

What's New with Cube?

Atlanta Regional Commission Model Users Group

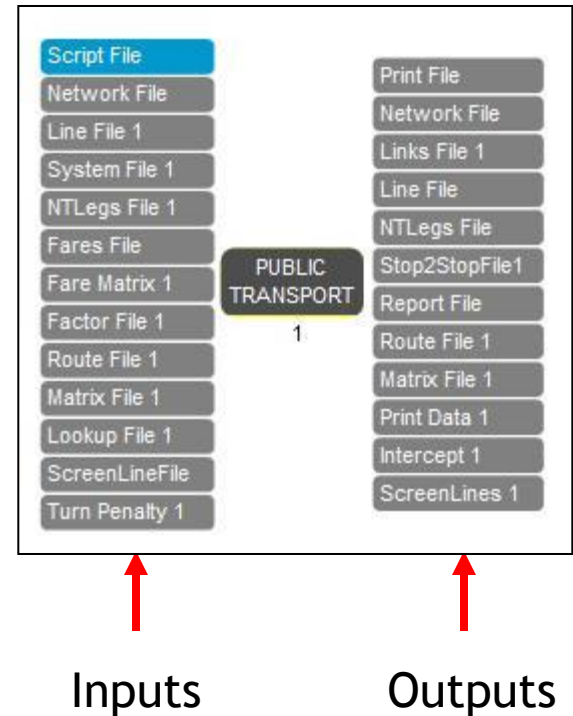
Robert G. Schiffer, AICP
Director of Professional Services, Citilabs

May 30, 2014



OVERVIEW

- Citilabs – the Company
- Cube 6.1
- Cube Suite and Other Citilabs Products
- Compatibility Updates
- Usability Updates
- Improvements to Highway Modeling
- Cloud Computing
- Questions



CITILABS – THE COMPANY

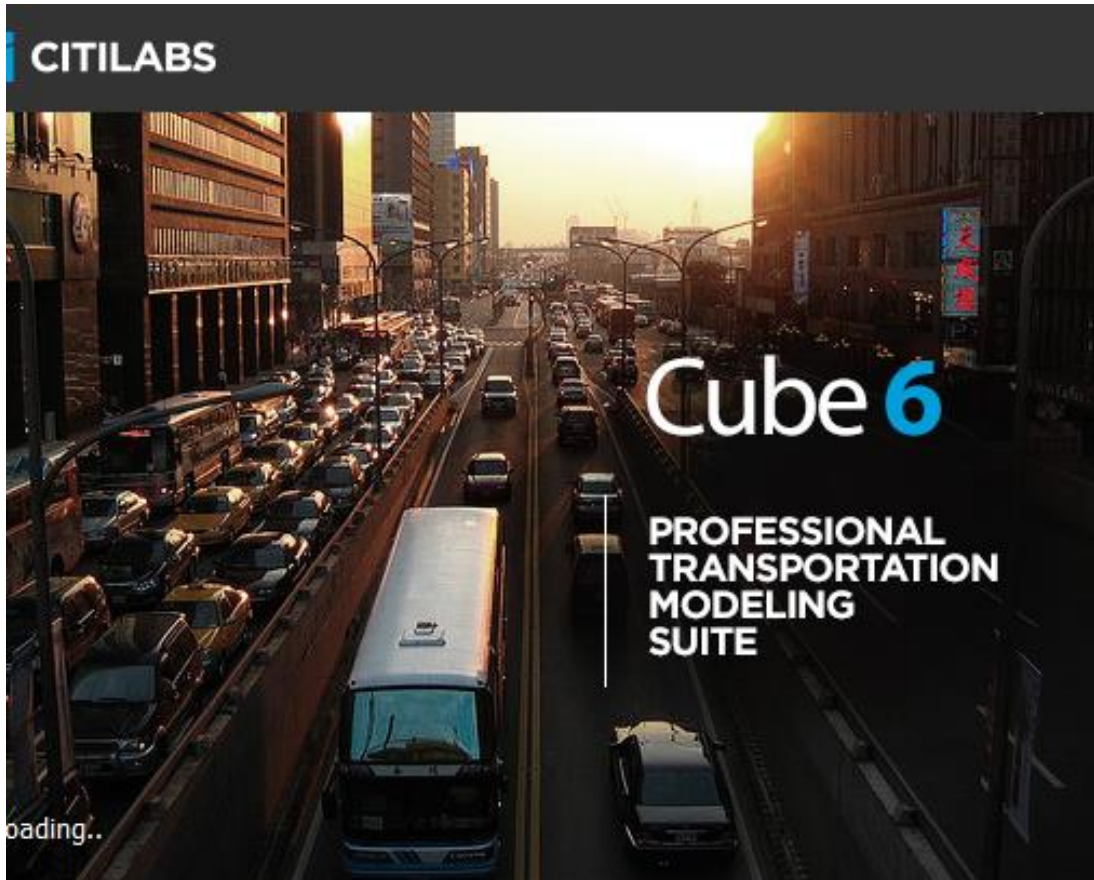
- Software developer for modeling transportation systems
- Offices
 - USA: Tallahassee, San Francisco, Hartford, Atlanta
 - Europe: London, Milan, Munich
 - Asia: Beijing, Mumbai, Bangkok
- 2,500 cities on 6 continents in more than 80 countries

CITILABS – THE COMPANY (Cont'd)

- Longstanding ESRI business partner
- Owners:
 - Management and staff – 60%
- Professional services/consulting



CUBE 6.1



- Released: April 10, 2013
- Service Pack 1 released shortly thereafter with some additional updates
- An update to Cube 6 keeping the same overall look and feel
- Addition of many commonly requested features and tools
- Major overhaul of an entire library

CUBE: PROFESSIONAL TRANSPORTATION MODELING SUITE

System Interface

- Cube Base – comprehensive interface for data editing, mapping, reporting, model development and scenario creation and management

Demand Modeling

- Cube Voyager: urban, regional and long distance demand forecasting and assignment
- Cube Land: land use model for combined transport-land use modeling
- Cube Cargo: commodity-based freight forecasting

