



# Bus Rapid Transit (BRT) System

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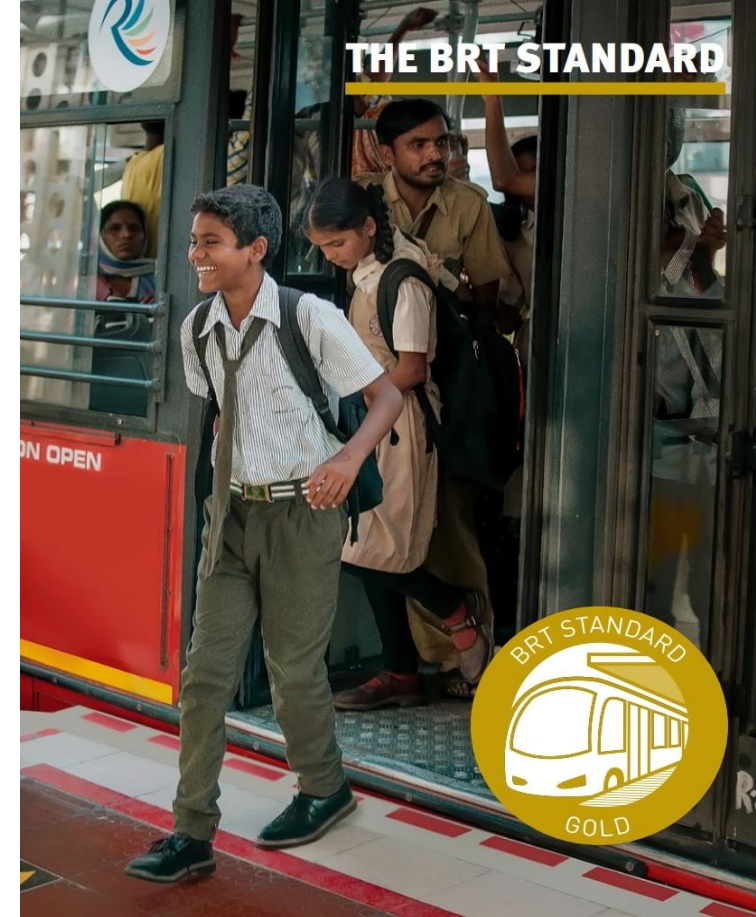
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# What is BRT System?

- Bus Rapid Transit (BRT) is a bus-based transit system that can achieve high capacity, speed, and service quality at relatively low cost by combining segregated bus lanes that are typically median aligned with off-board fare collection, level boarding, bus priority at intersections and other quality-of-service elements.
- The ITDP\* BRT Standards is an evaluation tool for Corridors based on international best practices.

