# IoT/ M2M STANDARDISATION - The Indian perspective

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# AGENDA

- India's unique challenges
- The role of Standardisation

# INDIA's SMART CITY CHALLENGE
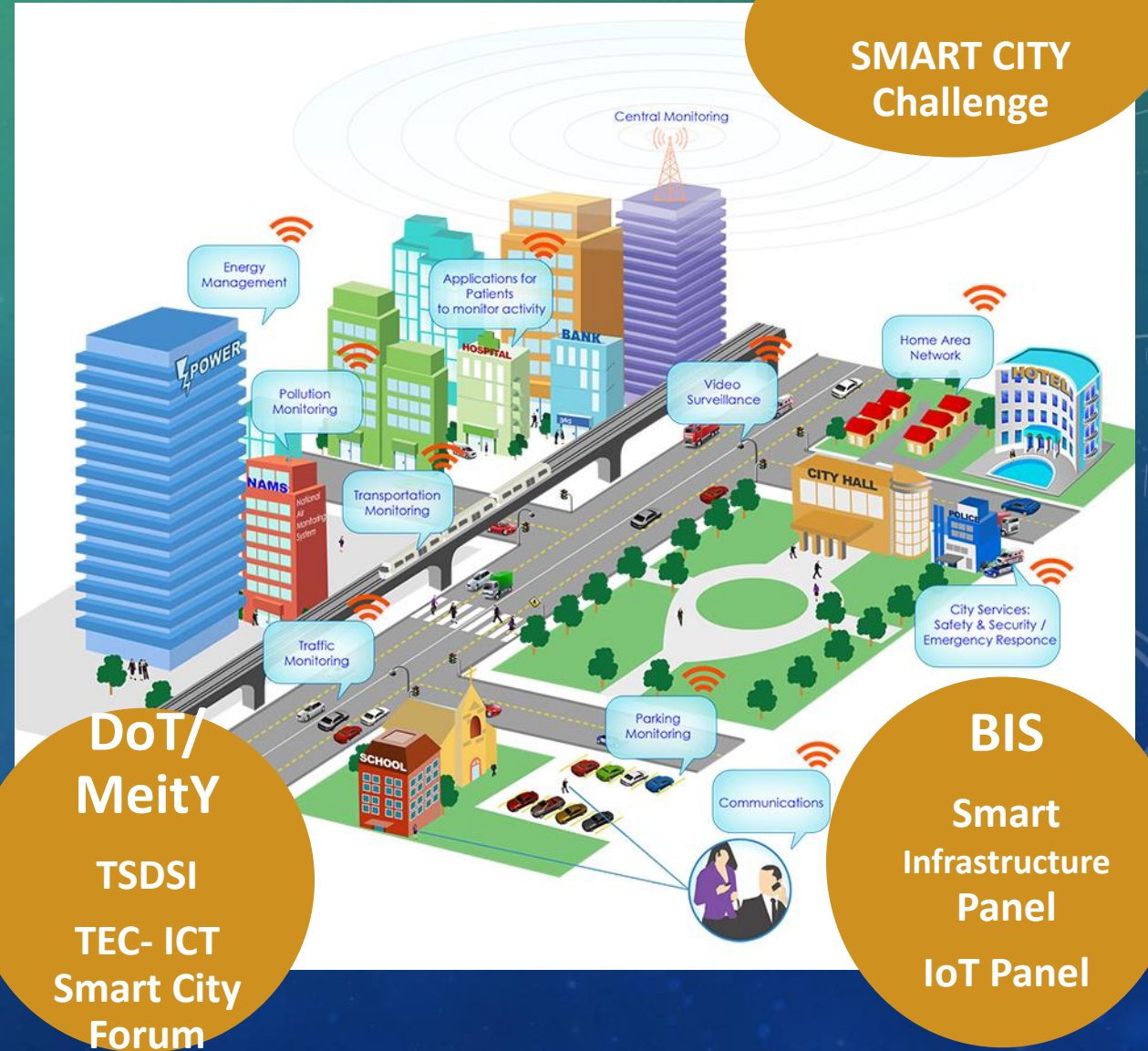
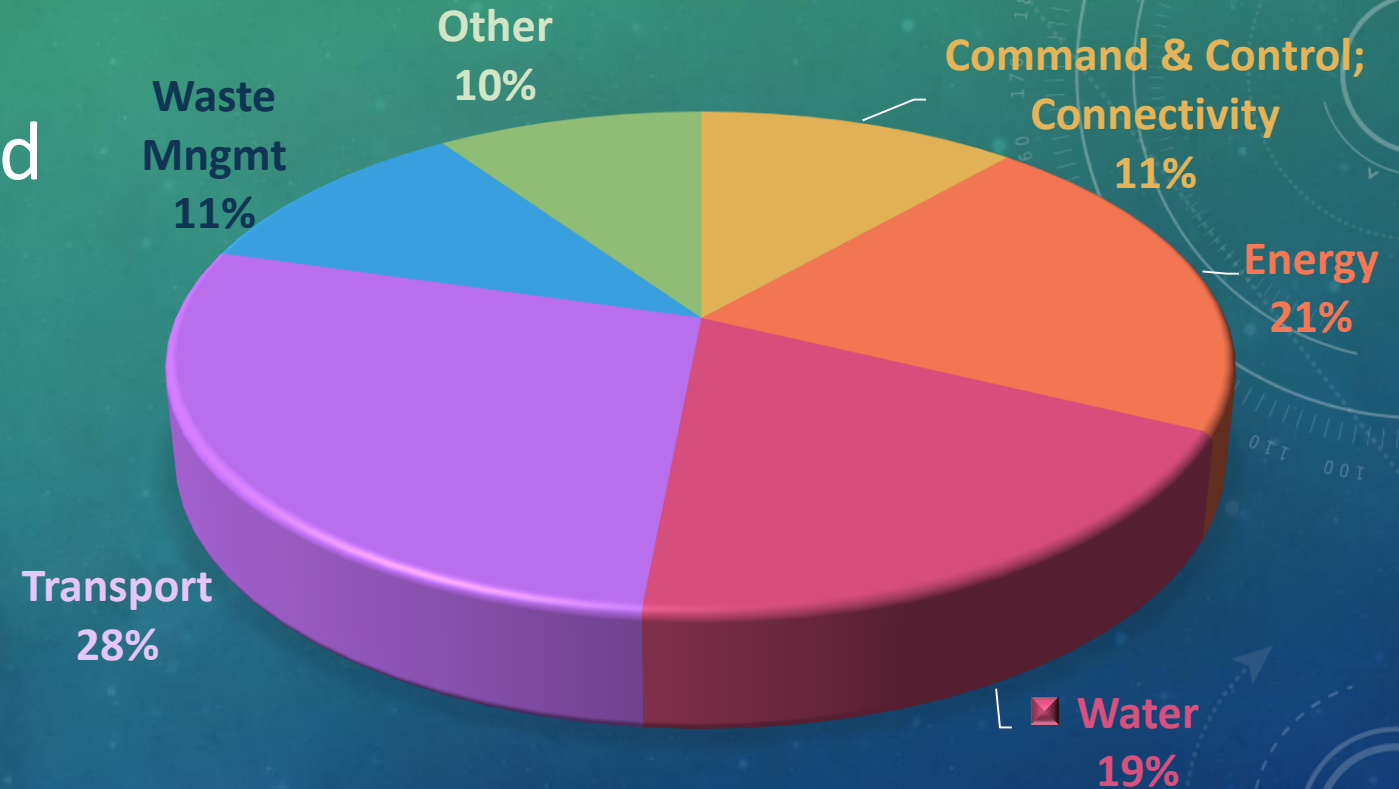# Smart City Solutions in India

