High-Quality Public Transport
References, Benefits and Recommendations

Muscat, 13 October 2014
Overview

LRTC – Experienced Partner in Middle East

Don’t separate – integrate!
Intermodal Integration of Public Transport

It’s so easy –
Intelligent Applications for smart Public Transport

Don’t be equal to Individual Traffic – be ahead of it!
Convincing People of Public Transport

Recommendations
LRTC – At a Glance

- Founded in 1985
- Public Transport Consultants
- Operational Experience
- Fully independent
- Extensive international Experience
- All Transport Modes
International Know-How and Experience

Worldwide: 30 years of experience in 37 countries on 5 continents
Comprehensive Experience in MENA Region

Middle East: 10 Years of continuous Partnership in major PT Developments

- Urban Bus
- Intercity Bus
- ITS Systems
- Light Rail
- Metro
Middle East

Selected References
Kingdom of Saudi Arabia

Riyadh Bus Project
2007-2014
Arriyadh Development Authority

Riyadh ITS Architecture
2012-2013
Arriyadh Development Authority

Intercity Bus Project
Since 2008
Ministry of Transport
United Arab Emirates

Dubai Bus Master Plan 2005-2007
Road and Transport Authority

Dubai ITS 2006-2009
Road and Transport Authority

Abu Dhabi ITS since 2012
Department of Transport

Dubai

Abu Dhabi
Hashemite Kingdom of Jordan

Jordan Bus Master Plan, Stage II
2006-2009
Land Transport Regulatory Commission

Amman
Don’t separate – integrate!

Intermodal Integration of Public Transport
Case Study

Riyadh Public Transport Project
Facts about Riyadh

- Capital of the Kingdom of Saudi Arabia
- Around 7 million inhabitants
- Average summer temperature 45 °C
- Frequent sand storms
- Gender separation intensively discussed
- Women banned from driving cars
- Modal split 98% individual traffic
- No Public Transport

40 km
40 km
Project Goals

MISSION
To create a world class integrated public transport system.

VISION
To improve the quality of life of the people of Riyadh by offering greater mobility and inclusivity to everyone who lives and works in the City and Metropolitan area.

VALUES
The design of the public transport system will be consistent with the principles of the Metropolitan Development Strategy for Riyadh (MEDSTAR) and will embody the relationship between...
**MEDSTAR**

- **Metropolitan Development Strategy for ArRiyadh**
- Published in 1997
- Updated in 2004 and in 2010
- Provides the vision for the development of the City and the Metropolitan Area of Riyadh for the next 50 years
Fields of Work

- Bus Network
- Vehicles
- Depots
- Park & Ride
- Stops & Stations
- Bus Lanes

Hardware
Fields of Work

- Operation Concept
- Marketing Concept
- Business Plan
- Procurement Strategy
- Institutional Set-Up

Consultancy
Fields of Work

- AVM / OCC
- ITS
- AFC
- RTPI
Network Hierarchy Levels

- **METRO**
  - Major Traffic Axes
  - System Backbone

- **BRT**
  - Urban Rapid Transit
  - Circle Lines

- **Community**
  - Detailed Exploitation
  - Mixed Traffic

- **Feeder**
  - Exploitation of Residential Areas
  - „Last-Mile-Service“
Line Network Overview

METRO

BRT

Community
Line Network Interfaces

- METRO
- BRT
- Community
Bus Line Network
Implementation Phases

August 2016

February 2017

August 2017
# Bus Line Network Numbers

<table>
<thead>
<tr>
<th>Line Type</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bus Rapid Transit</strong></td>
<td>52.5 km</td>
<td>12.5 km</td>
<td>37.5 km</td>
<td>102.5 km</td>
</tr>
<tr>
<td><strong>Community Line</strong></td>
<td>190 km</td>
<td>133 km</td>
<td>193 km</td>
<td>516 km</td>
</tr>
<tr>
<td><strong>Bus Rapid Transit</strong></td>
<td>31</td>
<td>10</td>
<td>32</td>
<td>73</td>
</tr>
<tr>
<td><strong>Community Line</strong></td>
<td>394</td>
<td>550</td>
<td>600</td>
<td>1,544</td>
</tr>
</tbody>
</table>

**Length**

**Stops**
Focus: Bus Feeder Lines

• More than 70 Feeder Lines
• Exploitation of Residential Areas
• Routing guided by POIs (Mosques, Schools, Malls, Office Buildings, etc.)
• Development of Planning Basis
  • Alignment
  • Headway
  • Stop Distances
  • Connections
  • Bus Types
  • Barrier-free Access
Bus Feeder Lines
2 parallel Concepts

A – Fixed Line Feeder
• Fixed lines, fixed timetable
• “Hail&Ride” principle
• Exploiting major axes inside Residential Areas
• Connection to stations of the superior network
• Operated by 10.5 m MidiBus
Bus Feeder Lines
2 parallel Concepts