\* ITDP: Institute for Transportation & Development Policy



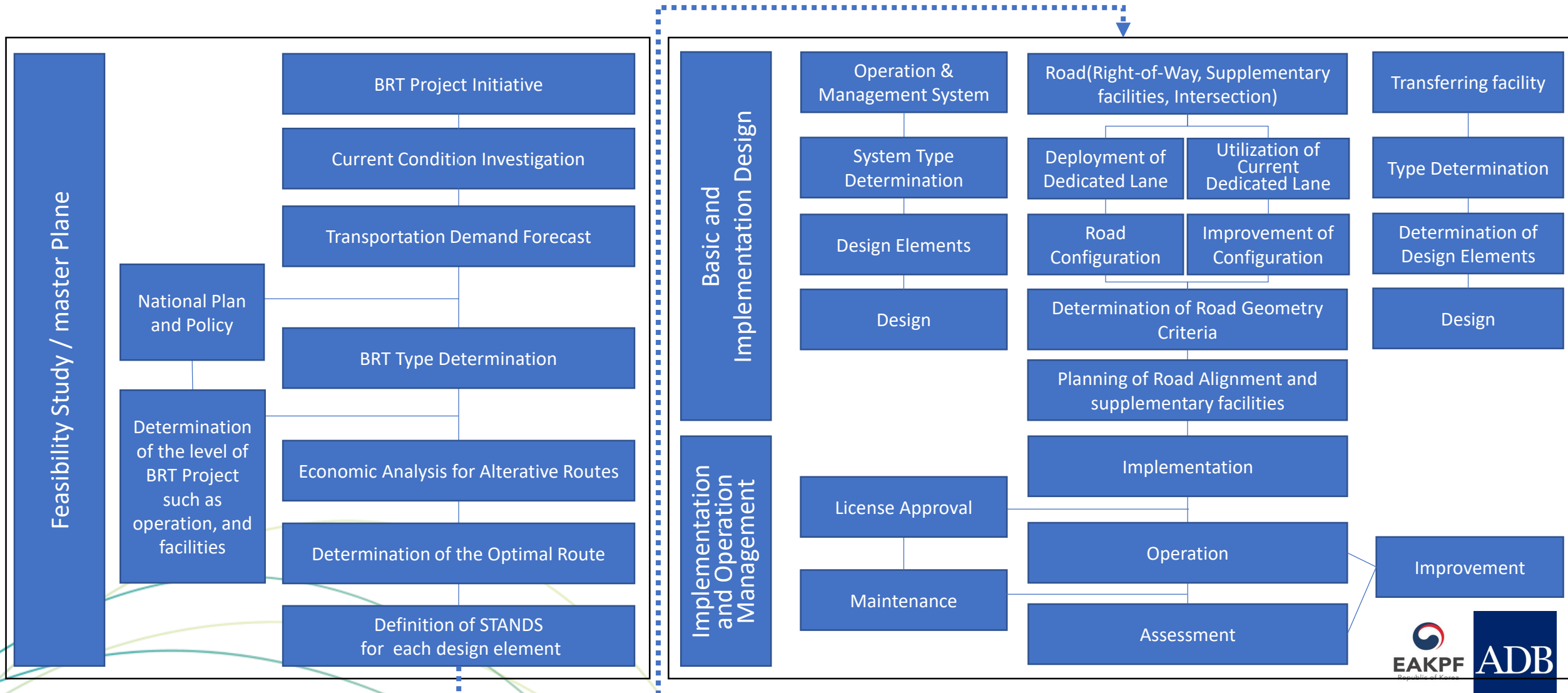
# What would be the issues in R.O.K?

- Inefficiency of road capacity management when frequency of bus operation is low
- Exceeding V/C on dedicated lane, or building severe queue at stops
- Inconsistency of dedicated lanes when buses run over city boundary
- Mismatching between screen doors and bus doors when buses comes from other cities
- Huge gaps of OBU (On Board Unit) for bus communication equipment among cities; Disconnection of Advanced Bus System and Service



➡ **K-BRT Standard** is required.

# What is the process of building BRT System in R.O.K?



# How do we make BRT system special?

- Four elements of S-BRT System: S-BUS, S-BMS, S-BITS, and S-BRT Priority Signal System
  - S-BUS: Articulated bus with doors on both sides, powered by electricity, and connected to S-BMS
  - S-BMS: Central System monitoring location, punctuality, and status of S-BUS, and operation environment
  - S-BITS: Providing Real-time information and comfort environment to passengers at stops
  - Priority Signal System: Priority to S-BRT when it meets signal intersection

S-BUS (Articulated bus with doors on both sides)



S-BMS (S-BRT Management System)



S-BITS (S-BRT Information Terminal and Station)



