Slide 1

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C
Cube

SCAG MODELING TASK FORCE MEETING
SEP. 28, 2016

Slide 2

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Luke Cheng, Regional Director

Education:
- MS from MIT – CTS

Experience:
- Nashua Regional Planning Commission
- City of Upland, CA
- Wilbur Smith Associate, New Haven, CT
- Wilbur Smith Associate, Hong Kong
- LA Metro
- Citilabs

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FUTURA 16 – New Data For Transportation Planning

- Location: **Renaissance Palm Springs Hotel** Palm Springs, CA, USA
- Date: Oct. 22-28, 2016
  - Oct 22 - Training - Introduction to Cube: Focus on Model Calibration Approaches and Statistical Package Integrations
  - Oct 23 - Training - Leveraging ArcGIS with Cube: Geoprocessing through Multi-User Editing
  - **Oct. 24-26 - Futura Conference**
  - Oct 27 - Training - Activity-Based Modelling Approaches with Cube
  - Oct 28 - Training - Cube Land: Methodology and Practical Implementation
  - Oct 27-28 - Training - Cube Avenue and Cube Analyst: Dynamic Traffic Assignment and Matrix Estimation

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Slide 4

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FUTURA 16 – New Data For Transportation Planning
Keynote Speakers

- **Dr. Luis (Pilo) Willumsen -** Pilo is the co-author of the leading transportation modeling text book in the world, **"Modelling Transport,"** and an experienced modeling practitioner. Traveling from London, he will present on the topic of "**Experience modeling using mobile phone and other sensor data."** Pilo's presentation will provide an overview of the advantages and disadvantages of sensors used to obtain trip matrix, travel times and other useful travel information — such as ANPR, Bluetooth, GPS, mobile phone and WiFi data.

- **Mikel E. Murga 0f Massachusetts Institute of Technology -** Mikel is a researcher and lecturer at MIT where he teaches courses in Urban Transportation Policy and Transportation Modeling. He has many years of hands-on experience using Cube to study transportation planning issues. Mikel will present **"Learning from Available Data before Modeling,"** which will focus on Public Transportation networks and will challenge the traditional beliefs of modeling travel behavioral patterns based on a uni-modal person.

Slide 5

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Agenda

- Who is Citilabs?
- What is Cube?
- Cube Cloud
- California Statewide Model on Cube Cloud
- Sugar Network Editor
- Sugar Access

Slide 6
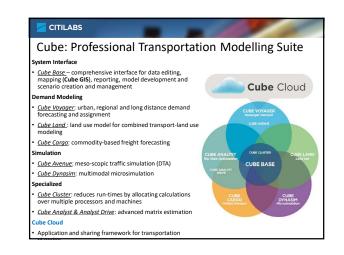
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Who is Citilabs?

Citilabs provides the **most flexible and open** transportation and **land-use** modeling **platform** for **planners and transportation engineers** around the globe.

With **decades of modeling development expertise** and a close **partnership with Esri**, Citilabs strives to use new technologies to **expand access** to urban models and **improve communications** with the local communities.

Citilabs solutions enable governments to make the **most informed** transportation and land use development decisions to

create a better future.

Slide 1:

CITILABS

BASED IN FLORIDA, USA WITH REGIONAL OFFICES IN:

✔ Munich ✔ Manchester ✔ Milan

✔ Beijing ✔ Sacramento ✔ Tallahassee

EXISTING CLIENT BASE OF
3000 URBAN AREAS IN 80 COUNTRIES

SELECTED KEY CITIES:
San Francisco, Washington, Atlanta, Houston, London, Paris, Milan, Moscow, Singapore, Hong Kong, Beijing, Taipei, Guangzhou, Shenzhen, Abu Dhabi, Bangkok, Melbourne

SELECTED KEY NATIONAL GOVERNMENTS: Ireland, Scotland, England, Netherlands, Belgium, France, Spain, Italy, Norway, Sweden, Brazil, Thailand

