

# Intelligent Urban Exchange: IoT Analytics Helps Cities Achieve Social, Economic and Operational Sustainability

## IoT Analytics for Smart Cities and Businesses

Digital Software & Solutions



As the world's urban population continues to grow at unprecedented rates, sustainable cities have become a necessity. Managers, planners and administrators are struggling to keep pace. Crucial functions and services must be responsive, flexible, and integrated as never before to effectively serve citizens, commerce, and employees amidst such expansive growth.

TCS Intelligent Urban Exchange (IUX) is a unified Internet of Things (IoT) analytics platform offering both City and Workplace Resilience Command Centers and pre-built multi-functional use cases for water, energy, transport, and workplace management. It provides a connected, optimized ecosystem for enhanced city sustainability, world-class citizen experiences, and safe workplaces.

## Smart City 2.0 / Smart Workspaces

City leaders are challenged to address urbanization and deliver superior services to citizens while managing limited resources. They must leverage data from multiple Smart City 1.0 sources such as IoT infrastructure and siloed systems to provide services that promote sustainable living, economic development, and a superior citizen experience

Additionally, cities and businesses today are seeking ways to provide cost-effective sustainable services, real-time incident responses and more safe, resilient connected environments.

City and business leadership is turning to technology to achieve more viable, modernized, and sustainable urban living conditions and workspaces. Smart City and Smart Business initiatives combine data from multiple domains, systems, and IoT devices and run advanced analytics that support real-time decision-making and actions at strategic and operational levels. TCS' Intelligent Urban Exchange (IUX) is an IoT enabled, insight-centric analytics solution designed to address these Smart City and Smart Workspace challenges.

## Why IUX

TCS' IUX is a modular, integrated software solution that helps cities and businesses accelerate the implementation of smart IoT initiatives, easily and cost-effectively – enabling them to achieve greater levels of social, economic and operational sustainability and safety. TCS IUX provides:

### Visibility Across City and Business Functions

TCS IUX provides managers and administrators an intelligent, connected ecosystem to deliver more interactive public and business services, advanced incident response support, and effective citizen engagement to support more desirable, safer urban communities and workspaces.

### Faster and Better Decision Making

City and business management must coordinate timely multi-departmental responses to sudden incidents. At such times TCS IUX provides the prescribed initiation and execution protocols for

effective crisis mitigation actions across agencies such as energy, water, transportation, and operations.

### Higher Infrastructure Up-time, Fewer Incidents

TCS IUX meets cities' and business's constant and growing need to accurately predict physical system maintenance needs and potential failure points. This allows entities to proactively apply the right resources to the right assets and maintain healthy, reliable, and resilient infrastructures.

### Simplified, Centralized View of Key Infrastructure

TCS IUX allows city and business managers the means by which they can see an intelligent overview of their IoT infrastructure utilization and output to holistically understand and address sustainability and to improve citizen and employee satisfaction and safety. TCS IUX also provides a clear, intuitive view of core systems and connected devices. This enables operations, engineering, and safety staff to monitor performance, load balances and alerts through real-time dashboards that integrate key KPIs into a single view of entity-wide systems and IoT device metrics.

## IUX - Our Solution

TCS IUX empowers management to optimize city and company-wide systems, processes and assets and can run in either a cloud or on-premise environment. It supports incident management, addresses key system sustainability and efficiency challenges, and enables extensive citizen and employee engagement.

Additionally, TCS IUX is based on a unique city-centric analytics platform that incorporates pre-built use cases for key city and business functions while supporting additional analytics use custom cases. The flexible, open source components and packaged use cases enable fast, cost-effective deployments with maximum ROI.

TCS IUX offers five innovative use case-based modules including: City Command Center (CCC), Intelligent Transportation, Intelligent Energy, Intelligent Water, and Workplace Resilience.

## IUX for Workplace Resilience

TCS' IUX for Workplace Resilience is an integrated analytics platform with a business command center that helps enterprises coordinate and optimize responses to crises such as pandemics, natural disasters, and other major disruptions to business.



By ingesting and analyzing all types of data, IUX for Workplace Resilience provides leaders with an insights-driven business command center to accurately determine the extent and depth of specific incidents and enhance real time decision making at the point of need. Features include:

### Smart Workplace Protection

Allows organizations to monitor site level infection risk and take immediate action, determine optimal workplace occupancy, and identify alternate movement flows to avoid congregation and identify at risk individuals

### Smart Comprehensive Regulatory Compliance

Ensures regulatory measures are followed. Our solution makes it easier to comply with regulations and record and report to local administration.

### Smart Operational Agility

Empowers organizations to profile risk at specific site locations based on variables such as infection, workforce impact and client relationships. What-if analysis' predict risk enabling entities to tailor proactive business continuity and plans.

## IUX City Command Center

IUX CCC makes city operations and services more resilient and intelligent by breaking down data and operation silos across multiple city domains for more effective situational awareness and better collaboration and coordination of city resources and services. CCC features:



### City Data Platform

Open source platform that ingests multi-domain city data providing insights spanning departmental data boundaries through platform-based City Data Model

### City Command Center

Addresses emergency situations needing cross domain coordination with multi-domain event data capability Configurable KPI dashboard provides maximum flexibility for vital city metric visibility

### Integrated City Operational Dashboard

Provides visualization, monitoring and analysis of the impact of city-level events and alerts coming from various city operations systems and sub-systems

### City Emergency Response Module

Automates and accelerates multi-departmental response efforts across domains such as energy, water, and transportation.

