

Analysis of Freeway Improvements for Express Bus Service

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Outline

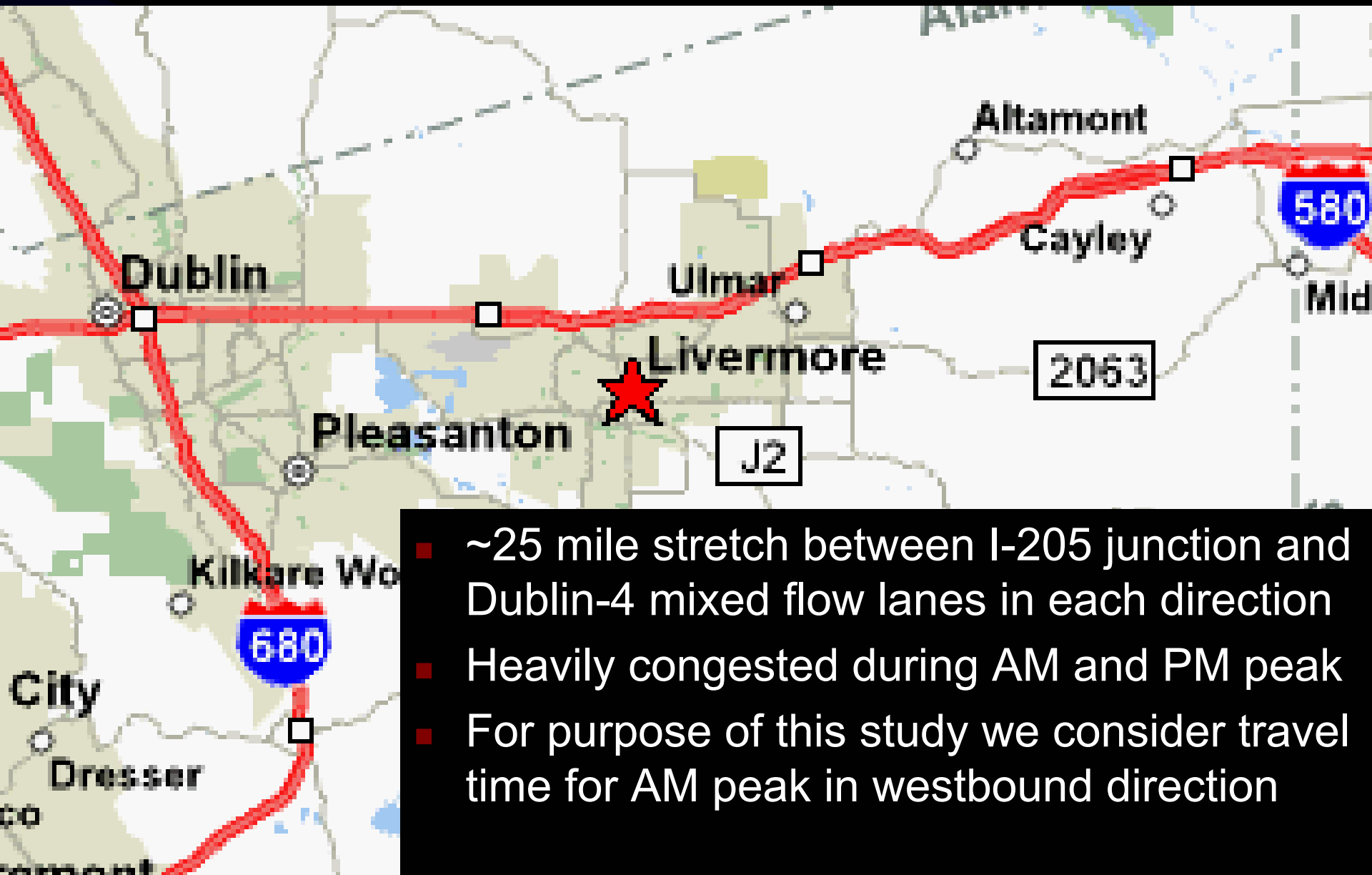
- Background of Regional Express Bus Project
- HOV Gap Analysis
- Microsimulation of I-580 HOV lane alternatives
- Conclusions

