

Task 7 – Further Investigation of Convergence in User Equilibrium Traffic Assignment and Speed Feedback

presented to

TPB Travel Forecasting Subcommittee

presented by

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Transportation leadership you can trust.

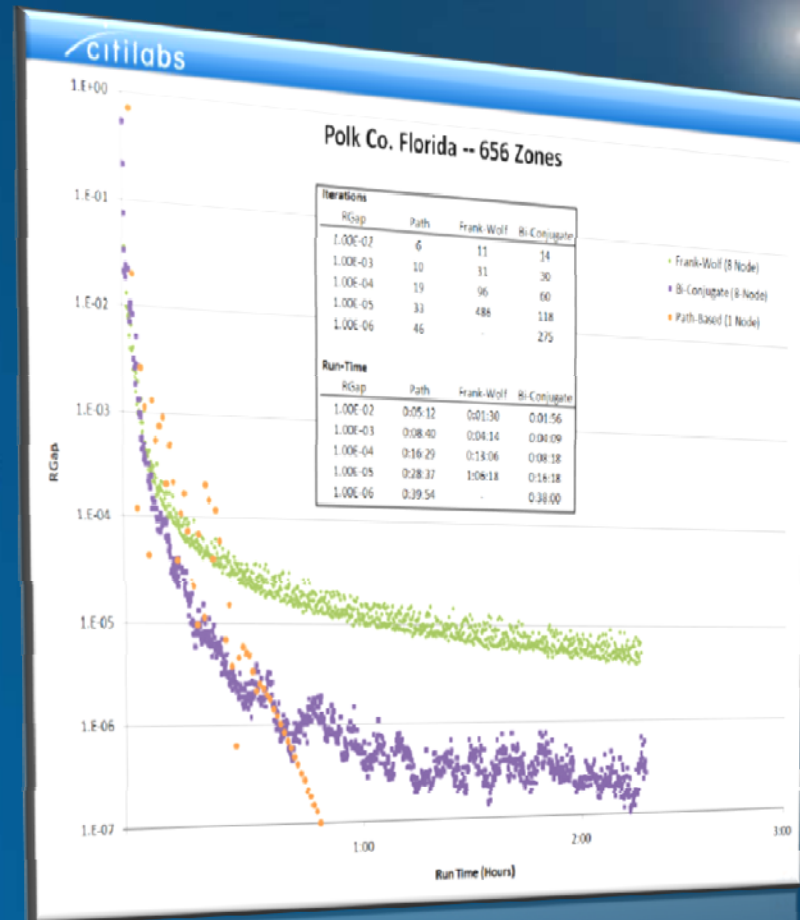


Objective

- Discussion and review of the advanced assignment algorithms in each of the commercial travel demand forecasting software packages including Caliper, Citilabs, INRO, and PTV
- The suitability of using route flows resulting from any user equilibrium assignment methodology
- Discussion of the adoption of advanced assignment algorithms in regional travel demand forecasting models through contacts with MPOs and planning agencies
- Description of the use of a hybrid assignment approach as described in the Fiscal Year 2009 Task Reports
- Further description of speed convergence metrics, including comments on the suitability of the metric and threshold mentioned in a 2007 presentation by Dr. Howard Slavin

Advance Assignment Algorithms

- What makes them advanced?
 - » Convergence to 10-5
 - » “Quick”
 - » Warm start
- Approaches
 - » Path based
 - » Origin based
 - » Link based

