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6/17/04

City of Austin Traffic Signal Operation and Synchronization Peer Review May 3 & 4, 2004

FHWA Peer to Peer Program
Request No. 20040036, Task No. 100773

FHWA Peer to Peer Program

The Federal Highway Administration's Peer to Peer Program is a special grant program intended to assist government agencies in learning from each other about their intelligent transportation systems, including traffic signal systems.

Peer Review Process

- Identify Professionals Highly-Experienced in Urban Traffic Signal Operations
- Bring them to Austin for two days to overview current operations
- Produce a collaborative assessment report



Primary Objective of this Peer Review

To determine if Austin's traffic signal system is being designed, operated and maintained in accordance with "state-of-the-practice" techniques, in order to achieve maximum efficiency and safety for roadway users.

Professionals on Panel*

Marshall Elizer, P.E., PTOE, Nashville, TN

Wayne Gisler, P.E., Houston, TX

Jenny Grote, P.E., PTOE, Phoenix, AZ

Kang Hu, P.E., Los Angeles, CA

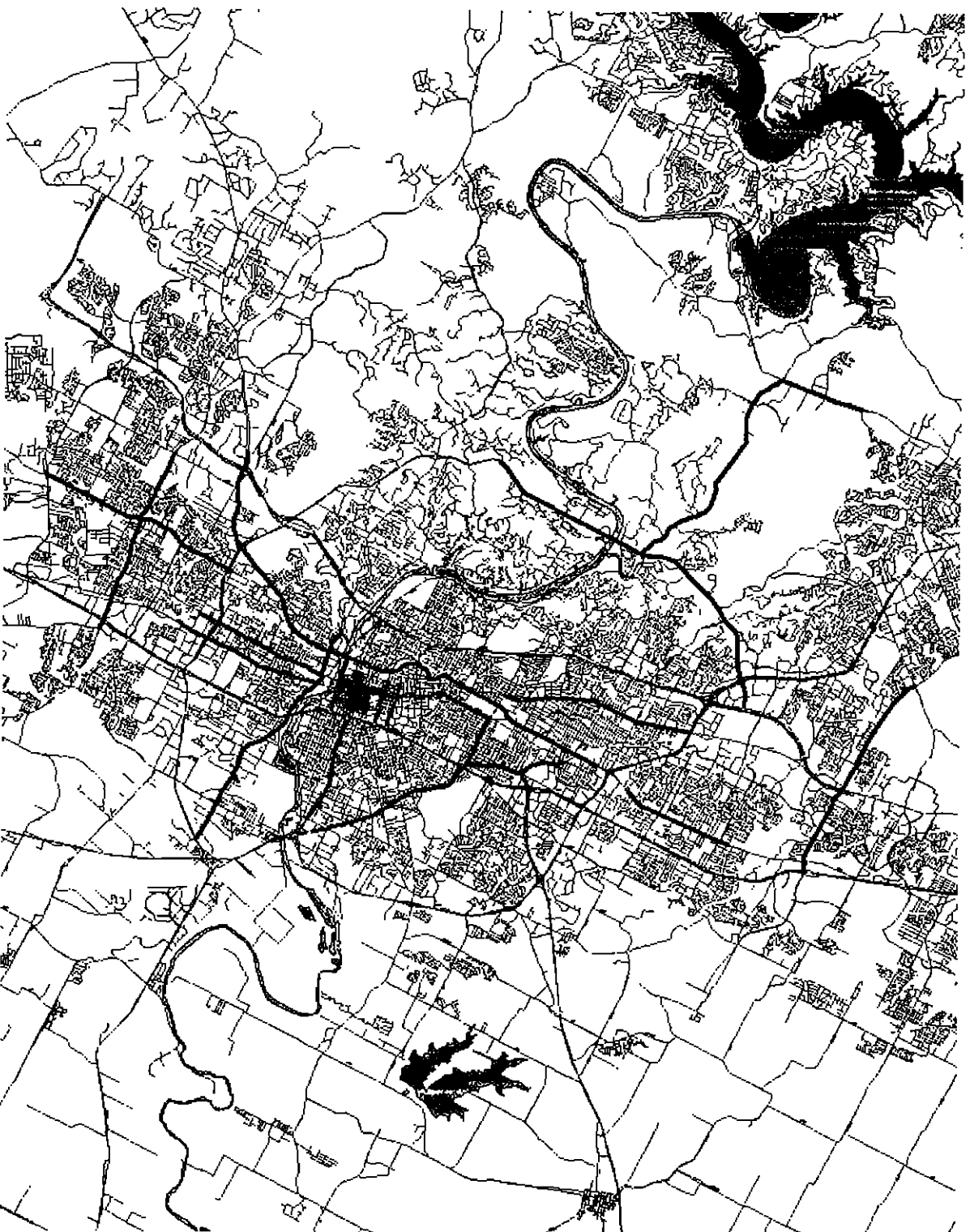
Bill Kloos, P.E., Portland, OR

* Panel cumulatively provides over 120 years signal experience in 8 metro areas, two Past International ITE Presidents, two Professional Traffic Operations Engineers, and involvement in several national traffic signal research and standards-setting activities

