Common DNA in CalEEMod, Vision CA and Transit Benefit Tools

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Essential Relationships affecting Travel Generation: Land Use, Transportation Service, Management

1. **D**ensity
2. **D**iversity (mix of uses)
3. **D**esign (form, connectivity)
4. **D**istance to transit
5. **D**estinations accessibility
6. **D**evelopment scale
7. **D**emographics
8. **D**emand Management

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National Findings on the Effects of Built-Environment "D" Factors on Travel

- **Density**: Household/population density **- 0.04**
- **Diversity**
  - Land use mix (entropy index) **- 0.09**
  - Jobs-housing balance **- 0.02**
- **Design**
  - Intersection/street density **- 0.12**
  - % 4-way intersections **- 0.12**
- **Destination accessibility**
  - Job accessibility by auto **- 0.20**
  - Job accessibility by transit **- 0.05**
  - Distance to downtown **- 0.22**
- **Distance to transit**: nearest transit stop **-0.05**

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Role of "D" Factors in Travel Generation Related to Land Use, Demand Management, Transit

	Land Use Form (MXD)	Demand Management (BMP)	Transit Performance (DRM)
Density	■	■	■
Diversity	■	■	■
Design	■	■	
Destination Accessibility	■	■	
Distance from Transit	■	■	■
Development Scale	■		
Demographics	■	■	■
Demand Management	■	■	

	Land Use Form (MXD)	Demand Management (BMP)	Transit Performance (DRM)
Density	■	■	■
Diversity	■	■	■
Design	■	■	
Destination Accessibility	■	■	
Distance from Transit	■	■	■
o Transit Mode(s)	■	■	■
o Service Frequency		■	■
o Access Quality	■	■	■
o Park-Ride Spaces		■	■
o Bike Parking		■	■
o Modal Competetiveness		■	■
Development Scale	■		
Demographics	■	■	■
o Household Income	■	■	■
o Family Size	■		
Demand Management	■	■	
o Parking Pricing	■	■	
o Road Pricing	■	■	
o Commuter Programs		■	
o Neighborhood Measures		■	
o Car Share/ Bike Share		■	

VMT Reduction BMP -- Land Use

Land Use/ Location *Max Reduction = 65% (urban), 30% (compact infill), 10% (suburban center), 5% (suburban)*	**Neighborhood/ Site Enhancements** *Max Reduction = 5% (without NEV) 15% (with NEV)*
Density (30%)	**Pedestrian Network** (2%)
Design (21.3%)	**Traffic Calming** (1%)
Location Efficiency (65%)	**NEV Network** (14.4%) <NEV Parking>
Diversity (30%)	**Car Share Program** (0.7%)
Destination Accessibility (20%)	**Bicycle Network** <Bike Lanes> <Bike Parking> <Land Dedication for Bike Trails>
Transit Accessibility (25%)	**Urban Non-Motorized Zones**

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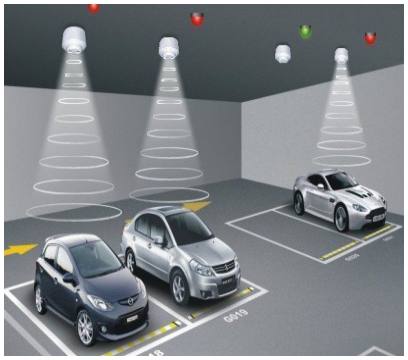
VMT Reduction BMP – Parking, Transit



Parking Policy/ Pricing *Max Reduction = 20%*	**Transit System Improvements** *Max Reduction = 10%*
Parking Supply Limits (12.5%)	**Network Expansion** (8.2%)
Unbundled Parking Costs (13%)	**Service Frequency/Speed** (2.5%)
On-Street Market Pricing (5.5%)	**Bus Rapid Transit** (3.2%)
Residential Area Parking Permits	**Access Improvements**
	Station Bike Parking

