

JCCTRP

Joint Clean Climate Transport Research Partnership
Partenariat de recherche conjoint sur le climat et les transports



Comparing Low-Carbon Urban Transport Policy in Montreal, Toronto and Los Angeles: Preliminary Findings

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Special Thanks to

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Outline of Presentation

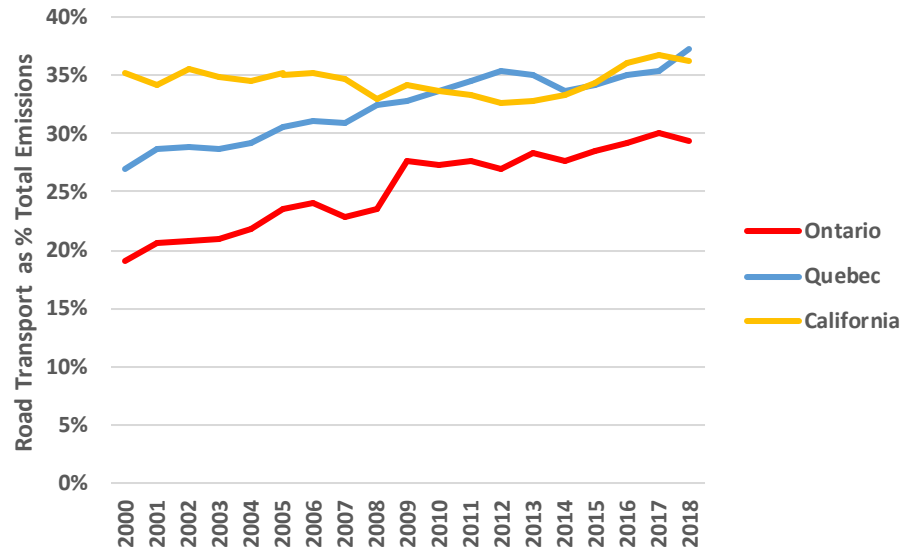
- **Introduction**
- **SB375: California Sustainable Communities and Climate Protection Act**
- **Findings**
 - **Los Angeles Metropolitan Region**
 - **Montreal Metropolitan Region**
 - **Toronto Metropolitan Region**
- **Discussion & Preliminary Conclusions**

Challenges to the Replication of California-style Climate Policy

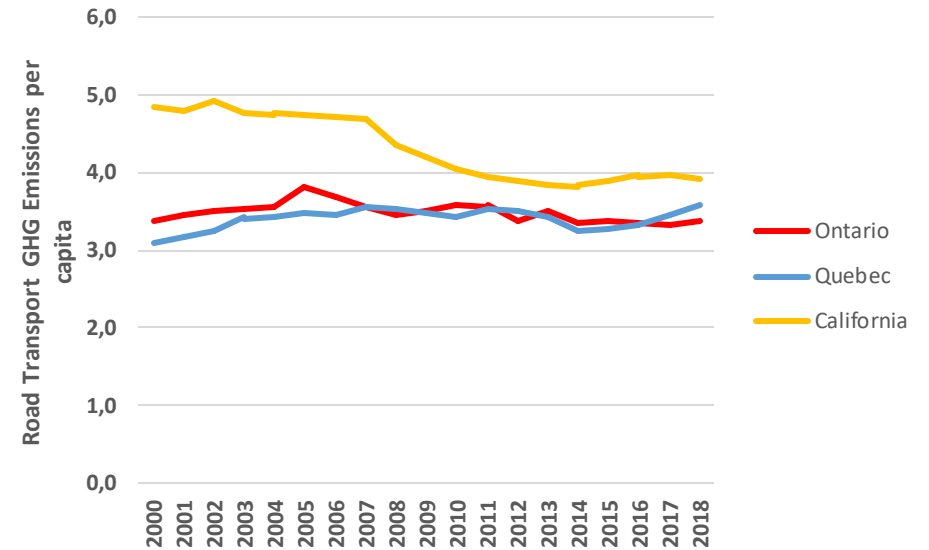
- **California is a recognized leader in climate change mitigation, a lot of policy innovation in transportation sector**
 - GHG emissions trading system linked with Quebec
 - Low Carbon Fuel Standard
 - Vehicle Emission Standards
 - ZEV mandates
 - SB375 Sustainable Communities and Climate Protection Act
- **Can California climate policy be replicated?**
 - “[California] has designed a system that relies almost uniquely on the capabilities of California and will not be easily replicated elsewhere.”
 - Bang G, Victor DG and Andresen S (2017) California’s Cap-and-Trade System: Diffusion and Lessons. *Global Environmental Politics* **17**:12-30.
 - **Quebec has replicated many but not all of California climate and transportation policies**
 - Purdon M, Witcover J, Murphy C, Ziaja S, Winfield M, Giuliano G, Séguin C, Kaiser C, Papy J and Fulton L (Forthcoming) Climate and Transportation Policy Sequencing in California and Quebec. *Review of Policy Research*.

Comparing Transportation Emissions in California, Ontario and Quebec

Road Transport as % Total GHG Emissions



Road Transport GHG Emissions per Capita



- **Goal**

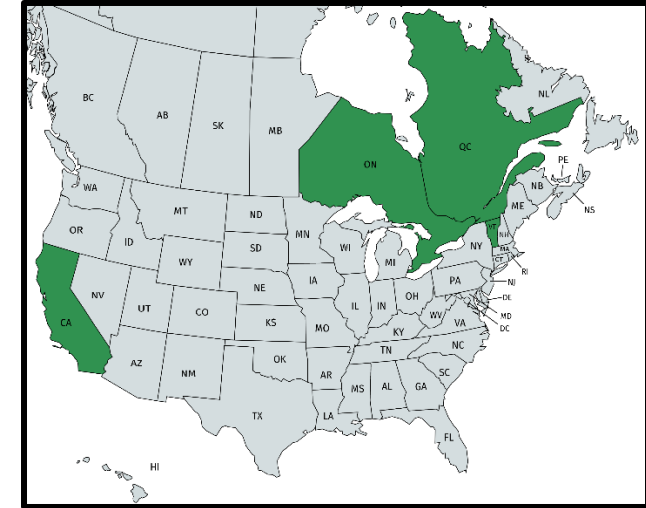
- To identify technical, economic and political factors shaping the potential for environmentally effective, economically efficient, and politically viable low-carbon transport and climate mitigation policy. The JCCTRP is addressing this goal by bringing together modeling and policy researchers in various jurisdictions into engagement with decision-makers.