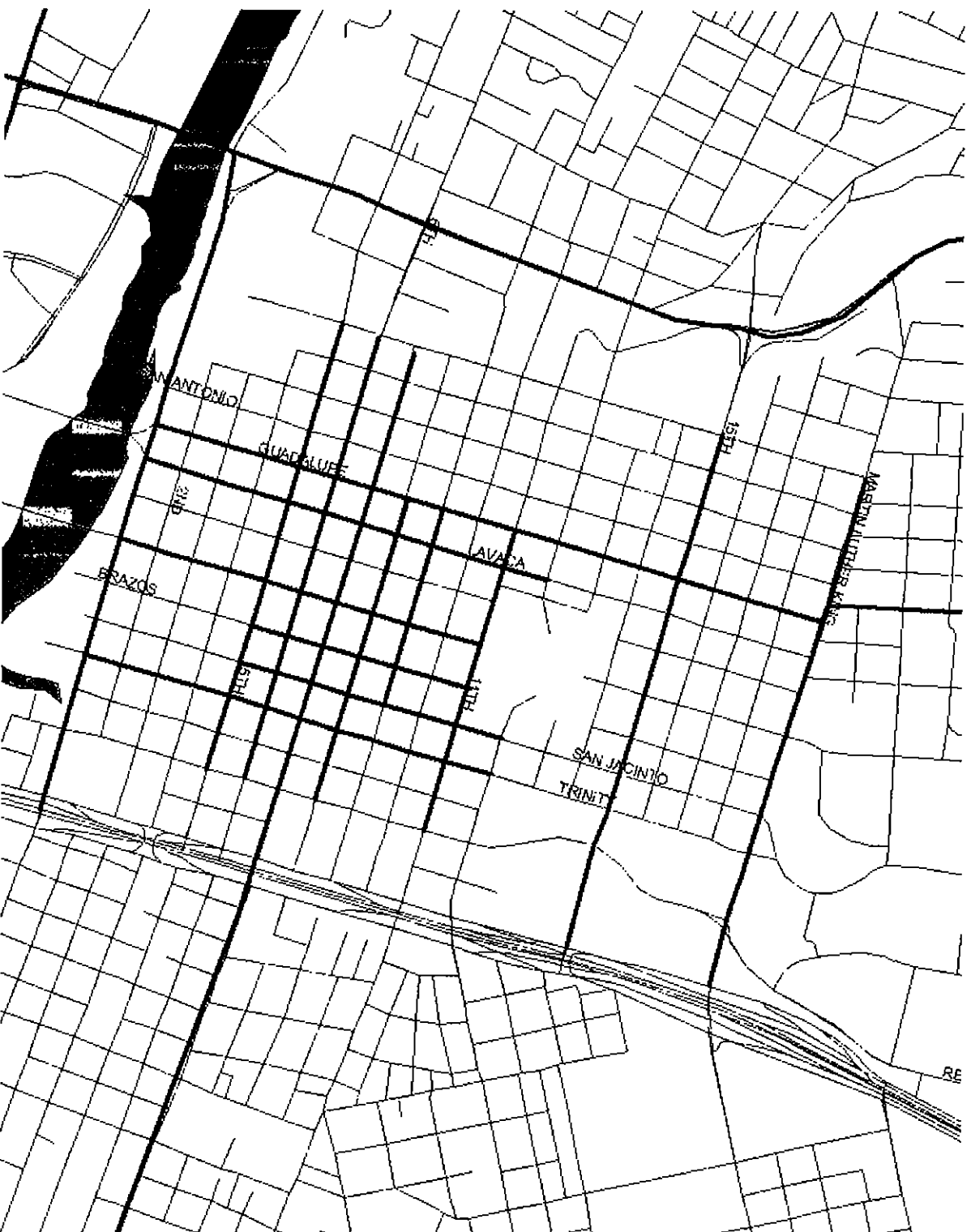
Peer Review Panel Activities

- Review of past traffic signal requests, correspondence and issues
- Tour of traffic management center (TMC)
- Staff presentation on signal system:
 - operating policies and procedures
 - “optimization” philosophies and techniques
 - timing, phasing, coordination operations
 - central system and field equipment
 - traffic growth trends
- About 8 hours driving main arterial corridors and downtown streets
- Final discussion session

Corridor Review Streets



Downtown Review Streets



Observations & Findings in Four Areas

- Signal Timing Operations
- System Operations & Management
- Impediments to Maintaining Optimized Signal Timings
- Other Potential Improvements to Signal Operations

NOTE: An * denotes a perceived resource limitation

Observations & Findings

Signal Timing Operations

- Individual Intersection Timing is Very Good
 - Results are very good due to advanced phasing techniques; most constraints due to inadequate number of lanes* and limited vehicle detection*
- Arterial Corridor Timing is Excellent
 - Results are very impressive with excellent progression balanced throughout the day; aggressive use of advanced phasing and lane management techniques allows for optimal synchronization

