

Metro TripMaster for Transit Model



Presented by Paul Burke of Metro
for the SCAG Modeling Task Force

If you can't explain it simply,
you don't understand it well enough.

Albert Einstein

Lots of people
want to ride with you in the limo,
but who will ride the bus with you
when the limo breaks down?

Oprah Winfrey
(kind of)

I learned long ago,
never to wrestle with a pig.
You get dirty,
and besides, the pig likes it.

George Bernard Shaw

Introduction

Objective?

Introduction

Objective

**Let someone else
code network**

Metro TripMaster for Transit Model

Introduction

TripMaster ?



Introduction

TripMaster ~

**Google
Transit
Feed
*Specification***

Introduction

GTFS ?

Introduction

GTFS



Google Maps

Get *Transit* Directions



developer.metro.net

Metro TripMaster for Transit Model

Google Maps Transit

Google union station

burkep@metro.net

Get directions My places

Car, Bus, Walk, Bike

A North Alameda Street, Los Angeles, CA 90012

B 818 7th St, Los Angeles, CA

Add Destination - Hide options

Leave now 09/17/13 1:28pm

Prefer Any transit mode Best route

Suggested routes

- Metro Red Line (802)** 11 mins
1:29pm - 1:40pm
- Metro Silver Line (910)** **8 mins**
1:37pm - 1:46pm
- DASH Downtown B** 17 mins
1:32pm - 1:49pm
- 70** 17 mins
1:30pm - 1:47pm
- Or Drive/Taxi 5 mins

Transit directions to 818 7th St, Los Angeles, CA 90057

Union Station
800 N Alameda St
Los Angeles, CA 90012

Walk to El Monte Busway / Alameda - Union Station
About 3 mins (0.2 mi)

El Monte Busway / Alameda - Union Station
Stop ID: 9129
Metro Silver Line (910) Bus towards 910 Silver Ln - Harbor Gateway TC Via Dwntrn
1:41pm - 1:45pm (4 mins, 5 stops)

Flower / 7th Stop ID: 13489
Walk to 818 7th St, Los Angeles, CA 90057

Metro TripMaster for Transit Model

Introduction

TripMaster → **Metro
Trip Planner**

323.GO.METRO



Metro TripMaster for Transit Model

Metro Trip Planner Web Page

M **Metro** Trip Planner

[New Trip](#) | [Nextrip](#) | [Metro Fares & TAP](#) | [How to Ride Metro](#)

Trip Details

You are traveling on **Tuesday** and **Arriving** at **3:09PM**. Fare class: **Regular**.
 Max walk: **1/3 Mile**. Mode: **ANY**.

Tip: Click on a location to view on the map.

Starting at UNION STATION
[Find Nearby... Pass/TAP Outlets](#) | [Park & Ride Lots](#)

Ride **METRO RAIL RED LINE** [NORTH HOLLYWOOD STATION] heading west

From: **UNION STATION Lv: 02:59PM**

To: **7TH STREET/METRO CENTER STATION Ar: 03:04PM**

Pay \$1.50, Monthly Pass: \$75.00, EZ Pass accepted, **TAP card** required to board

Ending at 818 W 7TH ST
[Find Nearby... Pass/TAP Outlets](#) | [Park & Ride Lots](#)

Headsign	Day	Leaving	Arriving	Trip Time
NORTH HOLLYWOOD STATION	tue	04:30AM	04:35AM	5 mins
NORTH HOLLYWOOD STATION	tue	04:48AM	04:53AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:03AM	05:08AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:11AM	05:16AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:24AM	05:29AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:36AM	05:41AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:47AM	05:52AM	5 mins
NORTH HOLLYWOOD STATION	tue	05:57AM	06:02AM	5 mins
NORTH HOLLYWOOD STATION	tue	06:07AM	06:12AM	5 mins
NORTH HOLLYWOOD STATION	tue	06:17AM	06:22AM	5 mins
NORTH HOLLYWOOD STATION	tue	06:25AM	06:30AM	5 mins
NORTH HOLLYWOOD STATION	tue	06:35AM	06:40AM	5 mins
NORTH HOLLYWOOD STATION	tue	06:45AM	06:50AM	5 mins



Metro TripMaster for Transit Model

TripMaster Database

Pros & Cons ?

TripMaster Database

Pros

- Someone else updates
- Always fresh
- 5 Counties, 24-7 Coverage
- Matches TBM Streets
- Support....M.E.

TripMaster Database

Cons

- No Paths between stops
- No School trips
- No Station attributes
- No Fares
- No Imperial, Kern Counties
- No SCAG Highway Network

