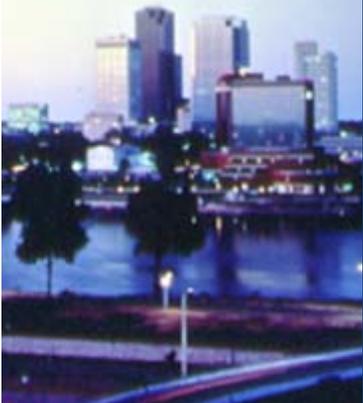


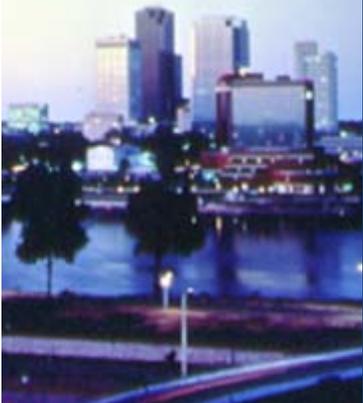
City of Little Rock
Dallas Phasing
Implementation
Rodney Parham Road

William Henry, P.E.
Traffic Engineering Manager



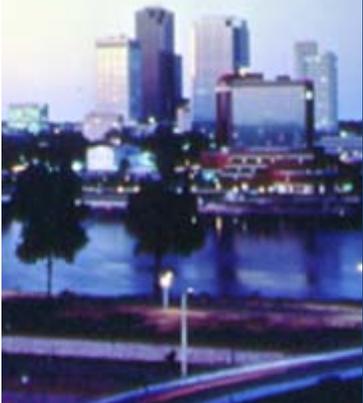
Protected Permitted Left Turns (PPLT)

- Provides drivers with the option to wait for a protected left turn when there are insufficient gaps or to make a left when there are available gaps to make the turn.
- PPLT increases efficiency over fully protected left turn phasing
- Approximately 30% of intersections in the US include PPLT phasing



PPLT Phasing Concerns

- PPLT phasing can cause a “Yellow Trap”.
- A yellow trap occurs when a driver waiting to make a permitted left turn sees the adjacent through phase turn yellow while the opposing green phase stays green.

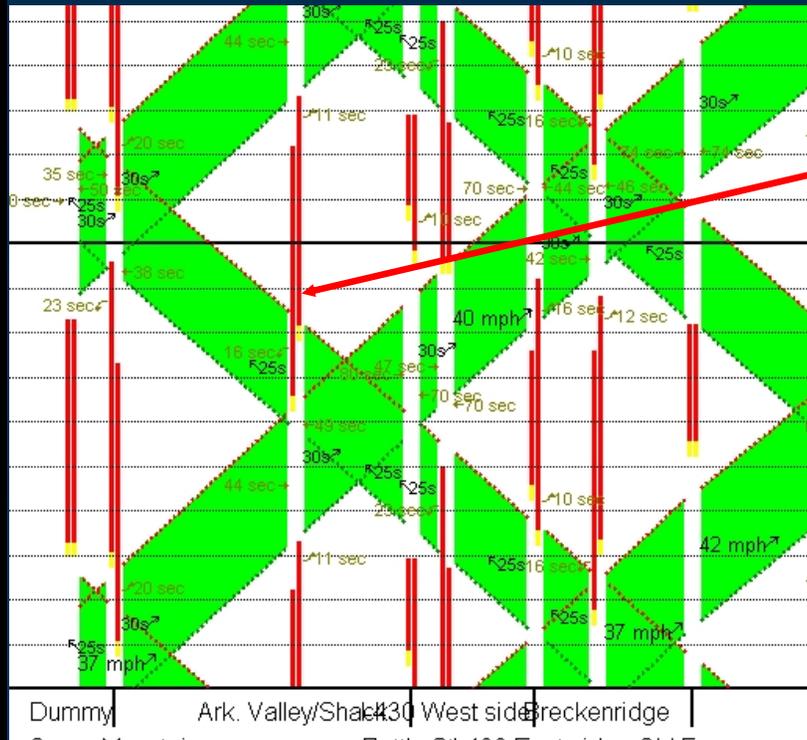


Correcting the *Yellow Trap* with the Dallas Display

- Dallas Phasing utilizes an exclusive left turn signal head with the green and yellow ball displays louvered to prevent adjacent lanes from seeing the signal indications
- The louvered display shows the opposing through indication instead of the adjacent through indication to eliminate the yellow trap