NEXTbus

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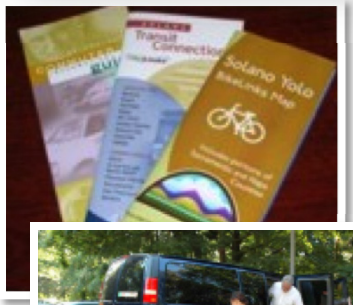
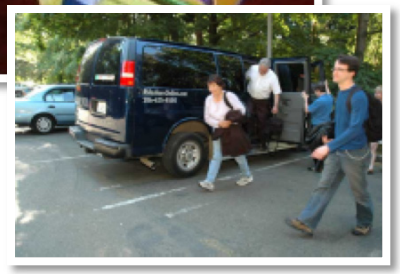
VMT Reduction BMP – Employer, Network





Commute Trip Reduction (CTR) Progams

Max Reduction = 25% work VMT

CTR Program
<Required> (21% work VMT)
<Voluntary> (6.2% work VMT)

Transit Fare Subsidy
(20% work VMT)

Employee Parking Cash-Out (7.7% work VMT)

Workplace Parking Pricing (19.7% work VMT)

Alternative Work Schedules and Telecommute Program
(5.5% work VMT)

CTR Marketing (4.0% work VMT)

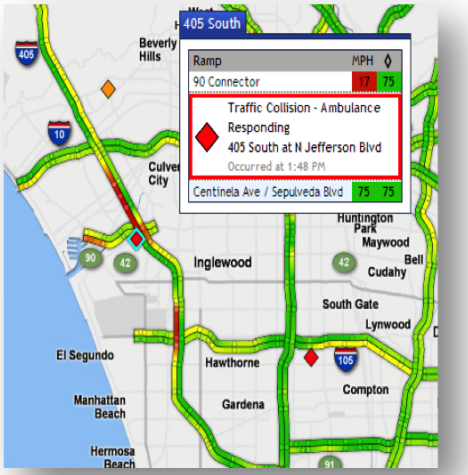
Road Pricing/ Management

Max Reduction =25%

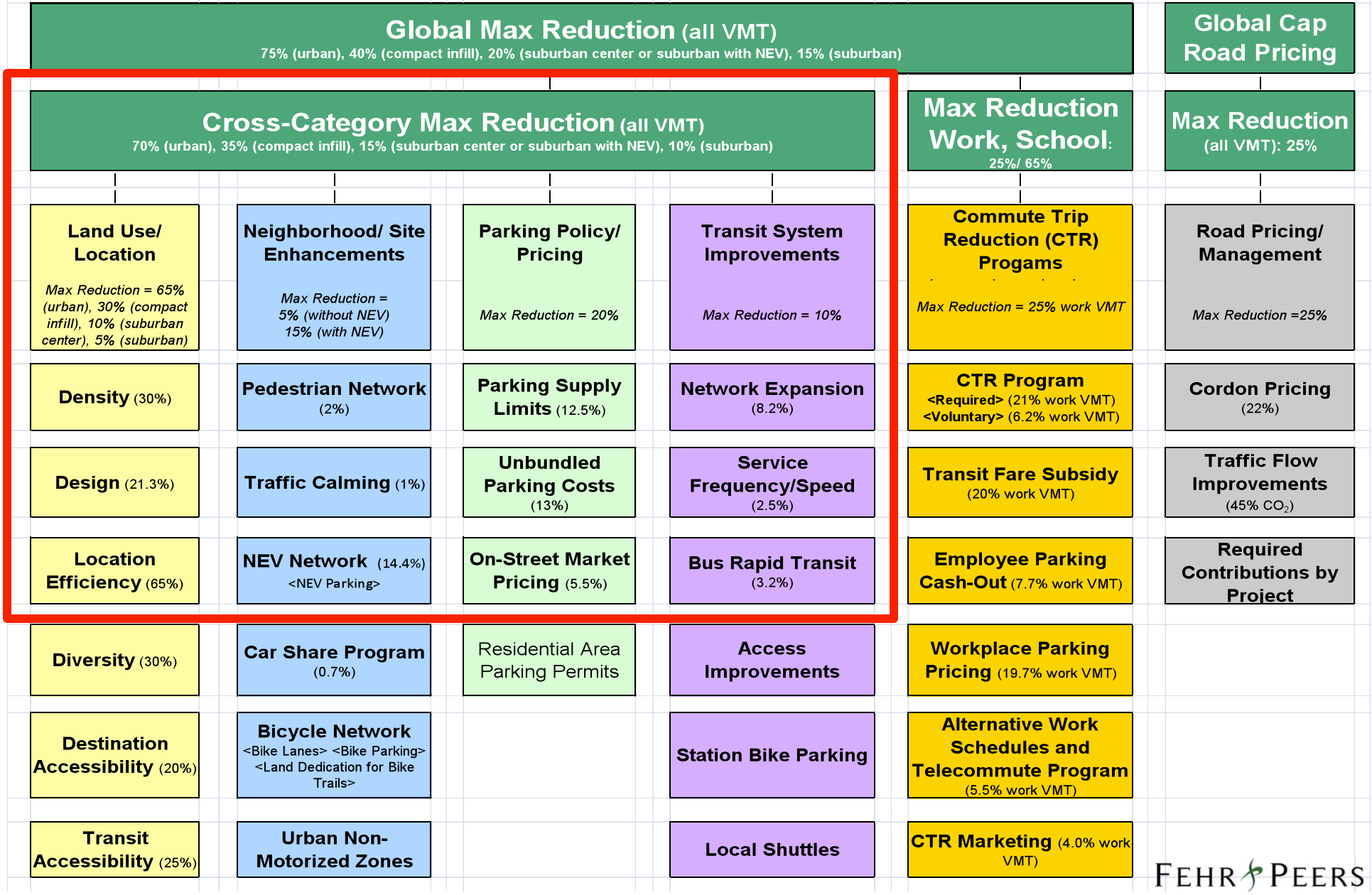
Cordon Pricing
(22%)

