Gamuda’s Experience in EIA and Post EIA

For Ensearch
27 Oct. 2015
Gamuda Berhad

Leading infrastructure and property developer with operations in Asia and Middle East Regions

3 Core Businesses

- Engineering and Construction
- Infrastructure Concessions
- Property Development
Our Expertise

Design & Technical
- Transport Planning
- Geotechnical

Project and Construction Management

Tunneling
- Karstic Limestone & Mixed Soil Tunneling
- Soft Ground Tunneling
- Hard Rock Tunneling

Project Delivery Partner
- Current MRT Project
# Our Projects

## Expressways and Highways

**Malaysia**
- Shah Alam Expressway
- Damansara Puchong Highway
- Western KL, Traffic Dispersal Scheme

**India**
- Panagarh-Palsit and Durgarpur Expressway

**Qatar**
- Dukhan Highway

## Bridges

**Malaysia**
- Kuantan Bridge
- Pulau Bunting Bridge

**Bahrain**
- Sitra Causeway Bridge

## Ports, Marine Structure and Buildings

**Malaysia**
- Prai Power Station
- Sungai Selangor Dam
- Rasa and Bukit Badong Treatment Plant

**Hanoi**
- Yen So Sewage Treatment Plant

## Stormwater Management and Road Tunnel (SMART)

**Malaysia**

## Property Development

**Malaysia**
- Kota Kemuning
- Bandar botanic
- Valencia
- Jade Hills
- Horizon Hills
- Madge Mansions
- The Robertson

**Vietnam**
- Gamuda City
- Celadon City
## Our Rail Projects

### MRTs and Railways (Local)

**Malaysia**

- **KTMB:**
  - Electrified Double Track

- **KVMRT:**
  - Line 1 (SBK)
  - Line 2 (SSP)

**PDP** – SBK and SSP line Work Package Contractor – SBK line UG section

### MRT (Oversea)

**Taiwan**

- Kaoshiung Metropolitan
KVMRT Project

- SBK Line - First MRT Project in Malaysia
- Aim to increase modal share of 40% public transport by 2020.
KVMRT Sg Buloh – Kajang (SBK Line)

Segment 1: Sg. Buloh – Semantan (14 stations)
Segment 2: Semantan – Maluri (8 stations)
Segment 3: Maluri – Kajang (13 stations)

Length: ~51 km
- Elevated: 41.5 km (27 stations)
- Underground: 9.5 km (8 stations)

35 stations; 4 interchange stations; 13 park and ride stations
Serves northwest and southeast sectors of Klang Valley
Ridership: 442,000 per day (by 2017)
LEGEND:
- Line 1 SBK
- Line 2 (SSP)

Interchange Station:
- KTM
- KJ LRT
- AG / SP LRT
- MONORAIL
- ERL
- MRT
- High Speed Rail
- Park & Ride
# EIA Study

<table>
<thead>
<tr>
<th>Project</th>
<th>Type of EIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMART Tunnel</td>
<td>PEIA (2002)</td>
</tr>
<tr>
<td>Ampang Line LRT Extension</td>
<td>PEIA (2009)</td>
</tr>
<tr>
<td>Kelana Jaya Line LRT Extension</td>
<td>PEIA (2009)</td>
</tr>
<tr>
<td>MRT SBK line</td>
<td>DEIA (2011)</td>
</tr>
<tr>
<td></td>
<td>(First DEIA for a Metro Project in Malaysia)</td>
</tr>
<tr>
<td>LRT Line 3</td>
<td>DEIA (2015)</td>
</tr>
<tr>
<td>MRT SSP line</td>
<td>DEIA (2015)</td>
</tr>
</tbody>
</table>

