

Theme 3: Living Together

We are presented with more and more options for helping us move about, from travelling over long distances, to technology that helps us to be more mobile.

How can we use AI to make sure that we're able to move more easily, safely and greenly?

In this pack you will find:

- An overview of the theme and how it links to the Industrial Strategy's Grand Challenges
- Examples of the opportunities and challenges within this theme
- Probing questions and sub-themes to help you think about how AI can be used within this theme
- Case studies of real examples of how AI is helping issues within this theme.



The Grand Challenges

The Grand Challenges form part of the Industrial Strategy.

They aim to improve people's lives, and transform the UK's industries for the better. The four Grand Challenges are linked to the themes of the Longitude Explorer Prize:

Theme 3 Living Together

Grand Challenge: Future of Mobility is aimed at reducing emissions to zero by 2040 and improving transport to make it safer, cleaner and better connected.



Theme 1 Living Longer
(Ageing Society Grand Challenge)



Theme 2 Living Better
(Artificial Intelligence & Data Grand Challenge)



Theme 4 Living Greener
(Clean Growth Grand Challenge:)





Transforming how we move around

Better transport systems could have a large positive impact on everybody living in the UK today. From less time wasted travelling, to safer and cleaner modes of transport improving our overall health.

Here are just some of the ways better transport could make our towns and cities better places to live:

- Cleaner air
- Safer roads
- More free time
- More options for people with mobility problems (e.g. for anyone using a wheelchair, or people with limited vision)

How can AI help?

- How could AI help make travel safer?
- Could AI monitor and analyse data in a way that would help us create safer ways of moving around?
- What information would help keep people safe as they travel?

How can AI help?

- How can we use AI's ability to monitor, analyse, and learn help us create more efficient transport system?
- What information would help people navigate transport systems better? Could AI be used to provide this information?
- Could AI be used to help make transportation systems more accessible to everyone, including those with disabilities?

Safer Roads



Globally between 20 to 50 million people ¹ are injured in car accidents each year. The majority of these accidents are caused by human error.

Challenges

Better Transport Systems



A transport system is all the ways that people in a specific place move around, e.g. trains, busses, cars, bikes etc. Overcrowding on trains is at the highest level for years and UK drivers wasted an average of 31 hours in rush-hour traffic last year, costing each motorist £1,168².

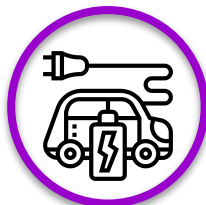
Challenges



How can AI help?

- How can we use AI to help us use cleaner modes of transports?
- What information would help you recycle more plastic? Can you use AI to get that information to people?

Cleaner Transport



One of the major sources of air pollution in the UK is exhaust from gasoline and diesel powered vehicles, in 2017 road transport contributed 80% of nitrogen oxides pollution³. Air pollution is very damaging both to the environment (by contributing to climate change) and to people (contributing to lung and heart diseases)

Challenges

How can AI help?

- How can AI be used to help develop the use of new methods of transport further?
- What could AI do to make new technologies more accessible to everyone?

Innovative Transport



Making the most of new technologies, such as drones, could transform the way we move people and things around. The challenge is how to make these new technologies accessible and what new uses can we find for them.

Challenges





Use Case 1

Safer Roads



Olli - Self-driving cars and AI



Watch Jay Rodgers introduce Olli the self-driving vehicle [video](#)
(3.48 min)

A self-driving car does exactly as you would expect - it drives itself

There are many reasons why self-driving cars would make our lives safer and easier:

- It is estimated that self driving cars could result in up to 90% fewer car accidents. ⁴
- If used with smart traffic lights, wait times could go down by 40% and overall travel time by 26% ⁵
- Smart cars could also lead to more efficient ride sharing, and reduce the number of cars on the road by 75% ⁶

What are the challenges self driving cars are trying to solve?	How is AI being used to help?	What data is the AI using?
<p>Safety</p> <p>Globally between 20 to 50 million people are injured in car accidents each year. The majority of these accidents are caused by human error.</p>	<p>Machine Learning</p> <p>After analysing millions of situations and examples, the car's computers use machine learning to teach itself how to recognize pedestrians and cyclists, identify lanes, calculate fastest routes, park etc. The car is continually learning from its environment and adapting.</p>	<p>Data from sensors: cameras, motion and proximity sensors, are all used to help the car navigate</p> <p>Traffic, mapping, and road data, from the internet, satellite feeds ect, these help with navigation and route mapping</p>

What are the risks?

Jobs

There are some jobs that could be at risk as this tech develops. Experts say that while AI will cause the loss of some jobs, it will create others. How can we, as a society, support those at risk of losing their jobs to transition into newly created jobs.





Use Case 2

Better Transport Systems



BICO - Bike Sharing Schemes



Watch this short explanatory [video](#) (2:00 min) from BICO

Bike sharing schemes are a great way to get people cycling in urban areas.

In short, a bike sharing scheme is a service in which bicycles are available to rent or for free for single short term rides. Most schemes allow people to take a bike from a dock (a special bike rack) and then return them to another dock, although increasingly you can park shared bikes anywhere, and find them using smartphone mapping apps.

What are the challenges Bike Sharing Schemes are trying to solve?	How is AI being used to help?	What data is used?
<p>Road congestion, air pollution, capacity/overcrowding and reduce cost of transport to individuals.</p>	<p>Machine Learning</p> <p>AI is helping to make bike sharing technology available by predicting demand based on weather and past use patterns, bike sharing companies can ensure there are enough bikes available.</p> <p>Machine learning algorithms are useful to bike sharing schemes,</p>	<p>Traffic, map, and road data from the internet, satellites, etc. which</p> <p>Location from trackers on bikes</p> <p>Weather data to help predict demand for bikes</p> <p>Data from the number of users (their past ride history)</p>



Some other examples you can check out:

- **iWeech** - AI helping to design better bikes
 - [video](#)
 - [website](#)
- **Intelligent Transport Systems** - Toyota creating a smart transport system
 - [video](#)
 - [website](#)
- **Didi** - AI helping to create better ride sharing systems
 - [website](#)

References:

1. <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>
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5. <https://www.cmu.edu/homepage/computing/2012/fall/smart-traffic-signals.shtml>
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