

The SUNWAY Bus Rapid Transit (BRT) Line: Lessons for The Future¹



By:

Dr. Ong Kian Ming

Jonathan Fong



Date: February, 2016

¹ Additional inputs from Chung Yi Fan, parliamentary researcher.

Executive Summary

Malaysia's first Bus Rapid Transit (BRT) line – the Sunway BRT line – was officially launched by Prime Minister Najib Tun Razak on the 2nd of June, 2015. Costing a total of RM634 million – which averages out at RM117 million per km (or approximately US\$30 million per km) – the 5.4km elevated BRT line appears to be on the high end of the cost spectrum for BRT systems. The manner in which the design and contract of this BRT system was decided upon – via a directly negotiation public private partnership (PPP) contract raises many questions in terms of conflict of interest and private sector 'capture' of a public infrastructure project. The biggest beneficiary of the Sunway BRT line is Sunway Berhad which has many properties (already built and in the process of being built), businesses and educational institutions that is being served by the Sunway BRT line. The fact that one of Sunway Berhad's subsidiaries – Sunway Construction – was given the contract to build the elevated BRT line, the inclusion of Sunway Berhad as one of the stakeholders in this PPP project via its CSR contribution (15%), the partial funding of this PPP project via the Facilitation Fund (15%) which comes under the Public Private Partnership agency in the Prime Minister's Department (otherwise known as UKAS), all point towards possible explanations for the decision to build the elevated BRT line at what seems to be a high cost.

The private sector 'capture' of this PPP project is reflected in the naming of the BRT stations whereby four out of the seven stations have the name 'Sunway' (or an abbreviation of Sunway) in it and another station (South Quay) is the name of one of Sunway's property developments.

The decision to build the costly elevated BRT line, funded primarily by an already heavily indebted Prasarana (70%), could explain the decision to structure the fares of the BRT line at the exorbitant rate of RM1 per km. After a trial period of 2 months in which the rides on the BRT Line were offered for free, the exorbitant fare structure caused a 63% drop in the average daily ridership when it was implemented in August 2015. The ridership recorded in August 2015 – 4616 per day or 256 per hour – is approximately 11% of the initial projected ridership of 2400 per hour.

The many lessons learned from the Sunway BRT line needs to be incorporated into future BRT lines in the country starting with the already approved but yet to be implemented 34km KL-Klang BRT line, where construction is supposed to begin in the 3rd quarter of this year and be completed by 2018.

Table of Contents

1.0	Quick Facts on the Sunway BRT Line	5
2.0	Introduction to BRTs	5
3.0	Background to the Sunway-BRT Line.....	6
4.0	An example of a Public Private Partnership ‘captured’ by private interests.....	7
5.0	Inflated Costs	8
6.0	Route alignment, Station names, Bus Lanes and Station Accessibility.....	11
7.0	Ticketing System, Fare Structure and Ridership	23
8.0	Conclusion: Lessons for the future	27

List of Tables

Table 1: Size of Facilitations Funds (2011 to 2016) under the Development Expenditure of the Prime Minister’s Department in the Federal Government’s Budget	10
Table 2: Average Daily and Monthly Ridership for the Sunway BRT Line, June to August 2015	26

List of Figures

Figure 1: Sunway BRT stations & connections to the Port Klang KTM Line & the Kelana Jaya LRT extension.....	12
Figure 2: Map showing the distance between the South Quay BRT station and the actual South Quay housing area (separated by the KESAS highway).....	13
Figure 3: View from the SunU-Monash station showing Monash University and the electric bus used ...	14
Figure 4: Example of ground level bus lane in Curitiba, Brazil.....	15
Figure 5: Showcasing the large station footprint of the Setia Jaya BRT station	15
Figure 6: Showing the start of the small terminating loop outside a Seoul bus station.....	16
Figure 7: The exit end of the terminating loop outside a Seoul bus station.....	16
Figure 8: Aerial view of the roundabout for a Metrobus line in Belfast, Northern Ireland.....	17
Figure 9: Ground level view of the roundabout for a Metrobus line in Belfast, Northern Ireland	17
Figure 10: The much larger loop at the Setia Jaya station.....	18
Figure 11: Example of a ground level BRT stop & bus lanes on the BRT system in Bogota, Colombia	18
Figure 12 The elevated Setia Jaya BRT station.....	19
Figure 13 Escalators heading to the ticketing concourse and platform level.....	19
Figure 14 The Taylors' bus dropping off students	20
Figure 15 Showing the poor pedestrian access on the Mentari side. The link bridge is a better option. .	21
Figure 16 Featuring the short roof at the USJ7 bus laybys	21
Figure 17: Ticketing concourse of the Setia Jaya BRT station.....	23
Figure 18: Common paid area to be shared by LRT and BRT at USJ7 station	23
Figure 19: Showing the link bridge connecting with the BRT station at Setia Jaya	24
Figure 20: The dark interior of the link bridge.....	24
Figure 21: Fare Table for the Sunway BRT Line (from August 2015 onwards)	25

1.0 Quick Facts on the Sunway BRT Line

- Type : Fully elevated dedicated bus lane
- Project launch date : 9th June 2012
- Start of operations : 2nd June, 2015
- Ticketing : Closed system Auto Fare Collection. Linked with Seri Setia KTM train station via a covered walkway. Integrated with the LRT Kelana Jaya Line LRT via USJ7 station from October 2016.
- Route length : 5.4km
- Number of stops : 7 (SB1 Setia Jaya to SB7 USJ7)
- Fleet : 15 electric buses built by BYD, a Chinese company
- Total cost : RM634mil (estimated) shared between Prasarana (70%), Sunway Bhd (15%) and Facilitation Funds from UKAS (15%)
- Operator : Prasarana Malaysia Berhad (100% by Ministry of Finance)
- Operation Hour : 6am to 12 midnight every day, 4 to 8 minutes interval.