Simulation

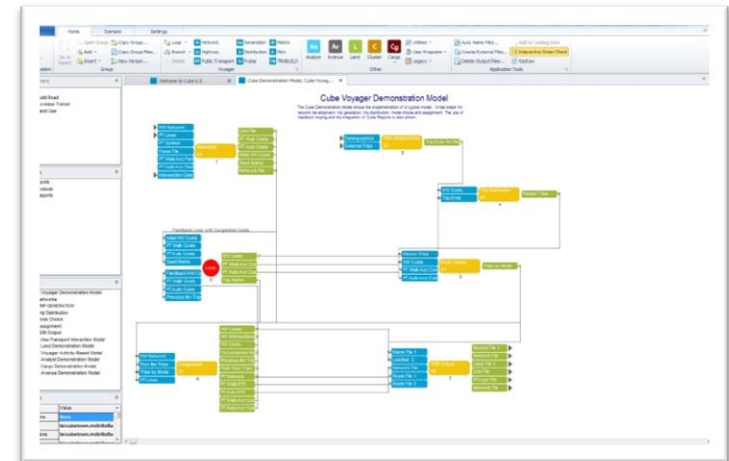
- Cube Avenue: meso-scopic traffic simulation (DTA)
- Cube Dynasim: multimodal micro-simulation

Specialized

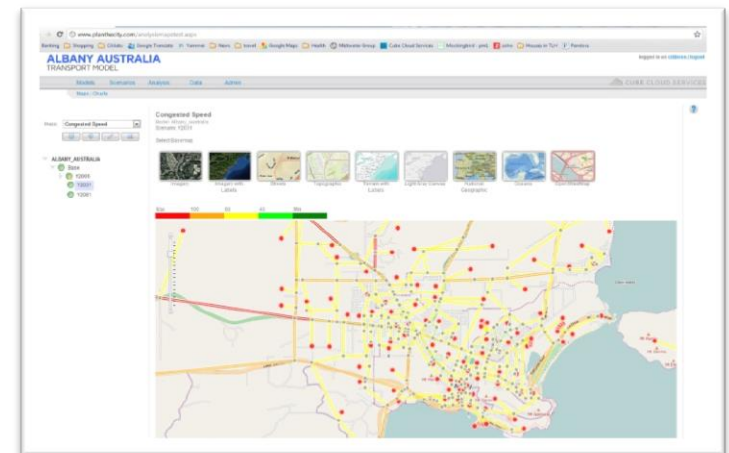
- Cube Cluster: reduces run-times by allocating calculations over multiple processors and machines
- Cube Analyst: advanced matrix estimation for all modes

Cube Cloud

- Application and sharing framework for transportation planning



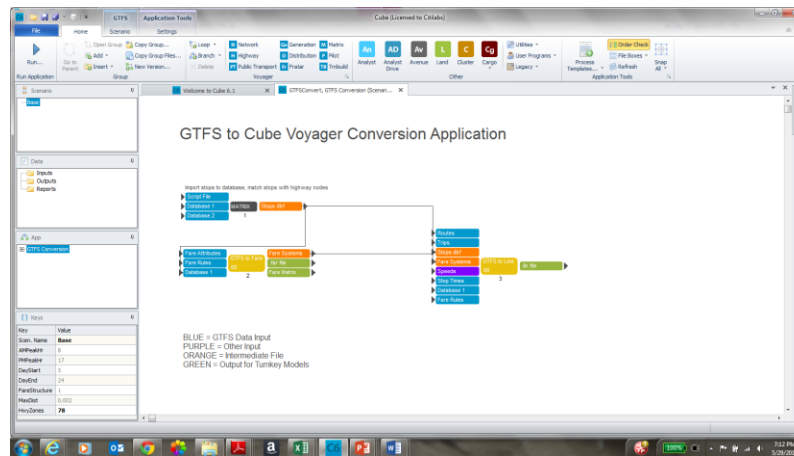
Cube Base



Cube Cloud

Other Citilabs Products

- Sugar Network Editor – *ArcGIS extension for editing networks*
- Accession – *GIS-based accessibility calculation and mapping*
- Beta versions – *sign up online to participate*
- Turnkey Models and Tools – *e.g., GFTS conversion tool*
- GIS Web Apps – *under development*



COMPATIBILITY UPDATES

- Cube is now compatible with ESRI ArcGIS 10.1/SP 1 and uses this as the default ArcGIS Engine
- Cube is also now compatible with Windows 8 & Server 2012