Regional Express Bus Project

- There are currently more than two dozen transit agencies in the SF Bay area
- Many serve same corridors
- Goal of project is to improve coordination and service in region
- Provide service that is competitive with driving alone
- Need infrastructure to improve performance of buses



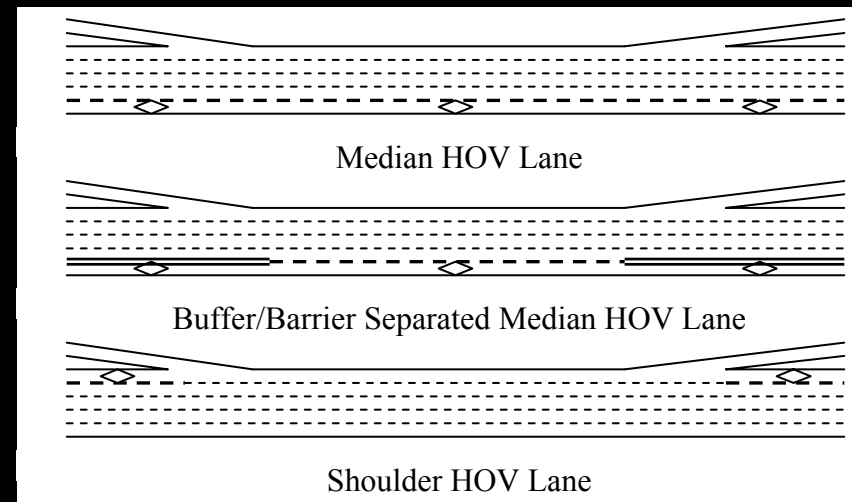
I-580 HOV Lane Improvement



- ~25 mile stretch between I-205 junction and Dublin-4 mixed flow lanes in each direction
- Heavily congested during AM and PM peak
- For purpose of this study we consider travel time for AM peak in westbound direction

