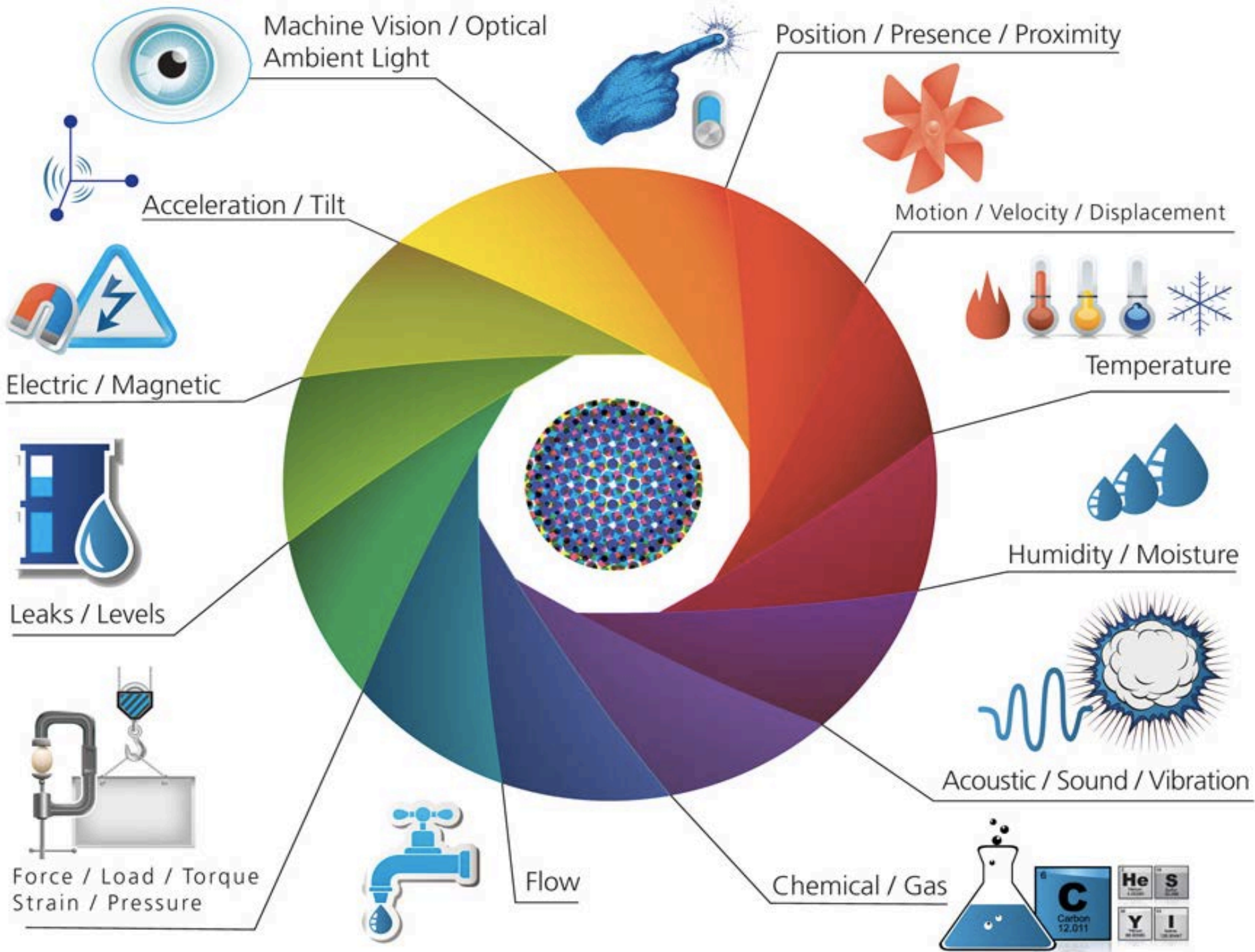


**Smart Systems and the Internet of Things  
are driven by a combination of:**

**1 SENSORS  
& ACTUATORS**

**2 CONNECTIVITY**

**3 PEOPLE &  
PROCESSES**



Machine Vision / Optical Ambient Light



Position / Presence / Proximity



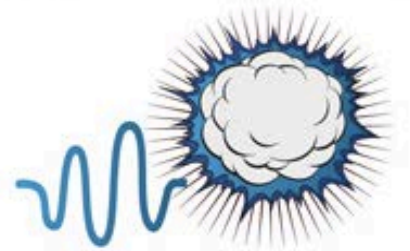
Motion / Velocity / Displacement



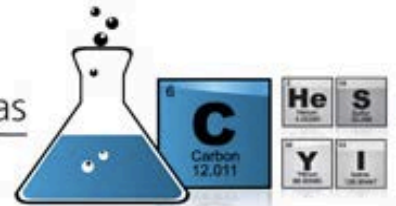
Temperature



Humidity / Moisture



Acoustic / Sound / Vibration



Chemical / Gas



Flow



Force / Load / Torque Strain / Pressure

Leaks / Levels



Electric / Magnetic

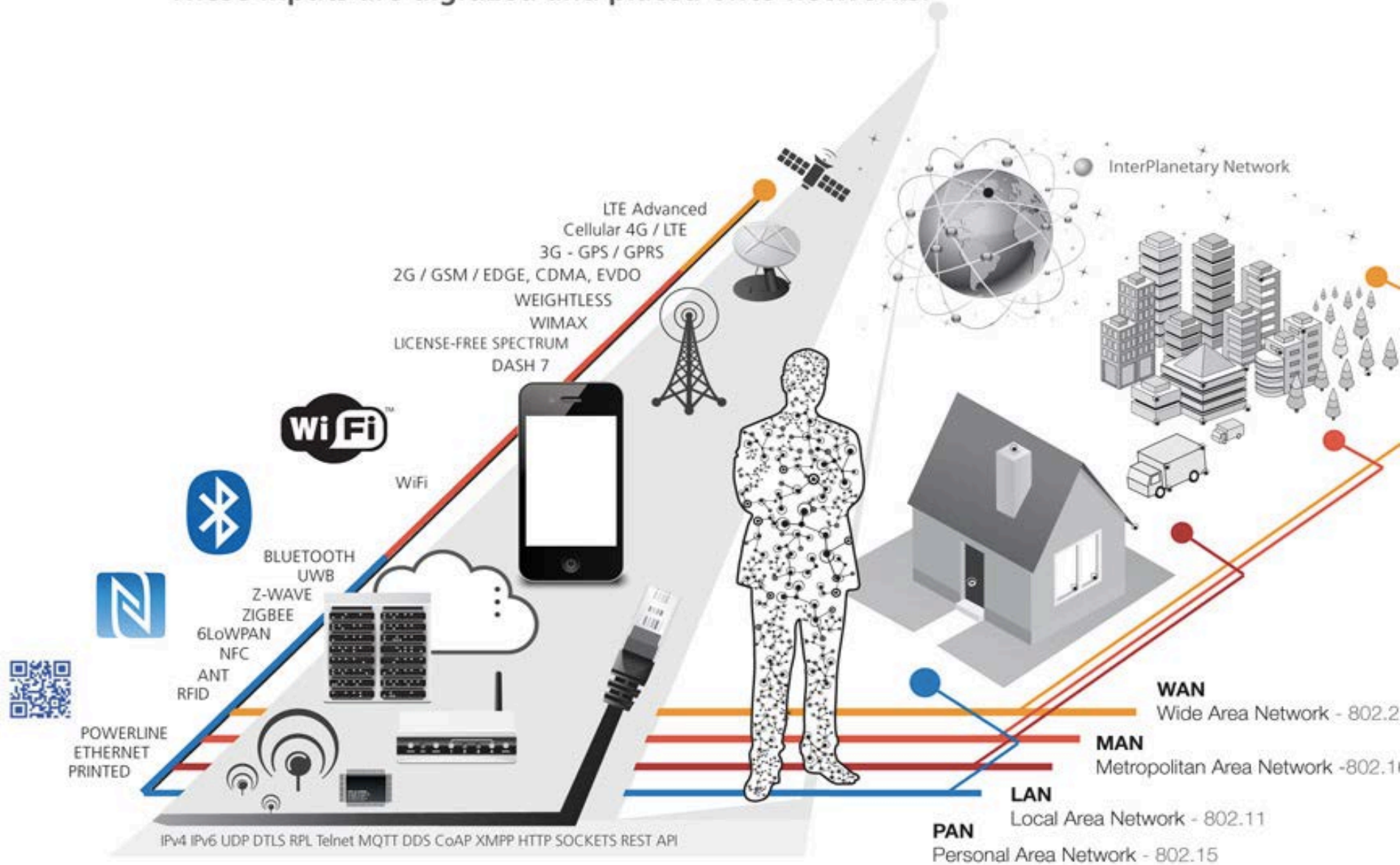


Acceleration / Tilt



# 2 CONNECTIVITY

These inputs are digitized and placed onto networks.





**Customer Relationship & Support**



**Analytics & Cloud/API**



**Upgrades & Configurations**



**Remote Monitoring / Maintenance**



**Control & Automation**



**Supply Chain Management**



**Security / Energy**



**Mobile Devices & Apps**

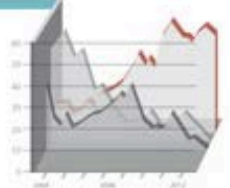
**People**



**Location & Tracking**



**Financial**



**Processes**

# The interactions between these entities are creating new types of smart applications and services.

SENSORS + CONNECTIVITY + PEOPLE + PROCESSES

