“M & E” FOR TRANSPORT NAMAS

Monitoring & Evaluation Design for Colombia’s TOD NAMA

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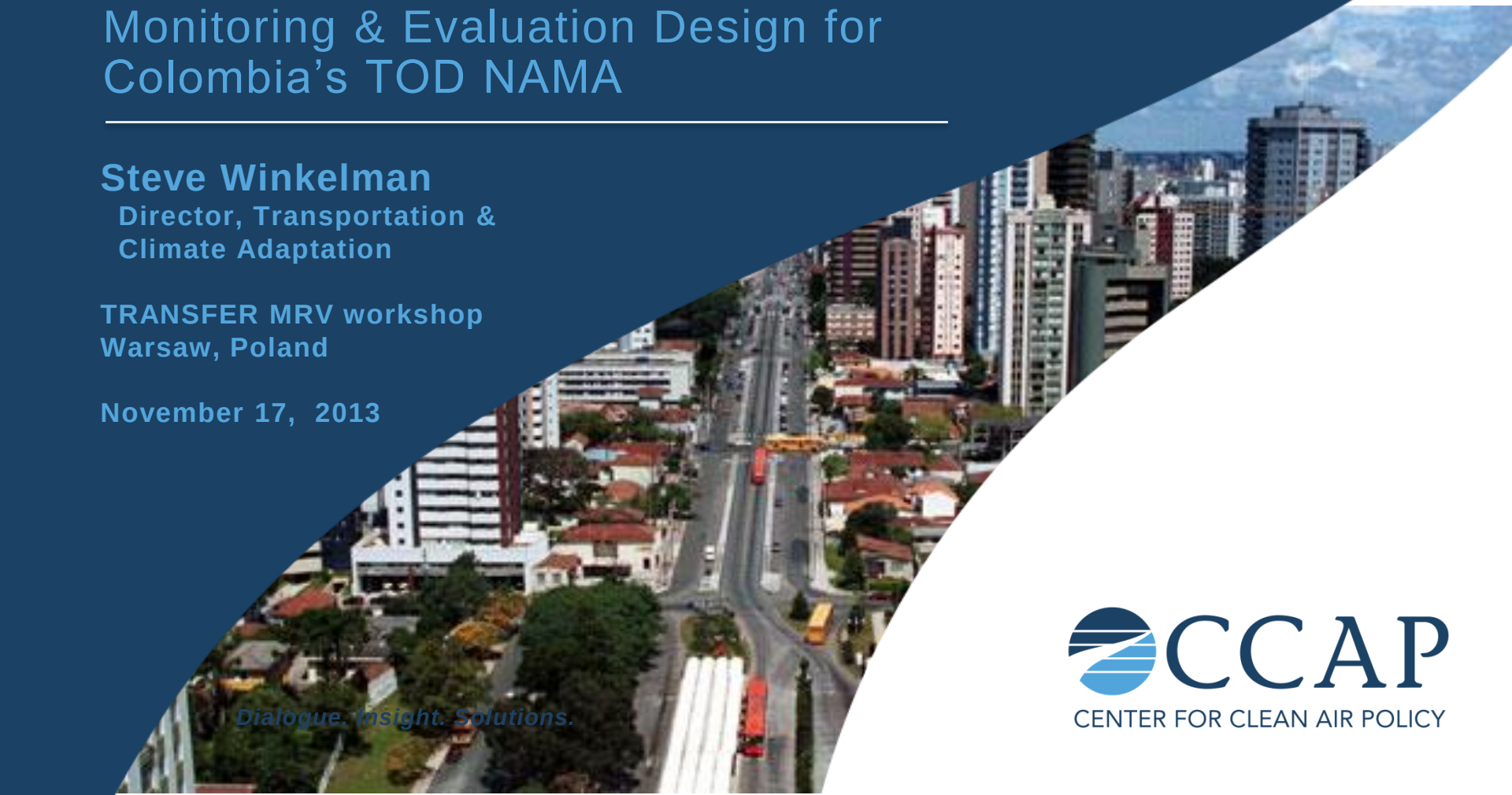
TRANSFER MRV workshop
Warsaw, Poland

