2007 Intermodal Operations Planning Workshop

Bus Stop & Bus Lane Capacity: Planning Bus Routes in Downtown Seattle **Owen Kehoe, PE, PTOE Transportation Engineer** Speed & Reliability Group King County Metro Transit Seattle, WA

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Background

Speed & Reliability Group

- Special projects, improve existing service
 Traffic Engineering background
- Work with local DOT's

Transit in Downtown Seattle: 5000+ daily buses on 5 Avenues Bus Tunnel



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Background

2-year Bus Tunnel Closure -Buses diverted to surface streets 3rd Avenue: Two way, Four Lanes Skip Stop operation: Blue & Yellow Zones General Traffic Restricted: Right-Turn Only AM/PM Peak 2nd & 4th Avenues: One way with transit lane Tunnel opening September 2007 -Traffic restrictions remain on 3rd Avenue -Shift additional routes to 3rd Avenue How many buses can we load onto 3rd Avenue?



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Too Many!



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How Many Buses?

Methodology presented in TCRP TCQS Manual -Bus Stop Capacity RANST COOPERATIVE RESEARCH PROGRAM -Bus Lane Capacity Developed custom worksheet -Need to automate, user-friendly -Uses available input data 2nd Edition Transit Capacity and **Ouality of Service** -Dialog with transit planning staff RANSPORTATION RESEARCH BOAR Focus on PM peak condition -3rd Avenue, NB & SB -2nd Avenue, SB only



Bus Stop Capacity



<u>Output</u>

Capacity buses/hr



Bus Lane Capacity





End Results

Compared bus volume to capacity Assigned routes to 3rd Avenue -Just enough buses/hr added -Skip-stops well-balanced Future Planning -Identify improvements to increase capacity -BRT service integration Triple skip stop pattern?



Key Lessons Learned

Planning bus stop capacity for reliability -Maximize use of transit priority streets -Tool for planning/scheduling routes Balance: bus volume vs. reliability -Capacity = limit for acceptable reliability -Failure Rate sets reliability level Critical bus stops are key -Analysis/data collection efforts -Capacity improvements



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