Starting with popular connected devices already on the market



## SMART THERMOSTATS

nest



Save resources and money on your heating bills by adapting to your usage patterns and turning the temperature down when you're away from home.

## CONNECTED CARS

CAR  
2GO



Tracked and rented using a smartphone. Car2Go also handles billing, parking and insurance automatically.

## ACTIVITY TRACKERS

BASIS



Continuously capture heart rate patterns, activity levels, calorie expenditure and skin temperature on your wrist 24/7.

## SMART OUTLETS

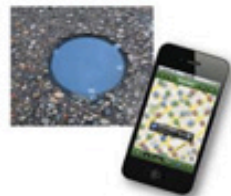
belkin



Remotely turn any device or appliance on or off. Track a device's energy usage and receive personalized notifications from your smartphone.

## PARKING SENSORS

STREETLINE  
CONNECTING THE REAL WORLD



Using embedded street sensors, users can identify real-time availability of parking spaces on their phone. City officials can manage and price their resources based on actual use.

## HOME CONSUMER



## TRANSPORT MOBILITY



## HEALTH BODY



## BUILDINGS INFRASTRUCTURE



## CITIES INDUSTRY



*Light bulbs  
Security  
Pet Feeding  
Irrigation Controller  
Smoke Alarm  
Refrigerator  
