



Alternative technologies in urban mobility

Alternative systems, electro & digital mobility
AFD's experiences and projects in India

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AGENCE FRANÇAISE DE DÉVELOPPEMENT

AFD AT A GLANCE AND IN INDIA



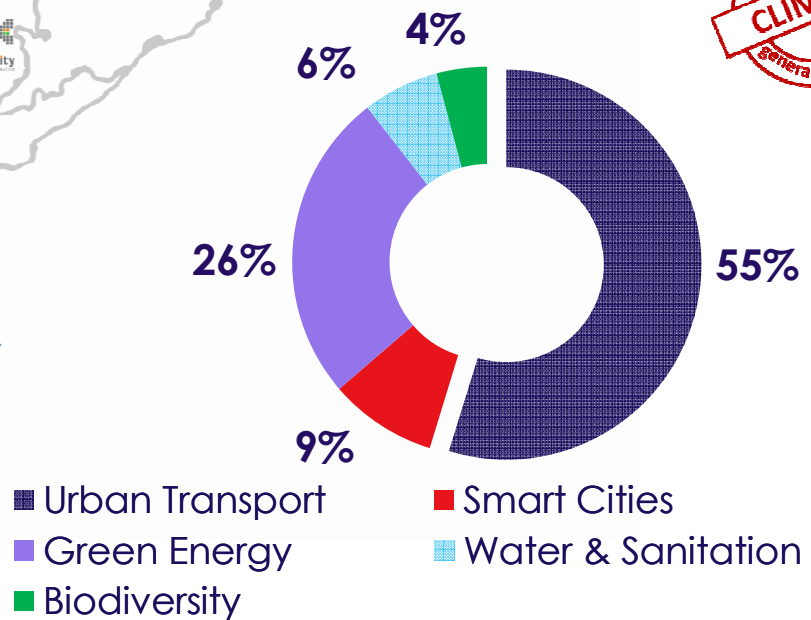
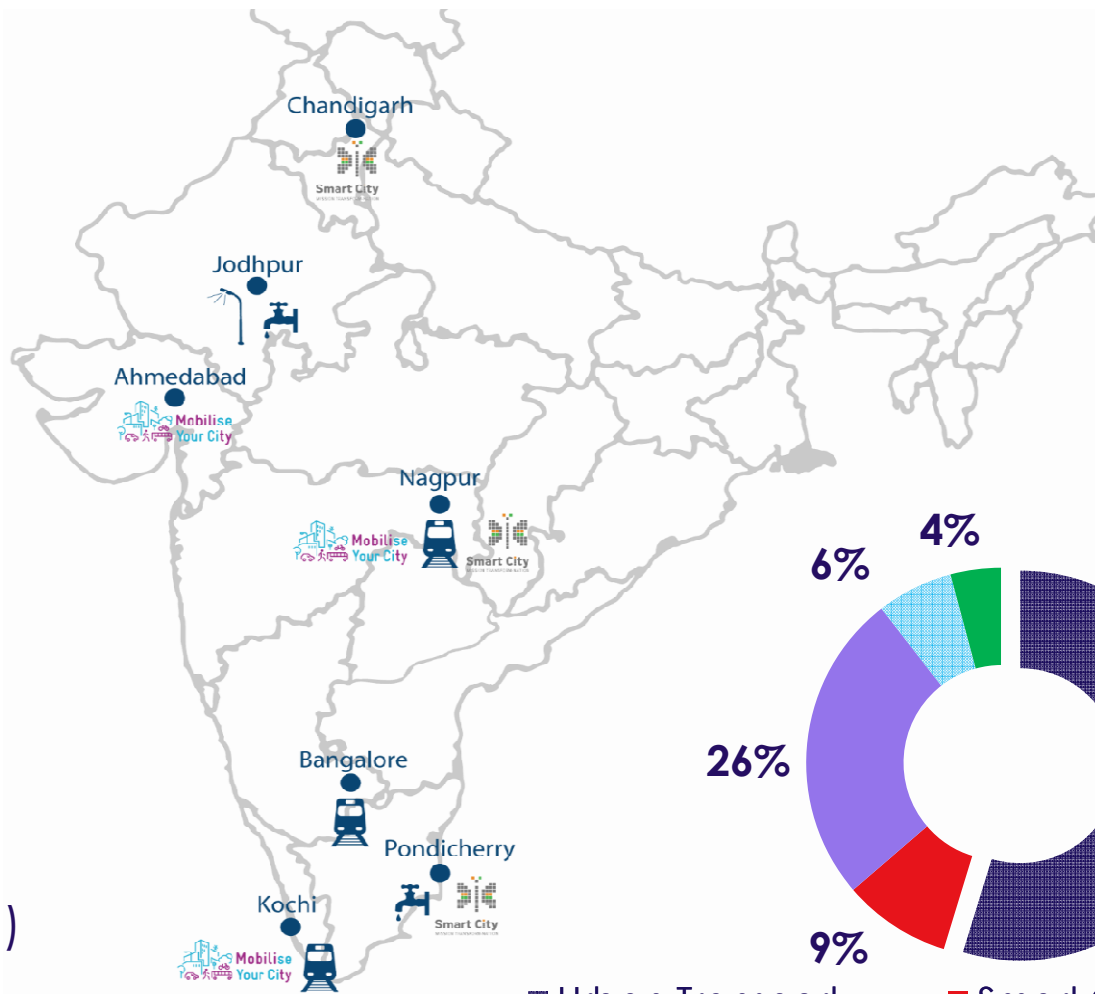
108 countries



