The MTC TERM Lite Scenario Manager

Making Multiple Scenario Runs Easy

Nicholas Richter – WSP | PB Transportation Planner
11th National Conference on Transportation Asset Management

July 2016

ABOUT ME

METROPOLITAN TRANSPORTATION COMMISSION

WSP | PARSONS BRINCKERHOFF

→ **Former Asset Management Program Coordinator for MTC**
  - *April 2014 – April 2016*

→ **Current Transportation Planner / Systems Analyst at WSP | PB**
  - *April 2016 - Present*

→ Original Developer of the MTC TERM Lite Scenario Manager

→ Primary TERM Lite Analyst architect RTCI SQL Database
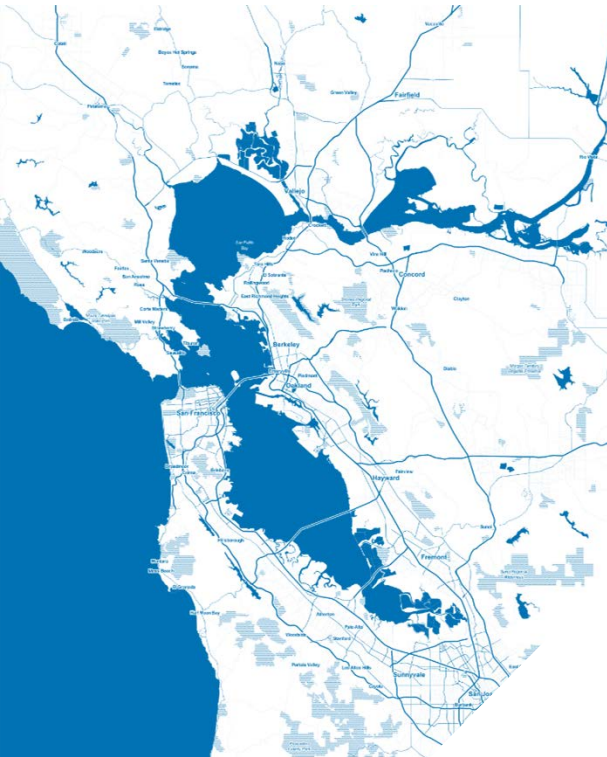
→ Currently developing the WSP | PB TERM Lite Support Suite

→ Also serving as a data analyst for WSDOT Tolling Division

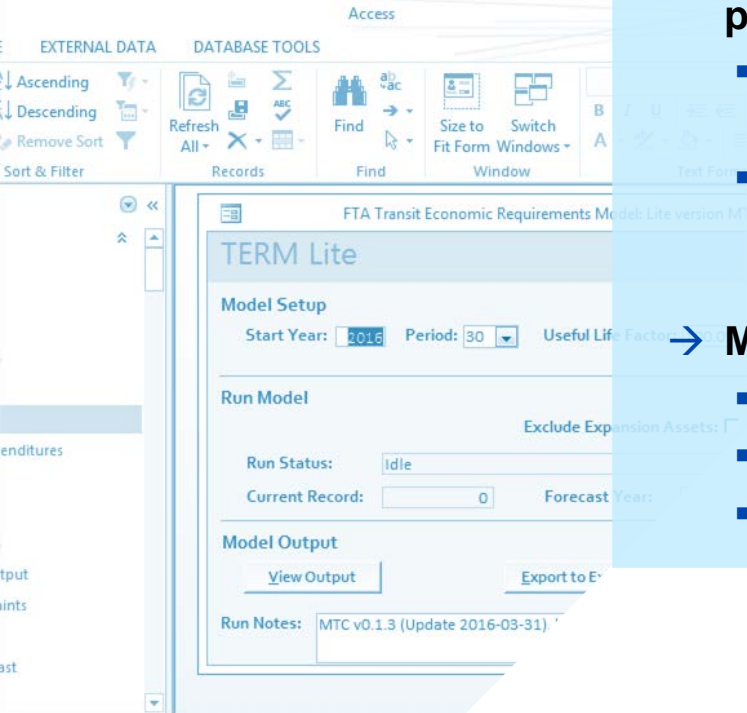# MTC'S MODELING CHALLENGE

Section 1

MTC AT THE CENTER OF A COMPLEX REGION

→ **MTC is the Metropolitan Planning Organization for the Seven-County, 101-Jurisdiction Region**

