



**Choose certainty.  
Add value.**

## **Contribution of TUV SUD To the Adoption of Connected and Automated Driving**

Eley Querner  
Vice President,  
TÜV SÜD Digital Service Center of Excellence  
Singapore

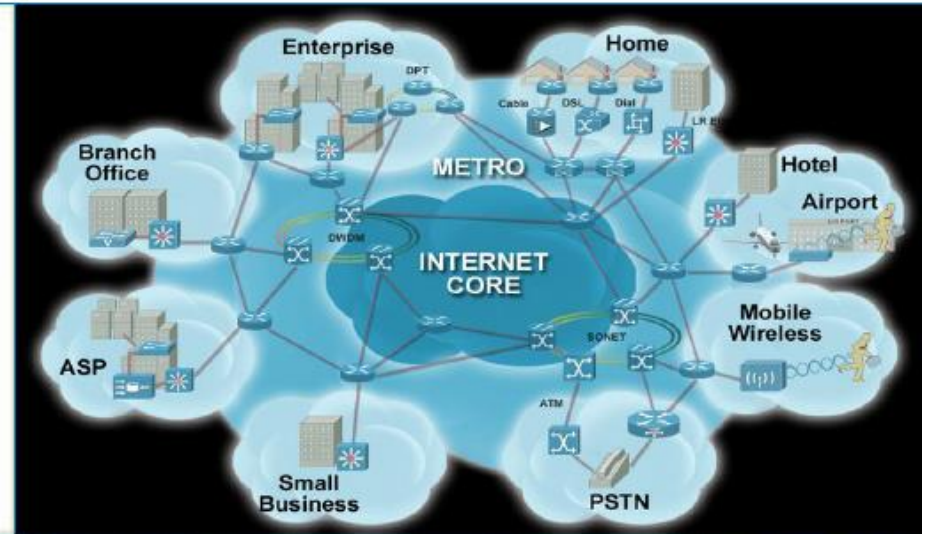
- Commoditization of telecommunications enabled **rapid digitization** and **disruptive technologies**.
- “Digital” is changing experience of consumers in all industries:
  - media, retail, entertainment, hospitality, finances...
- Expectations for “smarter living” are set. Smart cities are in the rise.



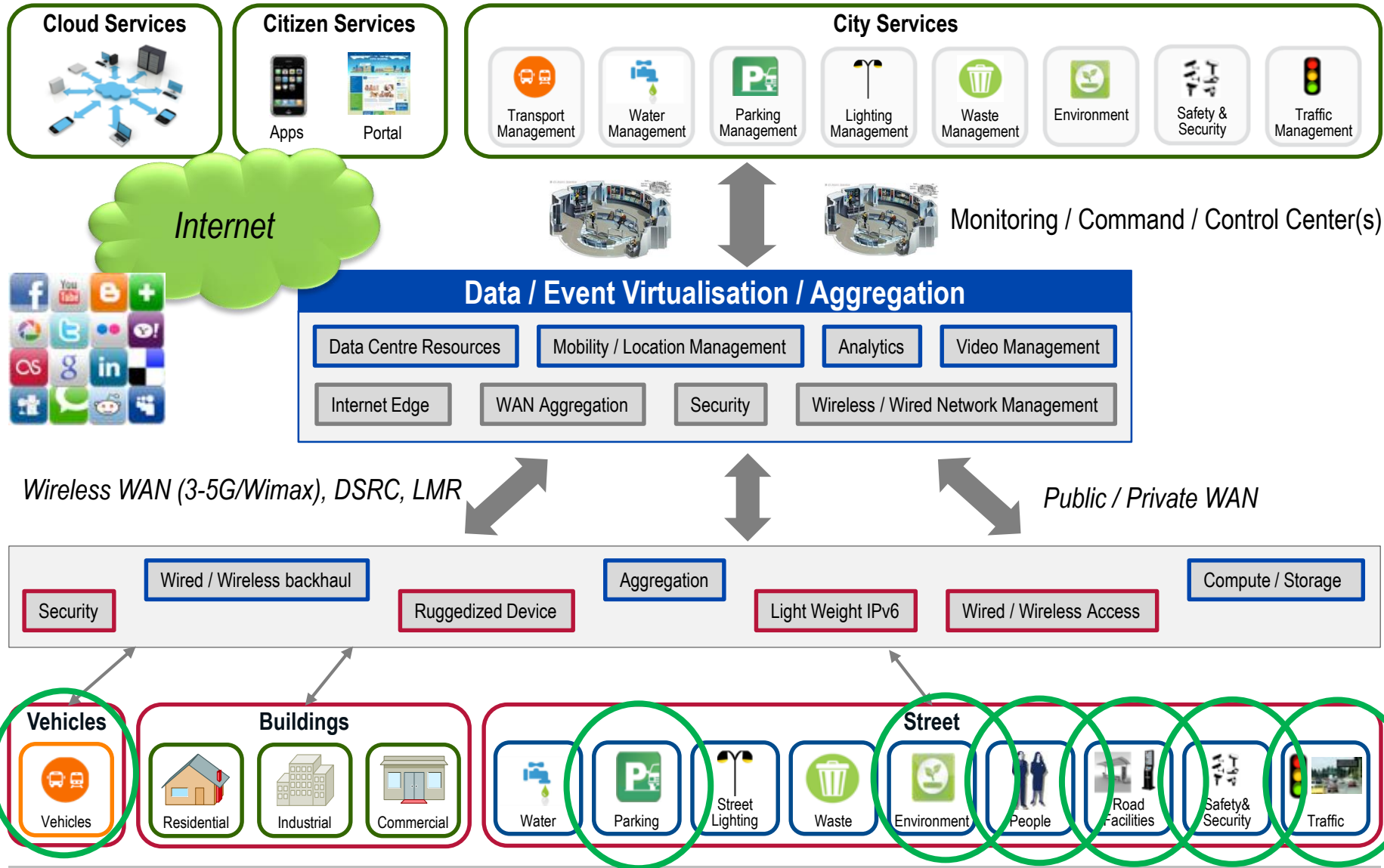
## First Four Waves: Mechanical Metabolism (“Public Works as Platform”)