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Cube: Professional Transportation Modelling Suite

System Interface
- *Cube Base* – comprehensive interface for data editing, mapping (**Cube GIS**), 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 microsimulation

Specialized
- *Cube Cluster*: reduces run-times by allocating calculations over multiple processors and machines
- *Cube Analyst & Analyst Drive*: advanced matrix estimation

Cube Cloud
- Application and sharing framework for transportation

Cube Cloud

CUBE VOYAGER
Passenger Demand
CUBE AVENUE
CUBE ANALYST
Trip Table Optimization
CUBE CLUSTER
CUBE LAND
Land Use
CUBE BASE
CUBE ANALYST
DRIVE
CUBE CARGO
Freight Demand
CUBE DYNASIM
Microsimulation

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CITILABS – PARTNERSHIP WITH ESRI

- Through Citilabs' partnership with Esri, users have the ability to maximize the efficiency of their workflows through familiar tools
- Citilabs works with Esri data formats such as .MDB and .GDB
- Possibility to share maps/workspace between GIS and Cube teams through .MXD files
- Seamless integration between Cube and ArcMap for one unified workflow among different processes
- Sugar Network Editor and Sugar Access, Citilabs in-built tools for transport analysts within ArcMap

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Cube: Solutions for Any Modelling Challenge

The flexibility of the software allows to include any mode of transport to create a fully multi-modal approach with feedback interactions between different modes:
- Pedestrians, Bikes, Motorcycles,
- Cars (Highway, Tollroads),
- Freight/Trucks,
- Public Transport: Buses, BRT/LRT/Metro Rail,
- Air,
- Water, etc.

Slide 5:

V

Cube Voyager

Slide 6:

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Advancing Technologies – Demand

- Enabling advanced methods in demand models with an explicit scripting language developed specifically for transportation modeling.

- Enables the development of any demand methodology:
  - Classic 4-step models
  - Mode/Destination Choice Models
  - Activity-based models
  - Population Simulation
  - Tour Based Models

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FLEXIBILITY

The only system equipped with its own comprehensive scripting language for transportation modeling

- Create customized models without difficult programing languages
- Access many scripts through simple menu clicks
- Move custom scripts and add as point and click functions within Cube

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Advancing Technologies – PT

- Advancing Public Transport (PT) modeling with a simulation of how travelers actually chose their routes to assign trips to competing routes.
- Simulates the unique choices of multiple user classes.
- Wait times consider the effects of capacity (seating and crush)
- Nested Logit Choice Models at each decision point estimate the probability of needing to wait for a second service or take an alternative route
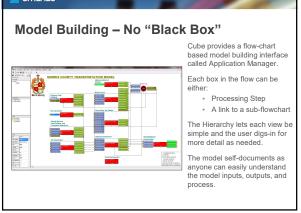

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A TRANSPORTATION-GIS BUILT ON ESRI

- Only modelling system that comes with a complete transportation GIS built on ESRI's leading GIS technology.
- Store all data directly in ESRI's geodatabase format
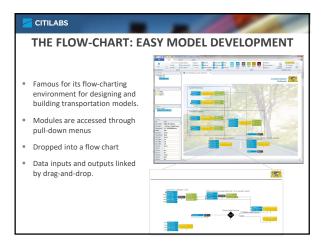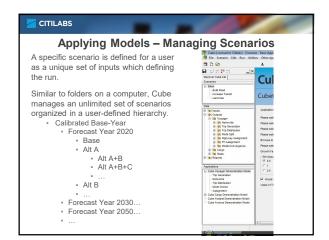- No need to convert data back and forth between the GIS department and the modeling team
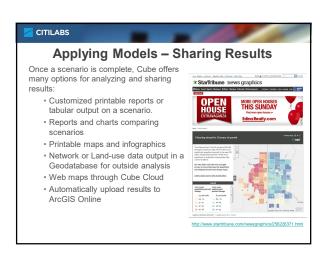- ArcGIS Extension for transportation network editing (Sugar)

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Model Building – No "Black Box"

Cube provides a flow-chart based model building interface called Application Manager.

