ETM 534 - TECHNOLOGY ROADMAPPING SUMMER 2022

“S-PLAN”- STRATEGIC LANDSCAPE - “MOBILITY FUTURES”

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Presented by Team 3

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CONTENTS

METHODOLOGY

- Team gathered virtually, used Miro software as a tool
- Brainstorming, Open discussion on layers and sublayers
- Team members used Miro simultaneously to add or modify input on virtual road map wall chart
- Interaction and discussion capturing ideas in multiple sessions
- Deciding element value in timeline

Trends and Drivers

Social

- ✓ By 2022: safety, public health, land use, and congestion
- ✓ By 2025: Traffic calming measures, Pedestrian facilities, Bicycling networks
- ✓ Future: Increase in population, and a world of carsharing

Economical

- ✓ By 2025: Fossil fuel prices, inflation post COVID economy, Lack of financial ability of globalized countries
- ✓ Future: Increasing vehicle prices and reducing mobility and maintenance costs

Trends and Drivers

Environmental

- ✓ By 2022: CO_2 emissions – sustainability
- ✓ By 2025: increases demand for biofuels - environmental-friendly, autonomous, and personalized commutes
- ✓ Future: Prevalence of Renewable Energies

Political

- ✓ By 2022: War on Ukraine - splitting the world on two sides, west and east
- ✓ Future: The emergence of China as a superpower

Other

- ✓ Future: Safer Commutes

PRODUCT

SUPPLY

- 2022: Predominantly fossil fuels

- 2025: In upcoming years, part of solution could be the use of renewable energy with vehicles such as a high speed train. Incorporating sustainable with fast and electric trucks

- 2030 - vision: In future all of the vehicles used currently, trains, trucks, ships, and airplanes could be proficient enough at utilizing renewable energy with help of technology, to deliver the product quick and efficiently

CARS

- 2022 - 2025: Personal rapid transit or Podcars, Autonomous driving, EV, rideshare cars

Discussion was on how Hybrid cars and EV emerged in the last years, technologically with the autonomous driving and socially with rideshare companies to the what's expected to be in future solar powered vehicle and fusion powered vehicle

- 2030 - vision: VEHICLE-TO-EVERYTHING (V2X)

a vehicular communication system that supports the transfer of information from a vehicle to moving parts of the traffic system that may affect the vehicle. The main purpose of V2X technology is to improve road safety, energy savings, and traffic efficiency on the roads

BUS AND RAIL

- 2022: Current Bus and rail Available
- 2025: Fully electric Buses and trucks will emerge
- 2030- vision: Fast buses and flying taxi
- 2040-vision: Subway Tunnel Portland city
- 2030-vision: The boring Company hyperloop
- 2030- vision: Maglev train maglev line using partly evacuated tubes or tunnels. Reduced air resistance could permit vactrains to travel at very high speeds with relatively little power—up to 6,400–8,000 km/h Hoverbike, Hover train

- AIR
- CYCLE


Man flying in a jet pack

JETPACK

BACKPACK
HELICOPTER

FLYING CARS

LIGHTEST
E-BIKES

FOLDABLE
E-BIKES

- PEDESTRIANS

UNDERGROUND
PEDESTRIAN PASSAGE'S

PIEZO ELECTRIC
PATHWAY

- INTEGRATION

FLYING HOVERBOARDS

Materials

- Materials which in use today for production of cars:
  - Steel
  - Plastic
  - Aluminum
  - Rubber
  - Glass
  - Fiberglass
  - Lead
  - Copper
  - Titanium
  - Magnesium
- Future advanced materials which will probably be used in producing of cars
  - Plastic and polymer composites
  - Carbon fiber reinforced plastic
  - 3D printed plastics parts
  - Plastic parts from carbon dioxide

Manufacturing

- In 2007 there were about 806 million cars and light trucks
- They were consuming 980 billion liters of gasoline and diesel yearly
- The global automotive industry is a major consumer of water. Some estimates surpass 180,000 L of water per car manufactured
- In 2020 it was produced 77,621,582 cars
- China is the biggest producer of car, in 2021 they made 26,082,220
- The biggest car maker in 2021 is Volkswagen Group

Information technology

- GPS navigation
- Uber and Lyft
- Mobility as a service MAAS
- Trimet Hop for paying ticket on TRIMET

Chemistry

- Emissions gasses is main concerns and one of main causes for global warming
- Bio products (bio-diesel)
- New fuels which will get chemical reaction
- Chemical reaction in batteries

Biotech, Medical, Electronics,Mechanical, Emerging Tech, Others:

2022 ->

- Emergency services use sensors to have right of way in traffic
- Services made available through applications on handheld devices

2030 ->

- Improved sensors to collect diverse data that helps make autonomous manufacturing more efficient.
- Making use of different materials to improve efficiency and durability
- Improved EV charging stations
- Infrastructure for Hydrogen fuel pumps

2050 ->

- Hyperloops for super fast travel
- Super charging stations for EV

Market pull and Technology Push

Technology Push is where the technology is available and the designers make a product to use it.
Market Pull is where the market is need of a product, so designers make a product to meet that need.