2.0 Introduction to BRTs

A Bus Rapid Transit or BRT is a bus transit system that seeks to provide the high service quality and speed of heavy rail systems with relative flexibility and affordability. Buses are utilised as vehicles of transportation, and the infrastructure is also designed to allow the provision of a service quality equal to that of rail systems, while still allowing a certain degree of flexibility not available to rail systems. The defining feature of a BRT are the bus lanes, which can either be re-designated lanes on normal roads, or grade separated roads limited only to bus access. Ground level bus lanes can either be completely separated from normal traffic, may allow access by local buses along certain stretches of the lanes, or even allow the BRT buses to depart the closed lanes at certain points to serve various local neighbourhoods before re-joining the network. Given that ground level bus lanes still interact with common traffic at intersections, priority is usually given to buses at traffic junctions in order to maintain the desired frequency and speed of travel. Another form of bus lanes are guided busways, though this system is not widely used (with the exception of Adelaide², Cambridge³ and Nagoya⁴, among others).

Apart from bus lanes, BRT systems also seek to provide high frequency services by providing a minimal amount of stops compared to normal bus routes. As a matter of fact,

² https://en.wikipedia.org/wiki/O-Bahn_Busway

³ <http://www.thebusway.info/>

⁴ <http://www.worldbrt.net/en/cities/nagoya.aspx>

a BRT system is usually described as providing a “premium level of service with fewer stops”⁵.

BRT systems are considered more cost effective compared to light or mass rapid transit systems because of lower infrastructure costs.

Another characteristic of BRT systems is that they are usually “implemented on longer corridors dotted with higher density activity centres” or “providing connections between large city centres and outlying residential and commercial centres”⁶. In other words this means BRTs are supposed to serve as a rapid transit backbone for a dense population area.

3.0 Background to the Sunway-BRT Line

The Sunway-BRT line was first launched by PM Dato’ Seri Najib Tun Razak on 9th June 2012⁷ with the given intention of relieving congestion in Bandar Sunway, Subang Jaya as well as to link the Sunway area to the KTM Komuter line via the Setia Jaya KTM Station and the Kelana Jaya Line extension via the USJ7 LRT station.

The project was undertaken as a Public-Private Partnership (PPP) project. These projects are typically defined as situations where “some service obligations of the public sector is taken up by the private sector”⁸. In this case, the partnership was facilitated by Unit Kerjasama Awam Swasta (UKAS)⁹ which is a powerful agency in the Prime Minister’s Department in charge of awarding these projects. The companies involved in this PPP are the Prasarana Malaysia Berhad which would run and operate the BRT system via its Rapid Bus Sdn Bhd and the Sunway Group which would construct the infrastructure for the BRT system via its subsidiary Sunway Construction.

The Sunway BRT line started its operations on the 1st of June, 2015.¹⁰

This project is significant because it is the first BRT system in Malaysia. It sets a benchmark for the other BRT systems that will be constructed, either within the Klang valley or in one of the other major urban centres in the country.

This report will highlight the following areas of concern that needs to be taken into account when planning for the next BRT project, which will likely be the KL-Klang BRT line:

- (i) The manner in which the project was awarded

⁵ Page 2, Bus Rapid Transit Service Design Guidelines, Santa Clara Valley Transportation Authority (VTA)

⁶ ibid

⁷ <http://www.themalaysianinsider.com/malaysia/article/najib-launches-brt-sunway-line>

⁸ <http://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships>

⁹ <http://www.ukas.gov.my/home>

¹⁰ <http://www.mysin Chew.com/node/109455>

- (ii) The design and costing of the Sunway BRT line
- (iii) The efficacy of the route alignment, the bus lanes and station accessibility
- (iv) The ticketing system, ridership and fare structure of the Sunway BRT line

4.0 An example of a Public Private Partnership 'captured' by private interests

The Public Private Partnership Unit, established in April 2009, under the Prime Minister's Department, has been tasked with the responsibility to 'plan, evaluate, coordinate, negotiate and monitor the implementation of the PPP projects'.¹¹ The scope of projects which fall under PPPs include Built-Operate-Transfer (BOT) projects, Build-Lease-Transfer (BLT) projects, Build-Operate-Own (BOO) projects, Build-Lease-Maintain-Transfer (BLMT) projects, land swap projects, management contracts and corporatisation exercises.¹²

Despite the wide scope of possible PPP projects, only a small number are awarded via open and competitive tenders. According to the listed tenders on the website of UKAS¹³, a tender documents were given out publicly for 39 PPP projects from 2010 to 2015. Some examples include:

- (i) The building of a waste-to-energy (WtE) plant in Taman Beringin, Kepong in Kuala Lumpur via a Build-Operate-Transfer (BOT) model in 2015
- (ii) The building of a Royal Malaysia Police Housing Complex and Multi Purpose Hall in Bukit Aman and a Police Station in Bandar Sri Damansara with housing quarters through a land swap deal in 2015
- (iii) The building of a hostel for the students for Universiti Malayisa Kelantan (UMK) campuses in Bachok and Jeli in 2014
- (iv) The building of a specialist children's hospital for Universiti Kebangsaan Malaysia in 2010
- (v) The building of the Integrated Public Transportation Hub in Gombak in 2010

Only a small percentage of PPP projects are awarded via open and competitive tenders. The awarding of many large infrastructure projects by UKAS is usually done via direct negotiations. For example, none of the toll concession contracts which come under the purview of UKAS have been awarded via an open and competitive tender process. All of them have been done via direct negotiations through this very powerful agency in the Prime Minister's Department. There are no records indicating that the Sunway BRT PPP project was awarded via open tender. It is almost certain that the proposal for this BRT

¹¹ <http://www.ukas.gov.my/en/perutusan-ketua-pengarah>

¹² <http://www.ukas.gov.my/en/ppp>

¹³ <http://www.ukas.gov.my/en/arkib-tender-2015>

system as a PPP project was brought to the attention of UKAS by a private party, in this case, Sunway, which would be and is the biggest beneficiary of this project.