Each box in the flow can be either:

- Processing Step
- A link to a sub-flowchart

The Hierarchy lets each view be simple and the user digs-in for more detail as needed.

The model self-documents as anyone can easily understand the model inputs, outputs, and process.

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THE FLOW-CHART: EASY MODEL DEVELOPMENT

- Famous for its flow-charting environment for designing and building transportation models.
- Modules are accessed through pull-down menus
- Dropped into a flow chart
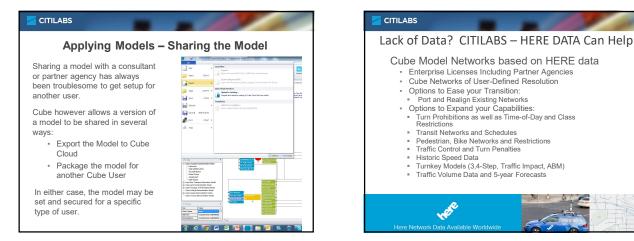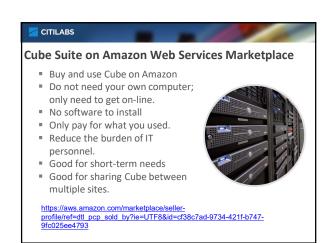- Data inputs and outputs linked by drag-and-drop.

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Applying Models – Minimize Human Error

Model Developers may customize the interface for any type of user. The customized interfaces help to eliminate any user error:

- The users can only access the parameters and inputs appropriate for their use.
- The set-up to make a new run is simplified making each scenario quick and efficient.
- The inputs may be validated and checked for quality automatically to prevent any mistakes.

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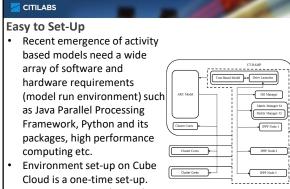## Applying Models – Managing Scenarios

A specific scenario is defined for a user as a unique set of inputs which defining the run.

Similar to folders on a computer, Cube manages an unlimited set of scenarios organized in a user-defined hierarchy.

- Calibrated Base-Year
  - Forecast Year 2020
    - Base
    - Alt A
      - Alt A+B
      - Alt A+B+C
      - …
    - Alt B
    - …
  - Forecast Year 2030…
  - Forecast Year 2050…
  - …

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Applying Models – Sharing Results

Once a scenario is complete, Cube offers many options for analyzing and sharing results:

- Customized printable reports or tabular output on a scenario.
- Reports and charts comparing scenarios
- Printable maps and infographics
- Network or Land-use data output in a Geodatabase for outside analysis
- Web maps through Cube Cloud
- Automatically upload results to ArcGIS Online

http://www.startribune.com/newsgraphics/256226371.html

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Applying Models – Sharing the Model

Sharing a model with a consultant or partner agency has always been troublesome to get setup for another user.

Cube however allows a version of a model to be shared in several ways:

- Export the Model to Cube Cloud
- Package the model for another Cube User

In either case, the model may be set and secured for a specific type of user.

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Lack of Data? CITILABS – HERE DATA Can Help

Cube Model Networks based on HERE data

- Enterprise Licenses Including Partner Agencies
- Cube Networks of User-Defined Resolution
- Options to Ease your Transition:
  - Port and Realign Existing Networks
- Options to Expand your Capabilities:
  - Turn Prohibitions as well as Time-of-Day and Class Restrictions
  - Transit Networks and Schedules
  - Pedestrian, Bike Networks and Restrictions
  - Traffic Control and Turn Penalties
  - Historic Speed Data
  - Turnkey Models (3,4-Step, Traffic Impact, ABM)
  - Traffic Volume Data and 5-year Forecasts

here

Here Network Data Available Worldwide

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New Trend in Software – "Software As A Service"

Amazon Web Services (AWS)

Sugar Access

Cube Cloud

Urban Engines

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Cube Suite on Amazon Web Services Marketplace

- Buy and use Cube on Amazon
- Do not need your own computer; only need to get on-line.
- No software to install
- Only pay for what you used.
- Reduce the burden of IT personnel.
- Good for short-term needs
- Good for sharing Cube between multiple sites.

https://aws.amazon.com/marketplace/seller-profile/ref=dtl_pcp_sold_by?ie=UTF8&id=cf38c7ad-9734-421f-b747-9fc025ee4793

Cube Cloud

What is Cube Cloud?