An example from the S- plan presented:

The need for renewable forms of energy, we have made use of piezoelectric material properties and plan on powering street light from pedestrians movements. (Market pull)
This research has led people to apply it in public surveillance which preserves people's identity. (Technology push)

RESOURCES

Finance:

Government incentives, private sector (investments) and finance programs

Partnerships

2022 - 2025 Google maps, higher education institutes, corporate companies in the region
2022 — > Public-private partnerships. governments partnerships

Organizations

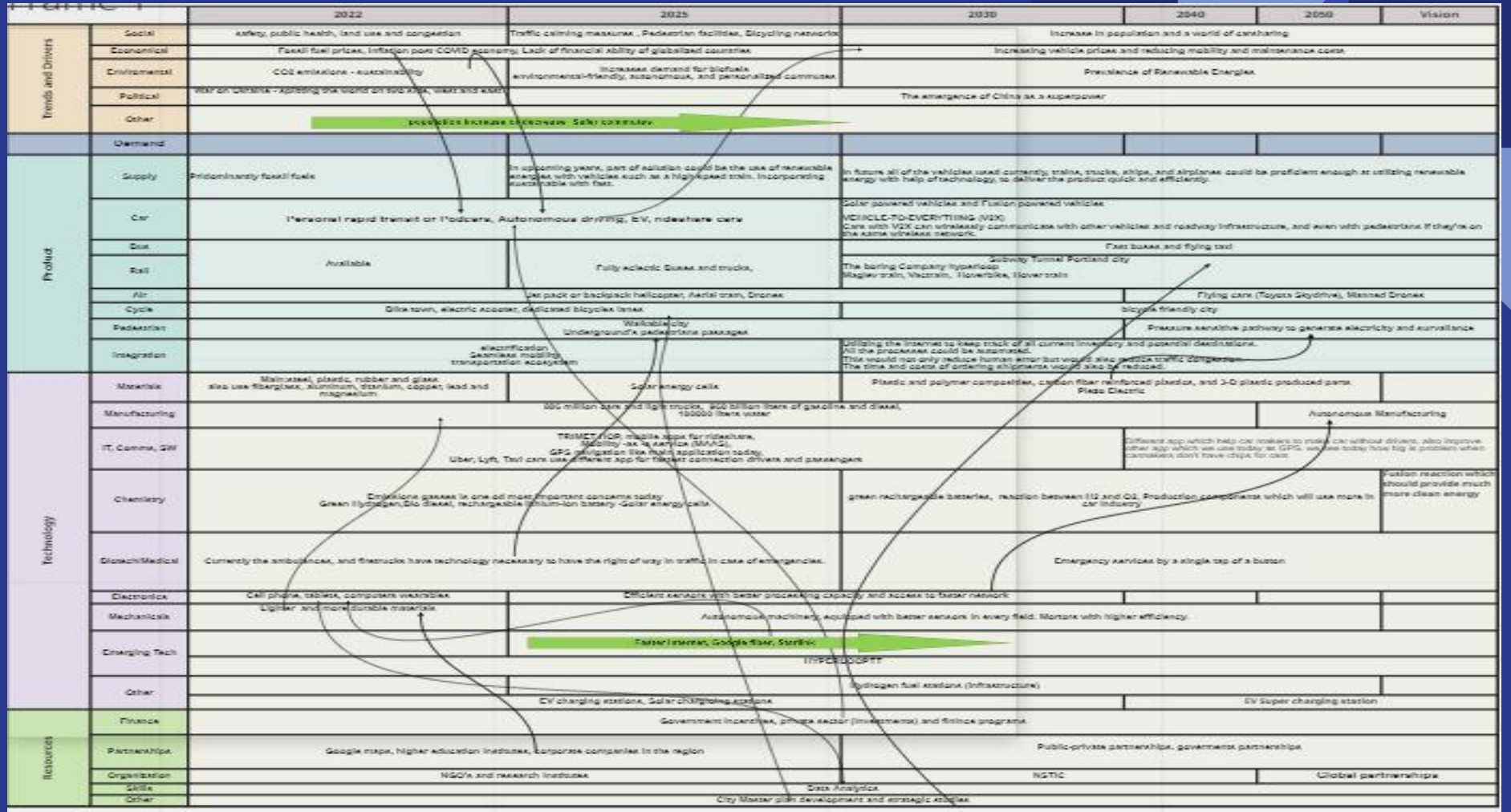
NGOs and research institutes
NSTIC(National Strategy for Trusted Identities in Cyberspace)
Global partnerships

