التطبيقات التكنولوجية المتقدّمة لتشغيل ومتابعة النقل الجماعي

المهندس رامي سمعان
إستشاري في قطاعي النقل واللوجستيات

الدعم الفنّي لمصلحة النقل البرّي في وزارة المواصلات الليبية

في مجال استخدام التكنولوجيا الحديثة لتخطيط وإدارة شبكات النقل الحضري الجماعي في المدن الليبية

ورشة العمل الفنية الثالثة
الخميس 6 حزيران/ يونيو 2024
الأدوات البرمجية لدعم تخطيط وتشغيل النقل الحضري الجماعي
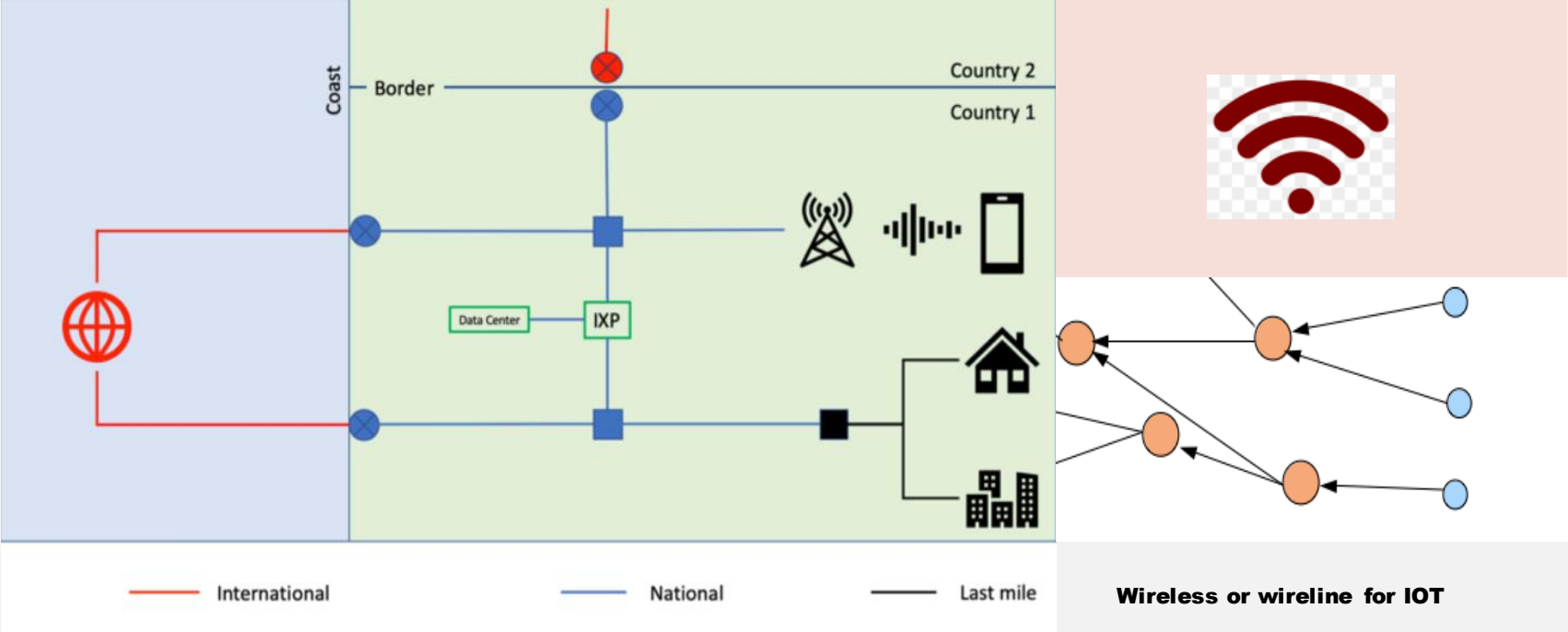
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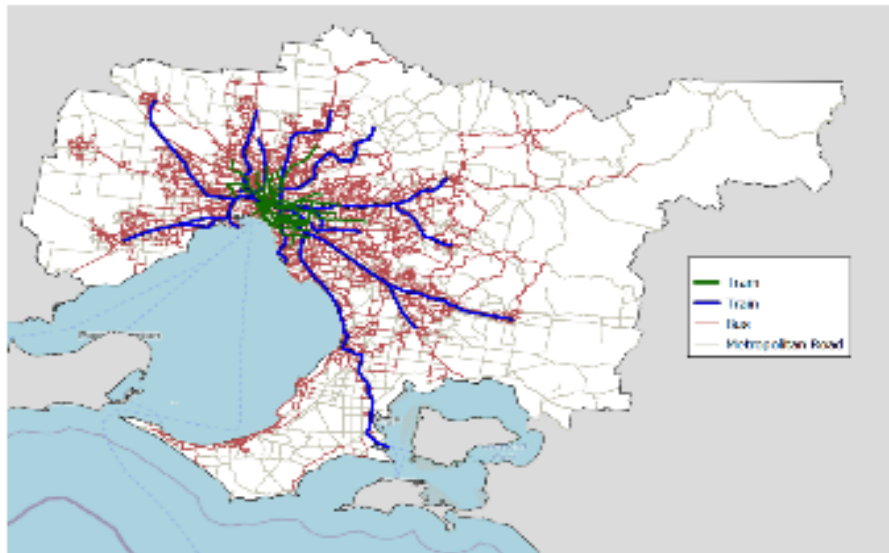
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Technology applications in Public Transport

