Transport GHG Emissions Evaluation: Bottom-up and Top-down Efforts

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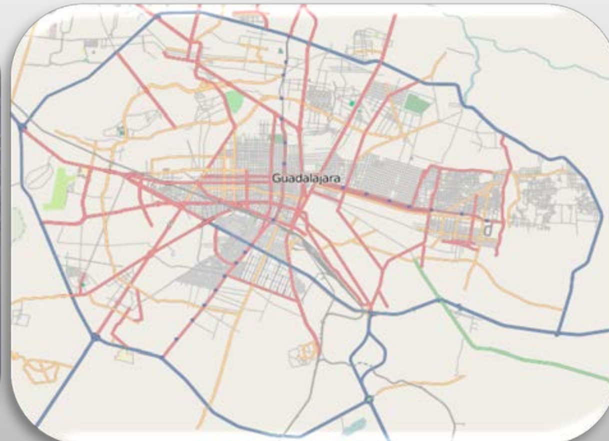
WCTR SIGs Durban Workshop
December 5th 2011

GHG Evaluations Needed at Multiple Scales



Project Level

- Need to evaluate system wide impacts, induced demand

TEEMP

City Plan & Region

- City Mobility plans
- Non-motorized mobility plans

TEEMP City

National Level

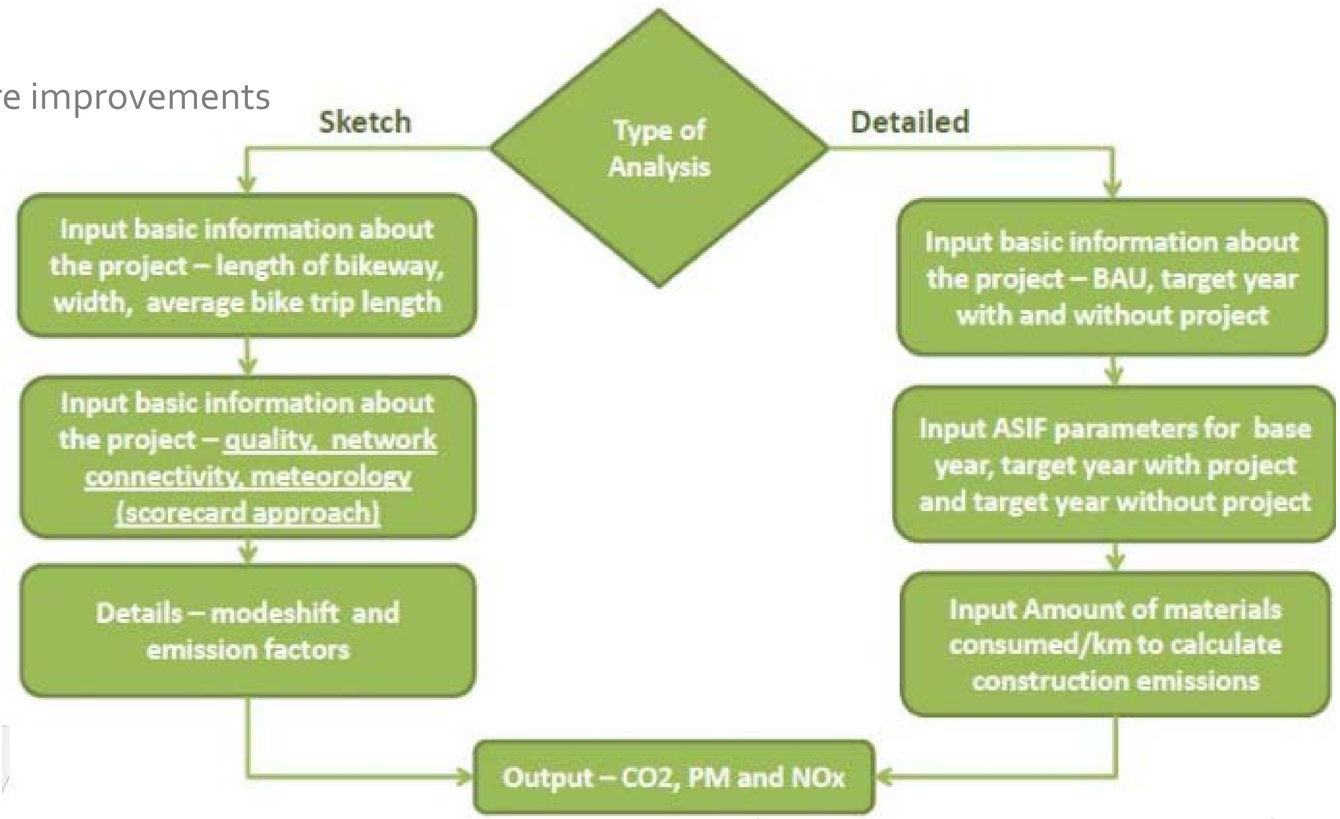
- Large Federal Programs y plans
- Federal transport and land use policies

