Transforming Mobility through Advanced V2I technology

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Connected Vehicles in Smart Cities

GTT changes the way your city moves with intelligent transportation solutions

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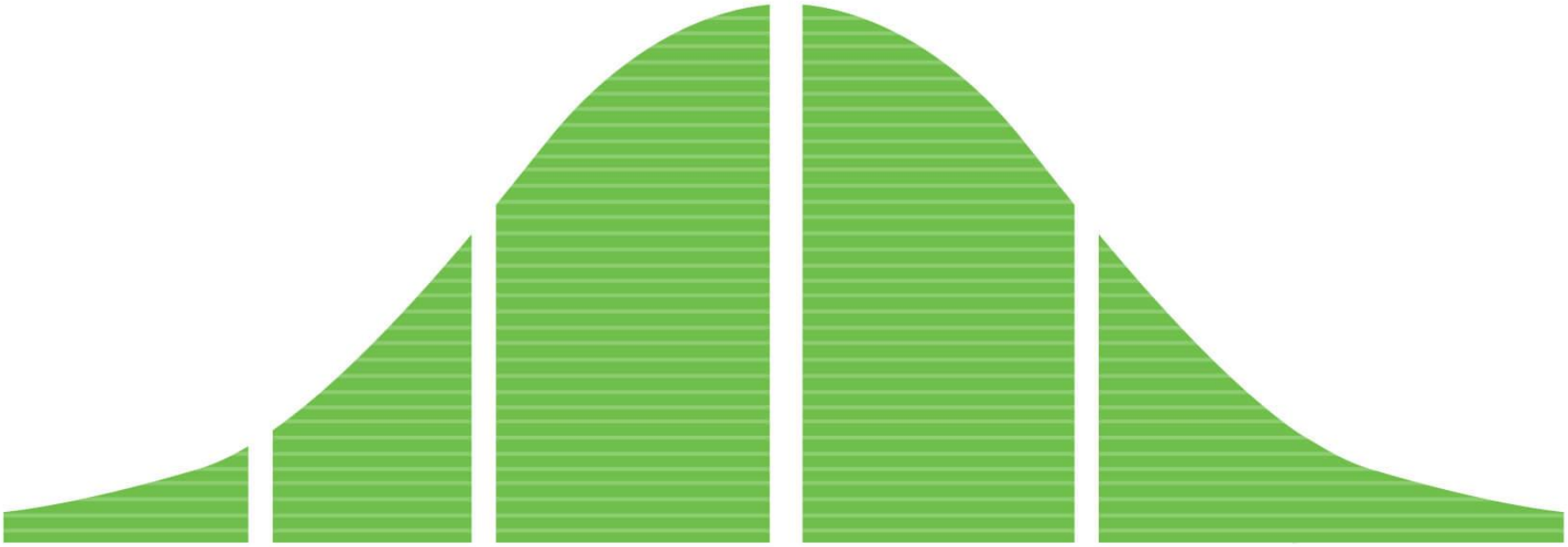
The Intelligent Transportation Journey



Technology Adoption Curve

Everett Rogers – Diffusion of Innovations, 1962

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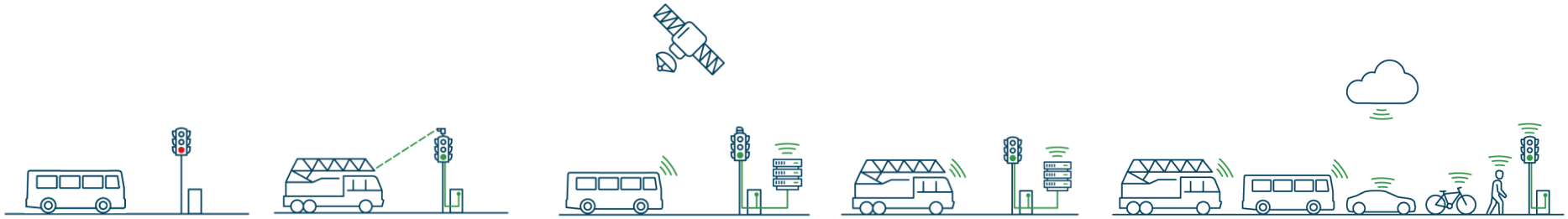

Laggards

Dependent on driver and fixed signal timing. No V2X communication

Late Majority

Legacy point-to-point communications, including optical and sound

Early Majority

Modern point-to-point communications with GPS locating and remote management

Early Adopters

Integrated software solution leveraging city and vehicle infrastructure

Innovators

Fully integrated solution leveraging IoT and third party data sources and cloud technology