- **Partner organizations**

- Leading universities, private research institutions, businesses and non-profit organizations
- **Quebec, California, Ontario and Vermont**
- Includes jurisdictions of the WCI, RGGI and TCI

- **Funding**

- Recipient of a Partnership Development Grant from the Canadian Social Sciences and Humanities Research Council (SSHRC)



Methodological Approach

- **Research Question**
 - What role does techno-economic modeling play in efforts to decarbonize the transportation systems of major metropolitan areas in North America?
- **Comparative approach investigating greater Montreal, Toronto and LA regions**
 - Policy review and analysis
 - Key informant interviews in Quebec, Ontario and California over 2020-2021

	Policy Experts	Modeling Experts	Total
Montreal	5	7	12
Toronto	6	6	12
Los Angeles	8	3	11
TOTAL	19	16	35

SB375: California Sustainable Communities and Climate Protection Act of 2008

Regional Transport Planning in California (before climate policy)

- **Metropolitan Planning Organizations (MPOs)**
 - Since 1962, large US metropolitan areas must create an MPO to facilitate a “continuing, comprehensive, and cooperative” transportation planning process in order to obtain federal transportation funds
- **Regional Transportation Plans (RTPs)**
 - MPOs fulfill its mandate by creating regional transportation plans (RTPs) every five years which define transportation investments over the next twenty years
- **Important Role for Transport System Modeling**
 - Bulk of day-to-day operations of MPOs involves assessing the impact of planned investments for the RTP using transportation forecasting models

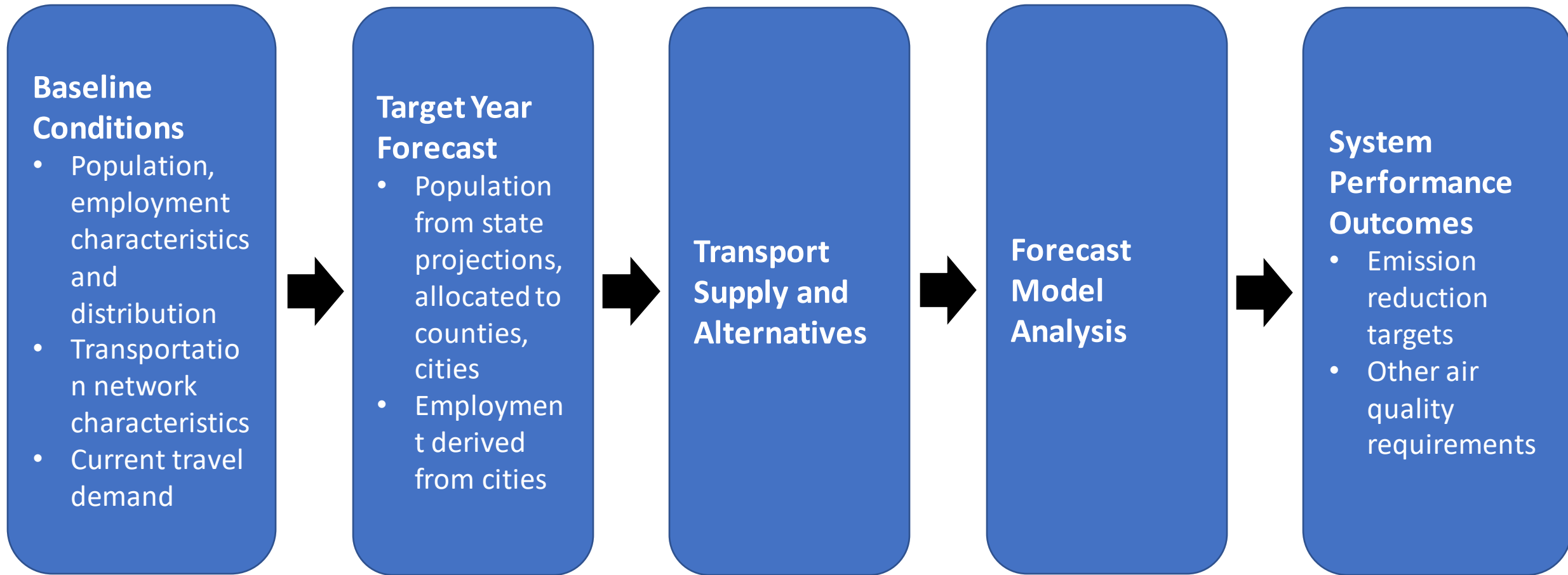
“SB375”: California Sustainable Communities and Climate Protection Act of 2008

- **Requires that MPOs adopt “Regional Plan Climate Targets”**
 - Expressed as a percent change in per capita passenger vehicle GHG emissions relative to 2005
 - In practice, these focus on reductions in vehicle miles traveled (VMT)
 - 18 MPOs currently plan for a 9.6% reduction by 2020 relative to 2005 levels of per capita passenger vehicle GHG emissions on average and an 18% reduction by 2035
- **Requires that a Sustainable Communities Strategy (SCS) be incorporated into the RTP**
 - A land use element that accommodates forecasted population growth
 - A transportation network to meet all regional needs
 - Transportation forecasting models have become critical to the demonstration of RTP compliance with federal and state air pollution and GHG reduction requirements.
 - CARB determines SCS compliance

SB375 Emission Reduction Targets for Various MPOs in California

Metropolitan Region	Sacramento	San Diego	San Francisco	Los Angeles
MPO	Sacramento Area Council of Governments (SACOG)	San Diego Association of Governments (SANDAG)	San Francisco Bay Area Metropolitan Transportation Commission (MTC)	Southern California Association of Governments (SCAG)
Regional Population (Approx, 2010)	2,323,000	3,095,000	7,375,000	18,075,000
Regional Land Area	6,193 sq. mi.	4,230 sq. mi.	7,000 sq. mi.	38,000 sq. mi.
No of Counties in Region	6	1	9	6
No. of Cities in Region	22	7	101	191
Size of RTP-SCS (latest)	2016 MTP-SCS (\$35 billion)	San Diego Forward 2050 (\$204 billion)	Plan Bay Area 2040 (\$303 billion)	2016 RTP-SCS (\$556.5 billion)
CARB Approved GHG Emission Reduction Target	2020 : 7% 2035 : 19%	2020 : 15% 2035 : 19%	2020 : 10% 2035 : 19%	2020 : 8% 2035 : 19%