The manner in which the Sunway BRT project was awarded is symptomatic of the larger problem with PPP projects in the country. It is usually the private sector who are the main initiators of these PPP projects. They would bring their proposals to UKAS for consideration and since these private companies own the 'intellectual property' for these proposals, it is often assumed (by UKAS as well as by these companies) that the project, if approved, would be awarded to the company which first proposed it.¹⁴ Hence, the likelihood of private sector 'capture' of these types of PPP projects cannot be ignored and appropriate steps must be taken in order to avoid such occurrences as far as possible or to mitigate its effects.

The potential drawbacks of a PPP project being captured by private sector interests include the following:

- (i) Escalation of costs due to conflict of interests and accessing of facilitation funds
- (ii) Design of public infrastructure influenced by private interests
- (iii) Increase cost of usage for the users

Each of these drawbacks will be explored below.

5.0 Inflated Costs

When the Sunway BRT project was first announced by Prime Minister Najib in 2012, the estimated cost was RM300 million.¹⁵ The value of the contract which was awarded to Sunway Construction in 2013 was RM453 million.¹⁶ The final announced cost of the project was RM634 million when the BRT line was opened to the public in 2015.¹⁷ The more than doubling of the initial costs estimates could be due to several factors.

Firstly, the decision to build an elevated rather than a ground level BRT system significantly increased costs. At RM117.5 million per km (or approximately US\$30 million per km)¹⁸, the Sunway BRT-Line is definitely on the expensive end of BRT systems. While like for like comparisons are not always accurate because of differences in infrastructure

¹⁴ Even though UKAS' PPP guidelines stipulates that the relevant ministry / agency considering a particular PPP project has to submit 3 companies for submission, this is often not done since the company which brings a specific PPP project to UKAS has already done the costing, obtained the letters of support from potential lenders and tailored its business plan to put itself as the best party to be awarded such a project. See: http://www.ukas.gov.my/c/document_library/get_file?uuid=02f1ea81-8075-4387-8b69-ebb2120292f1&groupId=15223. In the case of the Sunway BRT project, the in-built advantage of Sunway to carry out this project is even more pronounced since it is willing to fund some of the construction costs as part of its Corporate Social Responsibility (CSR) when in actual fact, it would reap a disproportionate share in the services provided by the Sunway BRT project because of the many Sunway properties which is served by the BRT.

¹⁵ <http://www.themalaysianinsider.com/malaysia/article/najib-launches-brt-sunway-line/>

¹⁶ <http://www.thestar.com.my/business/business-news/2013/03/12/sunway-unit-gets-rm453mil-job-for-bus-rapid-transit--sunway-line/>

¹⁷ <http://www.themalaysianinsider.com/citynews/greater-kl/article/prasarana-awaits-green-light-for-brt-federal-highway-line/prasarana-awaits-green-light-for-brt-federal-highway-line>

¹⁸ Using 4RM:1US\$ exchange rate.

improvements and technological choices, most BRT systems have been put in place with investments of less than US\$10 million per km.¹⁹ Some ground level BRT systems in Latin America cost less than US\$3 million per km in terms of capital costs.²⁰ Even a paper on the Daegu Monorail in South Korea argues that ground level stations are considerably cheaper than elevated stations.²¹

A dedicated bus lane for a ground level BRT system in the Sunway / Subang area may not have been feasible because it may not have decreased traffic congestion for passenger vehicles. But since this PPP project was awarded via direct negotiation, it is unsure if a ground level system was ever discussed as a possible option. (More on this point below)

Secondly, having Sunway Group participate in this PPP project as one of the stakeholders exposes the project to conflict of interest issues. For example, as stated above, the construction contract for the BRT system was awarded to Sunway Construction, probably without an open tender. The argument for the awarding of this contract, from the perspective of UKAS and Sunway, is that the Sunway group would be able to provide CSR contributions in the form of additional infrastructure works. And indeed, Sunway stated that it contributed RM123 million to this project as part of 'the company's continuous corporate social responsibility to enhance connectivity, accessibility and mobility around Bandar Sunway'.²² Conflicts of interest arise in that there is an incentive for the Sunway group to negotiate for a higher value to the construction contract in order to increase its profits from the construction portion of the contract and use some of those proceeds to cover for its CSR contribution. In addition, it is also difficult to independently ascertain the value of the CSR contribution without knowing the exact specifications of the BRT contract, since this was never publicly disclosed.

Thirdly, there may have been an incentive to increase the costs of construction in order to access a larger portion of the facilitation funds which is under the purview of UKAS. Other than playing the role of the approving authority for PPP projects, UKAS also has access to a sizable portion of development expenditure known as facilitation funds. For example, from 2011 to 2016, a total of RM15.5 billion was allocated to the facilitation funds under the development expenditure portion of the Prime Minister's Department's budget (See Table 1 below).

