

Smart Driving Pilots

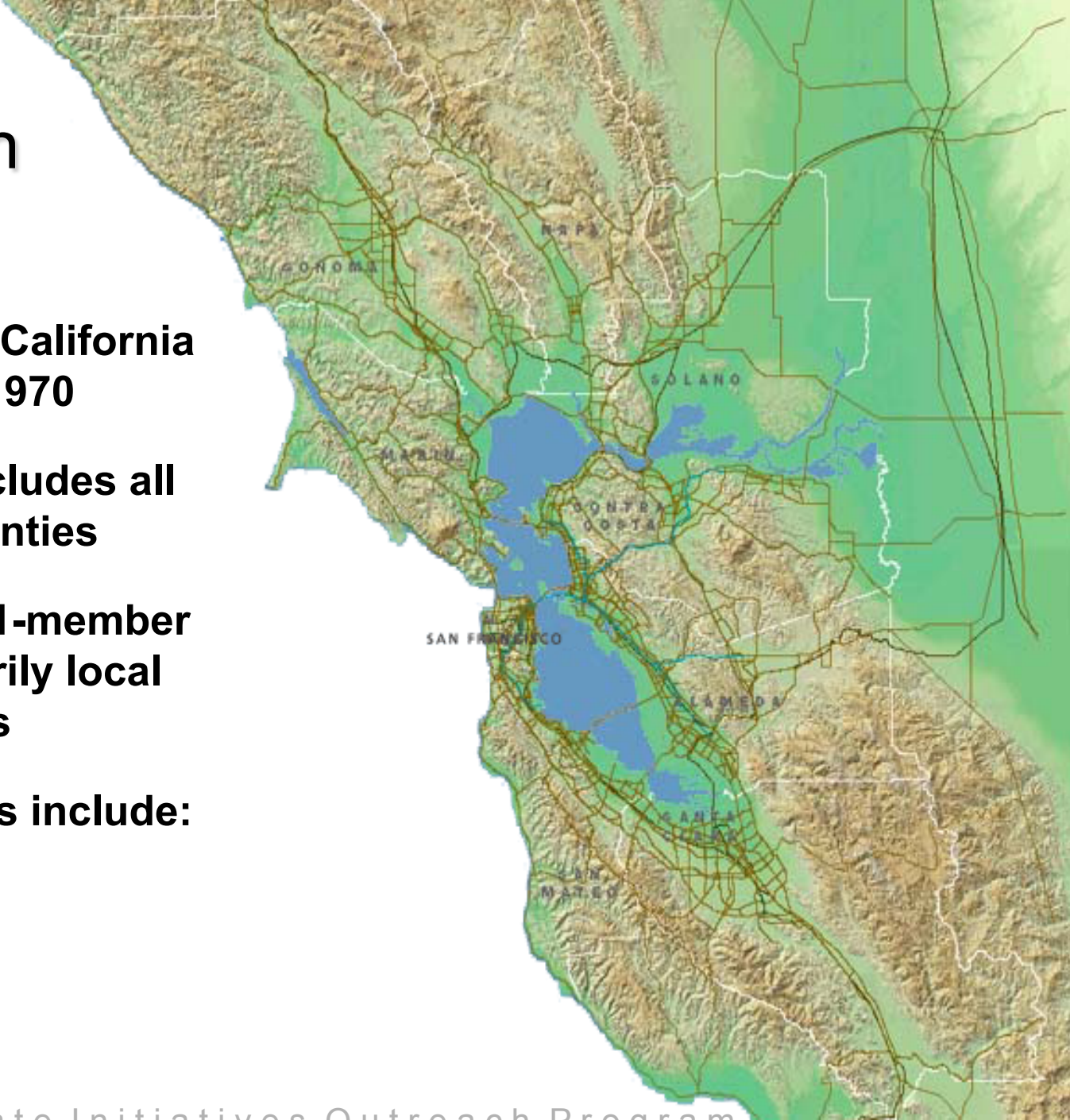
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Ursula Vogler, MTC &
Jeff Ang-Olson, ICF Intl.
BECC Conference
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Metropolitan Transportation Commission