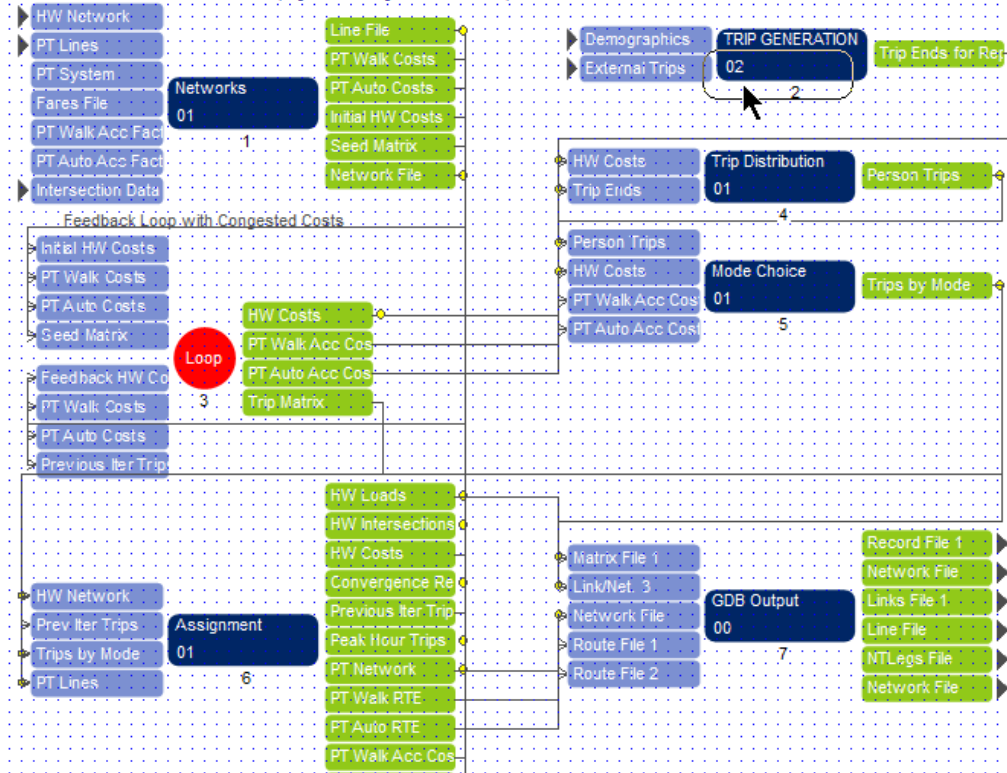
ArcGIS 10.1  esri



USABILITY UPDATES

Cube Voyager Demonstration Model

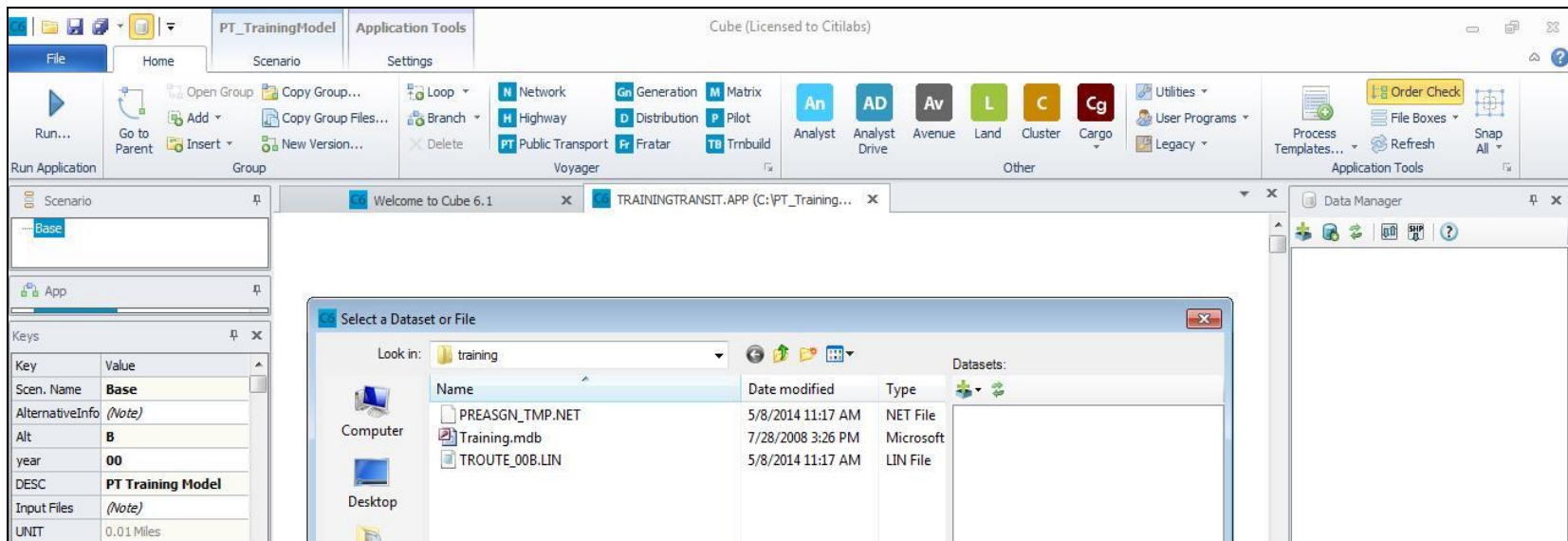
The Cube Demonstration Model shows the implementation of a typical model. It has steps for network development, trip generation, trip distribution, mode choice and assignment. The use of feedback looping and the integration of Cube Reports is also shown.



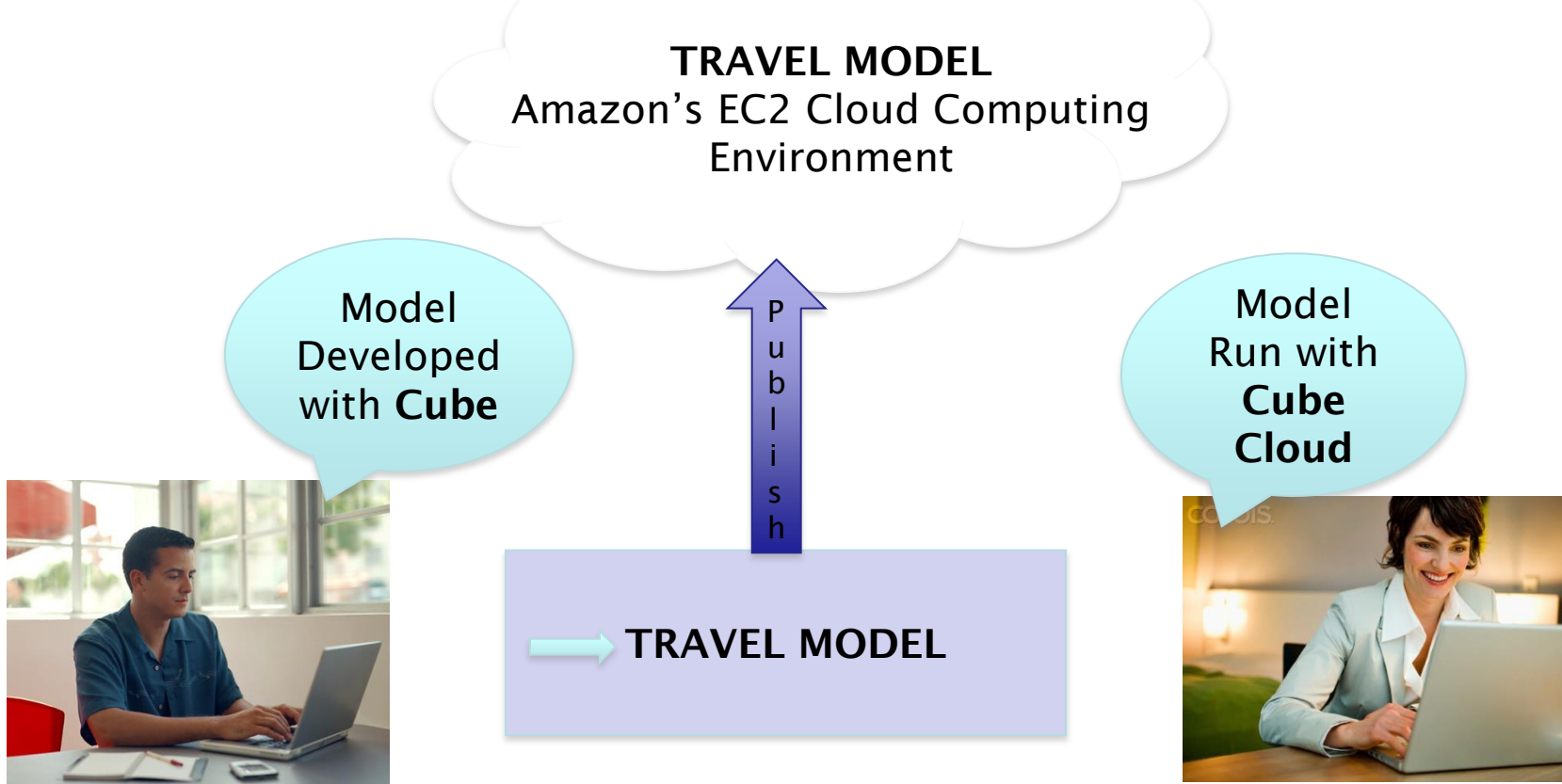
- Snap-to-grid in application manager
- Improved editing of file geodatabases
- View larger matrices in Cube Base
- Bigger road networks (up to 10 million nodes and links)
- Multi-language capabilities in Cube script editor
- And numerous others..

