BUSINESS VALUE IN TRANSPORT AND LOGISTICS IN MAKING CITY SMARTER

City
Transportation
Logistics
Enforcement
Our vision on Digital City

Technology enabled sustainable, competitive, participative, creative, and innovative citizen-centric smart city.

To enable such a city, DXC uses different types of technologies to collect, use and analyze the data to manage assets and resources efficiently.
Digital City - Customer perspective

Governments have to execute strategy through policies and prove the effectiveness.

City can only grow within boundaries (Safety, environment, pollution, health).

Stakeholders need to align their demand in a city with strategic goals and limits.

Coexistence within boundaries of conflicting interests.

Digital transformation with positive impact on business, logistics, health, safety.

Client Strategy
- Challenges
- Desired outcomes
- High level solutions
- Future roadmap

Transform to business value
- Business relevance
- Business value
- Improvement steps

Link & Correlate
- Relate and link different entity measurements
- Relate with traffic and movement patterns
- Predict and forecast

Execution plan
- Desired situation
- Standard building blocks
- Integration into Ecosystem

Actual Measurements
- Real time measurement (vehicles, speed, weight, vibration, IoT, etc.)
- Interface to Central Intelligence
- Storage to support analytics

DXC Proprietary and Confidential
Smart Solutions

Digitally transforming Smart City
Spot Speed and Red Light Enforcement

Detection, investigation and prosecution of traffic offences
Integration with local/national government and law enforcement
Integration with existing systems

Challenges

- **Road safety**: in every traffic accident speed plays a role
- **Environment**: the faster a vehicle drives, the higher the fuel consumption, the more $CO_2$ emissions and the more noise pollution
- **Flow through**: if road users drive at roughly the same speed, fewer traffic jams will occur. Moreover, the risk of accidents is smaller, and that also saves on traffic jams.

Solution

- Loops in the road that detect the vehicles;
- Infrared flash and a camera for registering the registration number of vehicles;
- Build in electronics for transmitting the data;
- Image AI analytics;
- Processing back office software for handling fines.

Results

- **5% improved traffic flow** (lower speed)
- **20-30% lower emission** (NO2 and PM10)
- **50% less accidents**
- **96% less violations in speed** (stabilized to 300 per working day on a volume of 150k vehicles; 0,2%)

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- **50% Accident reduction**

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Flow through; if road users drive at roughly the same speed, fewer traffic jams will occur. Moreover, the risk of accidents is smaller, and that also saves on traffic jams.
Average Speed Enforcement

- Detecting, investigating and prosecuting traffic offences
- Integration with existing surveillance systems
- Integration with law enforcement

**Challenges**

- **Road safety:** in every traffic accident speed plays a role
- **Environment:** the faster a vehicle drives, the higher the fuel consumption, the more CO₂ emissions and the more noise pollution
- **Flow through:** if road users drive at roughly the same speed, fewer traffic jams will occur. Moreover, the risk of accidents is smaller, and that also saves on traffic jams.

**Solution**

- Loops in the road (a pair at each start and end of the route) that detect the vehicles; Infrared flash and a camera per lane at the start and end of the route for registering the registration number of vehicles;
- Two porches or bridges on which everything is mounted;
- A cabinet with electronics for transmitting the data;
- Fiber optic network about which the data is sent;
- Processing servers to match photos;
- Processing back office software for handling fines.

**Results**

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Free flow Weigh in Motion

Safe, smooth and sustainable mobility for all road users

Challenges

- Low reliability of traditional visual solutions - hit rate of 15-20%
- Detection of overloaded vehicles in an automated way by weighing all vehicles while passing a certain point

Solution

- Overview cameras take an overview of the situation
- License plate recognition cameras automatically register the license plate of every passing vehicle.
- Inductive loops in the road surface detect the vehicle, determents the length of the vehicle and the (indicated) speed of the vehicle
- Weighing sensors in the road surface detect the axles and register the axle loads.

Results

- Free Flow WIM system interception efficiency increased to 83% (instead of 15 to 20% when interceptions were made on visual basis)
- Save time for policemen and drivers
Free Flow Border Control

► Safe and secure borders;
► Fast and comfortable border crossing

**Challenges**

No automated systems to:
- Monitor border traffic
- Conduct Information led operations
- Have more insight in Migration crimes (illegal documents, human trafficking, smuggling)
- Have more insight in Organized crime (correlating vehicles, changing vehicles, patterns)
- Resulting into a too high number of violations

**Solution**

By using DXC’s integrated solution, the client was able to:
- Conduct Information led operations at a free flow border
- Gather Statistical information of border traffic
- Conduct Predictive analyses in order to bring down the number of violations