## IUX for Intelligent Transportation

TCS' IUX for Intelligent Transportation helps cities enhance and improve bus services and passenger experience. It provides real-time and trend views of wait times, queue build-up, and ridership across various routes and times.



TCS IUX for Intelligent Transportation enables city administrators to decrease wait times, optimize bus frequency and capacity across routes, and increase revenues through greater ridership and improved utilization. Features include:

Comprehensive real-time transit metrics analysis Provides platform analysis of static open city data and real-time sensors, bus telematics systems, devices and wireless access points provide a view of the city's bus services

### Insights from rider pattern analysis

Delivers real-time analytics from citizen movement and demand patterns designed to give insights that allow transportation operators to anticipate and respond to citizens' transportation needs

### Recommended Transit Actions

Collects, filters, and analyzes data from multiple sources to generate real-time and trend alerts enabling fast response remediation

### Multi-modal Transport Optimization

Optimizes operations across all modes of public transport based on multi-modal passenger demand and reduces wait times for citizens at potential choke point in the bus network.

## IUX for Intelligent Energy

TCS IUX for Intelligent Energy is an integrated, end-to-end streetlight optimization system based on real-time analytics. It enables cities to meet their sustainability targets through integrated energy efficiency planning and empowering

digital participation by citizens in sustainability initiatives. Features include:



- **Adaptive Streetlight Optimization**  
Delivers real-time performance monitoring and analysis of streetlights on a pole-by-pole, street-by-street or sector-by-sector basis. Permits proactive management with real-time recommendations and actions based on pedestrian traffic patterns or special events (concerts and sports events for example). Offers plug and play integration with most edge devices and luminosity sensors.
- **Building Energy Optimization**  
Analyzes and optimizes HVAC operations for various sections of a building based on predicted occupancy patterns. Includes energy benchmarking and root cause analysis that benchmarks the performance against the community performance. Allows plug and play integration and compatibility with existing standards-based building control systems.

## IUX for Intelligent Water

TCS IUX for Intelligent Water Management collects and analyzes data from multiple sources—flow, pressure, and level sensors and SCADA, meter data management systems, water

management systems, Geographic Information Systems (GIS), enterprise systems, and Leak Detection systems (LDS)—to generate real-time insights and next step recommendations. This solution helps governments, utilities, and water technology partners adopt a proactive approach to water loss management. Features include:

- **Goal Based Water Loss Management**  
Analyzes water flow balance metrics to reduce water loss (over/under flow rates) using goal-based process.
- **Leak Detection**  
Supplies water system infrastructure leak detection mitigating significant water loss through concealed/slow leakage as well as catastrophic system failure using patented leak detection model.

- **Pressure optimization**  
Provides water system managers recommendations on optimal pressure settings at various water network points based on usage patterns ensuring optimal flow and reducing spikes in the system.

## Benefits

TCS IUX helps cities and businesses:

- **Optimize Cross-domain Management**  
Remove departmental silos through integrative approach with the city as a platform, or infrastructure as a platform for businesses, to deliver a unique view of all events across city and companies for effective management.  
  
Maximize reach of existing information systems resources by integrating the IoT infrastructure to the city / business platform.  
  
Optimize cross-domain coordination of key functions and resources, proactively mitigate incidents, and provide a safe, clean, and efficient urban and business environment.
- **Lower OpEx and CapEx**  
Collective innovation and robust ROI realization due to easy city and business data and intelligence availability across departments and multiple stakeholders.  
  
Reduce capital expenses with As-a-Service subscription pricing.
- **Accelerate Implementation and Benefits Realization**  
Integrate key data into the data model using REST APIs to speed integration, including emerging IoT sources.
- **Pre-integration with Geo servers**  
Easy data transformation and exposing the data to develop custom applications.

## The TCS Advantage

- **Industry solutions:** Our software has been created by experts with proven experience in city operations. Our City Command Center and City Data Platform city data model incorporates the latest technology innovations and expertise from TCS' R&D.
- **Faster deployment:** IUX's open standards platform enables faster solution implementation and integration with your enterprise's existing systems. APIs allow for the rapid building and integration of custom applications.
- **Lower cost of ownership:** IUX's modular architecture lets you buy only what you need now with the option to grow as your needs mature. The IUX applications also extend across additional domains such as water and transportation for collaborative and integrated city initiatives.
- **Simplified business and engagement models:** As-a-Service subscription pricing does not require capital outlay. IUX applications are accessible online, on desktop or on mobile devices.
- **Experience Certainty commitment:** Our corporate culture is one of superior delivery and customer certainty. Our consulting clients know the quality of our work, and now, companies can get that same level of quality, speed and certainty with our Digital Software and Solutions offerings.

## Awards & Recognition

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### About TCS Digital Software & Solutions Group

TCS Digital Software & Solutions Group delivers on the promise of Connected Consumer Intelligence™. Our experience working with the world's most successful enterprises drives the development of integrated software that helps them meet the higher expectations of today's wired consumers and citizens. With TCS DS&S Group software, organizations can design experiences that logically connect every touch point of the consumer's digital and physical journey.

### To know more

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Blog: [Catering to the Connected Consumer](#)

### About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

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