November 17, 2013



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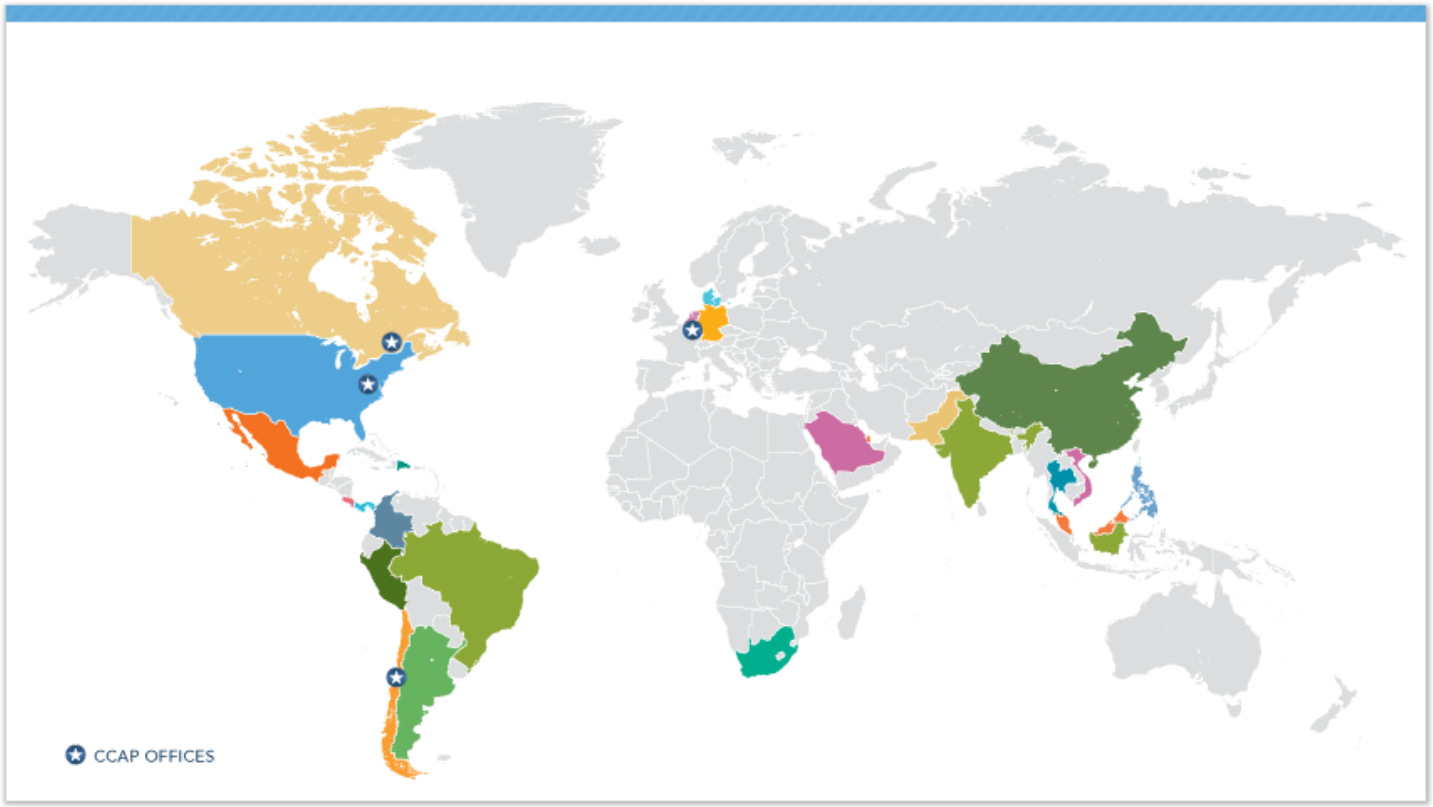


CCAP works with policymakers around the world to develop, promote and implement innovative, market-based solutions to major climate, air quality and energy problems.

Key themes

GHG Mitigation ("MAIN")

