Connected World: Transforming Travel, Transportation and Supply Chains

EU Transport Business Summit

March 2014
Transport 2025: Plenty of Transformation

- Subscription, Sharing & Services
- Vehicle Automation & Innovation
- Cloud Driven Decisions
- Demand Growth & Attitude Change
- New Protectionism
- Velocity & Capability Needs

We could make a long list…
Determining likely multistakeholder challenges and opportunities

Phase I: Megatrends

- Hotspots (e.g., energy, environment, megacities)
- Blind spots¹ (e.g., cloud solutions/big data, aging)

Phase II: 2025 scenarios

- New Balance
- Maximized Growth
- Mind the Gap
- Local is King

Phase III: Representative solutions

- IPITA—integrated proactive intermodal travel assistant
- COMET—condition based megacity traffic management
- ACIS—fully automated check-in, security, border control/smart visa
- TATLO—tracking and transparency-based logistics optimization

Impact

- Multi-stakeholder platform with over 50 leading companies across travel, transportation, and ICT² industries
- Identify future challenges and opportunities of future mobility ecosystem
- Pinpoint concrete scenario implications for each stakeholder group
- Create insights on future blind spots and new business models
- Influence policy makers by pragmatic recommendations and dialogue

1. Megatrends less understood regarding implications on the travel and transport ecosystem, exemplary blind spots from Task Force survey
2. Information and communication technology
CONDITION • BASED • MEGACITY • TRAFFIC • MANAGEMENT

COMET

REAL-TIME DATA ANALYTICS
BIG DATA ANALYTICS IN REAL-TIME

REAL-TIME MONITORING
DATA COLLECTION FROM INFRASTRUCTURE AND VEHICLE SENSORS

INTELLIGENT STEERING
• REAL-TIME TRAFFIC MANAGEMENT
• COMMUNICATION WITH VEHICLE / DRIVER

SMART PARKING
REAL-TIME PARKING SPOT MANAGEMENT

DYNAMIC TOLLING
DYNAMIC PRICE ADJUSTMENTS BY DEMAND

ACCESS REGULATION
• BLOCKING OF AREAS
• SURCHARGES FOR ACCESS

LEVERAGING REAL-TIME INFORMATION COLLECTED FROM VEHICLES, INFRASTRUCTURE AND PEOPLE FOR ACTIVE TRAFFIC MANAGEMENT THROUGH ROUTING AND DYNAMIC TOLLING ENSURING TRAFFIC FLOW, AIR QUALITY ACCESS RIGHTS AND SECURITY

PARK & RIDE
Initial traffic management systems established, but substantial room for improvement to reach COMET value proposition—examples

<table>
<thead>
<tr>
<th></th>
<th>Hong Kong</th>
<th>Zhenjiang</th>
<th>Rio de Janeiro</th>
<th>Singapore</th>
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</thead>
<tbody>
<tr>
<td>Real-time monitoring</td>
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<td>Real-time analytics</td>
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<td>Intelligent steering</td>
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<td>Dynamic tolling</td>
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<td>Access restriction</td>
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<td>Smart parking</td>
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System focusing on traffic steering to reduce congestion; no smart parking component
System with advanced analytics capabilities to steer traffic, but no tolling and parking capabilities
Comparably strong analytics, but largely human-powered; no dynamic tolling or smart parking
Dynamic tolling system to smoothen traffic flows, but no advanced analytics capabilities

Degree of fulfillment of COMET characteristics

Source: ITS; roadtraffic-technology.com; IBM; Rio de Janeiro; NY Times; Singapore Ministry of Transport; U.S. Department of Transport; World Economic Forum/BCG analysis
COMET roadmap consists of four phases, expanding scope and functionalities over time

