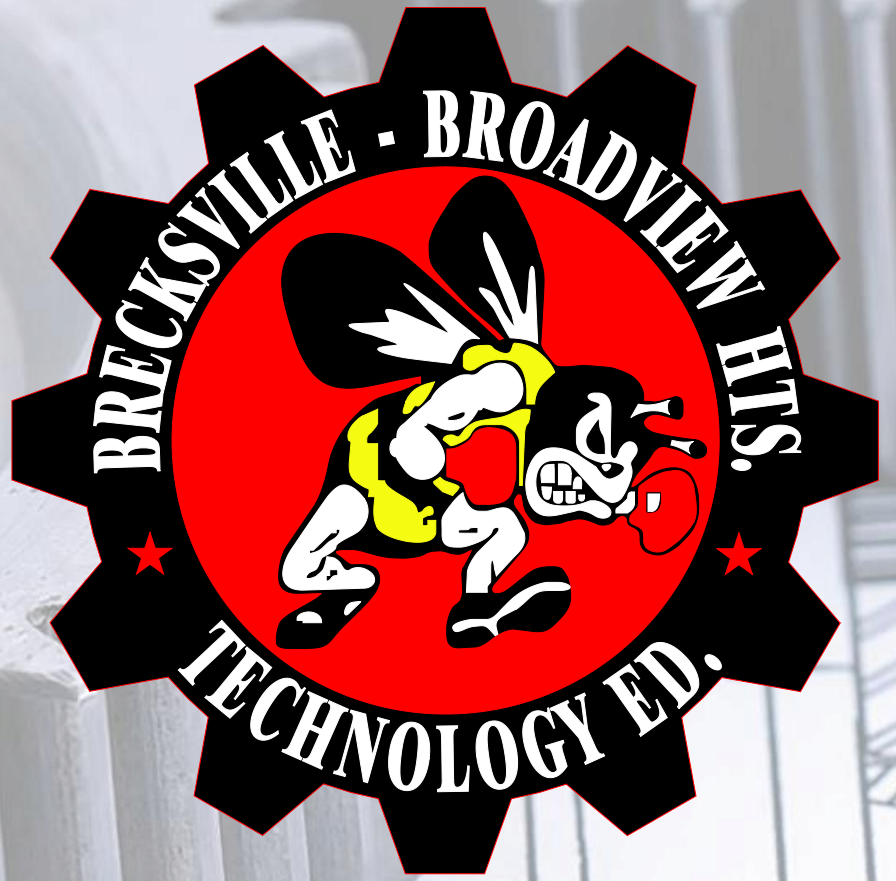


MAGLEV

BBHHS Tech Ed

Mr. Goubeaux

Systems of Technology

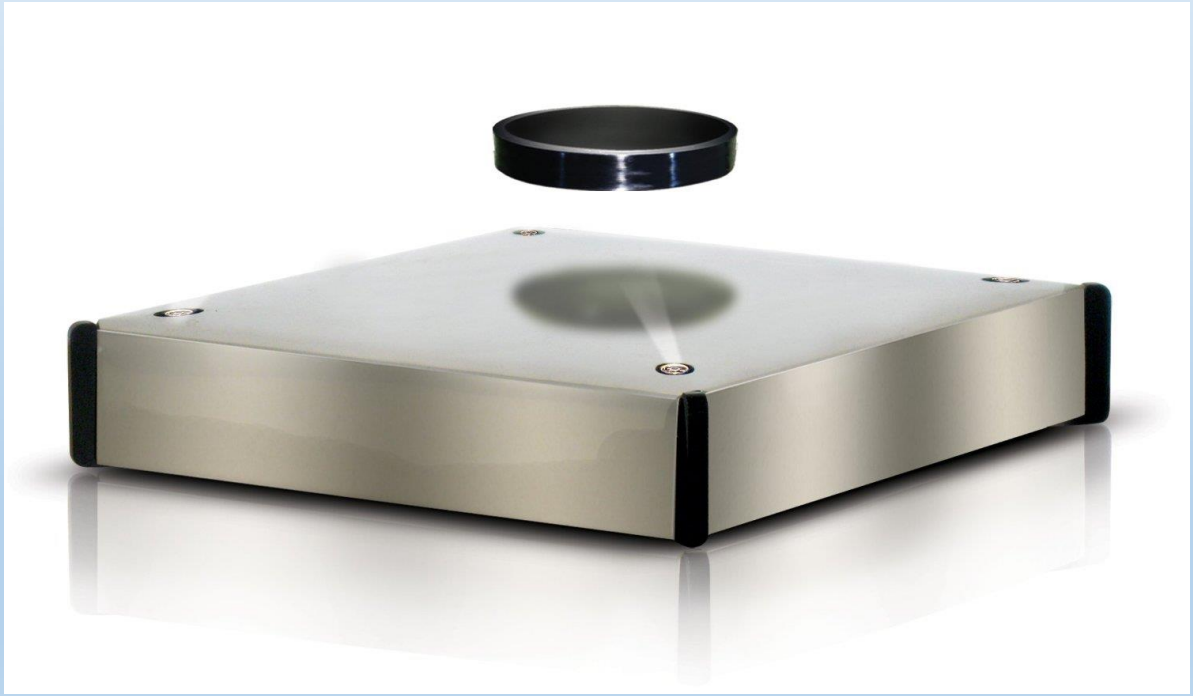
- TRANSPORTATION
- Manufacturing
- Construction
- Energy & Power