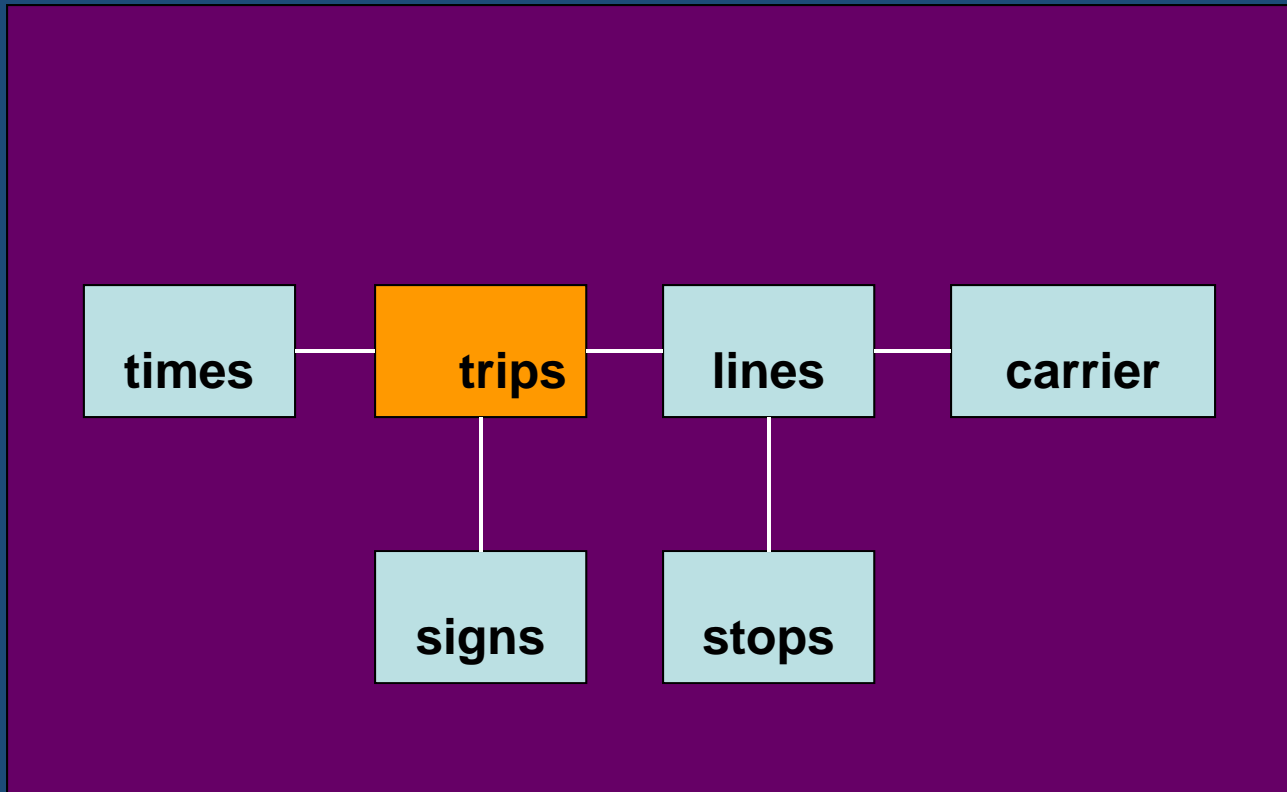
Metro TripMaster for Transit Model

TripMaster Database

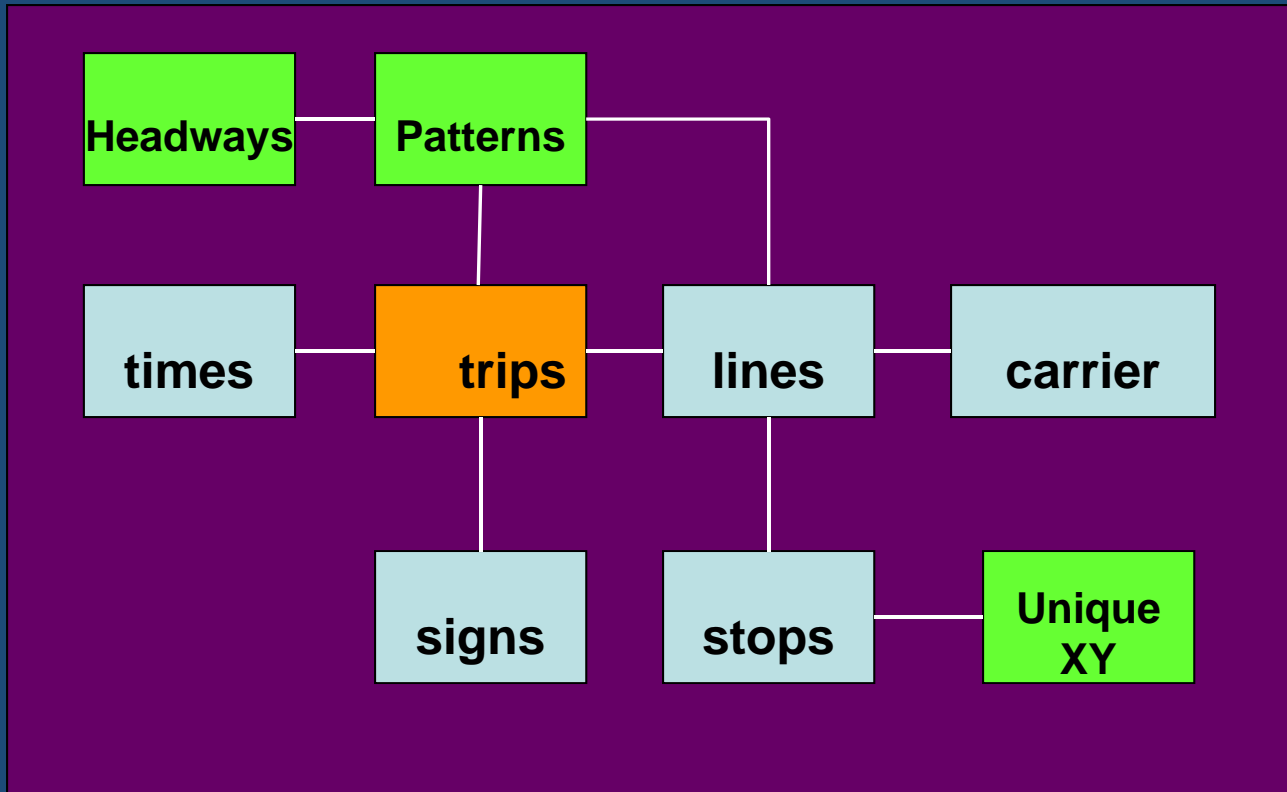
Tables ?