- Water and Waste
- Transportation
- Energy
- Communications

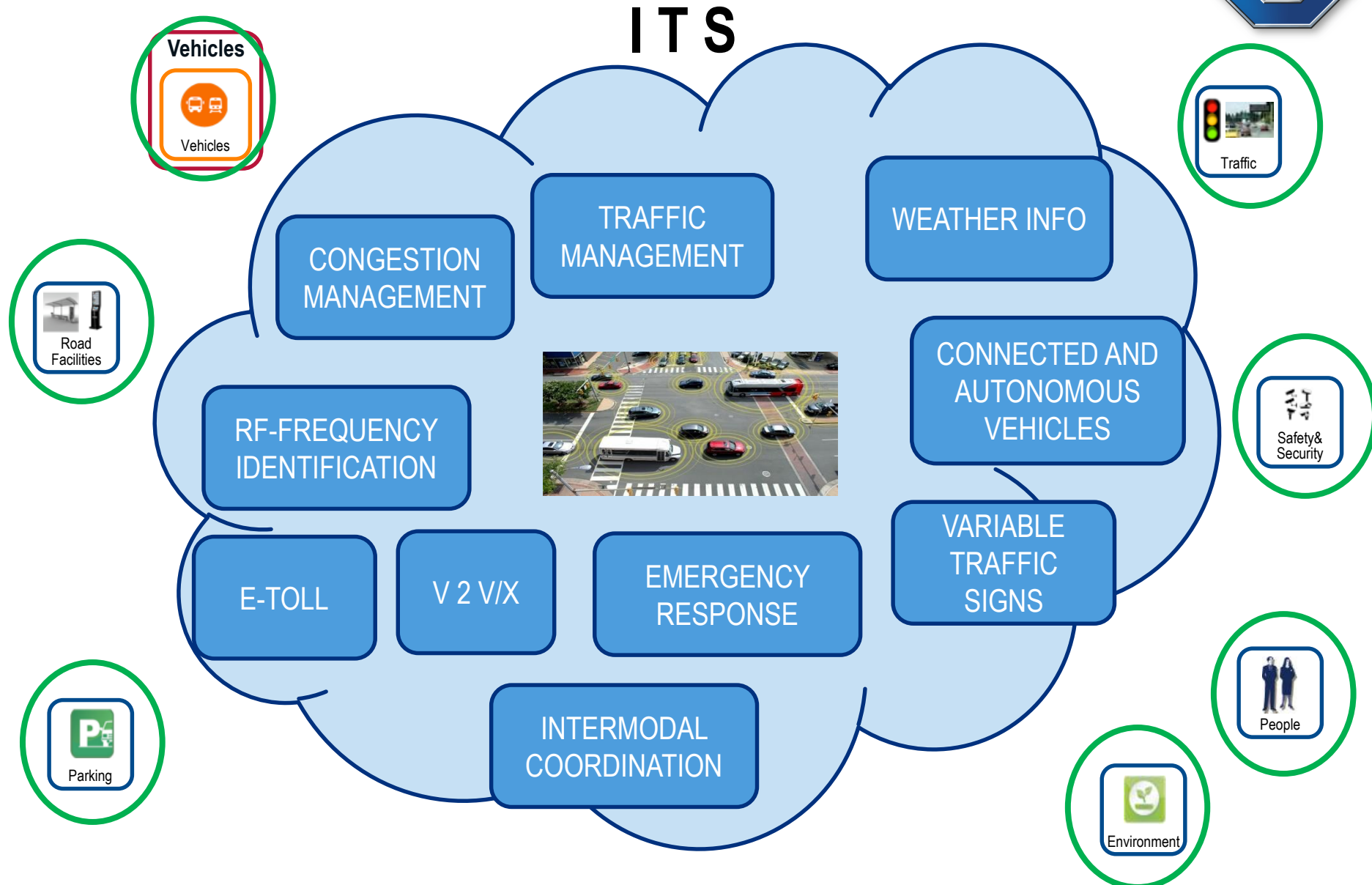
## Fifth Wave: Digital Nervous System (“Network as Platform”)