- Management of PT services
    - Transportation Management Systems (TMS)
    - Fleet Management Systems (FMS)

- Management of Traffic and Infrastructure
    - GeoFencing
    - Electronic payment and operation system
    - Intelligent Transport Systems (ITS)

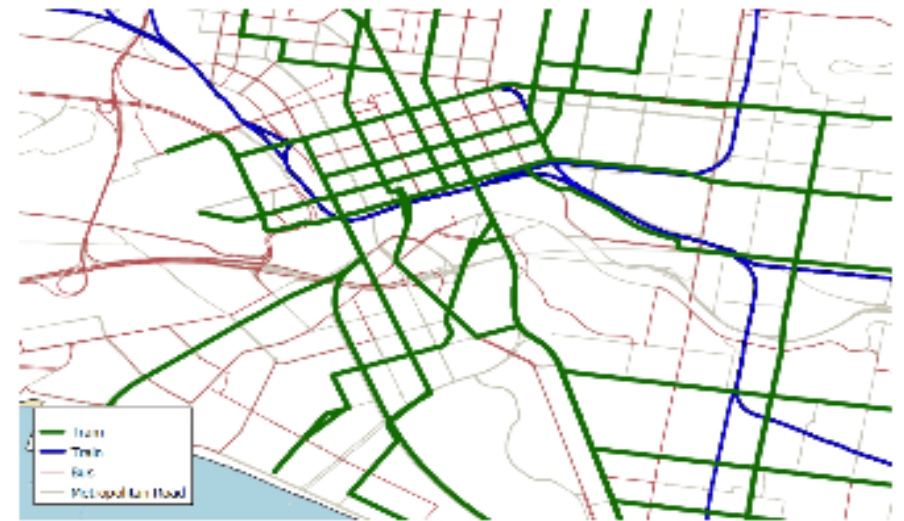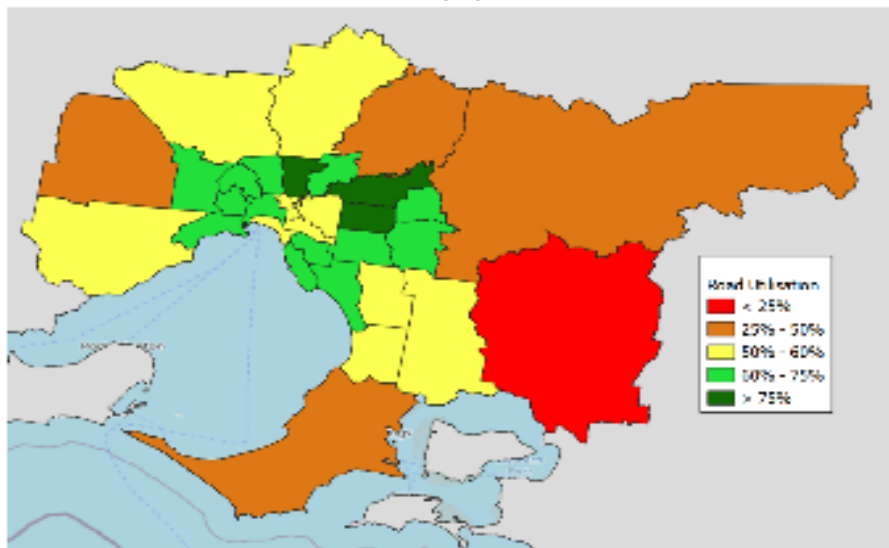# Levels for connectivity