Technology Systems

- Transportation
  - Cars
  - Bikes
  - Ships
  - Space Shuttle
  - Moon Rover
  - Shoes
  - Skate Board

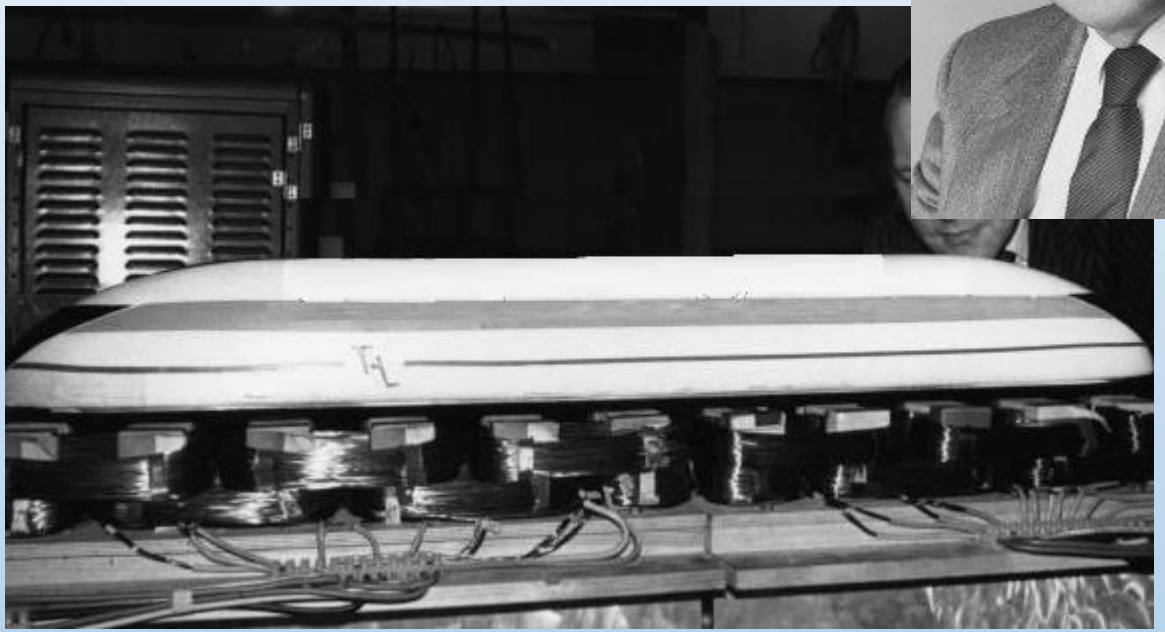
What is MAGLEV

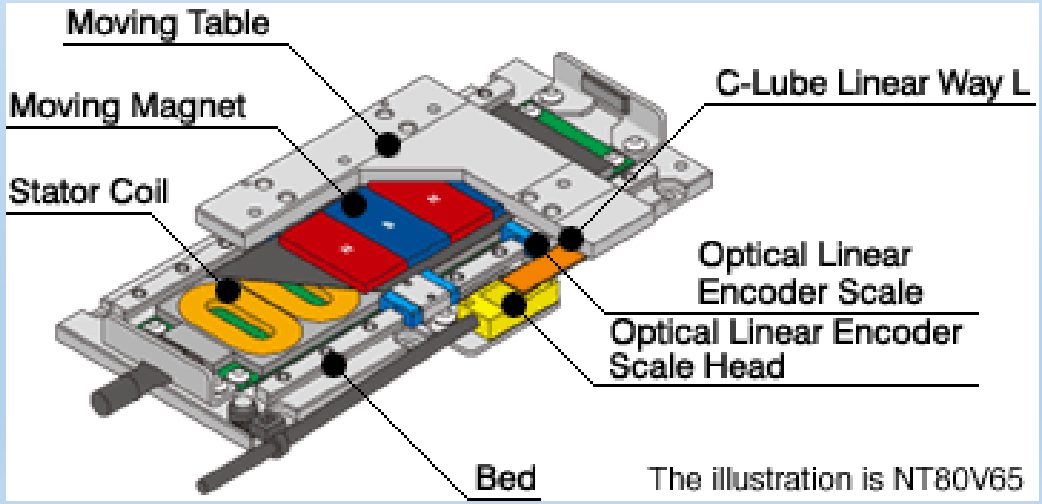
- Magnetic Levitation



Eric Laithwaite “Father of Maglev”