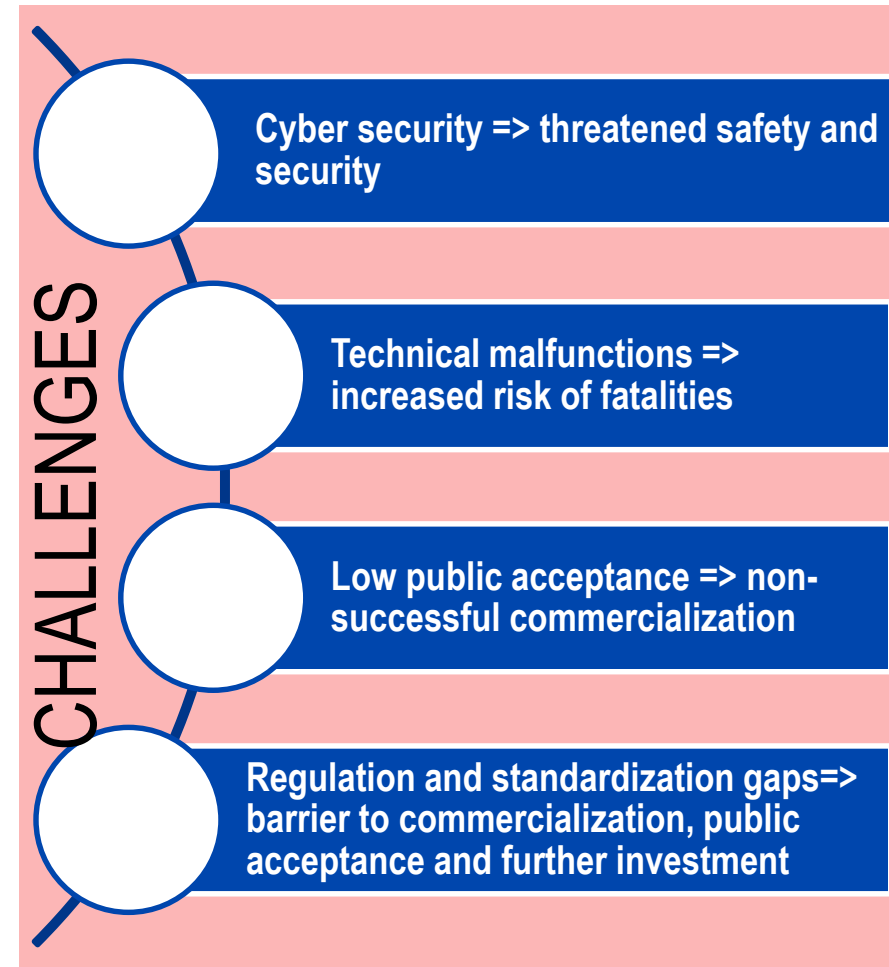
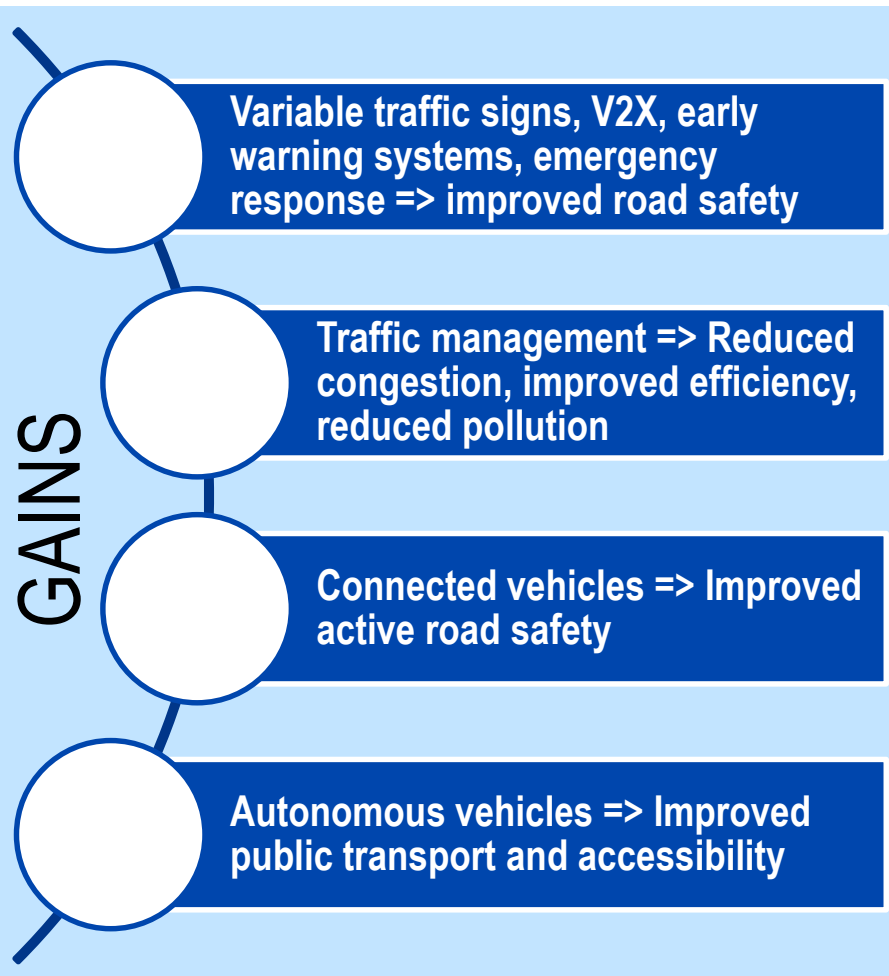
# What does this mean for Smart Mobility? – It is embedded in the city