¹⁹ See Cervero (2013), pg.26 (<http://iurd.berkeley.edu/wp/2013-01.pdf>)

²⁰ <http://www.citymayors.com/transport/brt-latin-america.html>

²¹ Part 2.1, Page 2, Feasibility Analysis on Ground-level Stations and Wireless Power Transfer Technology Applications for Monorail Systems, Karam Hwang and others, International Journal of Railways, Sept.2014 Vol.7 No.3

²² <https://www.sunway.com.my/group/malaysias-1st-brt-system-brt-sunway-line-is-now-open/>

Table 1: Size of Facilitation Funds (2011 to 2016) under the Development Expenditure of the Prime Minister's Department in the Federal Government's Budget

Year	Allocation (RM)
2011	1,000,000,000
2012	2,500,000,000
2013	2,500,000,000
2014	4,000,000,000
2015	2,500,000,000
2016	3,000,000,000
Total	15,500,000,000

Source: Budget Estimates, Ministry of Finance, 2011 to 2016

While there are well-defined guidelines²³ on what kinds of projects are eligible to access these facilitation funds, these guidelines can be interpreted so broadly that almost any project can qualify if it has the necessary political backing. For example, the guidelines stipulates that new investments which will bring about strategic impacts or significant contribution to the country's economy including in the main sectors identified in the National Key Economic Areas or initiatives under the Malaysian Plans can be considered for facilitation funding.²⁴ Two 'dud' projects – the Tanjung Agas Oil and Gas Industrial Park and the Karambunai Integrated Resort City – managed to obtain access to these facilitation funds because they were listed as Entry Point Projects (EPP) under the Economic Transformation Program (ETP) which encapsulates 12 NKEAs. Since the maximum amount of development expenditure from the facilitation funds is set at 10% to 15% of the total value of the project, these project owners have an incentive to artificially inflate their values in order to increase the amount of facilitation funds they are eligible for. The Tanjung Agas Oil and Gas Industrial Park was estimated to be a RM3 billion project while the Karambunai Integrated Resort City project was estimated to be a RM9.6 billion project. The viability of both projects have been called into question in the past.²⁵ Almost five years after they were announced via the ETP, both of these projects have yet to take off.²⁶

In the case of the Sunway BRT project, the breakdown of the costs are as follows:²⁷

- Prasarana: RM443.8mil (70%)
- Sunway: RM95.1mil (15%)

²³ <http://www.ukas.gov.my/documents/10157/e36a8e7a-6d8f-49df-aa32-e8f2243c8ada>

²⁴ Section 4.1 of the Guidelines for Facilitation Funds under UKAS.

²⁵ <http://www.themalaysianinsider.com/sideviews/article/etp-part-3-iii-two-dud-projects-ong-kian-ming-and-teh-chi-chang>

²⁶ <http://www.theantdaily.com/Main/Tanjung-Agas-O-G-hub-hobbled-by-lingering-issues>

²⁷ <http://www.thestar.com.my/business/business-news/2015/03/18/brtsunway-line-nears-completion/>

- UKAS: RM95.1 mil (15%)

Sunway's contribution is in the form of additional infrastructure works that is part of its CSR contribution as explained above.²⁸ UKAS contributed RM95million or 15% of the total cost of this project which raises the issue of in-built incentives to raise the overall cost of the project in order to increase UKAS' contribution. One cannot also discount the possibility that the need to deliver a BRT system under the Government Transformation Program's (GTP) Urban Public Transportation National Key Results Areas (NKRAs) may have pushed UKAS to approve this PPP as well as the contribution from the facilitation funds.

The three factors above are possibly contributory factors in explaining the high cost of the Sunway BRT system. The decision to build this BRT system at the stated cost has implications on the fee structure for users as well as the debt burden of Prasarana. This will be discussed further below. Another implication of this project is that the private sector, in this case Sunway, will continue to reap a disproportionate amount of benefits from this BRT system in the form of additional traffic to its malls, increase student enrolment to its education institutions and an additional selling point for its properties, some of which are still being developed in the affected area. Should so much public have been used in a project where a single private sector entity would stand to gain a disproportionate amount of the ensuing benefits?

6.0 Route alignment, Station names, Bus Lanes and Station Accessibility

Figure 1 below shows the connectivity of the Sunway BRT lines to the Setia Jaya on the Port Klang KTM Line and the yet to be operational USJ7 station on the Kelana Jaya LRT extension. The Sunway BRT line has a total of 7 stations covering Sunway-Setia Jaya, Mentari, Sunway Lagoon, SunMed (Sunway Medical Center), SunU-Monash (Sunway University and Sunway Monash), South Quay and USJ 7.

Land use surrounding the BRT line is a well mix of residential, commercial and institutional properties. The first and second station (Setia Jaya and Mentari) to the north of New Pantai Expressway (NPE) are surrounded by high density medium cost apartments e.g. the Damai Apartments, Makmur Apartments and the Mentari Court Apartment Complex. To the south of NPE, there are low density landed residential properties, commercial areas represented by the Sunway Pyramid mall and institutional properties such as the Sunway Medical Centre, Sunway University and Monash University.

²⁸ Although there is a discrepancy in the figures since the Sunway group website lists its contribution at RM123million while the amount reported in most of the newspapers puts the contribution at 15% of the total cost of the project which comes up to only RM95 million.

Given that the Subang-Bandar Sunway is largely a suburban area, the Sunway BRT thus fulfils a different role compared to other BRT systems worldwide that serve as a transit backbone in dense urban areas. This is because an estimated²⁹ 90% of the Subang Jaya-Bandar Sunway zoning are residential zones, populated by mostly middle aged middle income families that frequently commute to Kuala Lumpur or other townships³⁰ to work. Commuting within Subang Jaya and Bandar Sunway is thus limited to educational institutions and the commercial areas, and mostly done by car. Seeing as the Sunway BRT line serves as a gap filler between the KTM Komuter and Kelana Jaya Line, we can conclude that its purpose is not an urban transit backbone, but rather a very limited city shuttle serving a small section of the Subang Jaya area.

