



# A CAPACITY ESTIMATION MODEL FOR CONTRAFLOW LEFT-TURN POCKET LANE AT SIGNALIZED INTERSECTIONS

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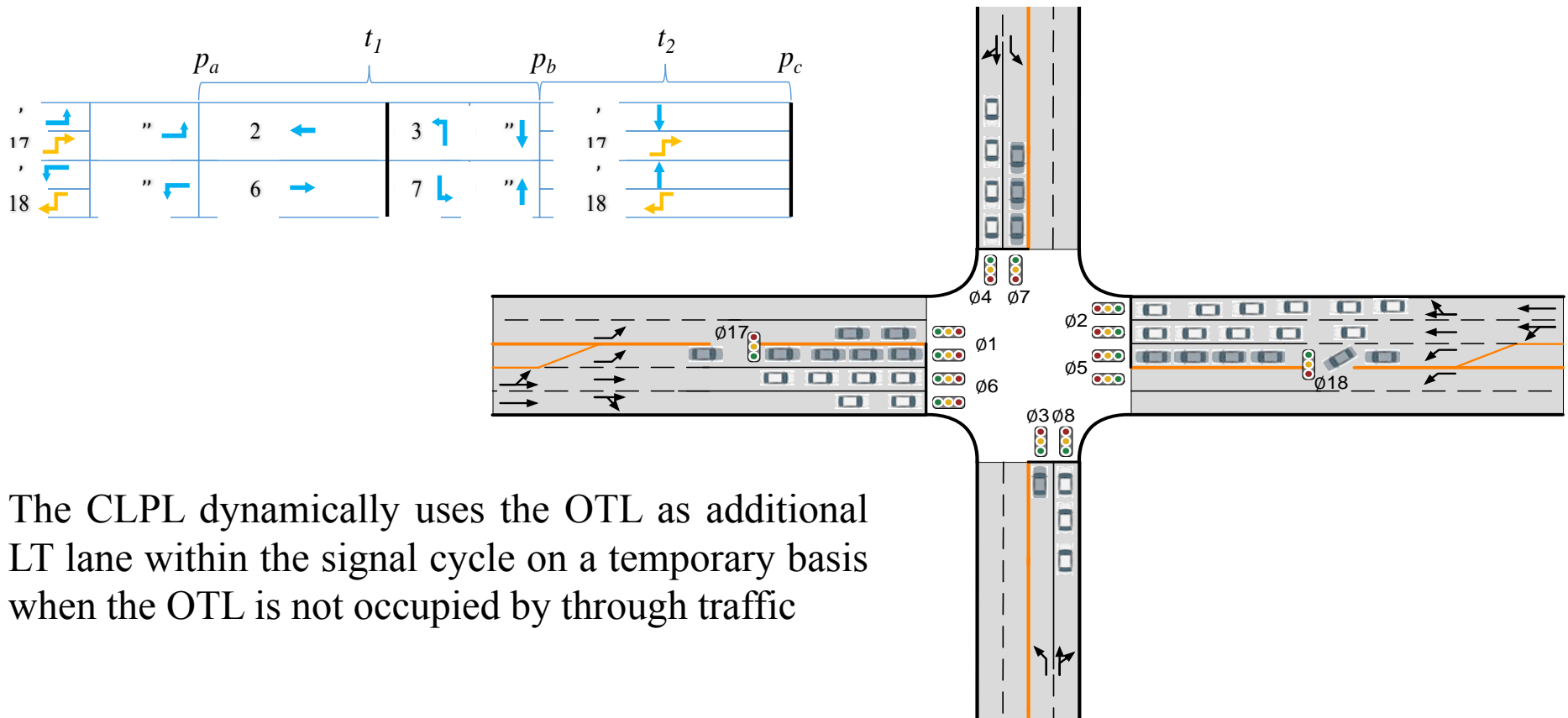
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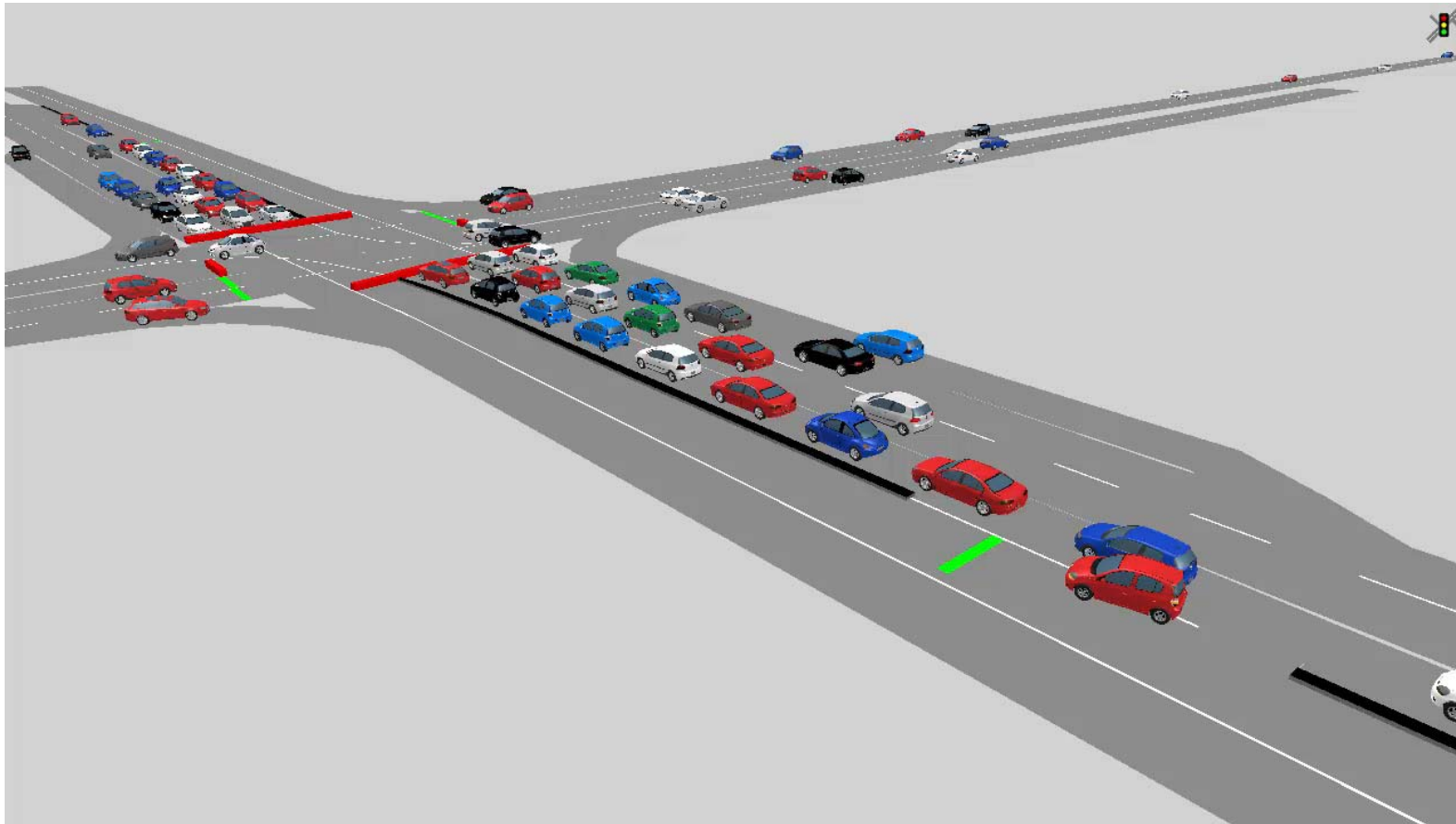