Coast | Border | Country 2 | Country 1

Data Center — IXP

— International   — National   — Last mile

Wireless or wireline for IOT

Applications in public transport management and operation

(a)

(b)

(c)
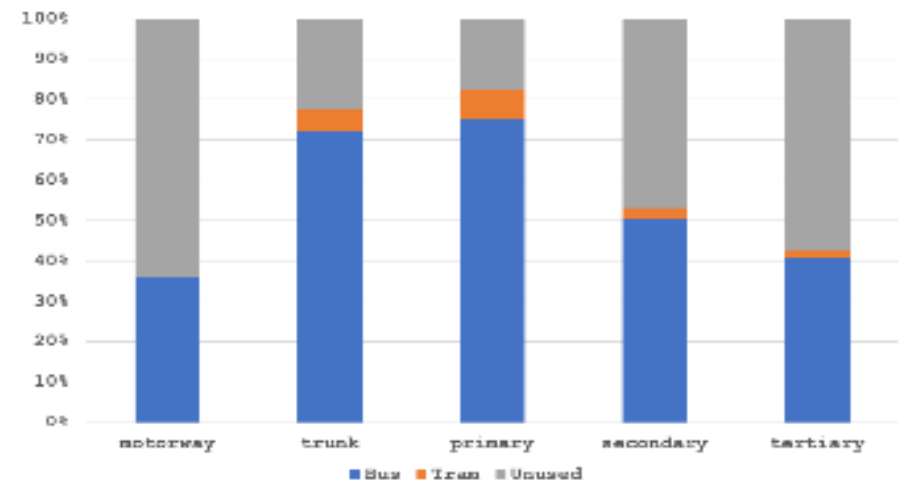
(d)

Integration of ITS

SMART CITY TECHNOLOGIES

Centralized Control and Management via Web Based Software

Visual Programming

24/7 Location and Speed Information

Accident Damage Detection

Route Control

4.5G/3G/GPRS

SQL

Vehicle Tracking and Management

Reporting

SERVER

Monitoring & Evaluation

Cost per Unit — 1

Labor Cost Ratio — 2

Material Cost Variance — 3

Overhead Cost Ratio — 4

Return on Investment (ROI) — 5

Main Fields

- **Planning:** Software solutions for planning assist in route optimization, demand forecasting, infrastructure design, and service planning.

- **Operation:** Operational software helps manage day-to-day operations, including scheduling, dispatching, real-time tracking, and incident management.

- **Management:** Management software provides tools for administrative tasks, such as fleet management, resource allocation, financial management, and performance monitoring.