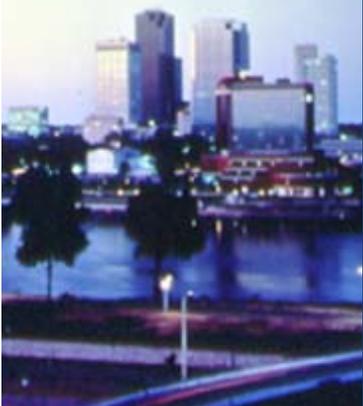


Time Space Relationship



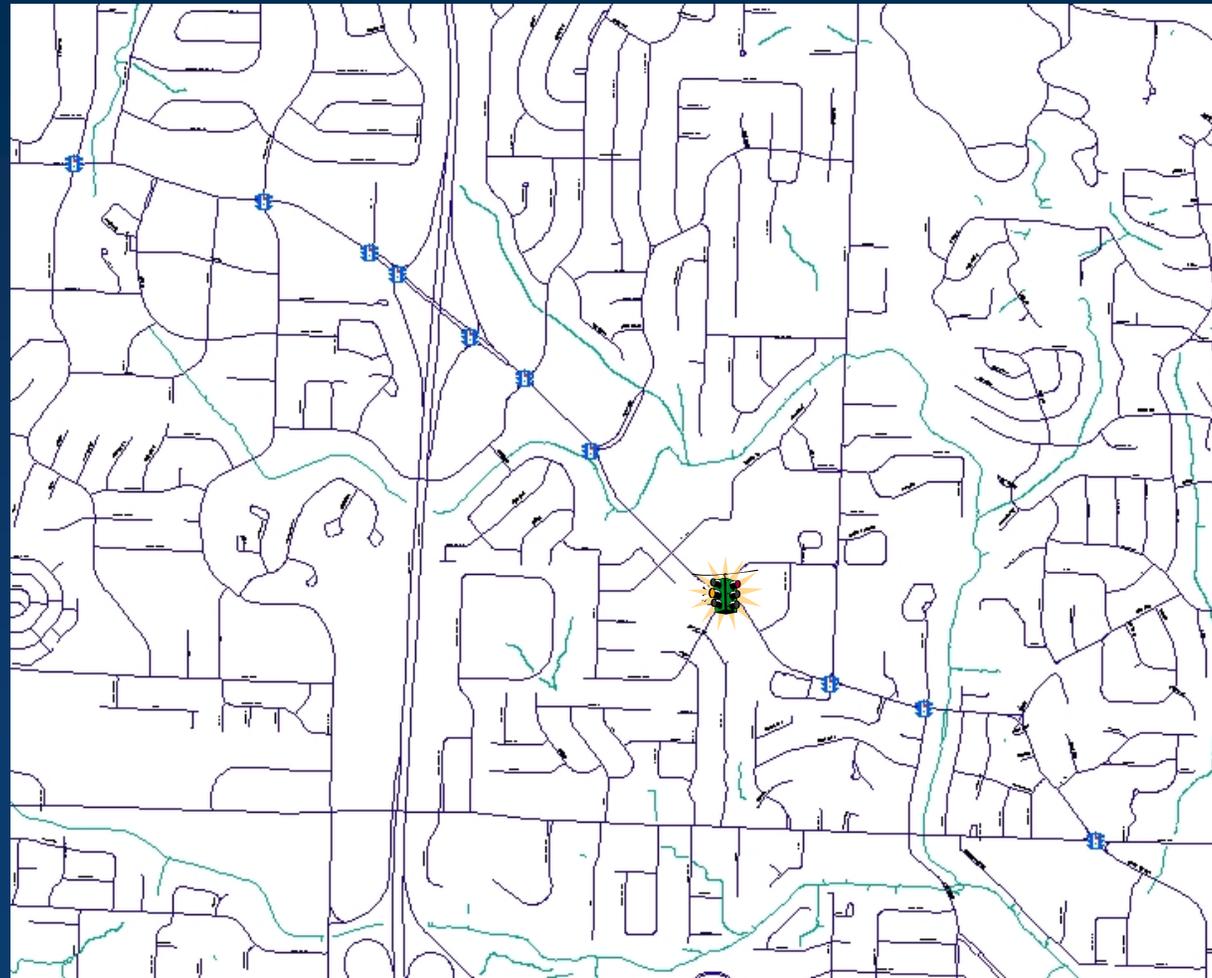
Lead-Lag Operation corrects inefficiencies due to unfavorable spacing of traffic signals along the corridor

Efficiency is improved when providing early releases to keep the main traffic platoon moving