IMPROVEMENTS TO HIGHWAY MODELING

- Cube Base, Cube Voyager and Cube Avenue now support 1,000 volume sets! Allows the simultaneous assignment and storage of up to 1,000 trip matrices and/or select link results.
- Bi-Conjugate Frank-Wolfe Assignment has a new SMOOTH parameter to reduce oscillation patterns at the tail of the curve.
- Update: currently in internal beta: new traffic assignment– bush-based assignment for tight closure at high speed.

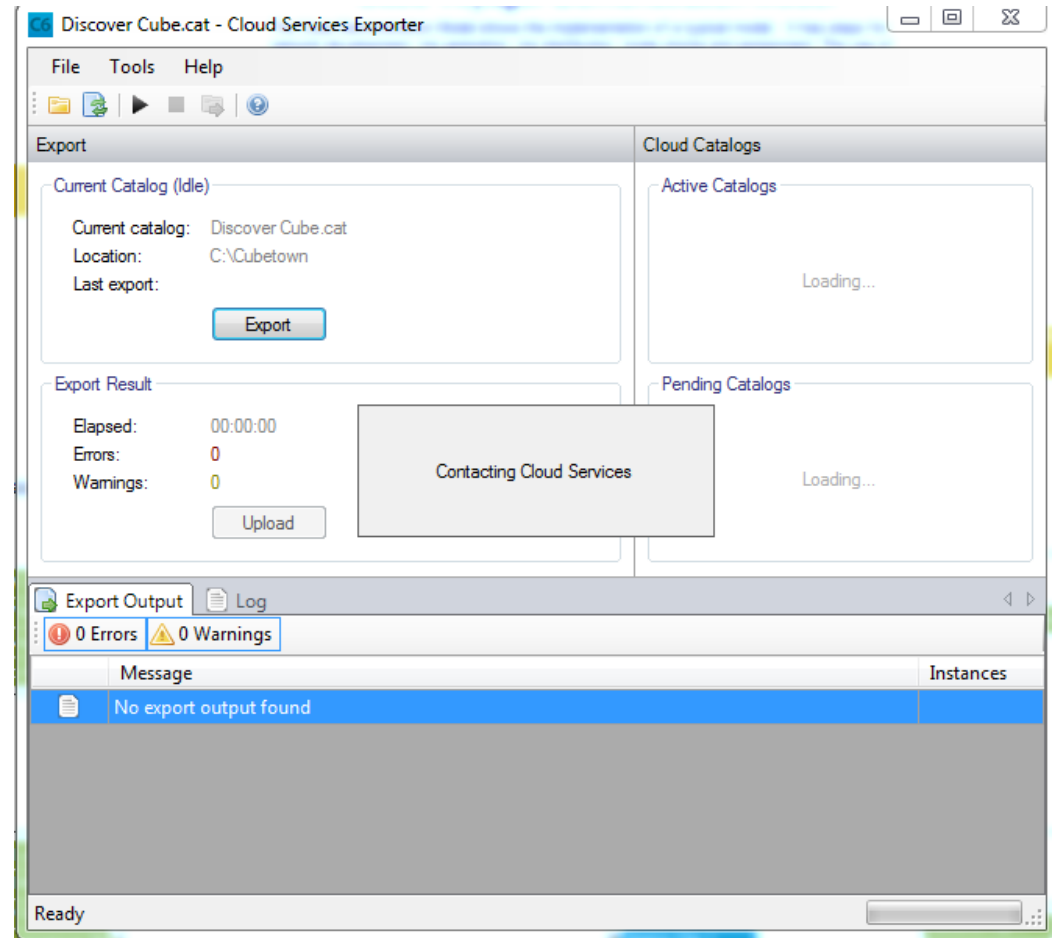
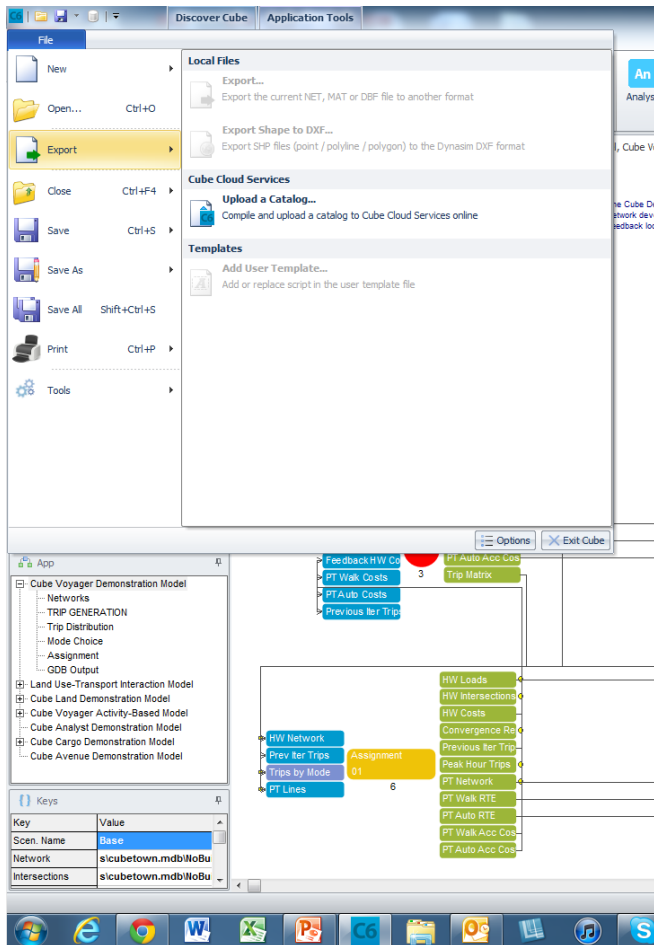