86 agencies



76 years (1941)



CONTENT

THE 3 DIFFERENT WAYS FOR AFD TO SUPPORT ALTERNATIVE TECHNOLOGIES

- **Alternative systems to complement MRT networks**
 - An at grade electric system for Hyderabad core center
 - a comprehensive plan for Kochi using cable car solution
- **Alternative motorization to support cleaner solutions**
 - Pilot solar charging stations for electric rickshaw in Puducherry
- **Alternative technologies to move to digital transport**
 - Digital app to structure the Informal Public Transport (IPT) network in Kochi

01. ALTERNATIVE SOLUTIONS TO COMPLEMENT MRT SYSTEM

LRT – THE CASE OF MEDELLIN (COLOMBIA)

- **2.5 million** (25 Laks) inhabitants
- A comprehensive “green corridor” in Ayacucho Valley with :
 - a **4 km long tram trunk**
 - connected to **2 metrocable lines**
 - Direct access to **socially affected districts**
- 12 trains, 5' headway
- 85 000 pax/day
- \$250 M



01. ALTERNATIVE SOLUTIONS TO COMPLEMENT MRT SYSTEM

METROCABLE - THE GUAYAQUIL PROJECT (ECUADOR)

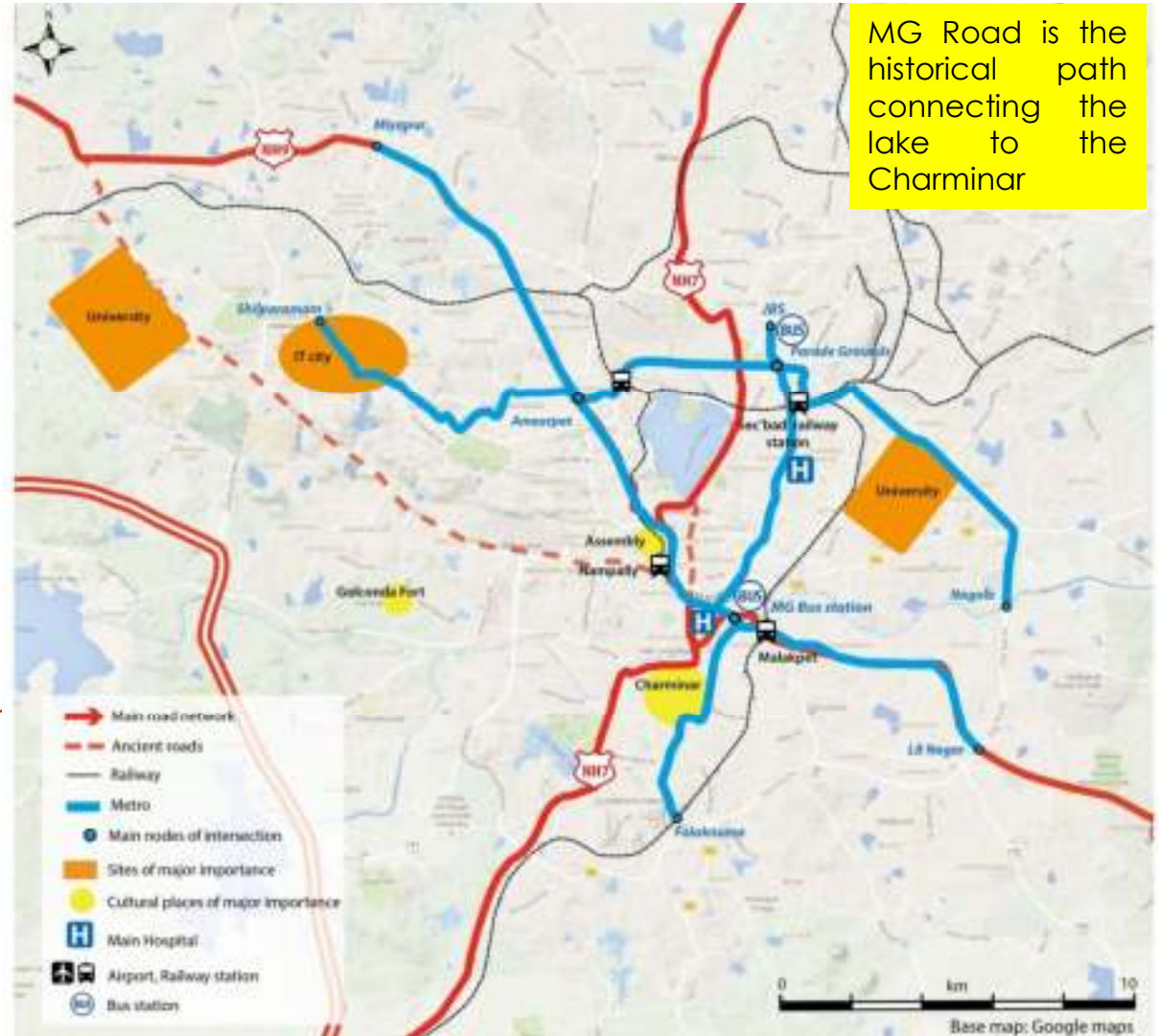
- A **metrocable** to cross the river and feed the metro
- **4,1 km**
- **3200** pax/h, 36000 pax/d
- 135 MUSD
- **DBOT :**
 - 30 years,
 - traffic risk on contractor
- **Financing :**
 - \$20M by contractor,
 - \$115 M AFD loan
- Winner: POMA-Sofratesa



01. COMPLEMENTING MRT NETWORKS

THE HYDERABAD PROPOSAL BASED ON A TECHNICAL ASSISTANCE FINANCED BY AFD in 2018

- **10 million (1 Crore inhab.) Metro network**
 - 72 km existing
 - 321 planned by 2041
- **BRT/LRT routes:**
 - 393 by 2041
- **2 proposed projects :**
 - Pedestrianization of the Charminar area
 - Beautification of Musi River (Bicycle tracks, bridges, walkpath)