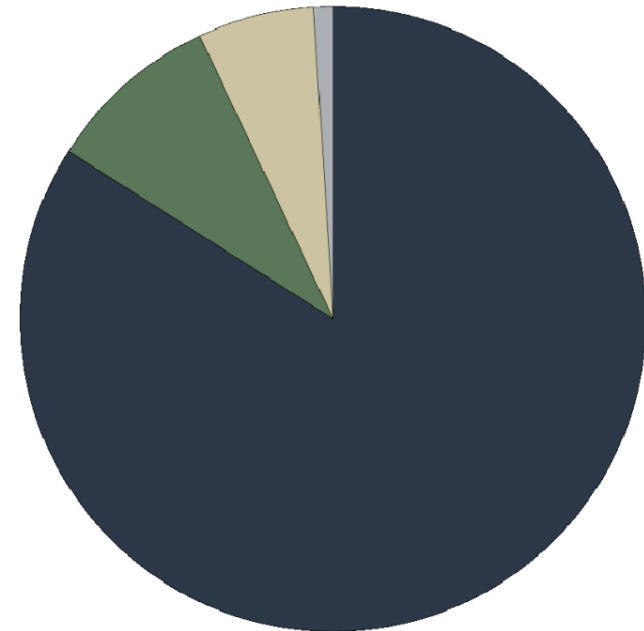
- **Created by the California Legislature in 1970**
- **Jurisdiction includes all 9 Bay Area counties**
- **Governed by 21-member board of primarily local elected officials**
- **Responsibilities include:**
 - Planning
 - Funding
 - Coordination
 - Operations
 - Advocacy



Bay Area Transportation Basics



- More than 4.6 million cars
- Some 28 transit agencies with 4,500 buses, railcars, and ferries
- 20,000 miles of local streets and roads
- 1,420 miles of highway
- 340 miles of carpool lanes
- Eight toll bridges
- 7th most congested region in U.S.



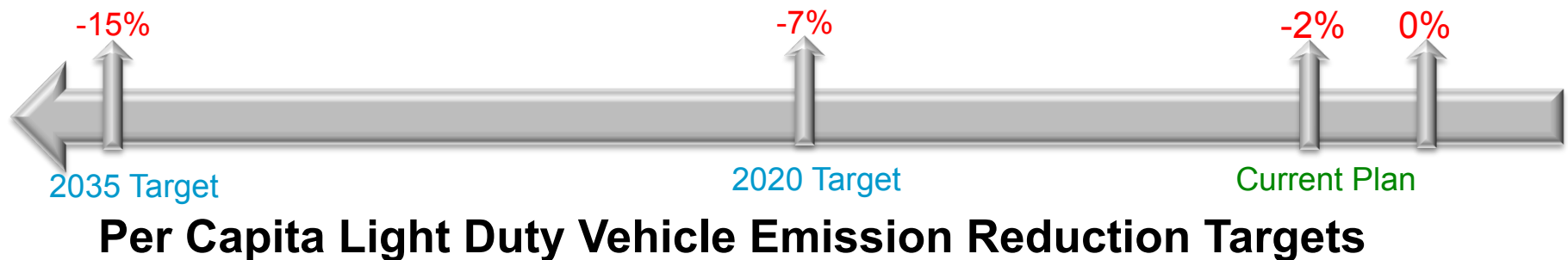
	AUTO	84%
	WALK	9%
	PUBLIC TRANSIT	6%
	BICYCLE	1%



California Climate Change Legislation



- **Assembly Bill 32: Global Warming Solutions Act**
 - Sets the state GHG emissions limit in 2020 at 1990 levels and points the way towards 80% reduction by 2050
- **Senate Bill 375: Sustainable Communities Strategy**
 - Requires the integration of land use and transportation planning in a Sustainable Communities Strategy (SCS) to reduce emissions from light duty vehicles



Regional Transportation Plan/ Sustainable Community Strategy



- Road map that guides region's transportation development over 25-year period
- Updated every four years
- Projects must be consistent with RTP to receive federal, state or regional funding
- SB 375 requires the integration of land use and transportation planning in a Sustainable Communities Strategy
- Plan Bay Area's GHG emission reduction targets:
 - ~9% reduction expected from land use
 - ~6% reduction expected from elements of Climate Initiatives Program