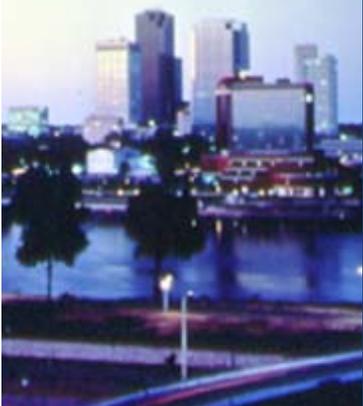
Project Location

Rodney Parham Road – 2.6 mile Arterial



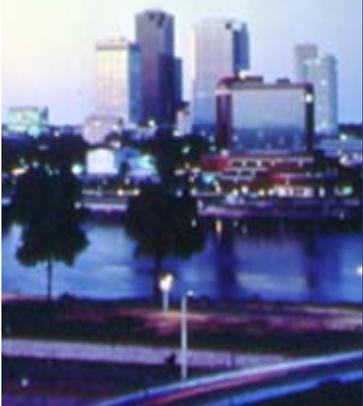
Project Scope

- Coordinate 11 Signals
- Utilize Synchro for Initial Timings
- Implement Lead-Lag Left Turn Phasing using Dallas Display
- Develop System Cycle Length
- Optimize Cycle and Splits – Synchro
- Export Data to TSPPD
- Evaluate Time Space Diagram Solution Provided by Synchro



Noon Peak Flows - 2006

- Shackelford 1427 WB 1258 EB
- Breckenridge 1181 WB 1074 EB
- Reservoir Rd 973 WB 915 EB
- Brookside 449 WB 1443 EB



Synchro Signal Progression

- 40 MPH Design Speed
- Balanced Noon Flows
- 1000-1400 vehicle per hour flows
- Synchro Model only reduces intersection delays, does not look at arterial flows and the benefits of 2-way progression.
- Left Turn splits are excessive, and do not utilize the natural gaps in traffic produced by well designed traffic plans with ample 2-way green bands.
- Synchro optimized plan does not provide any significant through traffic bands.



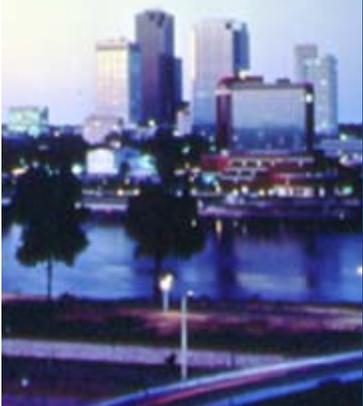
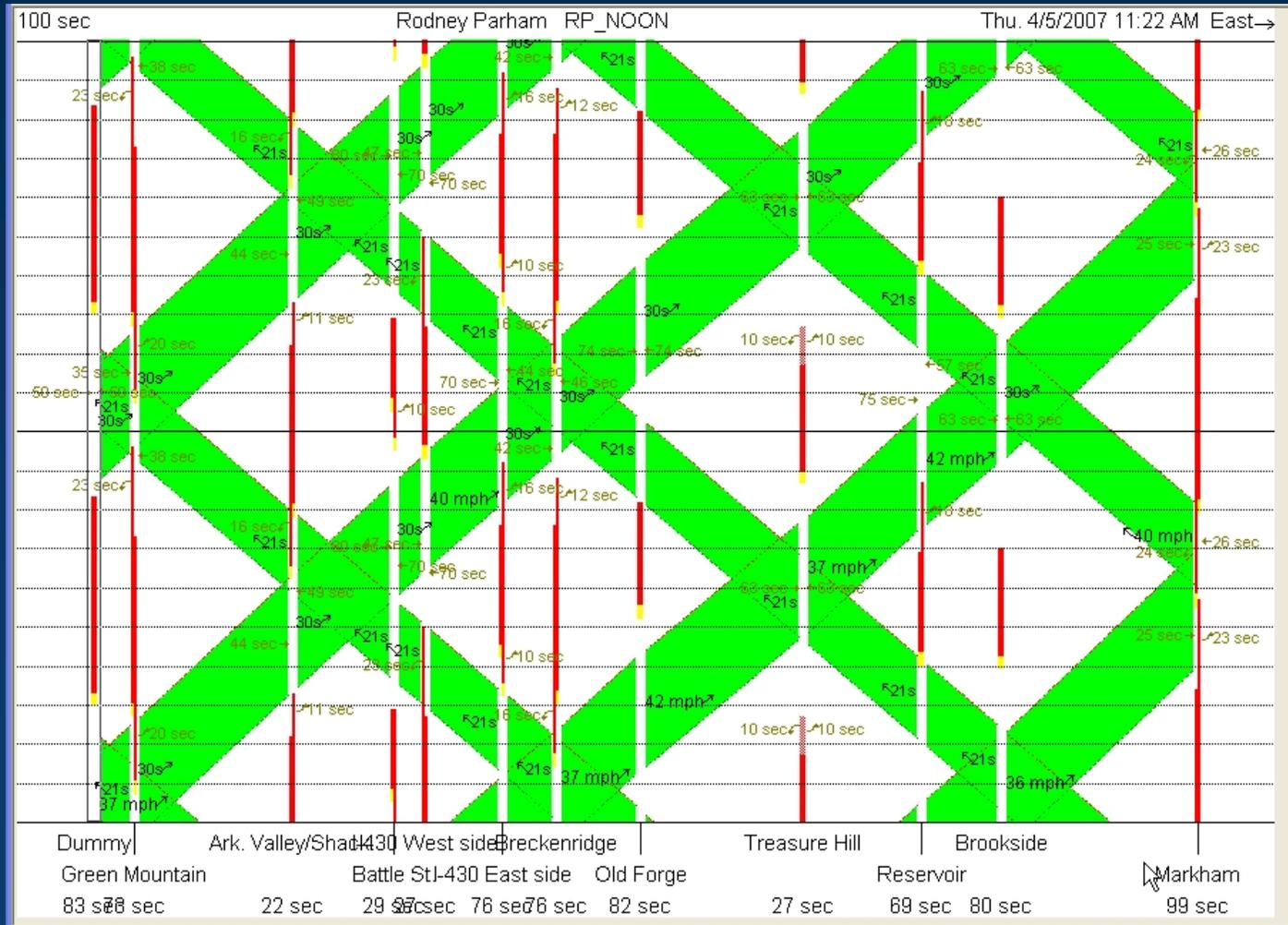
Designing Timing Plans

