**IDEATION**

* Primerail Infralabs – Design Innovations – Provide existing mainline railway, rapid transit, and urban transportation with services like surveys, inspections, and design, they also develop radical solutions. PSC Plinths and Biebus are two of their patent-pending systems that stand to benefit urban transportation by reducing the costs of laying tracks.

### REDS – Safety & Efficiency Improvements - Develops software solutions to support railway operators to increase their safety, punctuality, and energy efficiency. Their Eco Driving system enhances the energy efficiency of all rail vehicles and helps optimize energy usage by automatically controlling the usage or suggesting actions like slowing down, speeding up, maintaining a constant speed or controlling heating and cooling.

### SIA KTN – Electrical Railway Points Heating - develops the Supervisory Control and Data Acquisition (SCADA) system for railway points heating. The fully automated point heating control system uses a series of models on climate and weather conditions. It can assess the best cleaning technique required, blowing snow off the track or electrical heating of ice on tracks. Their solution, which is still under testing and trials, allows real-time monitoring of tracks in regions that are hard to access.

### Rail-Veyor – Intelligent Material Handling - develops its eponymous bulk material hauling solution using railway tracks and intelligent design of tracks, loading and unloading systems, and freight locomotive. Once set up, operators benefit from reduced operating costs for overall material handling. Watch the video on their website to understand their solution in more detail!

### Icer Rail – Friction Technology - develops organic brake blocks covering a range of friction coefficients like LL (very low), L (low), K (high), and KK (very high) for locomotives, passenger coaches, freight wagons, and metros following international railway standards. They also replace cast iron blocks for freight and supplementary brake block for coaches, in compliance with the European Union for ‘rolling noise reduction’.

* Augmented Reality and Holographic Projection for Rail - The idea behind this was to enable office-based workers to offer advice without needing to travel to the site, which can help save both time and money for the company and reduce delays for passengers. In the next few years, this will go even further. High Speed 1 is partnering with NRHS to introduce AR headsets that can holographically project digital assets into the real world. These Microsoft HoloLens headsets will turn any space into a training environment for maintenance workers so they no longer need to spend large amounts of time on tracks. This can help improve safety, quality of training and reduce service disruptions for passengers.

### 3D Laser Scanners - This technology has the ability to collect millions of measurable data points, from dimensions to spatial relationships of objects, accurately within seconds. This dramatically reduces the time that would have been spent otherwise, eliminates the chances of inaccurate data being collected and in particular, helps with complex projects.

* Thermal and Visual Imaging Equipment – Includes Survey helicopters feature high-tech thermal and visual equipment which allows maintenance teams to quickly cover large areas and identify the smallest of faults in assets or the surrounding environment. Equipment like this can help to significantly cut down on the time and money spent checking rail equipment for faults and allow teams to quickly react to problems before they occur.

### Interactive Train Window - Although there has been some delays to the project, the trains are set to reach speeds of up to 760mph. This train’s most notable feature is the touch-screen interactive windows which would allow passengers to access information like the destination and high profile events, time and date, temperature, train speed and more.

* Digital Twin Models - London’s Crossrail, which will be known as the Elizabeth Line when it opens sometime in 2021, uses a digital twin model of the entire network. Digitally twinning all of the physical assets, from facilities and systems to environments, makes it much easier for engineers and data scientists to gain a deeper understanding of the complete network.But it’s not just a digital representation. It also allows teams to see what the actual physical system is doing, [so they can monitor activities in real-time](https://www.wifispark.com/blog/the-4-biggest-benefits-of-real-time-passenger-information) and respond to changes before they happen. This can help engineers design future networks that are smarter, more efficient and effective
* The Internet of Trains - By providing this passenger entertainment, TOCs can ensure that their passengers are occupied while they travel which helps to boost mood and improve their overall travelling experience. This, alongside [other rail engagement tactics](https://www.wifispark.com/blog/improving-the-passenger-experience-6-engagement-strategies-for-rail), will encourage passengers to travel with you again.  Passenger WiFi can also provide TOCs with vital analytical data. It can enable TOCs to see passenger activity, such as the routes they take, the times they travel and how long they dwell on transport and in stations.With [smarter analytics platforms](https://www.wifispark.com/advanced-analytics), other data sources can be integrated into the WiFi platform, which can include ticket sales, parking information, weather feeds and more. This allows TOCs to build a complete passenger profile and begin to understand their passengers behaviour in great detail.