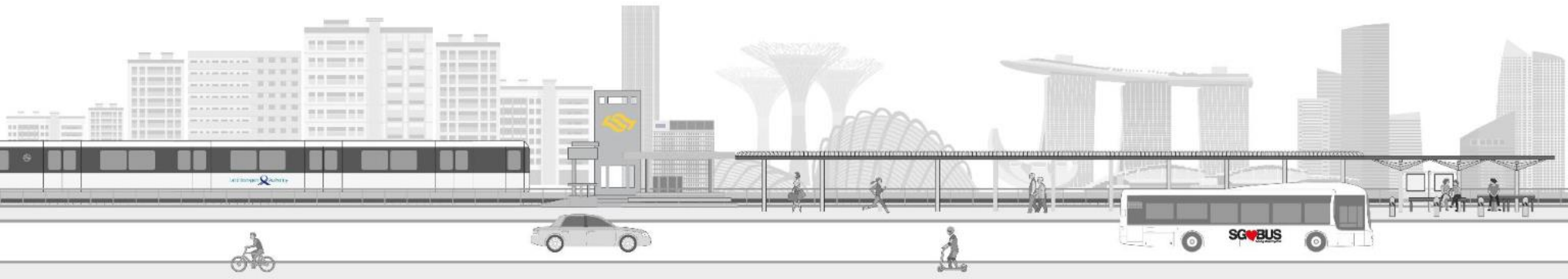# Technical Briefing
Immobiliser System for Lorry Cranes

12 September 2019
Enterprise Singapore, Solaris

Incidents Involving Lorry Cranes

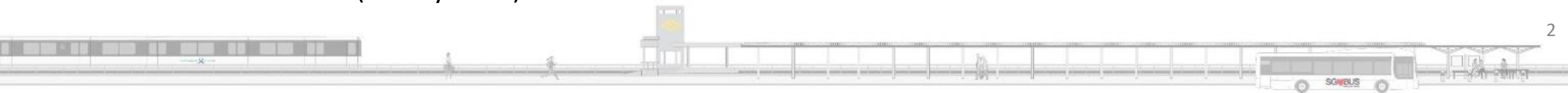Bukit Batok West Avenue 6 (17 June 2016)

Woodlands Road (27 November 2016)
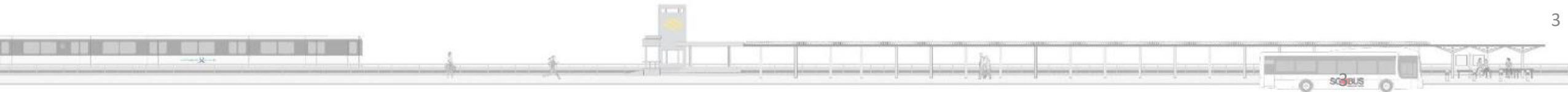

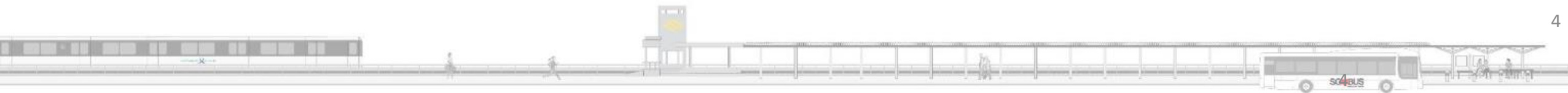Bukit Batok St 52 (20 July 2016)

CTE Tunnel (5 December 2016)

Examples of Lorry Crane Operations

<u>Nature of Operations</u>

- Logistics Contractors
  - ➤ Transports goods on deck
  - ➤ Able to completely stow cranes when traveling between sites

- Tree Pruning / Road Works Contractors
  - ➤ Performs road-side operations (e.g. tree pruning)
  - ➤ Commonly rest the crane on the cargo deck when performing operations / traveling between sites
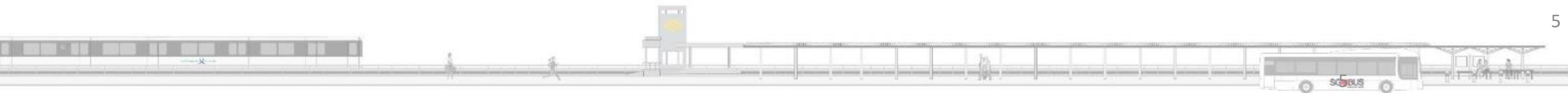
Audio Warning System for Lorry Cranes

Audio Warning System Requirement

- Mandatory for all lorry cranes (both new and in-use) to be fitted with an Audio Warning System (AWS)

- Purpose of AWS to provide audio warning to driver when crane is not adequately stowed/retracted

- Consists either of a limit switch linked to an audio warning buzzer in driver's cabin (Home Position Limit Switch AWS); OR

- For lorry crane operators who are unable to completely stow their cranes due to operational constraints, a sensor on crane linked to the audio warning buzzer (Angle Sensor AWS)

- Tampering of AWS is an offence under the Road Traffic Act

Home Position Limit Switch AWS

- In the "home" position (i.e. completely stowed), the crane boom rests on a lever of the limit switch → Buzzer <u>will not</u> be activated.