ROADMAP

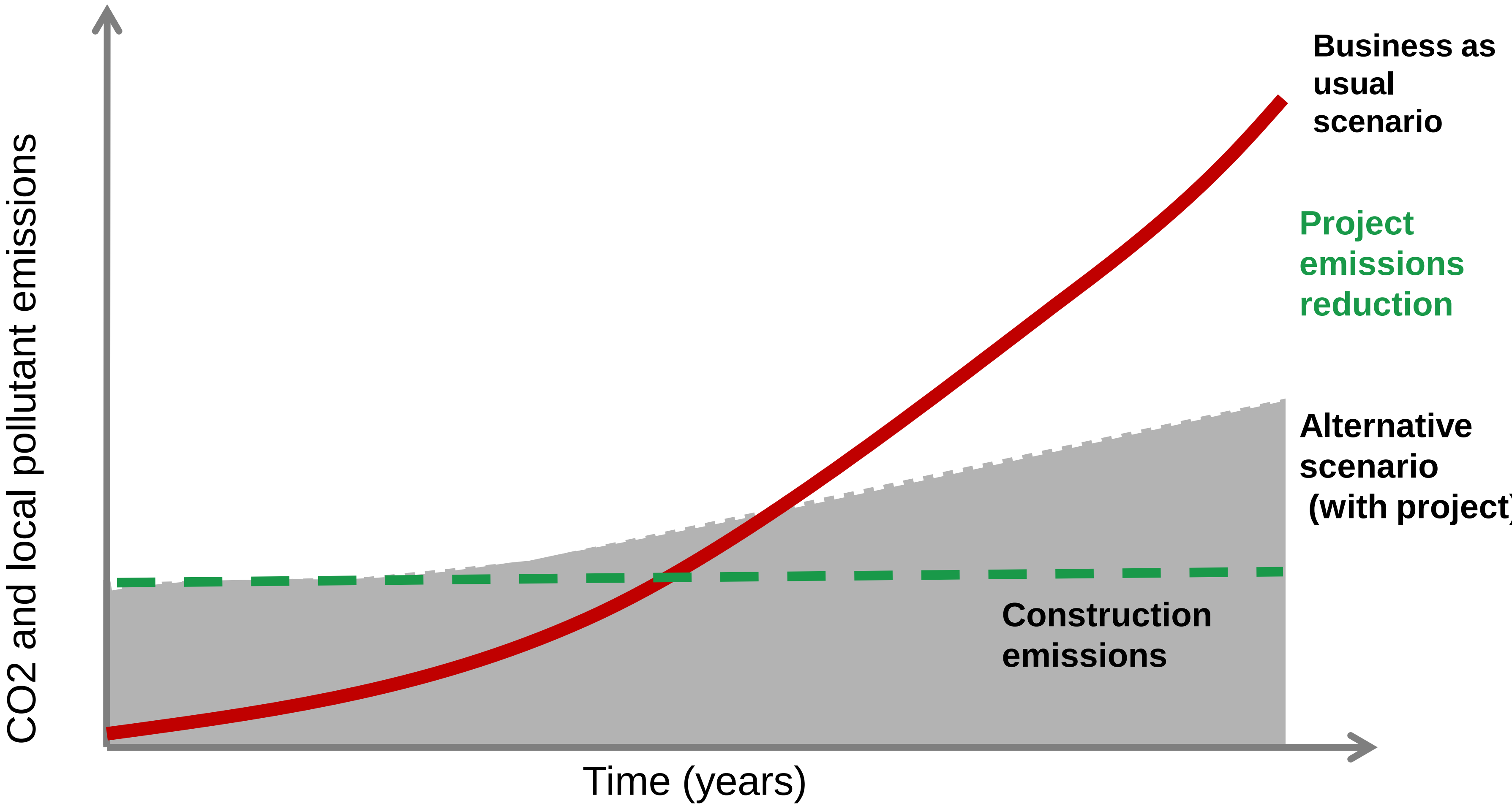
What is TEEMP?

