



University of Idaho

College of Engineering



Opportunities and Barriers of Smart Vehicles and Cities for RIT Communities

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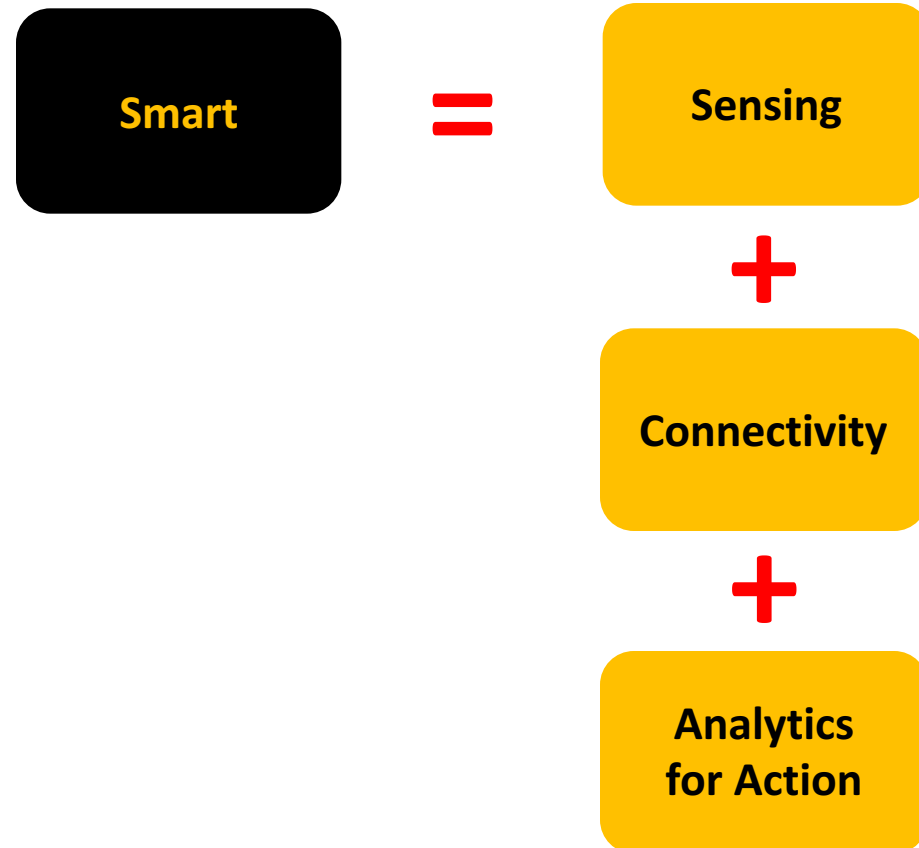


- **Introduction: Towards Smart Cities**
- **Opportunities for Smart and Safe Mobility in RITI Areas**
 - **Smart Mobility Solutions**
 - **Smart Safety Solutions**
- **Barriers for Smart Mobility in RITI Areas**
- **Conclusion**



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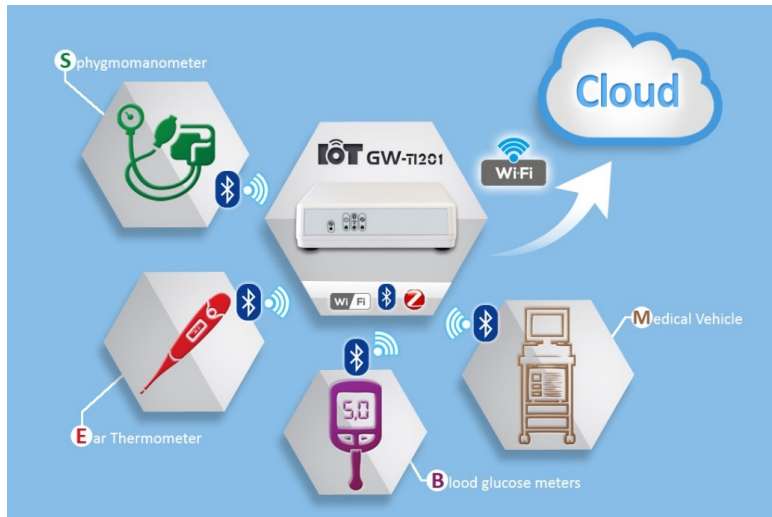
Towards a Smarter Future



