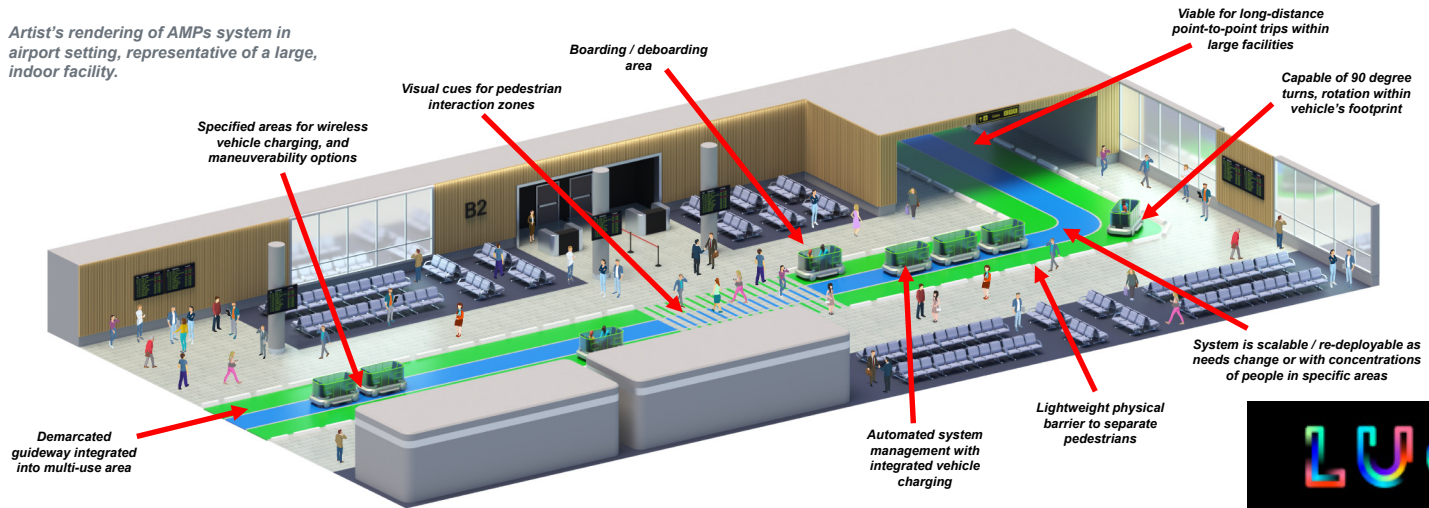


# Automated Mobility Platforms (AMPs) for Versatile, Energy Efficient, Facility and District Scale Transport

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Artist's rendering of AMPs system in airport setting, representative of a large, indoor facility.



## Overview

The Automated Mobility Platforms (AMPs) concept is envisioned as an on-demand network of automated lightweight electric vehicles serving mobility needs in a large facility or district-scale setting. Supplanting the function of legacy automated people mover systems and moving walkways, AMPs are scalable to meet the needs of moving people in large interior spaces with destinations that are too distant for walking and in which larger motor vehicles would be unfeasible or undesirable, with extensibility to outdoor district-scale environments.

The AMP system is designed for automated management and operation—pre-positioning vehicles to anticipate mobility needs under a supervisory management system as with modern elevators. AMP vehicles are requested either via smartphone app or infrastructure call buttons.

AMP vehicles function similarly to elevators, though in the horizontal plane, wherein users summon vehicles and are moved point-to-point, with user requested destinations set through intuitive interfaces and vehicles shared when logistically convenient.

The concept targets extensibility, manageability, and improvements (such as load to vehicle mass ratio) over legacy technologies, with accessibility and safety features integrally designed into the system.

## Accessibility

**Accessibility is inherent in the design of AMPs from the ground up, and through partnership with LUCI.**

	AMPs	Moving Walkways	Micro-mobility
Navigation	Discreet destination choices to rider	Straight, single entrance/exit	Free-ranging on streets and paths
Scalability	Up to ~2 miles, not limited to linear paths, add vehicles to scale	Practically limited to 100 yards, no connecting ability, expensive	Dense urban districts
Accessibility	Any age, ability, socio-economic demographic <b>ADA compliant</b>	Any economic / demographic <b>not ADA compliant</b> or handicapped accessible	Primarily young, agile users <b>not ADA compliant</b> or handicapped accessible
Energy Requirements	Modest, battery powered, rechargeable	Continuous power draw of 7.5 to 1.5 KW, even with no riders	Modest, battery powered, rechargeable
Safety	AV control & protected / shielded guideways	Completely segregated walkways, electro-mechanical faultsafe machinery	Can be hazardous due to improper use, insufficient safety infrastructure
Speed	2x to 6x walking speed	0.3x to 0.5x walking speed	2x to 5x walking speed
Cost model	\$\$, cost burden on development, ride for free	\$\$\$, cost burden on development, ride for free	\$, Smart phone application, rider rental charges.