kills

Data analysis

Others

City Master plan development and strategic studies


2022
2025
2030
2040
2050
Vision
Trends and Drivers
Social
safety, public health, land use and congestion
Traffic calming measures , Pedestrian facilities, Bicycling networks
Increase in population and a world of carsharing
Economical
Fossil fuel prices, Inflation post COVID economy, Lack of financial ability of globalized countries
Increasing vehicle prices and reducing mobility and maintenance costs
Environmental
CO2 emissions - sustainability
Increases demand for biofuels
environmental-friendly, autonomous, and personalized commutes
Prevalence of Renewable Energies
Political
War on Ukraine - Agitating the world on food Area, water and water
The emergence of China as a superpower
Other
population increase slowdown, Solar corridors
Product
Demand
Supply
Pridominantly fossil fuels
In upcoming years, part of solution could be the use of renewable energies with vehicles such as a high-speed train, Incorporating sustainable with fleet.
In future all of the vehicles used currently trains, trucks, ships, and airplanes could be proficient enough at utilizing renewable energy with help of technology, to deliver the product quick and efficiently.
Car
Personal rapid transit or Podcars, Autonomous driving, EV, ridesharе cars
Solar powered vehicles and Fusion powered vehicles
VEHICLE-TO-EVERYTHING (V2X)
Cars with V2X can wirelessly communicate with other vehicles and roadway infrastructure, and even with pedestrians if they're on the same wireless network.
Bus
Fast buses and flying taxi
Rail
Available
Fully eclectic Buses and trucks,
Subway Tunnel Portland city
The boring Company hyperloop
Maglev train, Vactrain, Hovertrike, Hovertrain
Air
Jet pack or backpack helicopter, Aerial train, Drones
Flying cars (Toyota Skydrive), Manned Drones
Cycle
Bike town, electric scooter, dedicated bicycles lanes
bicycle friendly city
Pedestrian
Walkable city
Underground's pedestrians passages
Pressure sensitive pathway to generate electricity and surveillance
Integration
electrification
Seamless mobility
transportation ecosystem
Utilizing the Internet to keep track of all current inventory and potential destinations.
All the processes could be automated.
This would not only reduce human error but would also reduce traffic congestion.
The time and costs of ordering and moving shipments would also be reduced.
Technology
Materials
Main steel, plastic, rubber and glass
also use fiberglass, Aluminum, titanium, copper, lead and magnesium
Solar energy cells
Plastic and polymer composites, carbon fiber reinforced plastics, and 3-D plastic produced parts
Piezo Electric
Manufacturing
600 million cars and light trucks, 900 billion liters of gasoline and diesel,
180000 liters water
Autonomous Manufacturing
IT, Comms, SW
TRIMET TOP, mobile apps for ridesharе,
Mobility -as-a-service (MAAS),
GPS navigation like main application today,
Uber, Lyft, Taxi cars use different app for faster connection drivers and passengers
Different app which help car makers to make car without drivers, also improve other app which we use today as GPS, we have today how big is problem when carmakers don't have chips for cars
Chemistry
Emissions gasses is one of most important concerns today
Green Hydrogen,Bio diesel, rechargeable lithium-ion battery -Solar energy cells
green rechargeable batteries, reaction between H2 and O2, Production compliance which will use more in car industry
Fusion reaction which should provide much more clean energy
Biotech/Medical
Currently the ambulances, and firetrucks have technology necessary to have the right of way in traffic in case of emergencies.
Emergency services by a single tap of a button
Electronics
Cell phone, radwos, computers wearables
Efficient sensors with better processing capacity and access to faster network
Mechanicals
Lighter and more durable materials
Autonomous machinery equipped with better sensors in every field. Motors with higher efficiency.
Emerging Tech
Faster Internet, Google fiber, Starlink
Hyperloop
Other
Hydrogen fuel stations (Infrastructure)
EV charging stations, Solar charging stations
EV Super charging station
Resources
Finance
Government incentives, private sector (investments), and fintech programs
Partnerships
Google maps, higher education institutes, corporate companies in the region
Public-private partnerships, governance partnerships
Organization
NGO's and research institutes
NSTIC
Global partnerships
Skills
Data Analytics
Other
City Master plan development and strategic analysis

REFERENCE

Link of S PLAN in Miro template:
https://miro.com/welcomeonboard/QklualRrc2doVEdGUzRjb1JRRmVDT2ZmcjVwWGozRU02N1lrNFY3eEZBTkNaMkpkR1RGY3I1SVo2cTFWZ0RybHwzNDU4NzY0NTI5NTEyNzU0NzEw?share_link_id=643166305831


Thank
You!