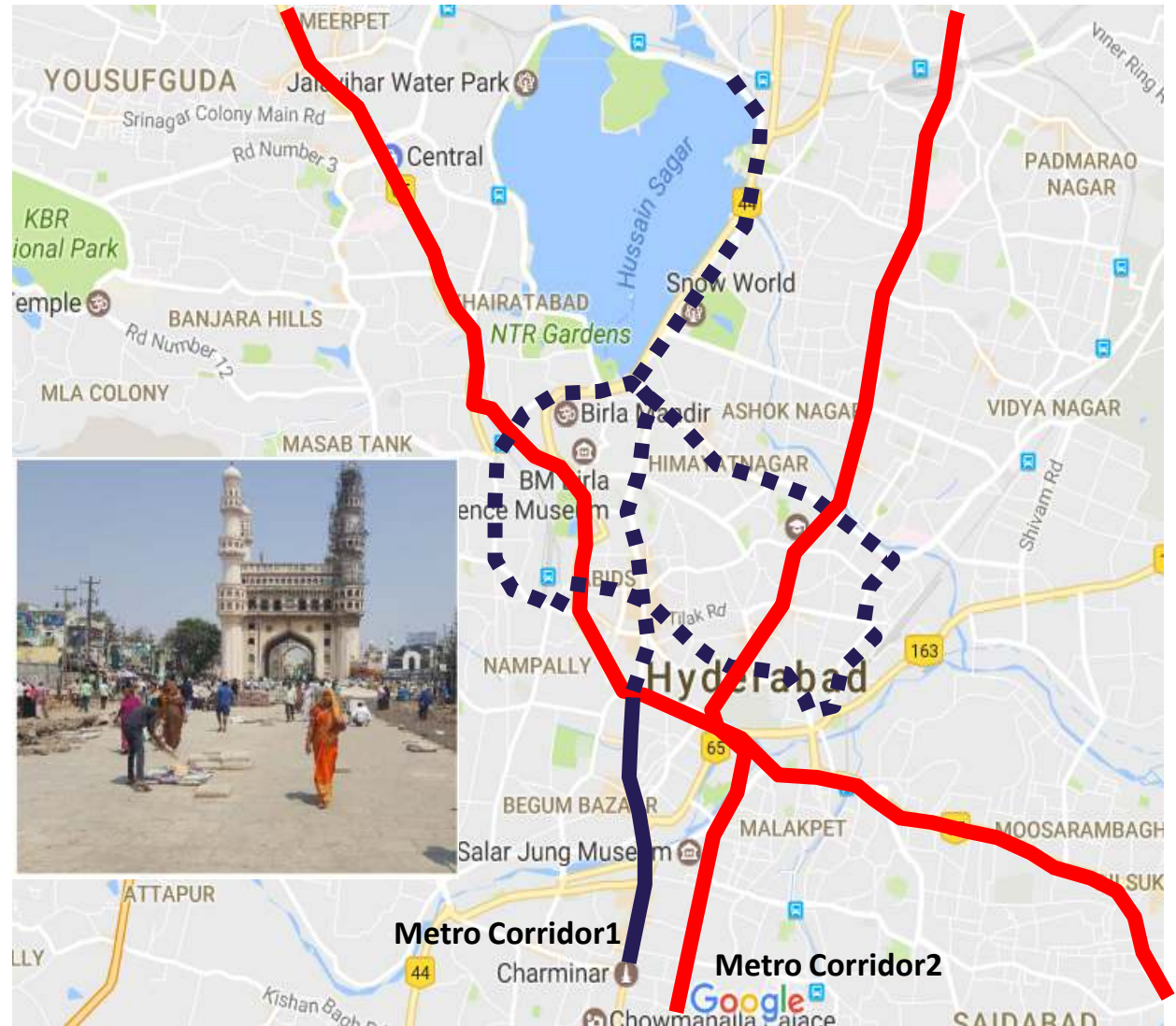
01. COMPLEMENTING MRT NETWORKS

A TRANSPORT LINK TO CONNECT CHARMINAR, MUSI RIVER AND HUSSAIN SAGAR LAKE

- Link the city center and the renovated Charminar area to enhance city attractiveness
- A study to identify the appropriate solution (at grade LRT, electric shuttle...)

 Metro Corridors 1&2

 Proposed secondary transport corridor



01. COMPLEMENTING MRT NETWORKS

THE KOCHI CASE

- **Kerala economic hub**
- **2,1 million (21 laks) inhabitants**
- **2007: City Mobility Plan approved**
 - improve urban mobility & transport services
 - reduce congestion and pollution
- **A MRT system with:**
 - a 25.6km elevated line
 - a 651 M€ project financed by AFD (20%) in 2013
- **2015: A 800 K€ AFD TA for :**
 - Small urban pilot projects
 - O& M strategy
 - Operations costs optimization
 - Unified Metropolitan Transport Authority