- Cloud based environment for travel demand modeling in CUBE
- SaaS – Software as a Service
  - Infrastructure
  - Platform
  - Application
- Pay for what you use
- Three major elements
  - Contracts
  - Models
  - Users

CUBE DESKTOP AND CLOUD

1. **Cube Desktop**: Comprehensive forecasting suite. All data stored and maintained within transportation GIS using ArcGIS Engine
2. **Cube Cloud**: platform for model and data sharing within Amazon Web Services

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WHAT IS CLOUD COMPUTING

Offsite data
Offsite computing
Web GUI
Dynamic updates

WHY CLOUD?

- Scalability
- Easy to set up
- Sharing
- Ease of access
- Easy to manage
- Collaboration
- Speed

Scalability

- Scalability is useful when doing alternative testing and sensitivity analysis.
- Capable of running multiple scenarios simultaneously.
- Each scenario run uses dedicated resources (processing power, memory and bandwidth).
- Performance of individual scenario runs not affected by other scenario runs.

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Easy to Set-Up

- Recent emergence of activity based models need a wide array of software and hardware requirements (model run environment) such as Java Parallel Processing Framework, Python and its packages, high performance computing etc.
- Environment set-up on Cube Cloud is a one-time set-up.
- Environments can be easily cloned for different users.

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Easy to Share

- Resource – Sharing of computing resources such as core run time hours and storage
- Model – Sharing of model scenario trees with input parameters
- Data – Sharing of input data
- Analysis – Sharing of output analysis templates

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Easy to Access – Cube Cloud Architecture

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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

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Easy to Manage

- Central repository for management of models and data
- Updates are readily available to users

Cube Cloud Version Control

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ABILITY TO 'PUBLISH' YOUR MODEL TO CUBE CLOUD

RUN SCENARIOS WITH A SIMPLE WEB INTERFACE

MANAGING ACCESS THROUGH ADMIN CONTROL PANEL

MAKE IT EASY TO MAP RESULTS

MAKE IT EASY TO GET CHARTS AND TABLES

Collaboration:
State Department working with Regional Agency
US Standard: DOT & MPO

Collaboration:
Regional Agency with County/City Municipality
US Standard: MPO & City/County

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Collaboration:
Public Private Partnership

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Speed

- Availability of large number of computing cores, combined with the distributed processing capabilities provided by Cube cluster have provided significant reduction in run times for several models.
- Models have been successfully tested using up-to 512 cores.
- Models have to be optimized using Cube Cluster to better use the available cores.

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Speed

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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

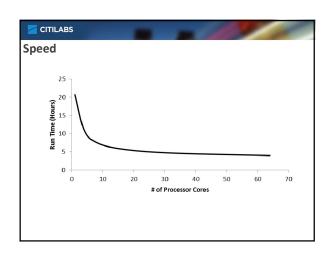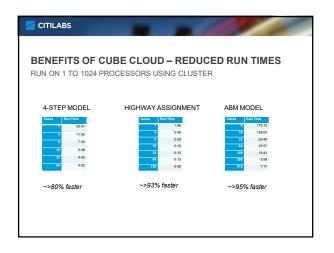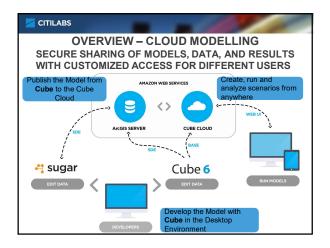| Cores	Run Time
1	1:59
4	0:46
8	0:29
16	0:18
32	0:15
64	0:13
128	0:08