TEEMP Models are excel based models developed by ITDP & CAI-ASIA to for ex-ante evaluation of GHG impacts in transport projects. The models compare a business as usual scenario with an “intervention” or “project” scenario.

1. Bus Rapid Transit
2. Bike Sharing Systems
3. Bikeways
4. Pedestrian infrastructure improvements
5. Light Rail
6. Among others…



Scenario Comparison:



Detailed Model for Bus Rapid Ttransit Systems

Parameters - BRTS Project

	2010	2020	2030
Cumulative Length of BRTS Constructed (km)	16	16	16

Total Ridership ('000)/day
Choose one option:
I have the ridership figures/day ('000). I would like to input it directly

	2010	2020	2030
Total Ridership ('000)/day	125.00	145.00	173.00

Average Occupancy

Vehicle Type	2010	2019	2029
Cars	1.6	1.6	1.6
2-Wheeler	1.2	1.2	1.2
3-Wheeler	1.6	1.6	1.6
Taxi	2.5	2.5	2.5
Bus	25.0	25.0	25.0
Jeepney/RTV	15.1	15.1	15.1
Walking/Cycling	1.0	1.0	1.0
BRT	96.0	96.0	96.0
LRT	0.0	0.0	0.0

1. Define the Baseline Scenario

2. Define the Project Scenario

3. View Outputs

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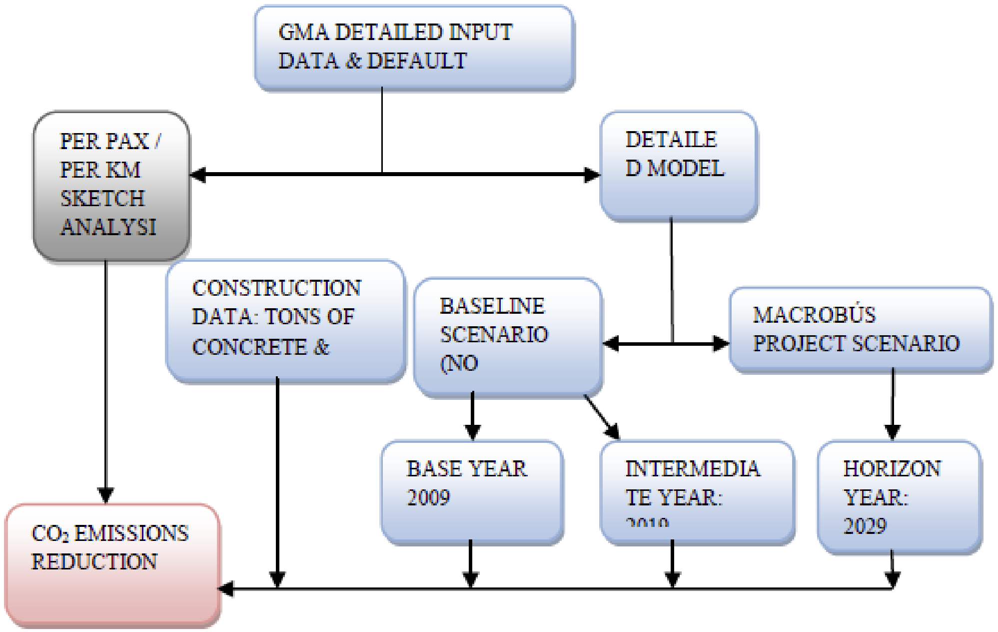
TEEMP Application for BRT, Guadalajara, Mexico 2009 - 2030