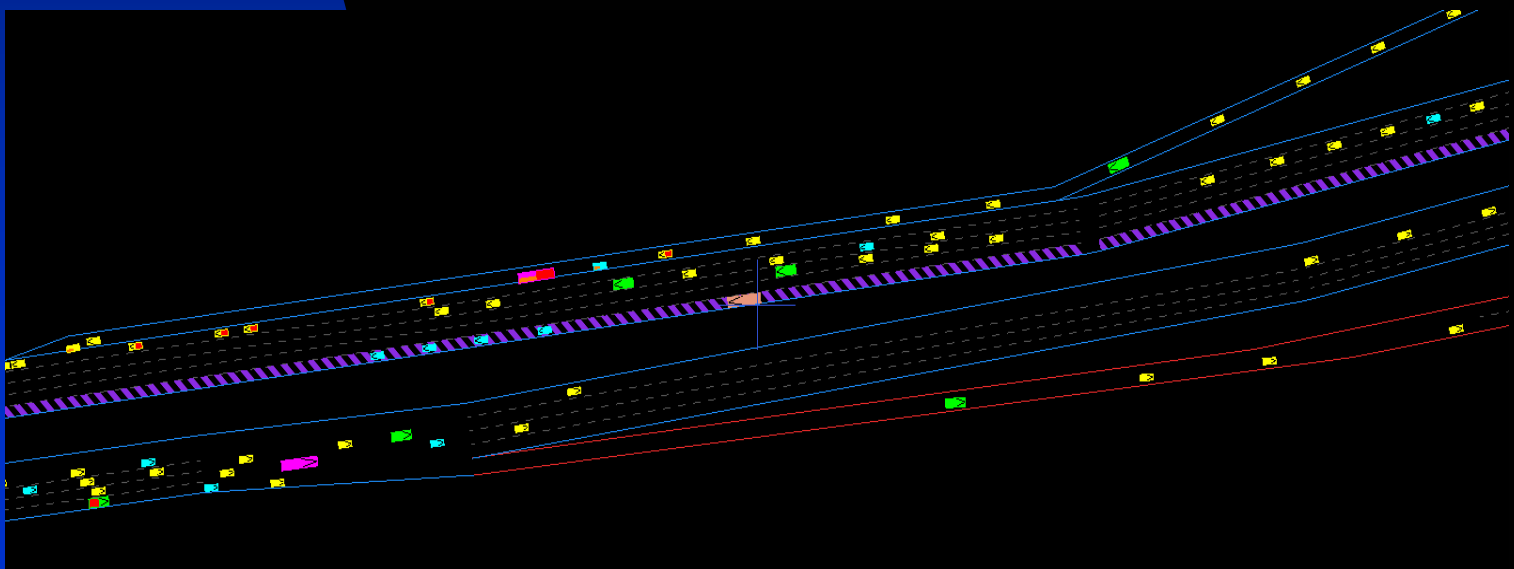
Simulation of I-580

- Paramics Microsimulation software
- Allow 2+ occupancy vehicles to use HOV lane (~15% of flow)
- Simulate addition of alternative types of HOV lanes to determine those that are most advantageous (end-to-end travel time) to Express Buses
- Three alternative types
 1. Median HOV lane
 2. Buffer/Barrier separated HOV
 3. Shoulder HOV lane



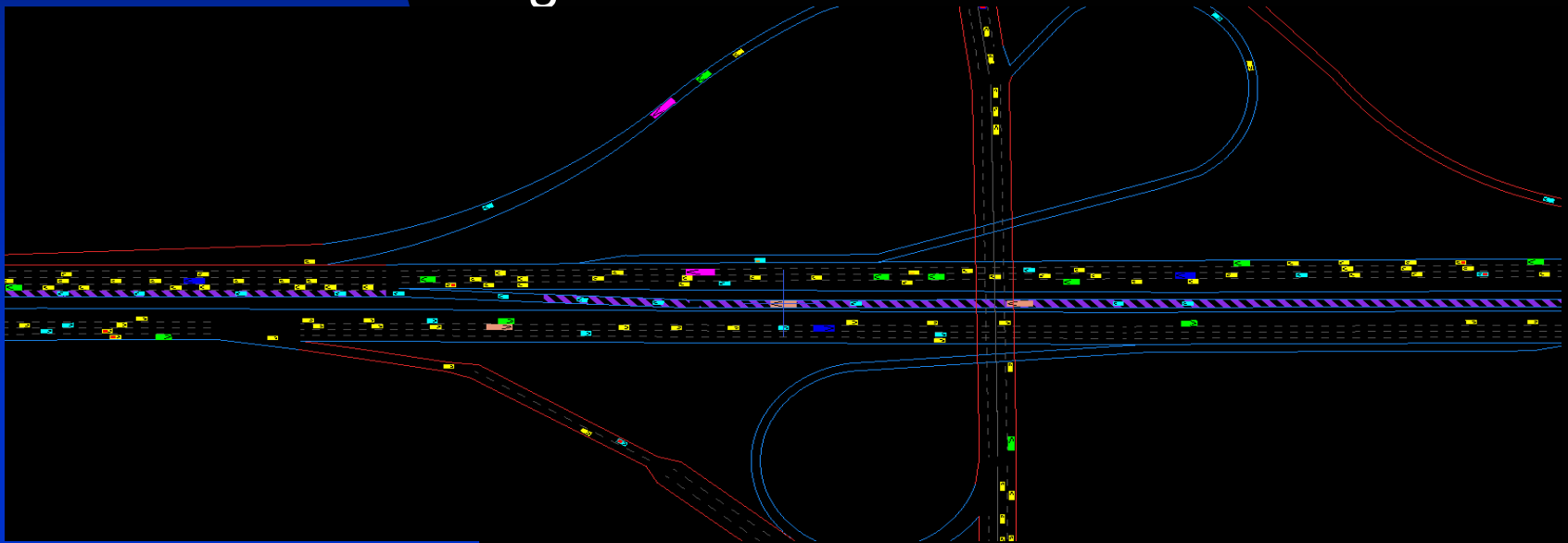
Median HOV lane

- Most common type of HOV lane in SF Bay Area
- Allows continuous weaving
- Potentially dangerous as speed differential increases
- Allows bus/HOV to move in and out of lane as necessary