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"99 smart cities have been selected and to be allocated Rs 2.04 lakh crore ($30 B)

**2020: $1.5 trillion market**

**Other 10%**

**Command & Control; Connectivity 11%**

**Waste Mngmt 11%**

**Energy 21%**

**Transport 28%**

**Water 19%**

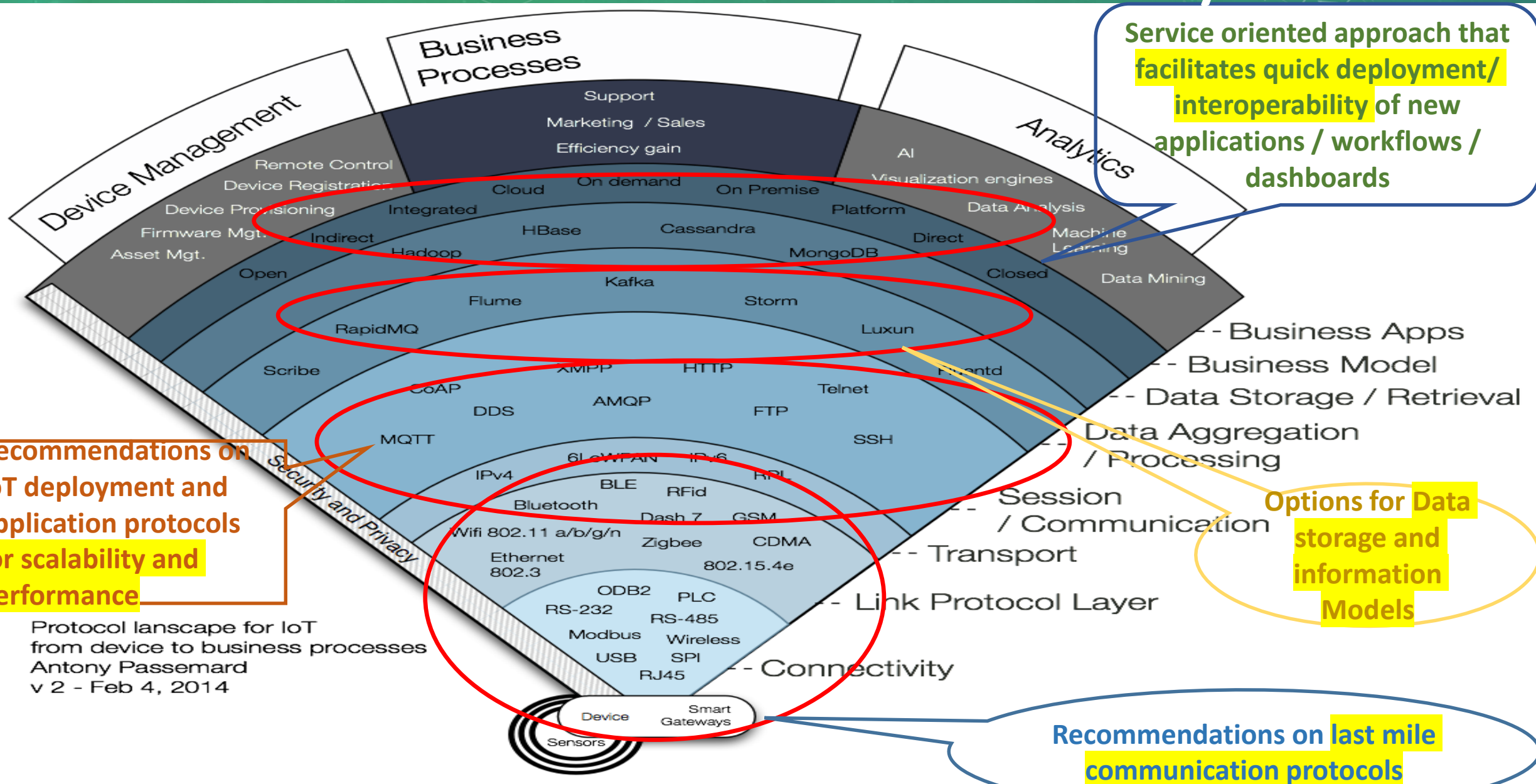**MoHUA has released Solution Exchange for Transformation of Urban India**

**Integrated Command and Control Center: Maturity Assessment Framework**

**Smart cities Promoting Innovation Research and Incubation in Technology (SPIRIT)**

**DataSmart Cities: Empowering Cities through Data**

**QUEST for an Interoperable Common Services Platform – Is oneM2M the answer?**

# Dilemma for the SMART CITY SPV today



Protocol lanscape for IoT
from device to business processes
Antony Passemard
v 2 - Feb 4, 2014

**Service oriented approach that facilitates quick deployment/ interoperability of new applications / workflows / dashboards**