- 1921-1997
- Creator of the linear motor
- Developed first Maglev



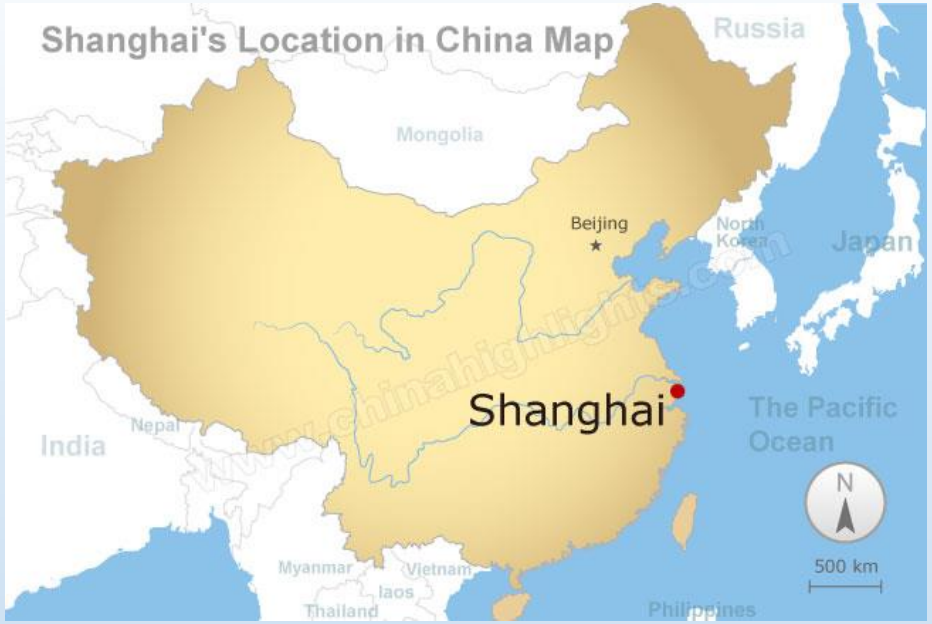


History

- 1940’s Eric Laithwaite developed the first full scale Maglev prototype
- 1960’s USA starts to develop Maglev technologies
- 1984 Birmingham, United Kingdom first commercial Maglev
- 2001-2004 Construction of Shanghai Maglev

