

The Benefits of Small Vehicles for Compact, Electric Cities Webinar

Institute for Transportation & Development Policy
May 2026

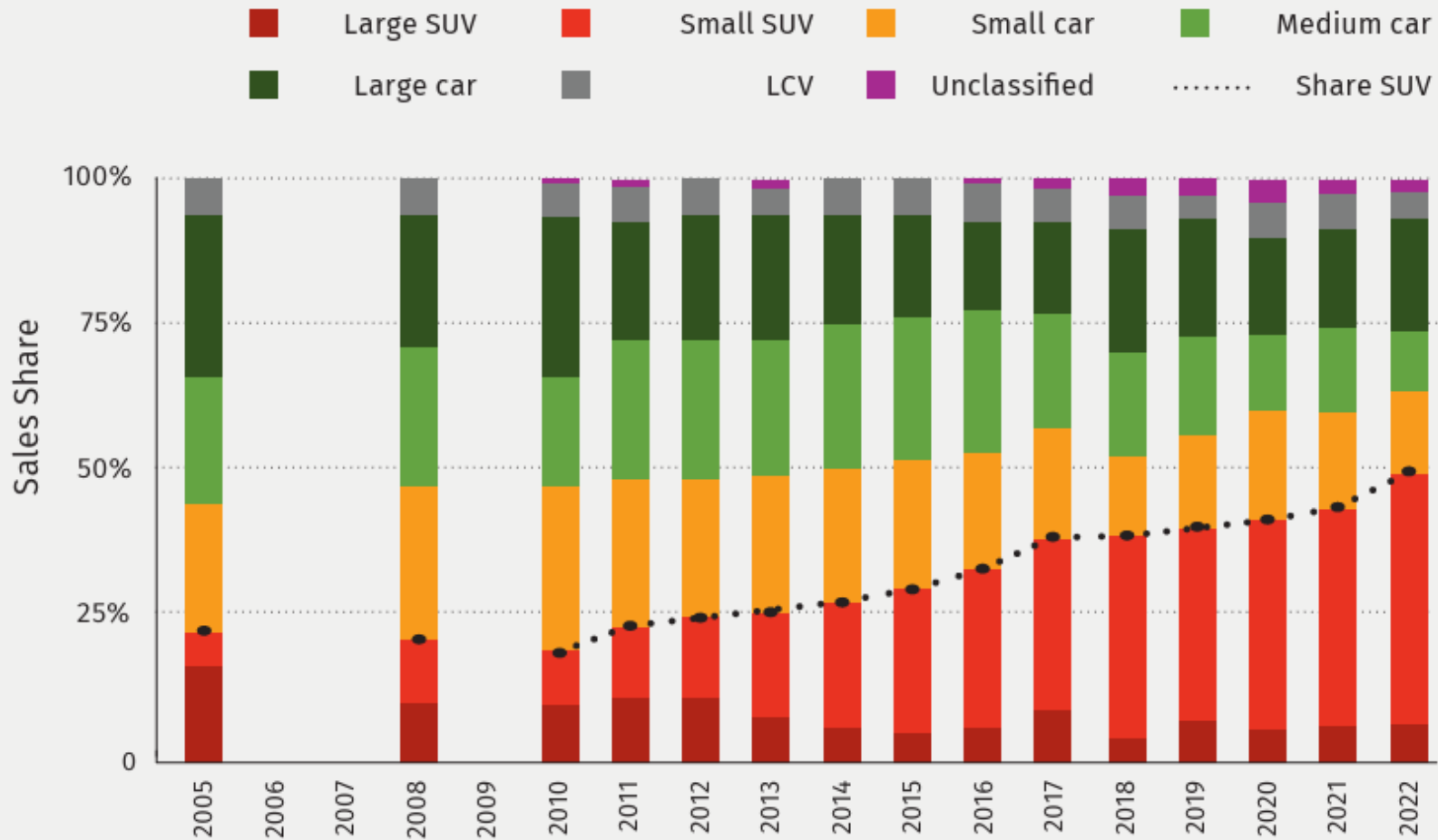
ITDP
Institute for Transportation
& Development Policy

UC DAVIS
UNIVERSITY OF CALIFORNIA

 **FOUNDATION**

Why Study This?