Model main Input data:
- System demand
- Corridor length
- Corridor modal share
- Vehicle load factors

Model assumptions
- BRT commercial speeds: 25kph
- Average speed on traffic lanes:
  - 2010 – 20 kph
  - 2030 - 10 kph
- Modal shift from car to BRT: 8%



Outputs: CO_2 emissions reduction of 36,100 tons per year
- Benefits of bus fleet renovation
- Improved traffic flow in and out of confined bus lane
- Modal shift from car to bus

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What is TEEMP City?

TEEMP City is being developed to provide a clear vision of a livable life, guiding these cities for the provision of efficient, clean and comfortable public transportation.

- Flexible bottom-up tool for the estimation of GHG emissions for city mobility plans.

- Based on TEEMP architecture for the quantification of:
    - CO_2, NO_x and PM emissions and emissions reductions
    - Health impacts
    - Road safety benefits of public transport improvements

- Metodology to score the quality, complexity and the completeness of urban mobility plans.

Global ROADMAP for the Transport Sector

Back to Top	POLICY LEVERS

Select the levers to be included in the trajectory case.

Lever	All	LDV	HDT	Other on-road	Rail	Aviation	Water
Fuel Economy Improvements		☐	☐	☐	☐	☐	☐
Biofuels / Efficiency Improvements in Upstream Processes (non-electricity)	☐						
Electrification / Grid decarbonization		☐	☐	☐	☐		
Mode shift	☑						
Activity Reduction	☑						
More stringent emission standards		☐	☐	☐	☐	☐	☐

The model's geographic scope includes 16 individual countries and regions

- Includes data on vehicle stock and vehicle activity by mode
- Data on vehicle and Fuel technologies
- Comparison of GHG emissions: base case scenario vs. alternative scenario

Contains levers for vehicle activity assumptions including:

- Mode shift
- Fuel improvement due to reduction in urban traffic
- Reduction of average trip lengths due to better urban Planning and design