Figure 1: Sunway BRT stations & connections to the Port Klang KTM Line & the Kelana Jaya LRT extension



Note: The green line is the Sunway BRT line

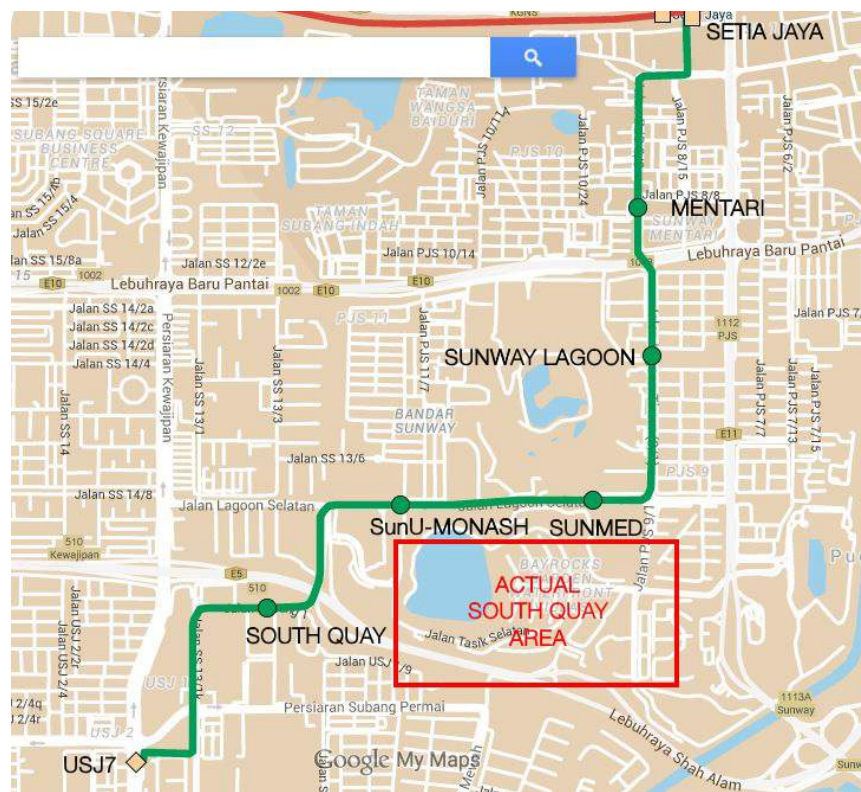
There are several features of the line that also seem to hint at heavy Sunway involvement in the route planning and station naming. The area served, Bandar Sunway, is obviously Sunway developed and still being developed by Sunway with new projects such as Sunway Geo, and also featuring higher end areas such as South Quay. Two major Sunway affiliated education institutions—Sunway University and Monash University, also has its own BRT station. The obvious advantage here is that Sunway would be able to market these 2 universities as being very easily accessible since the BRT connects to both the Komuter and Kelana Jaya Line, translating into higher revenue from increased student enrolment. Also, the presence of the BRT would also serve to raise the desirability (and

²⁹ Writer's own estimation based on familiarity with the area.

³⁰ Referring to more mature townships with established commercial centres like Petaling Jaya, Bandar Utama etc.

prices) of Sunway’s residential developments, seeing as the recent trends suggest developers are using public transit stations (both present and future proposals) as a major selling point to entice the purchase of their properties. In the case of the Sunway BRT, Sunway’s involvement in the route planning is very much evident since not only does it serve the eponymous Bandar Sunway, but there is also a station named South Quay, which is in fact inaccessible by South Quay residents³¹! (See Figure 2 below) It is true that the Sunway BRT may help to reduce congestion in the area, but the fact of the matter is that this benefit may apply only to Bandar Sunway, and the true potential of the BRT line may not be realised as Bandar Sunway is a rather tiny area when compared to the entire Subang Jaya municipality, which is also the main source and destination of traffic going to and from Kuala Lumpur. In other words, the Sunway BRT line is simply a guided tour of Sunway properties masquerading as a public service “aimed at relieving congestion”.

Figure 2: Map showing the distance between the South Quay BRT station and the actual South Quay housing area (separated by the KESAS highway)



The Sunway BRT features fully elevated bus lanes, essentially elevated roads throughout the 5.4km route. The lane starts at Setia Jaya station with a loop, and snakes its way

³¹ The South Quay station is actually right next to the USJ 1 MYDIN, and separated from the actual South Quay development by a major highway (KESAS).

through Mentari, pass Sunway Pyramid and various other Sunway properties before terminating with a loop at the USJ7 LRT station, which is in fact located in USJ6.

What sets the Sunway BRT apart from other BRT systems worldwide are these elevated guideways. Most BRT systems³² are built with at-grade bus lanes and stations to reduce costs, while providing good accessibility. In fact, only 2 other BRT systems utilise elevated bus lanes—the Xiamen BRT and portions of the Nagoya busway which are actually guided bus tracks.

Figure 3: View from the SunU-Monash station showing Monash University and the electric bus used



It is true that having elevated bus lanes completely eliminate the possibility of normal traffic interfering with the BRT service, such as a car entering the bus lane. However, elevated bus lanes significantly adds to the construction cost as additional piling works would have to be done for the support pillars, as well as the instalment of box girders, not to mention the additional infrastructures needed to serve elevated stations like escalators, elevators, and support pillars yet again. Also, elevated stations tend to have bigger footprints than at-grade stations as extra space is needed to accommodate the support structures (See Figures 4 and 5 below for comparison).

³² https://en.wikipedia.org/wiki/List_of_bus_rapid_transit_systems

Figure 4: Example of ground level bus lane in Curitiba, Brazil



To allow buses to turn around at the end of the line, both the terminating stops (Setia Jaya and USJ7) feature one way loops. While this is universal to all bus lanes, the loop used at the Setia Jaya station is inexplicably bigger compared to bus loops used in other countries, probably due to the limitations of building it elevated.

Figure 5: Showcasing the large station footprint of the Setia Jaya BRT station



For example, the main bus stop outside Seoul station features a relatively small terminating loop that serves the same purpose (Figures 6 and 7 below).

Figure 6: Showing the start of the small terminating loop outside a Seoul bus station.



Figure 7: The exit end of the terminating loop outside a Seoul bus station



In Belfast, Northern Ireland, one of the Metrobus lines terminate and turns around on a tiny roundabout that is bus-only, and serves as a bus stop as well (Figures 8 and 9 below).