Infotainment  
Washer / Dryer  
Stove  
Energy Monitoring*

*Traffic routing  
Telematics  
Package Monitoring  
Smart Parking  
Insurance Adjustments  
Supply Chain  
Shipping  
Public Transport  
Airlines  
Trains*

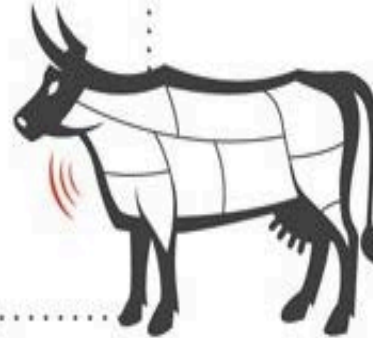
*Patient Care  
Elderly Monitoring  
Remote Diagnostic  
Equipment Monitoring  
Hospital Hygiene  
Bio Wearables  
Food sensors*

*HVAC  
Security  
Lighting  
Electrical  
Transit  
Emergency Alerts  
Structural Integrity  
Occupancy  
Energy Credits*

*Electrical Distribution  
Maintenance  
Surveillance  
Signage  
Utilities / Smart Grid  
Emergency Services  
Waste Management*

# DIGITAL FARM TO TABLE

- Farm & Livestock ID & Sensors
- Food packaging sensors
- Retail Supply Chain Monitoring
- Health Services



**Cattle**  
AIN: 840 003 123 456 789

Location: ID: Braymeadow Farm FR  
#00285453543  
Slaughterhouse ID: #45205343  
Sensor: Temperature, Accelerometer  
Connectivity: RFID, NFC, WAN



Maria and her daughter are picking up groceries for the week. Using packaging with printed sensors, the two can make sure the ground beef they are purchasing has never reached unsafe temperature levels while on the shelf or being transported.