Role of Techno-Economic Modeling in SB375



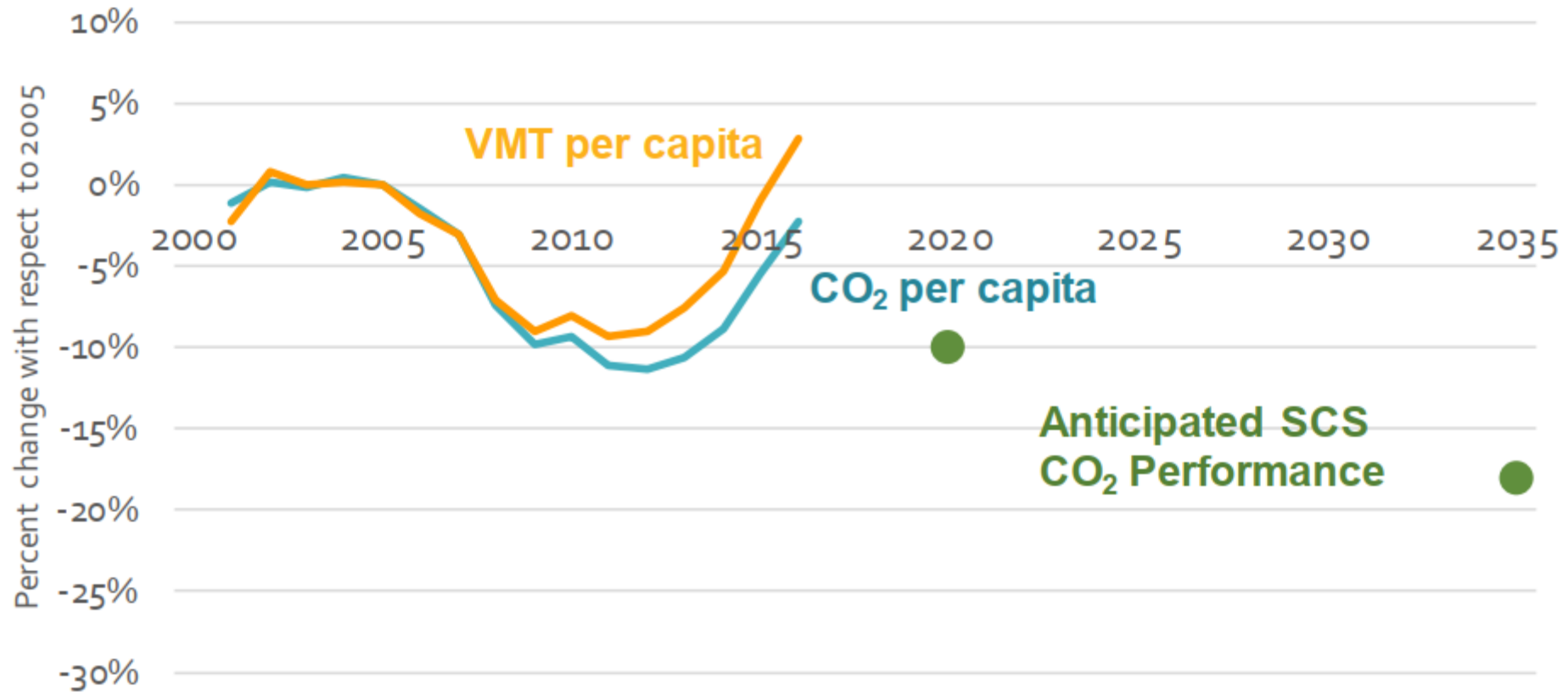
Techno-Economic Modeling is Formally Required to Demonstrate Conformity with SB375



If No, Revise Plan

Yes

California-wide CO₂ and Vehicle Miles Traveled (VMT) Per Capita Trend with Respect to Anticipated Performance of Current SCSs under SB375