Figure 3.3.a. GFEI results describing global LDV sales by size class and year



Children are **8 times more likely** to be killed in a crash with an SUV or pickup truck than a crash with a sedan.



Source: Edwards and Leonard, 2022

Background

Find these reports at [ITDP.org/Publications](https://www.itdp.org/Publications)



The Compact City Scenario – Electrified

THE ONLY WAY TO 1.5°C



2021



Compact Cities Electrified: Indonesia

EXECUTIVE SUMMARY



Compact Cities Electrified: India

BRIEF FOR POLICYMAKERS



Compact Cities Electrified: United States

BRIEF FOR POLICYMAKERS



Compact Cities Electrified: Egypt

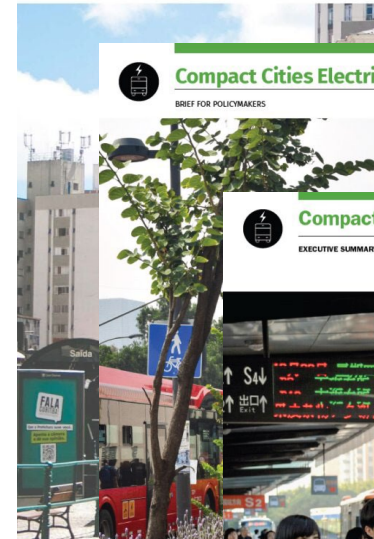


2023



Compact Cities Electrified: Brazil

BRIEF FOR POLICYMAKERS



Compact Cities Electrified: Mexico

BRIEF FOR POLICYMAKERS



Compact Cities Electrified: China

EXECUTIVE SUMMARY



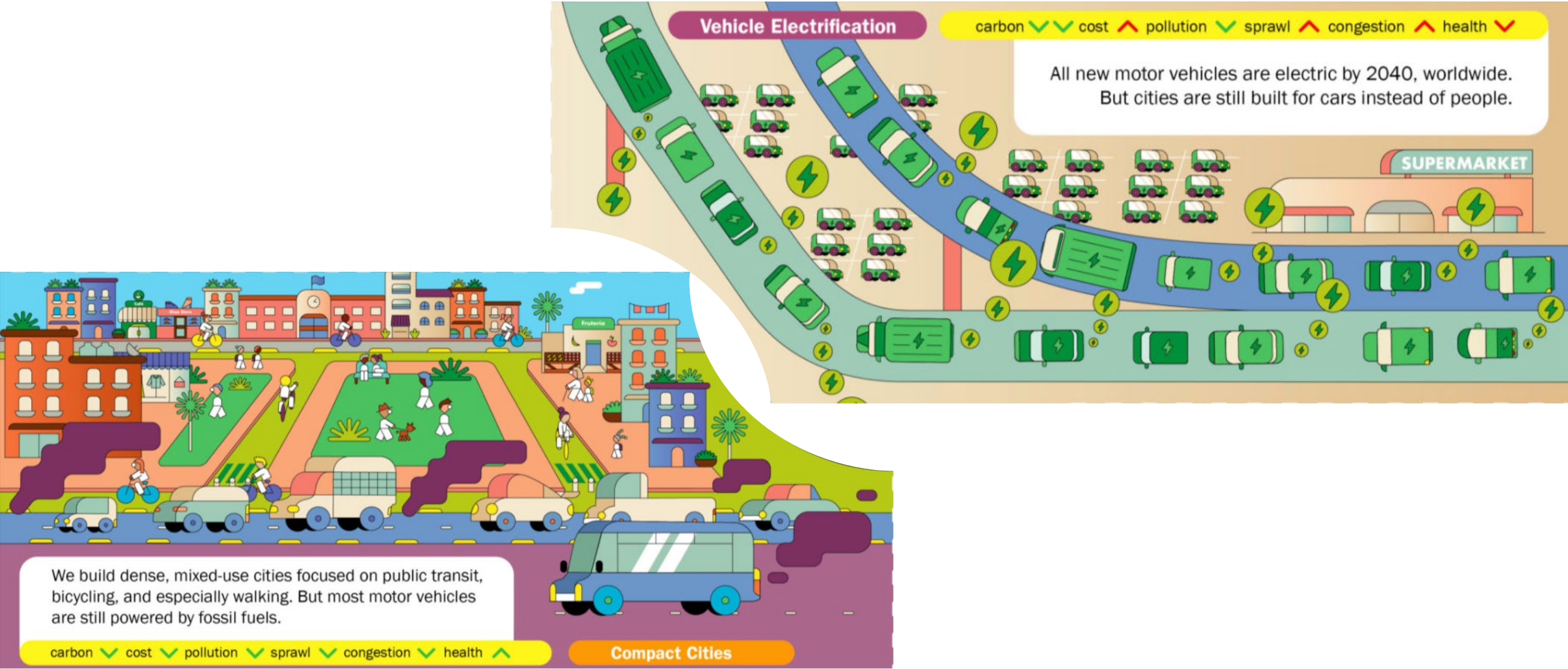
Methodology

Lead Authors: Taylor Reich (former ITDP), Lew Fulton (UC-Davis), Jameel Jamhar (UC-Davis)

What-if Scenario analysis

- Exogenous (not endogenous) model: *If* we achieve X, what would that mean for Y?
- Policy pathway is assumed
- Baseline data largely adopted from the International Energy Agency's (IEA) Mobility Model and subsequent versions
- Review from ICCT

Background



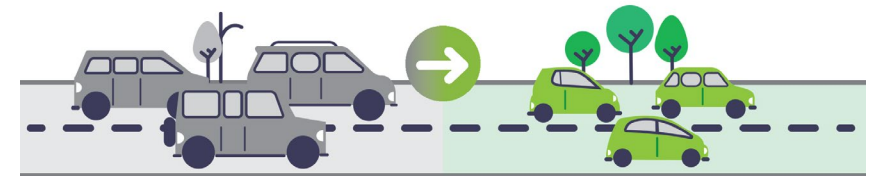
Methodology

Three ways urban transport could be improved:

1. **Mode Shift:** Increased walking, cycling, and public transport.