S-BRT Priority Signal System



# How do we make BRT system special?

- S-BUS

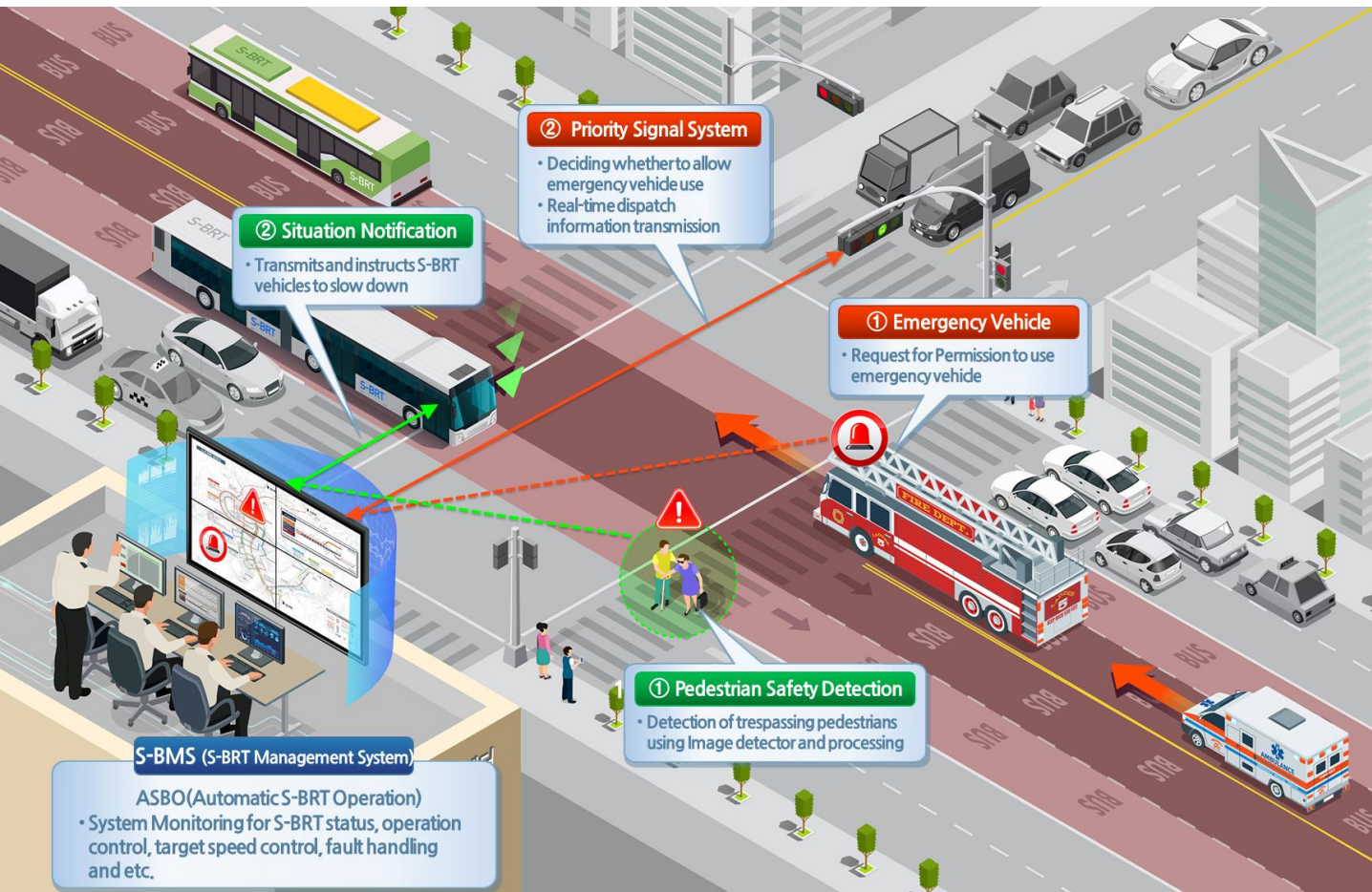
- Articulated bus with doors on both sides
- Powered by electricity
- Connected to S-BMS
- Good quality of passenger ride comfort
- Convenient boarding with vehicle scaffolding