01. COMPLEMENTING MRT NETWORKS

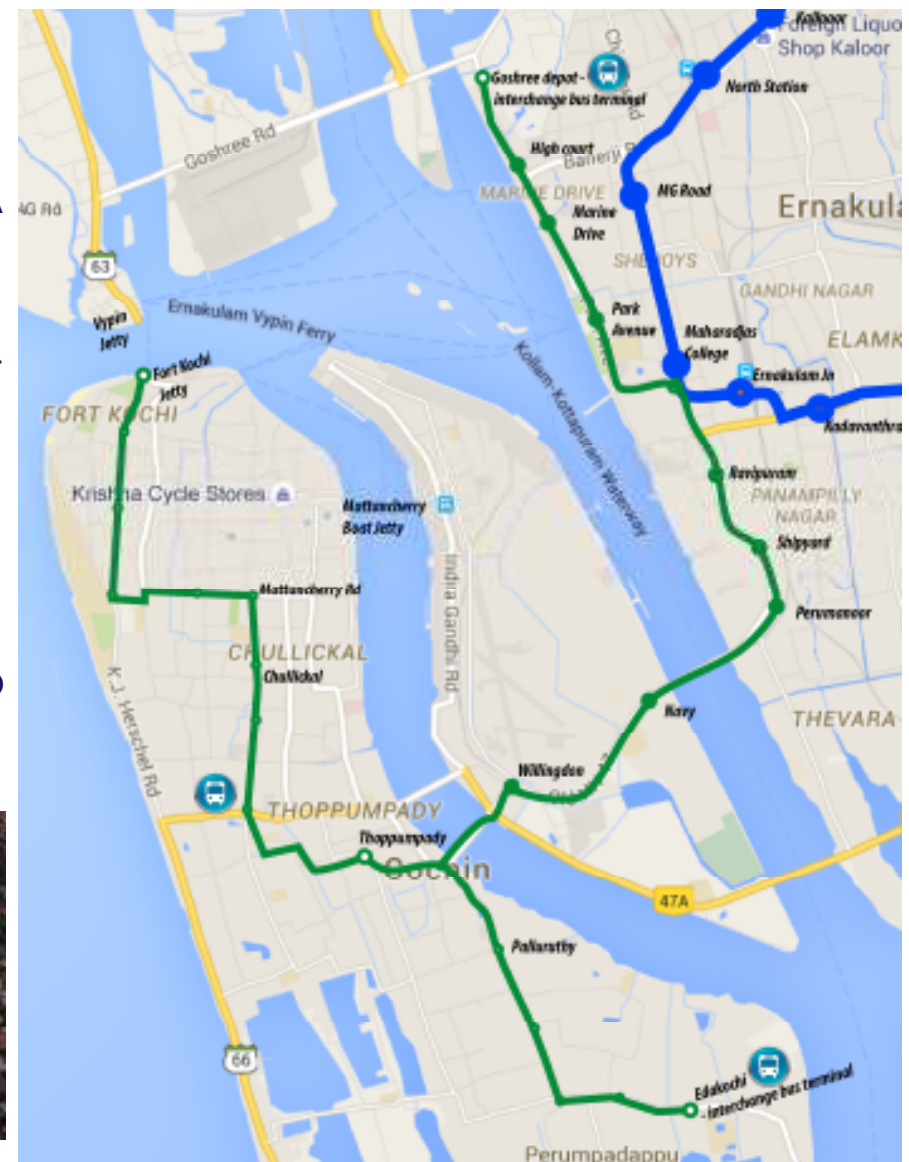
A COMPREHENSIVE AND HOLISTIC APPROACH FOR KOCHI IN 2017

Multimodal integration complementing the metro system :

- **Proposal for a cable car line by POMA** to connect Maharaja Metro station and the Water transport ferry terminal (<1km) with an extension on the coast

Along with

- **Kochi water metro** being revamped and energized with new fleet
- **BRT line** (20 km from Goshree depot to Fort Kochi and to Edakochi)



03.11.18

02. SUPPORTING ELECTROMOBILITY

A 3 DIMENSION APPROACH

● Modes	2-3 wheels	Bus	Private car	
● Technology	100% Electric (BEVs)	Plug in Hybrid	Conventional hybrid	Hydrogen cell (PAC)
● Investments	Vehicles	Infrastructure (power network, recharging points)	Batteries	Electro mobility branch