~>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

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OVERVIEW – CLOUD MODELLING
SECURE SHARING OF MODELS, DATA, AND RESULTS WITH CUSTOMIZED ACCESS FOR DIFFERENT USERS

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CALIFORNIA TRAVEL DEMAND MODEL
Caltrans | California, USA

Cube Cloud provides a hosted environment where model users can access the model through customized interface protocols based on their potential usage characteristics and data requirements

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cc.Citilabs.com

CUBE CLOUD

Username: | Password:

Dont have an account? Sign-Up | Forgot Password?

Citilabs Copyright © 2013 Citilabs

Login
☐ Remember Me

http://cc.citilabs.com/secure/login.aspx

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RUN SCENARIOS WITH A SIMPLE WEB INTERFACE

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MAKE IT EASY TO GET CHARTS AND TABLES

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MAKE IT EASY TO MAP RESULTS

CONTRACTS

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CONTRACTS

- Agreement between the user and the cloud service provider (i.e., Citilabs)
- It is also a component in the Cube Cloud system
- Contract defines the number of hours, users, amount of storage, etc.
- Same user can have multiple contracts
- Required to run models
- Contracts can be tied to a single model or can be used for any model
- Not all users need to sign contracts
- Contract hours can be shared between users

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MODELS

MODELS

- Models are your travel demand models on Cube Cloud
- Models can be shared between users
- Hosting and running models consumes resources
- Cube comes with built in tool to upload models to Cube Cloud
- Hosting or running a model on cloud requires a contract

USERS

USERS

- Users are the user accounts on Cube Cloud
- Don't consume any resources
- Free to register
- To do anything significant, users need to have access to a model or a contract
- Users get two levels of access to a contract/model
  - Admin
  - Regular user

CONTRACTS/MODELS/USERS

CONTRACTS/MODELS/USERS

- Pay for user runs

MODEL CONTROLS, SETTING AND GLOBAL INPUTS

- Zones – 7000
- Air Zones - 20
- CVR Zones - 300
- HSR Zones - 48
- Highway network starting node number - 7001
- Highway network maximum node number - 500000
- Path to Python executable – C:\Python27\
- Path to Java executable – C:\Program Files\Java\jre6\bin\
- Number of local cores - 32
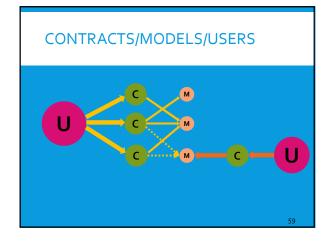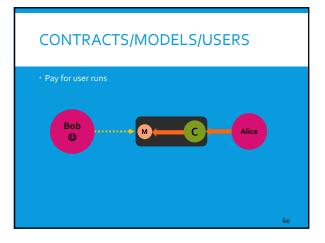- Total number of cores available, local plus remote - 32

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MODEL CONTROLS, SETTING AND GLOBAL INPUTS

SDCVM input control files:
- Fleet Allocator SDCVM file – FA.**csv**
- Industrial SDCVM file – IN.**csv**
- Retail SDCVM file – RE.**csv**
- Service SDCVM file – SV.**csv**
- Transport & Handling SDCVM file – TH.**csv**
- Wholesale SDCVM file – WH.**csv**
- Off Early SDCVM file – OE.**csv**
- AM SDCVM file – AM.**csv**
- Midday SDCVM file – MD.**csv**
- PM SDCVM file – PM.**csv**
- Off Late SDCVM file – OL.**csv**

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MODEL CONTROLS, SETTING AND GLOBAL INPUTS

SDPTM and LDPTM input control files:
- Daily Activity Patterns file - Day_Patterns_Full.**csv**
- Activity Pattern Co-effs file - Daypat_Coeffs.**csv**
- TAZ to SDPTM District correspondence - TazListI.**csv**
- Airfare Function file - Airfare Function.**csv**
- Airport station to TAZ correspondence - Airports.**csv**
- TAZ to CVR Station correspondence - Stations.**csv**