JULY 2012: RELEASE OF CUBE CLOUD



- Develop the Model with **Cube** in the Desktop Environment
- Publish the Model from **Cube** to the Cube Cloud
- Create, run and analyze scenarios from anywhere

ABILITY TO 'PUBLISH' YOUR MODEL TO CUBE CLOUD



BENEFITS OF CUBE CLOUD – REDUCED RUN TIMES

RUN ON 1 TO 1024 PROCESSORS USING CLUSTER

4-STEP MODEL

Cores	Run Time
1	20:41
4	11:05
8	7:33
16	5:48
32	4:42
64	4:02

~>80% faster

HIGHWAY ASSIGNMENT

Cores	Run Time
1	1:59
4	0:46
8	0:29
16	0:18
32	0:15
64	0:13
128	0:08

~>93% faster

ABM MODEL

Cores	Run Time
8	175:13
16	139:03
32	53:40
64	25:57
128	12:41
256	9:58
512	7:17

~>95% faster

BENEFITS OF CUBE CLOUD - SCALABILITY

- Start 1, 10 or 100 scenarios simultaneously—they all start immediately
- Improve validation and forecasts by doing more tests



BENEFITS OF CUBE CLOUD: SHARING

- You own the model
- You invite others to use it
- No more physical copy of scripts and models
 - Eliminate onerous, mistake prone process
 - Eliminate problems with version control
 - Protect model integrity by not sharing scripts
 - Protect intellectual property by not showing scripts
- Users run the model through simple web interface
- True solution for sharing and maintaining model(s) with multiple users and for delivering a turn-key solution
- **Sharing = Value Creation**



HAPPY PEOPLE SHARE

MANAGING ACCESS THROUGH ADMIN CONTROL PANEL

METROPOLITAN WASHINGTON
COUNCIL OF GOVERNMENTS

logged in as citiboss

[Models](#) [Scenarios](#) [Analysis](#) [Data](#) [Store](#) **[Admin](#)**




 CUBE CLOUD

[Manage Model Access](#) | [Model Run Activity](#) | [Model Setup](#) | [Invite User](#)

Manage Model Access

Model: MWCOG

List of Selected Users

Username	Email	Pay for User Runs	Is Model Admin?
citiboss 	mclarke@citilabs.com	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CitilabsAdmin 	amohideen@citilabs.com	<input type="checkbox"/>	<input checked="" type="checkbox"/>
colbybrown 	cbrown@citilabs.com	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Help - Manage Model Access

Manage users that have access to the selected model

Paying for Runs

Provides the user with an option to deduct their hourly usage from this model's contract; unchecking this option has the user pay for runs using their own contract

Model Administrators

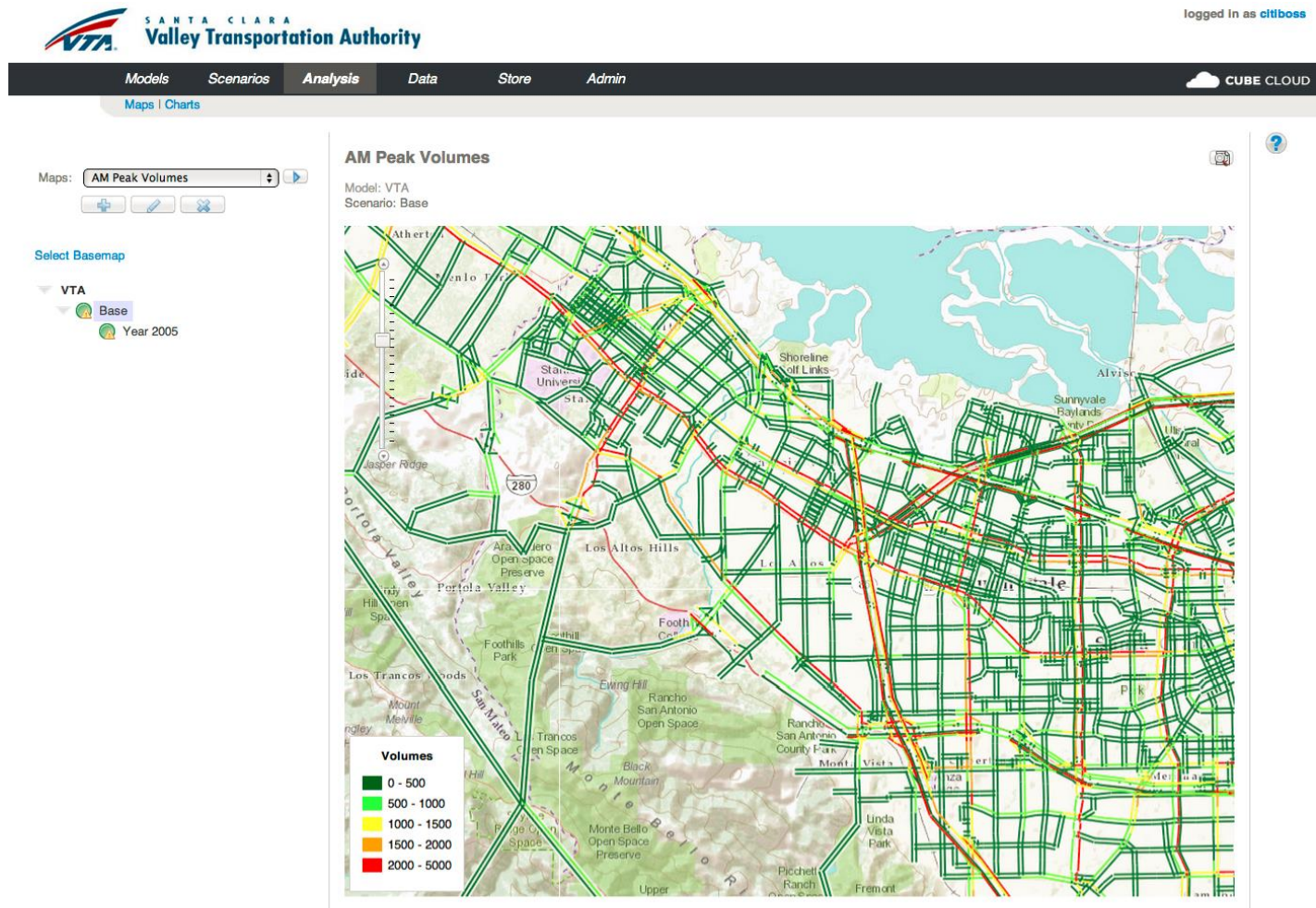
Allows a user to manage model access, view run activity, manage the model setup and invite users