Smart Applications



Smart Health



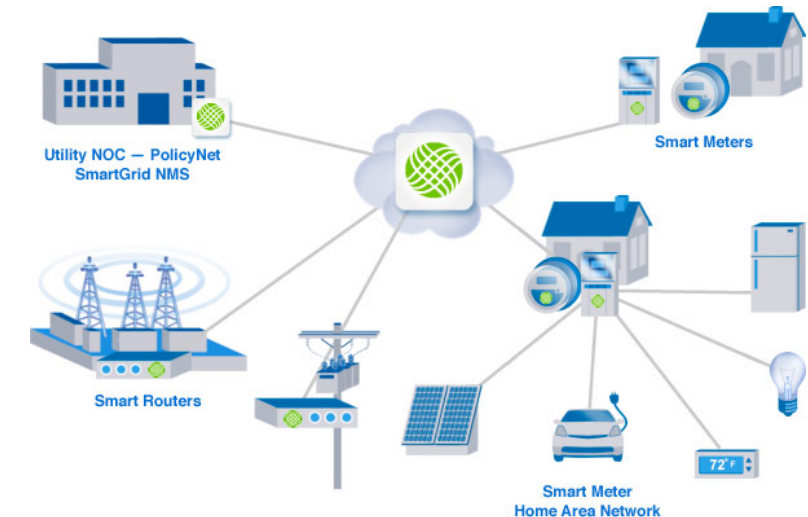
- Connected devices/wearables/implants monitoring medical indicators
- Indicators sent to clouds to:
 - Predict possible risks
 - Alert physicians intervene
 - Send actions to patient or implants
- Send ambulance request if needed

Smart Homes

- Remote Control
- Automated ON/OFF Options
- Voice Commands
- Automated Supply Management
- Advanced Security Features

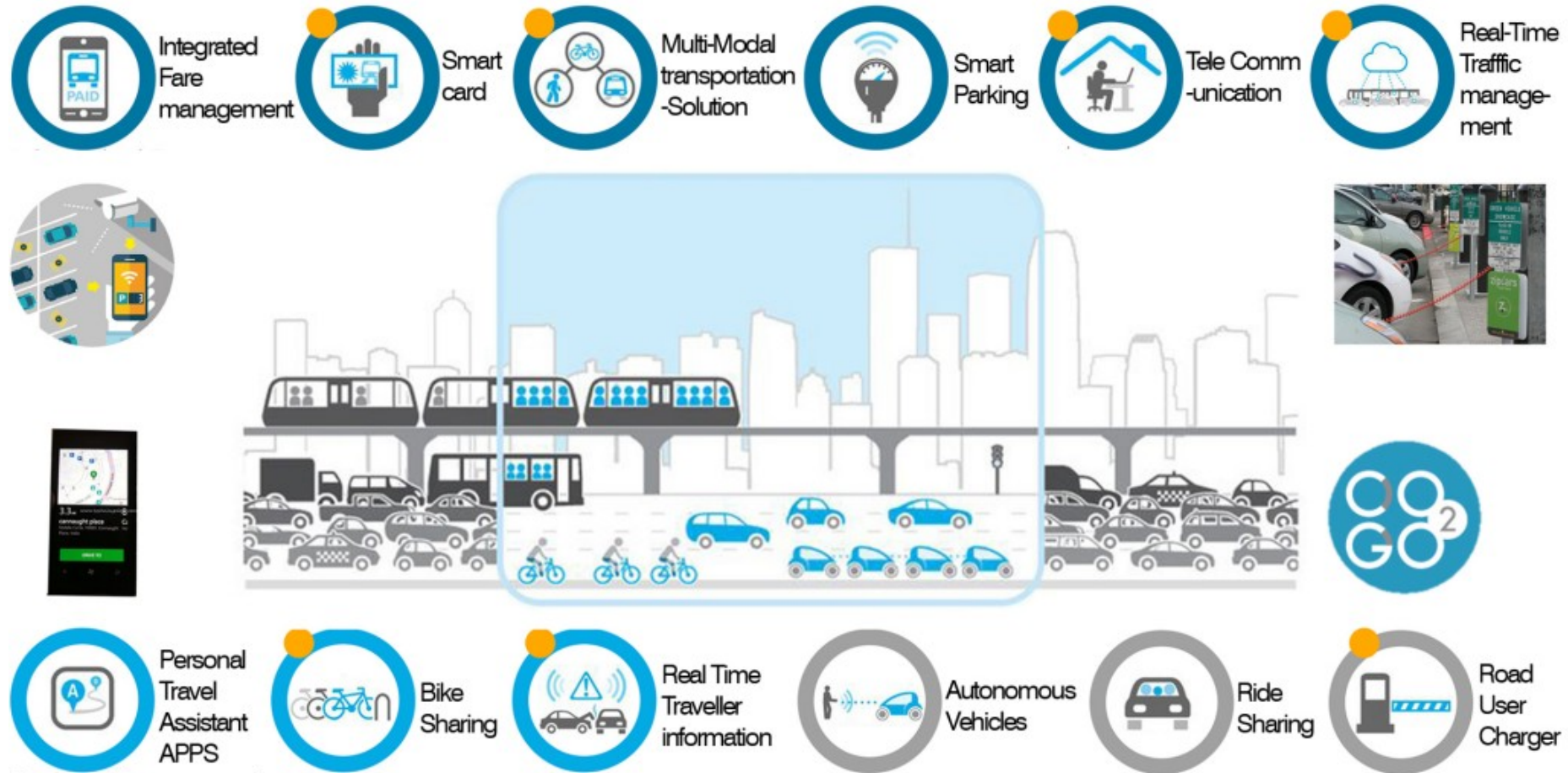


Smart Energy



- Smart Streetlights
- Smart Metering
- Smart Grids
- Demand Side Management
- Electric Vehicles (Vehicle-to-Grid)