Two-Way Progressive Flows

- Utilize Synchro TSPPD Base Plan as a Starting Point
- Drive Corridor to establish speeds
- Add dummy intersections at both end of the time-space-diagram to aid in developing true two-way progression
- With a 100 second cycle, plan for 35 second band widths in each direction for initial design.
- Analyze for lead-lag phasing to maximize band widths.
- Implement and Adjust Plan



Adjusted 2-Way Plan

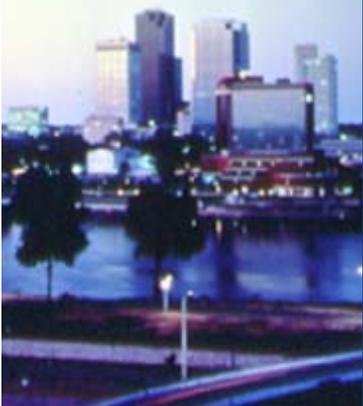


Two-Way Progression Plan

- EB Green Band – 30 Second Band Width
– 1427 VPH
- WB Green Band – 25 Second Band Width
– 1258 VPH
- Install Texas Display at 3 intersections in order to run permissive lead-lag left turn phasing
- Natural Gaps generated throughout system
- Synchro recommended left turn times significantly reduced, which provides more green band time for the major movements

Left Turn Split Reduction Examples

- Ark. Valley – Synchro 20 secs
TSPPD Adjusted 10 secs
- I-430 West Side – Synchro 44 secs
TSPPD Adjusted 15 secs
- I-430 East Side – Synchro 46 secs
TSPPD Adjusted 18 secs