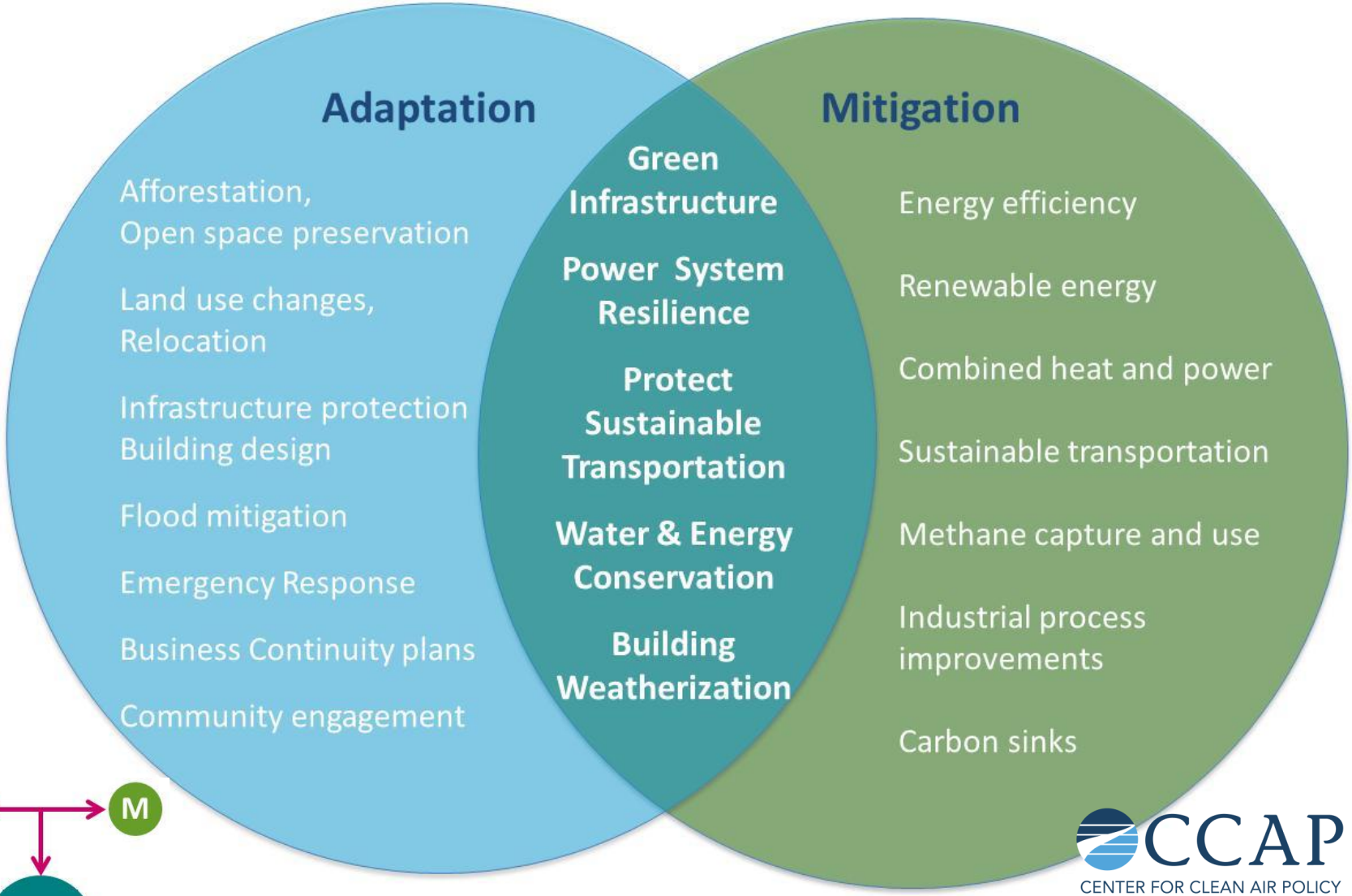
Adaptation

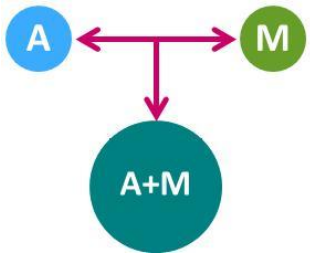
Public-private collaboration

Land use

CONNECT THE DOTS

Adaptation + Mitigation Synergies





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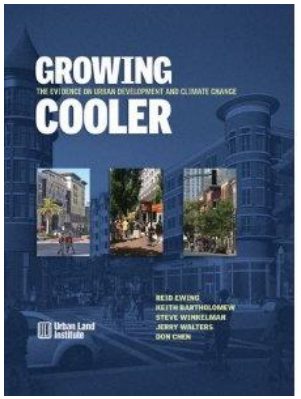
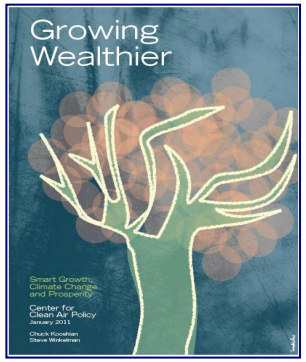
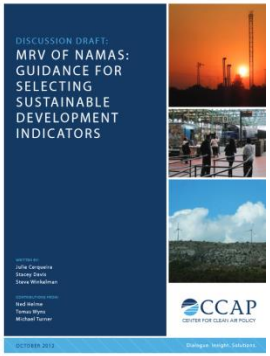
http://ccap.org/connecting-the-dots-adaptation-mitigation-synergies/