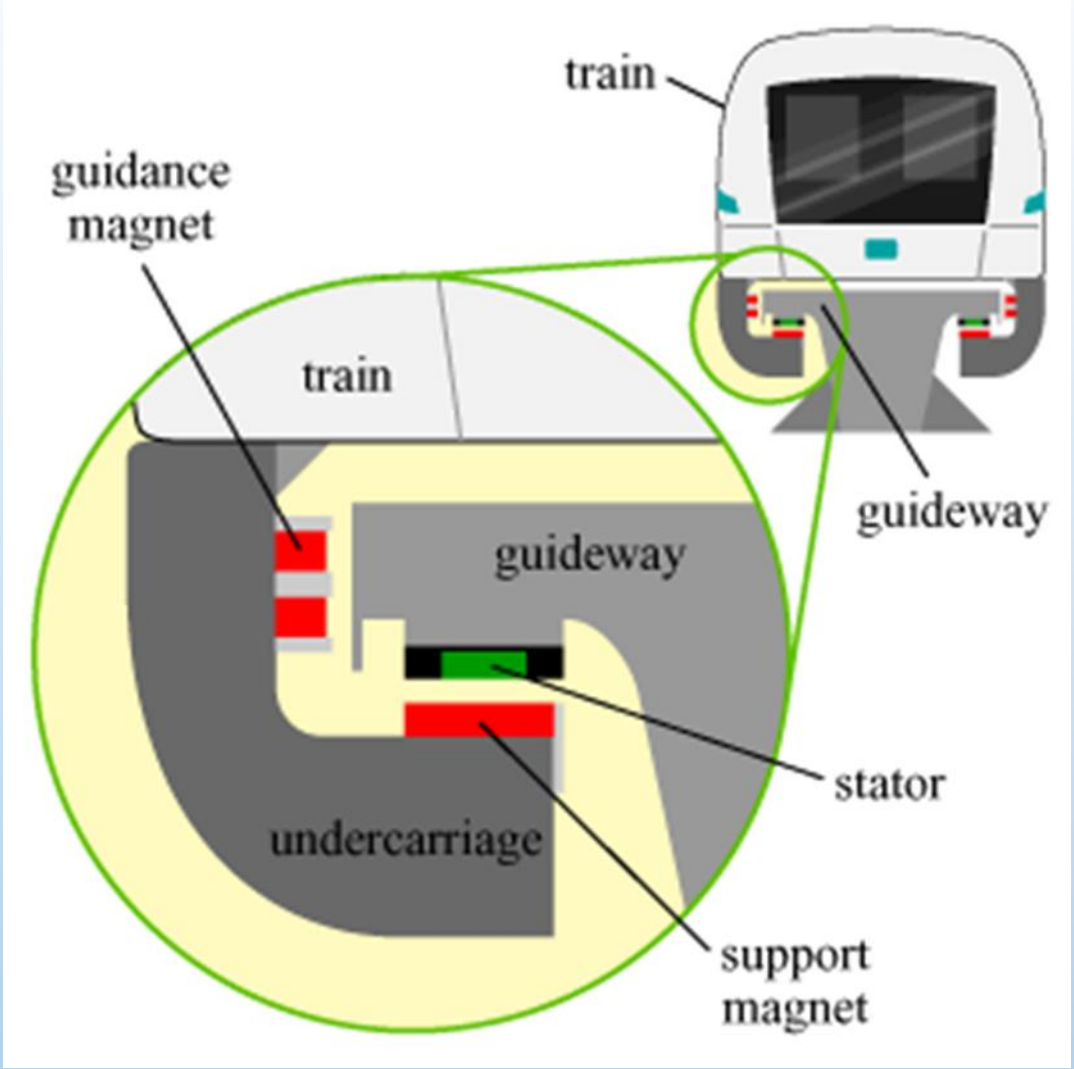
The Most Popular MAGLEV

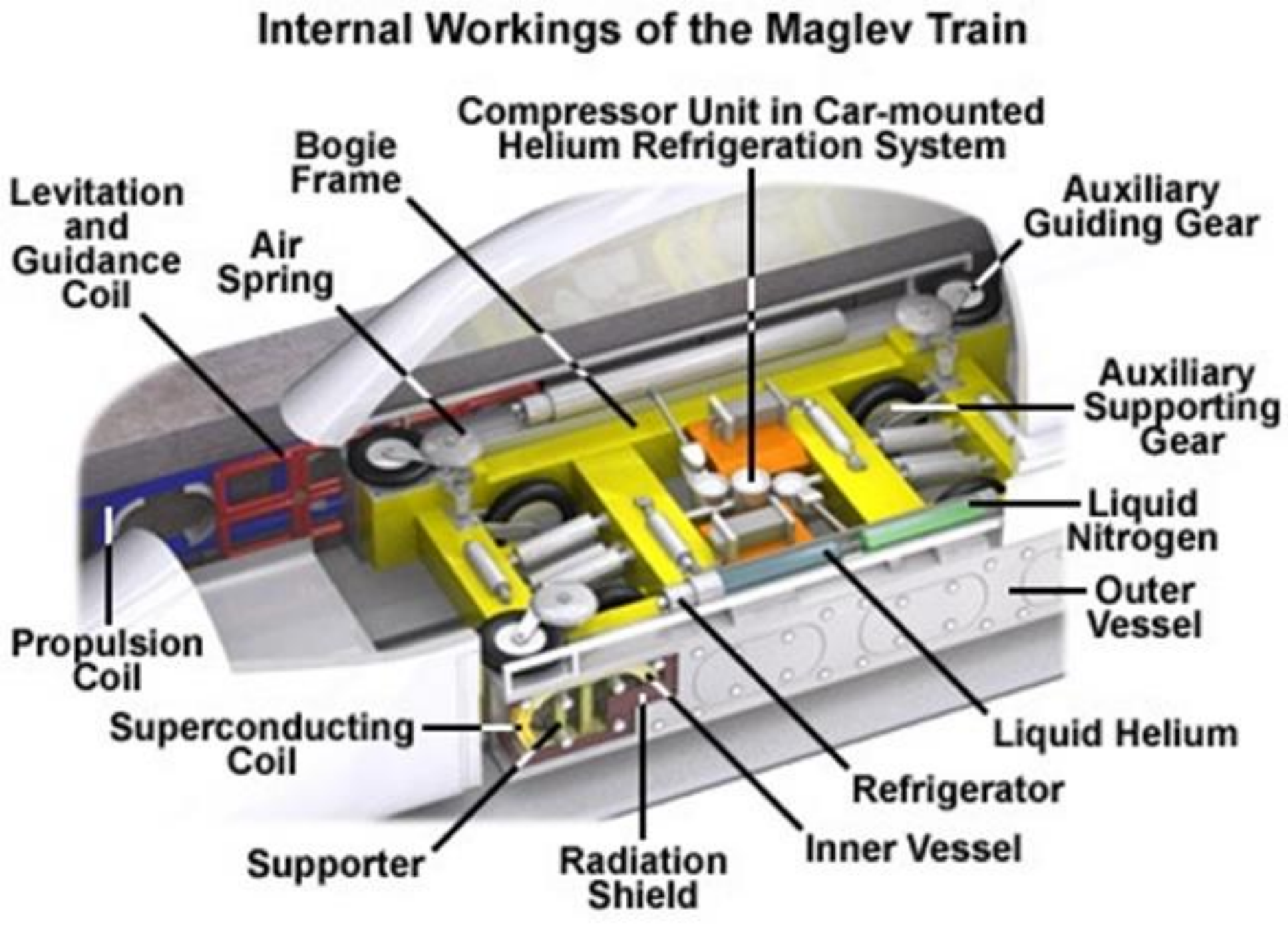
- Shanghai, China
- Opened in 2004
- 574 passengers per train
- Runs at a top speed of 268 mph
- Test run of 310 mph
- $1.2 billion
- 18.95 miles in length



