

Problem Based Learning: Teaching engineers to tackle the SDGs

Dr. WARESSARA WEERAWAT

Mahidol University



Academic challenges and opportunities for rail transit projects in Thailand

SDG 9

- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- **9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes...
 - **9.4.1** CO2 emission per unit of value added
- **9.B** Support domestic technology development, research and innovation in developing countries...
 - **9.B.1** Proportion of medium and high-tech industry value added in total value added



SUSTAINABLE DEVELOPMENT GOAL 11

- Make cities and human settlements inclusive, safe, resilient and sustainable
- **11.2:** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
 - **11.2.1** Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities



High Rail Transit Investment

- Heavily invest in rail transit including metro systems, conventional rail, and high speed links

Conventional Rail

Before 2015 / Yr 2023-2025

4,043 Km / 4,721 Km

Single 3,763 Km / 1,287 Km

Double 173 Km / 3,327 Km

Triple 107 Km / 107 Km



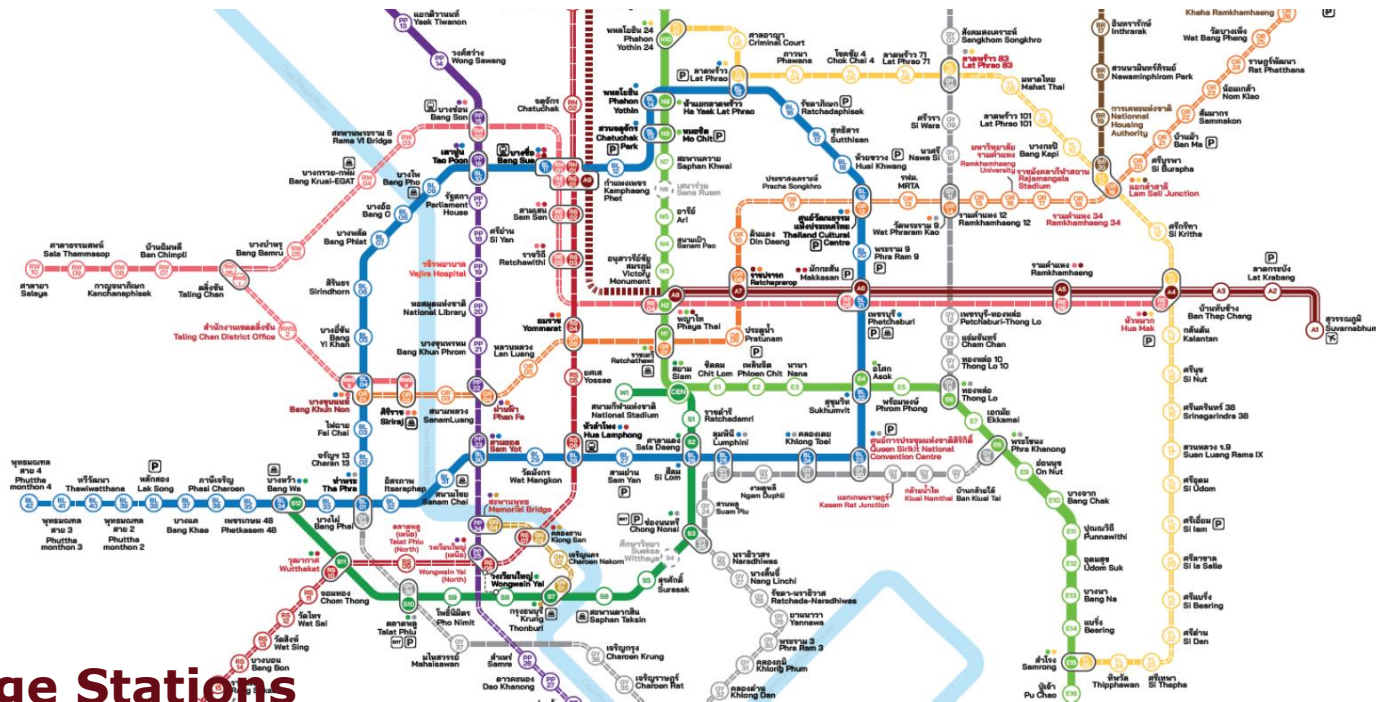
Bangkok Metropolitan Mass Transit Plan

14 Lines

559 km

36 Stations

56 Interchange Stations



In 2019: 5 lines / 100+ km



Challenges

- More convenient, Environmental friendly
 - Becoming sustainable transport solution?
- Lesson learned
 - High cost : Many Imported Technologies
 - Need to compete with road transport
 - Poor Integration: with different line/ different mode/city development
 - Many project owners
 - Low Accessibility
 - Less IT service
 - Many Engineering work!



Metro Exchange/ Rail Exchange



- Summer intensive course
- Joint academic papers
- Academic conference



“


*We need community-based
demonstration projects.*

”


Our Findings





BKK Rail : Demonstrating Project


**BKK Rail**
Version 1.5.1, b.68 [r.58, s.81]


Other information

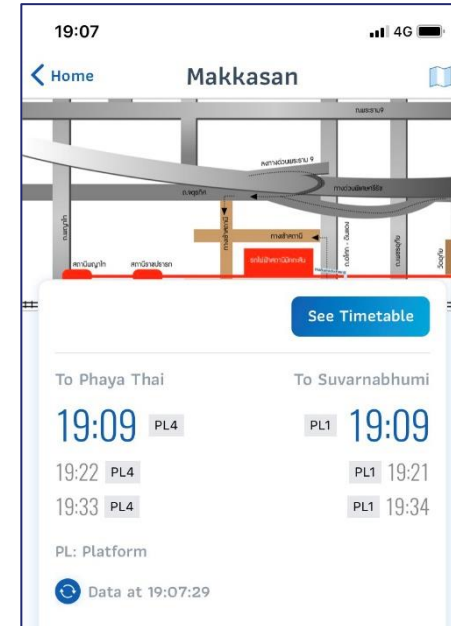
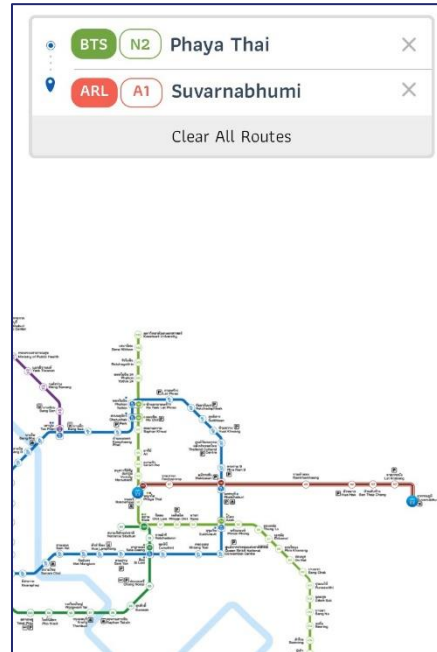
 About BKK Rail

 Project Plan

 Mass Rapid Transit Map

 Parking

 Feedback



Salaya Livable City: Demonstrating Project

- A good chance for **revitalize the town** >>> New Urbanism
- Salaya X Transit-Oriented Development (**TOD**)
 - Promote non-motorized travelling/ Mixed Used



Salaya TOD & Engineering education



- Assists on **sustainable city** development
- Integration of multidisciplinary **engineering education** and research to overcome the urban sprawl, **community** degradation, and traffic problem in Salaya.