Traffic Flow Improvements
(45% CO_2)

Required Contributions by Project



CAPCOA VMT-Reduction Strategy Framework



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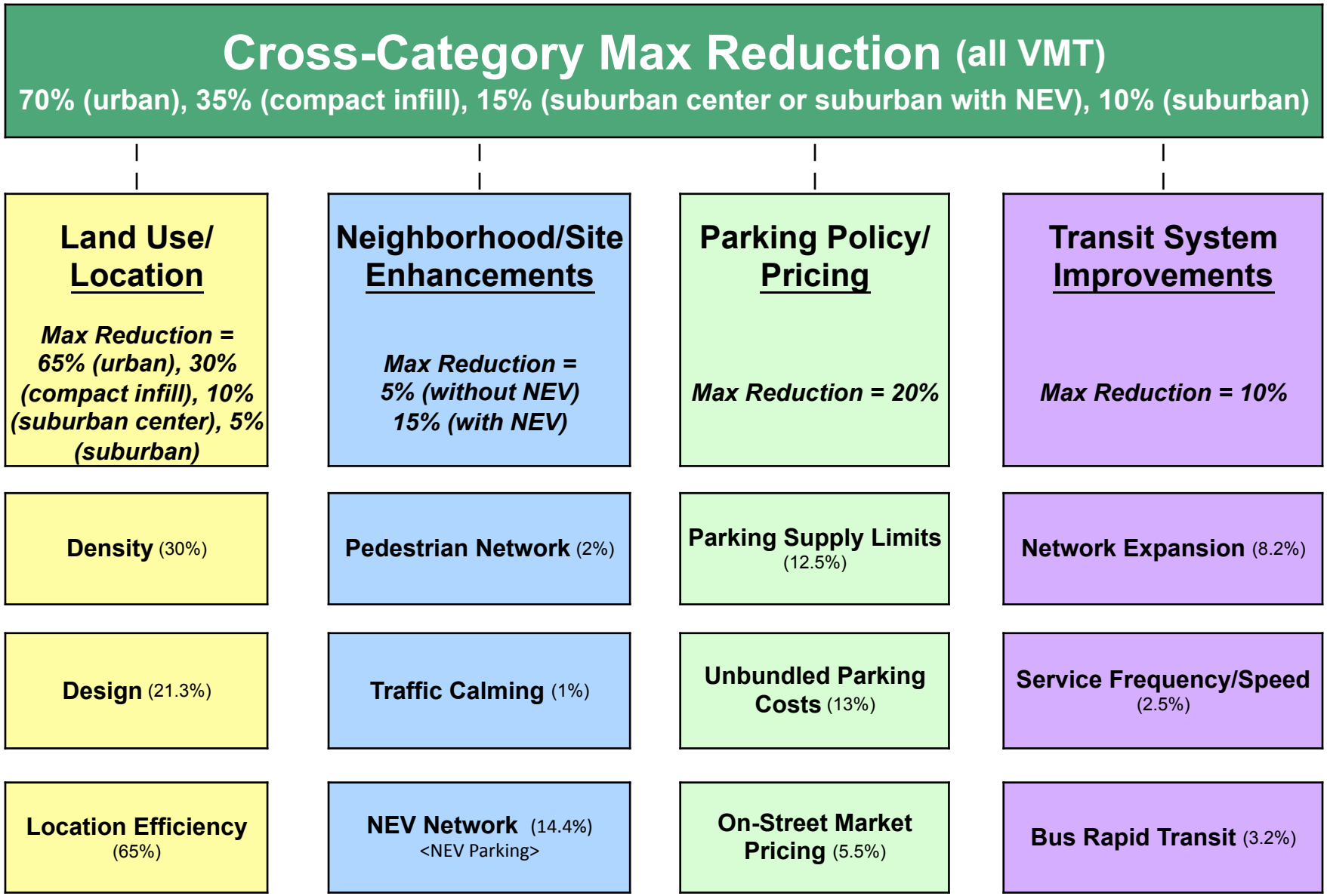
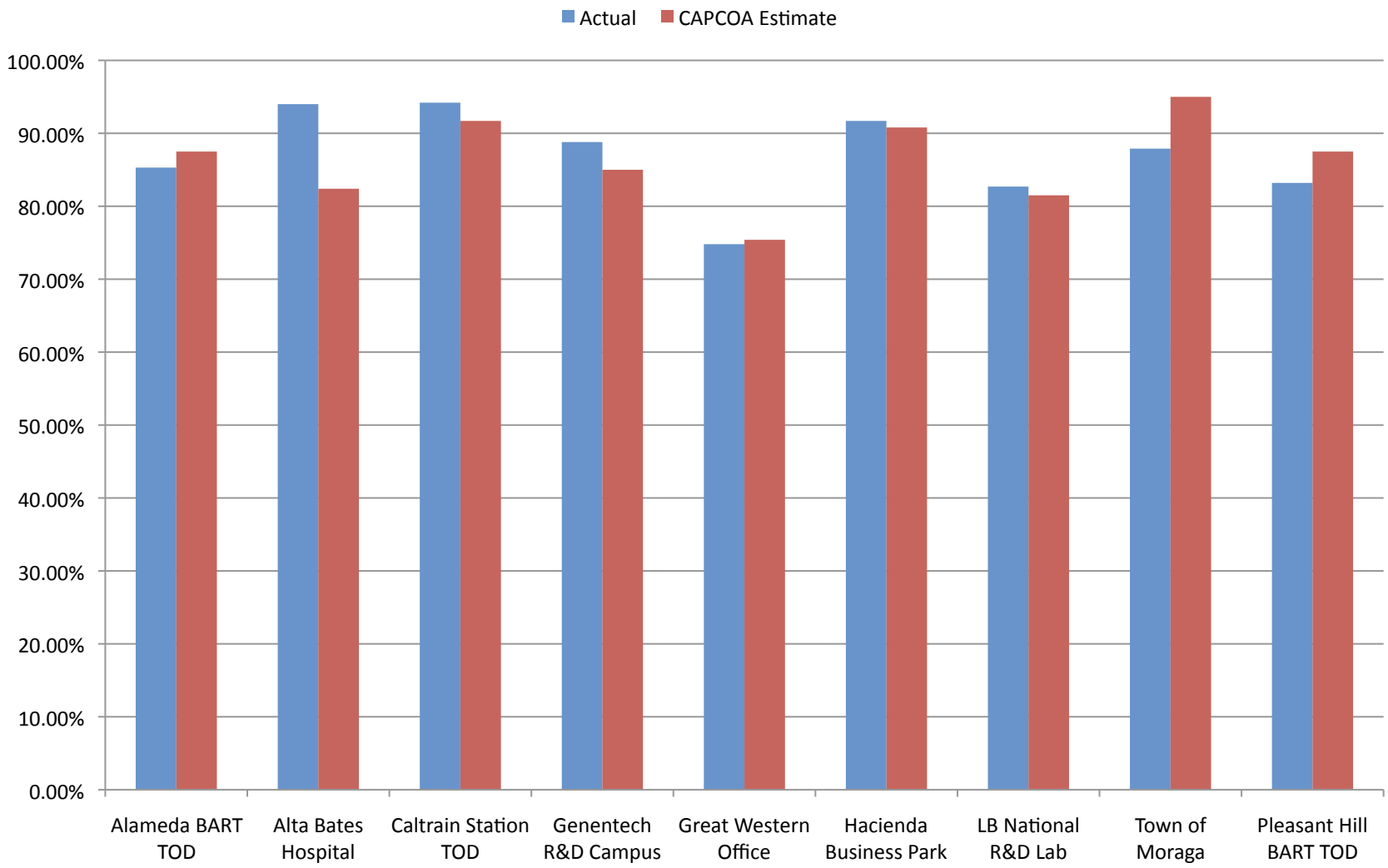
Combined and Interactive Strategy Effects