RUN SCENARIOS WITH A SIMPLE WEB INTERFACE

The screenshot displays the 'Scenario Manager' web interface for the Atlanta Regional Commission. The interface is divided into several sections:

- Header:** Includes the ARC logo, the text 'ATLANTA REGIONAL COMMISSION', and a user login status 'logged in as citilabs'.
- Navigation Bar:** Contains tabs for 'Models', 'Scenarios', 'Analysis', 'Data', 'Store', and 'Admin'. Below these tabs are links: 'Status | Edit Scenario | Delete Scenario | Schedule Scenario | Create Child Scenario'.
- Left Sidebar:** Shows a tree view with 'ATLANTA' expanded and 'Base' selected.
- Main Content Area:**
 - Scenario Manager:** Displays the selected scenario 'Base' and lists its associated data files, including 'Base Highway Network', 'Data for "major" park-and-ride lots', 'Data for "minor" park-and-ride lots', 'Rail data including distance and speed between stations', 'Transit fare for each mode', 'Transit line data for rail lines', 'Transit line data for non-rail lines', 'Toll rates by time-of-day for each toll link', 'Transit station nodes used for reporting', 'Household SE data stratified by Income', 'Population and Employment SE Data', 'Extra Zone Data File', 'Pedestrian Environment Data', 'Synthesized HH Population File', 'Synthesized Person Population File', 'Delta Trip Matrix for AM', 'Delta Trip Matrix for MD', and 'Delta Trip Matrix for NT'.
 - Help - Scenario Manager:** Provides instructions on how to use the interface, including sections for 'Scheduling a Scenario', 'Updating a Scenario', 'Creating a Child Scenario', 'View Run Status and Results', and 'Deleting a Scenario'.
- Right Sidebar:** Contains a 'Scenario States' section with a legend for run status icons: 'no data available', 'scheduled to run', 'completed without warnings (return code: 0)', and 'completed with warnings (return code: 1)'.

MAKE IT EASY TO MAP RESULTS



MAKE IT EASY TO GET CHARTS AND TABLES



BUDAPEST
TRANSPORT MODEL

logged in as **cltboss**

Models

Scenarios

Analysis

Data

Store

Admin

CUBE CLOUD

Maps | Charts

Charts: AM Peak - Count Vs Volume



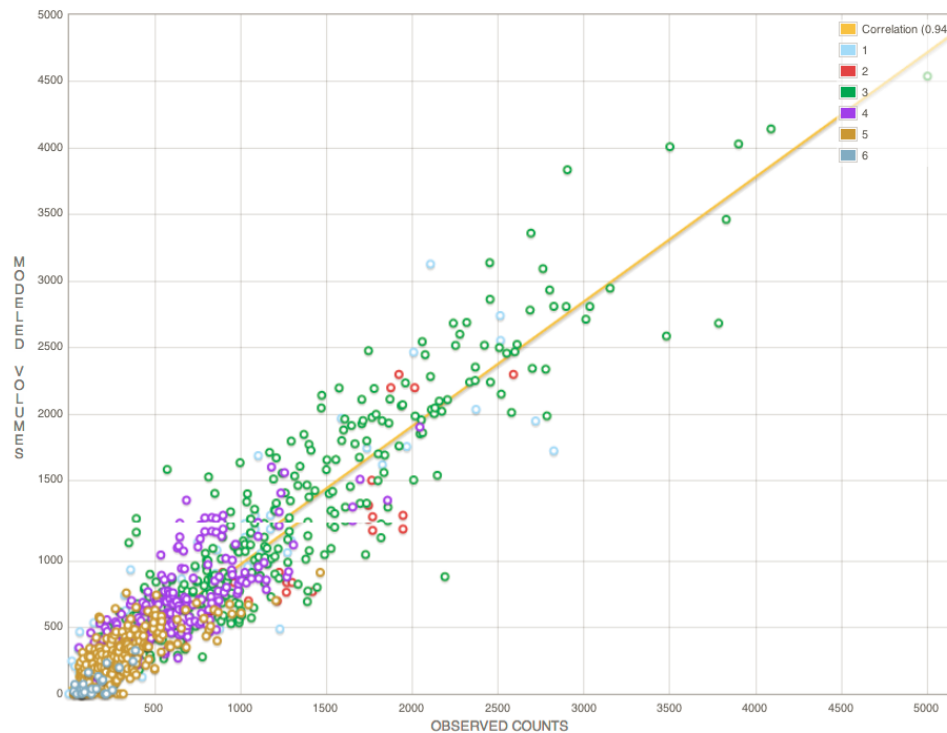
BUDAPEST-HUNGARY

Base

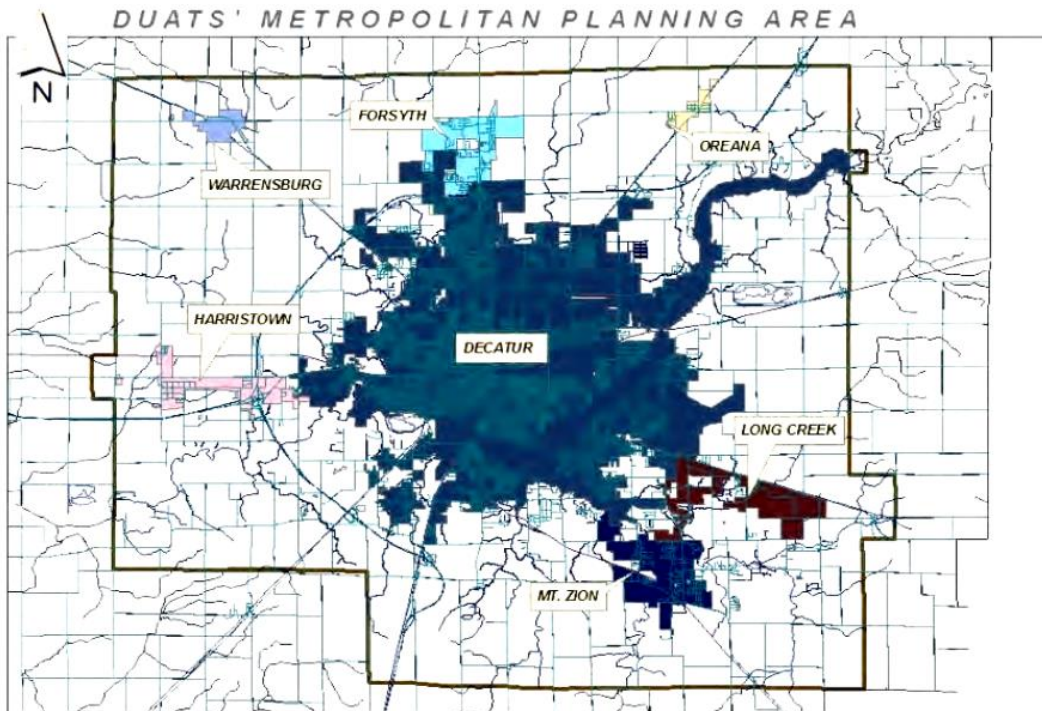
- BASE_2008
- BASE_2010
- BASE_2015
- BASE_2020
- BASE_2025