The packaging also contains a QR code which they can use to query the cow's RFID tag and bring up its history:

- Where it was raised
- Where it was slaughtered
- Where it was packaged
- What it was fed
- How it was transported
- The last time it was inspected.

A week later the U.S. Department of Agriculture's Food Safety Service determines ground beef from originating from a regional packing company and sold at a neighboring store is contaminated with E. coli O157:H7. All packages from this distributor change their alert color and notification messages are sent to those shoppers that may have been impacted.



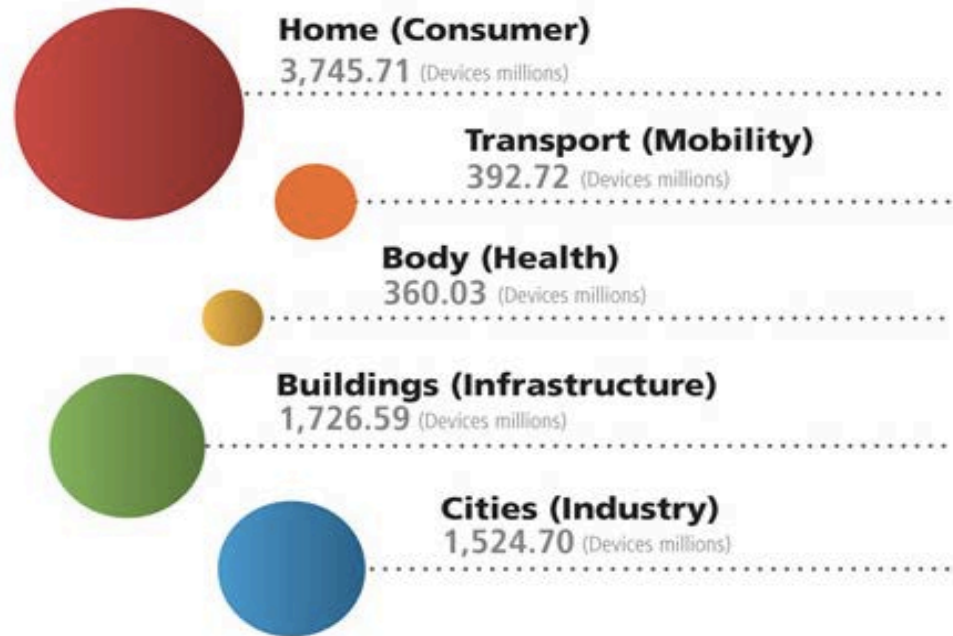
# Connected Devices



In 2014 nearly **2 billion** connected devices will be shipped

This number will grow to nearly **8 billion** devices for the year 2020

*\*Not including mobile phones*



# Revenue opportunities

from the Internet of Things:

# 2020

# 2017

# 2014

**HOME** CONSUMER

**TRANSPORT** MOBILITY

**HEALTH** BODY

**BUILDINGS** INFRASTRUCTURE

**CITIES** INDUSTRY

\$79.4B

\$10.4B

\$6.2B

\$25.0B

\$59.2B

\$180.3B

\$29.4B

\$18.5B

\$77.0B

\$129.8B

\$397.8B

\$76.1B

\$48.7B



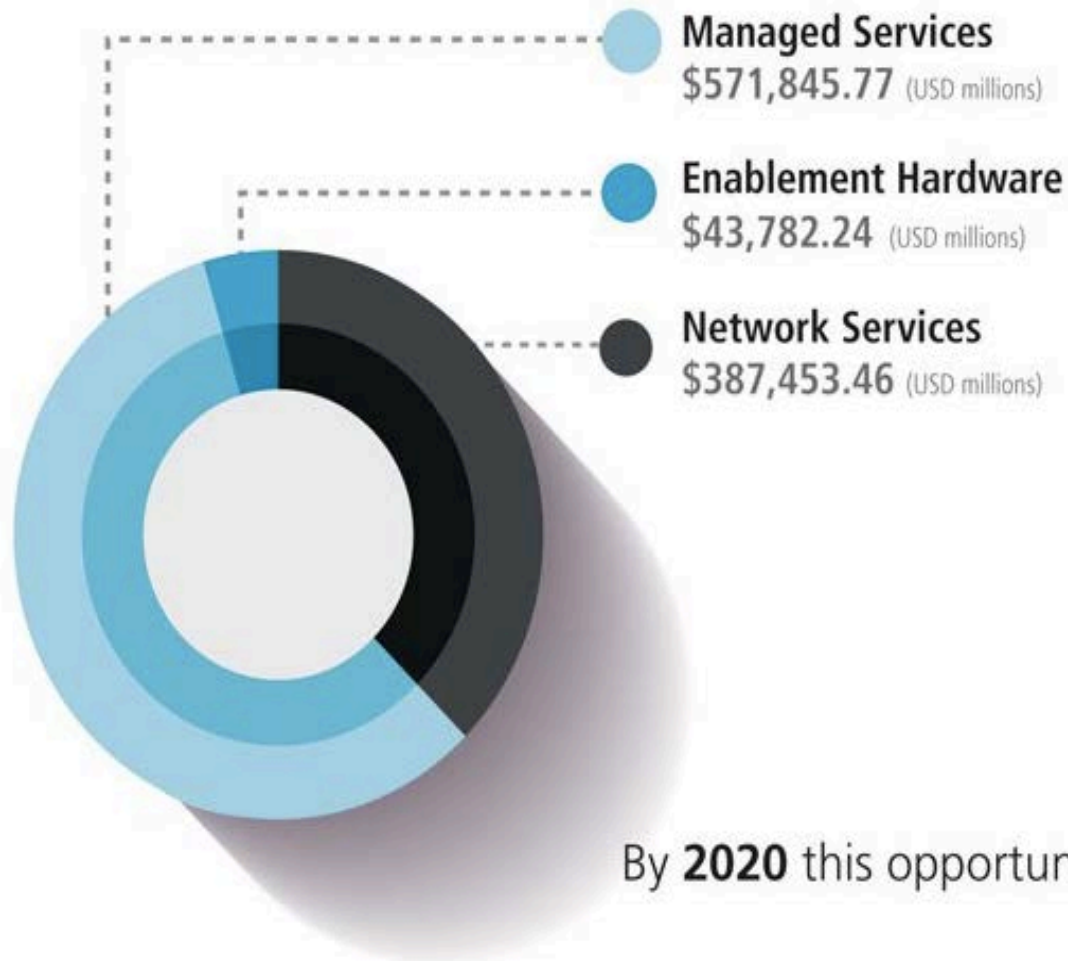
# 2014

# 180+

Billion in Revenue  
in 2014



2020



Managed Services  
\$571,845.77 (USD millions)

Enablement Hardware  
\$43,782.24 (USD millions)

Network Services  
\$387,453.46 (USD millions)