**Recommendations on IoT deployment and application protocols for scalability and performance**

**Options for Data storage and information Models**

**Recommendations on last mile communication protocols**

IoT SDOs and Alliances Landscape (Vertical and Horizontal Domains)

**F**orce fitting solutions - without factoring in India specific needs

**A**dvancements in technology - rapid and disruptive

**I**nappropriate last mile solutions - Deployment diversity

**L**imited Tech know-how by Administrators and City Officials

**U**nstandardised disharmony - No common framework and architecture

**R**estricted, closed solutions – vendor lock-in, proprietary interfaces

**E**xamples of failure due to technology, business & functional misalignment - Nirbhaya tender cancellation, Bangalore Traffic+Metereology

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# AGENDA

- India's unique challenges
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Global Standards Collaboration (GSC), a high-level gathering of world's leading ICT) standards organizations,

# TSDSI's contributions & engagements at oneM2M

| CONTRIBUTIONS | ENGAGEMENTS |
|---|---|

**CONTRIBUTIONS**

- TSDSI has 5 IMs for oneM2M – More in pipeline.
- C-DOT developed a Common Service Platform based on oneM2M . Made 100+ contributions & participated in Inter-op events.
- ***<u>TSDSI transposed Release 2 (2017) – DoT approval as National Standard in process</u>***
- TSDSI to Transpose Release 3 shortly (Published by oneM2M in May 2019)

| Working Groups (oneM2M) | Contributions |
|---|---|
| Architecture (ARC) | 21 |
| Protocols (PRO) | 64 |
| Security (SEC) | 2 |
| Testing (TST) | 3 |
| **Total** | **90** |

**ENGAGEMENTS**

- Indo EU collaboration- Hackathons and Tutorials
- TP # 31 in Bangalore during 19th to 23rd Sept 2017 with over 50 Global participants
- Industry Day with 90+ participants & 20+ global & Indian speakers
- TSDSI contributing man days to MARCOM & Work Program activities remotely
- TSDSI TEC CDOT studying over sixty Global installations based on oneM2M
- ***<u>TSDSI to host TP # 42 in September 2019 in Hyderabad with Industry day and inter-op event</u>***