# Telecommunications – Backbone of Smart Mobility (ITS)

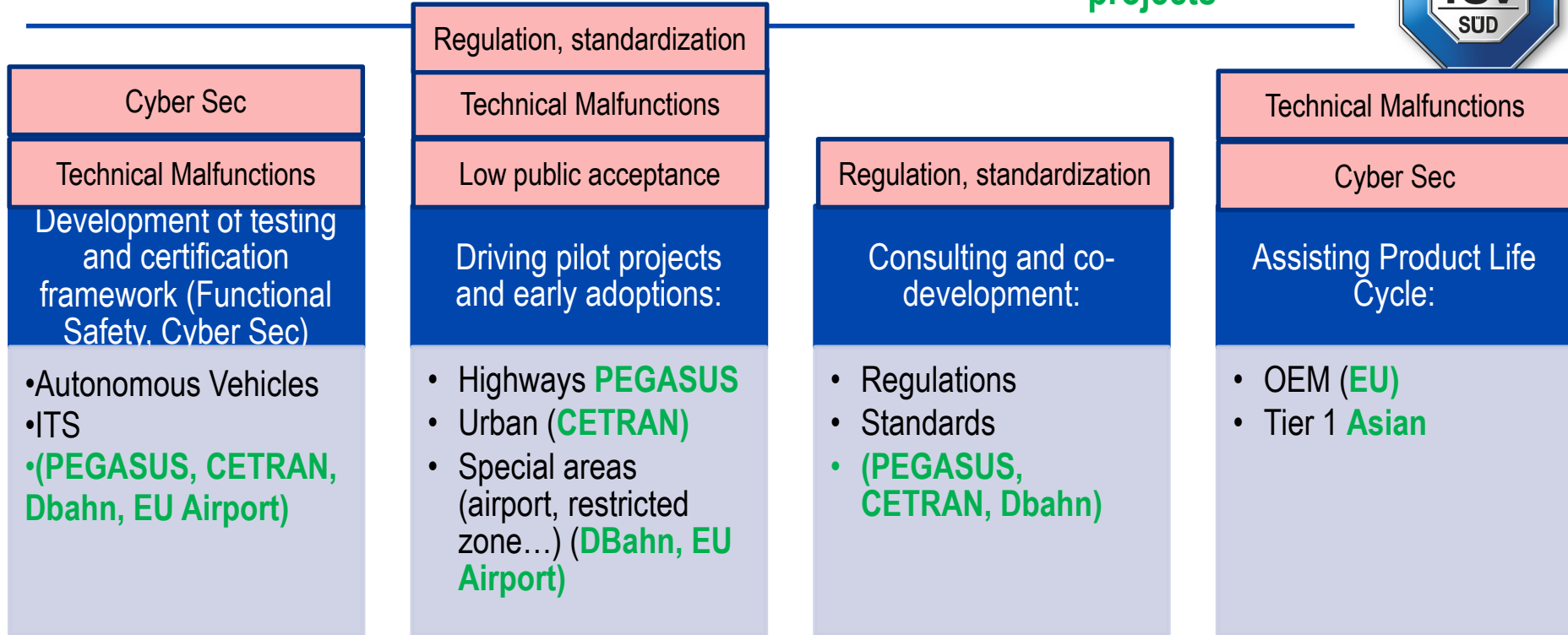


## User-centric transport - Smartphone as mobility centre, personalized transport Sharing economics - Mobility on demand Solution to public urban and suburban transport



# What TÜV SÜD is Doing to Overcome Challenges?

TÜV SÜD  
projects



- ✓ Verification and validation of functional safety – commercialization of the technology
- ✓ Risk analysis and contention plan for cyber security – assuring holistic safety and security
- ✓ Consultation for early adopters and new business models – business plan verification and rollout
- ✓ Contribution to standardizations – foundation for innovation adoption and mass deployment of technology
- ✓ Contribution to regulations – enablement of new business opportunities and market development
- ✓ Advisory as independent third party – contribution to all ecosystem players and newcomers

“The proliferation of new technology can only happen if it can be used safely & securely”



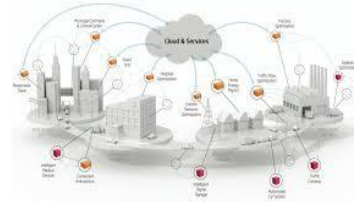
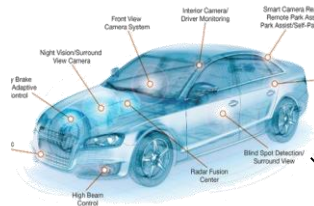
- Worldwide first operational centre of its kind (2<sup>nd</sup> CoE opened in Munich)
- Over three years:
  - Investment >\$40 million
  - over 50 experts in Singapore
- Aligned with Singapore's Smart Nation vision:
  - integrate technology into the management of infrastructure and industries to
    - improve the lives of citizens,
    - drive labour productivity
    - achieve greater operational-efficiencies

<https://www.edb.gov.sg/content/edb/en/news-and-events/news/2016-news/tuv-sud-opens-s40m-digital-service-centre-of-excellence-in-singapore.html>

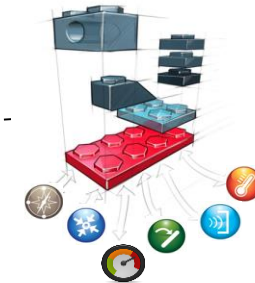