SELECTED PUBLICATIONS: TRANSPORTATION

- ***Growing Cooler***
  The Evidence on Urban Development and Climate Change
- ***Growing Wealthier***
  Smart Growth, Climate Change and Prosperity
- **Transportation NAMAs: A Proposed Framework**
- **MRV for NAMAs: Tracking Progress while Promoting Sustainable Development**
- **Data and Capacity Needs for Transport NAMAs**
  1. **Data Availability**
  2. **Data Selection**
  3. **Capacity Building Needs**







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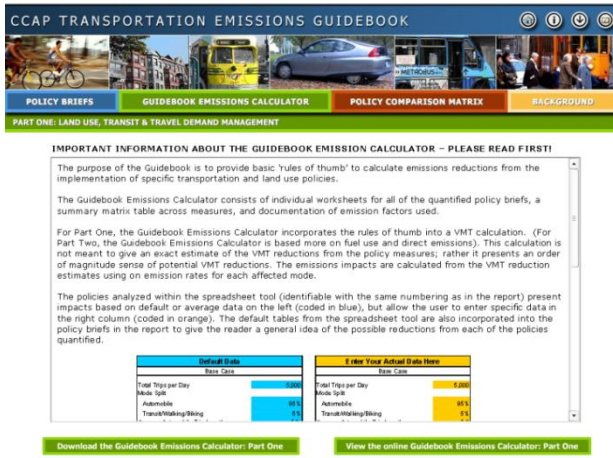
CCAP'S US TRANSPORT, DATA, MODELING & CAPACITY-BUILDING WORK

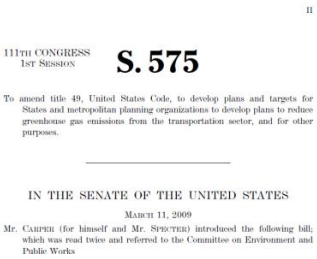
CCAP Travel Data and Modeling Recommendations to Support Climate Policy

CCAP Transportation Emissions Guidebook



Recommendations reflected in legislation, policy:

- Waxman-Markey: HR 2454 – American Clean Energy and Security Act
- Carper: SB 575 - Clean Tea
- Adaptation recommendations in
  - STRONG Act (House and Senate)
  - President's Executive Order on Climate Preparedness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111TH CONGRESS
1ST SESSION

S. 575

To amend title 49, United States Code, to develop plans and targets for States and metropolitan planning organizations to develop plans to reduce greenhouse gas emissions from the transportation sector, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 11, 2009

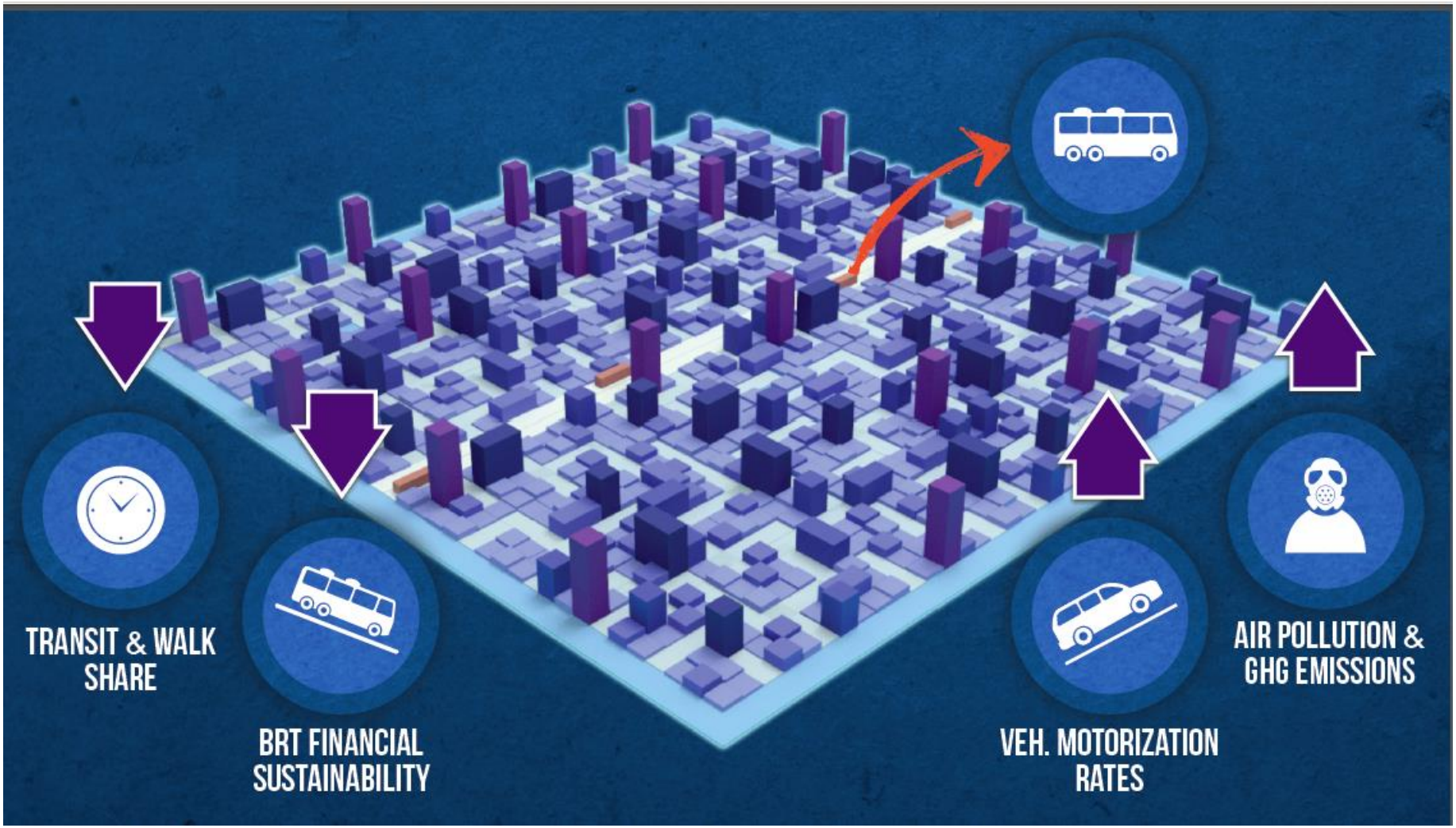
Mr. CARPER (for himself and Mr. SPECTER) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