- 26+ Different Transit Agencies

- 231 Square Miles, 7.65M People

- Variety of Agency Sizes, Capabilities, Structures

- Variety of Service Types (MB, LR, HR, CR, CC…)

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TERM LITE TOOL CONSTRAINTS

→ **FTA's TERM Lite is a long-range transit capital needs projection tool intended for use at the agency level**
- Assumes one "bucket" of funds, one inventory, one set of asset policies, one asset owner, etc.
- Assumes single agency sized asset inventory (<20k rows)

→ **MTC's modeling needs included:**
- Scenario analysis by operator and mode (46 total)
- Multiple Regional Investment Scenarios (12 total)
- RTCI Asset Inventory Export with over 40k rows

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TERM LITE INPUT

→ **Five input screens from which to enter data, plus…**

TERM Lite Scenario Parameters	**MTC Selected Scenarios for Analysis**	**Average Number of Scenario Runs**	**Total Scenario Parameters to be Entered and Verified**
45	**x** **58**	**x** **4**	**=** **10,440**

2,610 Parameters per Full Run

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FTA TERM LITE OUTPUT

→ By default, TERM Lite does **not** export:

- Raw model output
- Information about the parameters used
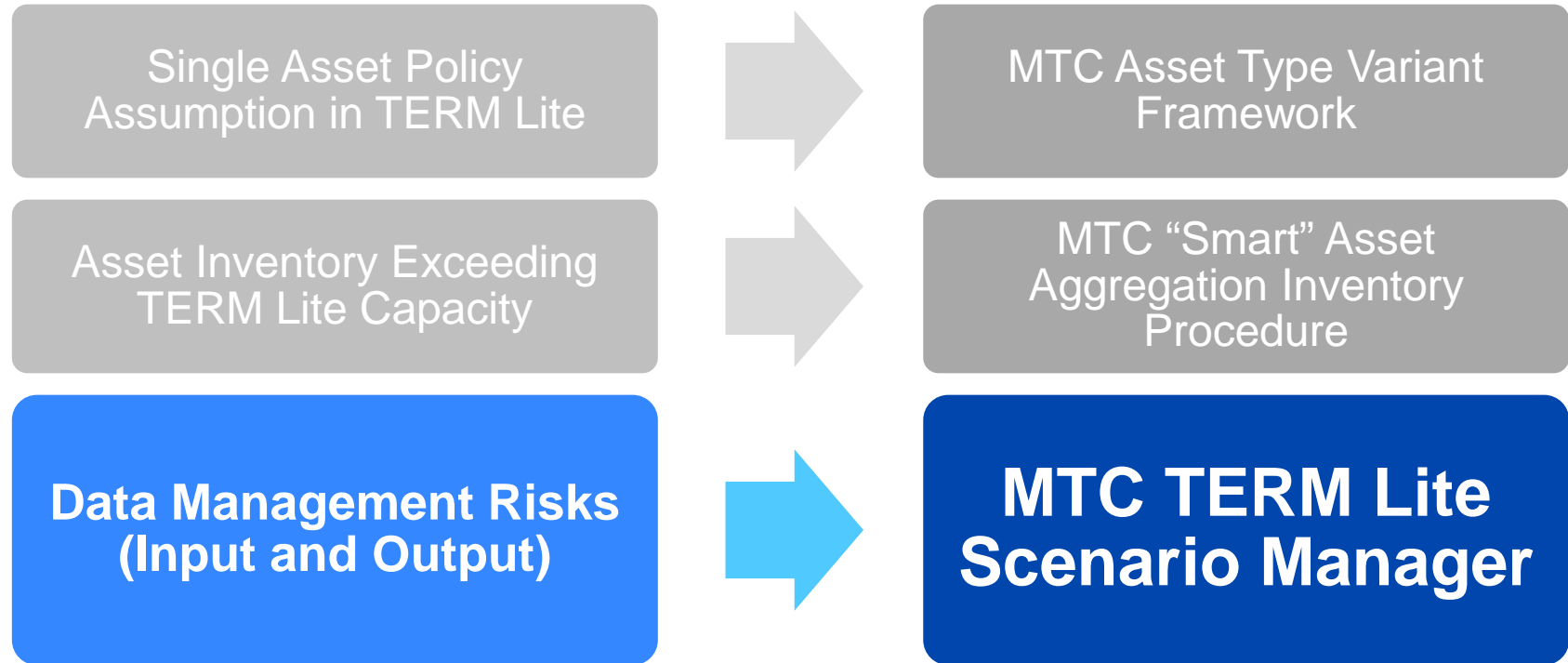- Descriptive names (i.e., "Run Notes" field)