- Corresponding Infrastructure

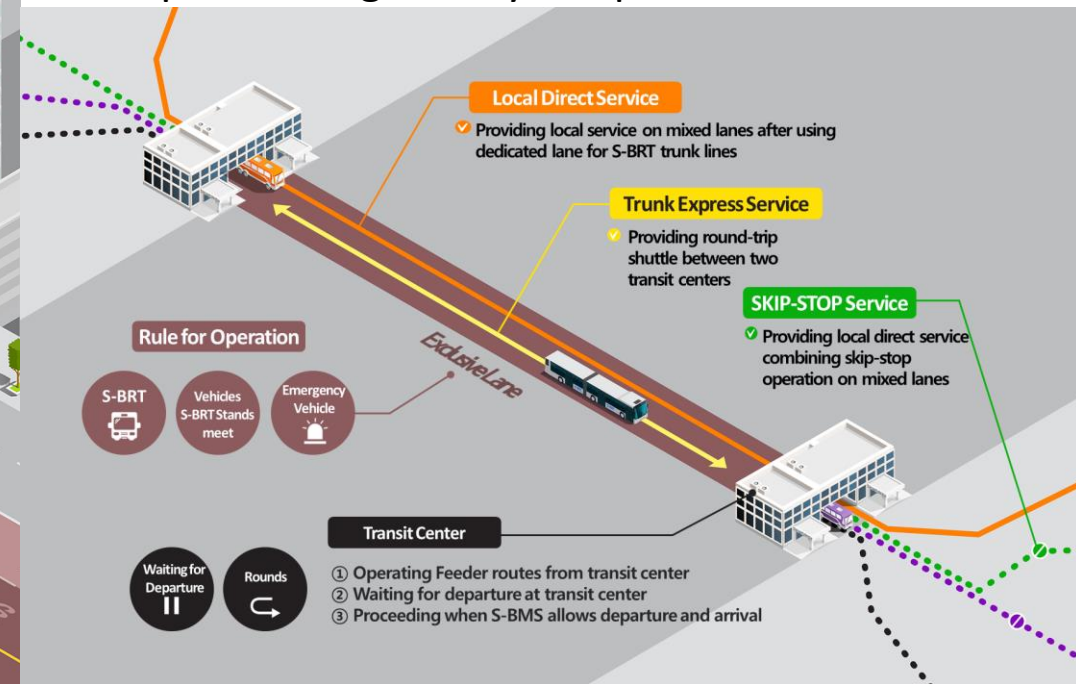
- Dedicated Right-of-way
- Island-type platform
- Overtaking Lanes



# How do we make BRT system special?



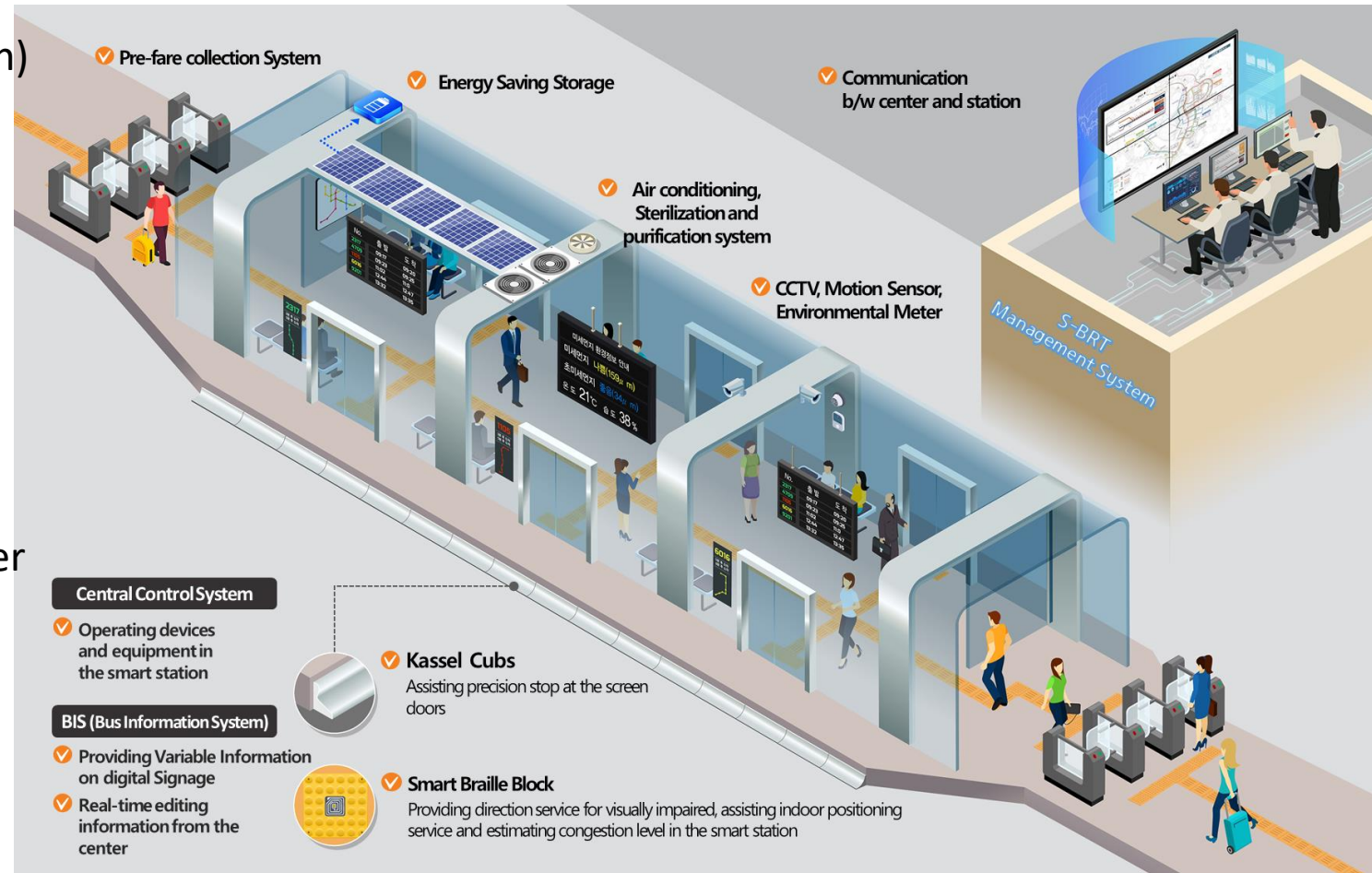
- S-BMS (Bus Management System)
  - Service Quality and Operation Efficiency Control
  - Implementing variety of operation scenarios