**Note:**
- MRT Project doesn’t fall under Prescribed Activities for DEIA before the new EIA Order
- DOE has the right to request for DEIA (EIA Guidelines Procedures and Requirements in Malaysia)
- MRT Project fall under Item 16, Jadual 2 in new EIA Order 2015
### Chronological Event of Approval (SBK Line)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of proposal to Government</td>
<td>Jan 2010</td>
</tr>
<tr>
<td>Appointment of EIA consultant</td>
<td>25 June 2010</td>
</tr>
<tr>
<td>PEMANDU workshop</td>
<td>10 December 2010</td>
</tr>
<tr>
<td>DEIA approval by DOE</td>
<td>6 April 2011</td>
</tr>
<tr>
<td>ESCP approval by JPS</td>
<td>18 February 2011</td>
</tr>
<tr>
<td>EMP approval by DOE</td>
<td>29 April 2011</td>
</tr>
</tbody>
</table>

**Note:**
- Advance study started early 2010
- PEMANDU Coordinated and facilitated the project
DEIA Preparation – SBK line

• In line with EIA Preparation Guideline.

Challenges & Areas for Improvement

• Alignment Option
• Social Economy Study & Public Engagement
• Hotspot
• DEIA & Railway Scheme Public Display
Alignment Options
(Lesson learn SBK Line)

• Availability of corridor

• Value Management Study

• Selection Criteria:
  - Geometrics
  - Ridership
  - Constructability
  - Cost
  - Social Impact (Land Acquisition, visual Impact, Traffic)
  - Journey time

• Documentations and Records
Alignment Options (Improvement SSP Line)

- Peer review and workshop with MRTC / Consultant
- Consultation with Local Authorities
- Proactive stakeholders engagement
- Safety and traffic impact during construction
- All processes are well documented
Jinjang – Batu Stretch

Option B was chosen
1. highest ridership
2. good economic regeneration potential
3. no major construction risks
Serdang to Putrajaya (Eastern and Western Corridors)

Western Corridor was chosen
1. Highest ridership
2. Provides a seamless integration with ERL Putrajaya
Social Economy Study & Public Engagement (Lesson learn SBK Line)

Perception Survey (18th Dec 2010 – 16th Jan 2011)
- 675 respondents interviewed
- Lack of focus on Underground Section

Dialogues (4th Jan 2011 – 15th Jan 2011)
- Government agencies & NGOs
- Kota Damansara – TTDI communities
- Cheras – Kajang communities
- No advance engagement and info available

Note:
- No designated PR and stakeholder engagement team
- MRTC formed on Sep 2011
Public Dialogue on 14 Jan 2011
## Social Economy Study & Public Engagement (Improvement SSP Line)

<table>
<thead>
<tr>
<th>Survey</th>
<th>SBK</th>
<th>SSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception survey</td>
<td>675</td>
<td>1500</td>
</tr>
<tr>
<td>Focus group discussion</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Public dialogue</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Case interview</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

- A 400m corridor on both sides of the alignment was adopted
- Designated team from MRTC / PDP
- Continuous Public engagement from MRTC / PDP (ADUN, Public, Community, School etc)
- Completed Social Impact Assessment
## Hot Spot (Lesson learn SBK Line)

<table>
<thead>
<tr>
<th>Issues</th>
<th>Hot Spots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition</td>
<td>TTDI, Taman Suntex, Malay Reserve Area</td>
</tr>
<tr>
<td>Noise &amp; Vibration</td>
<td>Persiaran Surian, LDP, Jln Damansara, Pinggiran Zaaba TTDI, Houses near</td>
</tr>
<tr>
<td></td>
<td>Semantan and Cochrane Launch Shaft, SJK (C) Nam Kheung near Maluri Retrival Shaft</td>
</tr>
<tr>
<td>Traffic Congestion</td>
<td>Persiaran Surian, LDP, Jln Damansara, Jln Semantan, Jln Bukit Bintang, Jln Cheras, Jln Semenyih, Lebuhraya Cheras Kajang</td>
</tr>
<tr>
<td>Soil Erosion and Sedimentation</td>
<td>RRIM Depot, Kajang Depot, Launch and Retrieval Shafts</td>
</tr>
</tbody>
</table>

**Unidentified hot spot area are:**
- Jalan Sultan
- Kajang Town Centre
2. RESIDENTIAL ALONG PINGGIRAN ZAABA

*Distance between parapet to fence line / lot boundary
Cross Section at Pinggiran Zaaba