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MODEL CONTROLS, SETTING AND GLOBAL INPUTS

ETM input control file:
- External Stations file – Externals.**csv**

Zonal correspondence files for summary reporting:
- TAZ Equivalency file – TAZEquivalency.**csv**
- TAZ to County with Ext Equivalency file – TAZCountyWithExternals.**csv**
- TAZ to Transit Sheds correspondence – TransitSheds.**csv**

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MANAGING MODELS

- The models page lists:
  - All the models the user currently has access to
  - Any apps downloaded from the store
  - Any pending models which have to be approved by Citilabs staff
- Each model has an associated contract which will be used for the model run.
- This contract is only for the model run and the model could be hosted on any contract.
- Opening a model (clicking on the model name) will open the scenarios page for the model.
- Only the model admin can remove users from model access.
- Only the user who uploaded the model can delete a model from Cube Cloud.

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MANAGING SCENARIOS

- Add new scenarios
- Upload/edit scenario inputs
- Delete scenarios

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RUNNING MODELS

- Model/Cluster set-up
- Selecting contract
- Scheduling runs
- Checking run status

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MODEL/CLUSTER SET-UP

- CC model run environment
  - e.g., CUBE 5.1.4, CTRAMP 5.1.4, CALTRANS Cube 6.4.1
- Cluster process name – should match with the name used in your model
- Number of cores to be used for this model run

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SELECT CONTRACT

- Contract to be billed for the current model run
- Lists the available contracts under your administration

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SCHEDULE MODEL RUNS

- Select scenario to run in the scenarios page
- Schedule Scenario starts model run
  - Requires user confirmation

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CHECK MODEL RUN STATUS

- Status
  - Lists currently running scenarios and completed scenario runs
  - Status
    - Pending – the model run is pending to be started
    - Running – the model is currently running
    - Completed – the model run completed

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DATA MANAGEMENT

- Data page
- Scenario run outputs
- Public/Private Folder
- Working with files/folders
- Managing data folders

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DATA PAGE

- Provides access to all data associated with all your models
- Organized by models and scenarios
- By default all scenario run outputs are organized under the scenario folder
- Follows a MS-Windows like folder structure
- Several tools are available to organize your output data

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SCENARIO RUN OUTPUTS

- By default all outputs from the model run goes to the scenario folder
- The outputs are further organized into sub folders under each scenario folder
  - ETM
  - LDCVM
  - LDPTM
  - Networks
  - Printfiles
  - SDCVM
  - SDPTM
  - Skims
  - SummaryStatistics
  - TotalTrips

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PUBLIC/PRIVATE FOLDER

- Each model will have a Public and Private folder
- Private folder is only accessible to the user
- Public folder is a special folder which is visible to all the users of the model
- Any files uploaded to the Public folder will be easily accessible by other users of the model
- Public folder is set-up with 2 sub folders: Inputs and Outputs
- Inputs folder contains the input files by each scenario
- Outputs folder contains the chosen outputs copied from the default scenario folder

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WORKING WITH FILES & FOLDER

- Copy files between folders
- Download files
- Upload files from your PC
- Delete files
- Add/Download/Delete folders

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DATA ANALYSIS

- Networks/Maps
- Database/Charts
- Tables

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NETWORKS/MAPS

- CC has map tools to plot network data
- The loaded network has to be in a geo-database (.mdb) or link and node shape files
- Link and Node shape files are more efficiently handled on CC than geo-databases
- The geometric data should have the correct projection defined.
- CC is compatible with all standard projection systems such as State Plane.