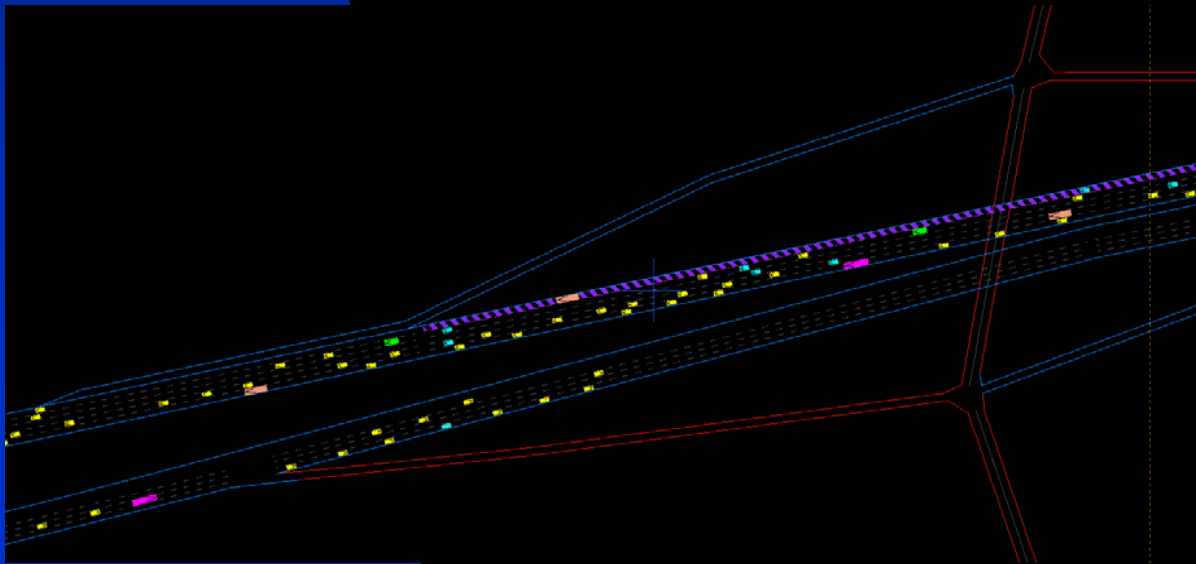
Buffer/Barrier HOV Lane

- Common in Southern California, few in SF Bay Area
- Weaving sections between sets of interchanges
- Limits weaving to specified areas, minimizing speed differential problem
- Potential safety improvement over median lane
- Buses/HOVs can get stuck in or out of lane