Metro TripMaster for Transit Model

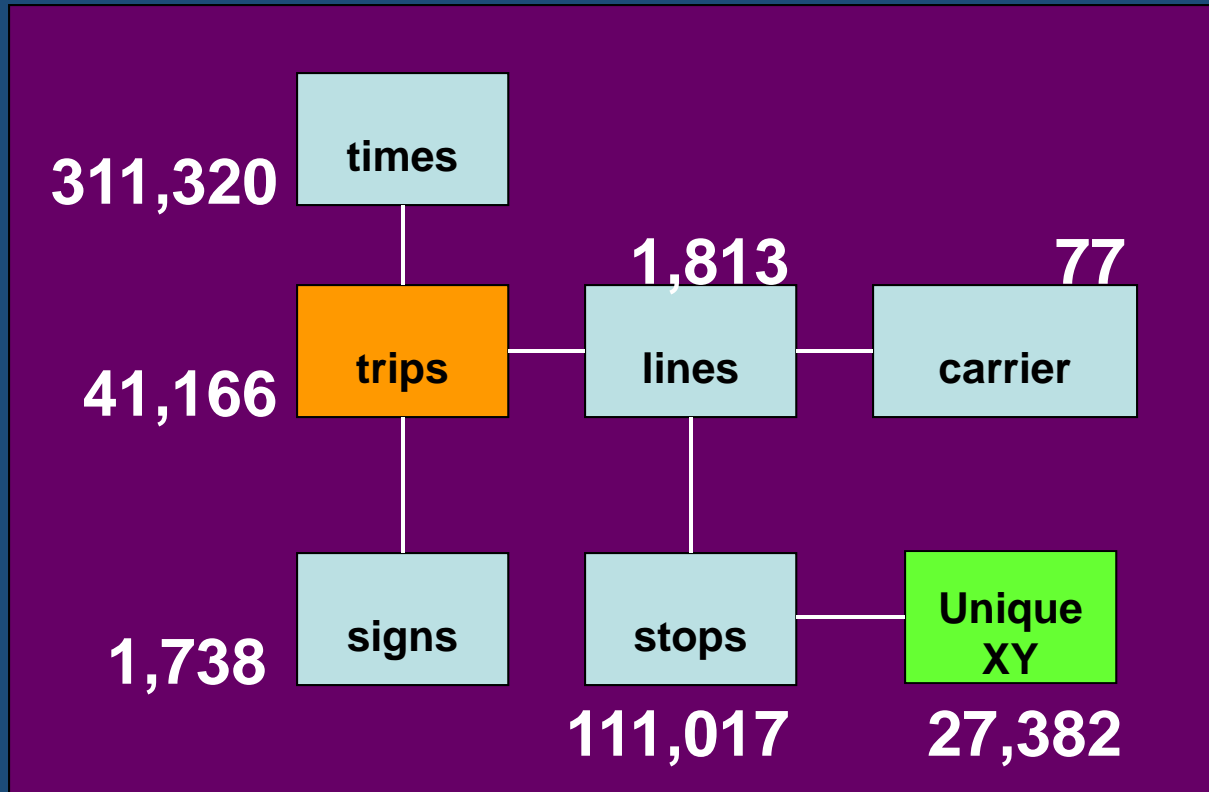
TripMaster Tables



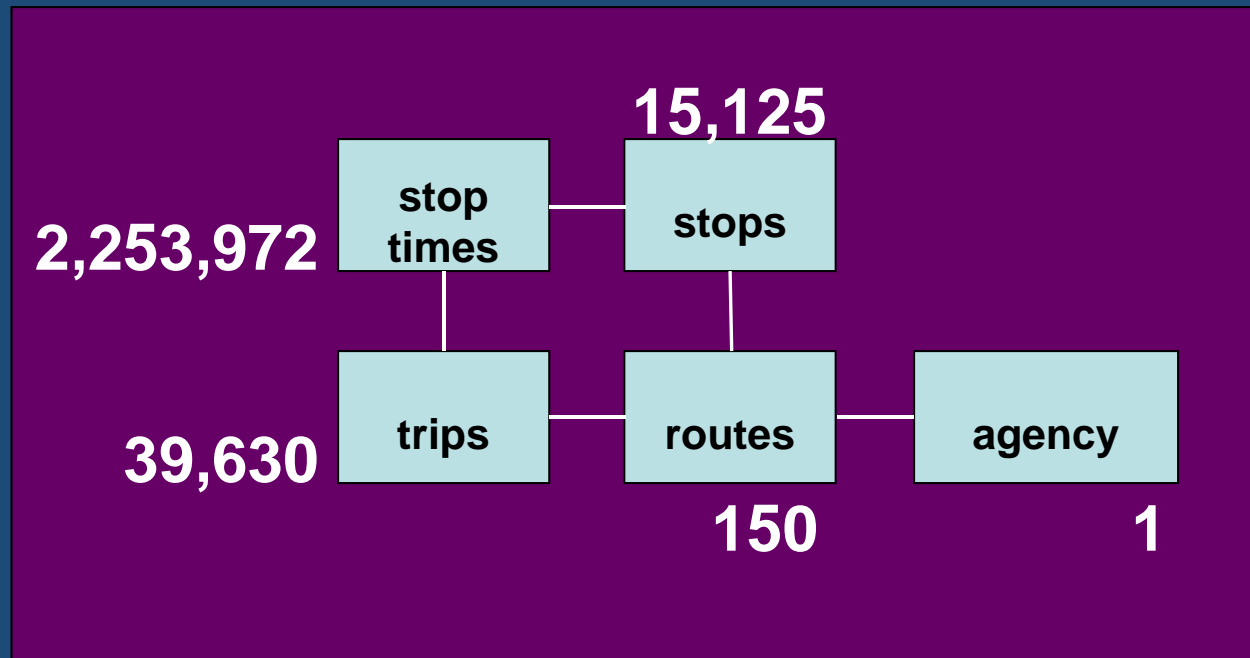
TripMaster Tables **Expanded**



TripMaster Table Sizes



Metro GTFS Table Sizes



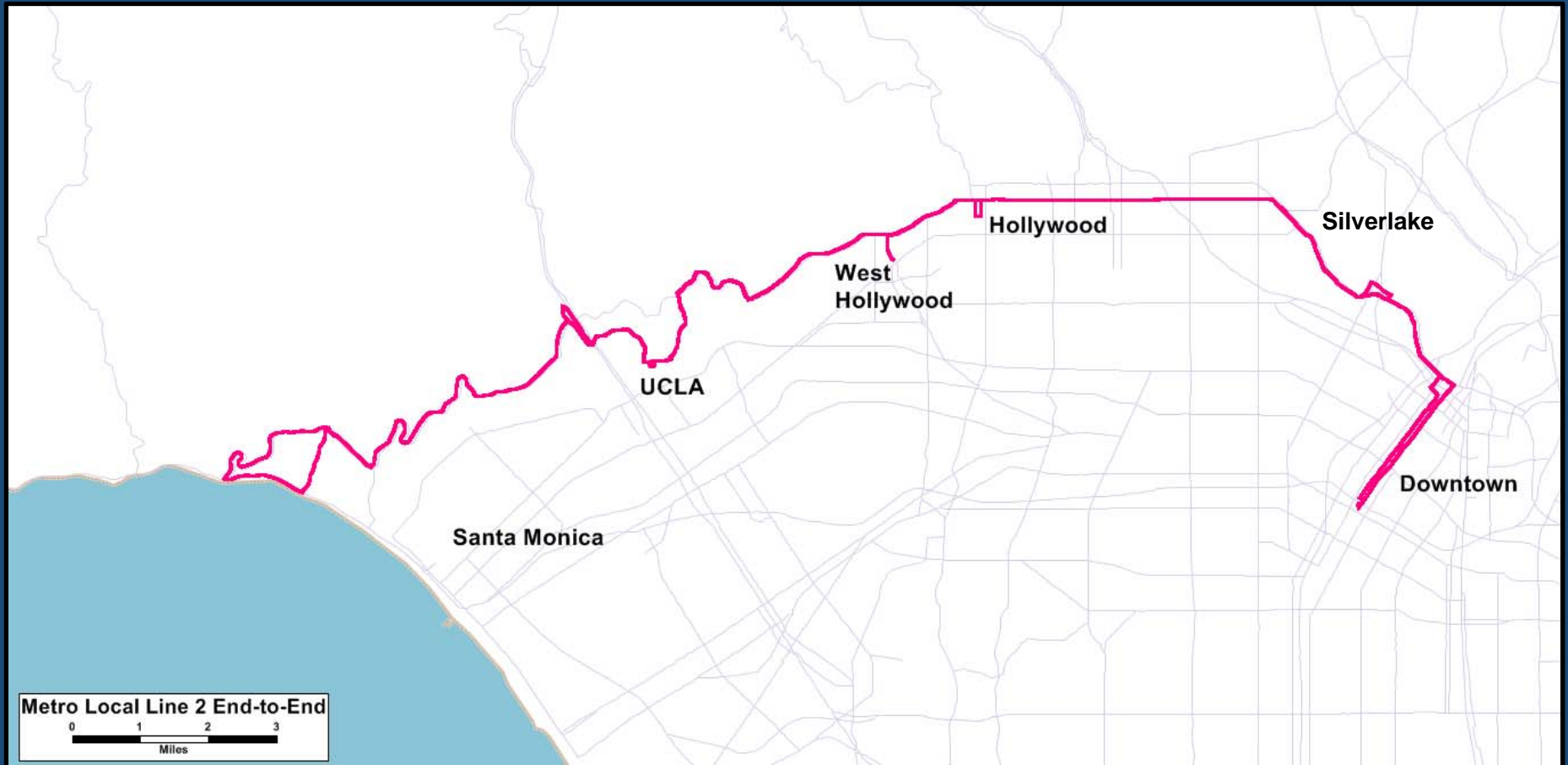
Metro TripMaster for Transit Model

TripMaster Database

Example ?