# How do we make BRT system special?

- **S-BITS** (Bus Information Terminal and Station)

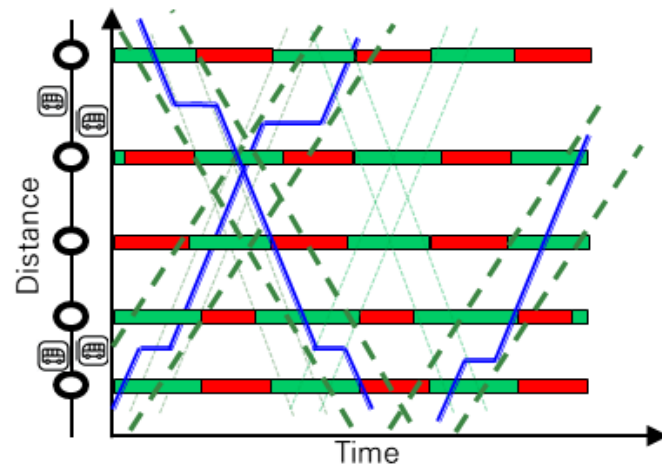
- Pre-fare collection system for saving passenger's boarding time
  - : replacing pre-fare collection system with tagless system in R.O.K
- Energy Saving Storage
- Air Conditioning, Sterilization and Purification System
- CCTV, Motion Sensor, and Environmental Meter
- Communication between center and station
- BIS (Bus Information System)
  - : providing variable information on digital signage



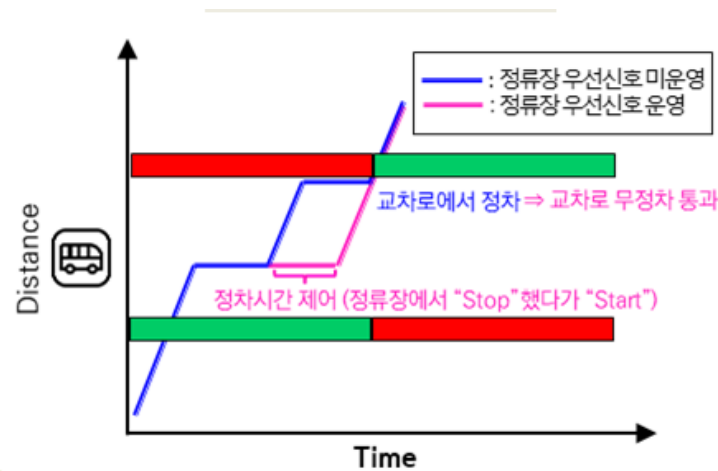
# How do we make BRT system special?