Connected Vehicle Adoption Curve

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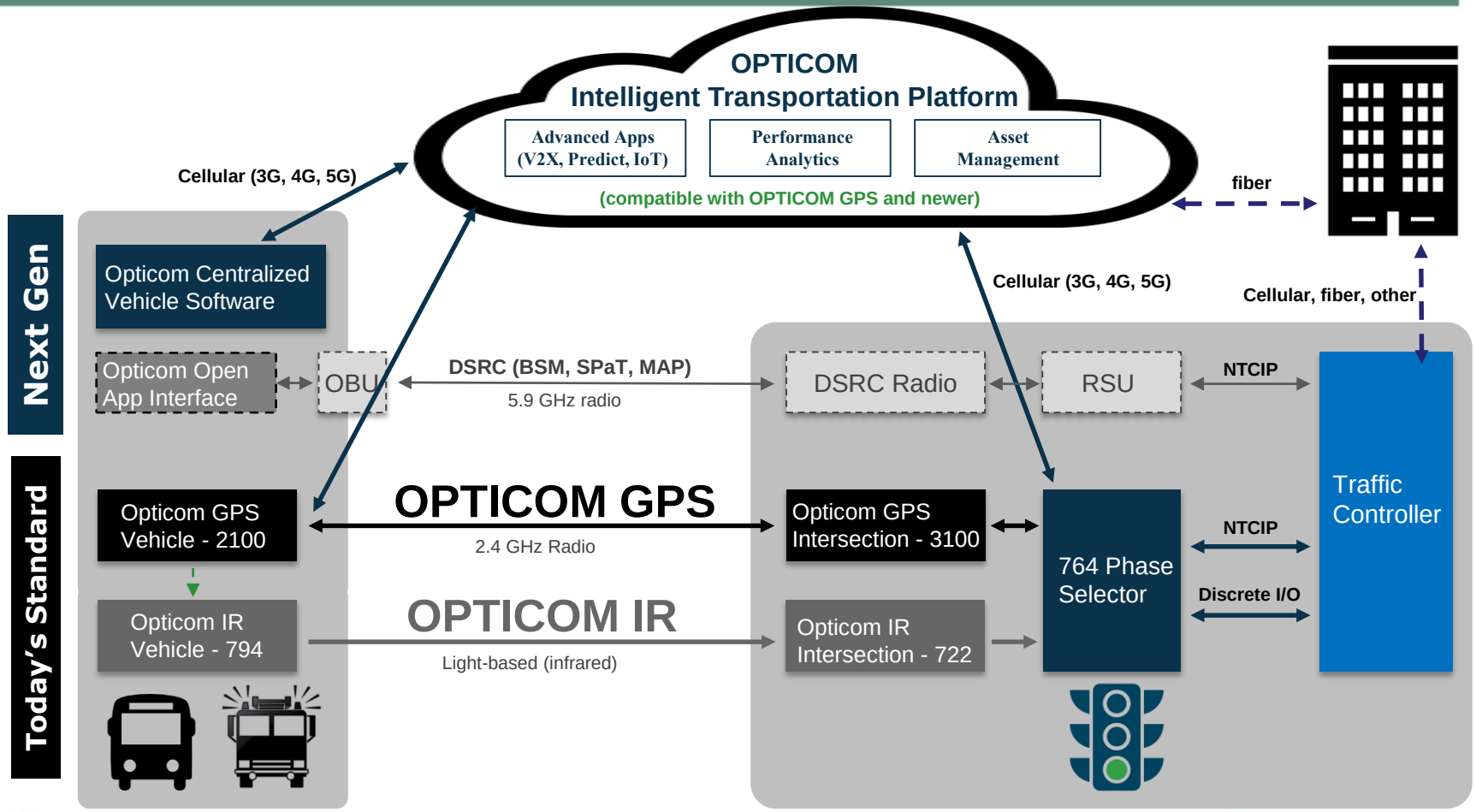

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Case Study: Laval, Quebec

OVERVIEW

- Goal: increase ridership by 40 percent between 2013 and 2022
- Preferential bus measures aimed at improving speed, reliability and punctuality will lead to more riders
- STL buses operate as both local and express buses as demand requires
- **Conditional** and **relative** priority based on lateness and passenger load