Metro TripMaster for Transit Model

Metro Buses on Sunset Blvd.



Metro TripMaster for Transit Model

Metro Line 2/302 Schedule

Monday through Friday

Effective Jun 23 2013

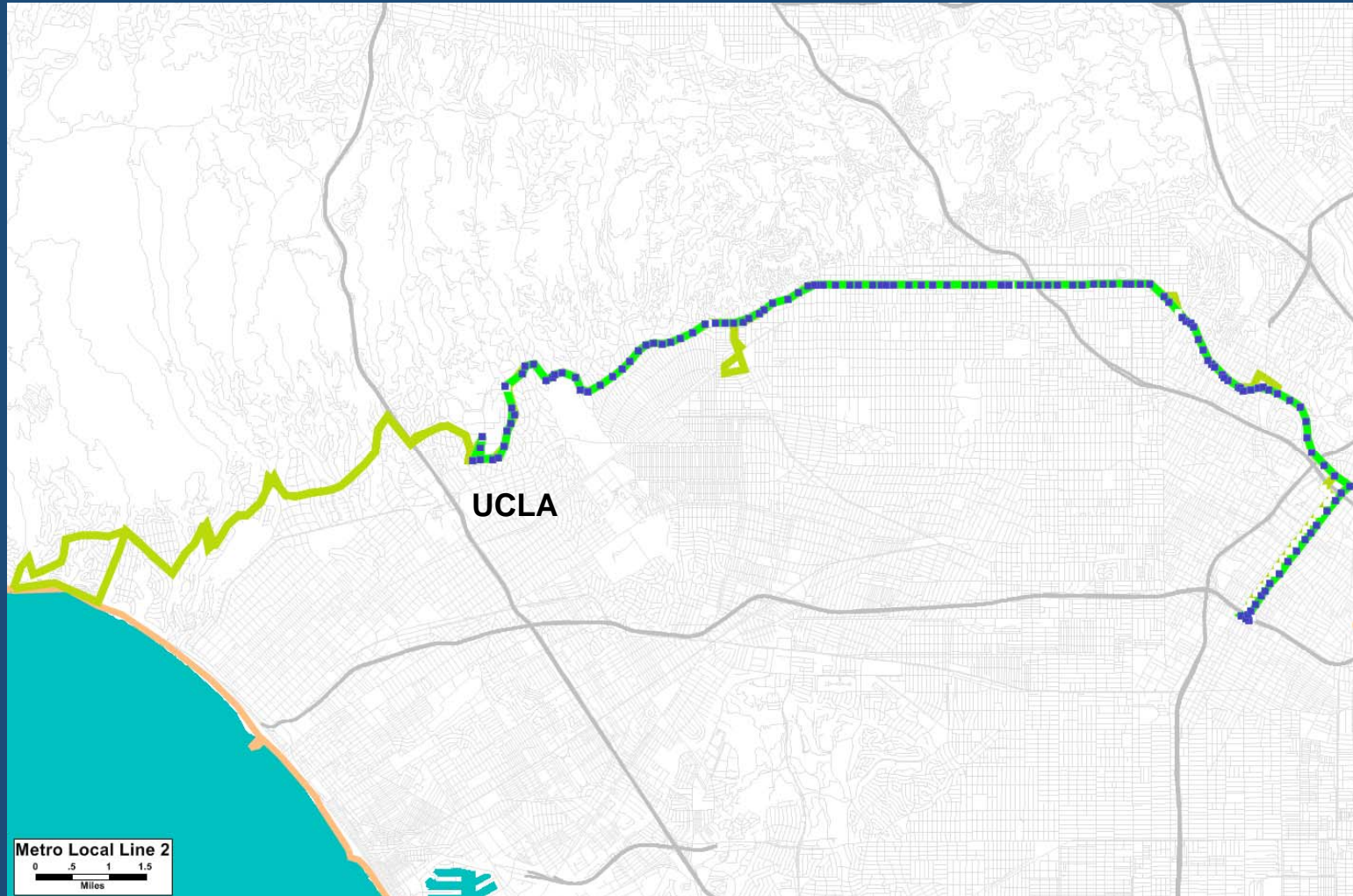
2/302

Eastbound (Approximate Times)

Route	PACIFIC PALISADES		WESTWOOD	BEVERLY HILLS	HOLLYWOOD	ECHO PARK		DOWNTOWN LOS ANGELES	
	Pacific Coast Hwy & Sunset	Sunset & Capri	Le Conte & Westwood	Sunset & Beverly	Sunset & Fairfax	Sunset & Western	Vermont/Sunset Station	Sunset & Echo Park	Broadway & Venice
2	—	—	—	—	5:06A	5:20A	5:25A	5:36A	5:53A
2	—	—	—	—	5:25	5:40	5:45	5:56	6:14
2	—	—	5:24A	5:34A	5:45	6:00	6:05	6:16	6:34
2	5:11A	5:24A	5:41	5:51	6:02	6:17	6:22	—	—
2	—	—	5:53	6:03	6:14	6:29	6:35	6:47	7:08
2	—	—	6:02	6:12	6:23	6:39	6:45	6:57	7:18
2	5:41	5:54	6:12	6:22	6:33	6:49	6:55	—	—
2	—	—	6:20	6:31	6:43	6:59	7:05	7:18	7:40
2	—	—	6:30	6:41	6:53	7:09	7:15	7:28	7:51
2	6:09	6:22	6:40	6:51	7:03	7:19	7:25	—	—
2	—	—	—	—	7:12	7:28	7:35	7:49	8:12
2	—	—	6:55	7:07	7:20	7:37	7:44	7:58	8:21
2	6:30	6:45	7:04	7:16	7:29	7:46	7:53	—	—
2	—	—	—	—	7:38	7:55	8:02	8:16	8:39
2	—	—	7:23	7:35	7:48	8:05	8:12	8:26	8:49
2	6:53	7:09	7:32	7:44	7:57	8:15	8:22	—	—
2	—	—	7:40	7:52	8:06	8:25	8:32	8:46	9:09
2	7:08	7:25	7:50	8:02	8:16	8:35	8:42	—	—



Metro Line 2 “Short Line” to UCLA



Metro

Metro Line 2 By the Numbers...