Dallas Display



Signal Head Louvered for the Leading Left
Phase Direction

Dallas Displays



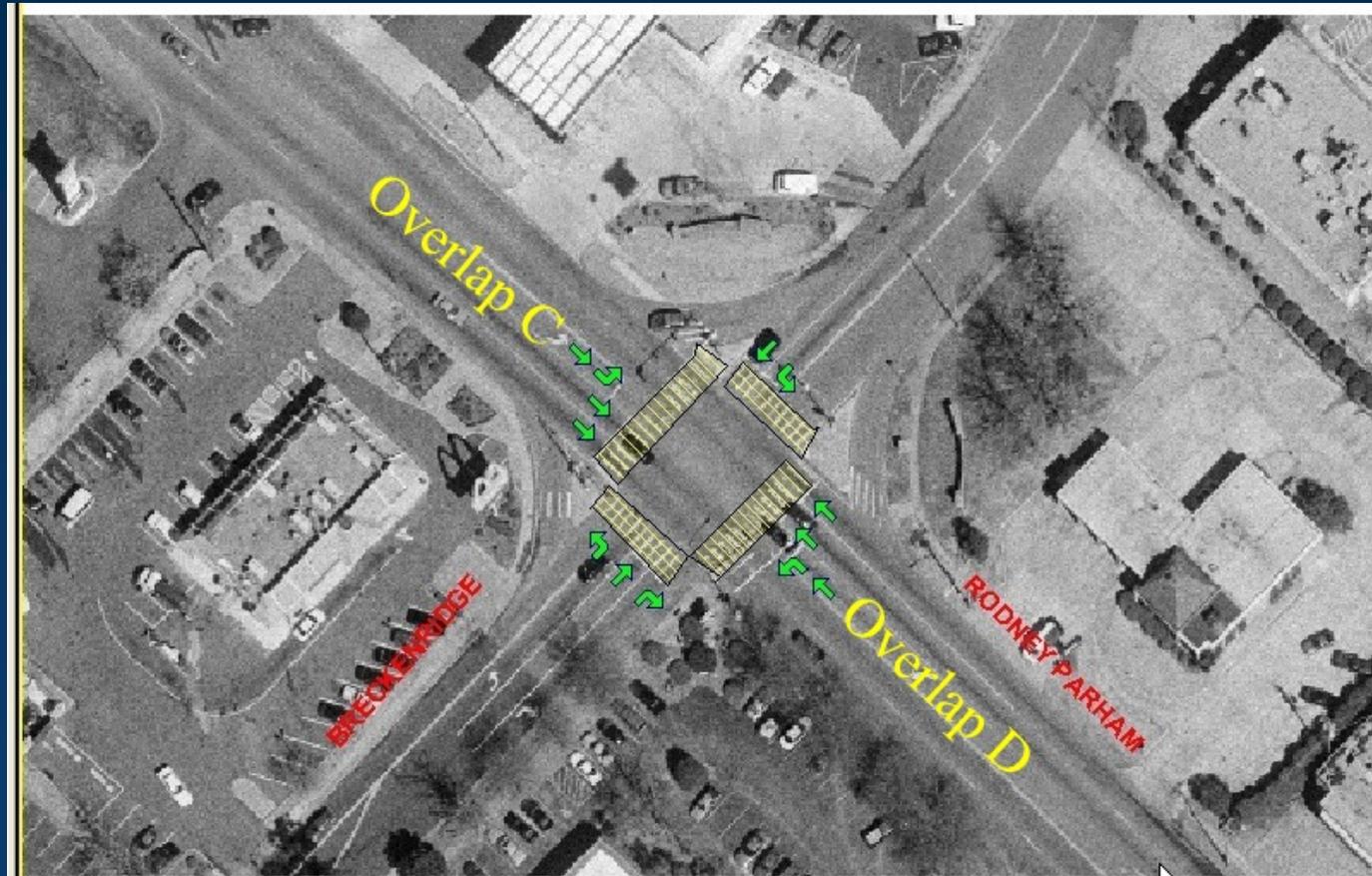
Doghouse 5-Section Signal w/louvers

Dallas Display for Leading Movement

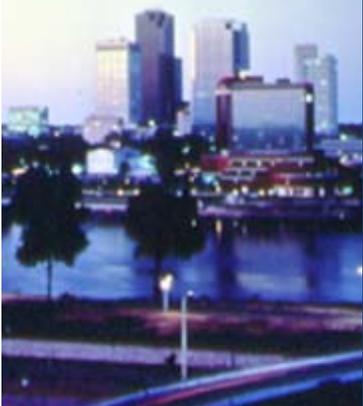


Display Prevents Yellow Trap

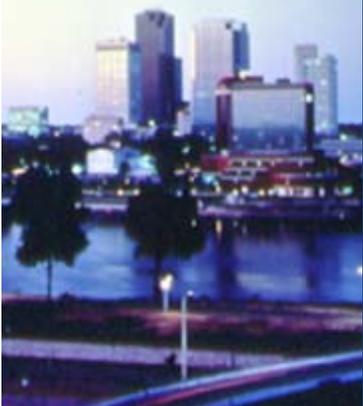
Breckenridge Overlaps for Dallas Displays



Eastbound on Rodney Parham – Noon Plan



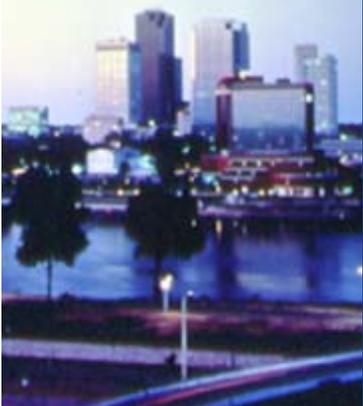
Westbound Rodney Parham – Noon Plan



Completion of Timing Plan

- Plans are never complete, constant adjusting due to changing patterns
- Next Improvement scheduled

**** Traffic Responsive ****



Contact Info

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