<table>
<thead>
<tr>
<th>Phase</th>
<th>Functionality scope</th>
<th>Asset scope</th>
<th>Data collection infrastructure</th>
<th>Responsibilities of REIT/public authorities</th>
<th>Benefits for...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch toll road nucleus</td>
<td>Transparency for users</td>
<td>Key toll roads operated by REIT</td>
<td>Floating car data</td>
<td>Public authority (PA) run most operational issues; REIT only toll roads</td>
<td>Users: Transparency over traffic situation, Active recommendations, incl. link to public transport, Smart parking features (availability, reservation, etc.)</td>
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<tr>
<td>Expand to active steering</td>
<td>Active traffic steering (incl. recommendations and access restrictions)</td>
<td>Signage installed, public transport included</td>
<td>Floating car data</td>
<td>REIT investment in sign., PA provide pub. transport data &amp; direct act. steering</td>
<td>City: Efficiently operated toll roads, less operational responsibility, Lower congestion due to active steering and ability to leverage traffic data, Added transparency over parking usage and better utilization of parking spaces</td>
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<tr>
<td>Complete service portfolio</td>
<td>Active traffic steering</td>
<td>Parking included</td>
<td>Add'l sensors where needed (e.g., parking)</td>
<td>REIT investment in sensors and parking, approval by PA</td>
<td>Companies: Opportunity to profitably run toll roads, Opportunity to op. add'l roads and signage infrastructure, Opportunity to monetize smart parking (e.g. dynamic pricing)</td>
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<tr>
<td>Fully enable COMET</td>
<td>Traffic steering and unified payment provision</td>
<td>Toll roads, signage, pub. transport, parking</td>
<td>Floating car data and sensors where needed</td>
<td>Full engagement of REIT, PAs in supervisory role (and control public transport)</td>
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Source: World Economic Forum/BCG analysis
IPITA
INTEGRATED · PROACTIVE · INTERMODAL · TRAVEL · ASSISTANT
Today's solutions not covering all required IPITA functions

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<tr>
<th></th>
<th>Real-time information</th>
<th>Natural user interface</th>
<th>Planning</th>
<th>Booking</th>
<th>Travelling</th>
<th>At destination</th>
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Source: World Economic Forum/BCG analysis  
Note: Selected companies only; some companies/services with limited geographical scope
ACIS
FULLY AUTOMATED CHECK-IN SECURITY, BORDER CONTROL

AUTOMATED CHECK-IN
- ELECTRONIC DOCUMENTS AND BIOMETRIC AUTHENTICATION
- NFC IDENTIFICATION

RISK BASED SCREENING
- ASSESS PASSENGER'S RISK CLASS

EFFICIENT SCANNER
- FULL-BODY/LUGGAGE SCANNER
- HEALTH SCREENING

AUTOMATED BOARDING
- BIOMETRIC AUTHENTICATION

SMART VISA AND AUTOMATED IMMIGRATION
- e PASSPORTS/E VISAS
- WALKING THROUGH eGATES
- CHECK BIOMETRICS AGAINST BLACK LISTS

HASSLE-FREE CHECK-IN AND SECURITY PROCEDURES AT TRAVEL HUBS, BORDERS AND HOTELS THROUGH EXTENSIVE PROCESS AUTOMATION
ACIS roadmap consists of four phases, phases can be completed with differing speeds by category

<table>
<thead>
<tr>
<th>International cooperation¹</th>
<th>Technology/ procedural implementation</th>
<th>Scanner and security infrastructure</th>
<th>Risk database use</th>
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<tbody>
<tr>
<td>National visa, traditional systems</td>
<td>Supra-country visa, risk-based screening</td>
<td>Multi-country visa, advanced risk-based screening</td>
<td>Regional visa, seamless security process</td>
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<td>No recognition of other countries’ visa</td>
<td>Recognition of select supra-country visa (unilateral)</td>
<td>Full recognition of other countries’ visa (bilateral)</td>
<td>One common digital visa with unified digital visa processes for entire region</td>
</tr>
<tr>
<td>Isolated nat’l visa systems, no biometric data used, state-driven app. process; no PAIP</td>
<td>Isolated nat’l visa systems, some biometric info used, private app. process; PAIP on selected airports</td>
<td>Int’l visa DB w/ supra-nat’l gov’t body, some biometric info used, private app. process; PAIP on selected airports</td>
<td>Int’l visa DB w/ supra-nat’l gov’t body, full biometric info used, private app. process; PAIP on all airports</td>
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<td>Traditional scanners, explosive detection dogs</td>
<td>Traditional scanners but separate lanes or processes per risk-level</td>
<td>Screen liquids and tablets w/o divesting, separate processes per risk-level</td>
<td>Stand-off screening, no need to divest electronics, separate processes per risk-level</td>
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<tr>
<td>Basic PNR data analysis using rule-based systems</td>
<td>Security screening depending on risk score, inclusion of add’l data sources</td>
<td>Automatic behavior detection, automatic delivery of risk score to checkpoint</td>
<td>Full behavior analysis across entire airport, e.g. via CCTV</td>
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</table>