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# Standardization @ TSDSI

## Standards Life Cycle



### PRE-STANDARDIZATION

- GOVERNMENT POLICY & MARKET REQUIREMENTS
- COLLABORATION WITH SDOs & INDUSTRY BODIES
- RESEARCH & INNOVATION

TECHNOLOGY ROADMAP

- CONSULTATIONS
- REPORTS
- WHITE PAPERS

NIP
NEW ITEM PROPOSAL

- COLLABORATIVE RESEARCH PROPOSALS
- TECHNOLOGY PLATFORM PROPOSAL

### STANDARDIZATION

STUDY GROUP ▸ NEW ITEM PROPOSAL

WORK ITEM | STUDY ITEM

DRAFT STANDARD | REPORT

IP DECLARATION

TSDSI MEMBERS' CONTRIBUTIONS → 3GPP oneM2M → TRANSPOSITION

GENERAL BODY
TSDSI STANDARD

INTERNATIONAL STANDARD

CANDIDATE FOR NATIONAL STANDARD

### POST-STANDARDIZATION

- EVANGELISATION
- MARKET ADOPTION
- COMPLIANCE/ CERTIFICATION

- STANDARDS REPOSITORY
- UPDATES
- END OF LIFE

- COMPONENTS & PRODUCTS
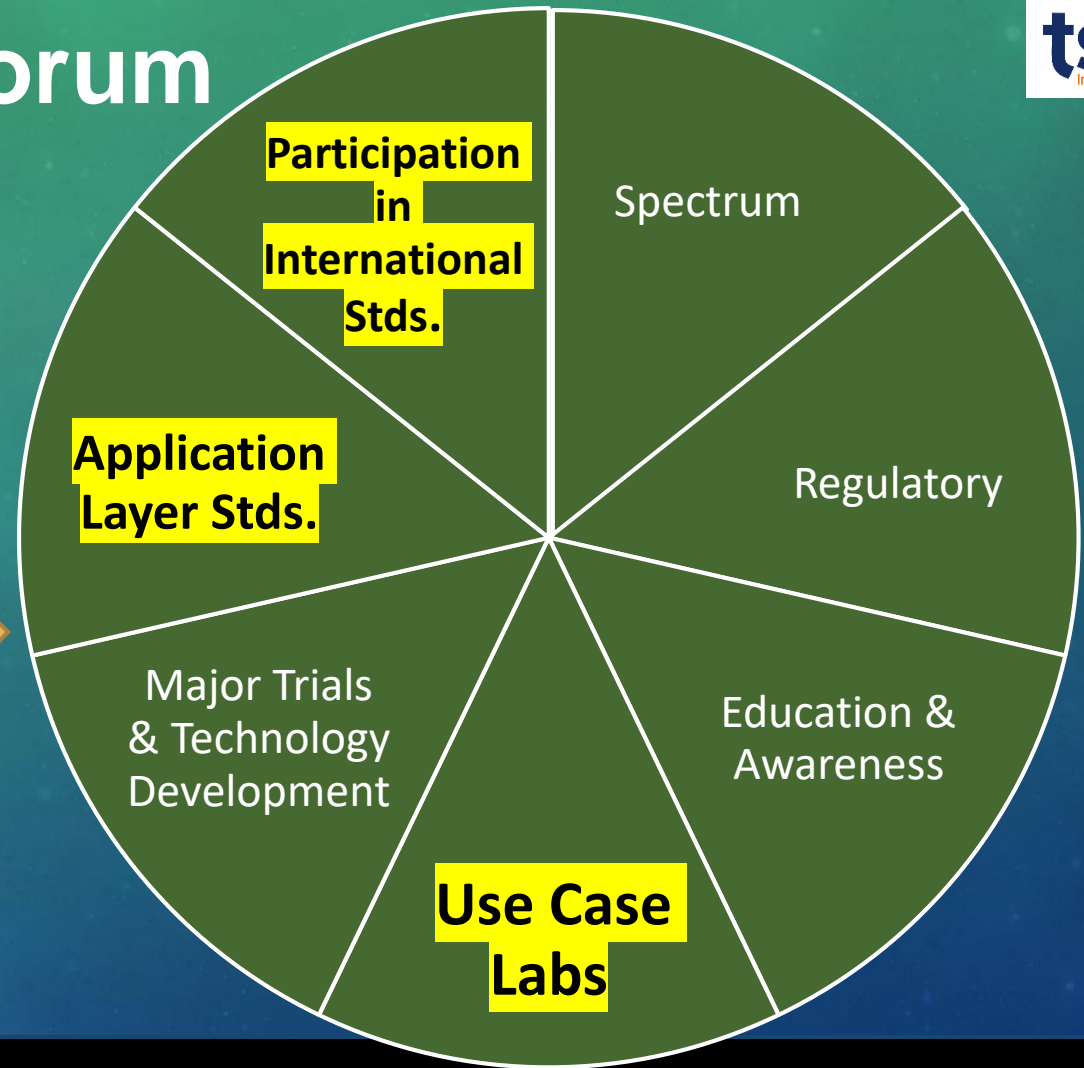- SYSTEMS & SERVICES
- END TO END SOLUTIONS

## Study Group- Networks

- CPRI FrontHaul
- Channel Characteristics : 60GHz for 4G/5G backhaul
- Enablers for Private Networks
- NB-IoT Extension
- Broadcast offload
- Spectrum Studies
- IMT2020 (5G) technologies ; 3GPP Release 17

## Study Group- Services & Solutions

- Cloud Interoperability and Portability
- Public Protection and Disaster Recovery
- Dual SIM Services
- Support for Indian Languages
- Information Centric Networking
- UAV/Drone Communications and Services
- M2M/IoT
- Security and Privacy
- oneM2M

# 5G India 2020 High Level Forum



Making India 5G Ready

**Participation in International Stds.**

**Application Layer Stds.**

Spectrum

Regulatory

Major Trials & Technology Development

Education & Awareness

**Use Case Labs**

5G technology has the potential of ushering a major societal transformation in India by enabling rapid expansion of the role of information technology across manufacturing, educational, healthcare, agricultural, financial &social sectors.
**India must embrace this opportunity by deploying 5G networks early, efficiently, and pervasively, as well as emerge as a significant innovator and technology supplier at the global level.**
Emphasis should be on 5G touching the lives of rural and weaker economic segments  to make it a truly inclusive technology.