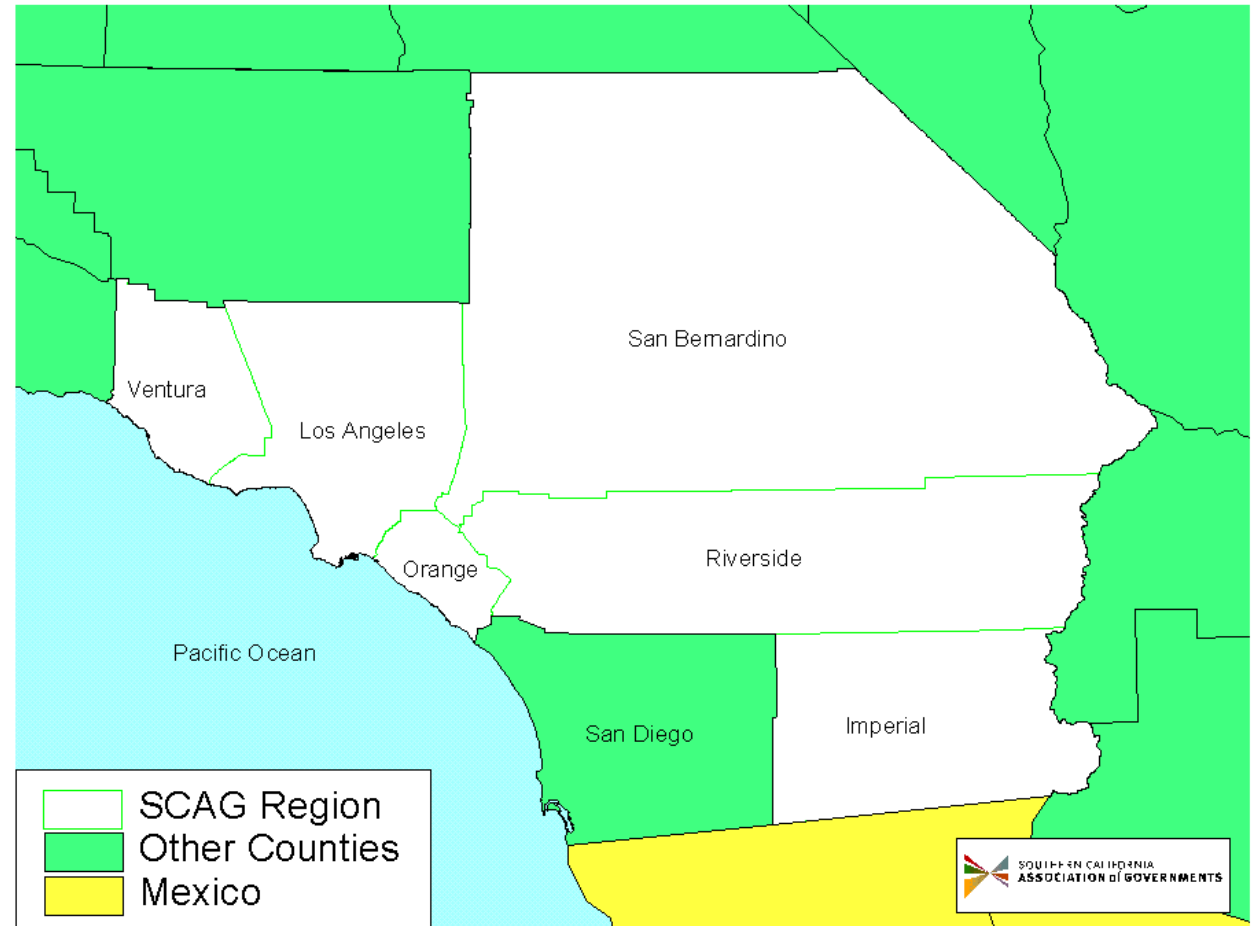


Results

Los Angeles Metropolitan Region

Southern California Association of Governors (SCAG)

- Under federal law, SCAG is designated as a Metropolitan Planning Organization (MPO) and under state law as a Regional Transportation Planning Agency and a Council of Governments.
- Very large area
 - 6 counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura)
 - 191 cities
- Population of 18.2 million



SCAG's Connect Southern California (SoCal) Plan

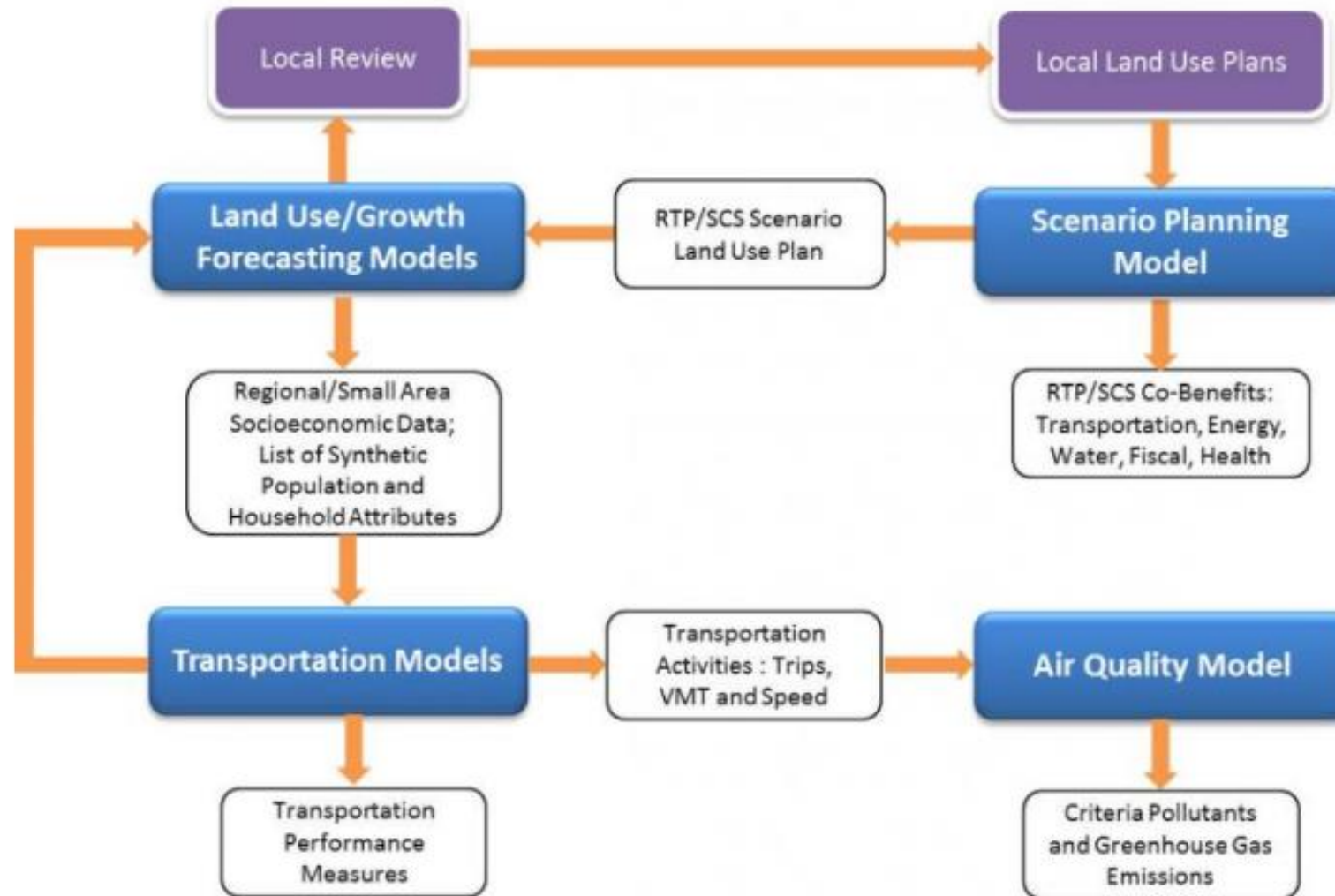
2020 RTP/SCS Plan

- Most recent RTP/SCS plan is known as “Connect SoCal”
- SCAG conducted a Plan vs. Baseline analysis, which compares how the region would perform with and without implementation of the SoCal Plan.
- Modeling indicated that Connect SoCal's aggregated strategies, measures and policies collectively* result in approximately 14% per-capita GHG reductions using the Activity Based Model, and 5% reductions using off-model methodologies



**See slide in appendix for aggregate measures*

Technical Capacity in Greater LA Region (SCAG)



