Modeling for Sustainable Complete Streets/Multimodal Transportation Planning
Acknowledgement

1. All speakers: USA, Australia and Canada
2. Sponsors: TSS, PTV and Citilabs
3. Moderators: Lin Zhang, Joy Bhattacharya and Mike Wallace
4. SF ITE Team: Kimberly Leung, Bhanu Kala, Denis Wu, Afsaneh Yavari, Ted Huynh
5. SF ITE Technical Program Chair: Jia Hao Wu
First Sino-US ITS/Adaptive Traffic Control Implementation in Panyu of Guangzhou, China

Jia Hao Wu, Ph.D.
W & S Solutions, LLC

2015, April 29
SF Bay Area ITE Modeling Workshop
San Francisco, USA
First Sino-US ATMS/Adaptive Control Project

1. Project Team: W & S Solutions (Prime), Econolite (Sub-consultant) and Wu & Song Associates (Shanghai) and Local Firms
2. Project listed as Part of 2013 Sino-US Strategic and Economic Dialogue Program
Integration Methodology

![Integration Methodology Diagram]

- Planning:
  - Signal Timing Project Initiation
  - User of the Signal
  - Geometry
  - Phasing
  - Detector Placement
  - Detector Function
  - Basic Signal Timing
  - Mode of Operation
  - Coordination Plan
  - Performance Measurement

- Design

- Operations/Maintenance

ATMS/Adaptive Control
Demand Forecasting in Emme: Existing and Future Volumes P.M.

2012 p.m.

2015 p.m.

2040 p.m.
Detailed Intersection Improvements with Aimsun: Yingbing Rd/Haizhu Rd: Before and After
ITS Solutions for Guangming Road: Major Arterial with Many Shopping Centers

晚高峰交通运行状况
Bottleneck: Spillback and Congestions
Challenging Issues:

- Long cycle length: 230 sec
- Conflicting movements
- Video cameras with no data collection
- No coordination
- No actuated control
- Green/red countdown with adaptive controls
- Loop detections
Traffic Movement Conflicts at Intersections
ATMS/Adaptive Control System: Big Data

- Data Collection
- Data Analysis
- Traffic Controls
- Operation Alerts

Internet

Video Detection

TMC Management

TMC Control

Traffic Data

ATMSS

Traffic Data

Centracs

W & S Solutions/吴宋美加
Production to Operation: January to May 1, 2-13
Big Data: Travel Volumes by Each Lane 24-7-365

- Type
- Volumes
- Occupancy
- Speed
- Phase
- Time
- Date
- Video
Redesign of Intersections and Signal Phases
Adaptive Control at Donghuan Road: 5:00-7:00 p.m.
ATMS with Actuated+Coordinated+Adaptive Controls: 6:00p.m.
Time Space Diagram
Flow Profile for Off-Set Adjustments

Flow Profile Summary
Results: System in Operations for a Year

- **Travel Time Reduction:** 20%
- **Travel Delay Reduction:** 30%
- **Emission Reduction:** 25%
Lessons Learned

• Start with existing timing
• Evaluate the traffic volumes from video cameras
• Evaluate the traffic operations
• Use the micro-simulations to test different adaptive signal timings (using average adaptive timings and volumes)
• Observe the system operation with analysis mode
• Fine-tune the system (even remotely)
• Operate the system in a semi-automatic manner
• Operate the system by restarting the server every few months
• Integrate US and Chinese ITS products