2. **High EV:** Rapid vehicle electrification.
3. **Small Vehicles:** Maintain vehicle sizes at 2020 levels.

Business as Usual (BAU): all three above turned OFF

Shift+EV+Small: All three above turned ON



Methodology

	SCENARIO NAME	MODAL SPLIT	VEHICLE ELECTRIFICATION	VEHICLE SIZE
1	<i>Business as Usual (BAU)</i>	Car-oriented	Slow electrification	Large vehicles
2	<i>Small Vehicles (Only)</i>	Car-oriented	Slow electrification	Small vehicles
3	<i>High EV (Only)</i>	Car-oriented	Fast electrification	Large vehicles
4	<i>Mode Shift (Only)</i>	Transit + walk + bicycle oriented	Slow electrification	Large vehicles
5	<i>Shift+EV+Small</i>	Transit + walk + bicycle oriented	Fast electrification	Small Vehicles

Base data modeling is centered around the ASIF methodology:

- 1. Activity:** Travel per capita.
- 2. Structure:** The share of modes used (in turn, a function of vehicle sales and stocks by mode and technology type).
- 3. Intensity:** The efficiency of modes, measured as fuel use per kilometer.
- 4. Fuel:** The carbon intensity of the fuels and energy carriers used by different types of vehicles, measured in carbon emissions per unit of fuel.

Smaller vehicles data methodology:

- Vehicle size only affects intensity inputs
- 5 vehicle-size classes
- Country-specific fuel economy for each size class
- Weighted average fuel economy for all LDVs based on the sales shares each year & top-selling vehicles per size class

Smaller vehicles projections:

BAU

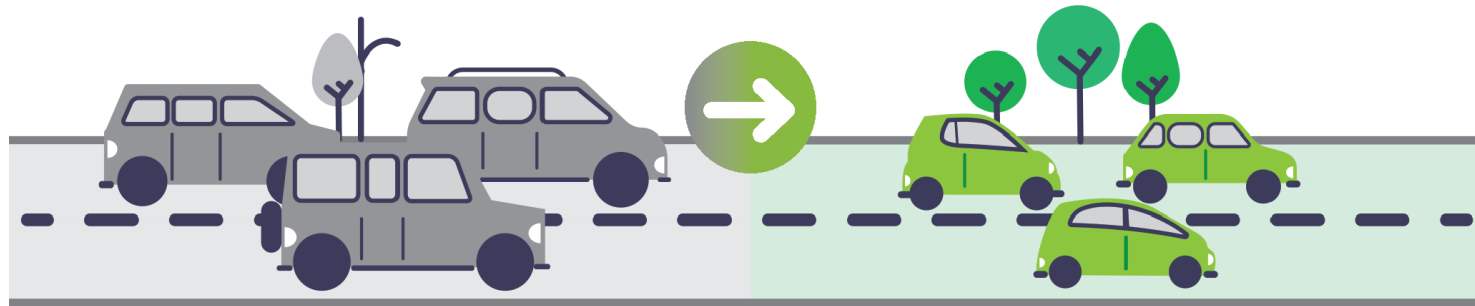
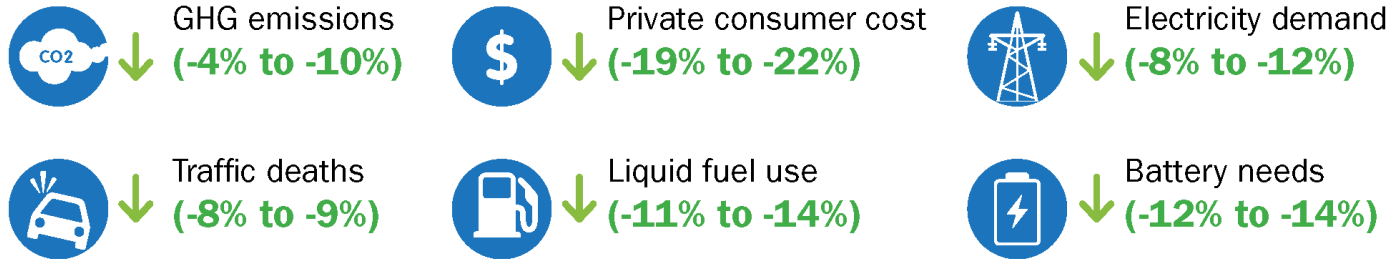
- project current trends into the future
- growth in SUV sales roughly linear for 10 years
- project BAU as a linear increase in the sales of larger vehicles

Small Vehicles

- Assume market share of each vehicle size class gradually reverts to 2020 proportion by 2035
- 2035 through 2050, hold proportions nearly constant.

Smaller Vehicles, Big Benefits

COMPACT CITIES ELECTRIFIED: THE BENEFITS OF SMALLER VEHICLES



Policies that limit vehicle size growth will likely have significant **positive impacts**, regardless of the other policies they accompany.