→ End user **must** manually manage documentation

→ Risk of improper documentation; cannot verify parameters used without user-generated documentation

	A	B	C	D	E	F
1	**Report Name:**	Investment Expenditures by Existing Ve				rus Expansio
2	**Query Name:**	Excel_Export_qry_Existing_Vs_Expansio				n_M_30
3	**Notes:**					

Investment Expenditure

$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$-

2016 2017 2018 2019 2020 2021 2022

DATA MANAGEMENT RISKS AND CONSEQUENCES

Risks	Consequences
Scenario Parameters Entered Incorrectly	Invalid Results. Error may not be detected, invalidating multiple model runs. **Must verify all parameters and rerun scenarios.**
Only Default TERM Lite Excel Export Saved	**Original model results are likely lost.** Must rerun scenario and new results may not be the same.
Original Model Results Saved Without Documentation	**Uncertainty about what scenario results represent:** Likely to lead to confusion and reruns to ensure accuracy

MEETING THESE CHALLENGES

Single Asset Policy Assumption in TERM Lite	MTC Asset Type Variant Framework
Asset Inventory Exceeding TERM Lite Capacity	MTC "Smart" Asset Aggregation Inventory Procedure
Data Management Risks (Input and Output)	**MTC TERM Lite Scenario Manager**