- Crane boom is <u>not</u> in its "home" position, nothing rests on the lever of the limit switch →Buzzer activated

Buzzer Not Activated

Buzzer Activated

Angle Sensor AWS

Angle sensor

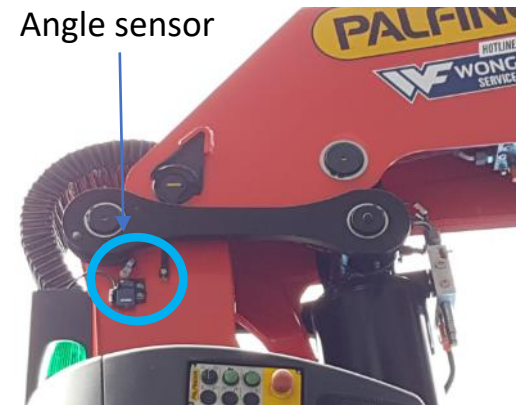Inner boom not greater than 90°, buzzer will not activate

Angle sensor

Inner boom more than 90° (above maximum stowed height), buzzer will activate

- Sensor installed on crane boom and determines the angle or inclination of the crane's inner boom

- The sensor activates the warning buzzer when the inner boom is greater than 90 degrees (i.e. above maximum stowed height / height of crane boom knuckle)

Example of Angle Sensors

Angle sensor

Illustrations of AWS

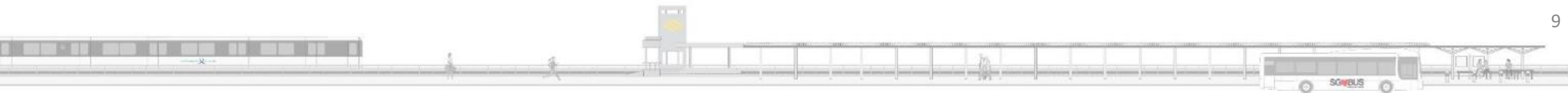Positions of Crane Boom (AWS **not** Activated)

Positions of Crane Boom (AWS Activated)

Installation of AWS

- Depending on their nature of operations, lorry crane owners can opt to install either the home position limit switch audio warning system or the angle sensor warning system

- Owners to ensure that the system serves to alert the driver when the crane boom is not adequately retracted below its maximum stowed height

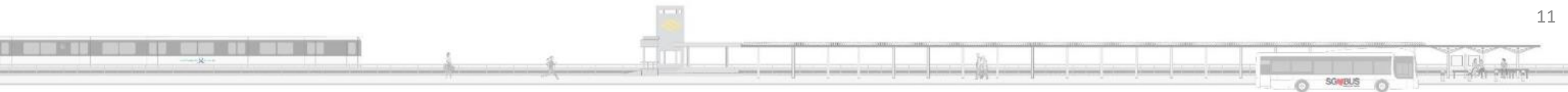- AWS inspected at the AICs during the vehicle's periodic inspection

Immobiliser System for Lorry Cranes

Immobiliser System for Lorry Cranes

- Explore the technical feasibility of installing an immobilizer system on lorry cranes

- Aim is to further complement the AWS and prevent the lorry from moving off from site if the crane boom is not adequately stowed

- Improves road safety by reducing the risks of lorry cranes hitting overhead road structures

- Eliminate or reduce such costly incidents (to both lorry crane owner and government for repairing the structure). Such incidents could also obstruct traffic flow and cause traffic congestion

- Solution to work with lorry cranes of different ages and makes considering that the cranes, of different models, are retrofitted on lorries of different makes (i.e. European or Japanese makes)

Immobiliser System on Vehicles Carrying Hazmat Materials

Evaluation Criterion	Weightage (%)
1. Technical feasibility of solution	30
2. Innovation	20
3. Economic Feasibility and Commercialization Potential (Include development cost and final product cost)	30
4. Capacity and Expertise to Execute Project	20
Total Score	100

Thank You

www.lta.gov.sg

WeKeepYourWorldMoving

LTAsg

LTAsg

LTAsingapore

LTA Singapore