Key Modeling Tools in Greater LA Region

- **Scenario Planning Model → Urban Footprint model**
 - SPM provides a powerful and dynamic scenario creation, modeling, and data organization framework designed to provide a comprehensive view of potential futures.
 - Estimate a wide range of potential benefits resulting from alternative transportation and land use strategies.
- **Transportation Models → new Activity Based Model “SimAGENT”**
 - State-of-the-art approach to forecast travel behavior
 - Generates performance indicators, conformity analysis, and environmental justice analysis for the 2016 RTP/SCS
 - Capable of analyzing the impact of infrastructure investment, land use development, pricing policy, active transportation, high speed rail, and travel demand management.
- **Many other policy actors in SCAG have modeling capacity**
 - For example, LA County Metropolitan Transportation Authority



SCAG Has Limited Implementation Capacity

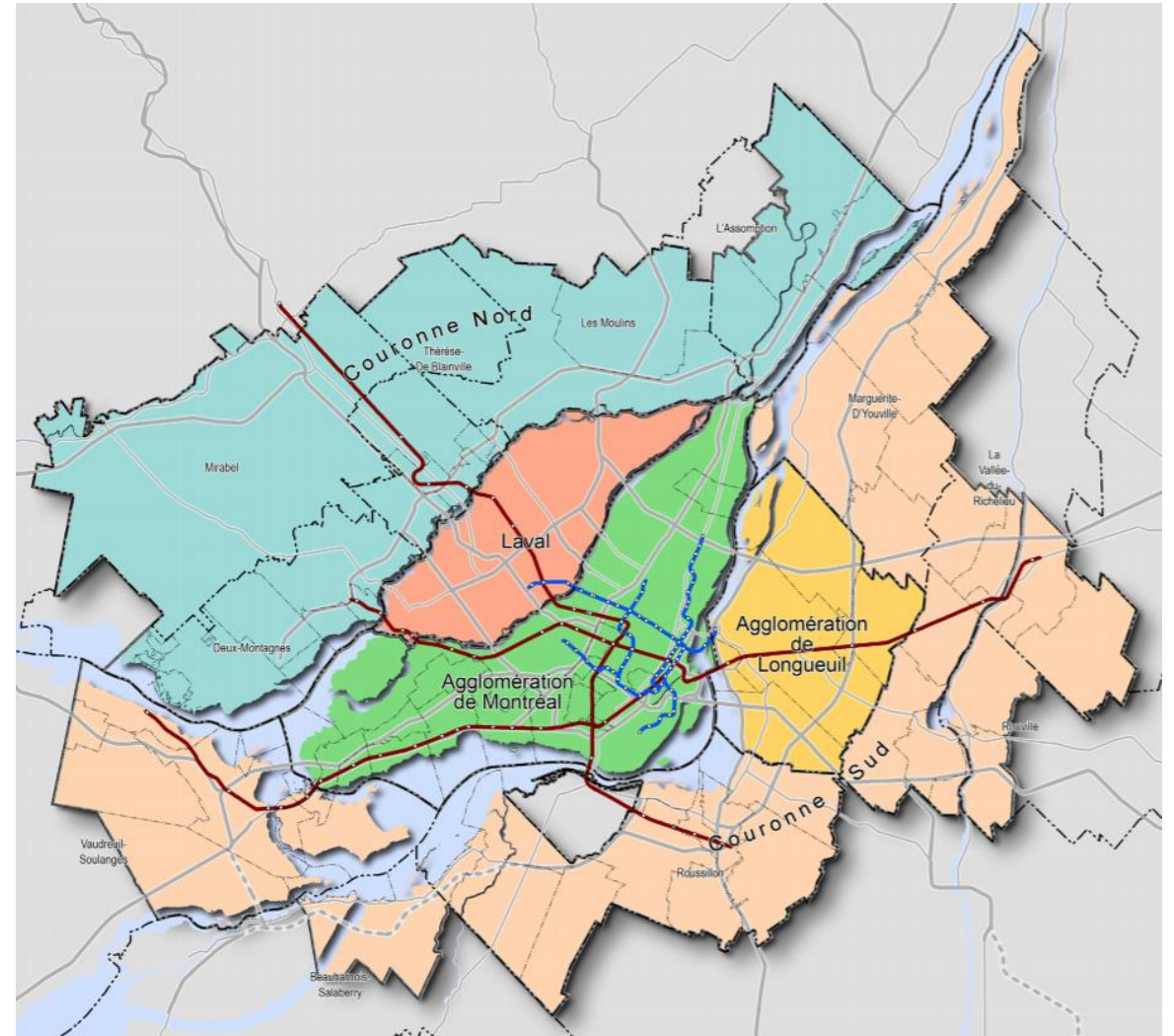
- **Example from Sustainable Communities Strategy Technical Report**
 - “It is important to note that SCAG does not have a direct role in implementing the SCS—neither through decisions about what type of development goes where, nor what transportation projects are ultimately built.”
- **Municipalities in LA region have greater financial autonomy than elsewhere in US**
 - LA county has effectively introduced a permanent 2% sales tax measures that allow it and other local governments to generate 60% of core revenues for transport improvements
- **Need for change?**
 - Interviews indicated that there is growing recognition that lack of coordination of land-use decision-making is inhibiting the effectiveness of SB375
 - Impetuous is not climate change but housing crisis in California

Results

Montreal Metropolitan Region

Transport Policy Actors in Greater Montreal Region

- **Communauté métropolitaine de Montréal (CMM)**
 - Metropolitan land use and development plan/*Plan métropolitain d'aménagement et de développement* (2011)
- **Autorité régionale de transport métropolitain (ARTM)**
 - Strategic plan for the development of public transit/*Plan stratégique de développement du transport collectif* (2021)
 - ARTM Responsible for public transport planning and modeling
- **Ministry of Transport (MTQ)**
 - Quebec Sustainable Mobility Policy-2030/*La Politique de mobilité durable-2030*
 - MTQ responsible for road transport planning and modeling
- **Caisse de dépôt et placement du Québec (CDPQ)**
 - Quebec pension fund
 - Developer and operator of new regional light rail project
- **Conseil du trésor**
 - Responsible for approving major public infrastructure projects