Validation of CAPCOA BMP Trip Reduction Estimates



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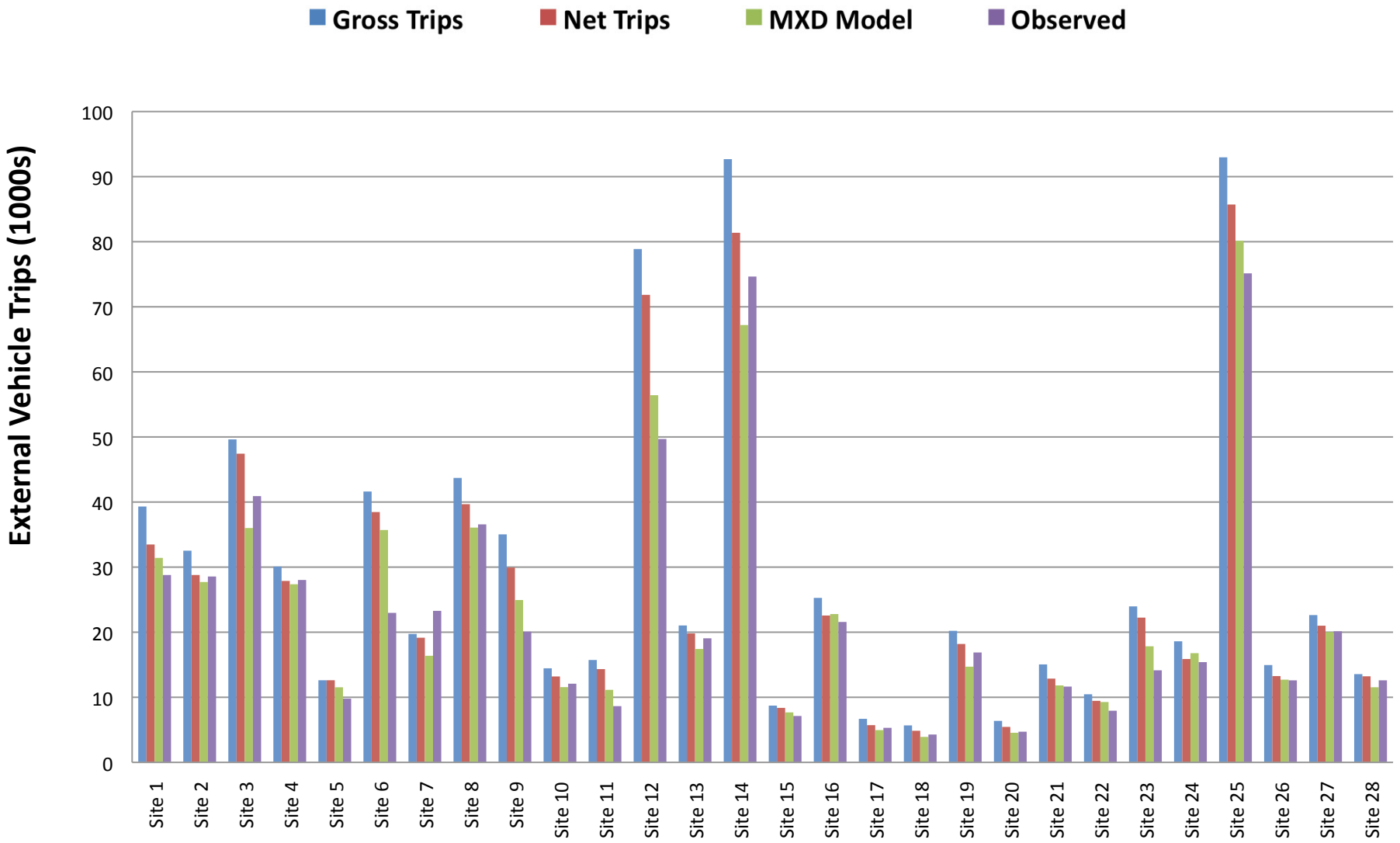
Validation of EPA MXD Trip Reduction Estimates