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DATABASE\CHARTS

- CC provides 4 chart types to plot data
- The database should be available in a geo-database (.mdb)
- The data should be summarized and filtered
- Chart Types:
  - Pie
  - Stacked Bar
  - Line
  - Scatter

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DATABASE\CHARTS

Pie Chart

Category	Value
Category 1	100
Category 2	200
Category 3	300
Category 4	400
Category 5	500

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DATABASE\CHARTS

Stacked Bar Chart

Category	Columns	Value
Category 1	1	100
Category 2	2	200
Category 1	1	200
Category 2	2	100

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DATABASE\CHARTS

Line Chart

Category	Columns	Value
Category 1	1	10
Category 2	1	20
Category 1	2	15
Category 2	2	25
Category 1	3	5
Category 2	3	15

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DATABASE\CHARTS

Scatter Plot

Category	X-Axis	Y-Axis
Category 1	1	2
Category 1	2	3
Category 2	0	2
Category 2	4	3
Category 3	2	4
Category 3	3	5

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TABLES

- Tables should be used for publishing smaller datasets such as summary tables.
- Bigger data sets can be accessed and downloaded from the 'Data' page.
- This page lists two types of files
  - .dbf
  - .table

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TABLES

- DBF tables are regular '.dbf' format files. However, in order to be listed as a table in this page, these files need to have 'table_' as a prefix to their name.
- '.table' files are any output text file named with extension '.table'.
- '.table' should be pipe (|) delimited. Below is a sample format

Title="Table Name"
Column1 Name | Column2 Name | Column3 Name
100 | 200 | 300
200 | 400 | 600

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BENEFITS – CUBE CLOUD

- **Internet**: movement from a desktop-bound, 'locked' environment to an internet-based, 'open', sharable, 'work from anywhere/anytime' environment
- **Community Resource**: model application and planning analysis done by non-experts using common web-browsers moving models to an active role in collaborative transportation planning
- **Cloud-Computing**: placement of the models, data and software in a cloud-computing environment lowering hardware costs locally while providing 'unlimited' high-spec resources
- **Lower costs for the user**: movement from locally licensed desktops to a software as a service model. Monthly subscription business model allowing many to use the model at low, or even, no cost
- **Lessens IT complexity**: much of the IT burden of modelling is shifted from the user to the vendor
- **Data and Software Integration**: easier to integrate with external systems: development reviews, regional air quality analysis, pavement maintenance systems, traffic and transit ITS systems and to receive and use data from data probes, detectors and static data sources

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CITILABS SOFTWARE
- SUGAR -

A New Product Line – ArcGIS Add-ons

TRANSPORTATION & LAND-USE SOLUTIONS
MODEL. ANALYZE. VISUALIZE.

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SUGAR NETWORK EDITOR

- Sugar Network Editor (SNE) is an add-on to Esri's ArcGIS Desktop.
- SNE Creates and maintains transportation networks directly within ArcGIS.
- SNE is the ideal tool for users of ArcGIS that need to create and maintain any type of transportation network. These networks are directly compatible with ESRI's Network Analyst extension and other ESRI extensions, and transportation software products such as Citilabs Cube and Trafficware® Synchro.
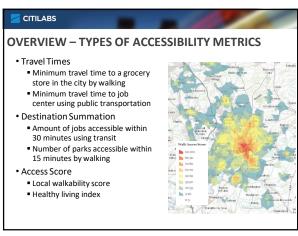