B – DRT Feeder
• DRT: Demand-Response-Transit
• Pick-up and Drop-off service “door-to-door” inside Residential Areas
• Bus call via phone, internet or smartphone app
• IT-based operation management
• Connection to stations of the superior network
• Operated by MiniBus

Examples
Vehicle Specification

- Insurance to meet European Quality and Safety Standards
- Definition of requirements relevant for ADA as authority (and not as an operator):
  - Reliability
  - Comfort
  - Design
  - Capacity
  - Function
  - Safety
## Vehicle Specification

<table>
<thead>
<tr>
<th>Type</th>
<th>Application</th>
<th>Make</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 m</td>
<td>BRT / Community</td>
<td>Mercedes Benz Citaro G</td>
<td>436</td>
</tr>
<tr>
<td>12 m</td>
<td>Community</td>
<td>Mercedes Benz Citaro</td>
<td>150</td>
</tr>
<tr>
<td>10.5 m</td>
<td>Fixed Line Feeder</td>
<td>MAN Lion’s City A47</td>
<td>250</td>
</tr>
<tr>
<td>&lt;10 m</td>
<td>DRT Feeder</td>
<td>Mercedes Benz Vito</td>
<td>120</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>956</td>
</tr>
</tbody>
</table>

(Status: 04/2014)
Station Layout

3 Types

**Type A**
BRT
- air-conditioned
- passenger screen-doors

**Type B**
Community
- air-conditioned
- 16 m length

**Type C**
Community
- air-conditioned
- 10 m length
Station Layout
Type A – Bus Rapid Transit
Station Layout
Type A – Bus Rapid Transit
Station Layout

Type B – Community Lines (16 m)
Station Layout
Type C – Community Lines (10 m)
Station Layout
Terminus Station
Transportation Control Center TCC Impressions
Transportation Control Center TCC
Central System + Functionalities

Central Hardware
- Bus Operation
- Metro Monitoring
- ITS workplaces
- Video wall
- Server system for AVM and RTPI
- Backup server system for AVM & RTPI

Functionalities
- Bus monitoring
- AVM dispatching
- AVM statistics
- AVM data preparation
- CCTV supervision
- IT software
- RTPI dispatching
- AFC management
- Clearing House
- Customer Care
- IT Software
Park&Ride Facilities

- Selection of Location
  - Along major lines
  - Periphery
  - Local conditions

- Equipment Specification
  - Dimensioning
  - Equipment
  - Green areas
  - Road alignment
Summary

✓ Fully integrated network covering all urban transportation needs
✓ Bus system providing major exploitation functions
✓ State-of-the-art monitoring and customer-relations applications
✓ Highest level of service comfort and functionality to provide optimal passenger benefits
It’s so easy –
Intelligent Applications for smart Public Transport
Customer’s View: Chain of Actions

- Check Destination and Start Point
- Find-out Line and Trip Length
- Inform about Connections
- (Order Taxi for Pick-up at Destination)
- Get Ticket
- Check real-time Schedule

at home at home
on-board on-board

LRTC
Customer’s Expectations

- SERVICE
- RELIABILITY
- COMFORT
- SAFETY & SECURITY
- TIME SAVINGS
- ENVIRONMENT
How it all works: IT Systems for Public Transport Operations

- Automated Vehicle Management (AVM)
- Real Time Passenger Information (RTPI)
- Depots Maintenance Management
- Journey Planner (JP)
- Interfaces e.g. PT Priorization
- Operation Control Center (OCC)
- Automatic Fare Collection (AFC)
- Reports & Statistics
- Planning e.g. Roster System, Timetables

High Level System Integration

AVM System is the Core of the ITS Architecture
Focus: Automatic Vehicle Management and OCC

Operation Control Center (OCC)

- Management reports and statistics
- Driver and Passenger Information Instructions for Drivers
- Scheduled data
  - Delay information
  - Special Announcements via text and voice
- Location Data
  - Real-Time Schedule Information
  - Voice and Data Messages
  - Priority Emergency Calls

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- Priority Emergency Calls
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- Location Data
- Real-Time Schedule Information
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Line | Destination | Departure
--- | --- | ---
X11 | King Abdulaziz International Airport | 6:00 pm
X99 | King Abdullah Financial District | 7:00 pm
X12 | Riyadh Railway Station | 7:03 pm
X99 | King Abdullah Financial District | 7:07 pm

*** message for passengers ***

*** messa
Focus: Real-Time Passenger Information (RTPI)

<table>
<thead>
<tr>
<th>Line</th>
<th>Destination</th>
<th>Departure</th>
</tr>
</thead>
<tbody>
<tr>
<td>X11</td>
<td>King Khaled International Airport</td>
<td>5 min</td>
</tr>
<tr>
<td>X09</td>
<td>King Abdullah Financial District</td>
<td>7 min</td>
</tr>
<tr>
<td>X12</td>
<td>Riyadh Railway Station</td>
<td>1:03 p</td>
</tr>
<tr>
<td>X09</td>
<td>King Abdullah Financial District</td>
<td>1:07 p</td>
</tr>
</tbody>
</table>

*** message for passengers *** *** messa ** Bus Station LED Display**
Focus:
Passenger Information & Journey Planner

• Enables routing between various locations
• Incorporates access to Public Transport
• Manages personalized data
• Provides information
Focus: Passenger Information & Journey Planner

Start / End of Journey

Generated Trips (all modes of PT are included)

Trip Details

Visualization on Map
In a nutshell

High-level integrated platform solution providing consolidated information out of one hand for multiple applications.
Don’t be equal to Individual Traffic – be ahead of it!