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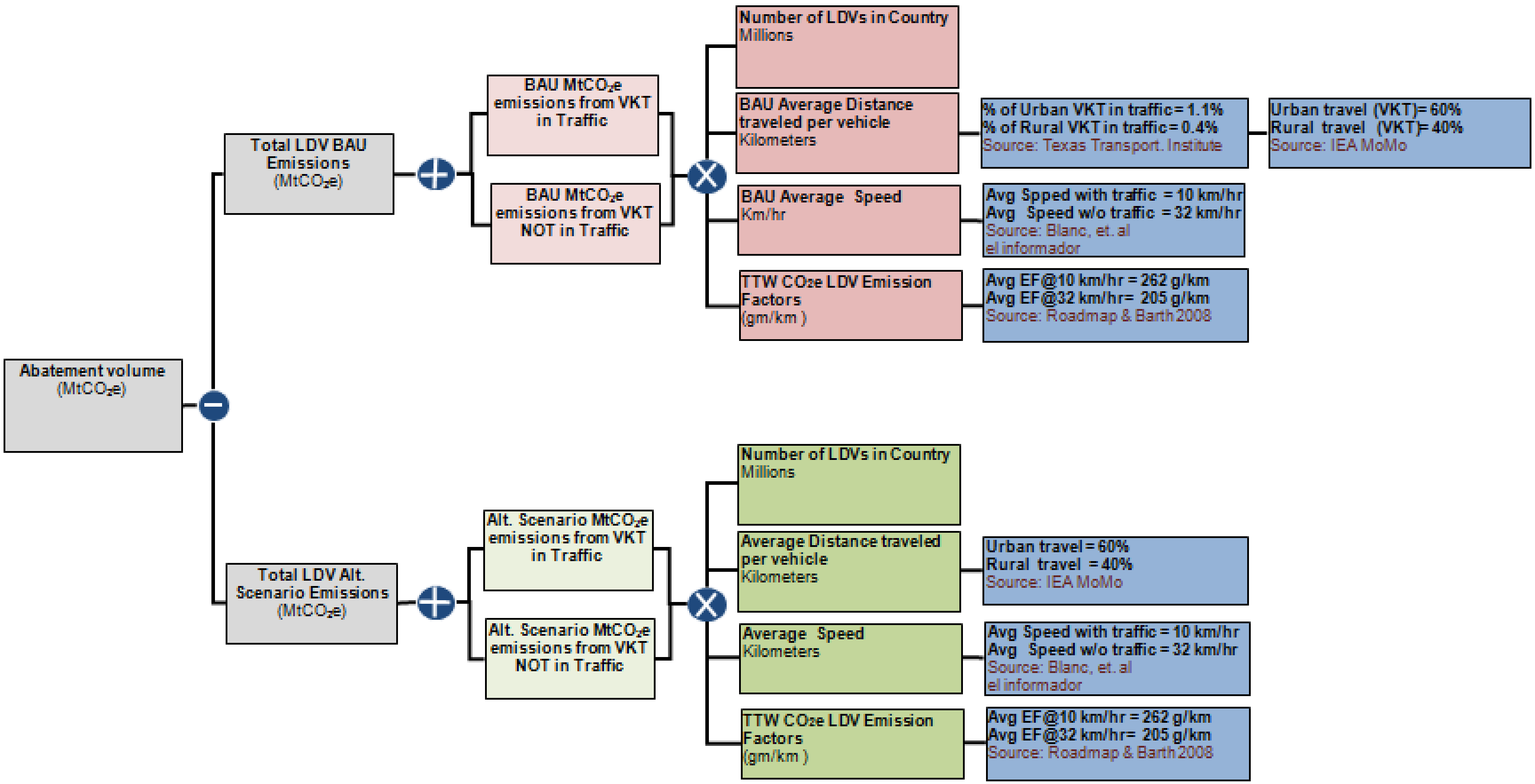
Vehicle Activity Reduction using ROADMAP