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SUGAR NETWORK EDITOR

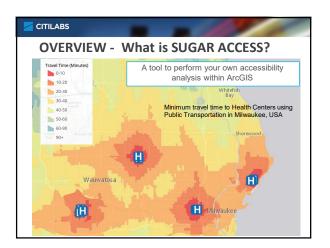SNE can edit all transportation network information directly within ArcGIS:
- Street networks including intersection characteristics and traffic control devices
- Public Transit, Rail and Trucking - including routes, schedules and stops
- Other modes such as air and ferry, and service networks such as school bus, postal routes, snow removal, garbage collection and maintenance.
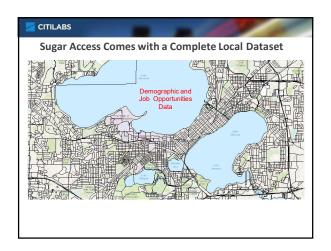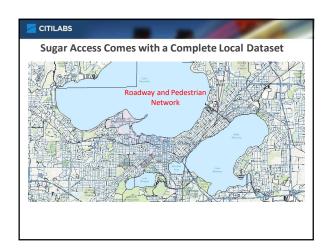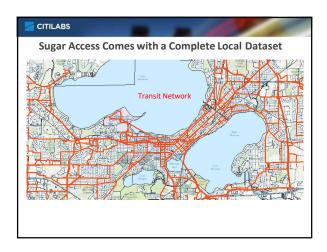

Sugar Access

CITILABS

OVERVIEW – ACCESSIBILITY

Oxford Dictionary: Able to be reached or entered.

- Accessibility, a measure that examines both land use and transportation systems, it is the ease of reaching valued destinations.
- Measure it for various transportation modes … to different types of destinations … and at different times of day

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CITILABS

OVERVIEW – TYPES OF ACCESSIBILITY METRICS

- Travel Times
  - Minimum travel time to a grocery store in the city by walking
  - Minimum travel time to job center using public transportation
- Destination Summation
  - Amount of jobs accessible within 30 minutes using transit
  - Number of parks accessible within 15 minutes by walking
- Access Score
  - Local walkability score
  - Healthy living index

Walk Access Score

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Applications of Accessibility Analysis

- Public Transportation
  - Rout Network Planning
  - Scheduling
- Active Transportation Plans (Walking & Biking)
  - Walkway System Planning
  - Bikepath System Planning
- Health and Human Services
  - Transportation services for senior or disabled community
  - Rural area medical services needs
  - Safe path to school plan
- TOD
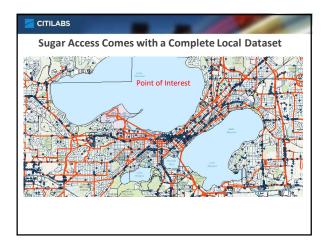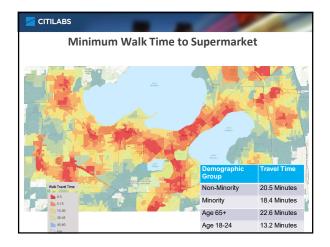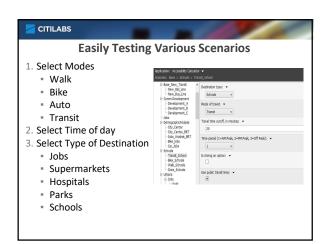- Economic Development Plans
- Environmental Justice

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OVERVIEW - What is SUGAR ACCESS?

Travel Time (Minutes)
- 0-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-60
- 60-90
- 90+

A tool to perform your own accessibility analysis within ArcGIS

Minimum travel time to Health Centers using Public Transportation in Milwaukee, USA

CITILABS

Lack of Data? CITILABS – HERE DATA Can Help

Cube Model Networks based on HERE data
- Enterprise Licenses Including Partner Agencies
- Cube Networks of User-Defined Resolution
- Options to Ease your Transition:
  - Port and Realign Existing Networks
- Options to Expand your Capabilities:
  - Turn Prohibitions as well as Time-of-Day and Class Restrictions
  - Transit Networks and Schedules
  - Pedestrian, Bike Networks and Restrictions
  - Traffic Control and Turn Penalties
  - Historic Speed Data
  - Turnkey Models (3,4-Step, Traffic Impact, ABM)
  - Traffic Volume Data and 5-year Forecasts

here
Here Network Data Available Worldwide

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Sugar Access Comes with a Complete Local Dataset

Demographic and Job Opportunities Data

Explore Future Scenarios

- Easily create new pedestrian paths and routable transit lines with Sugar Network Editor

- Transit lines automatically align with road network

Regional Transit Access Score

Reachable Area within a fixed time Period