## Equity

**If the prerequisite for high-quality transportation is individual vehicle ownership, we will never address the inherent inequities in our society, nor substantially advance transportation sustainability.**  
— S. Young

AMPs are designed from the outset to support mobility needs of a wide range of users, including wheelchair, hearing impaired, and vision impaired users. AMP vehicles will be capable of unassisted wheelchair loading and provide an easy alternative for people with limited mobility, those who may be traveling with older adults, or those traveling with children for whom a long walk to a destination may be challenging. The vehicles operate as part of a fully managed and automated system at no cost to a user, much like the function of modern elevator, providing an infrastructure integrated mobility function for large-scale facilities.

## Efficiency & Sustainability

Compared to legacy automated people mover systems present in airports, campuses, and other large facilities, energy efficiency opportunities exist.

- Moving walkways require a substantial electrical load in continuous operation, whether or not they are transporting people. An AMP system is designed to operate only when needed and where needed.
- Characteristics of light weight electric vehicles include greatly improved energy efficiency as compared to existing options of larger vehicles and less-capable fixed-in-place infrastructure such as moving walkways and traditional airport people mover systems (APMs). APMs of the past have depended on fixed rail or fixed guideway technologies which are not extensible to meet ever-changing demand.
- AMP vehicles are in motion only when responding to demand, thus expending minimal energy. They can be remotely repositioned to anticipated locations of demand, and moved to wireless charging locations, reducing management overhead of the system.
- AMP vehicles can maneuver in pedestrian traffic at walking speeds and provide higher speed connections on protected paths (see illustration).

## What's Next?

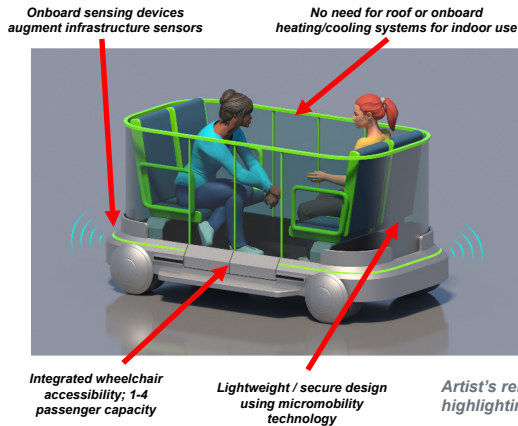
AMPs provide a clean slate approach to mobility integrated with buildings and infrastructure. Current architectural trends favor ever-larger buildings and facilities, for which conventional automated people mover technologies are poorly suited. Leveraging rapidly developing technologies within the areas of vehicle electrification and improved lightweight construction of micromobility vehicles, AMP systems offer scalable, efficient alternatives.

The National Renewable Energy Laboratory (NREL) teamed with LUCI, which makes smart technology for power wheelchairs and applies a design philosophy incorporating maximum accessibility from the onset.

- In mid 2022, the DEPARTMENT OF ENERGY AWARDED LUCI TECHNOLOGIES ([www.luci.com](http://www.luci.com)) IN PARTNERSHIP WITH NREL A FIVE YEAR SBIR GRANT with the objective of a complete systems study and initial hardware design
- The STATE OF TENNESSEE EXTENDED THE SBIR GRANT to include context specific case study applications of the AMPs concept beyond airports

These activities are combined with input from industry stakeholders including a consortium of airports and organizations representing the mobility needs of disadvantaged groups. The AMPs team aims for human and business sustainable mobility in large facilities (e.g., factories and airports) and in dense urban environments where traditional modes are costly, slow, and inaccessible to all. Solving the "last mile" or even the "last 100 yards" within in such contexts is an unmet gap in today's transportation infrastructure.

Potential future applications are being explored, such as enabling movement of people within car-free or car-light environments such as neighborhoods, industrial zones, education campuses, and military bases.



Artist's rendering of AMPs vehicle, highlighting features.