Observations & Findings

Signal Timing Operations

- Downtown Signal Timing is Very Good
 - Timing methodology is well-established; opportunity for some policy adjustment to better serve minor streets; most congestion is due to lack of adequate lanes in peak periods
- Centralized System Control is Very Good
 - System hardware & software is highly-advanced; provides for very effective signal monitoring and control; advanced system features should be evaluated and added as they become available*

Observations & Findings

System Operations & Management

- Management Philosophies & Policies are Very Good
 - System organization and management is well developed; opportunity exists for increased documentation & communication of these elements
- Optimization/Simulation Software Applications are Good
 - Accepted analytical tools are effectively used; opportunity exists to expand use of these tools to better define and demonstrate performance to users*

Observations & Findings

System Operations & Management

- Data Collection Efforts are Good
 - Traffic data collection drives signal timing; 3-yr cycle is adequate for some locations, but should be accelerated in high-growth areas*
- System Performance Documentation Efforts are Good
 - While current signal operations are excellent to very good, staff has limited data to quantify and communicate these results; opportunity exists to expand analysis to support this conclusion*

Observations & Findings

System Operations & Management

- Public Communication Efforts are Good
 - Staff effectively responds to service requests; pro-active efforts in this area may improve public perception and understanding of signal operations*
- System Maintenance Program is Good
 - Current maintenance levels are considered adequate; opportunity exists for increased preventative maintenance activities, primarily for vehicle detection devices*

Observations & Findings

System Operations & Management

- Central System Capability is Very Good
- Signal Field Equipment is Very Good
- Vehicle Detection Maintenance is Good
 - System is maintained at a generally acceptable level; opportunity exists to increase preventative maintenance schedule*
- Time-of-Day, Day-of-Week Timing Plan Flexibility is Good
 - Number and use of established timing plans is typical; opportunity exists to increase number of plans if data collection efforts are increased*

Observations & Findings

System Operations & Management

- Signal Timing Coordination with Construction/Maintenance is Good
 - Signal adjustments do occur with projects; opportunity exists to more pro-actively manage signal operations with contractors and other agencies*
- Incident Management & Special Events Signal Operations is Very Good

Observations & Findings

System Operations & Management

- Staff Experience & Capability is Considered Excellent
- Staffing Level is Good
 - Signal operations are considered excellent given existing resources; opportunity exists to increase level of service with increased resources*

Impediments to Maintaining Optimized Signal Timing

- Limited roadway capacity/lanes
- Design and timing of construction/maintenance zones
- On-street parking operations, especially angle parking
- Un-necessary traffic signals
- Excessively rough pavement conditions
- Poor geometric conditions at intersections & curves

Impediments to Maintaining Optimized Signal Timing

- Ineffective access management – too many driveways, wrong locations
- Inefficient curb lane bus operations
- Repeated pedestrian crossings or emergency vehicle preemption, especially during peak periods
- Duration of school zone times
- Rapid traffic volume growth and directional shifts due to land use growth

Other Potential Improvements to Overall Signal Operations

- Improved collision reporting system (only about 25% of collisions currently captured)
- Continued coordination with Enforcement groups
- Improved street name signing
- Evaluation of reversible lane applications
- Use of pedestrian “count-down” signals
- Enhanced signal head visibility

Summary of Key Findings

- Austin's traffic signal system is considered to be in the top tier of systems in the ~~country~~ *country*
- Staff is very capable, and overall system operations are considered excellent to very good
- Opportunity exists for some enhancements, most of which require commitment of additional resources
- Number and type of citizen requests are typical to those in similar urban areas
- Traffic congestion on signalized corridors is predominantly due to limitations in roadway capacity, not signal operations

Questions?



Traffic Signal Peer Review Briefing

Main Presenter - Marshall Elizer

- ❑ Chief Transportation Engineer for Gresham, Smith and Partners in Nashville, TN.
- ❑ Registered professional engineer, a registered Professional Traffic Operations Engineer.
- ❑ BS and MS degrees in transportation engineering.
- ❑ Past International President of the Institute of Transportation Engineers.

Wayne Gisler

- ❑ Transportation Operations Manager for Harris County (Houston) Texas. MS degree specializing in Transportation Engineering.

Other members of the Panel not in attendance:

- ❑ Bill Kloos Portland, OR; Kang Hu, Los Angeles, CA; and Jenny Grote Phoenix, AZ. Jenny is also a past International President of the Institute of Transportation Engineers.

Details of Peer Review

- ❑ The peer review was conducted May 3rd and 4th. The review consisted of reviewing the technology at the traffic management center and driving the arterial streets during the AM, PM and off peak periods.
- ❑ The report concludes that we have very good synchronization.
- ❑ Things we could be doing better:
 - preventive maintenance program, more traffic volume data collection, and developing additional signal timing plans for different times of day and days of the week. The report notes that to do these things additional resources would be needed.