# USE CASE LABS OBJECTIVES & OUTCOMES

Study and Analysis of India specific Use Cases → Development of Requirements, SLAs and Test Cases → Market Enablement, Accelerated deployment, Research, Innovation, Standards, Applications, Services & Products

## - FRAMEWORK for the Labs :

| USER GROUP | TECHNOLOGY GROUP | FACILITATORS | ACTIVITIES |
|---|---|---|---|
| End User Ministries | Technology Ministries | Govt. Agencies | DEMOs & Simulations : Hands-on experience for USER Group |
| TSPs/ ISPs | Vendors, OEMs; Start-ups | Global Partners | Study, analysis and modelling of India Specific Usage Scenarios, challenges & Use Cases |
| Domain/Mngt Institutes; Use Case Experts | Technology Institutes; Researchers & Innovators | Professional Bodies | Proof of concept testing, Interoperability and pilot testing |

## SCOPE - In line with national initiatives like Digital India, Smart Cities etc. and the focus areas in 5G :

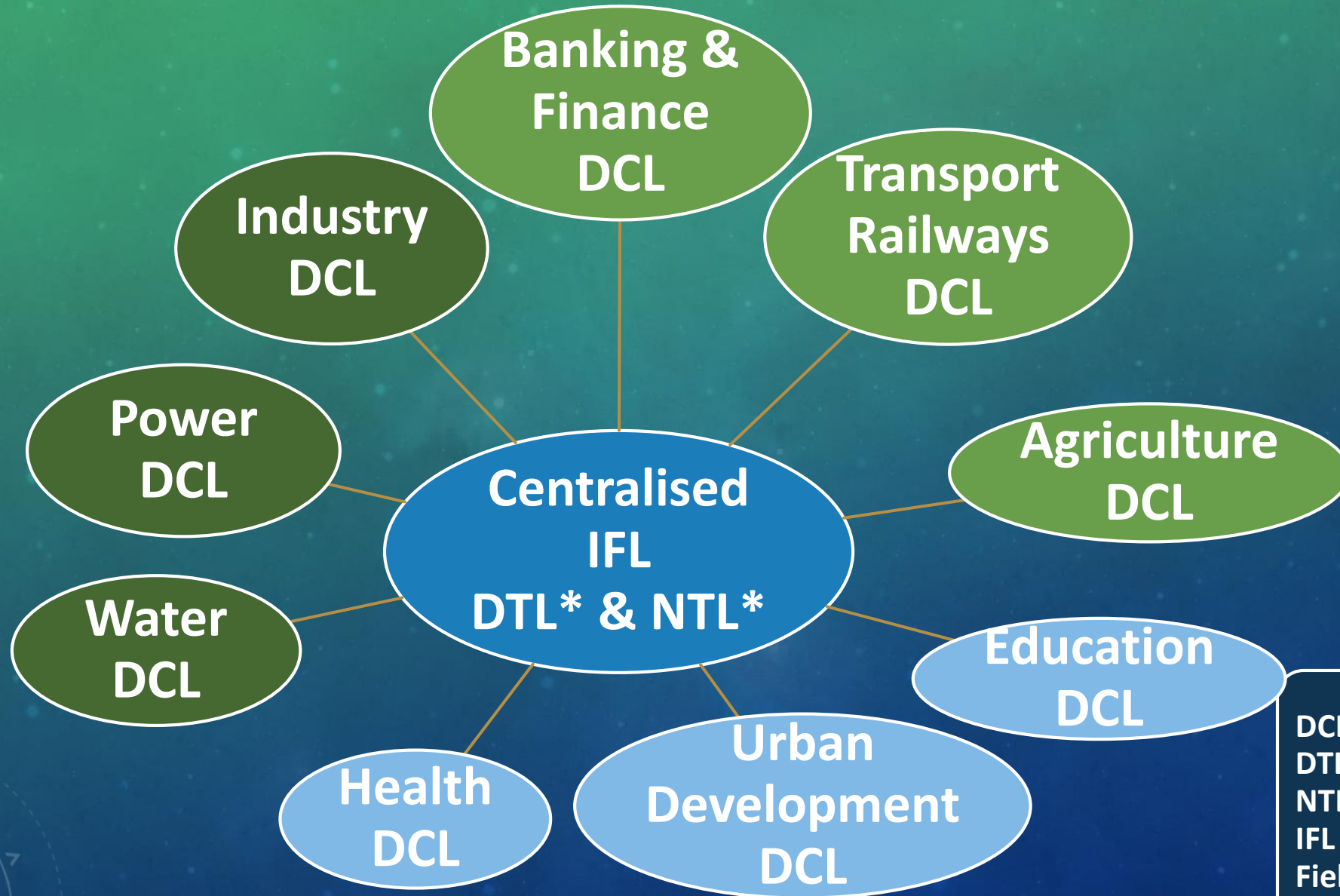| | | |
|---|---|---|
| SMART COMMERCE /BANKING : Department of financial services, LAB @ IDRBT | INTELLIGENT TRANSPORT : Ministry of Railways Ministry of Road Transport & Highways | SMART AGRICULTURE: Department of Agriculture & Farmers Welfare |
| SMART CITIES : Ministry of Housing & Urban Affairs | SMART GRID : Ministry of Power | SMART WATER : Ministry of Water Resources, River Development & Ganga Rejuvenation |
| INDUSTRY 4.0 Department of Industrial Policy and Promotion | SMART EDUCATION : Department of Higher Education Department of School Education | SMART HEALTH: Department of Health & Family Welfare |