Fuel Efficiency Improvement from Traffic Congestion Mitigation



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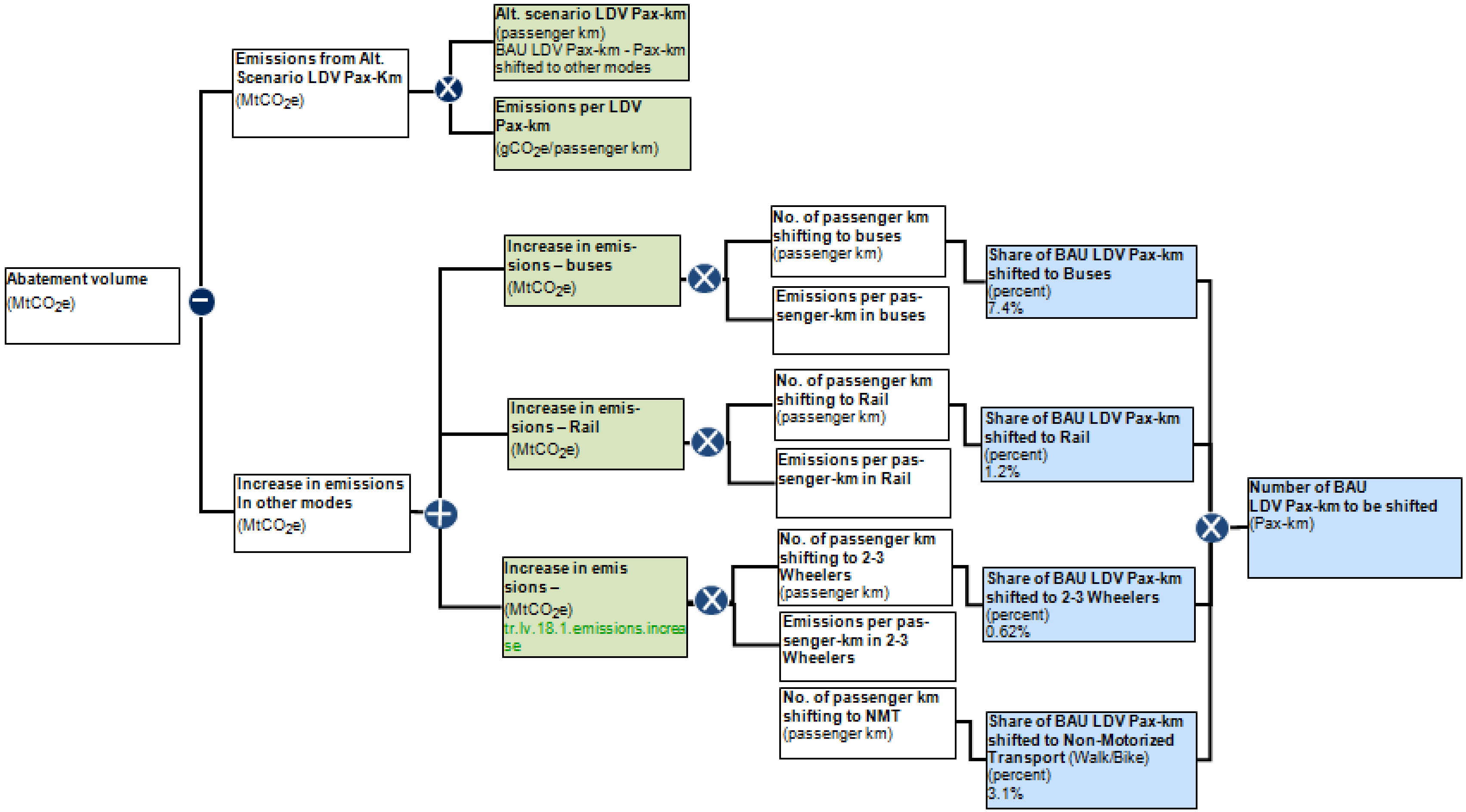
Modal Shift Using ROADMAP