1	Route Group (Schedule)
2	Metro Lines (2 and 302)
8	TripMaster Lines (ilin)
26	Patterns
17	Patterns in AM Peak or Midday
129	GTFS Routes imported to TransCAD

Metro TripMaster for Transit Model

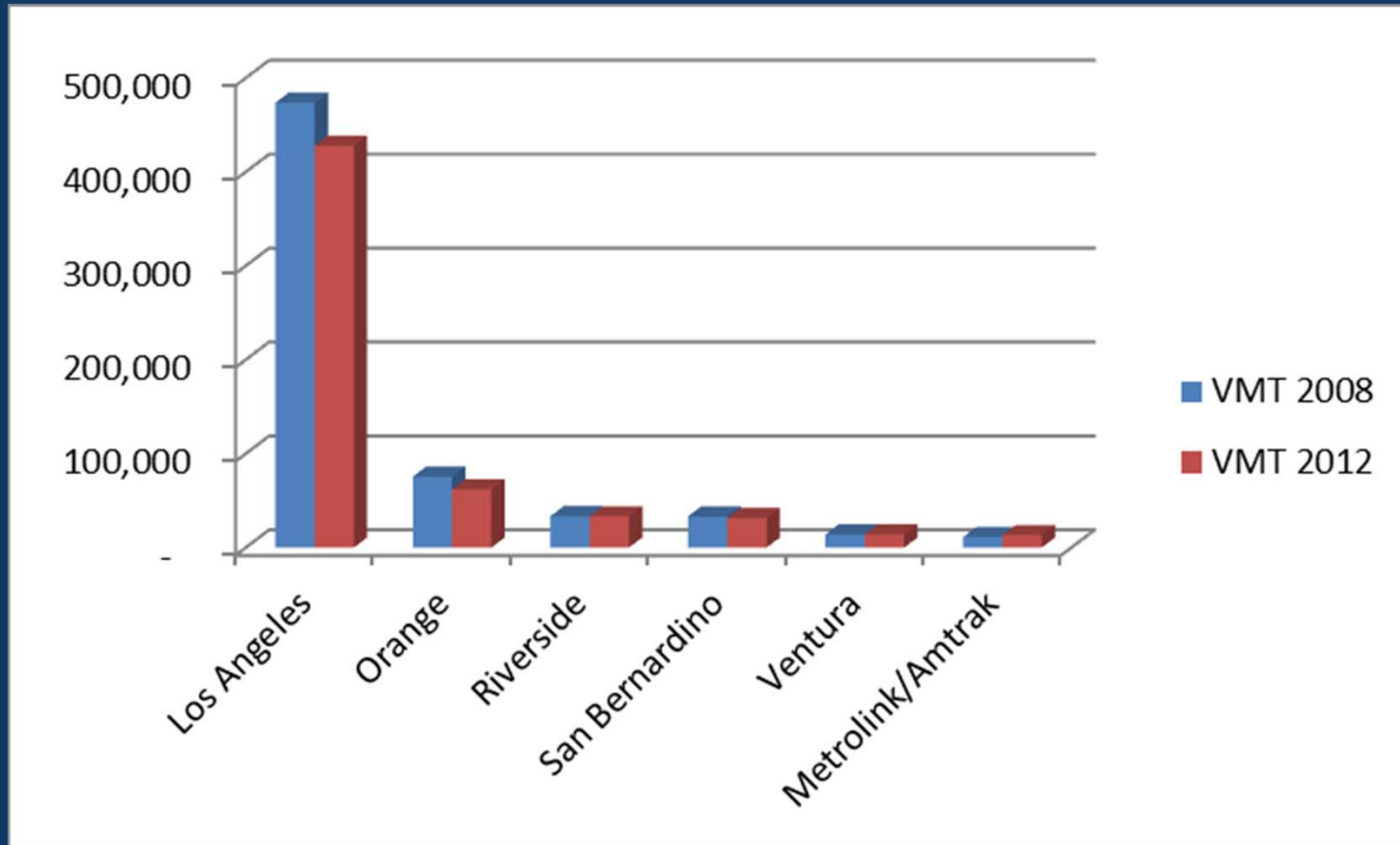
TripMaster Changes

2008



2012

Vehicle Miles Traveled 2008 v. 2012



Metro TripMaster for Transit Model

Changes 2008 to 2012

	2008	2012	Change
VMT	641,483	582,806	-9%
Patterns	3,190	2,951	-7%
Cancelled	120		
New		119	
Modify			
Stops	154,325	136,243	-12%
Trips	43,946	39,398	-10%

Metro TripMaster for Transit Model
Requirements

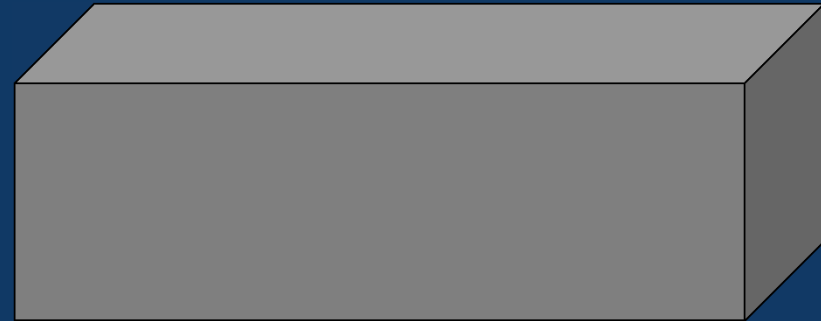
TripMaster



Transit Model

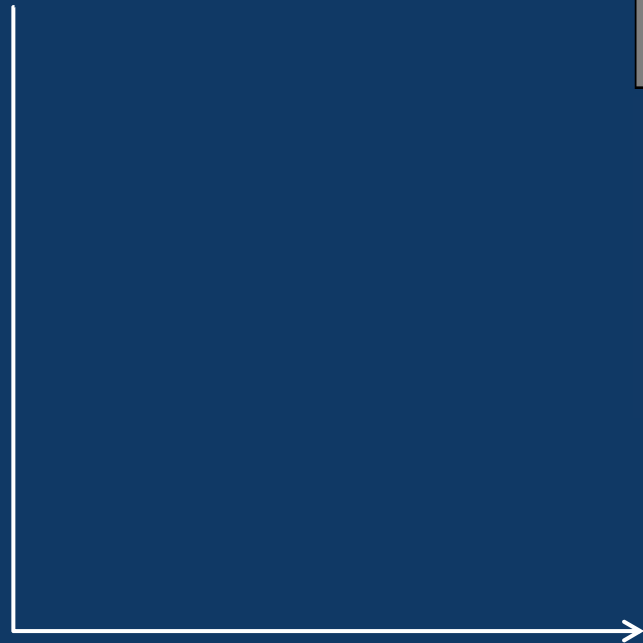
Metro TripMaster for Transit Model
Requirements