No Regional Emission Reduction Targets, though Provincial and City Targets

- **Neither CMM nor ARTM have regional emission reduction targets**
- **Quebec Sustainable Mobility Policy– 2030:**
 - Access to at least 4 sustainable mobility services for 70% of the Quebec population
 - A 20% reduction in average travel time between home and work
 - A 20% decrease in the share of solo car trips across Quebec
 - A 40% reduction in oil consumption in the transport sector below the 2013 level
 - A 37.5% reduction in GHG emissions in the transport sector compared to 1990
 - A reduction in the costs associated with road congestion for businesses in the metropolitan areas of Montreal and Quebec
 - A 20% reduction in gross household spending allocated to transportation
 - Also proposes to adopt the “Avoid-Shift-Improve” approach to transport planning
- **City of Montreal: Climate Plan 2020-2030**
 - A 55% reduction in GHG emissions from the community and municipal activities
 - A decrease in the consumption of fossil fuels in the Montreal community
 - A 25% reduction in the share of solo cars
 - 47% of electric vehicles registered in Montreal

No formal requirements for the use modeling to demonstrate conformity with policy targets

Key Modeling Tools in Greater Montreal Region

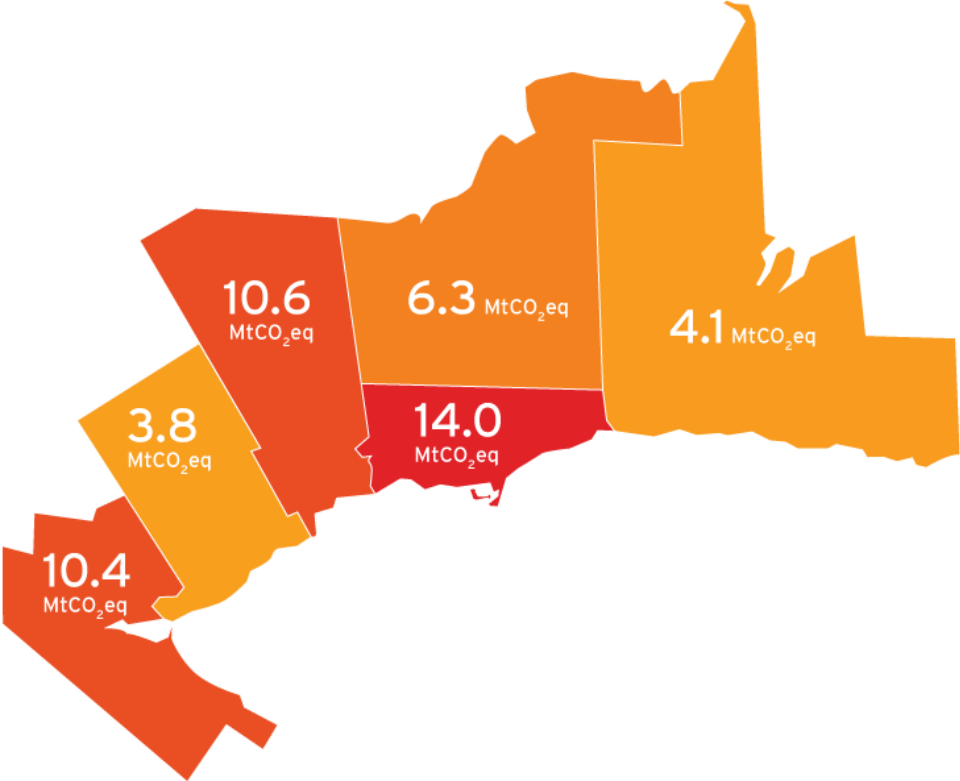
- **MADIGAS transport demand model**
 - Initially developed at Polytechnique Montréal
 - Has been used for the past 30+ years
 - Separate modeling efforts
 - Road transportation planning → Ministry of Transport
 - Public transportation planning → ARTM
 - Estimation of modal shift undertaken separately by MTQ
 - Development of “Transition” model at Polytechnique Montréal
- **No evidence of application of modeling for land-use planning**
 - CMM does not appear to do modeling
- **No evidence of integrated land-use and transportation planning**

