

**Section 5**  
**Existing Environment**

## **SECTION 5 : EXISTING ENVIRONMENT**

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### **5.1 INTRODUCTION**

The SSP line traverses highly built up areas in Kuala Lumpur and Selangor, running along highways and major roads, and passing along residential and commercial areas. In order to better appreciate potential environmental issues, the existing environmental setting is described in the following sections. The information on the existing environment was gathered through site observation, field survey, ground truthing as well as secondary information which include desktop research, technical reports and published literature.

The presentation of this section is organised into the following sub-sections:

- Section 5.1 Introduction
- Section 5.2 Topography
- Section 5.3 Geology, Soil and Groundwater
- Section 5.4 Land Use and Receptors
- Section 5.5 Climate
- Section 5.6 Hydrology and Water Resources
- Section 5.7 Water Quality
- Section 5.8 Air Quality
- Section 5.9 Noise and Vibration
- Section 5.10 Existing Road Traffic Condition
- Section 5.11 Social Economic Environment
- Section 5.12 Ecology

### **5.2 TOPOGRAPHY**

The SSP line passes through Sri Damansara, Kepong, Sentul, KL City Centre, Sg Besi, Serdang, Seri Kembangan, Cyberjaya and ends at Putrajaya. The ground elevations along the SSP Line range from RL 36m to RL 80m (**Figure 5-1**). The areas with higher elevation, more than RL 50m, are found along the southern stretch of the alignment namely at Taman Naga Emas, Taman Putra Permai and 16 Sierra. The terrain along the alignment is described in the following sub-sections.

#### **5.2.1 Northern Elevated Segment: Damansara Damai – Jalan Ipoh**

The ground level from Station S01 (Damansara Damai) to Station S03 (Sri Damansara West) ranges from RL 36m to RL 48m. The ground rises to elevation of RL 72m near Station S04 at Sri Damansara East and descends to elevations between RL 43m to RL 50m at Station S06 near Kepong Bahru to Station S11 along Jalan Ipoh.

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### **5.2.2 Underground Segment: Jalan Ipoh – Bandar Malaysia South**

From Station S12 (Sentul West), the ground level gradually declines up to RL 33m at Station S13 (Titiwangsa). It then rises to RL 40m at Station S14 (Hospital Kuala Lumpur). As the line travels towards Station S19 (TRX), the ground level ranges between RL 33m to RL 44m. After Station S19 (TRX), the elevation declines to RL 41m at Station S20 (Chan Sow Lin) and then moves towards a flat terrain (RL 31m to RL 33m) at TUDM Sungai Besi, Station S21 (BM North) and Station S22 (BM South).

### **5.2.3 Southern Elevated Segment 1: Bandar Malaysia South – UPM**

After Station S23 (Kuchai Lama), the ground level starts to rise as it heads towards Kg Baru Salak Selatan and Station S24 (Taman Naga Emas) which is located between RL 60m to RL 64m. Moving towards Station S25 (Sg Besi), the terrain begins to descend to elevation of RL 35m at Pekan Sg Besi. The alignment moves across a flat terrain along the KL-Seremban Expressway until it reaches the Station S26 at Serdang Raya North where the ground level is RL 45m. The SSP Line moves southerly towards Station S28 (Seri Kembangan) and Station S29 (UPM) where the ground level ranges from RL 39m to RL 45m.

### **5.2.4 Southern Elevated Segment 2: UPM – Putrajaya**

Between Serdang Station/Depot to Station S30 (Taman Universiti), the line passes undulating terrain with the ground level ranging from RL 71m to RL 80m. After Station S30, the elevation starts to decline to RL 42m at Station S31 (Taman Equine) rises to RL 52m at Station S32 (Taman Putra Permai). Thereafter, the terrain rises gradually as the line moves towards Station S33 at 16 Sierra. The ground level at this Station is about RL 69m.

After Station S33, the ground level gradually decreases to RL 40m at Station S34 (Cyberjaya North) and RL 31m at Station S35 (Cyberjaya City Centre). The ground level at Station S36 (Putrajaya Sentral) is RL 43m.

### **5.2.5 Serdang Depot**

The Serdang Depot is located on undulating terrain with elevations ranging from RL 84m to RL 140m (**Figure 5-2**). The highest ground is located at the centre of the depot while the south eastern parts of the depot are the lowest.

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### **5.3 GEOLOGY, SUBSOIL AND GROUNDWATER**

#### **5.3.1 General Geology**

The SSP Line will traverse five geological formations namely the Kenny Hill Formation, Kuala Lumpur Granite, Kuala Lumpur Limestone, the Hawthornden Formation and the Jelebu Schist. The Northern Elevated Segment will traverse through Kuala Lumpur Granite, Hawthornden Schist and Kuala Lumpur Limestone formations. The Underground Segment will traverse through mainly the Kuala Lumpur Limestone with a short stretch through the Kenny Hill formation. The Southern Elevated Segment 1 will traverse through Kuala Lumpur Limestone, Kuala Lumpur Granite and the Kenny Hill formations. The Southern Elevated Segment 2 will traverse through mainly Kenny Hill formation. The line will also pass over the Jelebu Schist for a short length at Putrajaya (**Figure 5-3**).

#### **Kenny Hill Formation**

Kenny Hill Formation is a monotonous clastic sequence of interbedded shale, mudstone and sandstone. It is believed to be formed during the period of Permian to Triassic/Carboniferous era and was deposited after the Schist Formation and the Limestone Formation. Kenny Hill Formation consists of meta-sedimentary rocks with interbedded meta-arenite and meta-argillite, and occasionally some quartzite and phyllite. Due to intense weathering process of tropical climate, the meta-sedimentary rocks have already been transformed into residual and completely weathered soils. The overburden materials generally consist of sandy/gravelly silt.