By **2020** this opportunity will grow to more than

**>\$1 Trillion**



Alberta SouthWest Approach

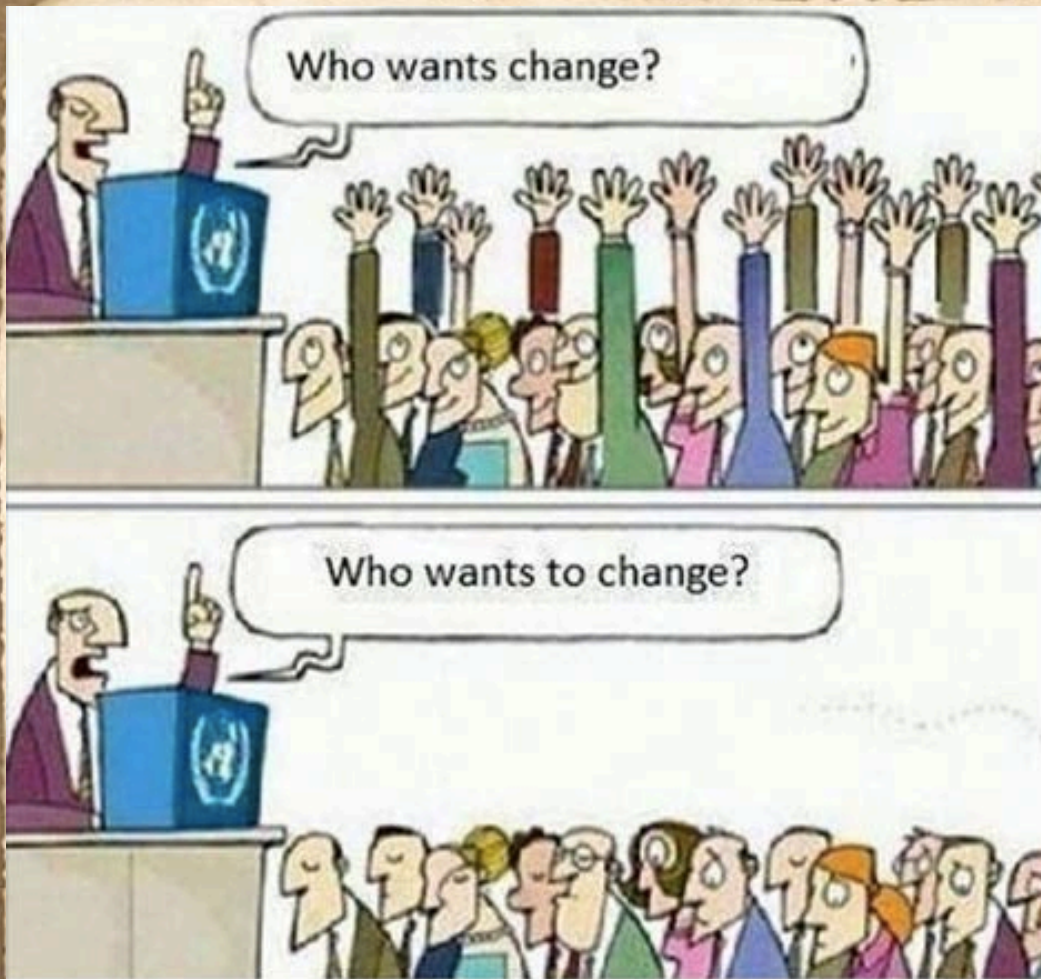
**Each community**

**Various Models**

**Regional Wholesale  
Backhaul?**



# Perspective



*“If we do what we’ve always done, we’ll get what we always got”*



## Contact Info

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403.627.3373



## Trends- Careers

- Precision agriculture - John Deere *Farm Forward*
- Manufacturing - utilization of robots
- Tele-presence and tele-commuting
- UAV - surveillance, agriculture, engineering
- Healthcare - age in place
- Education - delivery and consumption
- Big data applications



## 10 jobs that didn't exist 15 years ago

- Digital Marketing Specialist
- Social Media Manager
- Manager of Spectrum Advocacy - *John Deere*
- Blogger
- SEO Specialist
- App Designer/Developer
- Cloud Services Specialist
- Big Data Analyst
- Market Research Data Miner

Source: [DigitalMarketingInstitute.com](http://DigitalMarketingInstitute.com)



## Applications

- Cloud based gaming technology- larger than movie industry
- Immersive online educational opportunities
- PhD in Geo physics lands a job with the St. Louis Cardinals baseball team to analyze pitches.
- Immersive online healthcare
- Video conferencing will become ubiquitous- 93% of communication(non-verbal) is missed
- Tele-presence is fast emerging- medicine, multiple cameras, super hd



## Disruption

Uber

The world's largest taxi company, owns no vehicles.

The world's most popular media owner, creates no content.

Facebook

Alibaba

The most valuable retailer, has no inventory.

The world's largest accommodation provider, owns no real estate.