Notes: PAIP = Pre-approved immigration program; Airport security roadmap is compatible with IATA “Checkpoint of the Future” except for compressed timeline. Source: World Economic Forum/BCG analysis.
SET OF CONCEPTS AND SOLUTIONS THAT CREATE VALUE FOR END CUSTOMERS AND ALL ACTORS IN GLOBAL SUPPLY CHAINS BY DIGITIZING ALL INFORMATION REQUIRED FOR ADVANCED TRACKING AND TRACING.
Digitization of supply chain facilitates trade—clear benefits for society

Reducing trade barriers has substantive, positive influence on GDP

Deep dive: Specific benefits of eFreight in air cargo

Source: Ferrantino, Geiger and Tsigas: The Benefits of Trade Facilitation- A Modeling Exercise, based on 2007 base line; Ambitious Scenario; IATA; World Economic Forum 2013, World Economic Forum/BCG analysis
"Data integrators": Freight forwarders/3PLs could perform integration and translation tasks – gov't agencies accessible through single window

**Brief description**

- Freight forwarders/3PLs provide multiple interfaces so different consignors/consignees can connect to their systems; competitive advantage for forwarders/3PLs through
  - ability to provide additional services
  - cost reduction
- Government authorities provide single-window interface

- Consignor uploads info to freight forwarder/3PL and authorizes forwarder/3PL to use info in further process
- Freight forwarder/3PL communicates with gov't authorities and carriers
- Freight forwarder/3PL communicates with consignee
- Both push and pull models of info exchange are conceivable

**Setup**

1. Freight forwarder/3PLs provide multiple interfaces to different consignors/consignees, government authorities, and carriers.
2. Government authorities provide a single-window interface.

**Operation**

1. Consignor uploads information to freight forwarder/3PL and authorizes its use in further processing.
2. Freight forwarder/3PL communicates with government authorities and carriers.
3. Both push and pull models of information exchange are conceivable.

**Relationships shown:**

- National government authorities/customs agencies
- Single Window
- Carriers
- Freight forwarders/3PLs
- Consignor/shipper
- Consignee/buyer
- End Customer

**Additional information:**

- 3PL = Third-party logistics provider; some carriers do not use 3PLs and offer services directly to consignors/shippers.
- Source: World Economic Forum/BCG analysis

Serve as data integrators and translators – "speak multiple standards" and link different consignors, consignees, carriers, and gov't agencies.
TATLO roadmap consists of two parallel, yet interlinked B2B and B2G streams:

**Single Window**
- **Digitalization of comm. w/ customs**
  - Automated paperless trading environment
  - Use of ICT by relevant government agencies
- **Limited Single Window**
  - Single interface between traders & selected authorities
  - No full OGA permits & licensing coverage
  - Some digital exchange between countries, e.g., for transit of goods

**B2B digital information exchange**
- Exchange of limited set of simple e-documents between 3PLs and carriers

**Limited digital exchange**
- Full e-documents exchange between stakeholders within the (air, sea, dry) port community

**Full national digitalization**
- E-document exchange also between consignor/consignees, banks (e-payments), freight forwarders and logistics service providers

**International e-logistics**
- Full international electronic data exchange, incl. end-customers

**Example roadmap – alternatives possible**

- **Regional Single Window**
  - Exchange of trade information between NSWs
  - Enhancement of regional connectivity

Note: GA = Gov’t authorities; OGA = Other gov’t authorities; NSW = Nat’l single window; Roadmaps likely to differ strongly depending on individual local starting conditions

Source: World Economic Forum/BCG analysis
Easing Travel
Enabling Trade
Improving Lives