TripMaster



3.Add walk links

4.Code fares

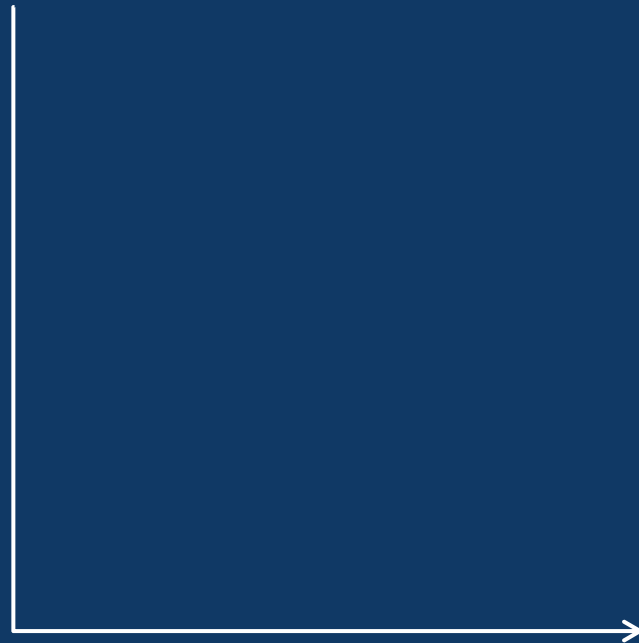
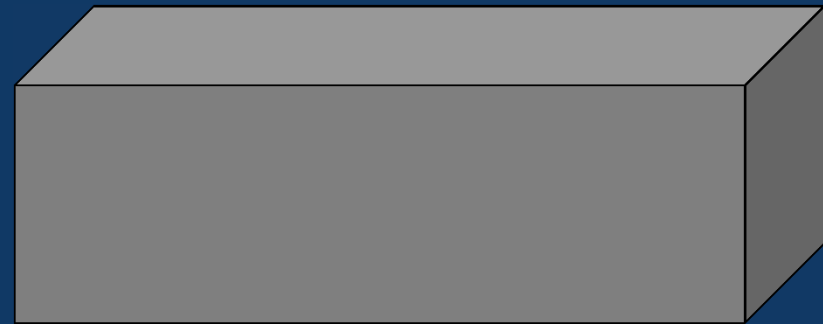


Transit Model

Metro TripMaster for Transit Model
Requirements

TripMaster

1. Calc Headways
2. Connect stops



Transit Model

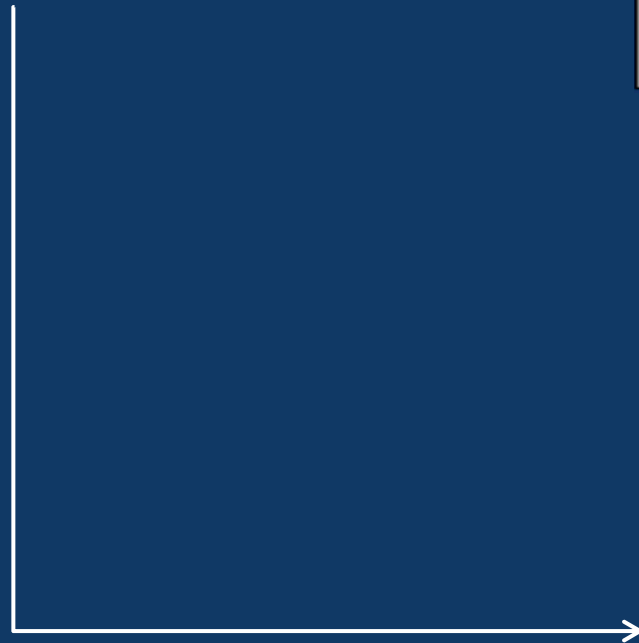
Metro TripMaster for Transit Model
Requirements

TripMaster



3.Add walk links

4.Code fares



Transit Model

Metro TripMaster for Transit Model
TransCAD App

TM3 ?

