San Mateo 101 Corridor Strategies: An Innovative Partnership in the Making

June 25, 2015
This is NOT 1976 Santa Monica

‘LOSS OF CREDIBILITY’

Diamond Lanes Stir Dissension in Caltrans
LA Times 7/20/76

A Total Flop

The time has come to chuck the Diamond Lanes. This experiment on the Santa Monica Freeway doesn’t work. It has not achieved its purpose. All evidence points to the conclusion that it never will.
LA Times 6/11/76

Bus-Car Pool Lanes
Popular in S.F. Area

Experiments Generate No Controversy Like That of Southland Diamond Lanes
LA Times 8/23/76

Many innovative strategies available today in Silicon Valley

- Private employer shuttles
- Privately operated transit (RidePal)
- Rideshare technologies (Lyft, Uber, Carma)
- Parking pricing & management
- Dynamic tolling to fill capacity
- Real time information
- Smartphones / Internet / GPS
US-101 Congested & Getting Worse

**Frequent & Variable Congestion**

**Growing Every Year**

Silicon Valley companies rapidly expanding, building new campuses → traffic will get worse

**Flat traffic profile → Midday will get congested too**

**US 101 Whipple Ave to San Francisco - Hourly Volumes**

Corridor Hourly Volumes (Veh/hour)

<table>
<thead>
<tr>
<th>Time</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 AM</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>7 AM</td>
<td>3,000</td>
<td>4,000</td>
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<tr>
<td>8 AM</td>
<td>5,000</td>
<td>6,000</td>
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<tr>
<td>9 AM</td>
<td>7,000</td>
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<td>10 AM</td>
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<td>11 AM</td>
<td>11,000</td>
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<tr>
<td>12 PM</td>
<td>13,000</td>
<td>14,000</td>
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<tr>
<td>1 PM</td>
<td>15,000</td>
<td>16,000</td>
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<tr>
<td>2 PM</td>
<td>17,000</td>
<td>18,000</td>
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<tr>
<td>3 PM</td>
<td>19,000</td>
<td>20,000</td>
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<tr>
<td>4 PM</td>
<td>21,000</td>
<td>22,000</td>
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<tr>
<td>5 PM</td>
<td>23,000</td>
<td>24,000</td>
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<tr>
<td>6 PM</td>
<td>25,000</td>
<td>26,000</td>
</tr>
<tr>
<td>7 PM</td>
<td>27,000</td>
<td>28,000</td>
</tr>
<tr>
<td>8 PM</td>
<td>29,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>

Average Travel Time vs 65 MPH:
- 6 AM: 25 minutes
- 7 AM: 30 minutes
- 8 AM: 35 minutes
- 9 AM: 40 minutes
- 10 AM: 45 minutes
- 11 AM: 50 minutes
- 12 PM: 55 minutes
- 1 PM: 60 minutes
- 2 PM: 65 minutes
- 3 PM: 70 minutes
- 4 PM: 75 minutes
- 5 PM: 80 minutes
- 6 PM: 85 minutes
- 7 PM: 90 minutes
- 8 PM: 95 minutes

95th Percentile Travel Time (1x/month):
- 6 AM: 35 minutes
- 7 AM: 40 minutes
- 8 AM: 45 minutes
- 9 AM: 50 minutes
- 10 AM: 55 minutes
- 11 AM: 60 minutes
- 12 PM: 65 minutes
- 1 PM: 70 minutes
- 2 PM: 75 minutes
- 3 PM: 80 minutes
- 4 PM: 85 minutes
- 5 PM: 90 minutes
- 6 PM: 95 minutes
- 7 PM: 100 minutes
- 8 PM: 105 minutes

Average Travel Time - 95th Percentile Travel Time:
- 6 AM: 10 minutes
- 7 AM: 15 minutes
- 8 AM: 20 minutes
- 9 AM: 25 minutes
- 10 AM: 30 minutes
- 11 AM: 35 minutes
- 12 PM: 40 minutes
- 1 PM: 45 minutes
- 2 PM: 50 minutes
- 3 PM: 55 minutes
- 4 PM: 60 minutes
- 5 PM: 65 minutes
- 6 PM: 70 minutes
- 7 PM: 75 minutes
- 8 PM: 80 minutes
Caltrain At Capacity & Demand Growing
San Mateo residents bear the burden