COLOMBIA TOD NAMA
SELECTED BY UK/GERMANY NAMA FACILITY

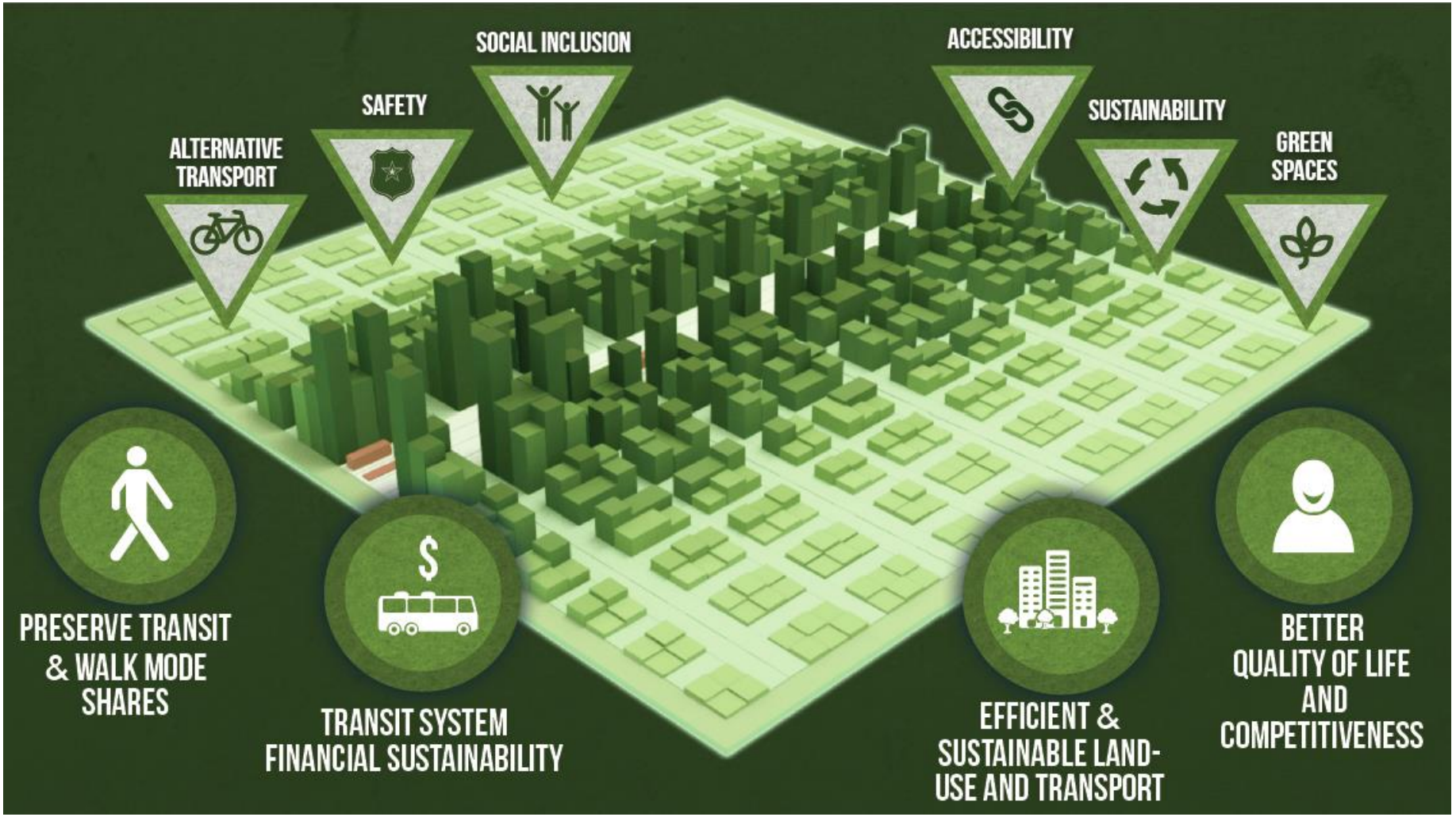
TOD NAMA will transform urban development in Colombia.