Metro TripMaster for Transit Model

TransCAD App

TM3

TripMaster

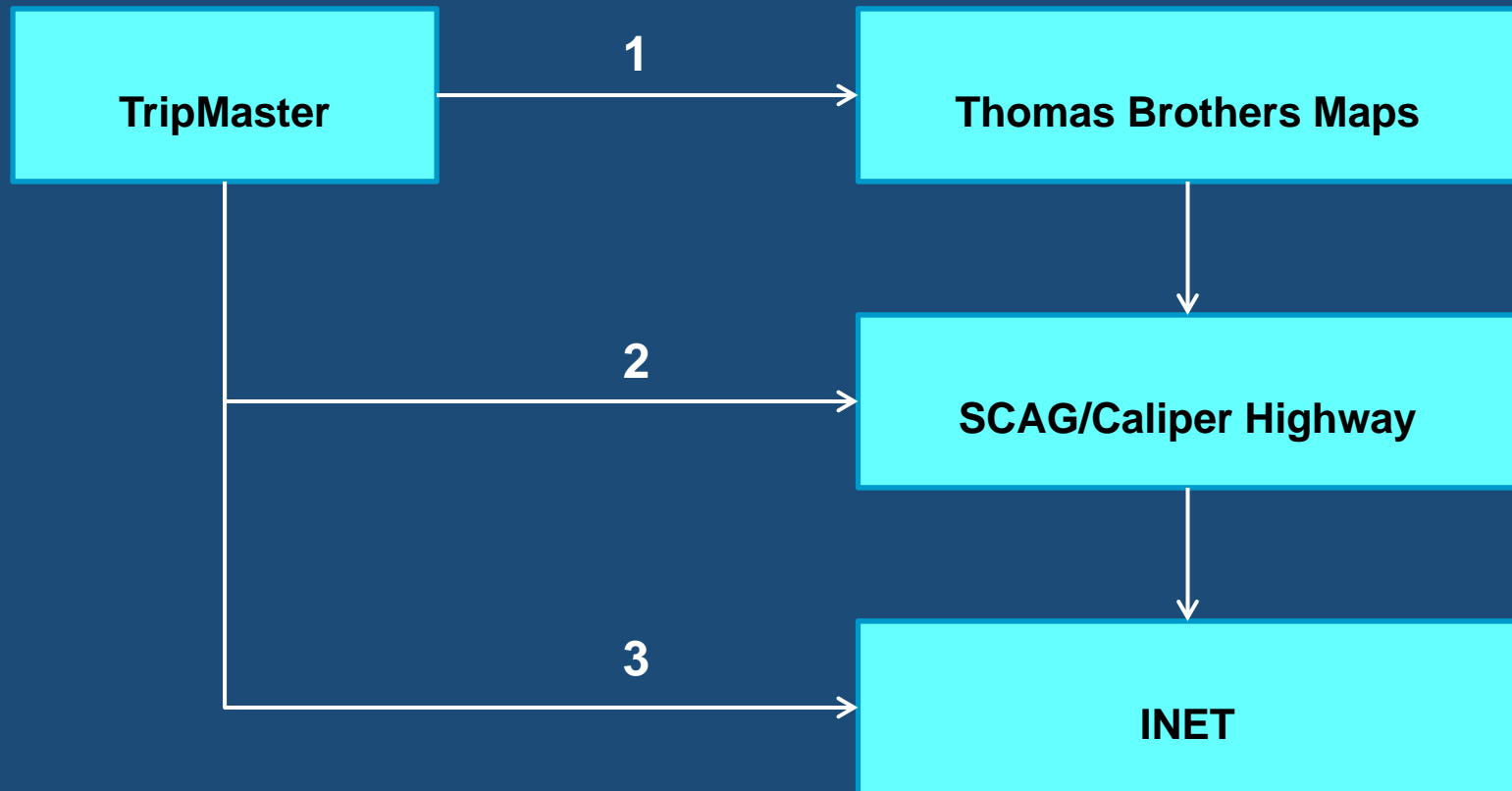
to

Transit Model

in

3 Stages

TM3 Stages



TM3 Data Levels

1

TripMaster

2

Thomas Brothers Maps

3

SCAG/Caliper

4

INET

TM3 Level 1



TM3 TripMaster on TBM Maps for Transit Model

Data Matrix Theme App Help

TM1 1Ed TBM SCC INET TBnet

TM1 ---- Level 1. TripMaster Features ---- New

Dir: C:\SAR.PJB\1209.TripMaster.2012\Test3_DB\test3_L1_

Files

- Carrier
- Linesx
- Signs
- Stops
- Times
- Trips
- TM Stops db
- Patterns
- Pattern Difs
- TM LineXY
- TM StopXY
- Headways
- Mileposts
- Runtimes

Startup
Snapshot
TRCard
Close
Restore

List
 All
 Exist

Prior Project

PD: -

Linesx Stops Patterns

TM3 Level 2



TM3 TripMaster on TBM Maps for Transit Model

Data Matrix Theme App Help

TM1 1Ed TBM SCC INET TBnet

TBM ---- Level 2. Thomas Brothers Maps based Route Systems ----

Focus

Bus
 Rail

Setup

Streets: tml mta 2009
C-N2S Net

Edit RS: TBM Edit RteSys
Update Err.Msg SRT XRS srt2bm

Project

Dir: C:\SAR.PJB\1307.TripMaster.2013.June\tm_L2_db

Add
Delete

Guide
Build
Stops

TBM Bus RS
TBM Rail RS
TBM Bus Net
TBM Rail Net

List
 All
 Exist

The screenshot shows the TM3 TripMaster software interface. At the top, there's a title bar 'TM3 TripMaster on TBM Maps for Transit Model'. Below it are several tabs: 'Data', 'Matrix', 'Theme', 'App', and 'Help'. A secondary set of tabs includes 'TM1', '1Ed', 'TBM', 'SCC', 'INET', and 'TBnet'. The main content area is titled 'TBM ---- Level 2. Thomas Brothers Maps based Route Systems ----'. It has a 'Focus' section with radio buttons for 'Bus' and 'Rail', where 'Rail' is selected. To the right is a 'Setup' section with a 'Streets' text box containing 'tml mta 2009', buttons for 'C-N2S' and 'Net', an 'Edit RS' text box containing 'TBM Edit RteSys', and buttons for 'Update', 'Err.Msg', 'SRT', 'XRS', and 'srt2bm'. Below this is a 'Project' section with a 'Dir' text box containing 'C:\SAR.PJB\1307.TripMaster.2013.June\tm_L2_db'. To the left of a list box are buttons for 'Add', 'Delete', 'Guide', 'Build', and 'Stops'. The list box contains 'TBM Bus RS', 'TBM Rail RS', 'TBM Bus Net', and 'TBM Rail Net'. To the right of the list box are icons for a grid and a list, and a 'List' section with radio buttons for 'All' (selected) and 'Exist'. At the bottom right of the list box are icons for a red 'X' and a trash can.

TM3 Level 3



TM3 TripMaster on TBM Maps for Transit Model

Data Matrix Theme App Help

TM1 1Ed TBM SCC INET TBnet

SCC ---- Level 3. SCAG/Caliper Conflation ----

Focus

Bus
 Rail

Setup

Base: nps_Mnet links
xCC Net

RTP: 12r14p_a1_links

Project

Dir: C:\SAR.PJB\1307.TripMaster.2013.June\tm_L3_db

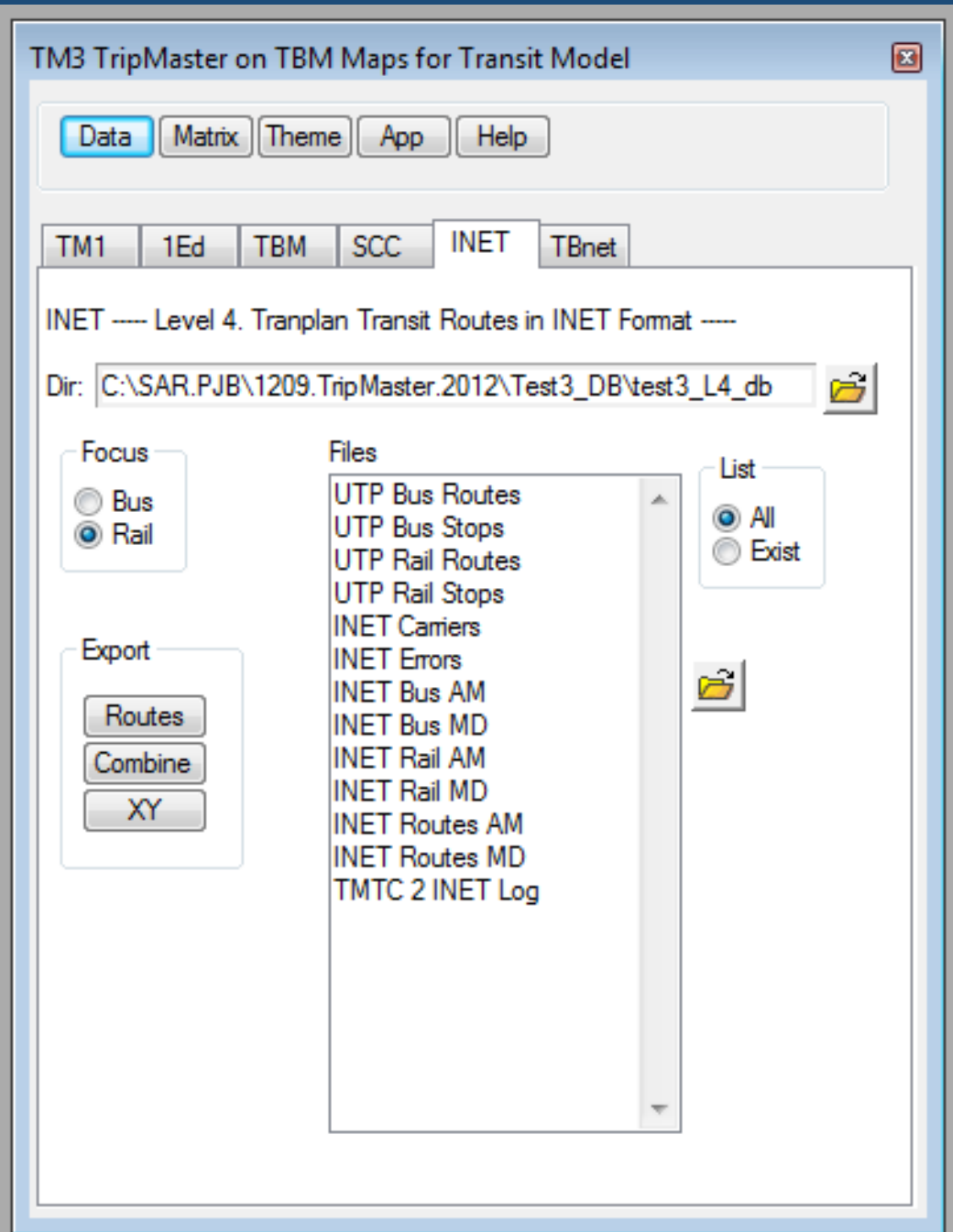
Add
Stops
Delete
New Gdwy
Guideway
Gdwy Stp
UTP