# NETWORK OF LABS



Banking & Finance DCL

Industry DCL

Transport Railways DCL

Power DCL

Centralised IFL DTL* & NTL*

Agriculture DCL

Water DCL

Health DCL

Urban Development DCL

Education DCL

First Set of LABS
Second Set of LABS
Third Set of LABS

DCL - Demo and concept Lab
DTL - Device Testing Lab
NTL - Network Testing Lab
IFL - Interoperability and Field Scenario Test Lab

# Application Layer Standards

## DOMAIN Working Groups

| Smart Cities | Finance | PPDR | Health | Agriculture | Education | Utilities | Transport | Industry |
|---|---|---|---|---|---|---|---|---|

**Technology Study Groups**

**Global SDOs**

- Immersive experience AR/VR
- Artificial Intelligence/ Machine Learning
- Automonous Systems
- Web Technologies
- Integrated Data Exchange
- Security and Privacy
- IoT /M2M Common Services Layer
- Cloud Computing

3GPP
A GLOBAL INITIATIVE

oneM2M

ISO IEC

IEEE

ITU International Telecommunication Union

**OPEN ++**

# STRENGTHENING THE GLOBAL FOOTPRINT

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**2019**

3GPP SA6 CHAIR

**2020**

3GPP PCG Chair

**2021**

5+ Chair /Vice Chair roles

**2022**

*10+ Chair/Vice Chair Roles*

20% CONTRIBUTIONS in PLENARIES

| 10 experts | 20 experts | 50 experts | 100 experts | 200+ experts |
|---|---|---|---|---|

( 50% of them contributing consistently in GLOBAL SDO meetings)

# Opportunities for members @ TSDSI

- Pre-standardisation :
  - Govt Consultations – *NDCP, Strengthening the STDs Framework*
    - 5G India2020 Forum – Use Case Labs; Education, Awareness & Promotion
    - Spectrum for 5G – *White paper*
  - Numerous workshops - *Smart City, Security, PPDR, Cloud Computing etc.*
  - Global Collaborations – Indo EU, Indo Taiwan, IEEE 5G World Forum
  - Conferences, tradeshows – IMC, World Telecom Day, NCC, COMSNETS
- Standardisation :
  - Participate in Standardisation Roadmap Committee
  - Participate in SG/WGs - Submit your use cases & innovations as NIPs, Contribute to ongoing Work Items
  - Collaborate & Participate in 3GPP , OneM2M , ITU- R/T.

STANDARDS are the Collaboration piece of "Co-opetition"
The TOOL is Consensus Building,
&
It is a lot of fun and learning in an open, fearless forum
THANK YOU

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1. TSDSI GC and Members
2. TSDSI Secretariat
3. 5G INDIA2020 HLF Task Forces          PRESENTED in MY PERSONAL CAPACITY

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