Municipality of Mashhad

A brief Introduction of

Intelligent Transportation Systems

Development

June 2019
About Mashhad (Year 2017)

- Municipal zones area: 352 Km$^2$
- Residential population about 3.2 million
- Population will Reach to 3.8 million in 2022
- Partly dry Climate
- A Religious city with ~ 25 million Travelers/Pilgrims per year
Fact & Figures (Year 2017)

❖ Traffic zones area : 275 Km²
❖ City mean length : 20 Km
❖ City mean width : 10 Km
❖ City mean height : 990 m
❖ More than 6.2 million trips per day (all transport modes)
❖ Travel rate in 24h : 1.97 Travel per Person
❖ Number of vehicles entering/leaving the city in 24h : ~ 300,000
Fact & Figures (Year 2017)

- Highways length: 100 Km
- Major arterial roads length: 134 Km
- Minor arterial roads length: 258 Km
- Local and collector roads length: 221 Km
- Number of traffic signal intersections: 242
- Number of flasher intersections: 300
So, We need ITS to ...

- Improve Traffic Flow
- Reduce air pollution
- Manage Energy consumption
- Maximize the safety and efficiency
- Facilitate Mobility
- Improve Emergency aids

Enhancing Quality of life!
Where we are Now?

❖ Establishment of MTCC (1999)

 Redesign and Reconstruction in 2013

❖ ITS Top-level Studies:

 Mashhad ITS Comprehensive Study (2016)
 Iranian National ITS Architecture (2016)

❖ ITS Development

 Intelligent Control Systems (from 1999)
 Automatic Video Surveillance/Enforcement Systems (from 1999)
 Public Transport Management/Payment Systems (from 2008)
 Traffic/Traveler Information Systems (from 2010)
 Archived/Online Data Processing/Analytics (from 2014)
ITS Top-level Studies:

Mashhad ITS Comprehensive study

9 Main Service Areas
30 User Services
92 Service Packages
ITS Top-level Studies:

Iranian National ITS Architecture

9 Main Service Areas

97 Service Packages
ITS Development:

Intelligent Control Systems

By Installation and utilization of SCATS and Other local similar systems:

- Integrated management and monitoring of traffic
- Integrated and Coordinated scheduling and phasing
ITS Development:

Intelligent Control Systems: Traffic Flow Monitoring

Site 201 - 15 min Traffic Volume Profile

- Approach 1 daily total: 10643 AM peak 10:30 - 11:30 516 PM peak 17:00 - 18:00 743
- Approach 2 daily total: 27638 AM peak 10:00 - 11:00 1537 PM peak 18:15 - 20:15 1021
- Approach 3 daily total: 7086 AM peak 10:00 - 11:00 456 PM peak 17:45 - 18:15 938
ITS Development:

Intelligent Control Systems: EVP

- Development and installation of Traffic signal preemption for emergency vehicles
ITS Development:

Video Surveillance

- CCTVs
- Robust Video Surveillance softwares
- Dedicated Communication infrastructure
- Display Walls
ITS Development:

Video Surveillance: Real-Time Accident Management
ITS Development:
Enforcement Systems

Red-light Camera

Speed Camera

Traffic Zone Camera
ITS Development:

Enforcement Systems: Speed Camera

Average Speed Camera

Speed Camera
ITS Development:

Enforcement Systems: Red-light Camera
ITS Development:

Enforcement Systems: Traffic Zone Camera
ITS Development:

Public Transport Management/Payment

- Bus FMS with 2500 supervised buses in operation
- An Integrated EPS Based on MiFARE DESFire EV1 Smart card, called “MAN CARD” with a vast support network, Usable on the Bus, Metro, Taxi and...
- Mobile payment based on NFC, Available on the Buses and Metro
- Mobile payment Based on QR Codes, Available on Metro and Taxi
ITS Development:

Traffic/Traveler Information systems

- RTTIS
- VMS
- Web/Mobile Apps
- SMS, ...
ITS Development:
Traffic/Traveler Information systems : VMS
ITS Development:
Traffic/Traveler Information systems: Online Map

- 131 Information Layers
- Routing
- Real-time Traffic Status
- Car parking Capacity
- RTTIS for Bus/Metro
- Real-time Traffic Cameras
- Real-time Air pollution status
ITS Development:

Traffic/Traveler Information systems : Online Map
ITS Development:
Traffic/Traveler Information systems: Mobile App

- 131 Information Layers
- Car & Public Transport Routing
- Realtime Traffic Status
- Car Parking Capacity
- RTTIS for Bus/Metro
- Realtime Traffic Cameras
- Realtime Air pollution status
- Crowdsourcing
ITS Development:

Data processing/Analytics: Traffic congestion recognition

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ITS Development:

Data processing/Analytics: Traffic congestion recognition
Now we have:

- Intelligent control systems: in 242 intersections
- CCTV: 427
- Enforcement Camera: 109
- VMS: 54
- Comm. Infrastructure: 350 KM Fiber
Obstacles and challenges

- **Excessive Traffic Demand**
  - new vehicles
  - Explosive Traffic in Particular Periods
  - Lack of Parking Capacity
  - Excessive Air pollution
  - wasting Time and Energy
  - Inadequate Public transport Development

- **Insufficient ITS Development & Maintenance Capacity**
  - Unintegrated Subsystems
  - Limited budget for using new systems and upgrading existing systems
  - Limited Control on Traffic Condition
  - Lack Of DSS and C-ITS

- **Insufficient Necessary Traffic Information System**
  - Unorganized Traffic data
  - Confined know-how in Big-Data
Thank you for your Attention!