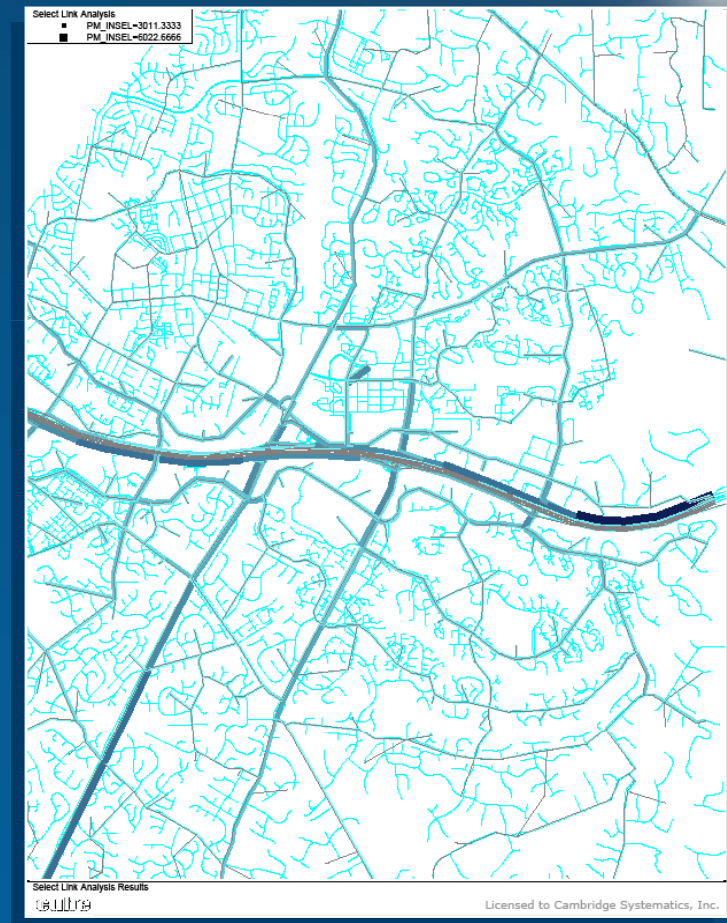


Advance Assignment Algorithms

- Citilabs CUBE Voyager 5.1.1
 - » Bi-Conjugate Frank-Wolfe UE
 - » Path Based Gradient Projection
- PTV VISUM 11.0
 - » Linear User Cost Equilibrium (LUCE)
 - » Equilibrium Lohse – a variant of Frank-Wolfe
- Caliper
 - » Bi-Conjugate Frank-Wolfe UE
 - » Origin UE – based on Algorithm B
- INRO
 - » Parallel Standard UE
 - » Path-Based UE

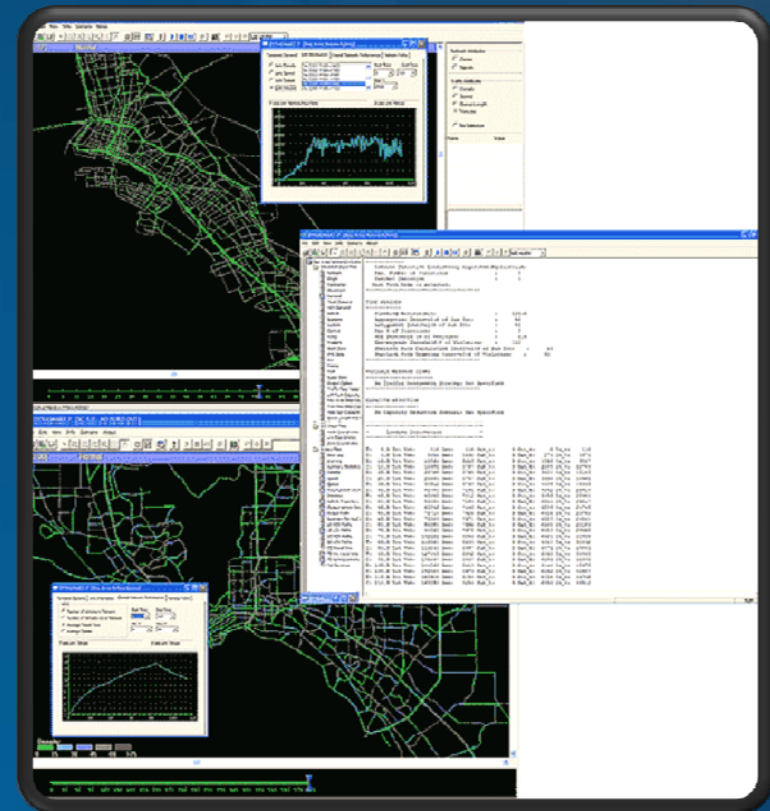
Route Flows

- Select link applications
- Uniqueness of route flow
- Frank-Wolfe
- Path-based issues
- Post processes applications