- **Analytics:** Analytical software enables data-driven decision-making by offering insights into passenger behavior, service performance, and system efficiency.
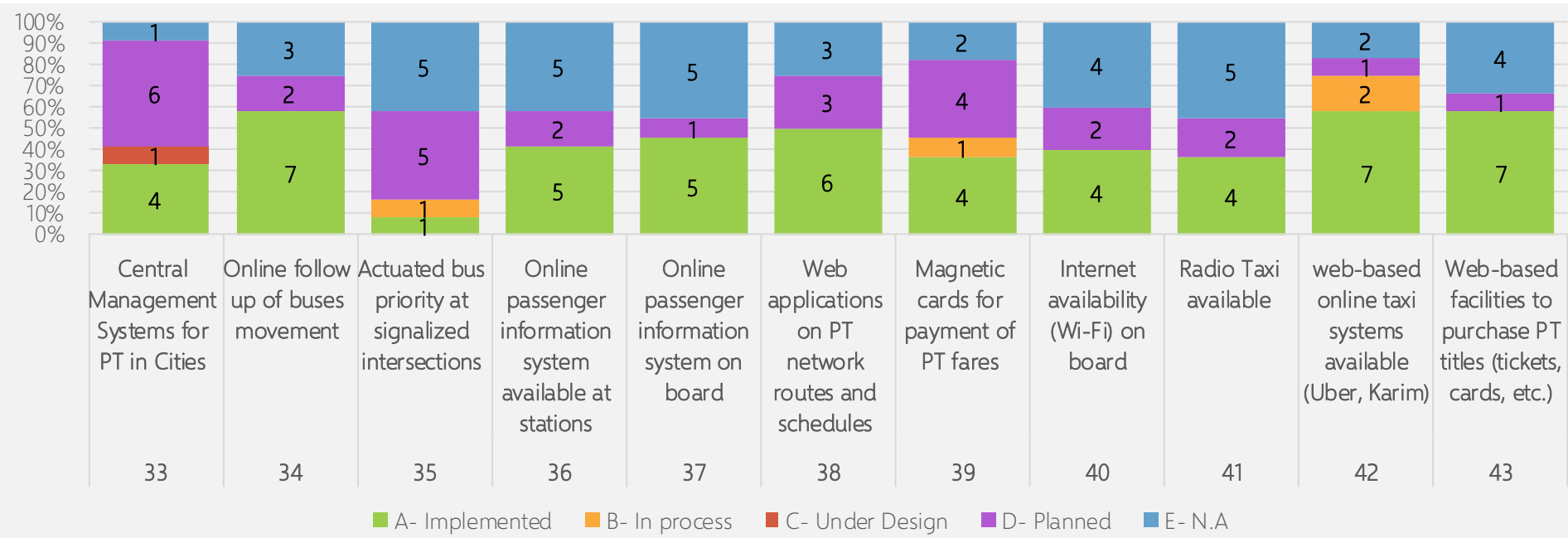
Tools

- **Planning Software:** Examples include EMME, TransCAD, PTV Visum, and Cube Voyager, which offer functionalities for route optimization, demand modeling, and infrastructure planning.

- **Operation Software:** Leading platforms like Trapeze Operations Management System, Optibus, and GIRO HASTUS provide features for scheduling, dispatching, real-time tracking, and incident management.

- **Management Software:** Solutions such as Routematch, Ecolane, and Swiftly offer tools for fleet management, resource allocation, financial planning, and performance monitoring.

- **Analytics Software:** Software platforms like Remix, Urban Insights, and Esri ArcGIS provide analytics capabilities for understanding passenger behavior, service performance, and system efficiency.

Status of technology and innovation in land transport in the Arab region

	Central Management Systems for PT in Cities	Online follow up of buses movement	Actuated bus priority at signalized intersections	Online passenger information system available at stations	Online passenger information system on board	Web applications on PT network routes and schedules	Magnetic cards for payment of PT fares	Internet availability (Wi-Fi) on board	Radio Taxi available	web-based online taxi systems available (Uber, Karim)	Web-based facilities to purchase PT titles (tickets, cards, etc.)
A- Implemented	4	7	1	5	5	6	4	4	4	7	7
B- In process			1				1			2	
C- Under Design	1										
D- Planned	6	2	5	2	1	3	4	2	2	1	1
E- N.A	1	3	5	5	5	3	2	4	5	2	4
	33	34	35	36	37	38	39	40	41	42	43