- **Shifting where & how public and private investments are made**
- **Increasing return on investments**
  - mass transit, social housing
  - environmental, economic and social
- **Catalytic Transit Neighborhoods**
  - Cali, Bogotá, Barranquilla, Medellín, Manizales
- **Policy reform & Integration**

BENEFITS OF BRT AT RISK:
LAND USE NOT INTEGRATED WITH TRANSIT



TOD BENEFITS FOR COLOMBIA

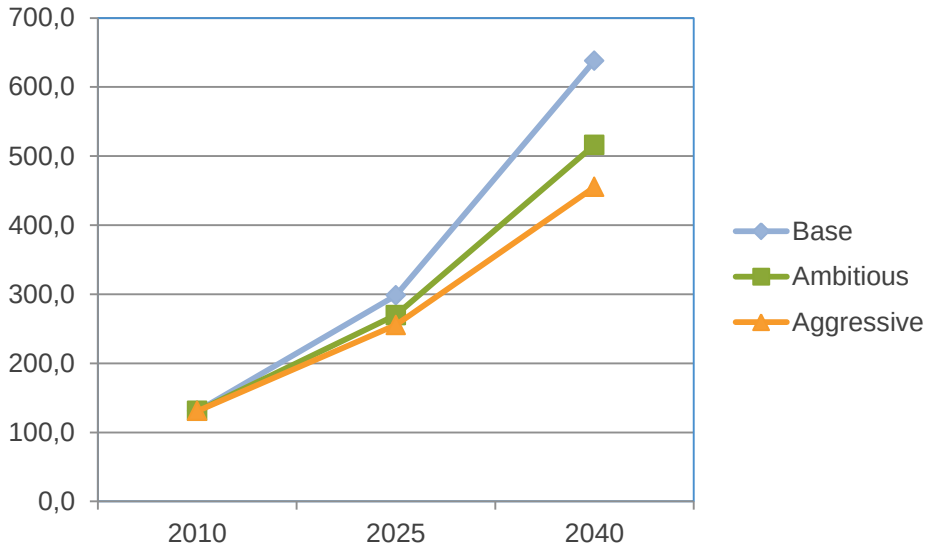


NEW APPROACH TO MRV IS NEEDED: "M & E" MONITORING & EVALUATION

- **Old approach: MRV for the Clean Development Mechanism**
  - CDM was focused on projects and short-term reductions
  - Stringent MRV required because generate emission reduction credits
  - Criticized for limited sustainable development benefits
  - Lee Schipper and I used to joke that the CERs just covered MRV costs

- **NAMA Opportunity: "M & E"**
  - **Transformative, sectoral policies** to reduce **long-term** GHGs
    - With short-term implementation and benefits
  - Emphasis on **sustainable development** (economic, social)
  - **Leverage finance: private sector**, international, shift public investment
  - **Do, Measure, Learn.**

GHG METHODOLOGY AND ASSUMPTIONS: VEHICLE KM TRAVELED (VKT)



Passenger Vehicle VKT (millions)

GHG reductions based on passenger VKT reductions.