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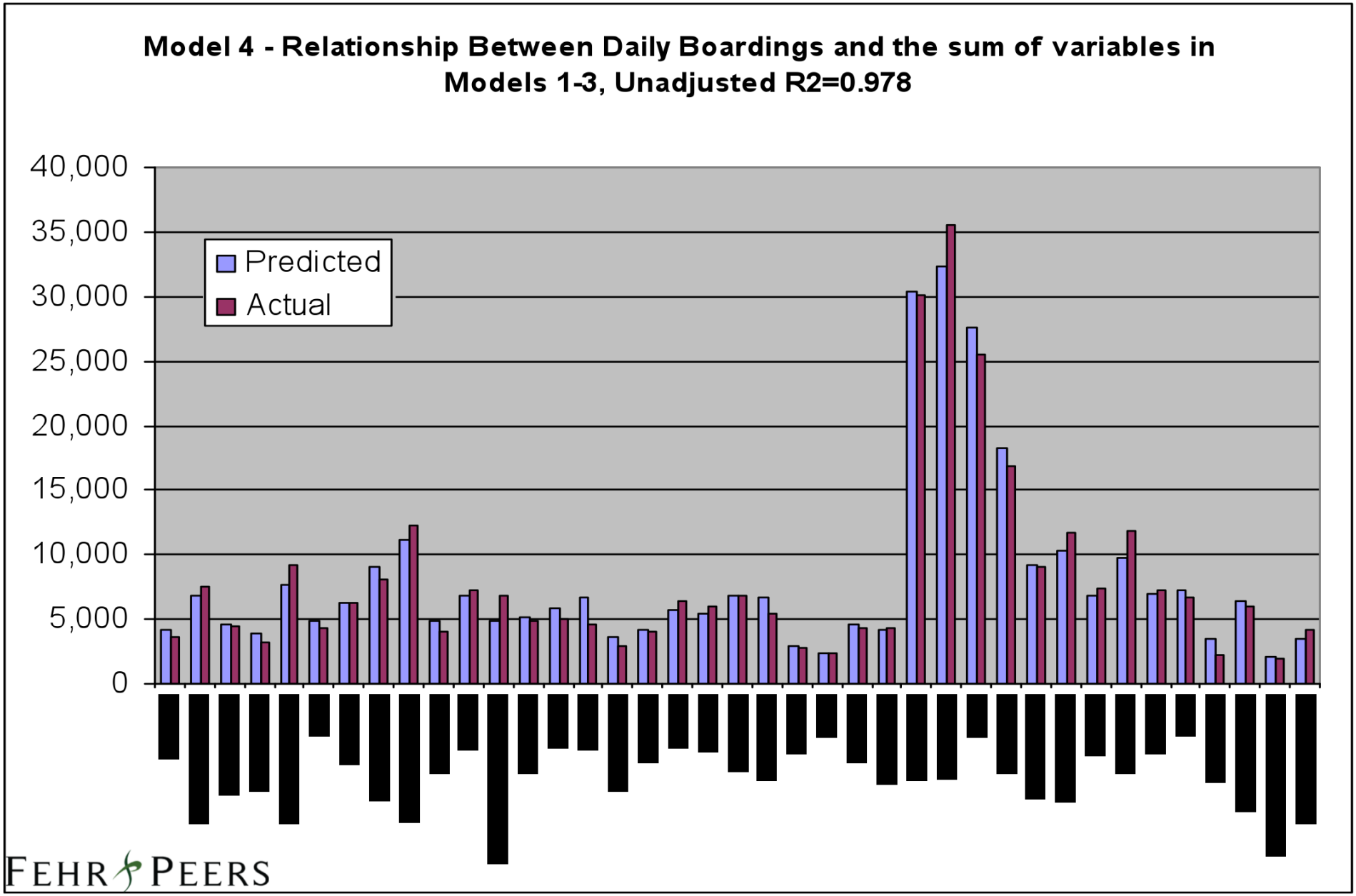
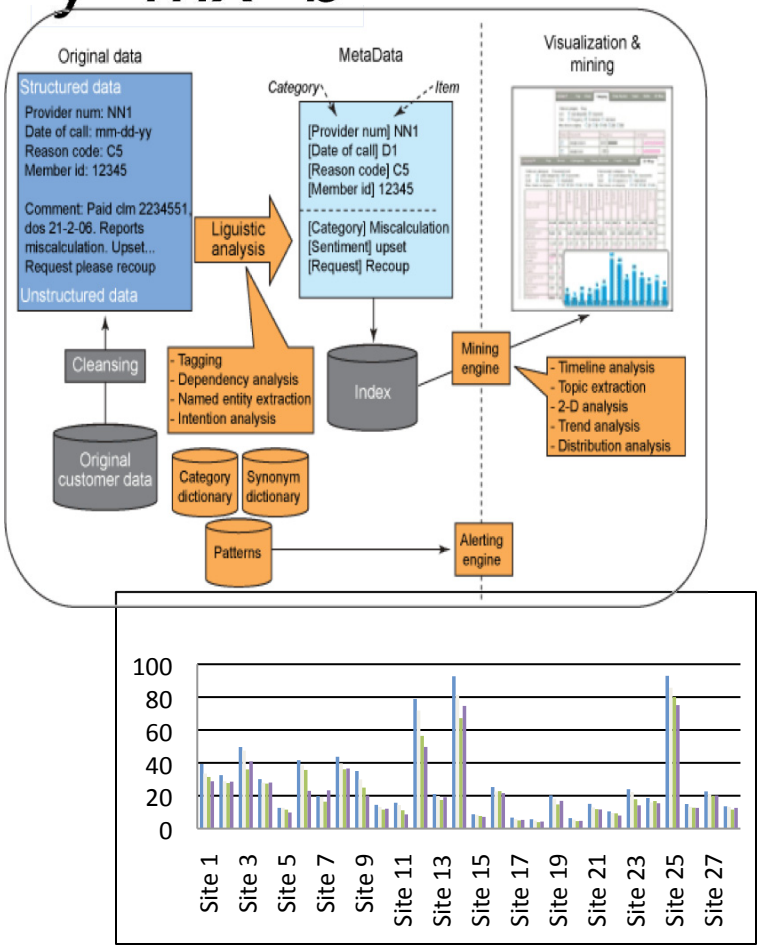
Validation of BART DRM Transit Ridership Estimates



Analytics to Tools

MXD BMP DRM

$y=mx+b$



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Acceptance

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