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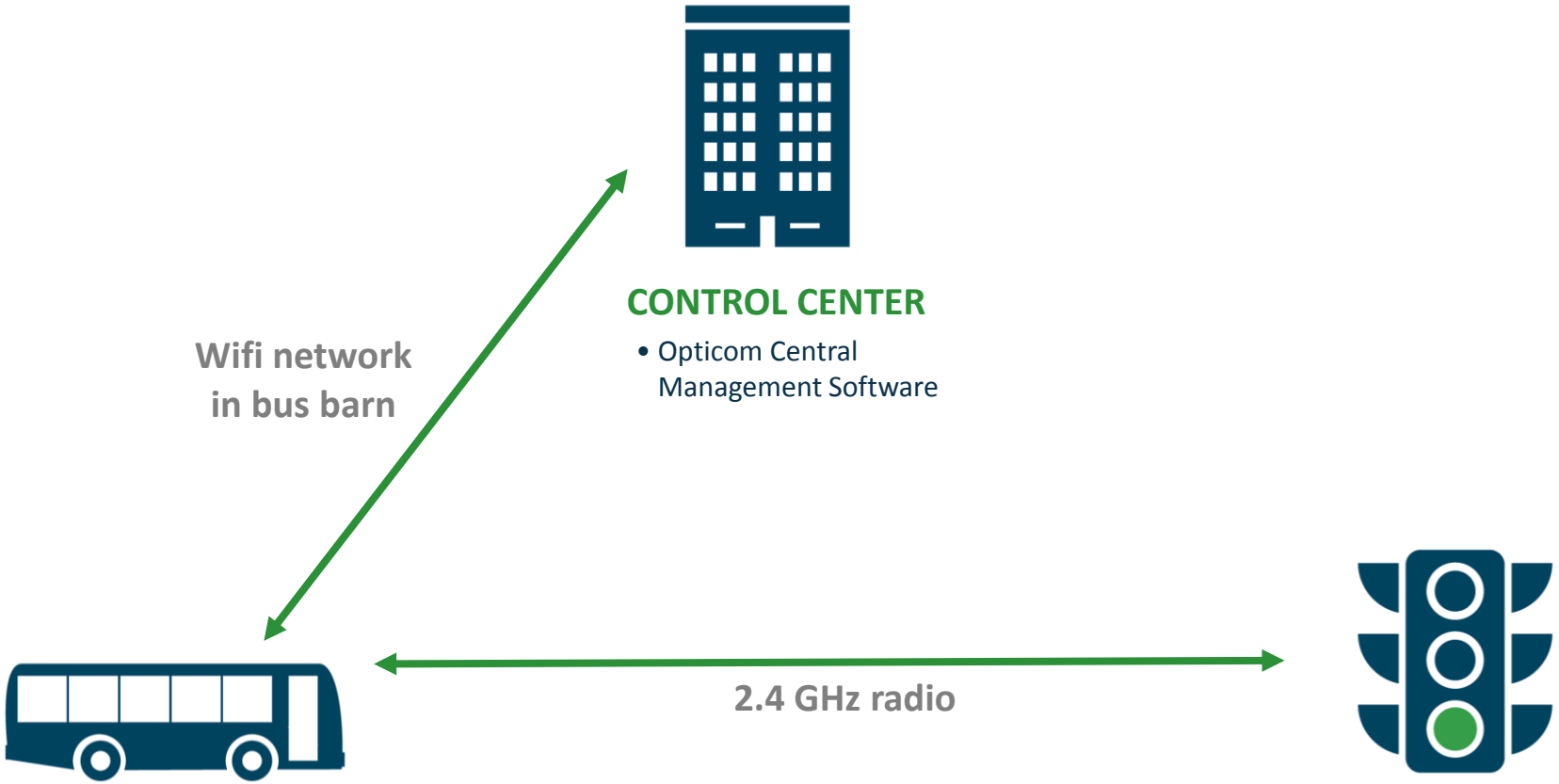
Case Study: Laval, Quebec



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Case Study: Laval, Quebec

RESULTS

- Lowered Bus Travel Time, **up to 10%**
- Carbon footprint expected to decreased by more than **30,000 metric tons over 10 years**

"People need punctuality. People need good information. People need reliability. People need speed. With TSP, we addressed all of these issues. So, we're very confident that we will be able to increase our ridership numbers."

Guy Picard
General Manger
Société de transport de Laval

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Case Study: New York City

OVERVIEW

- **5,700** buses operating on 2,800 miles of routes operated by MTA NYC Transit
- Streets and **13,000** traffic signals operated and maintained by NYCDOT
- **Highest passenger loads, slowest moving buses (and declining)**

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Case Study: New York City

SOLUTION: M15 SBS Pilot

- Wall Street Financial District
- Intermodal route
- Lots of congestion
- Coordination
- Canyon for GPS signal

Cellular data network

NYCWiN

OPTICOM SOFTWARE

CONTROL CENTER

- Opticom Central Software
- TransCore ATMS

INTERSECTIONS

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Case Study: New York City

RESULTS

- M15 - Lowered Bus Travel Time, **up to 18%**
- Implementing TSP along additional routes through 2020

"Since 2012, NYC DOT has worked with MTA to implement TSP on 5 corridors, with excellent results."

NYC Transit Signal Priority Report – July 2017

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Additional Advanced Solutions

- Schedule and Headway management
- Signal Phase and Time data – in-vehicle
- Enhanced reporting and analytics (system effectiveness, performance monitoring-historic and real-time)

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The Intelligent Transportation Journey

On-board Vehicle Systems

Computers, AVL, Preemption Equipment, GPS

Intersection Equipment

Signal Controllers, Preemption Equipment

Communication Networks

Radio, Cellular, Wi-Fi, Fiber, Ethernet

Control Center

ATMS, Hardware and Software IT Systems

Key Solution Strategy Questions

1. What are your primary objectives?
2. What infrastructure do you have today?
3. What infrastructure are you planning to have in the future? When?
4. What connectivity is available to vehicles, intersections, data?
5. Who are the key stakeholders, are they accessible (system mfg, IT, traffic)?

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Summary

- Connected Vehicle technology adoption will happen over time
- Find ways to use your existing infrastructure to become more connected
- Look for partners with expertise in these areas to help lead your cities migration

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THANK YOU

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