- Provide innovative solutions around **Safety, Security, Reliability, Efficiency and Interoperability** for complex systems
  - Smooth incorporation of new IoT based products, procedures, subsystems
  - **Enabler for Digital Transformation**
- Coming from the Segments, translate existing component knowledge to the **system level** and deliver **End-to-End Safety & Security Services**



**Autonomous Vehicles:**  
Safety and Cyber Security for AVs. Testing and Certification framework.



**Smart Sensor Lab**  
Self calibrating / healing and realtime validation of sensor networks



**IoT Platform**  
Safe and secure data handler, data analytics



**Smart Lifts**  
Make smart lifts safe, secure, reliable and efficient.



**CoE Digital Service**



**Industrie 4.0**  
Make I4.0 and robotics applications robust, interoperable and available. Assess Industrie 4.0 Maturity



**Smart Buildings**  
Requirements definitions, advisory for technology integration, safe and secure operation.



**Smart Healthcare**  
Make smart healthcare installations reliable, safe and secure.



**Smart Rail**  
Risk based smart maintenance, Test & certify automatic train operation, Certify cyber security



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## TÜV SÜD Digital Service CoE Singapore

Your partner on the way to  
excellence

[www.tuv-sud.com/digitalservice](http://www.tuv-sud.com/digitalservice)



**Dr. Andreas Hauser**

Director, CoE Digital Service  
TÜV SÜD, Singapore  
[andreas.hauser@tuv-sud.sg](mailto:andreas.hauser@tuv-sud.sg)



**Eley Querner**

VP, CoE, Digital Service  
TÜV SÜD Asia Pacific  
Singapore  
[eley.querner@tuv-sud.sg](mailto:eley.querner@tuv-sud.sg)

