Traffic Signal Systems for Small Cities

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Overview

- Rohnert Park, example small city
- Typical signal system approach
- Recently added system features to improve ongoing signal operations
Rohnert Park

- The City of Rohnert Park is located about 50 miles north of San Francisco and has a population of about 41,000.
- The City owns and operates 49 signalized intersections, with more being built each year in this growing City.
- Currently only 11 intersections have interconnect equipment, and another five are equipped with time clocks.
- The City has already started expanding their interconnect system by adding interconnect conduit into road widening projects.
Detailed Map

Key streets
- RP Expressway
- Golf Course Road
- Commerce Blvd
- Snyder Lane

Growth Areas
- Residential on east side
- Retail/restaurant on west side
- TOD/POD near new commuter rail
- Casino on NW side

Coordination Issues
Existing TS Infrastructure

- Rohnert Park currently runs McCain software
- They have a mix of cabinet types, some of which must be updated
- Most controller units are 170E with a few 170 and two new 2070Es
- Existing interconnect is limited to GPS clocks along Golf Course Drive and SIC in conduit along Rohnert Park Expressway
- Recent widening projects have allowed installation of SIC conduit on Snyder Lane
Proposed Interconnect

- Proposed interconnect will include:
  - SIC along streets where conduit has been installed
  - Wireless at other locations
  - Wireless using repeaters in street lights is being considered for streets with curved alignments or where the street tree canopy is very heavy
  - Connections to City comm hubs at City facilities
System Needs Study

Used many perspectives, including:
1. An evaluation of existing traffic patterns
2. Daily count profiles
3. Consideration of special generators
4. Future growth patterns
5. Implementation of a new commuter rail system
6. Regional commute patterns

Concluded with a variety of interconnect needs, ranging from traditional TOD to adaptive.

All require robust communications.
Wireless Interconnect Options

- Spread Spectrum Radio with YAGI antennae

- Wireless Metropolitan Area Network (WMAN) with transceivers in street lights and mesh network topology
TS Operations Issues for Small Cities

Reality Check

- The staffing at small cities may range from one engineer who does a bit of everything to multiple engineers, each of whom wears many hats and may have to prioritize issues identified by the Council or City Manager.

- Routine field review of traffic TS operations typically does not occur. Reactive response to input from residents may include assignment of personnel (often on-call) to investigate specific issues.

- Signal interconnect plans are typically developed by consultants and updated every 2 or more years.

- Holiday programming or special interconnect plans for summer break are rarely used.

- (These statements are solely intended as observations of the current situation, no criticism is intended or implied.)
On-Call Requests from Small City Staff

- Traffic signal timing audits/updates in response to claims:
  - Bike min greens, FDW, yellow clear, red clear

- Responses to resident complaints
  - Recent example: resident complained about long delay on minor street. Complaint was made during a school spring break when through volumes were low.

- Troubleshooting emergency vehicle timing inputs in response to requests from the Fire Department
  - Timing inputs were properly programmed, further investigation by maintenance staff revealed the EV equipment had been disconnected

- Fine tuning timing at an intersection that frequently held a minor northbound movement after traffic had dissipated
  - Discovered an eastbound right turn loop was programmed to the minor northbound phase
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Performance Monitoring

- Work pioneered by State of Indiana with support from FHWA and several DOTs identified a need to have full-time monitoring of key issues:
  - Maintenance monitoring, primarily detection
  - Operations monitoring such as Green utilization
  - Detector occupancy monitoring for minor movements
  - Automatic generation of Measure of Effectiveness reports

- For more information see:
Current and Future Status

- City of Rohnert Park has conducted a preliminary screening of traffic signal system options and identified priorities as follows:
  - Nearby systems already installed to allow easy User Group meetings
  - Cost
  - Adaptive capability
  - Performance Monitoring features
  - User Interface
- Preparing a TS System Request for Proposal
- Working on interconnect pilot program
- Developing a funding and deployment plan:

<table>
<thead>
<tr>
<th>Table 5 – Cost Estimate for Recommended Interconnected Traffic Signal System</th>
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<td><strong>Type</strong></td>
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<td>Central System Hardware and Software</td>
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Thank you for your attention!

Time for your questions