- Priority Signal System

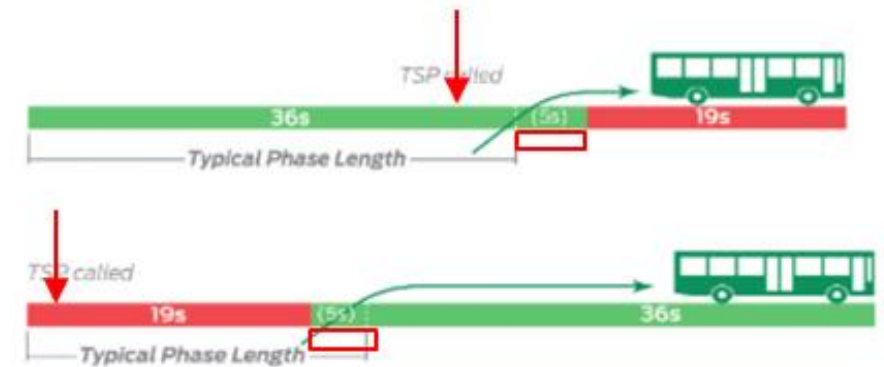
- Module 1: Pre-timed Control & Progression Priority
- Module 2: Real-time Control & Conditional Priority
- Module 3: Real-time Control & Active Priority



