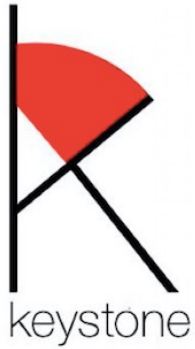
Scaling up Maglev

A disruptive transportation technology to get to net zero

ideas@keystone.ventures



About Helix Maglev

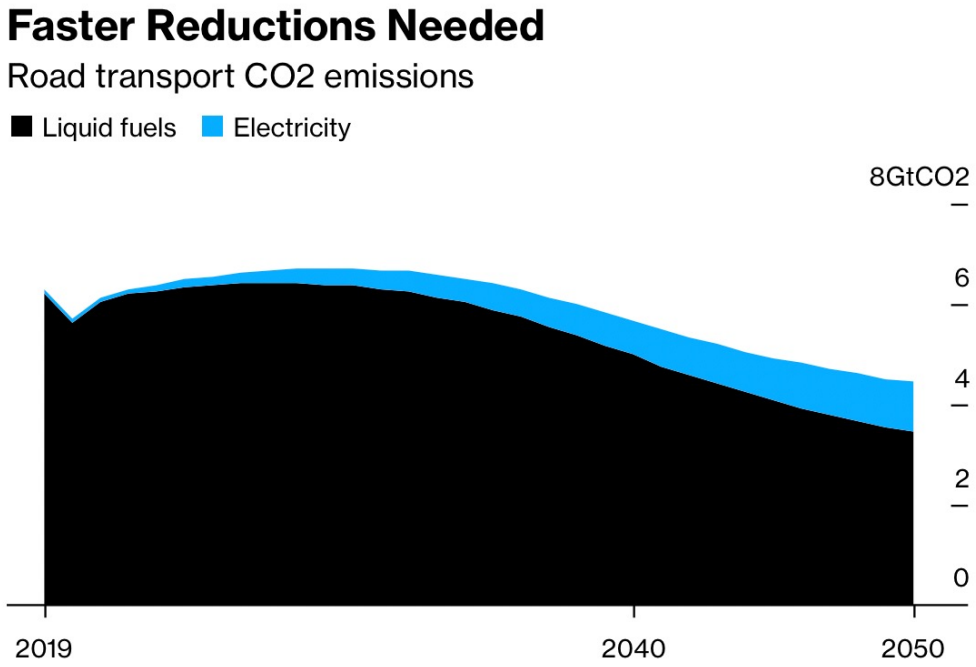
Keystone, with support of UCSD, is developing a minimalist or “gossamer” maglev to expand the possibilities of high speed personal transportation.

Our technology has the potential to deliver non stop travel at speeds of 250 mph and 15,000+ passengers per hour per direction (PPHPD) at the lowest cost in the market to significantly increase the number of cities in the world that can implement high speed transportation and related projects like affordable housing.

We are rising $520,000 for prototype 1.

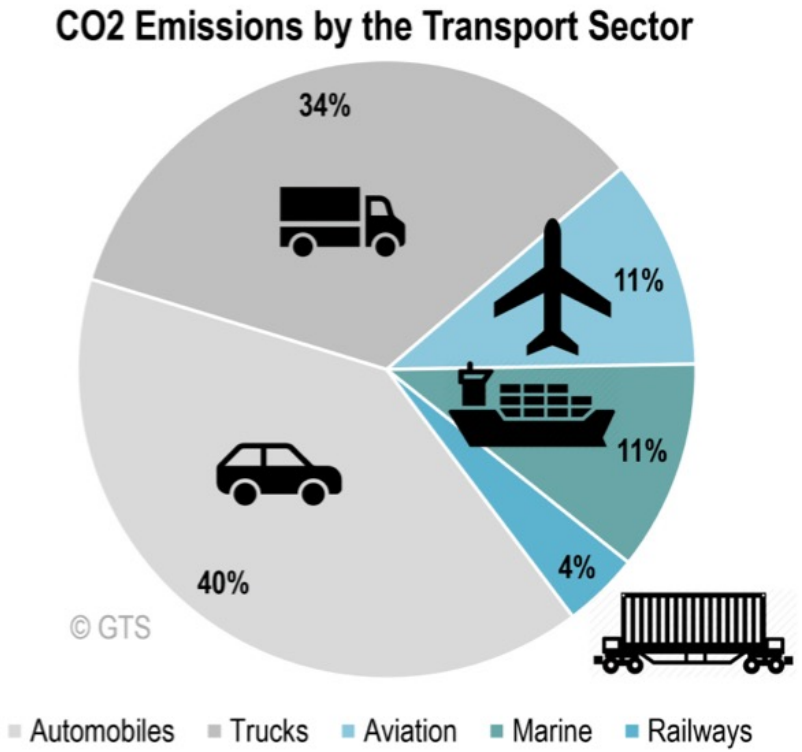
The transport industry is not on a path to net zero

Transport still come in at 4.4 gigatons in 2050



Source: BNEF 2022 Electric Vehicle Outlook
Note: data shows BNEF's Economic Transition Scenario which assumes no new policies are put in place

Cars are the main emitters of CO2 in the transport sector



No real options to reach net zero

- Electric cars
- Public transit (trains, subway)
- Micro-mobility (bikes, scooters)
- Hyperloops / other

>> Can’t scale fast enough (and create traffic)

>> Difficult and expensive to build in urban and suburban areas

>> Don’t work for long commutes/ bad weather

>> Not ready soon

Helix maglev has a massive potential

- Elevated ultra-light guideways can be built anywhere in or between cities.
- Minimalist maglev can provide urban and interurban transportation cheaper, faster and safer than incumbent technologies (car, buses, subway, trains, airplanes*).
- At speeds of up to 250 mph, a huge amount of land becomes available for finding ideal conditions of price, regulations, neighbours, etc. for building new, sustainable communities at much lower prices than in the costly and problematic heart of large cities.