Climate Initiatives Program Overview



- Transportation 2035: first RTP to outline GHG emission reduction strategies to comply with state laws, adopted in 2009
- \$80 million program adopted in December 2009
- Program developed by Commission members, representatives from Bay Area transportation agencies, advocates and staff
- Program makes short-term investments that reduce transportation-related emissions and vehicle miles traveled
- Program focuses on evaluation to inform the next Regional Transportation Plan/Sustainable Communities Strategy



Climate Initiatives Program: Cycle 1



THE PROGRAM

MTC Climate Initiatives Program (\$80M)

INITIATIVES

**Innovative
Grants
(\$33M)**

**Safe Routes
to School
(\$15M)**

**Youth
Education
(\$3M)**

**Public
Outreach
(\$7M)**

PROJECTS

Funded grant projects (i.e. Bike Share project, EV Charging Stations, Dynamic Car Sharing, etc.)

Funded infrastructure projects

TBD projects

Programs focused on inciting measurable behavior change (e.g. outreach campaigns or pilot programs)

TACTICS

Methods for increasing audience participation in projects (e.g. tools and outreach)

Identify Targeted GHG-reducing Transportation Behavior(s)



- **In late 2010/early 2011, MTC conducted primary and secondary research to identify target behaviors:**
 - Random Telephone Survey
 - Extensive Literature Review
 - Online Listening
- **Identification of Target Behavior(s) based on:**
 - Likelihood of Adoption
 - Scalability
 - GHG Impact

Market Research Findings



- **All behavior changes are not equal**
 - SMART driving actions are viewed as comparatively easy actions to take
 - Trip reduction/trip modification actions are mixed – trip linking and reducing a trip are viewed as easy, other strategies like telecommuting and flex-schedules were difficult.
 - Mode or vehicle shift are perceived as the most difficult actions to take, with walking being a possible exception. Since emission reduction impact of EVs is so great, scored higher.
- **Themes & motivators**
 - Altruistic factors were the most compelling – keep Bay Area beautiful for future generations, improving air quality, protect public health
 - Self-interested factors included better for their health, reduce energy use, save time & save money

Smart Driving Pilots



- **Pilot initially included testing of two devices:**
 - 1) In-vehicle devices using display real-time miles per gallon (MPG) efficiency.
 - 2) Tire pressure caps to encourage timely inflation, improving MPG and driver safety.
- **Began pilot in mid-2012 with pre-test of devices**
- **Found that two of the three devices were unacceptable**
- **Settled on testing of Ecometer (in-vehicle device) and smart driving education**
- **Will install OBD Key to capture MPG**

OBDKey Overview



- **Designed to allow owners to monitor vehicle performance and diagnose problems**
- **Bluetooth interface**
- **Custom programmed for MTC's pilot:**
 - Record average fuel use and mileage every 20 cold starts
 - Record % of miles over high speed (set at 65 mph)
 - Record % of miles with high throttle angle (set at 30%)
 - Record average speed
 - Record number of trips



OBDKey Overview, cont.



- **Challenges**

- Does not work with:
 - Vehicles that do not have OBD (before 1996)
 - Vehicles that do not have a mass air flow sensor (some earlier Hondas)
- OBD port access needed for Smog Check
- No internal clock – cannot determine non-use times, just when engine is running.
- Earlier vehicles shut off OBD port when key was turned off erasing data not stored
- OBDKey had limited storage capability

OBDKey Interface Program



OBDKey

get inside your car

KBM Systems Ltd.

Select the connection which is used to access the OBDKey MPG Recorder xxx, then click Connect

Connection Settings

COM4

Disconnect

Export Logged Data

Monitors OBDKey MPG Recorder. Version 1.009 Nov 2012

Air Fuel Ratio = 14.1 : 1
Fuel Density = 2828 grammes per gallon

Live Data - Reading from ECU

Reading	Status	Value
Battery	Ready	14.0 volts
Logging Supported	Ready	Reading data ...
Vehicle speed	Ready	0 kmh / 0.000 mph
Engine Coolant Temperature at start	Ready	22 Deg C / 71.600 Deg F
Total Distance	Ready	0.000 KM / 0.000 miles.
Mass Air Flow	Ready	3.86 grammes per second
Fuel Used This Trip	Ready	0.037 gallons
Average Speed This Trip	Ready	Not recorded
Throttle Position	Ready	3 % of wide open
Over Speed Distance This Trip	Ready	0.000 KM / 0.000 miles.
Over Throttle Distance This Trip	Ready	0.000 KM / 0.000 miles.
Total Logging Time	Ready	330 secs
Cold start trip distance(s)	Ready	0.000 KM / 0.000 miles.