Emissions Savings from Modal Shift: LDV to Bus, Rail and Non-Motorized Transport



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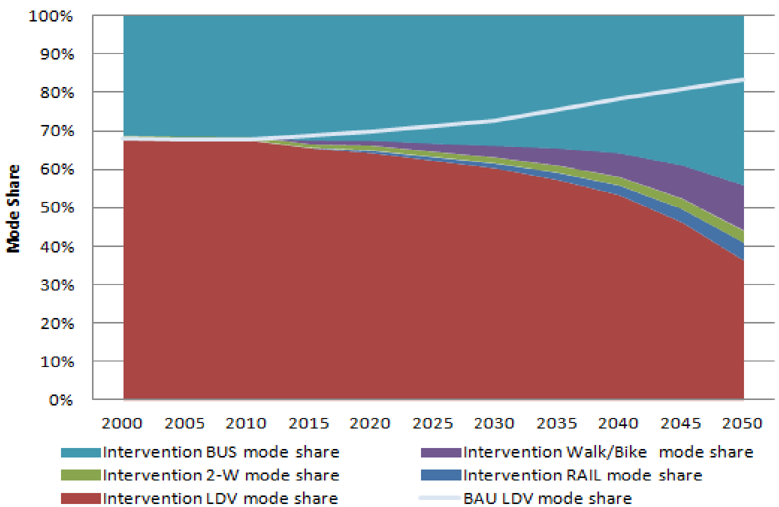
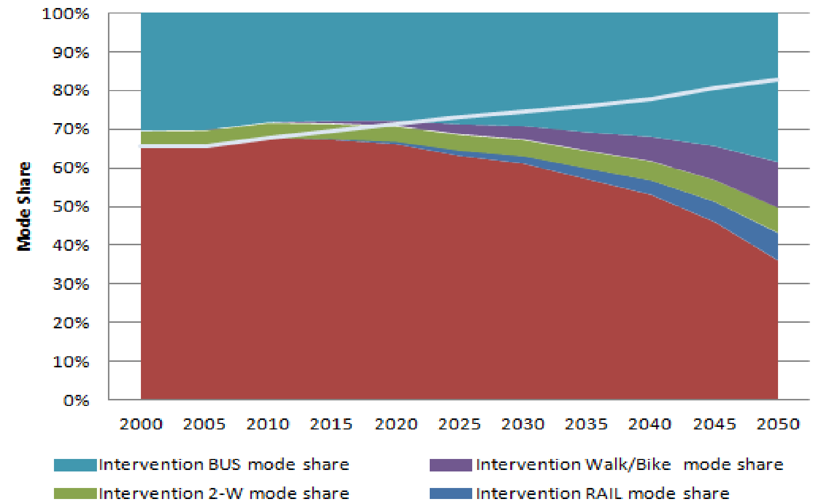
Scenario Results: Modal Shift