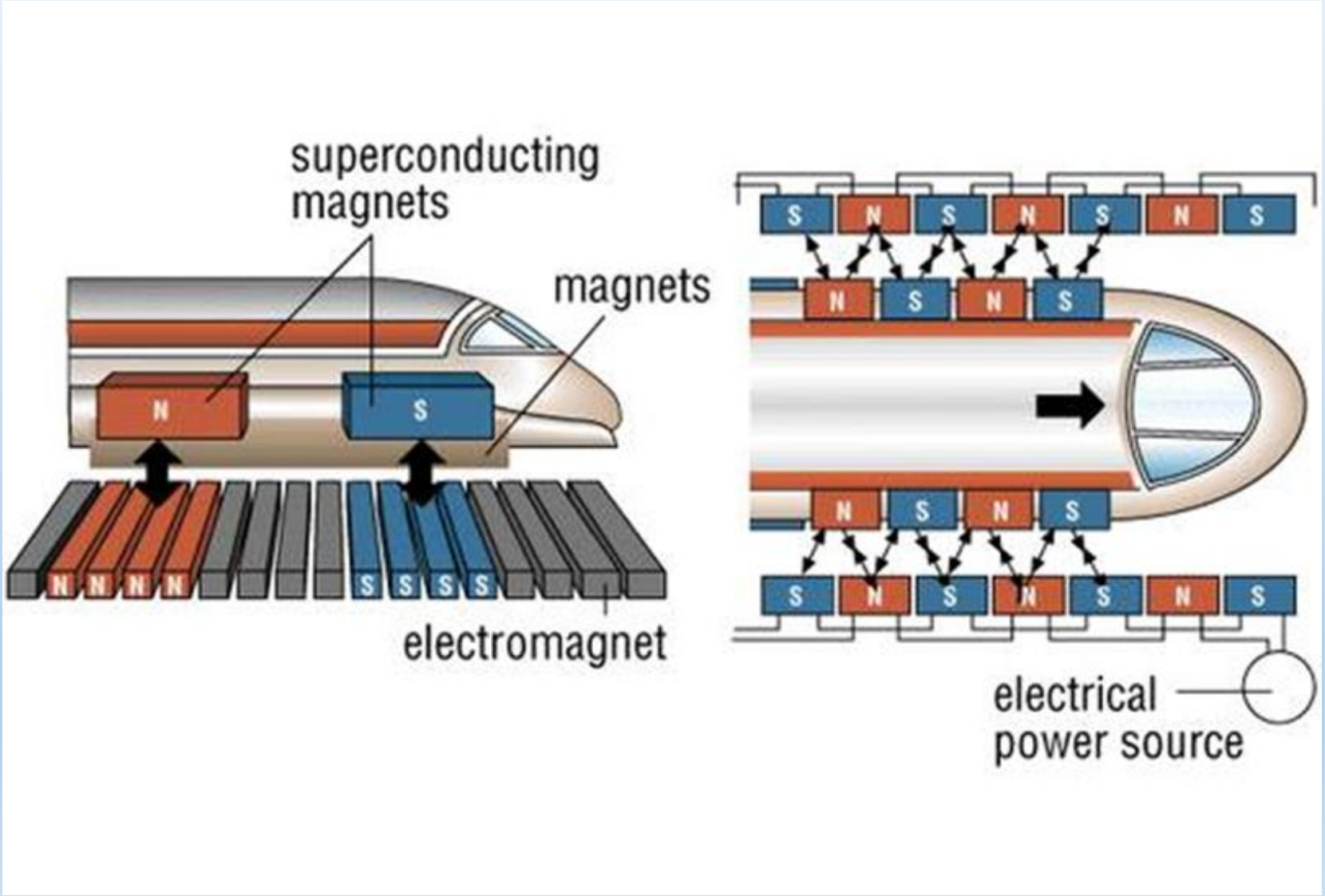
How Maglev Works

- The train wraps around the guideway
- Train
- Undercarriage
- Guideway
- Guidance Magnet
- Support Magnet
- Stator
- Electrodynamic Suspension (EDS)