Settings

Recorded Data

Archive Data

Reading	Value
Current # Log Records	13
Current # Trips	59
Over TPS Distance Total	16319m / 10.142 miles
Over Speed Distance Total	256008m / 159.110 miles
Distance Total	534266m / 332.049 miles
Fuel Total	10.460 gallons
Average Moving Speed	73.295kmh / 45.553 mph
Total recording time	26460 secs
Trip distance(s) since cold start	0m / 0.000 miles
Clear All Log and Archive Data	Delete all records

30s

Ready..

Ecometer



- Connects to OBD port, mounts on dash
- Digital readout of instantaneous fuel economy
- Colored slider band – turns yellow and red with low mpg



Smart Driving Pilots



- Began Pilot in late 2012 by recruiting participants on **511.org** website
- Offered \$50 gift card as incentive
- After screening for vehicle type, had over 30 interested participants
- Began installing OBD Key devices in early 2013
- Eight participants had Ecometer's installed, eight did not
- Started pilot activities/communication with first cohort with 16 participants in summer 2013

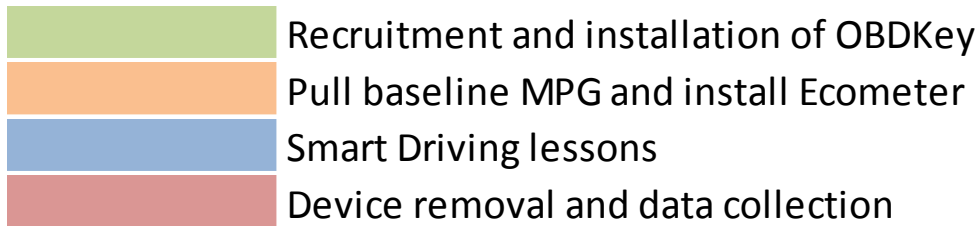
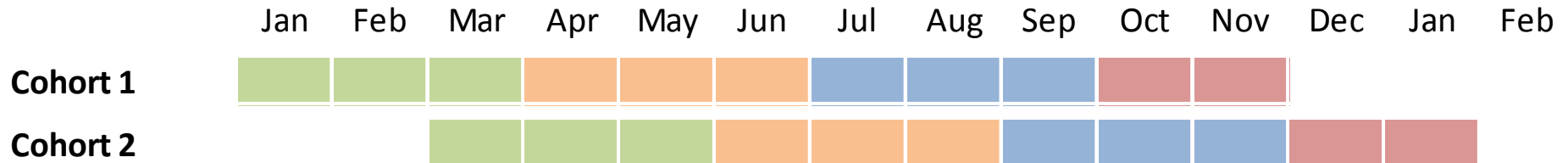
Smart Driving Pilots



- All 16 participants received biweekly “lessons” on smart driving and invitation to join a closed Facebook page
 1. Lesson 1: Smart Driving Overview
 2. Lesson 2: Driving Smoothly
 3. Lesson 3: Driving Defensively
 4. Lesson 4: Vehicle Maintenance
 5. Lesson 5: Vehicle Weight & Aero-dynamics
 6. Lesson 6: Trip Planning



Participant Schedule



Early Lessons Learned



- **Eager Participants**: Easy to recruit and resilient (didn't mind delay in start).
- **Collecting actual data with OBD Key is challenging**: It's difficult to schedule appointments, requires disassembly of dash and many older vehicles aren't compatible.
- **Facebook participation minimal**
- **Baseline fuel economy shows little weekly variation**. Most vehicles are within 10% of their EPA-rated fuel.
- Most find **Ecometer useful and functional**.

Next Steps



- Complete second cohort over the next few weeks
- Will evaluate results December 2013 & January 2014
- Will tweak second wave based on results of first cohort
- Hope to have a smart driving campaign summer 2014 using in-vehicle devices and education



THANK YOU!

Contact Information:

Ursula Vogler

Project Manager, Climate Initiatives Program
Metropolitan Transportation Commission
uvogler@mtc.ca.gov

Jeff Ang-Olson

Principal
ICF International
jeffrey.ang-olson@icfi.com