Public transport technologies are mostly either implemented, planned or not planned
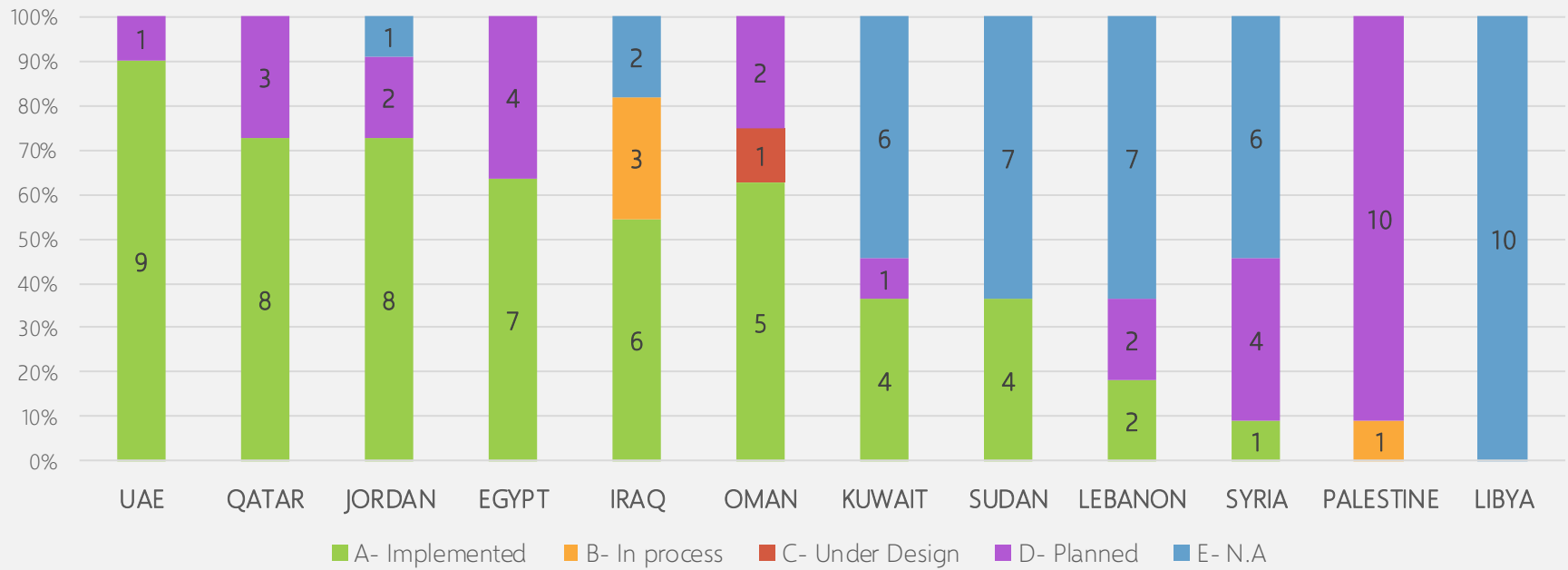
Public transport technologies are implemented in countries like UAE, Qatar, Jordan and Egypt, while countries like Libya have not yet planned for such technologies

Main Benefits – Environment

- Currently, the modal share is based globally on private motorized modes.

- This is why, reducing GHG emission and fuel consumption where cars and traffic are the main source, has become a common policy goal.

- Most approaches focus on curtailing automobile use in cities to reduce greenhouse gases, improve air quality, and support sustainable development.

Main Benefits – Socio Economic

- Public transport contribute to access to jobs

- Public & private spaces dedicated for transport facilities are needed for economic development

- Technology in transport creates jobs and digital skills and contribute to economic development (i.e. smart cities)

- Effective policies will demonstrate link between transport infrastructure and economic growth

شكراً

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