*in distances <1,000 miles

What is limiting maglev?

And why Keystone can change that.

Conventional maglev

The paradigm of big and expensive infrastructure requires massive planning, time, demand and capital.

1) Expensive and difficult to obtain Rights of Way (RoWs) that go through private parcels.
2) Difficult/expensive to build big stations in cities, not able to offer the ”last mile”.
3) High capex and opex = dependant on government subsidies.
4) Very complicated to build in non-flat landscapes.
5) Fewer time-schedules limit ridership demand.

Keystone maglev

Our technology’s minimalist design makes it easier to build and operate:

1) An elevated RoW is easier/cheaper to obtain.
2) Minimal footprint implies it can be built in any street, stations can be inside buildings (solves the “last mile”).
3) Total cost per passenger-mile is cheaper than any incumbent technology, allows to be profitable with regular transit fares. No need of subsidies, ideal for private capital funds.
4) Very easy to build in non-flat landscapes, can “climb” hills of any slope.
5) Personal pods make travel very convenient (available 24/7 non stop).

A design breakthrough is required.

Helix maglev opens a new frontier in personal transportation.

Renders of pods and track available upon request

Why helix maglev?

It’s the only technology with potential for 250mph+ speeds with the footprint of a bike lane.

Faster

Personal pods can travel at 250mph with no intermediary stops.

Our pre-fab modular helical guideways can be built 10x faster than conventional infrastructure. Elevated guideways means easier faster RoWs agreements.

Accelerated global adoption = accelerated CO2 reductions (next five years are key to solve climate crisis).

Cheaper

Our components are inexpensive (aluminium, off the shelf magnets and poles), infrastructure is modular and can be mass produced in local factories around the world.

With and conservative estimated capex of $16M per mile and energy consumption of 0.2 kWh per mile, we estimate a total cost per passenger mile below 8 cents.

Ultra-light

Our system can go into the heart of cities with multiple stops, and also have a very light infrastructure that can be built on almost any right of way, such as highway dividers, on top or railways, canals, power lines easements, etc.

Green

The light weight of the vehicle makes it very energy-efficient, and the nature of the system makes it easy to ensure that a clean electricity source will be used, like solar panels on top of the guideway.

How does helix maglev work?

Propulsion & Suspension

The key innovation is that helix maglev combines suspension (levitation) with propulsion, generated by the relative motion of permanent magnets and metal plates, in an extremely simple and light mechanism.

The integration of propulsion and suspension also makes it possible to have an extremely aerodynamic vehicle, so that very high speeds can be achieved with existing electric motor and battery technologies.

Control system

To simplify the problem of traffic control we introduce a few, simple restrictions, that reorganize the process of decision-making for routing and collision-avoidance to eliminate the need for complications such as real time adaptive software, and hardware such as lidars or radars.

It enables very fast routing and no traffic jams ever in a network.

Milestones based funding

	milestone	partners	capex US$	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024
	prototype 1		**520,000**						
1	Design charrette with Jacobs School of Engineering, to define engineering specs	UCSD	20,000						
2	1 Pod @ 1:1 scale to optimize weight, aerodynamics, industrial design.	UCSD	50,000						
3	Design competitions w/ faculty+students to solve engineering challenges	UCSD	100,000						
4	1 Track (10 feet long) + 1 Pod @1:1 scale to test KPIs (levitation, propulsion, etc)	UCSD	100,000						
5	Legal and salaries (1 year)	UCSD	250,000						
	prototype 2		**700,000**						
5	1 Track (300 feet long)/Pod @ 1:1 scale to be tested w/people	UCSD, industrial partner	500,000						
6	(optional) 1 Track (1 mile long)/Pod @ scale (pod =soda can size) to test speed 250mph	UCSD /UC system	200,000						
	prototype 3		**10,000,000**						
7	1 Track (2 miles)/many pods @ scale 1:1 @ UCSD campus	UCSD, industrial partner	10,000,000				TBD		

Engineering specifications to be designed with UCSD

UC San Diego
JACOBS SCHOOL OF ENGINEERING

1. Tolerances
2. Rotor materials and structure
3. Pod materials and structure
4. Guideway rigidity and alignment
5. Energy supply
6. Passenger comfort

A highly entrepreneurial team partnering with an academic powerhouse.

Arturo Farias

CO-CEO

Systems thinking and design

Linkedin

Juan Pablo Rico

CO-CEO

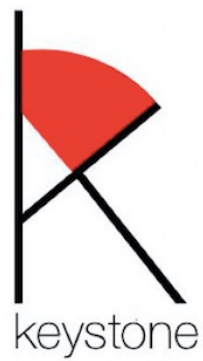
Economics

Linkedin

UCSD

School of Engineering

School of Urbanism


keystone