Results

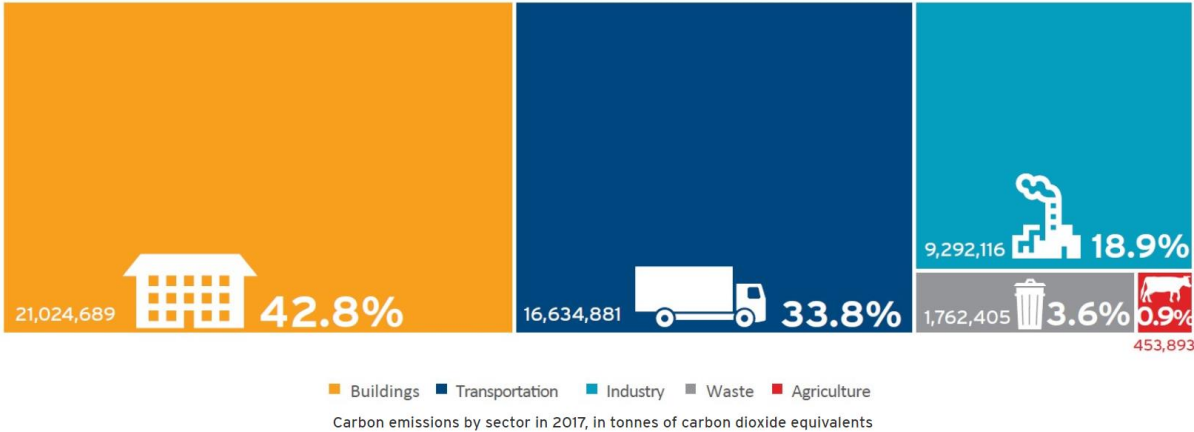
Toronto Metropolitan Region

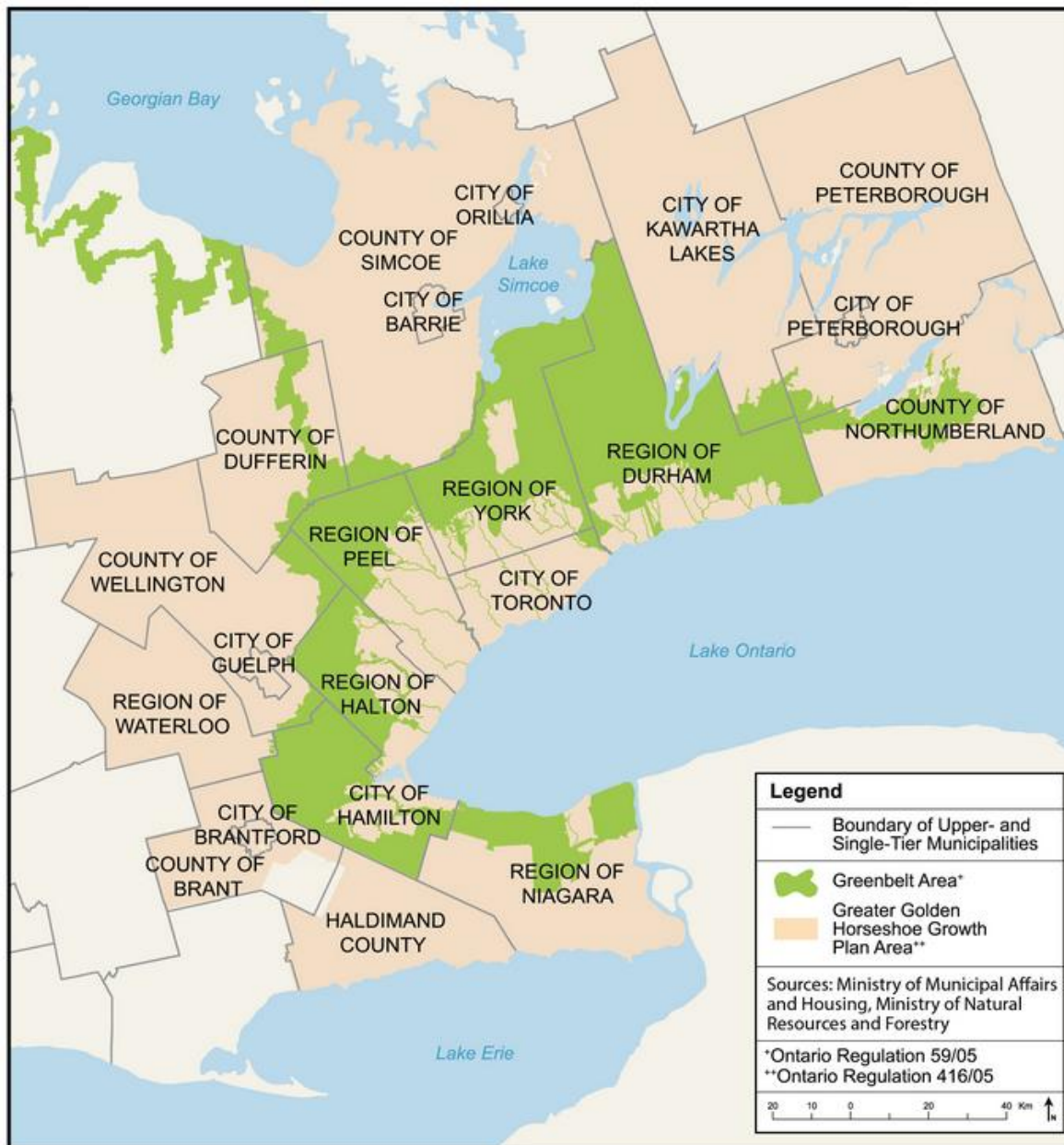
Toronto Metropolitan Region Climate Policy

- **Greater Toronto and Hamilton Area**
 - 49.2 MtCO₂e in 2017
 - 41% of Ontario's carbon emissions
 - Emissions fell 3.3% between 2015-2016, then remained flat between 2016-2017



Buildings and Transportation are the GTHA's Two Largest Sources of Emissions





Ontario Climate Policy

- **A Made-in-Ontario Environment Plan**
 - Presented in November 2018
 - Relaxed 2030 target vis-à-vis previous plan
 - Repealed cap-and-trade and replaced with regulatory framework for industrial emitters
 - Current target: 21% reduction of GHG emissions relative to 1990 by 2030
 - Previous government target: 37% reduction by 2030 relative to a 1990
- No links to modelling or other substantiation to support the claimed reductions



Preserving and Protecting our Environment for Future Generations

A Made-in-Ontario Environment Plan

As modelling energy

Ministry of the Environment, Conservation and Parks

Ontario

The graphic features a central cluster of five hexagonal images: a blue sky, a forest, a lake, a hand holding a plastic bottle, and a field. A white box with the text 'As modelling energy' is overlaid on the sky image. The background has a pattern of light blue dots.

Ontario Climate Policy

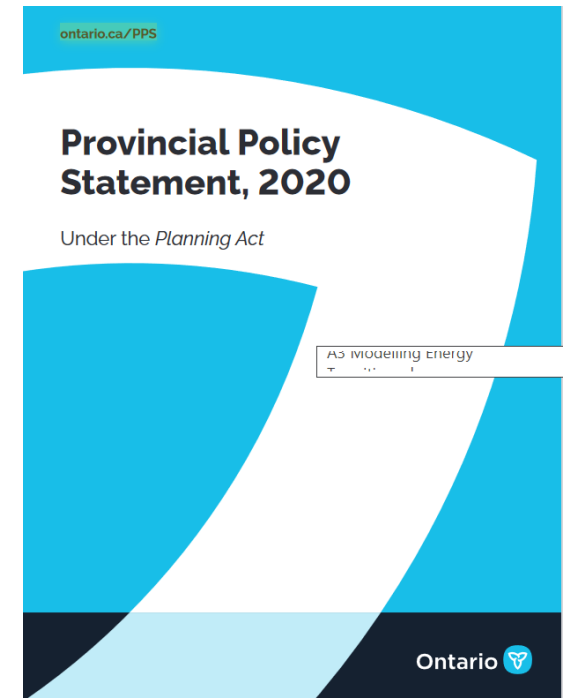
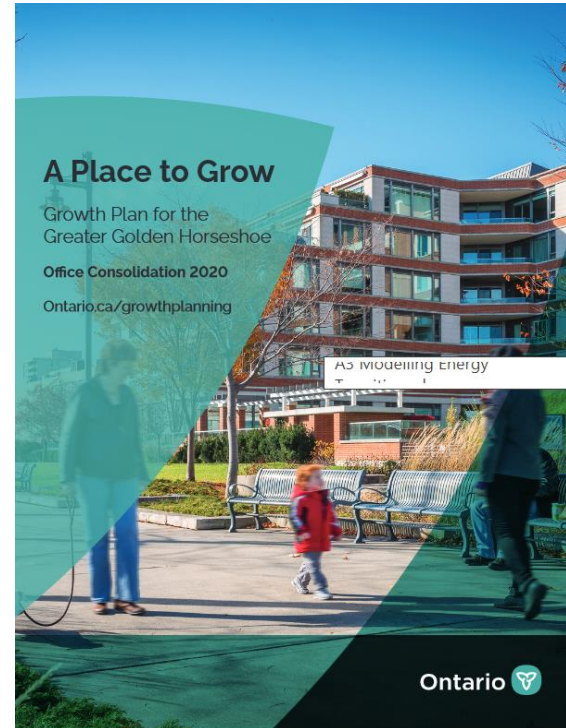
"Our audit found the province risks its 2030 emission-reduction target, in part because climate change and the reduction of greenhouse gas emissions is not yet a cross-government priority,"