SCAG Bus RS
SCAG Rail RS
SCAG Guide RS
Test_RS
SCAG Bus Net
SCAG Rail Net
SCAG UTP RS
IITP Errrs

Runtime

The screenshot shows the TM3 TripMaster software interface. At the top, there's a title bar and a menu bar with buttons for Data, Matrix, Theme, App, and Help. Below that is a tabbed interface with tabs for TM1, 1Ed, TBM, SCC (selected), INET, and TBnet. The main area is titled 'SCC ---- Level 3. SCAG/Caliper Conflation ----'. It has a 'Focus' section with radio buttons for 'Bus' and 'Rail' (selected). To the right is a 'Setup' section with text boxes for 'Base: nps_Mnet links' and 'RTP: 12r14p_a1_links', and buttons for 'xCC' and 'Net'. Below that is a 'Project' section with a text box for the directory path 'C:\SAR.PJB\1307.TripMaster.2013.June\tm_L3_db' and a folder icon. At the bottom, there's a list of project items: 'SCAG Bus RS', 'SCAG Rail RS', 'SCAG Guide RS', 'Test_RS', 'SCAG Bus Net', 'SCAG Rail Net', 'SCAG UTP RS', and 'IITP Errrs'. To the left of this list are buttons for 'Add', 'Stops', 'Delete', 'New Gdwy', 'Guideway', 'Gdwy Stp', and 'UTP'. To the right are grid view icons and a 'Runtime' button. At the very bottom, there are icons for a red 'X' and a trash can.

TM3 Level 4



Metro TripMaster for Transit Model
TransCAD App TM3

Improve ?

TransCAD App

Improve

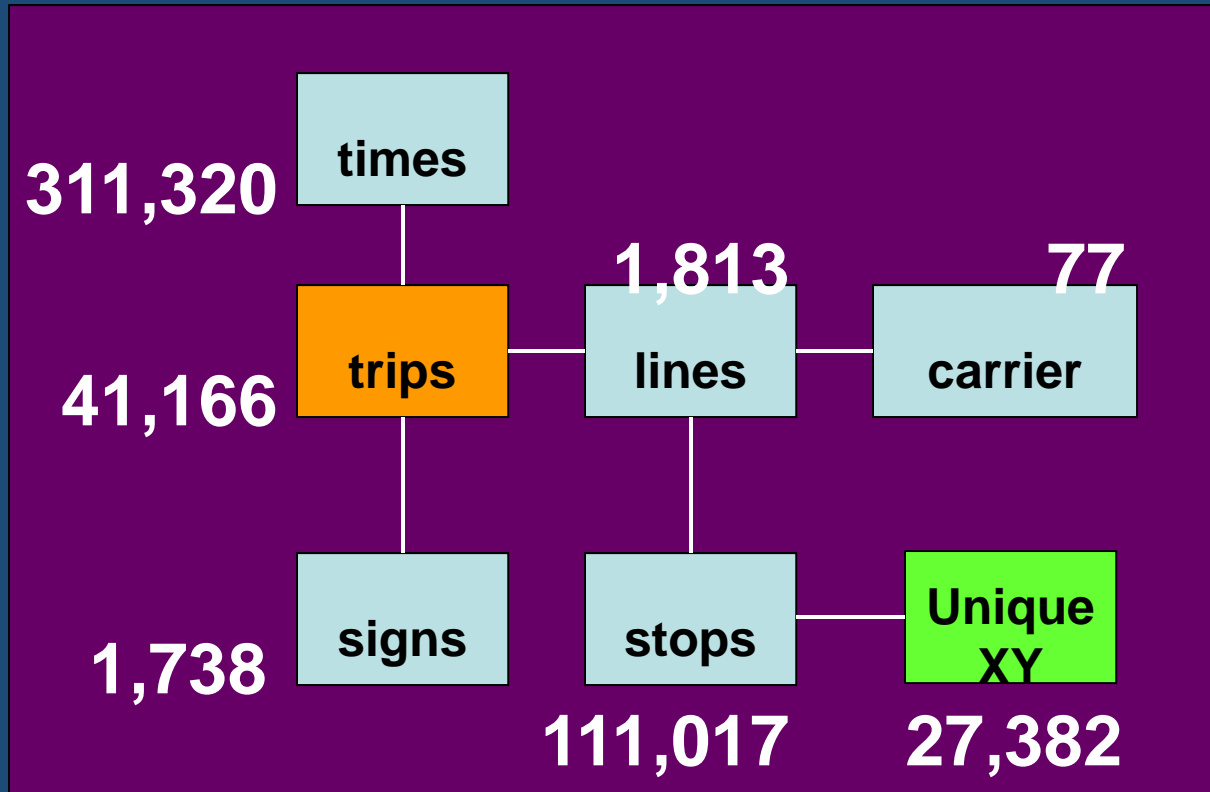
- Fewer routes
- Better conflation
- Export to SCAG RTP
- Maintain scenarios

TM3 Improvements

Fewer Routes

- Exclude Layovers
- Merge routes (super ilin)
- Maintain super ilin

TripMaster Table Sizes



Reduce
from
1813
to
1400

TM3 Improvements

Better Conflation

- Solve looping problem
- Include shape points
- Maintain physical stops?
- Add Edit Toolbox

Metro TripMaster for Transit Model
TM3 Improvements

Skip Conflation!

Build Skims Directly
from TripMaster



TM3 Improvements

Export RTP

- Expand routes to patterns
- Add RTP fields
- Transfer GeoDB?
- Add physical stops?

Metro TripMaster for Transit Model

Caliper TripMaster Script

Caliper

TM3



Metro

Import Trip Master Route System

Trip Master Directory ...

Dictionary Directory ...

Planning Network ...

Working Directory ...

Output Directory ...

Search Threshold (miles)

Operations

- Convert Trip Master Files
- Subset Planning Network
- Build Shape Point Database
- Build Route System
- Add Stops
- Verify Route System
- Compute Headways, Frequencies & Travel Times:
- Cleanup

Quit GO

TM3 Improvements

Maintain Scenarios

- Add future routes
- Add Route Edit Toolbox
- Code Project ID
- Maintain scenario sets
- Add Scenario Toolbox

Conclusion

Questions ?