* Closest section from the MRT structure to the building face
Typical ROW width 22.3 m
Realignment, Noise and Vibration Issues - Pinggir Zaaba TTDI

Urged to realign the MRT track underground, but MRT Corp. CEO said it was fixed and there was no turning back – July 2012

Noise and Vibration drive them crazy due to the on-going works – Nov 2012
TUNNEL (32m depth) BELOW JALAN SULTAN,
ACQUISITION OF BUILDINGS

KLANG BUS STATION
PLAZA WARISAN
UO SHOPPING MALL
2-STOREY SHOP LOTS (19nos.)
JALAN HANG JEBAT
PASAR SENI
STATION
32m
Demonstration at Jalan Sultan against Land Acquisition

Landowners mounted a high-profile campaign along Petaling Street that Putrajaya was conducting a “land grab” - Feb 19, 2012

Solutions:
- Not demolish or acquire any surface land/properties
- Only access to underground portion for tunnel construction
- Relocate the occupants temporarily for max 6 months
- Compensate business owner for the loss

Landowners protested outside PM’s Office in Putrajaya – Nov 11, 2011
Acquisition of Kajang Police HQ & Shop Houses

ACQUISITION OF 14M STRIP OF KAJANG POLICE HQ

ACQUISITION 2-STOREY SHOP HOUSES (27 nos.)

BANDAR KAJANG STATION

ACQUISITION OF 14M STRIP OF KAJANG POLICE HQ

ACQUISITION 2-STOREY SHOP HOUSES (27 nos.)
Bandar Kajang Station Relocated and Alignment Changes to Sg Langat
Hot Spot (Improvement SSP Line)

- The technical team has identified the hot spot based on:
  - Social (possible acquisition, displacement, relocation, loss of personal property and rights)
  - Traffic
  - Environmental (noise & vibration)
  - Heritage Impact Assessment (HIA) Study

- Optimize alignment and construction methodology to minimize social, traffic and environmental impacts.
## Identified Hot Spot Along the SSP Alignment

### Issues

<table>
<thead>
<tr>
<th>Issues</th>
<th>Hot Spots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition</td>
<td>Sri Damansara, Bandar Menjalara, Jinjang, Batu, North portal at Jln Ipoh, IMC Parkville, Ampang Park Mall, Kompleks Budaya Kraf &amp; etc</td>
</tr>
<tr>
<td>Noise &amp; Vibration</td>
<td>Schools, institutions, residential areas along along Jalan Kepong-Kuala Selangor, <strong>Persiaran Dagang</strong>, Jln Kepong, Jinjang, Jln Ipoh, GH KL, Istana Budaya, Setia Sky Residence, Jln conlay, Kg Baru Salak Selatan, Taman Naga Emas, Bandar Baru Sri Petaling, Taman Sri Serdang Serdang Raya &amp; etc</td>
</tr>
<tr>
<td>Traffic Congestion</td>
<td>Damansara Damai, Jln Kepong-Kuala Selangor, Jln Kepong, Jln Ipoh, Jln Tun Razak, Jln Tun Razak, Jln Ampang, Jln Sg. Besi &amp; etc</td>
</tr>
<tr>
<td>Soil Erosion and Sedimentation</td>
<td>Serdang Depot, launch and retrieval shafts</td>
</tr>
<tr>
<td>Heritage</td>
<td><strong>Sg. Besi Post office, Sg. Besi Airport Control Tower.</strong></td>
</tr>
</tbody>
</table>
Overview of Potential Hotspot Locations

A. Elevated North
   1. SSF Creative
   2. Persiaran Dagang
   3. Kampung Delima

B. Underground
   1. Ampang Park

C. Elevated South
   1. Kuchai Lama
   2. Mines Wellness City

D. Other
   1. Petrol Kiosk (9 stations)
Objection by Persiarian Dagang’s Residents – Close Proximity

**Issues**
- Residents objected MRT alignment and station at Persiarian Dagang

**Action Taken**
- Why alignment cannot be along MRR2? - Studies concluded that there is no available corridor at MRR2
- To maintain Public Inspection alignment as there is no acquisition of residential houses