Convincing People of Public Transport
Basic Philosophy

Famous words of the Mayor of Bogotá/Colombia:
"A developed country is not a place where the poor have cars…

It's where the rich use Public Transport."

Gustavo Petro
Recommendations

✓ Evoke Curiosity
✓ Take your time to make it right
✓ Offer a quality network right from the start
✓ Demonstrate clear benefits and added values
✓ Create a safe and secure environment
✓ Be well prepared for what will happen…
Evoque Curiosity…

Take-off now.

The way is clear! Experience a bus service that gives the feeling of an airline. You will reach your destinations fast, safe and affordable.
Evoque Curiosity...

Ready to take off?

It’s all ride.
Evoque Curiosity...

Ride and dine!
Bring your bus ticket and get 10% off at the great Indian restaurant XY.

Safe landings. Even under advert conditions.

Relax with us! Experience a bus service that gives the feeling of an airline. You will reach your destinations fast, safe and affordable.
It's all about Marketing…

- Integrate Marketing & Communication
- Create a strong Brand Identity
- Promote a unified Image
- Make Customer Services comprehensive
- Apply state-of-the-art Passenger Information
Recommendations

✓ Evoke Curiosity

✓ Take your time to make it right

✓ Offer a quality network right from the start

✓ Demonstrate clear benefits and added values

✓ Create a safe and secure environment

✓ Be well prepared for what will happen…
Recommendations

✓ Evoke Curiosity

✓ Take your time to make it right

✓ **Offer a quality network right from the start**

✓ Demonstrate clear benefits and added values

✓ Create a safe and secure environment

✓ Be well prepared for what will happen…
Offer a Quality Network right from the Start...

• Let your customers experience the performance of your network from Day 1.

• Start of operation must demonstrate a reasonable network that makes sense to use.

• Too small steps will disappoint your customers and will not offer obvious benefits.
Recommendations

- Evoke Curiosity
- Take your time to make it right
- Offer a quality network right from the start
- **Demonstrate clear benefits and added values**
- Create a safe and secure environment
- Be well prepared for what will happen…
Demonstrate clear Benefits and Added Values...

- Demonstrate the highlights of your system.
- Offer services free of barriers...

<table>
<thead>
<tr>
<th>Key accessibility factors</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility and appearance</td>
<td>Clear color schemes, color contrast and lighting</td>
</tr>
<tr>
<td>Signage</td>
<td>Visual and clearly located, Braille signs and information</td>
</tr>
<tr>
<td>Information</td>
<td>Audible and visual, clear and visible, additional English version where applicable</td>
</tr>
<tr>
<td>Staff</td>
<td>Trained in disability awareness</td>
</tr>
<tr>
<td>Bus stops</td>
<td>Signage clear, visual information to replicate audio, ramps, large waiting areas, dedicated boarding zone, safety barriers</td>
</tr>
<tr>
<td>Vehicles</td>
<td>Step free entry, flat floor, spacious priority areas/seats, visual signage and information messages</td>
</tr>
</tbody>
</table>
Demonstrate clear Benefits and Added Values...

- Invite potential customer groups and take special care for them.
- Set new standards in comfort.
  - Door-to-door service
  - Air-conditioned bus stops
  - Eco-friendly technology
  - Intelligent applications
Recommendations

✓ Evoke Curiosity

✓ Take your time to make it right

✓ Offer a reasonable network right from the start

✓ Demonstrate clear benefits and added values

✓ Create a safe and secure environment

✓ Be well prepared for what will happen…
Create a safe and secure Environment...

- **CCTV cameras** with loop storage at Stops and Stations as well as aboard of vehicles
- **SOS Contact** device for emergency and service requirements – activation leads to direct vocal communication with TCC and to real-time activation of cameras
- **Service Staff** presence majorly during night hours
- Intensive **staff training** and awareness-raising for potentially critical situations
- **Guided tours** for (potential) passengers
- **Barrier-free** layout
Recommendations

- Evoke Curiosity
- Take your time to make it right
- Offer a reasonable network right from the start
- Demonstrate clear benefits and added values
- Create a safe and secure environment
- Be well prepared for what will happen…
  … and be ready to (re)act
Summary

Transport Network

- Railways
- Intercity Buses
- Urban Rail and Buses
- Individual Traffic
- Ferries
Summary

 ✓ Consider the complete transportation chain for network design and operation
 ✓ Include innovative modes such as car-sharing, e-bikes, etc.
 ✓ Provide smart applications to ease access and use
 ✓ Focus the customer in all aspects!
Being inspired?
Invitation to talk…

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