**Results**

- 15 fixed locations
- 100 cameras
- 6 vehicles
- 43 EU and neighbouring countries recognised

Central Processing
Control
Server
Application

Managed 24/7
Construction Health Monitoring
Road operators

Task to manage roads
► Incident management
► Ensuring road is safe
► Deliver safe travel at all times
► Perform maintenance on entire infrastructure
► Ensure compliance with regulations

Challenges

• Status reports
• Problems: continuous 24/7 Alerting and Monitoring
• Maintenance forecasting
• Analytics: statistics, trends, learning

Solution

Solution which answers the following questions:
• Bridge movement within safety limits?
• Traffic passing bridge endangering bridge safety?
• Current mechanical status of bridge?
• What maintenance and when to be scheduled?
• What measures regarding traffic composition and patterns can be made to extend the bridge life span?
• What was original mechanical status of bridge at time X by model-based analytics reconstruction of bridge past?
• What is future mechanical status of bridge at time X by model-based analytics prediction of the bridge future?

Results

• Safe bridges
• Real time and historical documentation on bridge health
• Effective maintenance based on forecasting
• Able to alarm and act when bridge perform out of the safe specifications
And the value comes from Integration
Integration of digital innovation with mainstream IT

Client digital transformations...

- Results through integration of transformation and traditional IT
- Compelling offerings
- Consultative client engagement
- Agile delivery
- Business-outcome oriented

Mainstream IT modernization

- Efficiency-oriented
- Scale
- Automation capabilities
- Ability to simplify legacy

...While modernizing mainstream IT
Mobility Incident Management
Road Operator/Salvage companies

Task to manage roads
► Detect and respond to and manage incidents
► Road safety monitoring and prediction
► Maintenance of road infrastructure

⚠️ Challenges
• Continuous 24/7 Alerting and Monitoring
• Status report
• Maintenance forecasting
• Historical Statistics and prediction

💡 Solution
• Measurements from
  • Roadside surveillance cameras
  • Call center messages
  • Social media messages
  • Road authority control room
  • Apps
  • IOT Sensors
• Registration and documentation of events and incidents
• Event and Incident orchestration and handling
• Information fusion from social media, weather and public information channels
• Geo special analytics

✅ Results
• Situational awareness, common operational picture
• Reduce costs caused by events and incidents
• Shorten resolution time
• End to end process management
• Insight to recover better, safer, quicker and more
• Faster and cheaper pass through

Road Operator/Salvage companies

Challenges
Solution
Results
Journey Planner
Public Transport Operators

Provide passengers efficient travel itinerary, with minimal stopovers and focus on climate, as modern travelers demand a:

► completely connected
► end-to-end, multi-modal journey (plan & actual travel) with
► personalized experience recognizing traveler behaviors and preferences

This requires connecting multiple operators to share key data while keeping the traveler informed.

⚠️ Challenges

• Go and stand where you want with maximum comfort
• Travel time as time gained and time to spend freely
• Sustainable and focus on climate

💡 Solution

High performance software package providing public transport travel advices for timetable oriented services and additional timetable information:

• validity of the timetable
• departing and arriving services on a stop
• companies
• transport modes
• attributes on services
• stop name matching
• personal timetable.

✅ Results

• Door to door itinerary
• World class mobility;
• Nearby,
• Affordable
• Heart for the environment.

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Public Transport Operators

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DXC Proprietary and Confidential
Enforcement Backoffice
Private Services/Government Services/Police

Safe, environmentally friendly and efficient transport system in a good, professional manner in cooperation with politicians, law, users and other stakeholders

Challenges

- Visibility: targeted surveillance activities
- Stop crime in traffic and detecting criminality, such as stolen property
- Prevent crime, traffic safety on and along roads
- Vehicles not fulfilling requirements for using the roads are taken off
- The utilization of resources to control teams far better

Solution

- The back office system has been designed to allow different services to search through Reads from different types of traffic cameras in order to use it for various purposes.
- Searches can be done based on a particular license plate, but also on time, place, time period, brand of vehicle, country etc., or combinations thereof.

Results

- Central and integrated processing solution with associated interfaces
- Integration of existing cameras/sensors to the central processing solution
- Reliable identification of individual vehicles
- Further information about vehicle and its attributes
Making City Smarter
Our vision on Digital City

DXC enables:
• Better use of roads, less travel time
• Reduce accidents
• Utilize infrastructure efficiently, relieving pressure on city centers
• Decrease pollution, better city environment
• Prevent unnecessary delay and millions of lost economy cost and save the environment efficiently
Thank you.