Figure 8: Aerial view of the roundabout for a Metrobus line in Belfast, Northern Ireland



Figure 9: Ground level view of the roundabout for a Metrobus line in Belfast, Northern Ireland



As compared to the turning loop at Setia Jaya station which is comparatively much larger. (Figure 10 below).

Figure 10: The much larger loop at the Setia Jaya station



BRT stops are usually built to be easily accessible by passengers, much like tram stops. Hence most transit authorities around the world heavily recommend the usage of ground level stops³³³⁴. The ease of access, where passengers simply need to walk onto the path, is a major factor in increasing its attractiveness to transit users, and also costs significantly less to construct compared to normal elevated metro stops.

Figure 11: Example of a ground level BRT stop & bus lanes on the BRT system in Bogota, Colombia



This can be contrasted with the station structures on the Sunway BRT, where they take the form of elevated structures. Access is provided by stairs, escalators, and lifts. Generally pedestrians may find elevated structures to be less accessible as more effort

³³ APTA Standards Development Program Recommended Practice-Bus Rapid Transit Stations and Stops, October 2010

³⁴ Chicago Loop Link fact sheet stressing the convenience of ground level stations.

(and time) is required ascending the structure, hence discouraging them from utilising the system. Also, while effort has been taken to make the stations to look very nice indeed, the same cannot be said for the pedestrian access leading to the stations. Select stops, such as SunMed station which directly fronts the Sunway Medical Centre, features pedestrian walkways connecting the station concourse to nearby places of interest which happen to be mostly Sunway owned properties. Access to the PJS9 terrace housing next to stations, however, requires considerable walking and drain crossing, though this is largely due to urban design mistakes committed during the area's construction.

Figure 12 The elevated Setia Jaya BRT station



Figure 13 Escalators heading to the ticketing concourse and platform level



The Setia Jaya station, on the other hand, only provides access to those on the Mentari Court side, and is inaccessible to anyone staying in the Sungai Way. However, one way of getting around this physical restriction would be to enter the Setia Jaya Komuter station (via the Federal Highway), and then crossing the linkway to the BRT station, though this requires entering and exiting the paid area of the Komuter station. Interestingly, a Taylor's University bus was spotted stopping by the side of the highway to allow its passengers to do just that.

Figure 14 The Taylors' bus dropping off students



Passengers entering on the Mentari side, on the other hand, would have to walk by the side of an access road next to the Kurnia building, and then climbing up a flight of stairs before being able to access the escalators leading to the concourse. Either that, or they access the link bridge via the Kurnia building.

Figure 15 Showing the poor pedestrian access on the Mentari side. The link bridge is a better option.



New bus laybys were also constructed alongside the BRT stations to serve existing public bus routes, and while they look simple and minimalistic they contain several design flaws. One example spotted at SunMed station had a relatively short transparent roof and no wall panels. On the other hand, the new bus shelters at USJ7 station featured roofs that were too short and no wall panels either-----meaning inadequate shelter from the rain!

Figure 16 Featuring the short roof at the USJ7 bus laybys



Given all these design shortcomings, it is not surprising that the Institute of Transportation and Development Policy (ITDP), a China based research institute which

focuses on BRT systems, gave the Sunway BRT line a BRONZE rating, which is the lowest possible rating under its scoring system.³⁵

³⁵ <http://www.worldbrt.net/en/cities/kualalumpur.aspx>

7.0 Ticketing System, Fare Structure and Ridership

Unlike usual public bus services, passengers will buy their tickets before boarding the bus, much like conventional rail systems. As the drivers need not handle cash transactions, station dwell times are reduced, allowing for higher frequencies. Also, the closed ticketing system if implemented correctly, would allow for a seamless transfer across multiple BRT lines or other transit lines in the city.

As the Sunway BRT is run by Prasarana, it is seamlessly integrated into Prasarana's fare structure and ticketing system. Passengers are able to buy a ticket to any of the stations located on Prasarana's rail routes from all BRT stations. Seamless connectivity to the Kelana Jaya line is provided at the USJ7 station, which will be opened when the KJ Line extension opens. Passengers from both lines will be able to interchange without having to buy a new ticket.

Figure 17: Ticketing concourse of the Setia Jaya BRT station

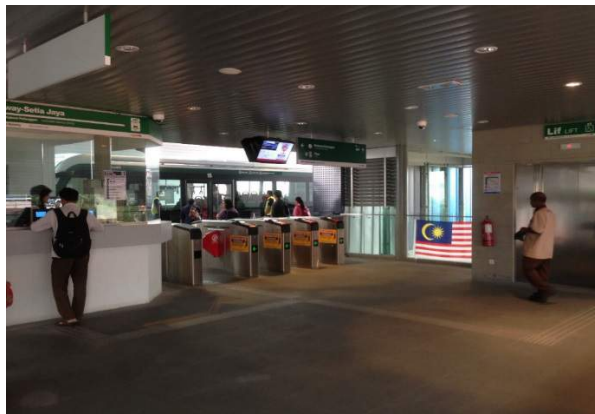
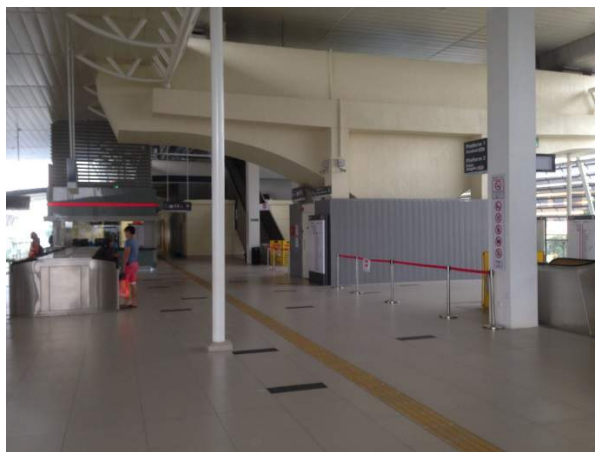


Figure 18: Common paid area to be shared by LRT and BRT at USJ7 station



Unfortunately, seeing as the KTM Komuter utilises its own separate ticketing system, no seamless ticketing integration is provided between the BRT and the Komuter. There is, however, a narrow pedestrian bridge that links from the Komuter concourse to the Setia Jaya BRT station concourse and also street level, providing a small amount of comfort when changing lines.