Caltrain Exceeding Capacity
Trains most crowded in San Mateo

<table>
<thead>
<tr>
<th>Average Weekday</th>
<th>2009</th>
<th>2015</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>36,232</td>
<td>58,245</td>
<td>61%</td>
</tr>
<tr>
<td>Traditional Peak</td>
<td>-</td>
<td>29,143</td>
<td></td>
</tr>
<tr>
<td>Reverse Peak</td>
<td>-</td>
<td>18,842</td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Trains</td>
<td>98</td>
<td>92</td>
<td>-6%</td>
</tr>
<tr>
<td>Max Load (Feb)</td>
<td>5</td>
<td>29,143</td>
<td></td>
</tr>
<tr>
<td>5 Fullest Trains Each Direction</td>
<td>85%</td>
<td>124%</td>
<td>46%</td>
</tr>
<tr>
<td>Max Load (High Season) Direction</td>
<td>-</td>
<td>145%</td>
<td></td>
</tr>
</tbody>
</table>

Ridership has grown over 10% annually since 2010

Caltrain fullest in San Mateo segments

AM - Feb 2014

 Ridership has grown over 10% annually since 2010
SamTrans SF Express Service Cut

SamTrans express bus ridership dropped because of service cuts, not lack of demand.

- Effectively no SF or SC commute bus service
- Odd compared to rest of Bay Area & SF commuter corridors

4th & King St. not the ultimate destination for many commuters

SamTrans SF Express Service Cut

- Introduced Baby Bullet
- Millbrae BART opened 6/2003
- Eliminated 7 of 8 express bus routes
- SamTrans Service Plan – further express bus cuts

Caltrain Thursday AM Peak Trips By Destinations Per Acre

All Trips starting 6AM-9AM

- 0 - 0.2
- 0.3 - 0.6
- 0.7 - 1.4
- 1.5 - 2.6
- 2.7 - 4.7

Transbay Terminal
Caltrain Station
BART Station

Source: MTC Onboard Survey 2015
Staged Hybrid HOV

Minimum Build: Staged Hybrid HOV (Aux → GP Lane)

Auxiliary Lane: I-380 to San Francisco (Project Study Report)

Staged Hybrid HOV: Whipple Avenue to I-380 (Project Study Report)

**Staged Hybrid HOV PSR Schedule:**
- **2015:** Begin Environmental
- **2016:** Circulate DED
- **2017:** Complete PA/ED
- **2018:** Begin Construction
- **2019:** Complete Construction

HOV2+ Is Not an Option

Limited Benefits

- Provides minimal GP congestion relief and will only last temporarily
- Does not provide any time savings to buses and HOVs as HOV lane will be oversubscribed

Hybrid HOV not enough

- HOV2+ would be degraded 1st day
- Doesn’t connect to SF or SCL counties
- Doesn’t work with SCL express lanes (2+2 HOT → 1+1 HOV)
- Would need to be HOV3+ → Empty HOV Lane → Need to be HOT 3+

Too long to deliver

- 8+ years too long for the public and employers

Need to consider alternative options
## Options on the Table

<table>
<thead>
<tr>
<th>Options</th>
<th>Ballpark Cost</th>
<th>Schedule</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paint HOV2+</td>
<td>25 M</td>
<td>2018</td>
<td>HOV degraded at opening &amp; GP worse than existing</td>
</tr>
<tr>
<td>Paint HOV3+ (Option 1 &amp; Increase Occupancy to 3+)</td>
<td>25 M</td>
<td>2018</td>
<td>HOV lane perceived as &quot;empty&quot; GP severely degraded</td>
</tr>
<tr>
<td>Toll HOV 3+ (Option 2 &amp; Add Tolling)</td>
<td>140 M</td>
<td>2018</td>
<td>Fills HOT lane GP congestion worse than existing levels</td>
</tr>
<tr>
<td>Transit &amp; TDM (Without HOV/T)</td>
<td>TBD</td>
<td>Now - 2018</td>
<td>Increase HOV traffic but still degraded Reduces GP congestion but still worse than existing Moves same/more people with fewer vehicles</td>
</tr>
</tbody>
</table>