Module 1



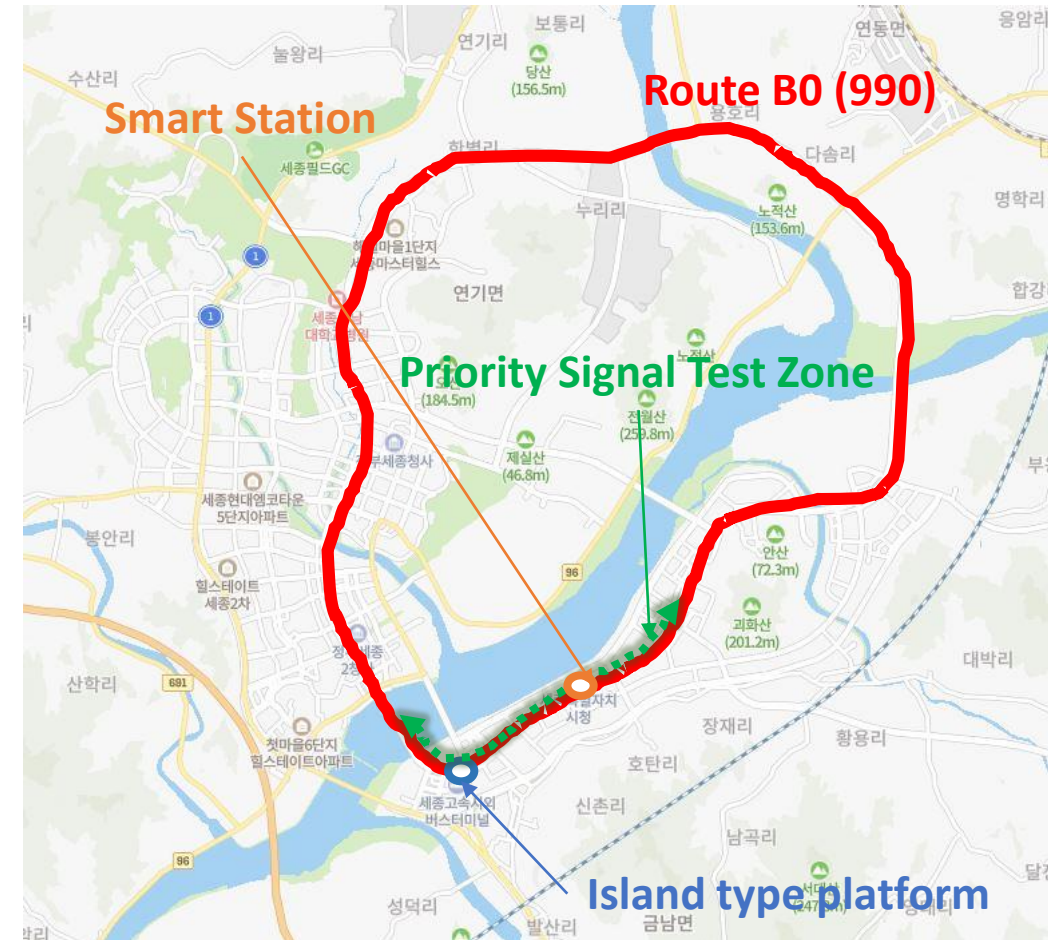
Module 2



Module 3

# When and Where can we meet brand-new BRT?

- Implementing S-BRT system in Sejong City
  - 1<sup>st</sup> Phase Implementation (~'21.11)
    - : Central Control and Monitoring with S-BMS
  - 2<sup>nd</sup> Phase Implementation (~'22.04)
    - : Articulated S-BUS with doors on both sides, Smart Station, and Island type platform
  - 3<sup>rd</sup> Phase Implementation (~'22.11)
    - : Integrated S-BRT System, and Performance Evaluation Result



**Thank you**

# Appendix (1)

- **Active Bus Control:** A bus Operations system that uses data from automatic vehicle location (AVL) systems, which are based on GPS information, to allow for bus service adjustments to be made in real time, often through an automated process;
- **Arterial Street:** A major transportation thoroughfare designed for longer distance trips within a city;
- **Busway Alignment:** The location of transit lanes within the right-of-way on a street;
- **BRT Corridor:** A section of road or contiguous roads served by a bus route or multiple bus routes with a minimum length of 3 km that has dedicated bus lanes and otherwise meets the BRT basic minimum requirements;
- **Direct Service:** A BRT service pattern where multiple bus routes operate in a BRT corridor busway as well as outside the BRT corridor. This allows passengers to make trips with fewer transfers than with conventional trunk and feeder services;
- **Frequency:** The number of buses that arrive in a given length of time on a single bus route or on a street segment (including multiple routes). For the purpose of the BRT standard, the deductions for low frequencies (large headways) are measured by bus route- for example, on the TransOeste corridor in Rio de Janeiro, Brazil, the frequency for buses on the Express routes is around 30 buses per hour;

## BRT Standard Rankings



### Gold-standard BRT 85 Points or above

Gold-standard BRT is consistent in almost all respects with international best practices. These corridors achieve the highest level of operational performance and efficiency while providing a high quality of service. The gold level is achievable on any corridor with sufficient demand to justify BRT investments. These corridors have the greatest ability to inspire the public, as well as other cities.



### Silver-standard BRT 70–84.9 points

Silver-standard BRT includes most of the elements of international best practices and is likely to be cost-effective on any corridor with sufficient demand to justify BRT investment. These corridors achieve high operational performance and quality of service.



### Bronze-standard BRT 55–69.9 points

Bronze-standard BRT solidly meets the definition of BRT and is mostly consistent with international best practices. Bronze-standard BRT has some characteristics that elevate it above the BRT basics, achieving higher operational efficiencies or quality of service than basic BRT.

### Basic BRT

Basic BRT refers to a core subset of elements that the Technical Committee has deemed essential to the definition of BRT. This minimum qualification is a precondition to receiving a gold, silver, or bronze ranking.

# Appendix (2)

- **Grade-Separated:** When a transportation corridor is designed so that users do not cross direct paths of users on the corridors that it crosses. Grade separation is achieved by separating transportation corridors vertically. A flyover and an underground metro are two examples of grade separation;
- **Headway:** The length of time between buses either on a single bus route or on a street segment (including multiple routes). For the purpose of the BRT Standard, the deductions for low frequencies (large headways) are measured by bus route-for example, on the TransOeste in Rio de Janeiro, Brazil, the average headway for the Express buses is two minutes, meaning that buses on that route arrive every two minutes;
- **Right-of-Way:** The width of public space dedicated to the movement of people and goods as well as other public uses;
- **Spur:** A stretch of BRT infrastructure that branches off a BRT corridor but is not long enough to be considered a corridor by itself, as it is less than 3 km in length;
- **Trunk and Feeder Service:** A BRT service pattern where all BRT bus routes operate only along the BRT corridor (the truck route) and feeder bus routes take people to and from BRT Stations. Passengers must transfer between feeder routes and BRT truck routes.