Charts

Model: Budapest-Hungary
Scenario: Base

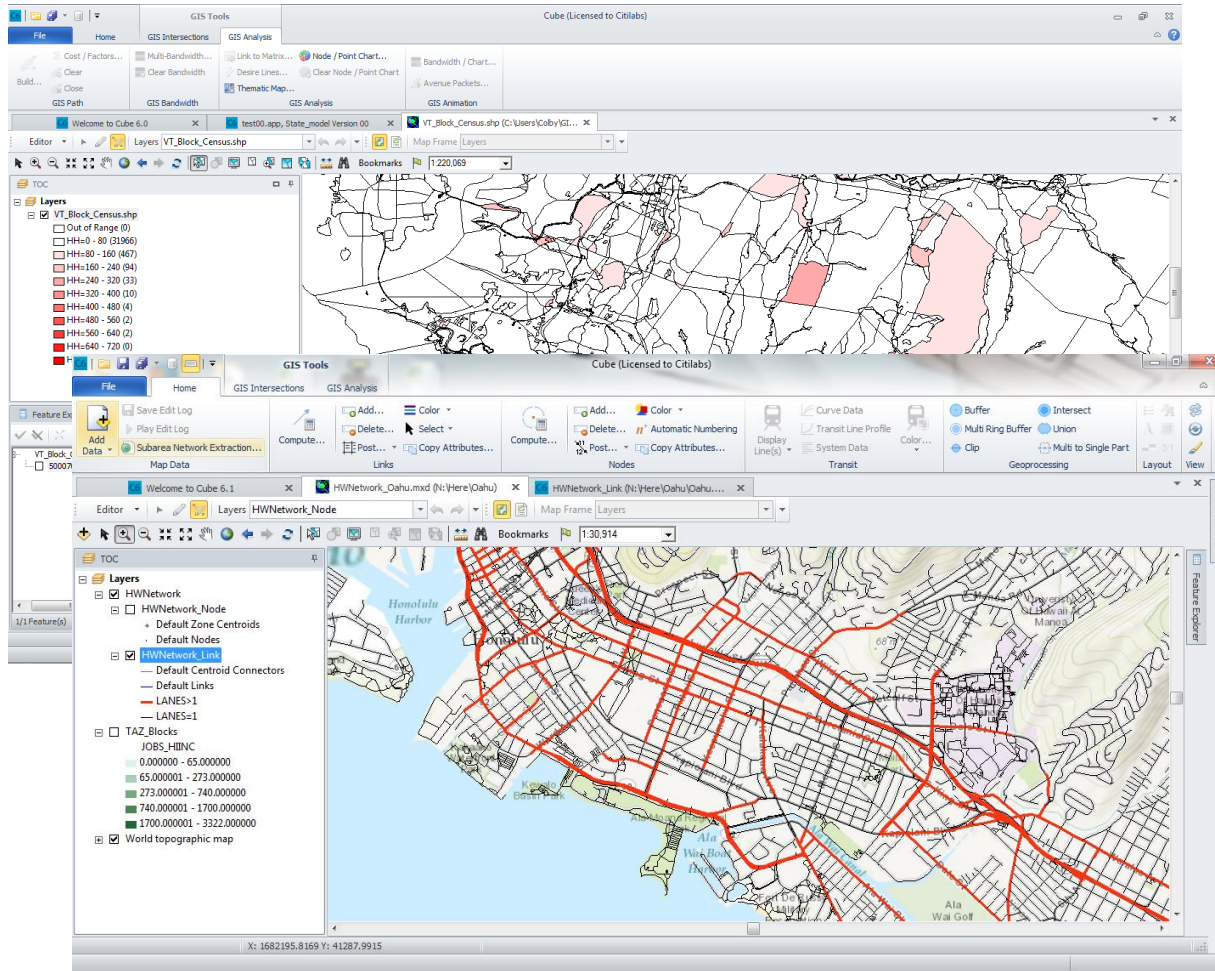


Decatur Urbanized Area Transportation Study



- Small MPO in Illinois (city pop. 76,096)
- Agency working with their consultant on a Cube travel model
- Cube Cloud as a low-cost solution for sharing and working together

CUBE CLOUD: BIG DATA



- At Cube Cloud store: nationwide block-level socio-economic data for the USA (free!)
- Now available: Here (NAVTEQ™) nationwide roadway network and traffic database

here

CUBE CLOUD STORE: APPS

Firefox Cube Cloud cc.citilabs.com/store.aspx logged in as colbybrown

Models Scenarios Analysis Data **Store** Admin Contracts

Store

Apps Data Resources

Apps

Name	Description	Create Date	Price
Compare 2 Loaded Networks	Cube Cloud App to Compare 2 Voyager Loaded Networks (Vol, Time, Speed, VMT, VHT)	7/9/2012	\$0.00 BUY
Select Link Analysis	Cube Cloud App for Select Link Analysis	7/9/2012	\$0.00 BUY
Flag Differences in 2 Voyager Networks	Cube Cloud App to Flag Differences in 2 Voyager Networks	7/10/2012	\$0.00 BUY
Post Assignment Appraisal	Cube Cloud App for Post Assignment Appraisal - Air Quality emissions, Road Traffic Noise, Accident Forecasts	7/10/2012	\$0.00 BUY
Trip Length Frequency Distribution	Cube Cloud App to Plot Trip Length Frequency Distribution	7/9/2012	\$0.00 BUY
Interpolate 2 Trip Matrices	Cube Cloud App to Interpolate 2 Trip Matrices	7/10/2012	\$0.00 BUY
Skim Highway Network	Cube Cloud App to Skim a Highway Network	7/10/2012	\$0.00 BUY
Zone to District Level Summary	Cube Cloud App to Compress/Summarize a Zone-level Matrix to District-level	7/10/2012	\$0.00 BUY

Have an app you would like to share, contact us

Help - Store

From Cube Cloud, you may browse the Store to obtain models, data and resources to incorporate into your own model.