Airbnb

Something interesting is happening.  
TOM GOODWIN

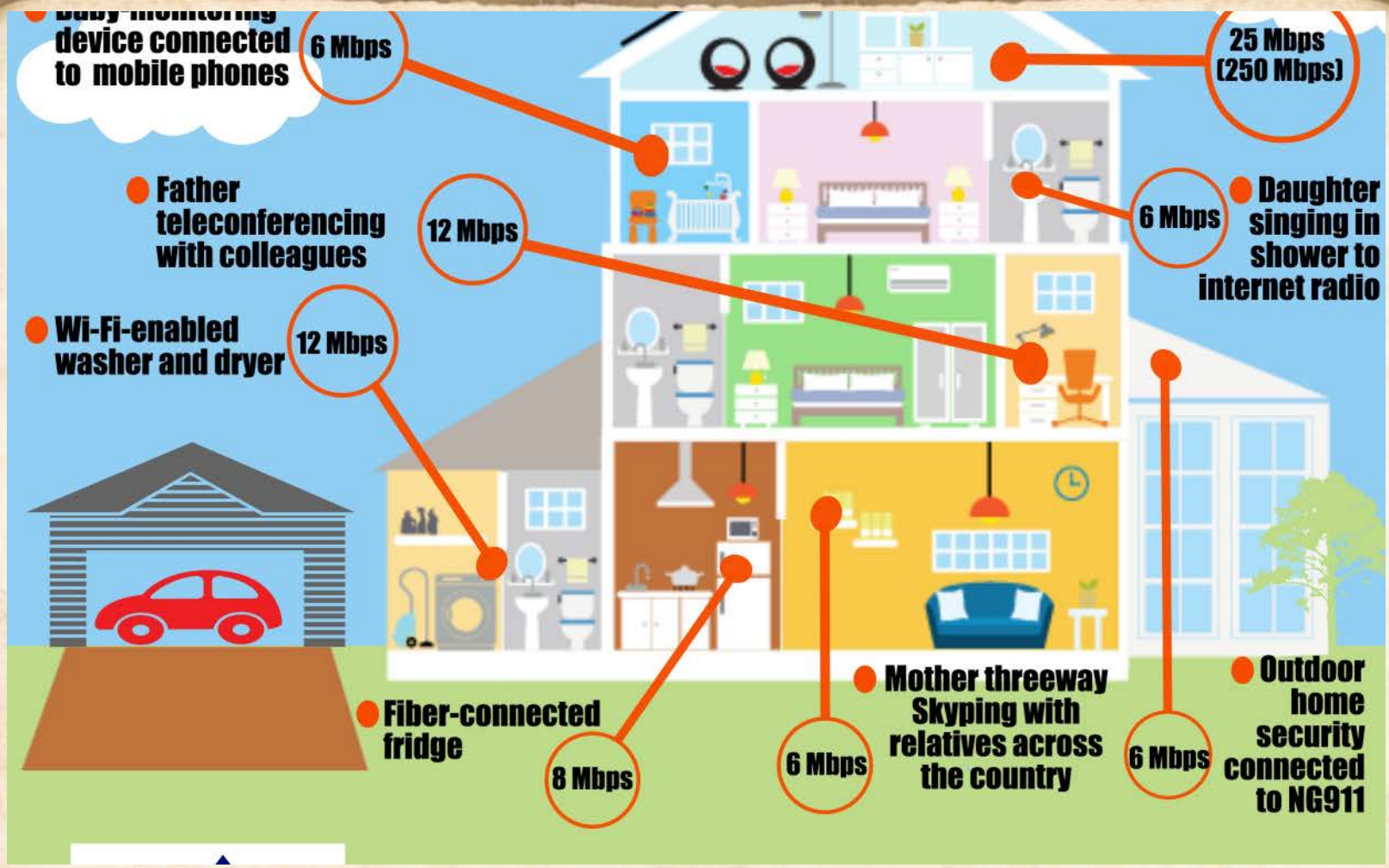


## Accelerated Change

- Internet usage is moving beyond a convenience to a need- internet of things, connected homes
- Usage increasing rapidly- 25% every year (AT&T and Telus)- low- others doubling every 2 years
- Broadband seen as a utility and important infrastructure piece.
- Residential realtors say it is the second question a family asks- commercial it is the first



# The Connected Home





4K/8K

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