
Test Bed

What's the Value Proposition?

Brand

- **World-wide and industry recognition** in having an **IIC Approved Testbed**
- Extensive experience - our members and IIC know Testbeds!

Partnering

- **Immediate array of ecosystem partners** with products, tech, and expertise
- Interested in joint testbed **funding**, **development**, and **business ventures**

Expertise

- **Leverage IIC's ecosystem** of expertise, technologies, resources, and best practices
- **Receive guidance** from industry & technical experts

Marketing

- Promote Testbed with IIC marketing and IIC venues
- **IIC website**
- **Press releases**
- **Demo and speak** at IIC / partner events
- **Publish** through IIC marketing

Influence

- Influence **direction of the Industrial** Internet, requirements, and technologies
- **Join industry leaders, academia, and government** agencies in testbeds and working groups

Current Publicly Announced Testbeds

What is an IIC Testbed?

CONTROLLED EXPERIMENTATION PLATFORM

~conforming to an IIC technical references, where solutions can be deployed and tested in environments resembling real-world conditions

Explore untested technologies or existing technologies working together in an untested manner

Create innovative new products, services, and business practices

Generate requirements and priorities for standards organizations

Testbed Results

Innovation

- What innovations have been realized? Any industry impact?
- What best practices have been learned

Standards

- What noteworthy standards does the testbed employ? Their purpose?
- What noteworthy standards is the testbed influencing? Which SDOs?
- What gaps have been identified that should become a future standard?

Technical References

- What changes would you like to see in IIC Technical References?
- What influence has the testbed had on IIC Technical References?

Connected Care Testbed

LEAD MEMBERS:

Infosys

SUPPORTING MEMBERS:

Massachusetts General Hospital MD PnP Lab, PTC, and RTI

MARKET SEGMENT:

Large hospital organizations, clinical organizations and any other health care providers. Medical device manufacturers developing products for cloud connected ecosystems.

Example IIC Testbed: Communication and Control for Microgrid Applications

Collaborators

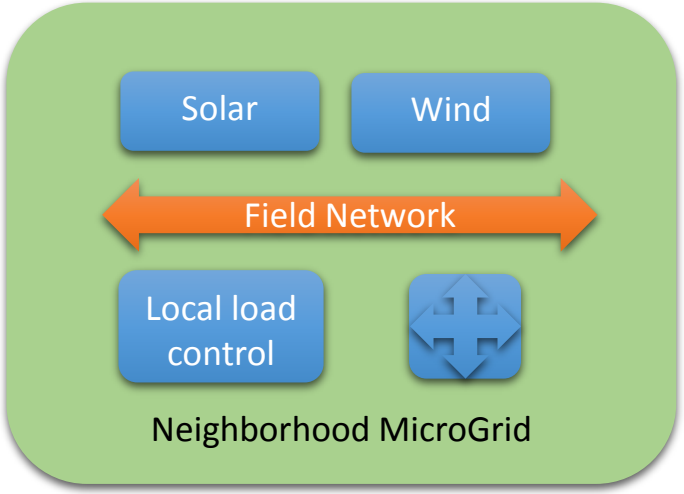
- Leads: RTI, National Instruments, Cisco
- With: CPS Energy (San Antonio), Southern Cal Edison, Duke Energy, SGIP

Market Segment

- Energy Industry

Goals

- Introduce the flexibility of real-time analytics and control to increase efficiencies and ensure that power is generated accurately and reliably to match demand



Features & Commercial Benefits

- Enable efficient integration of solar and wind into the grid
- Create a dynamic, open marketplace for smart grid vendors
- Prove the viability of a real-time, secure DataBus distributed-control architecture in real-world grids

Example IIC Testbed: Track & Trace

Industrial Internet Consortium Member participants:

- Bosch, Tech Mahindra, Cisco, National Instruments

Market Segment

- Industrial Manufacturing
- Power Tool Fleet Management

Goal

- Manage smart, hand-held tools in manufacturing, maintenance and industrial environments

Features & Commercial Benefits

- Asset Management, Work Management
- Integration with Factory Manufacturing Systems
- Improved Safety and Operational Performance
- Monitor/Control Quality

Example IIC Testbed: Condition Monitoring & Predictive Maintenance

Member Participants:

- IBM and National Instruments

Market Segment:

- Predictive maintenance cuts across multiple market segments like power plants, manufacturing, process, mining, transportation, aerospace, and defense