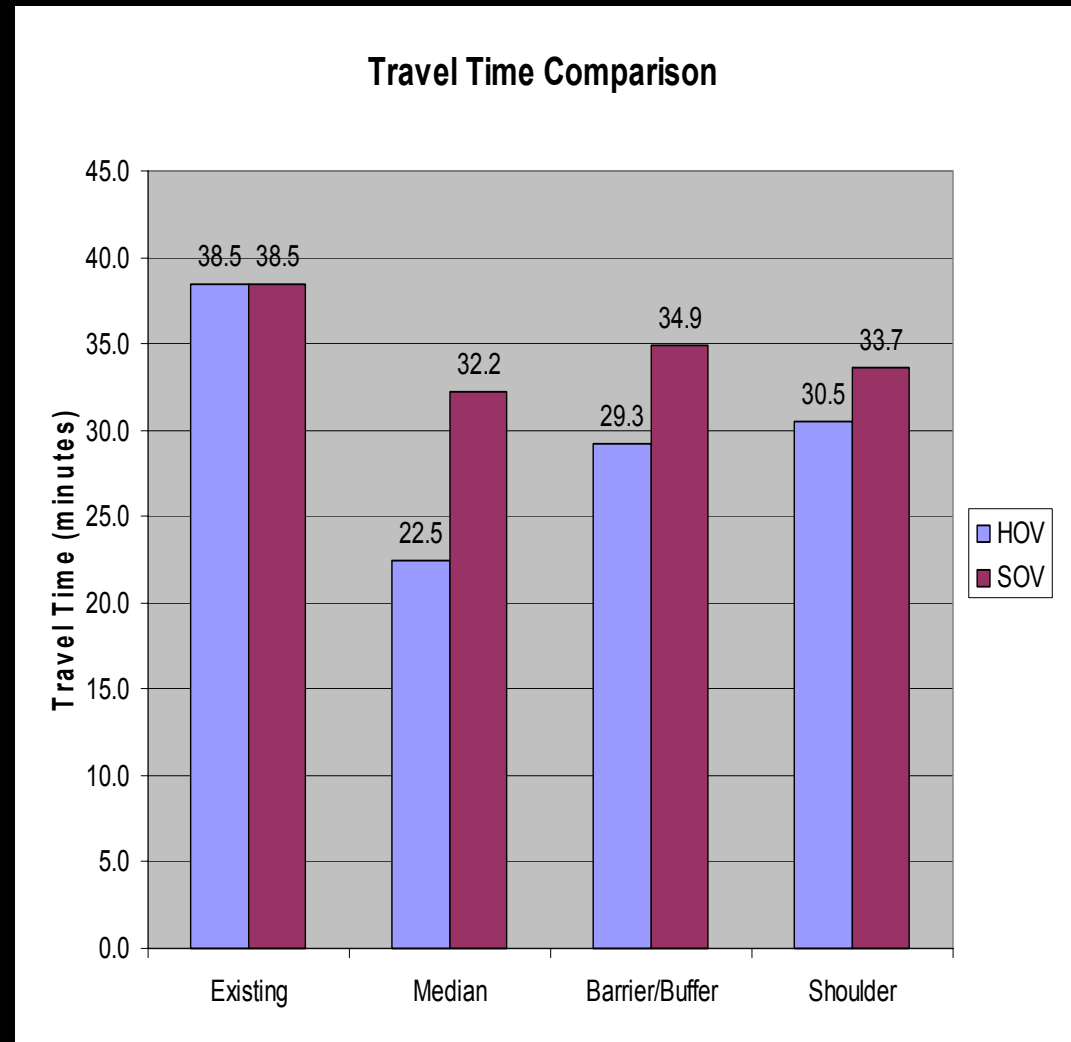
Shoulder HOV Lane

- Few applications in US (Minnesota, Maryland, Washington)
- Allows buses to enter/exit freeway easily
- Does not require traversing across congested traffic to median HOV lane
- Creates weave sections at interchanges with mixed flow
- Questionable driver behavior in simulation



Results of Simulation

- All HOV alternatives improve travel time for HOV/Express Buses and mixed flow vehicles
- Median HOV lane offers greatest travel time savings
- Buffer HOV lane offers safety of separation, but decreased performance
- Shoulder HOV lane offers poorest performance because of weaving and interference, but could be optimum depending upon the number of stops along the route (performs better with more stops)



Conclusion

- Microsimulation models can be good tools to analyze alternative infrastructure improvements for an Express Bus system
- Can test unlimited alignments and alternatives once the model is calibrated
- Operational changes (such as changing from 2+ HOV to 3+ HOV) can be analyzed
- Traffic growth scenarios can be modeled and the effect on Express Bus service determined

Acknowledgements

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- Questions/Comments?