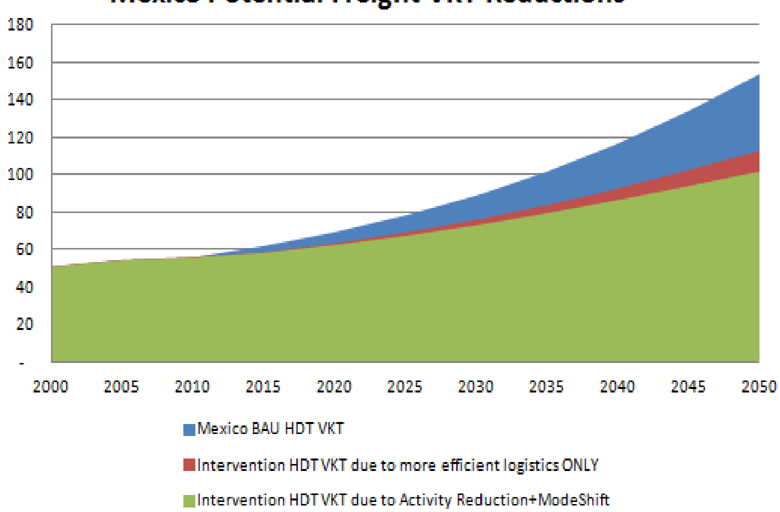
Mexico Intervention Strategy Mode Share



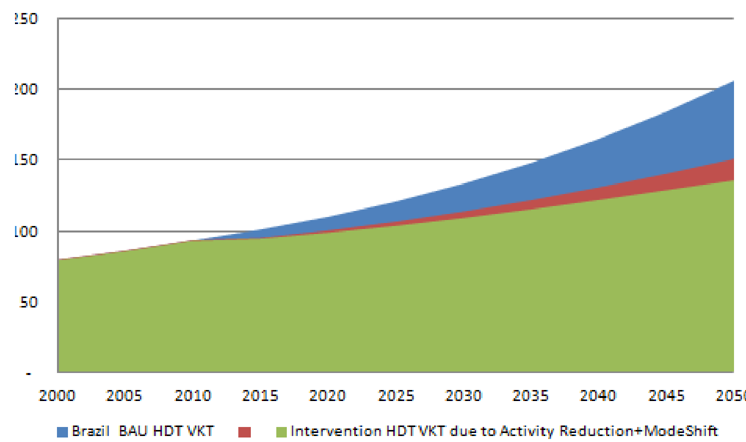
Brazil Intervention Strategy Mode Share



Mexico Potential Freight VKT Reductions



Brazil Potential Freight VKT Reductions



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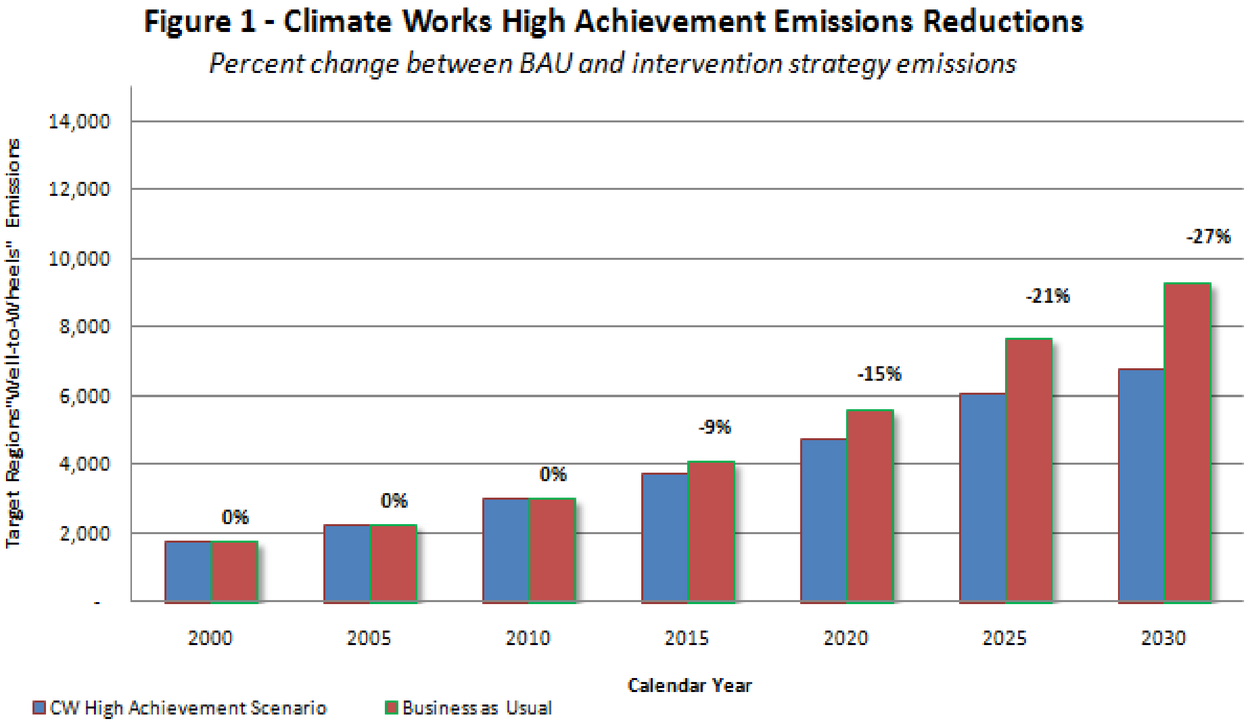
ROADMAP Scenario Results



Note: Targeted regions are Mexico, Brazil, China, and India.

This scenario reveals a maximum **reduction potential of 27 percent of CO2e per year by 2030** compared to the business as usual scenario in selected world regions.

Final Comments

- It's a great challenge to integrate micro-scale models (bottom-up) and national modeling efforts (bottom-up) to close the gap between GHG reduction targets for each nation and clean transportation projects on the ground

- The collection and availability of transport indicators, as well as regulatory frameworks for monitoring and evaluation GHG reduction from transport investments are extremely important

- GHG mitigation through avoid-shift-improve (ASI) paradigm is palpable and extremely important for the transport sector, which should encourage different organizations to cooperate in these efforts of data collection and analysis of potential pollutant reductions

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Thank you for your attention!

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