Goals:

- Develop new predictive maintenance analytics modeling techniques
- Document standard and secure architecture patterns and data formats for predictive maintenance in the Industrial Internet era

Commercial Benefits:

- Increase equipment uptime and prevent catastrophic failures
- Provide condition monitoring data to experts thru the cloud

Example IIC Testbed: High-Speed Network Infrastructure

Member Participants

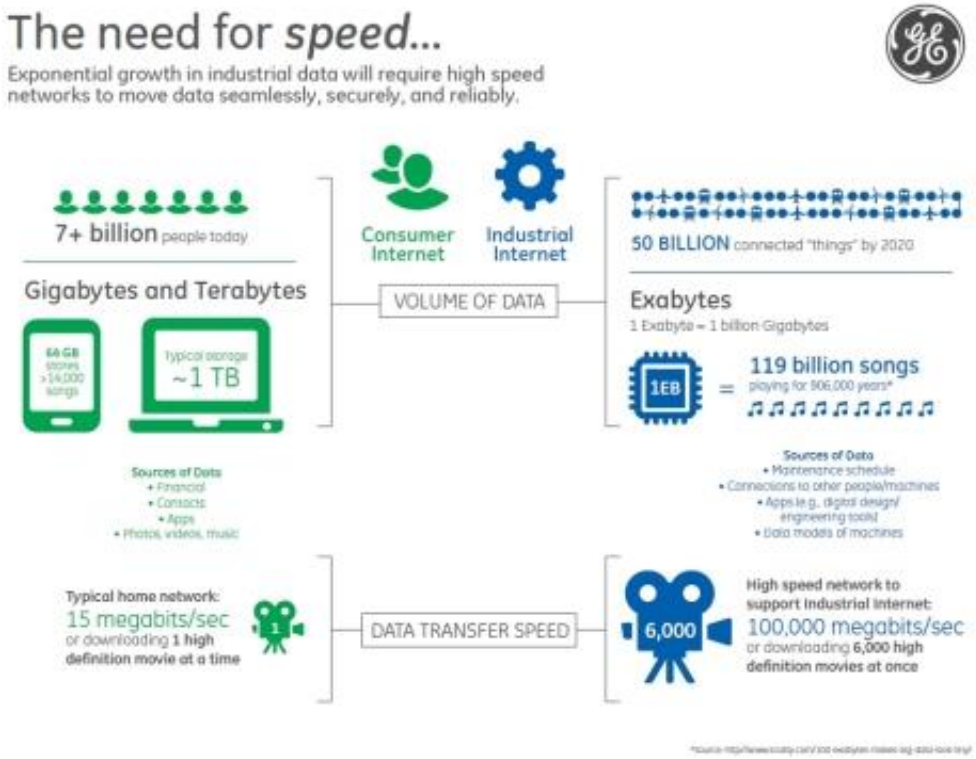
- General Electric, Cisco, Accenture, Bayshore Networks

What is the High-Speed Network Infrastructure?

- It transfers data at 100 gigabits per second to support seamless m2m communications and data transfer across connected control systems, big infrastructure products and manufacturing plants
- 100 gigabits per second is the equivalent of downloading more than 6,000 movies at a time on a typical Internet connection for home computers or mobile devices

Commercial Benefits

- With the 100 gigabit line, industries can instantaneously connect and control machines located thousands of miles away.



Time Sensitive Networks - Flexible Manufacturing for Robotics and Automation Cells

7 NEW Members

Testbed Objective and Overview

Market Segment

- Flexible Manufacturing providing tight coordination of multiple machines and Industrial-IoT (IIoT) integration

Goal

- Real-time control & synchronization of high performance machines over standard Ethernet

Features

- Combine different critical and best-effort traffic flows on a single network based on IEEE 802.1 Time Sensitive Networking (TSN)
- Demonstrate the real-time capability and vendor interoperability using standard, converged Ethernet
- Show ability for IIoT to incorporate highly performance and latency sensitive applications
- Provide integration points for smart edge-cloud control systems into IIoT infrastructure & application