**Option 1**
- Acquisition of 41 houses at Tmn Bkt Maluri or closure of MRR2 for 1 year for the construction of 200m arch bridge over Syabas facilities
- Water disruption to Sri Damansara / Bandar Menjalara and Kepong residents during the relocation of 1.85m dia. water pipe

**Option 2**
- Acquisition of 41 houses at Tmn Bkt Maluri for station facilities
- Clashes with DUKE highway (under construction)
### Summary of Affected Petrol Stations

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Lot No</th>
<th>Dealer</th>
<th>Land Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Northern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sri Damansara West Station</td>
<td>61911</td>
<td>Berkath Bonda Enterprise – Petron Sri Damansara</td>
<td>ESSO Malaysia Sdn Bhd</td>
<td>Full Acquisition</td>
</tr>
<tr>
<td>2</td>
<td>Kepong Sentral Station</td>
<td>21125 &amp; 21126</td>
<td>Fossil Fuel Enterprise</td>
<td>ESSO Malaysia Sdn Bhd</td>
<td>Full Acquisition</td>
</tr>
<tr>
<td>3</td>
<td>UG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sentul West Station (Jalan Ipoh)</td>
<td>242, 243, 244, 245, 246 &amp; 247</td>
<td>United SS Trading</td>
<td>Mobil Oil</td>
<td>Full Acquisition</td>
</tr>
<tr>
<td>4</td>
<td>Petron Sg Besi West (KL Seremban Hwy)</td>
<td>43710</td>
<td>N/A</td>
<td>Pertini Vista Sdn Bhd</td>
<td>Partial Acquisition</td>
</tr>
<tr>
<td>5</td>
<td>Petron Sg Besi 2 (Besraya Hwy)</td>
<td>34232</td>
<td>Noor Hakim Enterprise</td>
<td>ESSO Malaysia Sdn Bhd</td>
<td>Partial Acquisition</td>
</tr>
<tr>
<td>6</td>
<td>Southern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Serdang Raya North Station</td>
<td>49</td>
<td>Excel Synergy Trading &amp; Services</td>
<td>EXXON Mobil Malaysia Sdn Bhd</td>
<td>Full Acquisition</td>
</tr>
<tr>
<td>7</td>
<td>Petron Seri Kembangan</td>
<td>50</td>
<td></td>
<td>Mobil Oil Malaysia Sdn Bhd</td>
<td>Full Acquisition</td>
</tr>
<tr>
<td>8</td>
<td>Taman Equine Station</td>
<td>91984</td>
<td>Paragon Jaya Resources</td>
<td>Petron</td>
<td>Full Acquisition</td>
</tr>
</tbody>
</table>

**LEGEND:**

- SBK Line
- SSP Line

- Avoided by alignment tweak
- Full Acquisition
- Partial Acquisition
Note:
• No direct Impact to the heritage buildings (old post office building).
• Road widening to the station site, current curb to the heritage site is kept.

Sg Besi Old Post Office Building is next to the ROW, to be closely monitored during construction.
Heritage Impact - Control Tower (Bandar Malaysia South Station)
DEIA & Railway Scheme Public Display (Lesson Learn from SBK Line)

DEIA Report:
- DoE’s library, local council’s and public library
- No feedback of DEIA received compared with Railway Scheme Public Display.

<table>
<thead>
<tr>
<th>DEIA</th>
<th>No. of Feedback</th>
<th>Display Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBK line</td>
<td>0</td>
<td>1 Month</td>
</tr>
</tbody>
</table>

Railway Scheme Public Display:
- Local councils and SPAD office
- Information on detail alignment, plan and profile, depot and station features, tunnel and elevated guideways, feeder bus route and land acquisition plan.