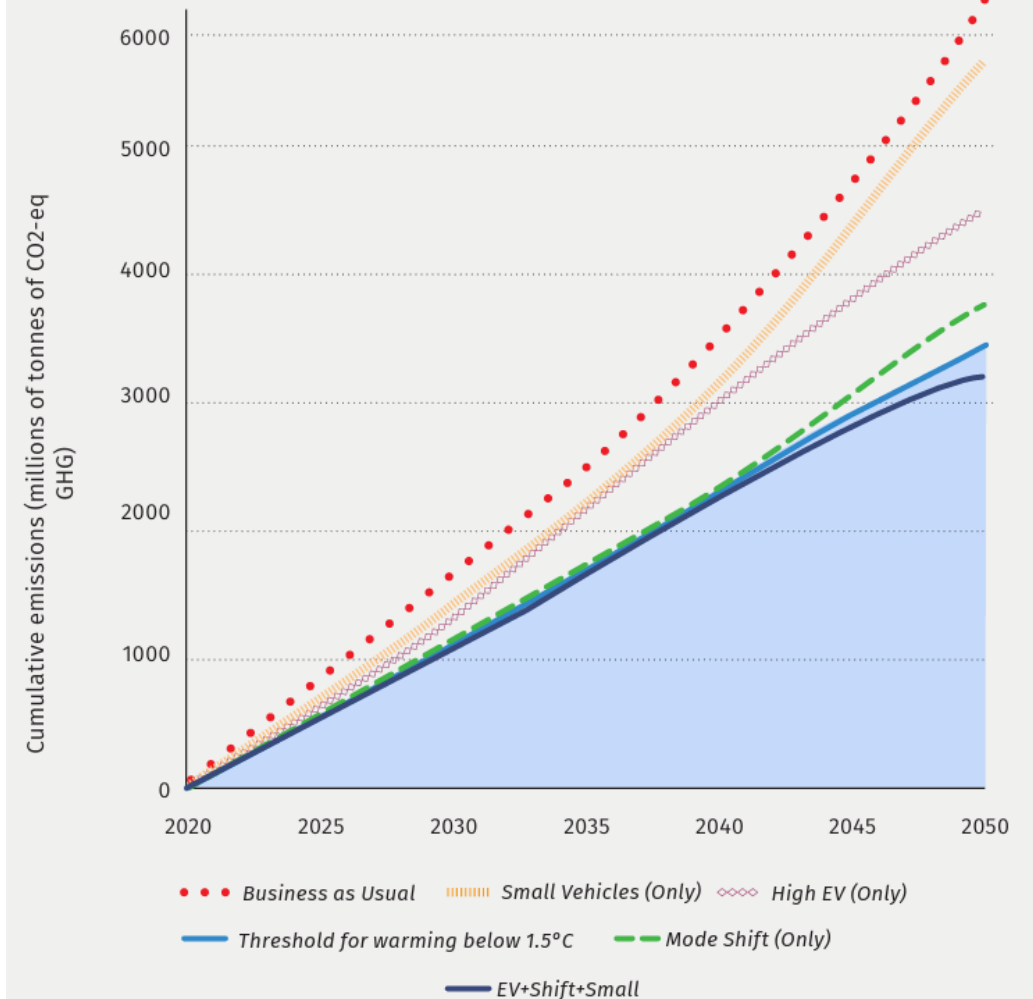
Compact Cities Electrified: The Benefits of Small Vehicles



Other Takeaways

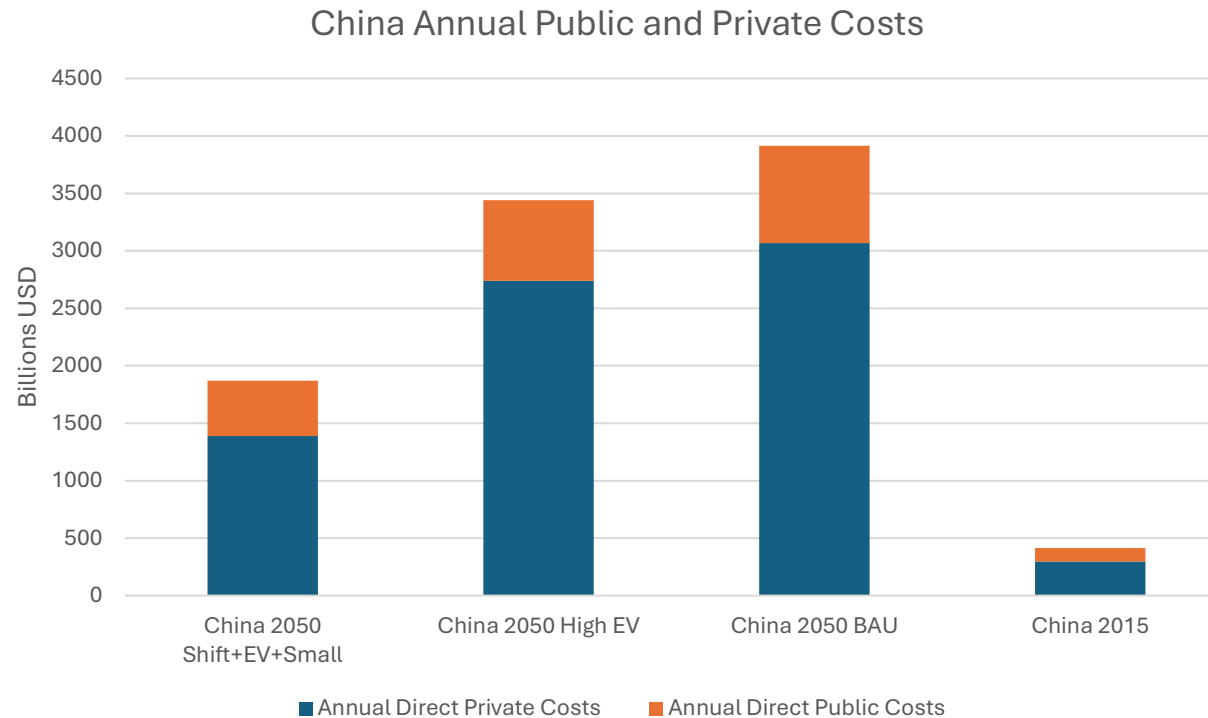
- GHG emissions can be strongly reduced by both **Mode Shift** and **High EV** strategies
- **Mode Shift** could save 1,500,000 lives and reduce road traffic deaths by 40% annually by 2050.
- **Small Vehicles** and **Mode Shift** can mitigate increasing demand for energy and batteries.