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Applied individually each of the options would fail on their own

But applying all 4 makes the project feasible
Significant Existing HOV & Private Transit

Existing US 101 PM Traffic Data (NB + SB)

Share by Classification & Occupancy

- SOVs are 75% of vehicles but only 52% of the passengers in the corridor
- Buses are less than 1% of the vehicles but are estimated to carry 15% of the passengers
- HOV3+ eligible vehicles (HOV3+, vanpool, bus) make up less than 3% of the traffic and an estimated 20% of passengers

1 Bus Capacity = 50+ Passengers = 40 Cars

Assumed ridership: bus = 30 passengers, vanpool = 8 passengers
Applying All 4 Options = Feasible Project

Vehicle reduction needed: 500 veh/hour

US-101 NB at Ralston Ave 4-5PM
2 days of data collected March/April 2015
How to achieve vehicle reduction: (1) SamTrans Express Bus - Reinstate & Expand

• Reinstate discontinued service in 0-2 years
  • Serve multiple downtown SF stops
  • Potential to run both directions

• Revamp & expand premium service at HOT opening
  • New premium buses
  • Supportive capital projects (stops, ramps, and park-ride)

• Express bus complements Caltrain
  • Caltrain + express bus should be viewed and used as a system
  • More and better options creates a more resilient and robust transit system
  • When one service is delayed riders will appreciate having an alternative

* Origin of Caltrain SF Alightings in AM Peak:
  1/3 Boarded at stations in San Mateo County
  2/3 Boarded at stations in Santa Clara County

- Transit & TDM strategies can be implemented within next 1-2 years
- Net toll revenue allocation to express bus & TDM is necessary
How to achieve vehicle reduction:
(2) Expand Private Shuttles

- Private employer shuttles
  - Significant existing operations & ridership
  - SF residents well served by largest employers, limited expansion potential
  - Need to identify areas not as well served by current shuttle services (San Mateo County)
  - Encourage other smaller employers to create/expand shuttle services

- Privately operated public shuttles (RidePal)
  - Private services, which are nimble, flexible, and innovative can be used to fill service gaps and complement publicly operated trunk lines

RidePal™
How to achieve vehicle reduction:
(3) Increase Carpools

• Currently no incentive to carpooling north of Whipple Rd.
• Many carpools will form naturally:
  • Express lanes will provide time savings and travel time reliability to eligible HOVs
  • Roundtrip gas ≈ $7 (full operating cost is higher)
  • SF Financial District parking = $30+/day, $400+/month
• Technology can be used to facilitate quicker and wider adoption than on other corridors
  • 511 rideshare (important but less nimble than private companies)
  • Bay Area Council & employers can coordinate with private providers
  • SFO is a significant rideshare market
How to achieve vehicle reduction: (4) Parking & First/Last Mile Service

• Improve ease of use and access to Caltrain/Express Bus/Carpool via:
  • Establish new park-ride lots to support SamTrans Express Bus and employer shuttles
    • Efficient management of existing parking
    • Parking real time info
    • Pricing to encourage use of all facilities
  • On-demand shuttle service targeted at commuters from low-density areas to access SamTrans/Caltrain/Shuttle stops
    • Bridj (Boston & DC) dynamically routes minibuses based on demand, the same concept could be applied focused on serving single Caltrain/SamTrans/Shuttle stops.
    • VTA is testing a dynamic transit service pilot program
How Can Employers Contribute?

**Targeted reduction in SOV traffic:**
1,000 vehicles/hour = 6,000 - 8,000 vehicles/day

**Vehicle reduction is achievable**
- Could be accomplished by shifting 10-12% of SOVs to HOV or transit
- 2010 SamTrans Express Bus Ridership = 40% of shift

**Potential employer strategies:**
- Increase employer shuttle service & ridership
- Support expansion of private shuttles available to the public (RidePal)
- Facilitate formation of carpools
  - Own employees
  - Leverage Lyft/Uber
  - Park-ride lots & real-time information

**Options aren’t prescriptive, employers can choose any combination as long as they have the necessary impact**
# What Passes the Litmus Test?