Auditor General of Ontario
November 2020



Climate, Transportation and Land-Use Planning Linkages

- Formal land use planning policies (PPS under Planning Act and GGH Growth Plan) make explicit linkages between transit, active transportation and urban form
- Policies reference climate change but do not mandate climate planning, or achievement of specific targets by municipalities or other agencies



Climate, Transportation and Land-Use Planning Linkages

- Local transportation/transit planning and services in hands of local governments with very weak climate mandates through PPS.
 - Some communities have developed Climate Change Plans which include significant transportation elements
 - E.g. TransformTO Transportation:
 - By 2050, 100 per cent of vehicles in Toronto will use low-carbon energy; 75 per cent of trips under 5 km will be walked or cycled.
- Regional transportation planning divided between Metrolinx (transit and active transportation) and MTO (roads)
 - Neither has climate mandate
 - Provincial interventions in name of transit supportive development brutally pro-development

Climate, Transportation and Land-Use Planning Linkages

- Major transit/transportation decision-making highly politicized
 - June 2021 Discussion paper on GGH transportation planning
 - “...excellent if your idea of transit planning is colourful lines on a map..... paltry evidence that it’s actually going to drive transit ridership.”
 - “evidence-free decision-making”
 - No regulatory process/oversight
 - Environmental Assessment (EA) process eviscerated to point of meaninglessness
 - Federal government follows provincial/local lead
 - Longstanding conflicts between City of Toronto and Province over regional transit planning



Climate, Transportation and Land-Use Planning Linkages

- Multiple, potentially high capacity actors
 - City of Toronto, TTC, Metrolinx, MTO, some 905 municipalities, Board of Trade, university research units.
- No integrative governance policy or regulatory framework
 - 416 (downtown) vs. 905 (suburb) conflicts
- Climate/environmental considerations rhetorical at best at regional level
- No meaningful sectoral policies around EVs and infrastructure, fuels, or TDM

Discussion & Preliminary Conclusions

Elements of Technical Capacity

	Road Transport Modeling	Public Transit Modeling	Land-Use Modeling
Montreal	✓	✓	
Toronto	✓	✓	
Los Angeles	✓	✓	✓

- **LA has greater technical capacity than two Canadian urban regions**
 - Montreal and Toronto only beginning to build inter-modal modeling capacity
 - Integrated Land-Use and Transport modeling capacity only really being used in LA

Elements of Institutional Capacity

	Regional Transportation Planning Capacity	Modeling Requirements	Regional Transportation Infrastructure & Finance	Land-Use Authority
Montreal	<u>Modal Separation</u> ARTM & Min Transport	Inconsistent Practice	CDPQ & Provincial Treasury Board	Provincial Authority, CMM & Municipal Implementation
Toronto	<u>Modal Separation</u> Metrolinx, City/TTC & Min Transport	Inconsistent Practice	Metrolinx & Provincial Treasury Board	Provincial Authority & Municipal Implementation
Los Angeles	<u>Integrated</u> MPO	Formal Requirement	MPO < Counties & Cities	Counties & Cities

Preliminary Summary Findings

	Strengths	Weaknesses
Montreal & Toronto	<ul style="list-style-type: none">• Provincial governments have greater authority over land-use planning, which could allow for more effective implementation	<ul style="list-style-type: none">• Currently have lower technical capacity but building greater modeling capacity, particularly for intermodal modeling• Little evidence of integration of transport and land-use modeling• Absence of regional institution for integrated planning
Los Angeles	<ul style="list-style-type: none">• Greater technical capacity<ul style="list-style-type: none">• Greater modeling capacity• Greater capacity for integrated transport and land-use planning• Formal requirement of modeling enhances transparency• MPO is a key regional institution for integrated planning	<ul style="list-style-type: none">• Limited coordinated authority over land-use planning results in major implementation gap

Preliminary Conclusions

- **California: lucid planning process but major implementation gap**
 - California regional authorities have greater technical and planning capacity but little authority for policy implementation.
 - The extent of the challenge for reducing emissions in the transport sector is relatively well understood, but planning authority does not have power for implementation.
 - Federal Clean Air Act and federal transport funding have been important driver of technical and institutional capacity (though federal funding less salient in LA region)
- **Canada: less transparent and more politicized planning process but greater potential authority for implementation**
 - Modeling capacity currently insufficient for grasping the size of the climate challenge
 - But as “creatures of the provinces”, municipalities are subject to provincial decision-making which could give Canadian urban regions an implementation advantage
 - Relative absence of federal leadership, especially conditional funding transfers

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Appendix

SCAG's GHG Reduction Approach

The following are the strategies that SCAG has included and quantified in order to demonstrate the region's ability to meet the targets.

Congestion Pricing	Bike Share and Micromobility
Express Lane Pricing	Increased Electric Vehicle Charging Infrastructure
Improved Bike Infrastructure	Electric Vehicle Incentives
Infill development and increased density near transit infrastructure	Improved Pedestrian Infrastructure
Mileage-Based User Fee	Multimodal Dedicated Lanes
New Transit Capital Projects	Safe Routes to School
Shorter trips through land use strategies such as jobs/housing balance	Transit/TNC Partnership Program
Transportation Demand Management	Increased Average Vehicle Ridership in Job Centers
Job Center Parking Strategy	Parking Deregulation in certain Priority Growth Areas