<table>
<thead>
<tr>
<th>Railway Scheme</th>
<th>No. of Feedback</th>
<th>Display Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBK line</td>
<td>6,500</td>
<td>3 Months</td>
</tr>
</tbody>
</table>
DEIA & Railway Scheme Public Display (Improvement for SSP Line)

- Increase the public display area & channel for feedback (SPAD, MRTC office, Shopping malls, Local Councils, MRTC Website, total 27 locations)

- 100 trained staffs were deployed as information officers (IOs) at the display booths

- Additional advertising and promotion efforts (TV & Radio interviews and Online advertisements)

- Provide Layman DEIA report

- Door Gift for public who provide feedback

- Feedback integrated with Railway scheme public display
Layman EIA Report

The MRT Sungai Buloh-Serdang-Putrajaya Line (SSP Line)

Detailed Environmental Impact Assessment
A Summary
Advertisement on SSP Public Inspection

Notice Advertisement (Berita Harian & The Star)

Monthly Teaser Advertisement
## DEIA & Railway Scheme Public Display
(Improvement for SSP Line)

<table>
<thead>
<tr>
<th>DEIA</th>
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<tbody>
<tr>
<td>SBK line</td>
<td>0</td>
</tr>
<tr>
<td>SSP line</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Railway Scheme</th>
<th>No. of Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBK line</td>
<td>6,500</td>
</tr>
<tr>
<td>SSP line</td>
<td>10,530</td>
</tr>
</tbody>
</table>
Post EIA for SBK line - Lesson Learn (Implementation stage)

- Compliance with DEIA's Approval Condition
- 3rd party auditor
- Site Specific EMP and ESCP reports

**Significant Environmental Issues:**
- Noise
- Flooding
- Schedule waste management
- Traffic jam
- Slope protection
- **Awareness of Work Package Contractor (WPC)**
- **Under Price (No Budget)**
- Ambiguity in contract requirement (GS, PS)
Burst Water Pipe (15th Feb 2014) : Flooding and Traffic Havoc near The Curve
Flashflood at Jalan Duta-Jalan Semantan-
Storm Wreck Havoc

ERT immediately deployed on site to help manage traffic and cleaning after the flood water subsided - May 2014

Water rose to more than 30cm high, triggered clogged traffic along Jalan Duta-Semantan - May 2014

ERT immediately deployed on site to help manage traffic and cleaning after the flood water subsided - May 2014
Storage of Sheet Pile along River Bank
Improper Scheduled Waste Management
Unprotected slope caused sediment runoff to the river
Improvement for SSP Line

- Noise barrier
- Conducted Scheduled Waste Management training
- Strict enforcement on slope protection
- Sedimentation ponds and silt traps
- Installed wastewater treatment plant (UG)
- Fixed price and 3% for SHE Bill (BQ)
- Penalization through SHE Performance Scheme
- KVMRT Training Center
- Strengthening the SHE Contractual Requirements
Semantan Station Noise Barrier
Noise Barrier
Scheduled Waste Management

- Skid tank with proper secondary containment
- SW stored inside area with proper 110% containment bund and roofing
- Generator set within concrete-bunded area
Scheduled Waste Management Trainings

Demonstrate the use of spillage kit for separation of oil/diesel from water

Training for Northern Packages

Training for Southern Packages
Erosion and Sediment Control

- Portable silt trap
- Silt trap
- Exposed slope was being turfed
- Silt fence
- Earth drain
Wastewater Treatment Plant

Underground Station

Treat the water and surface runoff from any discharge from the site prior release to public drain.
KVMRT Training Centre

KVMRT First Construction Training Center

“Having our own training center enable us to prepare our staffs, sub-contractors and other interested industry players adequately with technical know-how.”

– MMC-Gamuda, September 2015
KVMRT (SSP Line) SHE Display Item

- Formwork & Access scaffold
- Diesel storage
- Silt trap
- Erosion Control
- Guide way
- Noise barrier
- Scaffolding
Conclusion

- Challenges
- Lesson learned
- Improvement
- Sufficient budget
- Competence staff & workforce
- Self regulating WPC
- Compliance to legal & other requirement
- Less complaint
- Better environment for our future
Thank You