Figure 5.3.c. Cumulative urban passenger transport emissions, by scenario: India



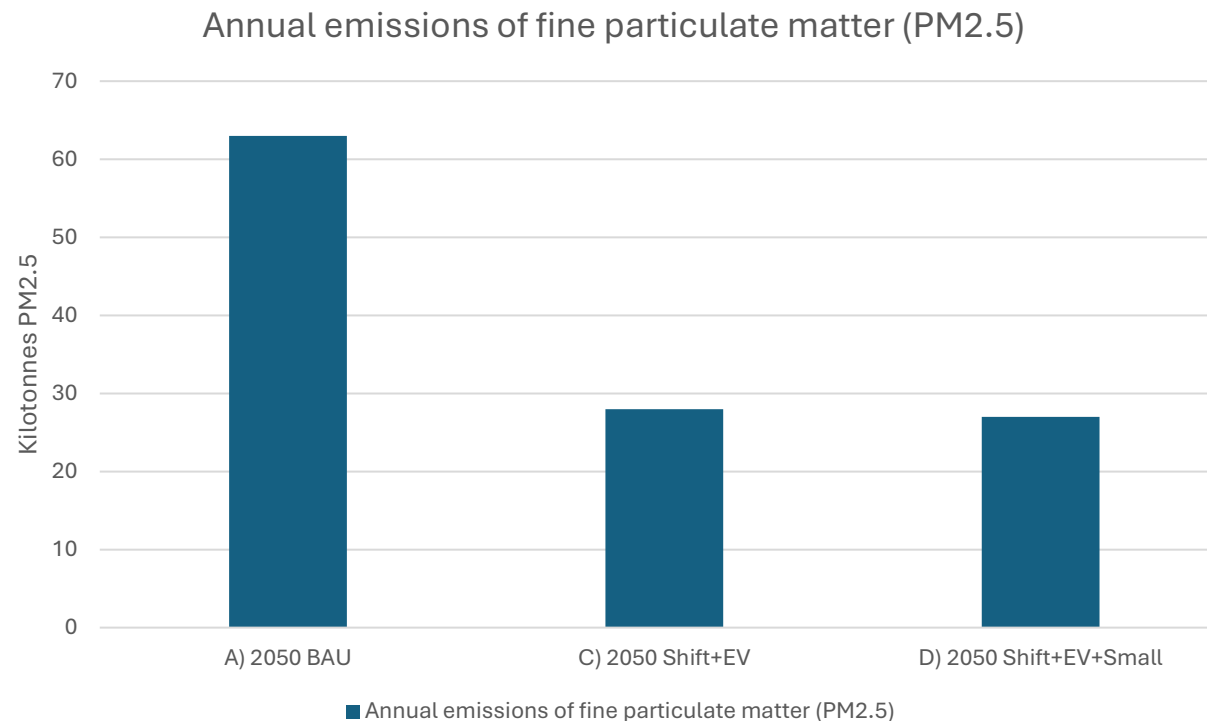
Other Takeaways

- Direct public and private costs are projected to increase by an order of magnitude in countries such as India and China



Other Takeaways

- **High EV** and **Mode Shift** can dramatically reduce local air pollution



Policy Conclusions

1. Limiting growth of vehicle size can mitigate a wide variety of suffering — particularly reducing transport costs.
2. Greatest benefit is from combining all three strategies.
3. Many benefits could not be effectively quantified:
 - Preserving natural areas and farmland
 - reduced urban noise
 - Better social health