



Analysis of World Railway Transportation

Presentation Number: P21-20945
Presentation Title DDETFP poster 137



Abstract

This research project is to create an easier way to get around the Bay Area. Many people rely on public transportation to get to their destination. Specifically, railway systems throughout cities that help reduce the congestion of cars on the road and help people who cannot afford a car. By analyzing the biggest railway systems of the world, much can be learned to improve local railway systems.

This will be done by looking at all the data collected from each system around the world, such as passengers, distance of travel, cleanliness, and length of time to travel. Japan, New York, and European railways are a few examples of systems that data will be collected from. Another aspect that will be investigated is how much the cost of improving the current system; and how much revenue will be generated by implementing these improvements.

The expectation is to find ways local railway systems can be optimized and improved. Another expectation is to make the local rail system more accessible to more passengers. By using the information and data gathered to ultimately improve everything for the general passenger.

Procedure

- Comparing Data Sheets from different railway systems.
 - Bay Area Rapid Transport
 - New York Railways
 - Japan Railway

Acknowledgements

I would like to thank MESA advisors Rene Rubio, Luis Alcazar, Professor Antonio Castro, for assisting in the creation of this project. I would also like to thank Dwight D. Eisenhower Fellowship for making all of this possible.

References

Most of this Research is attributed to data gathered by bart.gov, new.mta.info, hitachi.com, and jrailpass. Other sources include various news articles from sfgate, The New York Times, CBS News, Japan-magazine.jnto.go.jp, and japan-guide.com.

Current BART Systems

- Opened doors in 1972
- As of 2020
 - 800 Railcars
 - 122 miles of track
 - 50 Stations
- Average of 410,774 trips per weekday
- 118.1 million total trips
- New Train Car Project
 - Modernizing and replacing older model cars
- Updating Traffic Control systems
 - Fixed Block System
 - Communications-based system (2015)
- Station Modernization
 - Enhancing quality of life
- Expansions
- Cleaning Standards
 - Overnight Cleaning
- Covid-19 precautions



New York Railway

- Metropolitan Transportation Authority
- Average ridership 5.5 million
- 665 mainline track as of 2017
- Average speed of 30 to 50 MPH
- Use of the Communications-based Train Control (CBTC)
- Cleaning processes
 - Nightly Basis
 - Airfilters
 - Electrostatic Sprayers
 - Ultraviolet Light
 - Antimicrobial Biostats
- Covid-19 protections
 - 13 point plan

Japanese Railway

- Japan Railway Group
 - 6 different companies
- Shinkansen (Bullet Train)
 - 200 MPH (320KM/H)
 - World Record of 375 MPH
- Lines stretching entire country
- Different traffic control systems
 - SIRIUS Kyushu Shinkansen
 - COMTRAC Tokaido and Sanyo Shinkansen
 - COSMOS Tohoku, Joetsu, Nagano, Yamagata, and Akita Shinkansen
- Programs to maximize crowd flow
- Efficient Cleaning procedures
 - Cleans cars within minutes
- Covid-19 Protections

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