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Congestion Relief</th>
<th>Schedule</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Staged Hybrid HOV + 380-SF Auxiliary Lane</td>
<td>HOV/T Volumes: Too high</td>
<td>2023</td>
<td>Hybrid HOV: 120 M, 380-SF Aux: 130 M, Combined: 250 M</td>
</tr>
<tr>
<td></td>
<td>HOV/T Speeds: Degraded</td>
<td>8+ Years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Purpose Speeds: Slightly better, but only temporarily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bus &amp; Carpool (Speeds &amp; Effectiveness) (GP or HOV/T): Bus &amp; carpool travel at GP speeds (not attractive)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network Connectivity: Doesn’t extend HOV to SF, doesn’t connect well with VTA ELs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B</strong> Change-A-Lane HOT 3+ + Transit + TDM</td>
<td>Fills HOT lane: 45+ MPH</td>
<td>2018</td>
<td>140 M</td>
</tr>
<tr>
<td></td>
<td>Schedule: 45+ MPH</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness: Extends express lanes to SF, better connection to VTA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A+B</strong></td>
<td>Fills HOT lane: 45+ MPH</td>
<td>2018 / 2023</td>
<td>390 M</td>
</tr>
<tr>
<td></td>
<td>Schedule: Some improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness: Extends express lanes to SF, better connection to VTA</td>
<td></td>
<td></td>
</tr>
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</table>

## Meets Challenges:
1) Congestion Relief
2) Schedule
3) Cost
## Costs & Funding

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<th>Options</th>
<th>Ballpark Cost</th>
</tr>
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<tr>
<td>A) Staged Hybrid HOV + 380-SF Auxiliary Lane</td>
<td>250 M</td>
</tr>
<tr>
<td>B) Change-A-Lane HOT 3+ + Transit + TDM</td>
<td>140 M</td>
</tr>
<tr>
<td>A + B</td>
<td>390 M</td>
</tr>
</tbody>
</table>

What county/regional/state funds can be brought to the project?

Where might private capital best be deployed to accelerate the project?
How Can This Happen?  
Phasing Plan

- Reinstall SamTrans Express Bus
- Park-ride lots
- Employer Transportation Demand Mgt.
- Introduce Premium SamTrans Bus
- Transit Capital Projects
- Aggressive Transportation Demand Mgt.

**Change-A-Lane**
**Target Schedule:**

**Staged Hybrid HOV**
**PSR Schedule:**

Known & unknown risks may impact schedule
Changing 101 to HOT in 2018: Perfect Opportunity

- Key is **practical and achievable** TDM & transit, the question is not whether it can work but what it would take to shift enough SOV to transit & carpool
- Demonstrated underserved demand for transit (SamTrans cut express bus routes & Caltrain is at capacity) ➔ Express buses with HOT speeds/reliability will be very attractive to commuters
- No current benefit to carpooling ➔ Some carpools will form naturally
- Uber/Lyft/RidePal ➔ Can be leveraged to help and should be eager to look at underserved market
- Innovative business interests can help with nimble adjustments to TDM at opening
- High income/airport/business corridor ➔ High willingness to pay for time savings & reliability ➔ Net toll revenues can pay for transit/TDM

**Changing a general purpose lane to HOT is not the only option but it is viable**
“The Highway 101 corridor is the world’s leader on innovation, but our transportation system still looks a lot like it did decades ago.” – Assemblyman Kevin Mullin (February 2015)

“Silicon Valley is built for speed, but Highway 101 is moving at a slow crawl.” – Jim Wunderman, President and CEO of Bay Area Council (February 2015)

“A good express lane...converts existing highway lanes into express lanes, uses express lane revenues to fund more transportation options, has a strategy in place to ensure that everyone along the corridor benefits.”
– TransForm (April 2015)