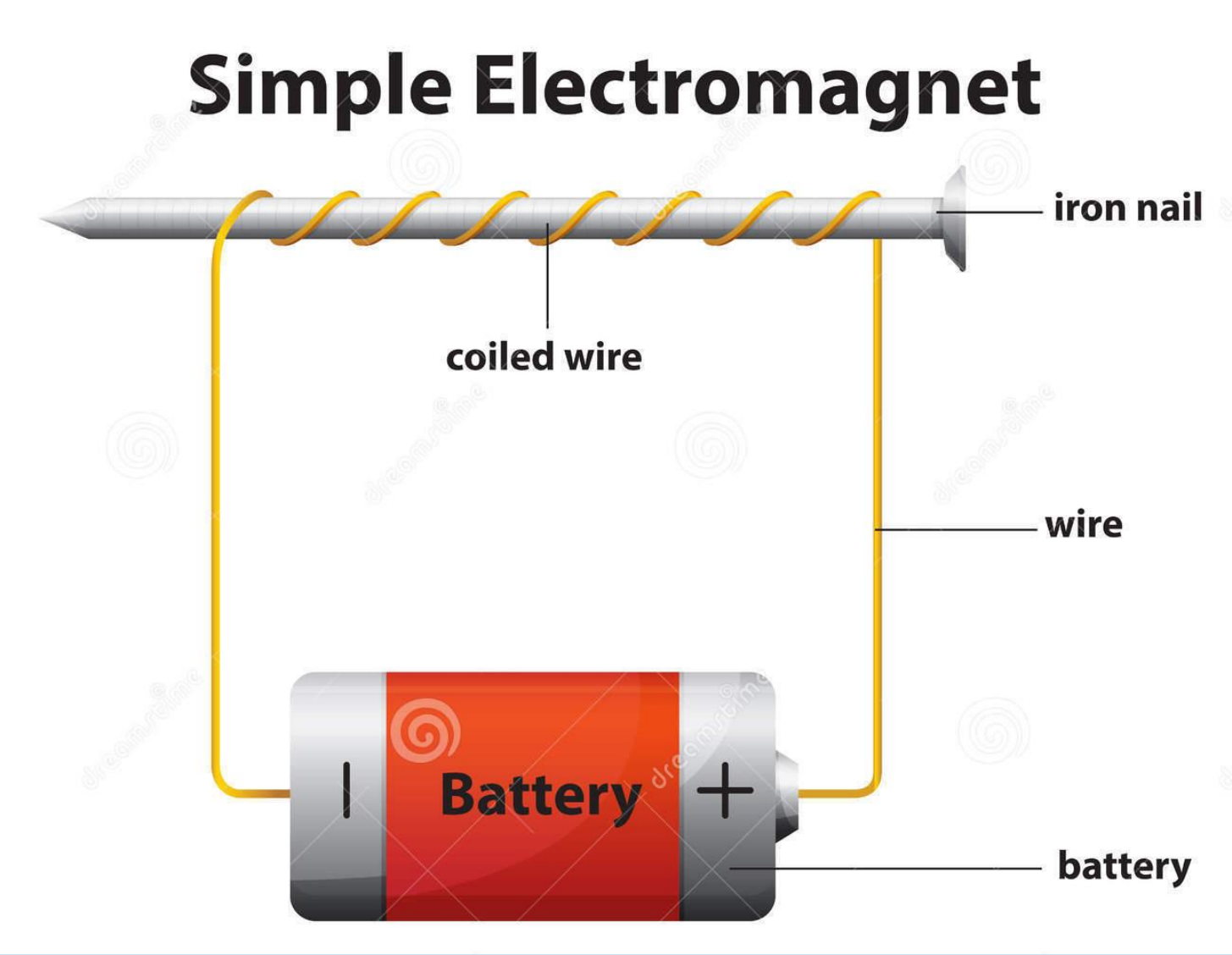



Internal Workings of the Maglev Train
Compressor Unit in Car-mounted Helium Refrigeration System
Bogie Frame
Levitation and Guidance Coil
Air Spring
Auxiliary Guiding Gear
Auxiliary Supporting Gear
Liquid Nitrogen
Outer Vessel
Propulsion Coil
Superconducting Coil
Liquid Helium
Refrigerator
Inner Vessel
Supporter
Radiation Shield

Linear Motor Stator



Electromagnet



Eco-Friendly

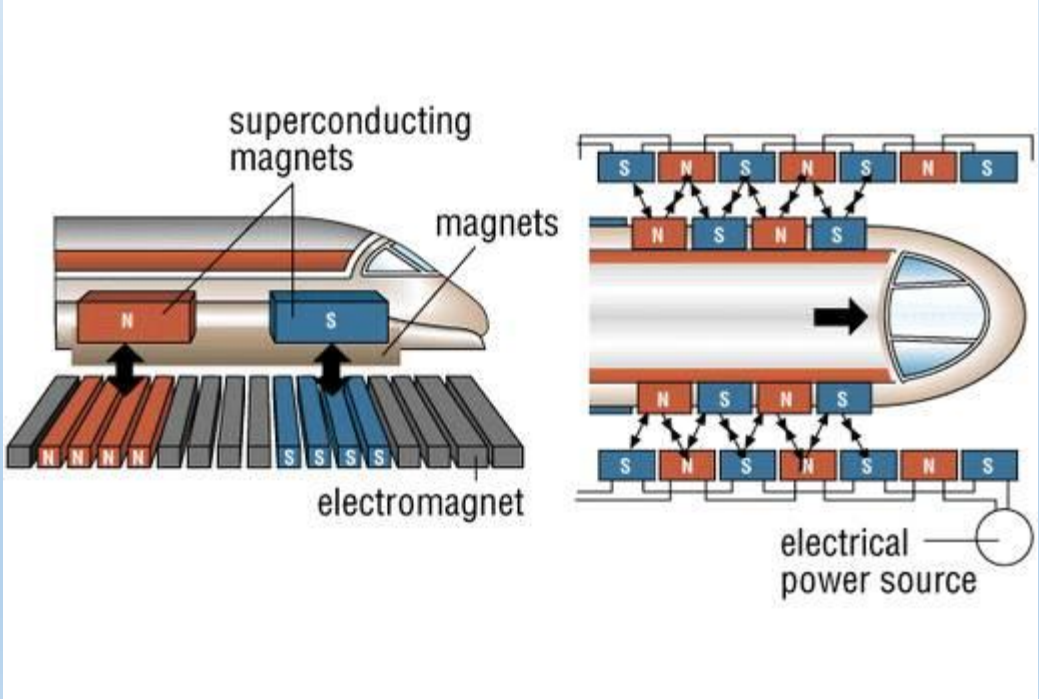
- Only the section being used is electrified.

Forces on a Maglev Train

- Thrust - push (something or someone) in the specified direction
- Lift – action of moving above the ground
- Gravity – Natural pull of mass on earth
- Drag – resistance to move