U.S. Department of Transportation  
**FEDERAL HIGHWAY ADMINISTRATION**

# What is a CLPL?



The CLPL dynamically uses the OTL as additional LT lane within the signal cycle on a temporary basis when the OTL is not occupied by through traffic



# CLPL Benefits

## REAL-WORLD IMPLEMENTATION (CHINA)

- At least 50 implementations since 2014
- Cities of Hohhot (18), Handan (15), and Shenzhen (10) have most reconfigured intersections
- Operational impacts
  - Capacity increased 30-40% for LT movements and 6% for entire intersection (Shenzhen)
  - Capacity increased 80% for LT movements (Hohhot)



Source: Professor Pan Liu of Southeast University School of Transportation with arrow overlay added by Leidos, Inc. to indicate the presignal location.

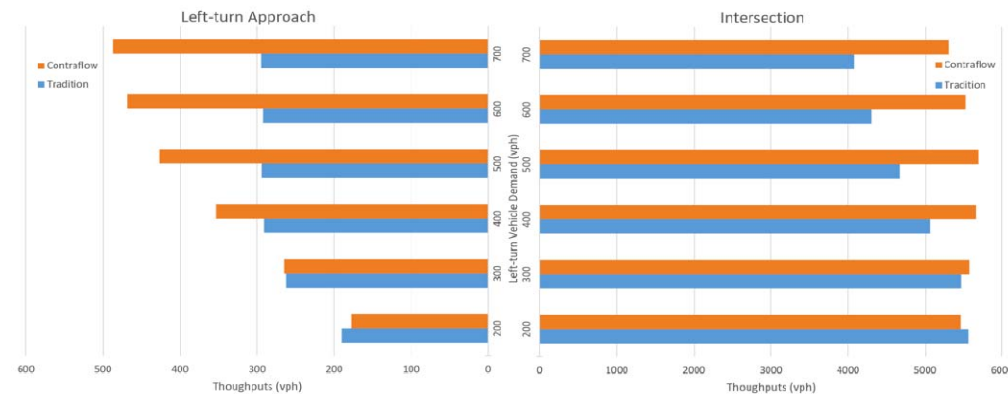


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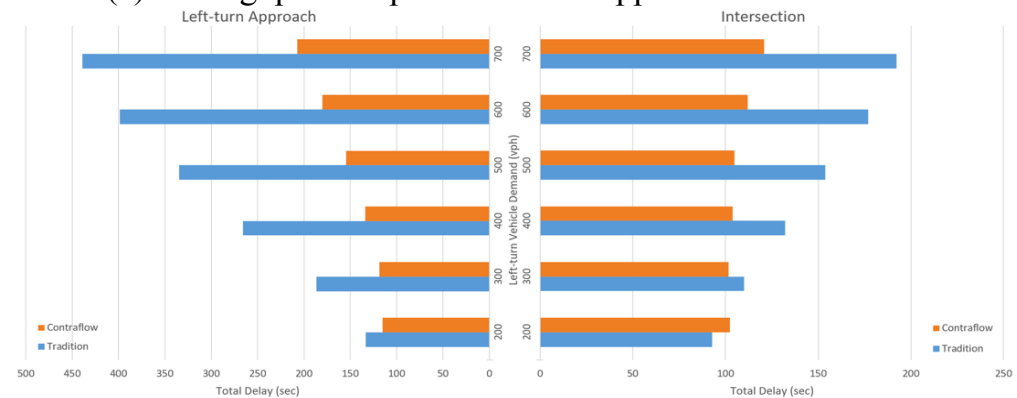
# CLPL Benefits

## SIMULATION ANALYSIS

- Left-turn capacity can be increased by up to 70% compared to single RLPL design
- Delay can be reduced by up to 50% for LT and 35% for all traffic using the intersection
- The CLPL design can shift superfluous LT green time to heavy through traffic



(a) Throughput comparison for LT approach and intersection



(b) Delay comparison for LT approach and intersection



Visualizations created by Textron for use in HDS for project sponsored by FHWA's Office of Research and Development

# HDS Human Factors Study at TFHRC

ON-PEAK (OPEN)



ON-PEAK (CLOSED) & OFF-PEAK CLT OPEN AT SIGNALIZED INTERSECTION



# Thank you for your time! Questions?

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Traffic Bottlenecks: Identification and Solutions Final Report available at  
<https://www.fhwa.dot.gov/publications/research/operations/16064/16064.pdf>

Simulator Assessment of Alternative Lane Grouping at Signalized  
Intersections Final Report will be available after project completion