You may access the store at any time by clicking Store on the top menu.

Apps

You may access the Apps, or sample models, by clicking the Apps tab from within the Store.

Apps include data and scenarios ? plus charts and maps you may customize. Or, you can add your own charts and maps.

You may view their Name, Description, Create Date and Price. If the App is already installed, you may elect to delete it.

Any apps you buy and install will appear under your Models section.

Data

You may access data sets from the store by clicking the Data tab from within the Store.

There you will find a list of data sets. You may view their Name, Description, Create Date and Price.

Resources

The Cloud Store includes freely-available datasets you may employ in your model. These include census data, survey information, and more, available for reference. To access these resources, click the Resources tab from within the store.

From there, you may browse a table listing the Name of the resource, a short Description, the Category (e.g., data), the Type (for example, a web link) and finally the resource's applicable Region.

CUBE CLOUD STORE: RESOURCES

Firefox
Cube Cloud
cc.citilabs.com/store.aspx
Google
logged in as colbybrown

Models
Scenarios
Analysis
Data
Store
Admin
Contracts
CUBE CLOUD

Store

Apps
Data
Resources

Resources

Name	Description	Category	Type	Region	
National Household Travel Survey (NHTS)	Comprehensive data on travel and transportation patterns in the USA	Data	Web Link	United States	link
Public Use Microdata Sample (PUMS)	Public Use Microdata Sample files from the American Community Survey - US Census	Data	Web Link	United States	link
American Community Survey (ACS)	Ongoing survey that provides data every year from the US Census	Data	Web Link	United States	link
Census Transportation Planning Package (CTPP)	Census data specific to transportation analysis	Data	Web Link	United States	link
CTPP Data on the web	CTPP Data available on the web	Data	Web Link	United States	link
Longitudinal Employer-Household Dynamics (LEHD)	Census employment data	Data	Web Link	United States	link
Quarterly Census of Employment and Wages	Bureau of Labor Statistics - Quarterly Census of Employment and Wages	Data	Web Link	United States	link
Census Population forecast estimates	Census Population forecast estimates	Data	Web Link	United States	link
Travel Estimation Techniques for Urban Planning - NCHRP 365	Travel estimation techniques and parameters from TRB	Report	Web Link	United States	link
Travel Model Validation and Reasonableness Checking Manual 2nd Edition:	Guide to model validation	Report	Web Link	United States	link
Online Travel Survey Manual	Guide to travel survey design	Report	Web Link	United States	link
Characteristics of Urban Transportation Demand (TCRP Report 73)	Guide to urban travel demand characteristics	Report	Web Link	United States	link
Batch geo-coding API(Choose Yahoo or Google)	Useful tool to geocode multiple addresses	Tool	Web Link	United States	link
ArcGIS Base Maps for download	Base maps for ArcGIS	Tool	Web Link	United States	link
2011 TIGER/Line Shape files	Place to download TIGER files	Data	Web Link	United States	link
Florida Geographic Data Library (FGDL)	Downloadable geographic data for Florida	Data	Web Link	United States	link
Library of German Transport data	Downloadable transportation data for Germany	Data	Web Link	Germany	link
German Road Statistics	Downloadable statistics for German roadways	Data	Web Link	Germany	link
Bavarian Road Statistics	Downloadable statistics for Bavaria	Data	Web Link	Germany	link
Austrian Road Statistics	Downloadable statistics for Austria	Data	Web Link	Austria	link
Swiss Road Statistics	Downloadable statistics for Switzerland	Data	Web Link	Switzerland	link
Census data for England	Downloadable census data for England	Data	Web Link	UK	link

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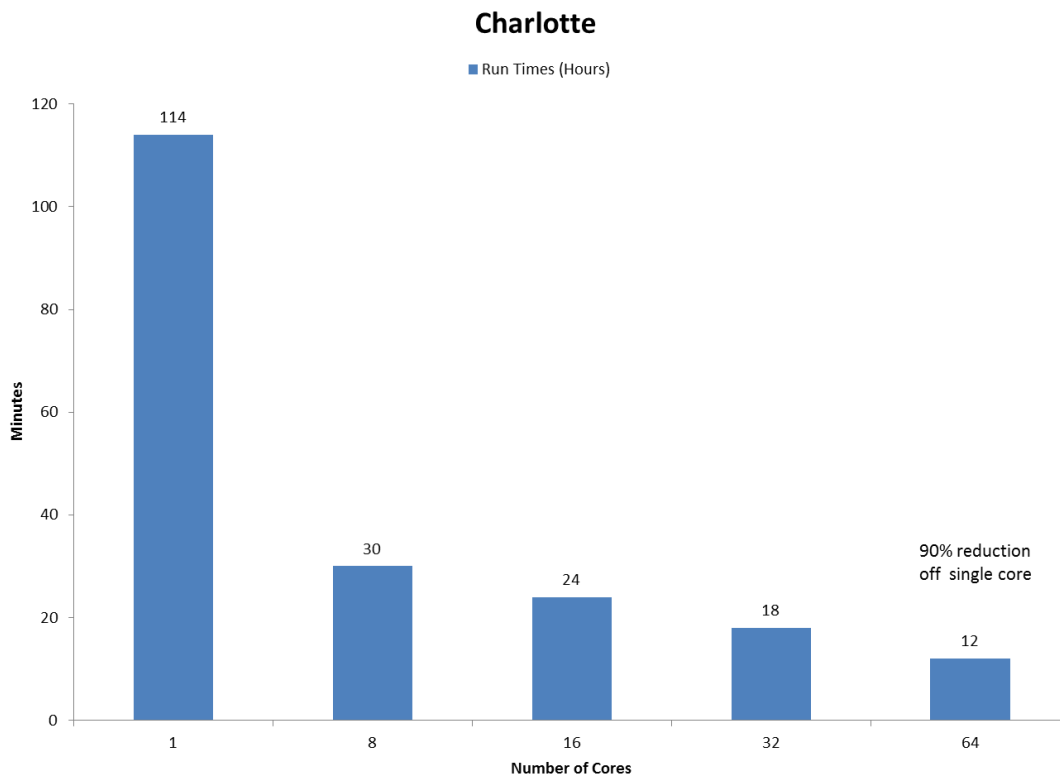
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Charlotte Cube Cloud Test Case



- Time-of-Day highway assignment model
- 3,000 zones
- 4 time periods
- 3 pathloads in each assignment

THANK YOU

Questions?