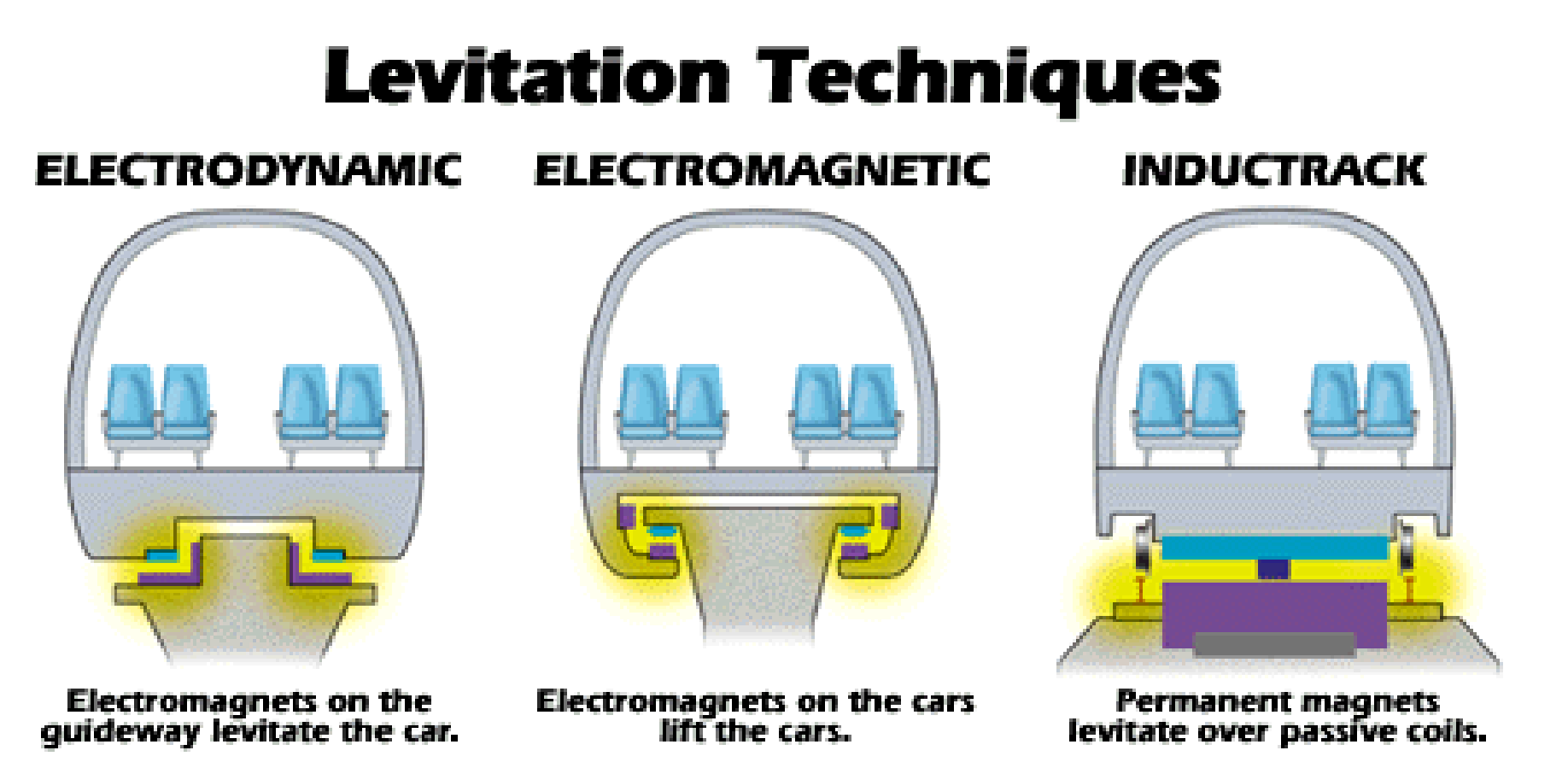
Thrust

- The stator
- Magnets repelling each other move the train forward



Lift

- Magnets repel each other to lift the Maglev train

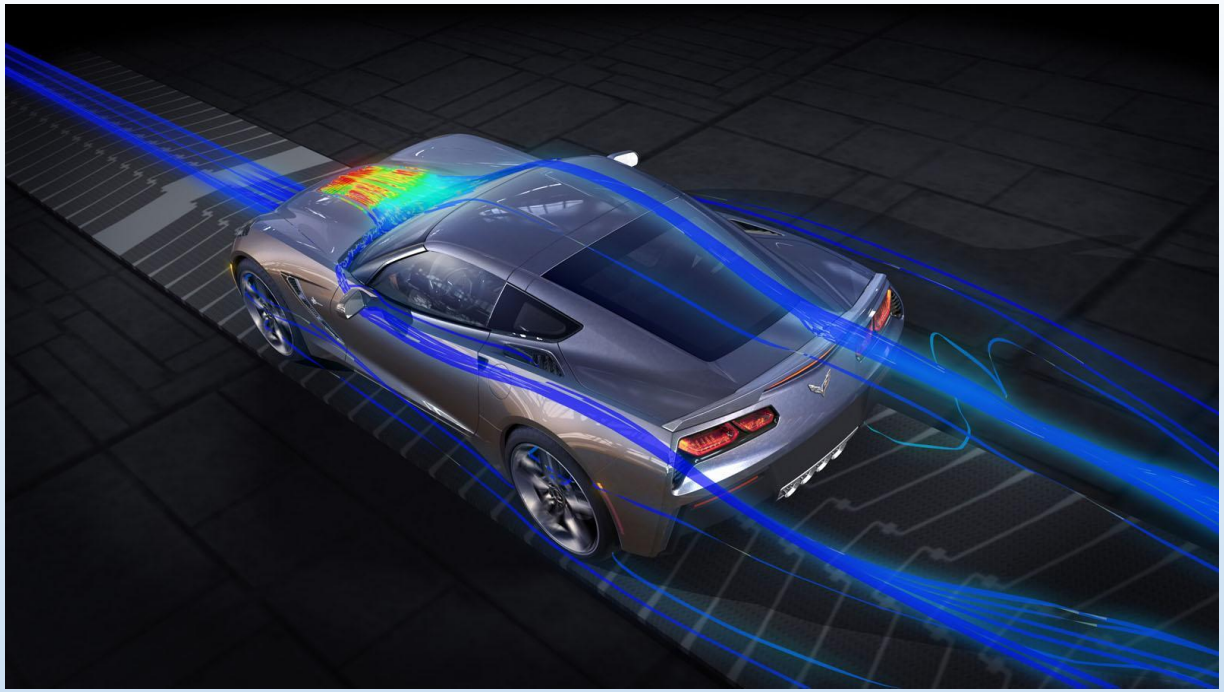


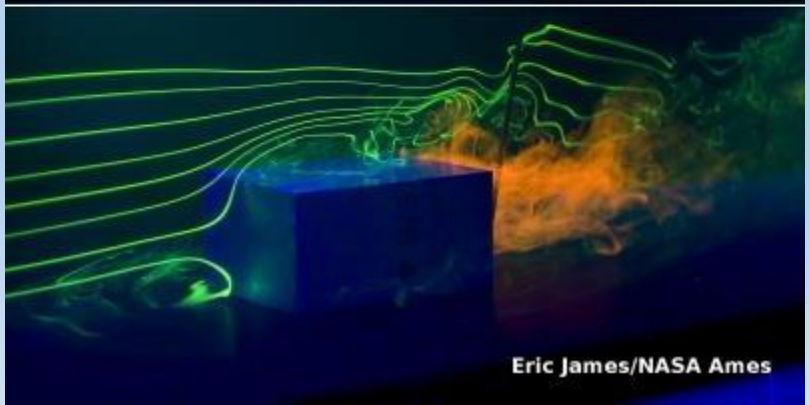
Gravity

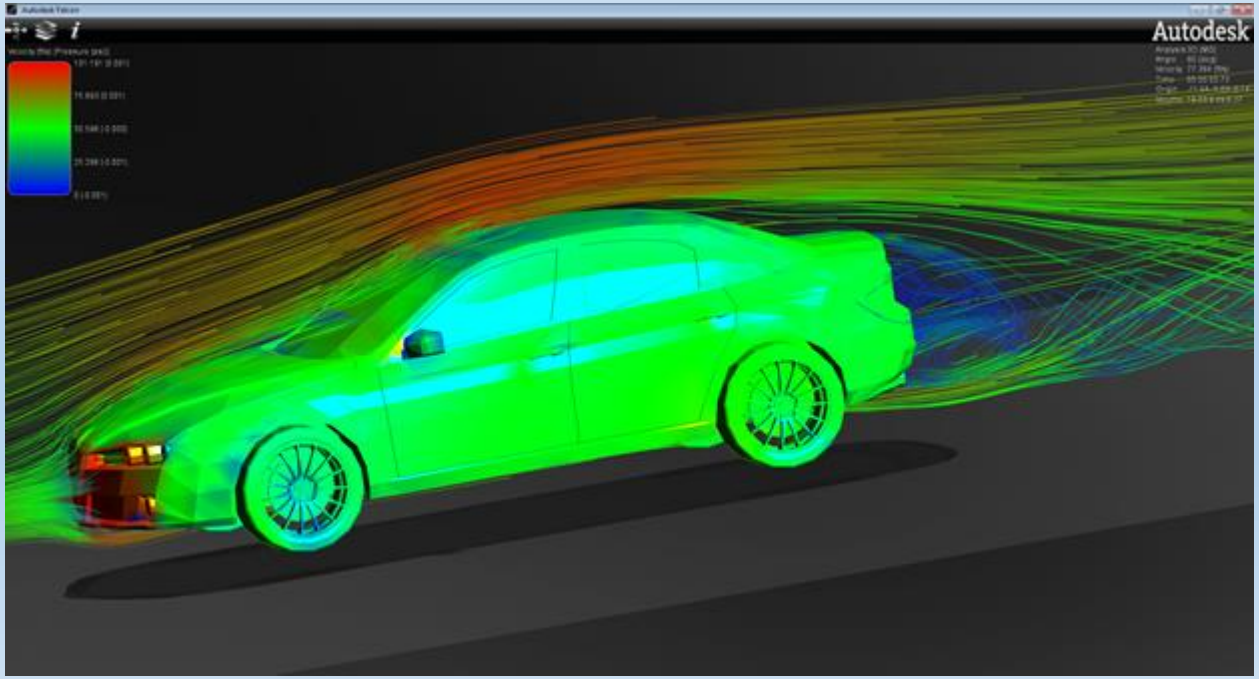
- Weight of Maglev train

Drag

- Wind resistance
- Airflow around train causes friction







Is MAGLEV worth it?

PROS

- FAST!
- Eco-friendly
- Helps eliminate other traffic problems

CONS

- Expensive to build
- Ticket price expensive
- Can be loud

The Future?

ONTARIO
QUÉBEC
WASHINGTON
MONTANA
NORTH DAKOTA
MINNESOTA
SOUTH DAKOTA
WISCONSIN
MICHIGAN
MAINE
VT
NH
MA
CT RI
OREGON
IDAHO
WYOMING
NEBRASKA
IOWA
ILLINOIS
OHIO
PENN
NEVADA
UTAH
COLORADO
KANSAS
MISSOURI
INDIANA
United States
MD
DEL
NJ
WEST VIRGINIA
KENTUCKY
VIRGINIA
CALIFORNIA
OKLAHOMA
TENNESSEE
NORTH CAROLINA
ARIZONA
NEW MEXICO
ARKANSAS
MISSISSIPPI
SOUTH CAROLINA
ALABAMA
GEORGIA
TEXAS
LOUISIANA
FLORIDA
Mexico

Washington
Montana
North Dakota
Minnesota
Montreal
Maine
Oregon
Idaho
Wyoming
South Dakota
Wisconsin
Michigan
Toronto
Chicago
Nebraska
Iowa
Illinois
Ohio
Indiana
Nevada
Utah
Colorado
United States
Kansas
Missouri
West Virginia
Oklahoma
Arkansas
New Mexico
Arizona
Mississippi
North Carolina
South Carolina
Georgia
Delaware
Maryland
District of Columbia
San Diego
Phoenix
Dallas
Houston
San Antonio
A
B
D
E
F
G
H
I
J
K
L
M
N
O
P
Q