Figure 19: Showing the link bridge connecting with the BRT station at Setia Jaya



Figure 20: The dark interior of the link bridge



Following 2 months of free rides after the initial opening, the fare structure for BRTs were announced by Prasarana after having them approved by SPAD, to be implemented from August 1, 2015 onwards³⁶.

³⁶ <http://www.themalaysianinsider.com/citynews/greater-kl/article/new-brt-fares-effective-august-1/new-brt-fares-effective-august-1>

Figure 21 below shows the fare table³⁷ for the Sunway BRT.

Figure 21: Fare Table for the Sunway BRT Line (from August 2015 onwards)

Stesen STATION	Sunway-Setia Jaya	Mentari	Sunway Lagoon	SunMed	SunU-Monash	South Quay	USJ 7
Sunway-Setia Jaya		RM1.60	RM2.30	RM3.00	RM3.60	RM4.50	RM5.40
Mentari	RM1.60		RM1.60	RM2.30	RM3.00	RM3.90	RM4.70
Sunway Lagoon	RM2.30	RM1.60		RM1.70	RM2.30	RM3.20	RM4.00
SunMed	RM3.00	RM2.30	RM1.70		RM1.60	RM2.50	RM3.30
SunU-Monash	RM3.60	RM3.00	RM2.30	RM1.60		RM1.80	RM2.70
South Quay	RM4.50	RM3.90	RM3.20	RM2.50	RM1.80		RM1.80
USJ 7	RM5.40	RM4.70	RM4.00	RM3.30	RM2.70	RM1.80	

As we can see from the Figure above, it would cost RM5.40 for a one way ticket from Sunway-Setia Jaya to USJ7. By comparison, even after the fare revision on the Kelana Jaya LRT line in December 2015, it would only cost RM4.00 to travel from the Kelana Jaya LRT station to the KLCC LRT station.³⁸

This costs significantly more than the toll rates on highways leading to KL, and will form a significant financial burden³⁹ on those who rely heavily on public transport, such as the lower income group. Students will also be among those affected, as they do not have a regular income. These exorbitant fares will definitely have an impact on ridership, and have already contributed to low ridership figures as compared to during the period of free rides, where it was normal for stations and buses to be packed. This does not bode well for the route's original aim of reducing congestion in the Bandar Sunway area, as given the comparatively cheaper toll rates people may choose to drive to and from Bandar Sunway instead.

³⁷ <http://www.myrapid.com.my/bus/brt-sunway-line/fares>

³⁸ http://www.myrapid.com.my/sites/default/files/02112015_faretable_cash.pdf

³⁹ A full length return ticket will cost RM10.80. Multiply that by 5 working days a week and the weekly expenditure on the BRT fare alone will hit RM54, whereas the monthly figure would be at RM216.

According to figures provided by Prasarana, the introduction of fares for the Sunway BRT Line had an immediate and significant effect on the ridership. The average daily and monthly ridership fell by 63% from 12,372 and 383,530 respectively in July 2016 to 4,616 and 143,107 respectively in August 2016 (See Table 2 below). In comparison, the MBPJ free bus service served an average of 9,000 users per day (as of October 2015) with an annual operating budget of less than RM7 million.⁴⁰

Table 2: Average Daily and Monthly Ridership for the Sunway BRT Line, June to August 2015

Month	Average Daily Ridership	Average Monthly Ridership
June	11,295	327,543
July	12,372	383,530
August*	4,616	143,107

(* New fare structure introduced. Free for the months of June and July)

Interestingly enough, Prasarana's rationale behind this fare structure was that it would be impossible to cover the Sunway BRT's operational cost at the current ridership rate, although this begs the question of how would this work given that ridership has drastically fallen since the introduction of the fares. Again, detailed breakdowns of the operational cost are currently unavailable, although we can speculate the additional cost comes from the maintenance of the elevated bus lanes, lifts and escalators in all the elevated stations. One might also argue that the signalling system may be a substantial cost, but this is in fact a common feature throughout all BRT systems in the world, therefore most of the spotlight would shine on the maintenance of the elevated infrastructures.

Another factor which may have influenced the fare structure is the decision to purchase 15 environmental friendly electric buses from BYD, a Chinese company.⁴¹ Even though the website of this Chinese company said that it had won the contract via a tender by Prasarana, we could not find any information regarding this tender (whether it was an open tender, for example) nor could we find any information on the cost of purchasing and operating these buses.

This ludicrously high fee structure also calls into question the decision to build an elevated BRT and the process by which the contract was awarded. Were there any studies done by either UKAS, SPAD or Prasarana on the possible fare structure of the Sunway BRT Line? Did Prasarana have to finance the RM444 million of its share in the construction costs of the Sunway BRT given that it was already in debt to the tune of RM13.91 billion at year end 2014⁴² and needed its debts to be restructured in order to meet these debt

⁴⁰ <https://www.malaysiakini.com/letters/315285>

⁴¹ <http://www.byd.com/news/news-285.html>

⁴² <http://www.thesundaily.my/news/1373830>

obligations?⁴³ Given that Sunway is one of the main beneficiaries of this project, why was it not asked to subsidize the fare of the BRT line in order to make it more accessible to low income users and students?