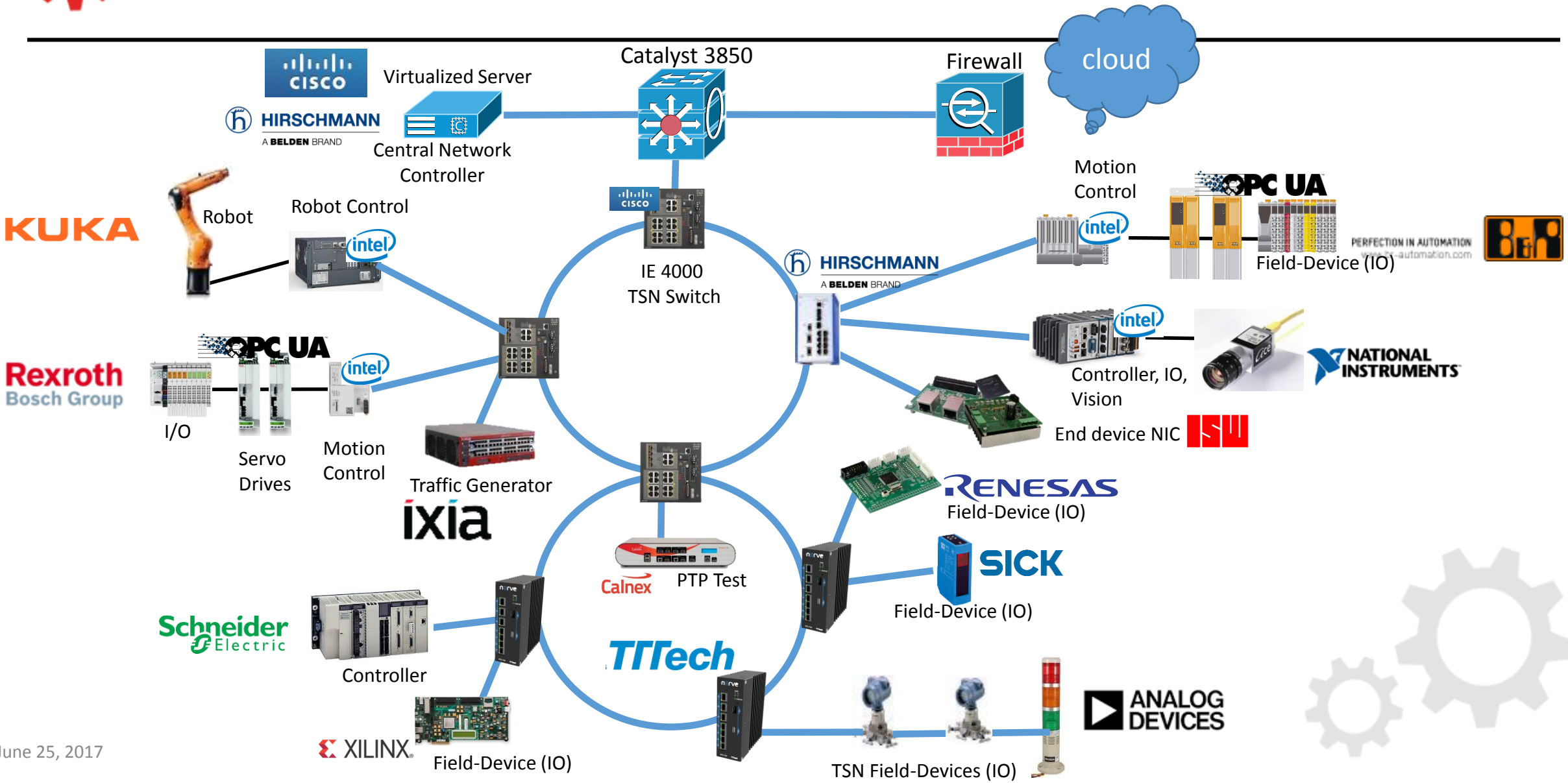
IIC Member participants

- **Analog Devices** – Jordon Woods
- Belden/Hirschmann – René Hummen
- B&R – Sari Germanos
- Bosch - Thomas Brandl
- Cisco - Paul Didier
- GE – Stephen Bush
- **Hilscher – Philip Marshall**
- Intel – Kirk Smith
- KUKA - Heinrich Munz
- NI - Todd Walter
- **Renesas – Arno Stock**
- Schneider Electric – Greg Lakis
- **SICK - Sebastian Heidepriem**
- TTTech – Markus Plankensteiner
- **Xilinx – Michael Zapke**

Non-member Participants

- **Calnex – Eric Percival**
- **ISW – Armin Lechler**
- Ixia – Bogdan Tenea
- **Phoenix Contact – Robert Wilmes**

