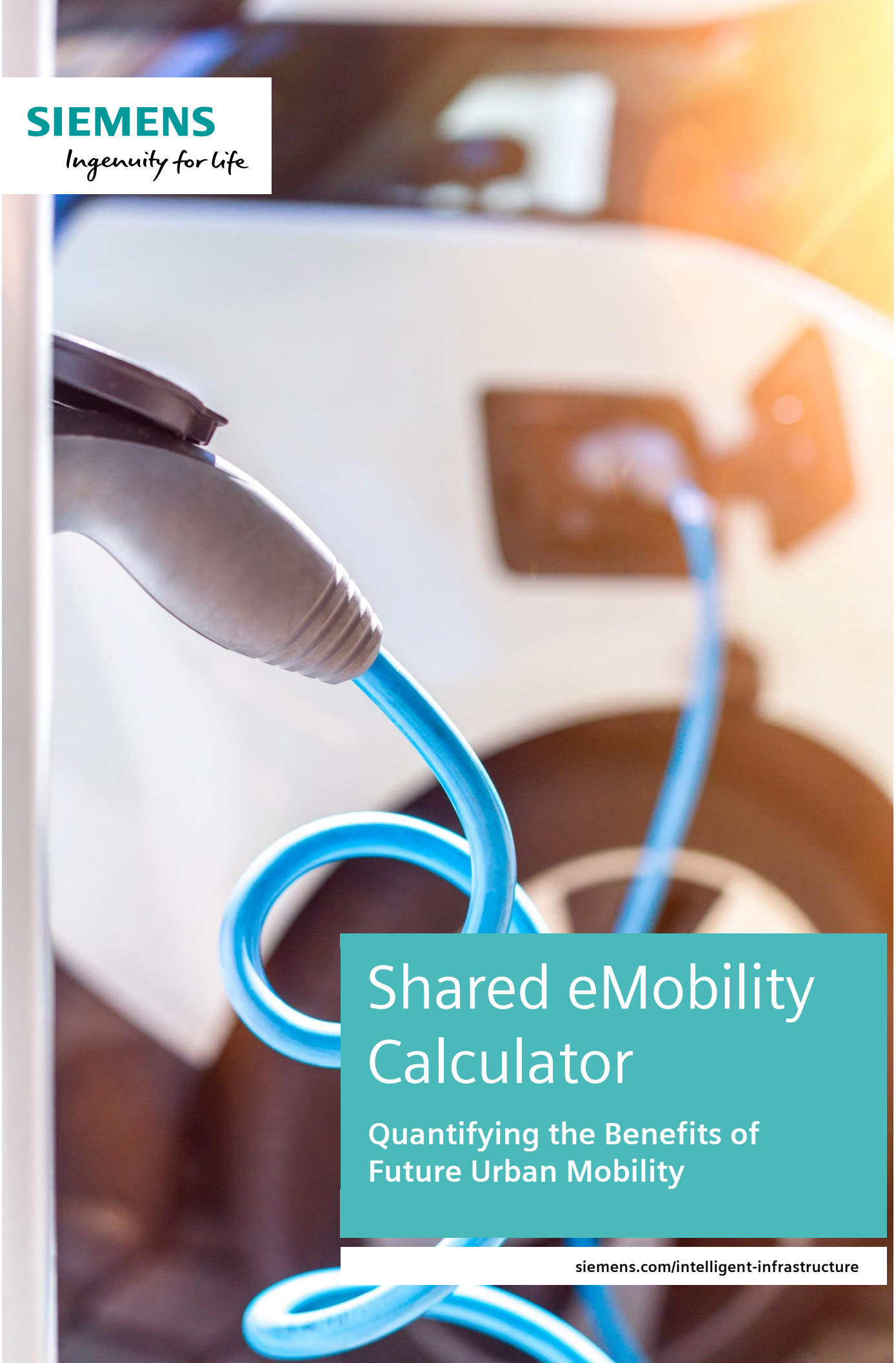

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Shared eMobility Calculator

Quantifying the Benefits of Future Urban Mobility

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Shared eMobility Calculator

Leveraging new mobility forces to re-design city streets as cleaner, safer, and more connected.

New mobility services, if wielded wisely, can help cities improve local air quality by upwards of 50 percent, smooth travel by 70 percent, and unlock millions of miles of street and parking lots for new development.

Overview

Transportation is an unavoidable daily routine for urban inhabitants. Whether traveling to work, to school, to home, to the store, to the park, or to see friends, city dwellers rely on a diverse set of modes to accommodate their needs. Our city streets also serve as extensions of the public realm, transforming temporarily into markets, meeting places, soccer pitches, and more.