Reduce *growth* in driving (VKT) by 25 - 36% due to changed land use and travel patterns

Considers a range of savings based on variation in TOD performance and penetration supported by literature

Range of VKT Savings (2040)			
	% of pop	Low	High
Large Cities	47%	27%	40%
Medium Cities	12%	20%	30%
Small Cities	30%	13%	20%
Rural	10%	0%	0%
Weighted average	100%	19%	29%

GHG METHODOLOGY AND ASSUMPTIONS: MODE SHARE & TRIP LENGTH

Representative assumptions for a 30% VKT reduction

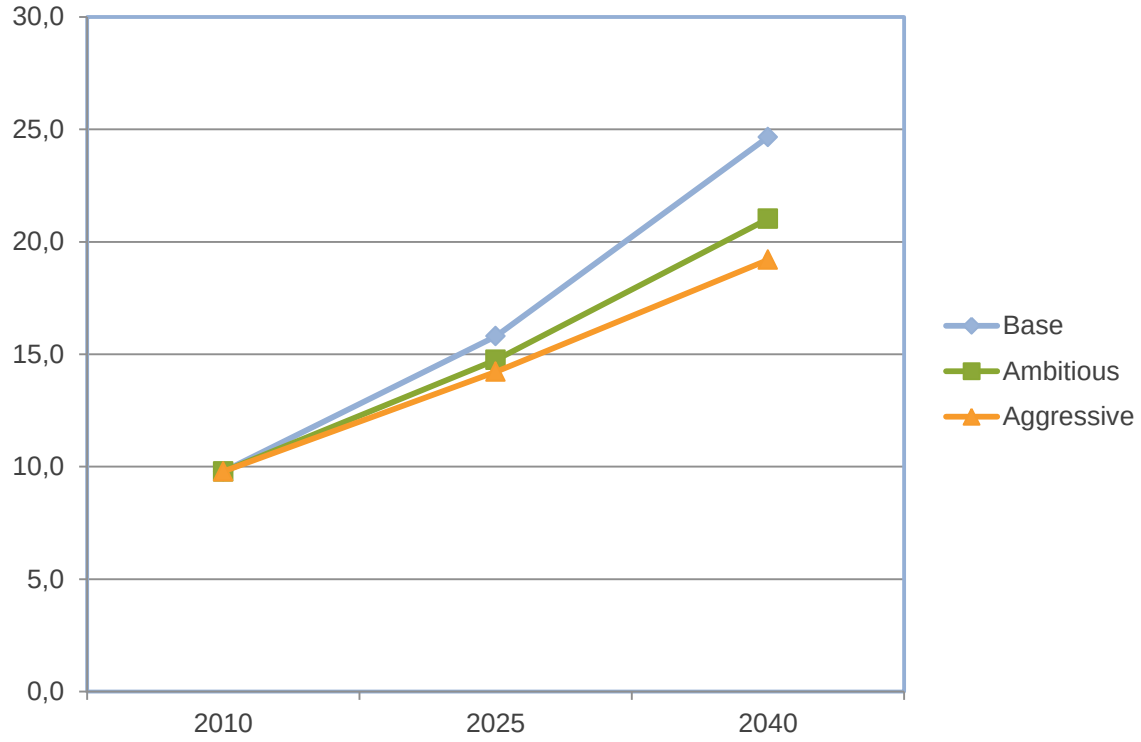
	Mode Share			
Mode	Base 2010	BAU 2040	TOD 2040	Change vs. BAU
Car	7%	25%	15%	-10%
Motorcycles	7%	25%	17%	-8%
Transit	54%	29%	41%	12%
Walk & Bike	20%	9%	15%	6%
Taxis	6%	6%	6%	0%
Other	6%	6%	6%	0%
TOTAL	100%	100%	100%	
Average Trip Length	12	12	10.2	-15%

VKT reductions come from shifting to other modes and shorter average trip lengths

Performance of TOD "technology" depends on technical, market and political considerations.

- the NAMA will address these
- M&E will measure

GHG METHODOLOGY AND ASSUMPTIONS: CO2 SAVINGS



Colombian light duty vehicle emissions ($MMTCO_2e$)

Annual savings by 2040:
3.6 to 5.5 $MMTCO_2$

(15-22% below base case)

Emissions corrected for increased transit emissions

Assumes 20% vehicle efficiency improvement in all scenarios

M&E: KEY POINTS

- **Practical and meaningful metrics required to assess progress, benefits & enhance policy performance**
  - Some impacts short-term, others take longer to manifest
- **Metrics for TOD areas should be compared to non-TOD areas** or urban averages to assess policy performance
- **M&E approach will evolve as NAMA Facility provides guidance**
  - Will be finalized in cooperation with Colombia & NAMA Facility

A BROADER M&E APPROACH: IMPLEMENTATION AND PROGRESS

Robust measurement can enhance policy performance.
If M&E addresses local priorities, it's desired not a burden.