● **Projects to finance:**

- Feeder services complementing Mass transit axes
- Recharging infrastructure / equipment
- Combustion engine vehicles scrapping programs (fleet renewals)

02. SUPPORTING ELECTROMOBILITY

A pilot mobility project in Puducherry with PV charging station with French INES institute and LITEN in 2018

- Design a **solar charging solution** to reduce impacts on the electricity grid
- Model the **optimal energy management** for smart charging from PV
- **Test an electric vehicle charging station with PV** and storage with an e-rickshaw fleet
- **Monitor operation data** and batteries performances before scaling up



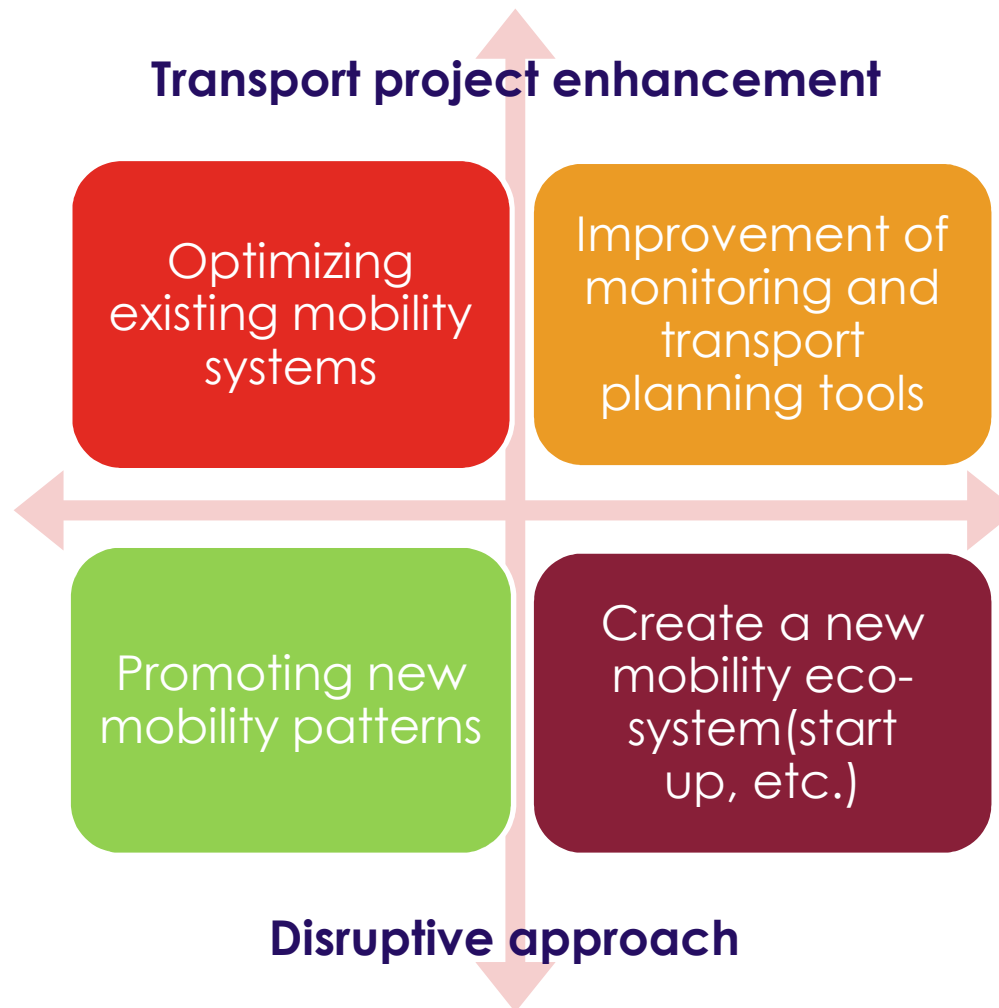
A partnership with LITEN - French Alternative Energies and Atomic Energy Commission