By using Siemens' Shared eMobility Calculator, cities can understand not only how technology and market forces may affect them, but also plan for a future, which leverages those forces for environmental and land use benefit.

However, in recent years, population growth, aging infrastructure, urban sprawl and densification, and shifting transport needs have changed the demands on urban mobility networks. Cities today are facing more congestion, more travel delays, more traffic-related air pollution, and more transport-related costs than ever before. The changing demands on urban mobility networks are also playing themselves out on our streets. In many cities around the world, fatalities and injuries on city streets are rising, as they become less safe places to be, or move.

New mobility services, or new business models and new technologies, are emerging with the promise of helping cities fix transportation challenges. Individually, autonomous, connected, electric, and shared mobility offer benefits of improved safety, travel time, and experience alongside reduced environmental impact. Combined, they promise to radically overhaul our urban mobility networks as we know them — dropping traffic incidents to near zero rates, improving local air quality by upwards of 50 percent, making travel more efficient by up to 70 percent, and unlocking millions of miles of streets and parking lots for new development.

What the Shared eMobility Calculator Is

To unlock the benefits of these new technology and market forces, cities must first understand how they might affect the status quo, in addition to charting paths forward. Only then can they leverage these forces for cleaner air, safer streets, and connected communities.

Enter Siemens' **Shared eMobility Calculator**.

The Calculator is a ready reckoner, designed to allow cities of all shapes, sizes, climates, and development levels to estimate the implications of shared and electric mobility (eMobility) for their cities, starting with impacts on environmental targets, land use, and power requirements.

The Shared eMobility Calculator was developed with cities in mind. It draws on the collective experience of advisors working for the public sector, engineering the grid, designing city streets, consulting for cities in the developed and developing world, and re-tooling software for intelligent transportations. It is also open-source and transparent, available to anyone interested in shaping future urban mobility.

Siemens' **Shared eMobility Calculator** is a ready reckoner for any city stakeholder interested in leveraging short-term action on shared and electric mobility for future sustainability and land use impact.

What It Does

Based on 500 data inputs, the Shared eMobility Calculator estimates the impacts of shared eMobility on a city's electricity grid, emissions, air quality, land use, and charging infrastructure.

The Calculator incorporates current information, estimates, and experts' validation on how three modes of passenger transportation (private cars, public buses, and shared fleets) will change over time. These changes are realistic, yet aspirational – reflecting increased electrification, utilization, and a shift towards shared mobility.

The model sources projections for these data for three urban typologies. Upon opening the tool, users can select one of three typologies for which to auto-populate the model: 1) Emerging Economy, High-Density City, 2) High-income, Low-Density City, or 3) High-income, High-Density City. They can also choose to build their own typology specific to their city context.

The Calculator sources projections and dynamically calculates outputs for three timeframes, in order to capture short-, medium-, and long-term actions. In addition to having a baseline for Today, estimates for 2035 and 2050 align to important target dates for local, national, and international GHG emissions goals.

Outputs of the model span sectors, and speak not only to the cross-sector coordination that transforming urban mobility networks poses, but also to the broad swathe of people who will need to be involved to effect those changes.

They range from outputs related to energy (additional electricity consumption from EVs), to transportation (passenger miles traveled), to capital planning and public works (numbers and types of chargers), to sustainability (GHG reductions and air quality improvements), to urban design, land use, and real estate development (reduction in total parking area needed).

City stakeholders can expect to use the Shared eMobility Calculator to convene cross-sector working groups aimed at understanding how new mobility services will challenge current transportation and energy infrastructure. The Shared eMobility Calculator can also serve as part of the foundation for a citywide Future Mobility plan, or be used to test assumptions about current levels and pace of investment in shared eMobility.

How It Compares with Other Tools

Given the anticipated impact of new mobility services on cities, there have emerged many tools to help stakeholders quantify the potential market for those services, as well as plan for the infrastructure and space needed to house and charge vehicles.

A scan of the tools available yields models that are grid-focused or that are transportation-focused, but few that are both.

For example, the National Renewable Energy Laboratory's (NREL) EVI Pro model is geo-spatial, speaks to time of use, and is based off historic data about travel patterns and projected consumption patterns. However, EVI Pro does not incorporate mode shifts (such as the trend towards ridesharing observed in major metropolitan areas), nor does it include estimates for buses or for shared fleets. It is also not a scenario planning tool. Moreover, it is a black box model, in which users are unable to see the back-end calculations and inputs into the tool.

The Shared eMobility Calculator differentiates itself from EVI Pro and other such models by having a transparent back-end, in which users can see inputs and outputs and the relationship between the two. It is also fundamentally a scenario planning tool, designed to put control back into cities' hands to determine their own future urban mobility.

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