THE MTC TERM LITE SCENARIO MANAGER

Section 2

MTC SCENARIO MANAGER OVERVIEW

→ Companion Application for TERM Lite

→ Fully Automates Data Entry of Scenario Parameters

→ Provides "One Click" Backup of TERM Lite Model Run Results

→ Automatically Associates Results with Correct Parameters

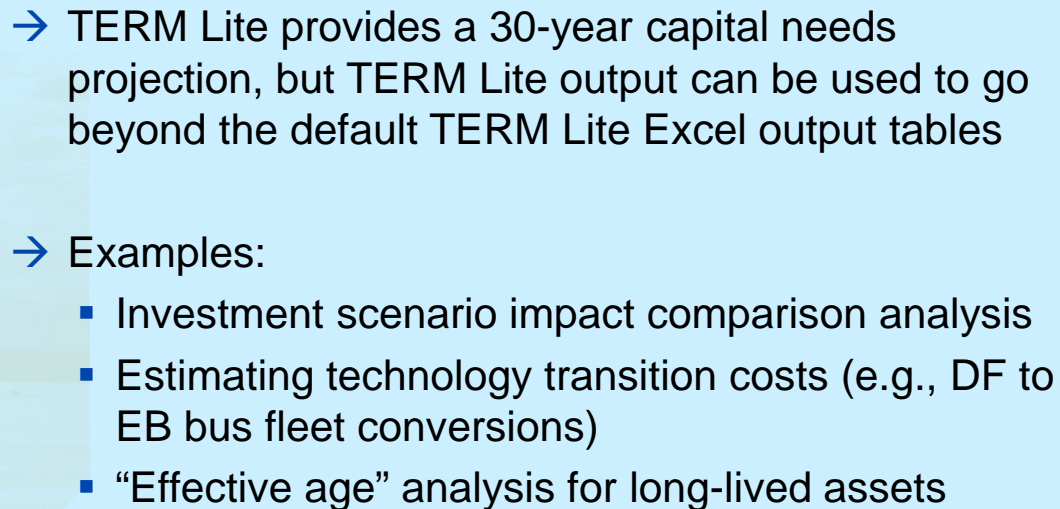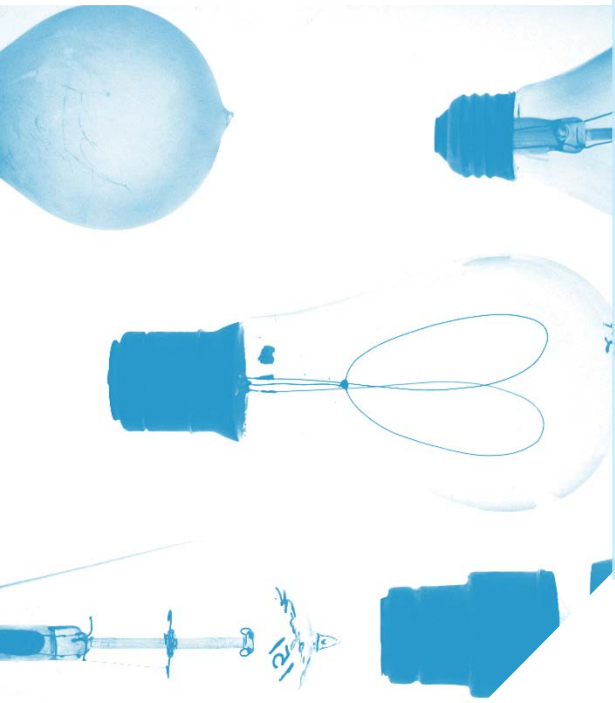| Scenario	Notes	Import Date	Last Push	Last Saved Run	# of Saved Runs	Complete?		
1	Inflation Adjusted Growth	5/19/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
2	Backlog Target Seek: 100% @ 24 years	5/19/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
3	Backlog Target Seek: 50% @ 24 years	5/19/2016	6/10/2016	No Runs Found	No Runs Found		Push Scenario	View Scenario
4	Unconstrainted Scenario	5/19/2016	6/10/2016	No Runs Found	No Runs Found		Push Scenario	View Scenario
5	Highway Focused Investment Strategy	5/19/2016	6/10/2016	No Runs Found	No Runs Found		Push Scenario	View Scenario
6	Transit Oriented Development Investment Strategy	5/19/2016	6/10/2016	No Runs Found	No Runs Found		Push Scenario	View Scenario
7	Rail First Investment Strategy	5/19/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
8	SGR First Investment Strategy	5/19/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
9	ighway Focused Investment Strategy v2	7/1/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
10	Transit Oriented Development Investment Strategy v2	7/1/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
11	Rail First Investment Strategy v2	7/1/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
12	SGR First Investment Strategy v2	7/1/2016		No Runs Found	No Runs Found		Push Scenario	View Scenario
13	Planning Ad Hoc Scenario	7/10/2016	7/10/2016	No Runs Found	No Runs Found		Push Scenario	View Scenario

LIVE DEMO

LESSONS LEARNED

Section 3

DATA MANAGEMENT IS CRITICAL

→ Data management from run #1 is critical for success

→ MTC TERM Lite Scenario Manager was <u>extremely</u> effective at solving data management challenges
- Improved turn-around time
- More time for analysis
- Reduced errors
- Very easy to use

TERM LITE IS AN INTERMEDIATE ANALYSIS STEP

→ TERM Lite provides a 30-year capital needs projection, but TERM Lite output can be used to go beyond the default TERM Lite Excel output tables

→ Examples:

- Investment scenario impact comparison analysis
- Estimating technology transition costs (e.g., DF to EB bus fleet conversions)
- "Effective age" analysis for long-lived assets

YOU <u>WILL</u> NEED TO RERUN TERM LITE

→ Analysis of TERM Lite output often identifies issues with the data or areas where parameters can be adjusted to better match reality

→ As a result, multiple reruns may be necessary to obtain an accurate and acceptable final analysis

→ New questions or differences in how a question is framed may alter parameters, leading to model reruns

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AVAILABILITY

Contact MTC for the current registration link

TRomell@mtc.ca.gov
Or
SHari@mtc.ca.gov

Thank you

richtern@pbworld.com