Smart Mobility



Question?



➤ **Focus is on cities**

➤ **How about RITI Communities?**



Mobility Challenges in RITl Areas

- Lower vehicle penetration
- Narrower and quieter roads and highways
- Higher percentage of non-paved roads
- Less driving licensure
- Less/Slower maintenance in bad weather conditions
- Longer trips to access services (shopping, government services)

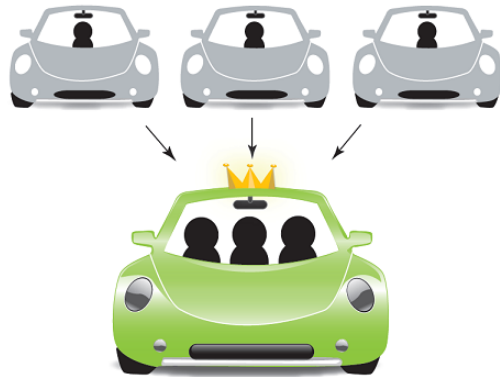


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Smart Mobility Solutions



Car Pooling



Demand Responsive Transportation



Road/Weather Condition Alerting



Relevance

- Low vehicle penetration
- Quiet rural roads

- Low vehicle penetration
- Mobility of elderly, disabled, and non-licensed customers

- Less-maintained, and non-paved roads
- Quiet rural roads

Opportunities

- Car pooling apps
- Hitchhiking apps with tracking options

- Smart reservation apps
- Real-time alerts to drivers with e-map directions and trajectory schedulers

- Phone/dashboard alerts
- Alternative routes given road/weather ratings

Smart Mobility Solutions



Cooperative Shopping/Services



School Bus Monitoring System



Autonomous Vehicles



Relevance

- Low vehicle penetration
- Distant trips to services

- Less maintained roads
- Distant trips to services

- Less traffic, bikes and pedestrians
- Fewer intersections

Opportunities

- Cooperative shopping apps
- Real-time group delivery trackers

- Smart and real-time tracking
- Information on driver, child, and bus

- Testing prototypes
- Early deployments



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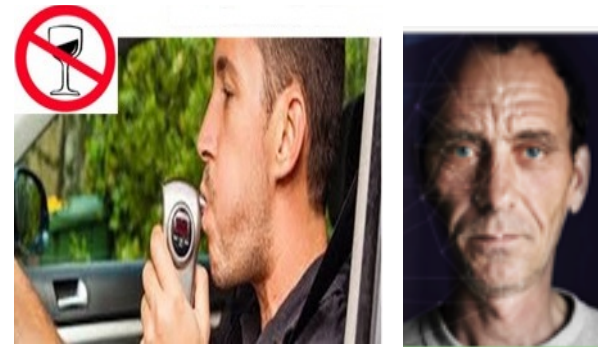
Smart Safety Solutions



Driving Behavior



Driver Monitoring/ Alert System



Wrong Entry Detection/Warning



Relevance

- Unexperienced drivers
- Non-paved roads and long/quiet highways

- Long travels on quiet rural roads
- Safety

- Less maintained rural roads
- Unexperienced drivers

Opportunities

- Advanced driving behavior tools/apps
- Real-time alerts

- Detection of fatigue, sleeping, lack-of-focus
- Possible connection to engine or ADAS

- Smart pavement markers
- Visual and/or vibration warning systems



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Barriers



Barrier	Possible Solution
<p>Limited broadband (3G/LTE) coverage</p> <div><div>AT&T</div><div>58%</div><div></div><div>Verizon</div><div>53%</div><div></div><div>T-Mobile</div><div>40%</div><div></div><div>Sprint</div><div>13%</div><div></div></div>	<p>Satellite and/or landline</p>
Longer distances (delays) to cloud servers	Edge computing
Less mastery/interest in technology	Education
Cultural barriers	Awareness



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Take Away Messages



- Smart mobility solutions need to find their way to serve RITI areas
- Different smart mobility and safety solutions are very relevant to and tailorable for these communities
- Several technical and cultural barriers need be resolved
- Many doors are open for innovation



THANK YOU!

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