Bastia



03. SUPPORTING DIGITAL MOBILITY

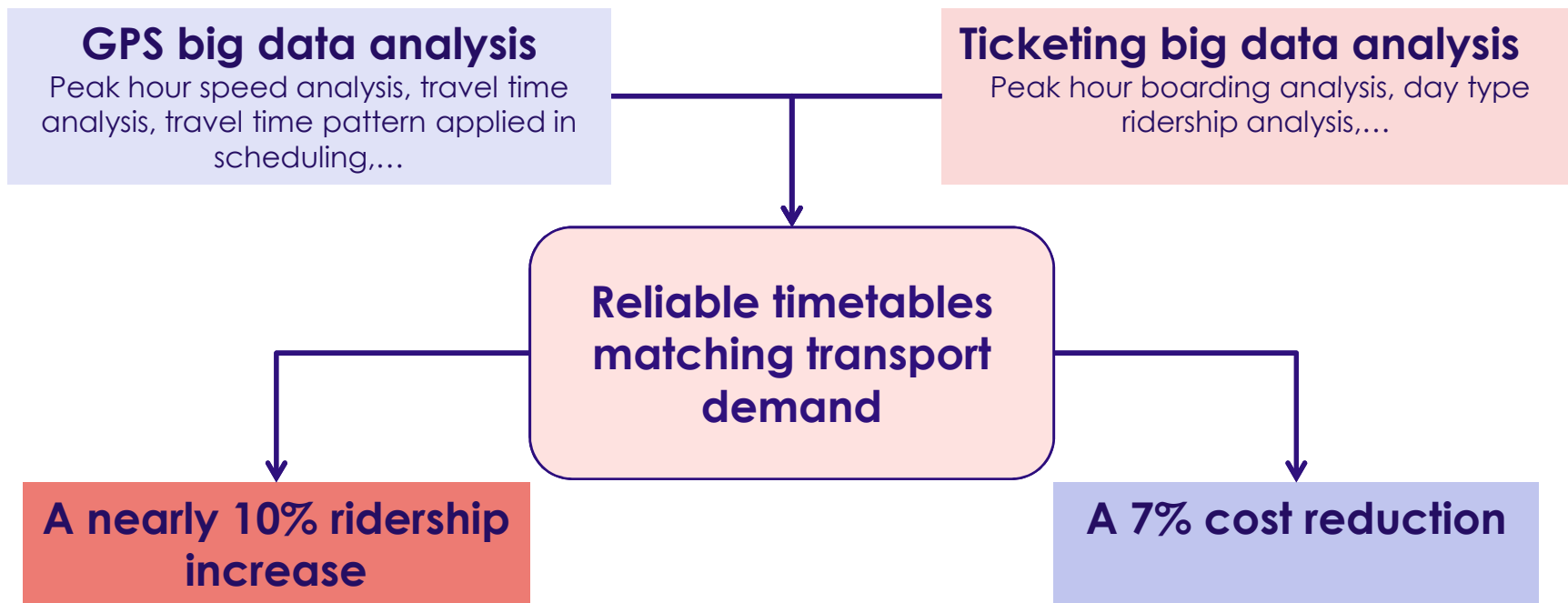
DIGITAL : PROMOTING « MOBILITY AS A SERVICE » (MAS)