Not surprisingly, many people complained about the high fare structure of the Sunway BRT Line. One letter writer made the following remark:

*My friends who live in the low-cost Mentari flats can't afford to use the service and they walk to work in Sunway Pyramid. I feel sorry that they can't benefit from the service as it would only take them less than five minutes to use the BRT compared to walking for 30 minutes in our climate.*⁴⁴

Another letter writer wrote the following:

*Simply put, the BRT has priced itself out of the market. By charging RM5.40 for such a short distance between two major transport lines, you are basically signalling to the public to continue using their own private vehicles as there is no incentive for public to make the switch.*⁴⁵

A columnist with a local newspaper opined:

*We do not want such a wonderful initiative to become a white elephant.*⁴⁶

The ever popular Lowyat.net forum had a special thread dedicated to complaints about the high fee structure of the Sunway BRT line.⁴⁷

It remains to be seen if the Sunway BRT line can increase its ridership to the initially projected 2400 per hour⁴⁸ from the August figure of less than 260 per hour, much less to reach its target of 5200 users per hour by 2035. But the initial evidence does not appear encouraging.

8.0 Conclusion: Lessons for the future

As the first BRT system to be built and launched in Malaysia, the Sunway BRT line is precedent setting in many ways. Firstly, it sets the benchmark for costing future BRT lines. And given the manner in which the contract to build this BRT was designed and awarded, future BRT systems in the country may also find itself being over-priced. The lack of

⁴³ <http://www.therakyatpost.com/business/2015/09/05/prasarana-debt-restructuring-delayed/>

⁴⁴ <http://www.thestar.com.my/opinion/letters/2016/02/01/reconsider-fares-on-brt/>

⁴⁵ <http://www.theantdaily.com/Main/Come-on-lah-Bus-Rapid-Transit-fare-way-too-high-now>

⁴⁶ <http://www.theantdaily.com/Main/Are-Sunway-BRT-fares-too-high-A-case-for-a-fare-review>

⁴⁷ <https://forum.lowyat.net/topic/3702747/all>

⁴⁸ <http://www.thestar.com.my/news/nation/2014/03/04/brt-sunway-june-2015/>

transparency and the all too obvious ‘capture’ of this BRT line by private sector interests in the context of a PPP project sets a poor precedent for future BRT lines.

Secondly, it also sets expectations that future BRT lines would also be elevated lines rather than ground level lines which are more efficient and affordable. For example, even though it has been announced that the KL-Klang BRT will be a ground level BRT with a dedicated bus lane along the Federal Highway⁴⁹, this has not stopped speculation that Sunway Construction, based on its experience in building the elevated Sunway BRT line, is one of the front runners to build an elevated KL-Klang BRT line.⁵⁰

Thirdly, the Sunway BRT line sets a poor precedent by having an exorbitant fare structure that averages RM1 per km. For the given fare structure guidelines issued by SPAD, if one would like to travel the equivalent of 24km on a BRT line in Malaysia, he or she would have to pay RM10. For the proposed KL-Klang BRT line, a one-way journey of 34km would cost RM12.10. A Do the math⁵¹ and the monthly expenditure on BRT fares alone will hit RM484. This represents almost 54% of Malaysia’s legislated minimum wage figure of RM900⁵², and will be a very significant expenditure indeed.

Attention needs to be focused on already announced KL-Klang BRT line. A sum of RM1 billion was initially announced for this project in the 2016 budget. But up till now, there has been little additional information regarding the estimated cost for this project, the exact location of the 25 stations along the 34km line, the overall design and route alignment of the line, the tender process to parcel out these contracts, just to name a few of the more crucial elements. And this for a project which is supposed to begin construction in the 3rd quarter of 2016 and be completed by 2018!⁵³

The lessons learned from the Sunway BRT line must be incorporated into all the aspects KL-Klang BRT system including (but not limited to) the following:

- (i) Proper costing that is transparent for different BRT models
- (ii) A BRT masterplan which integrates the planned stations with other public transportation hubs and stations⁵⁴
- (iii) Open and competitive tender process for construction of various parcels of the BRT line

⁴⁹ <http://paultan.org/2015/06/04/new-brt-federal-highway/>

⁵⁰ <http://www.thestar.com.my/business/business-news/2015/06/08/brt-lane-boost-for-sunway-construction/>

⁵¹ A single trip would cost RM12.10, meaning a return journey costs RM24.20, costing RM121 weekly with 5 working days, and the monthly total comes up to RM484 (4 weeks per month).

⁵² Minimum Wages Order 2012, accessed at http://minimumwages.mohr.gov.my/wp-content/uploads/2013/07/pua_20120716_P-U-A-214-Perintah-gaji-minimum.pdf

⁵³ <http://www.thestar.com.my/news/nation/2015/10/06/brt-klklang-line-expected-to-be-ready-by-2018/>

⁵⁴ The 2013 Klang Valley transport masterplan has some details for the KL-Klang BRT line but not to the degree of showing proposed station locations and integration with other modes of public transportation.

- (iv) Financing structure of the construction contract for the BRT line including ownership of the physical infrastructure post construction
- (v) Operation and management of the BRT line including proposed fare structure based on financing and operational costs
- (vi) Inclusion of the local authorities in Selangor and KL as part of the stakeholders in planning for an integrated public transportation network that is linked to the BRT line

The last point needs to be emphasized since the local authority in question – Majlis Perbandaran Subang Jaya (MPSJ) – was not given much say in the design and route alignment of the Sunway BRT line which is located within its jurisdiction. It is a common practice worldwide to delegate planning and operation of local transit to the local authorities as they are more familiar with the commuting patterns of the locality than a Federal agency. In other words, we have to demand that our local authorities play a bigger role in the proposing of local transit solutions, because ultimately, they are more familiar with the locality than a Federal agency, and certainly it is easier to hold them accountable if they bowed to corporate pressure on issues that concern public welfare, instead of the relatively distant Federal agencies.

In conclusion, the mistakes associated with the Sunway BRT line needs to be avoided to enable the KL-Klang BRT line to be one that is accessible, affordable, efficient and cost-effective.