IIC TSN Topology



CONNECTED VEHICLE URBAN TRAFFIC MANAGEMENT TESTBED

LEAD MEMBERS:

Infosys

SUPPORTING COMPANIES:

Bosch Software Innovations, Real-Time Innovations (RTI)

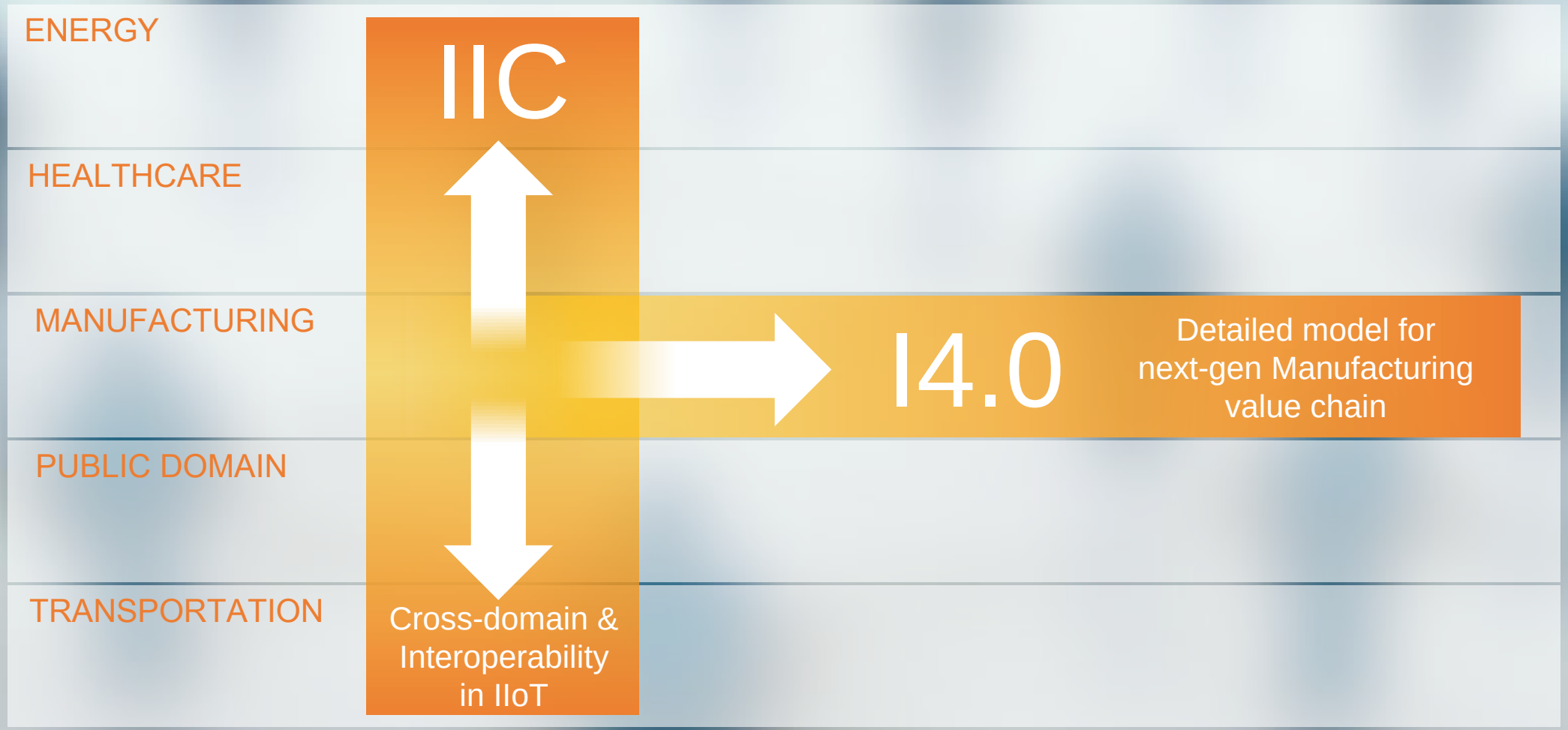
CLOUD SERVICE PROVIDER

Microsoft

MARKET SEGMENT:

Transportation (Connected Vehicles, Cooperative Traffic Movement, Shared Autonomous Mobility)

DOMAIN FOCUS AREAS ARE COMPLIMENTARY



BOSCH

Current Publicly Announced Testbeds