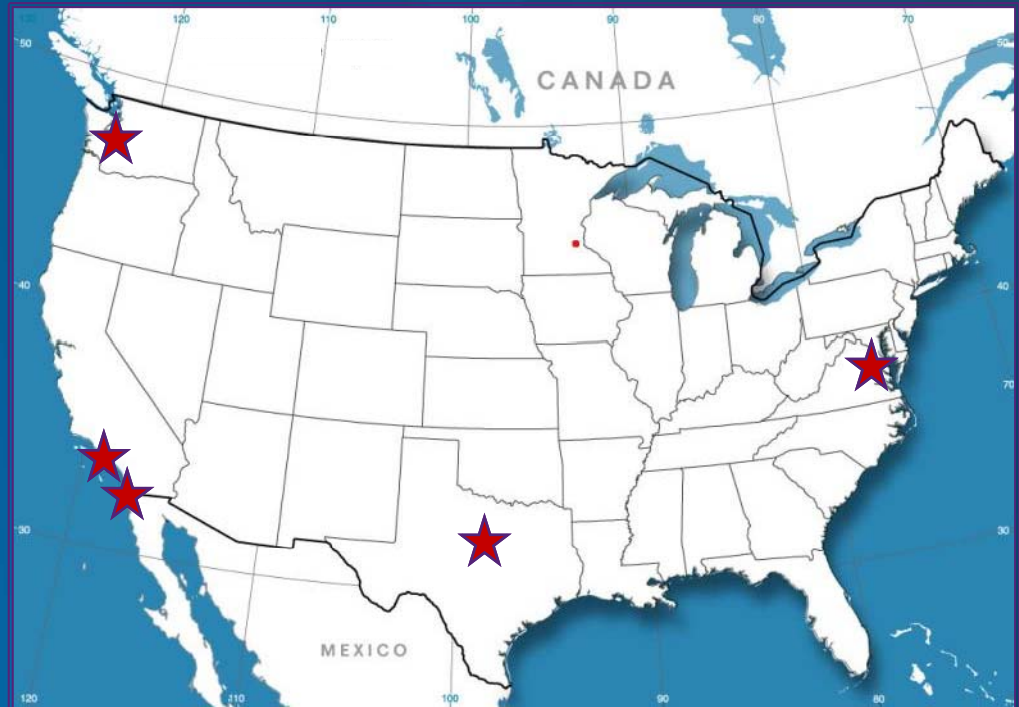
Future Developments

- Mesoscopic assignment algorithms
 - » Citliabs – avenue
 - » PTV – future development
 - » Caliper – TransModeler
 - » INRO – Dynameq



MPO Applications

- LA Metro
 - » Future Citilabs Bi-Conjugate Application
- SANDAG
 - » Caliper TransCAD
- Prince George's County
 - » Caliper TransCAD
- NCTCOG
 - » Caliper TransCAD
- PSRC
 - » INRO EMME/2



Hybrid Assignment

- Improve model run time
- Project planning experience
- BMC application
- Combining UE and incremental assignment algorithms
- Assigning final trip table

Convergence Metrics for Speed Feedback

- Heuristic approaches
- Denver Regional Council of Governments
 - » 1% or less of the links with 10% change
- Caliper Corporation
 - » Skim matrix RMSE
 - » 0.1% change
- Different thresholds depending on average travel time

Questions