Monitor and Evaluate:

1. **Implementation Actions**
2. **Transformational Aspects**
3. **Land Development and Travel activity**
4. **GHGs**
5. **Economic impacts** (household, business, governments)
6. **Social impacts**

1. IMPLEMENTATION PROGRESS

Assess whether the NAMA is on track:

- **Land use**
  - updated site zoning to accommodate TOD
  - improved design to enhance pedestrian connectivity
- **Public-Private collaboration**
  - selection of PPPs on TOD
  - formalization of agreements delineating public and private sector roles and responsibilities for TOD implementation (e.g., who funds and builds infrastructure, social housing)

2. TRANSFORMATIONAL ASPECTS

Is the NAMA on track to catalyze transformation?

- National and local policy shifts
  - CONPES, Decree, guidance for PPP on TOD
- Evidence of replication: share of public infrastructure funds in TOD areas
- Market shifts: interest by private sector, public

3. LAND DEVELOPMENT AND TRAVEL ACTIVITY

GHG savings are derived from VKT reductions due to more efficient land use patterns. The following metrics will be key for evaluating GHG impacts and refining projections.

- **Land use**
  - **Location:** % of development in TOD areas (m^2, $)
  - **Design:** Mix of uses, pedestrian orientation, parking requirements
- **Travel activity: <u>TOD areas vs. Control areas</u>**
  - **VKT/capita**
  - **mode share**
  - **trip length**

  Methods: Traffic counts, surveys, calibrated models
- **Motorization**
  - **Vehicle registrations**

4. GHG REDUCTIONS

- **Calculate based on travel and land use metrics**, comparing TOD and Control areas
  - Travel: Mode share, trip length…
  - Land use: location, design

- Take into account
  - Vehicle technology
  - Fuel carbon content
  - Travel speeds

5. ECONOMIC IMPACTS

Benefits and Costs

- for households, businesses and governments

- **Travel**: household transportation costs
- **Leveraged Investment:** private and international funds invested in TOD districts
- **Property values, retails sales, new businesses** (TOD vs. non-TOD areas)
- **Tax revenues**: increased property and sales tax revenue
- **Public costs**: per-capita infrastructure costs

6. SOCIAL IMPACTS

Impacts of TOD on quality of life, health and equity

- **Travel**: daily average travel time and distance
- **Household costs**: % of household budget spent on transportation
- **Accessibility**: % of population within 0.5 km of transit, shopping, jobs and services
- **Health:** physical activity levels; accident rates; air pollutant emission rates

KEY DATA AVAILABILITY: NATIONAL

Existing databases on vehicle registrations, drivers, travel demand on public transit systems, land use

- Need to connect, integrate (RUNT, SISETU, IDGT, IAU, IEEO…)

Colombian Ministry of Transport programs collect data for cities with transit built using national funds.

- Travel time: public and private vehicles
- Travel costs
- Transit service quality (*como vamos*)
- % of mass transit users with access to private vehicles
- Local air pollutant concentrations (PM10, O3, CO, NO2, SO2)
- Passenger/kilometers, vehicle occupancy, vehicles per hour and direction, platform passenger density
- BRT system financial data

KEY DATA AVAILABILITY: LOCAL

Bogotá's Mobility Survey (2005 & 2011)

- **Origin-Destination (OD) Household Surveys**
  15,500, all trips. Also, trip ;engths distribution in the city
- **OD Intercept Surveys**
  70,000 (car, transit); OD, purpose. Vehicle counts, occupancy
- **Travel Speed Studies** Along main corridors peak and off-peak (using floating car GPS measurement in selected segments)

Cali Green Corridor

- Starting primary data collection
- Assess VMT per mode with calibrated trip/mode generation model sensitive to accessibility and land use

CONCLUSIONS

- **Appraisal process will determine essential M&E needs**
- **Need for data, capacity building and model improvements**
  - Included small portion of NAMA budget for M&E, data improvements
  - Could be built into national policies, infrastructure investments
- **Sustainable development metrics key for deep penetration**
- **Measuring catalytic effect will be done over time**
  - Replication actions in other neighborhoods, cities
- **Partnering will be important** for comprehensive, long-term measurement of travel, environmental, social and economic benefits
  - Univ. los Andes CityLab: travel surveys and traffic counts
  - Business groups and NGOs: economic and social data
  - With international experts (such as you!)

¡GRACIAS!

DZIĘKUJĘ!

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Thank you: Chuck Kooshian & Felipe Targa.

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