03. SUPPORTING DIGITAL MOBILITY

OPTIMIZING EXISTING BUS SERVICES IN AHMEDABAD WITH LUMIPLAN IN 2017

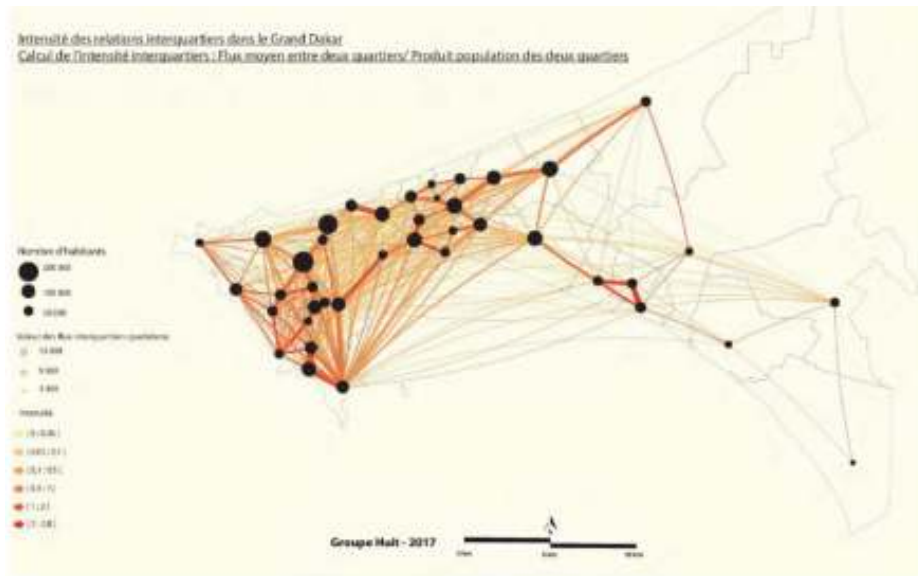
- Intelligent transport system (OCC optimization, traffic management, etc.)
- Real-time passenger information system
- Ticketing system (mobile payment)



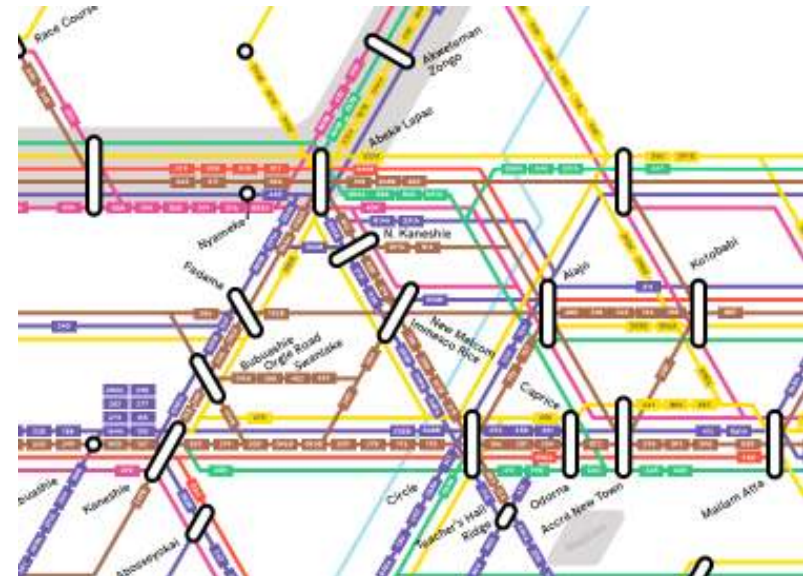
03. SUPPORTING DIGITAL MOBILITY

DIGITAL: IMPROVING TRANSPORT PLANING

- Discover travel patterns (with mobile data)
- Map the informal transport services network



- Dakar



- Nairobi, Accra

03. SUPPORTING DIGITAL MOBILITY

THE KOCHI PROPOSAL TO INTEGRATE RICKSHAW

- **Kochi Metro Rail Limited (KMRL)** motto : “**One network, One fare, One timetable**” to include all existing modes of public transport
- **Auto Rickshaw** as **feeder** to Public Transport
- Joint Declaration of Intent (JDI) **agreement KMRL and** the District Coordination Committee of **auto rickshaw drivers’ unions** (Jan 2018)
- **Rickshaw integration with:**
 - GPS tracking
 - Smart card ticketing
 - Integration into Kochi metro's app (online hire)



04. AFD SUPPORT TO ALTERNATIVE TECHNOLOGIES

SUPPORT INNOVATIVE SOLUTIONS IN AN OPEN SYSTEM

- **Promote alternative solutions complementing MRT like:**
 - TRAM/LRT/BRT
 - Cable car solutions
- **Promote electro mobility solutions for:**
 - Auto rickshaw
 - Bus, minibus and taxis
- **Promote digital transport to :**
 - Push for open data and manage transport data
 - Mapping informal Public Transport services
 - Help developing app for multimodal uses
 - Open data Platform



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