#### **Kuala Lumpur Limestone**

Generally, the lithology of Kuala Lumpur Limestone consists mainly of marmorised limestone (marble) but contains a small proportion of phyllite and schist interbedded with the limestone. Besides, banded marble, saccharoidal dolomite and pure calcitic limestone may also occur. The overburden soils are normally found to be alluvium materials. In certain locations, the mining activities left behind numerous ponds and remnants mainly consisting of loose sand and silt/clay slime, forming a highly heterogeneous overburden material. Kuala Lumpur Limestone is well known for its highly erratic karstic features. The erratic and highly unpredictable nature of the limestone karsts posts great uncertainties in foundation construction.

#### **Kuala Lumpur Granite**

The Kuala Lumpur Granite is a part of the Main Range Granite that has intruded into folded and regionally metamorphosed clastic and calcareous Palaeozoic rocks mainly the Kenny Hill and Limestone formation. The granite texture generally varies from coarse to medium grained, porphyritic to slightly porphyritic with colours ranging from white to pale grey. Quartz vein, aplo-pegmatite complexes, tourmalinisation and sclieren are among the common modifications in the granite. The overburden materials consist mainly of completely weathered residual soils, which are derived from the weathering of granitic rock and generally consists of silty sand and sandy silt with traces of gravel.

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### **Hawthornden Formation**

Hawthornden Formation (also known as Hawthornden Schist or graphitic schist) is a mixture of quartz–mica amphibolites and carbonaceous schists, phyllites and quartzites. It underlay the Kuala Lumpur Limestone, with thickness of about 910 m. This formation has correlation with the Mahang Formation, Baling Group and Terolak Formation. The upper part is equivalent to the Kuala Lumpur Limestone and the lower boundary gradational with Dinding Schist, which is the oldest formation in the Kuala Lumpur area. The overburden material of Hawthornden Formation generally consists of silt and sandy silt.

### **Jelevu Schist Formation**

A small stretch at the end of this proposed alignment which is near to the Putrajaya Sentral is underlain by Jelevu Schist formation which consists of mainly phyllite, slate with minor quartz-mica schist and is believed to be probably aged middle Ordovician to early Siluran. The sedimentary rocks in the Jelevu Schist formation have undergone thermal and regional metamorphism, resulting in the alteration of the shale and mudstone to phyllite, slate and minor schistis.

#### **5.3.1.1 Geology along the Northern Elevated Segment: Damansara Damai – Jalan Ipoh**

The alignment from Station S01 (Damansara Damai) to Station S11 (Jalan Ipoh) is underlain by Granite, Hawthornden Formation and Kuala Lumpur Limestone (**Table 5-1**). In general, the stretch from Station S01 at Damansara Damai to Station S04 at Kepong Sentral is underlain by Granite while from Station S05 (Metro Prima) to Station S11 in Jalan Ipoh is underlain by Kuala Lumpur Limestone. Only a short stretch from Kepong Sentral to Station S05 (Metro Prima) is underlain by Hawthornden Formation.

**Table 5-1 Geology along the Northern Elevated Segment**

<b>Station</b>	<b>Geological Formation</b>
Station S01 (Damansara Damai)	Granite
Station S02 (Sri Damansara West)	Granite
Station S03 (Sri Damansara East)	Granite
Station S04 (Kepong Sentral)	Hawthornden
Station S05 (Metro Prima)	Kuala Lumpur Limestone
Station S06 (Kepong Bahru)	Kuala Lumpur Limestone
Station S07 (Jinjang)	Kuala Lumpur Limestone
Station S08 (Sri Delima)	Kuala Lumpur Limestone
Station S09 (Kampung Batu)	Granite
Station S10 (Kentonmen)	Granite
Station S11 (Jalan Ipoh)	Granite

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### 5.3.1.2 Geology along the Underground Segment: Jalan Ipoh – Bandar Malaysia South

In general, the underground segment is underlain by Kuala Lumpur Limestone except Station S13 at Titiwangsa, Station S16 at Ampang Park, Station S17 at KLCC East and Station S18 at Jalan Conlay which are underlain by Kenny Hill Formation. There is a small stretch (approximately 10% of the alignment) between Station S12 at Sentul West and Station S13 at Titiwangsa which is underlain by Granite (**Table 5-2**).

**Table 5-2 Geology along the Underground Segment**

Station	Geological Formation
Station S12 (Sentul West)	Kuala Lumpur Limestone
Station S13 (Titiwangsa)	Granite
Station S14 (Hospital Kuala Lumpur)	Kuala Lumpur Limestone
Station S15 (Kampung Baru North)	Kuala Lumpur Limestone
Station S16 (Ampang Park)	Kenny Hill
Station S17 (KLCC East)	Kenny Hill
Station S18 (Conlay)	Kenny Hill
Station S19 (Tun Razk Exchange)	Kuala Lumpur Limestone
Station S20 (Chan Sow Lin)	Kuala Lumpur Limestone
Station S21 (Bandar Malaysia North)	Kuala Lumpur Limestone
Station S22 (Bandar Malaysia South)	Kuala Lumpur Limestone

### 5.3.1.3 Geology along Southern Elevated Segment 1: Bandar Malaysia South - UPM

The geological formation along this stretch consists of Granite, Kenny Hill and Kuala Lumpur Limestone. Station S27 (Serdang Raya South) is located at the interface between two different geological formations namely Kenny Hill and Kuala Lumpur Limestone (**Table 5-3**).

**Table 5-3 Geology along the Southern Elevated Segment 1**

Station	Geological Formation
Station S23 (Kuchai Lama)	Granite
Station S24 (Taman Naga Emas)	Kenny Hill
Station S25 (Sungai Besi)	Kuala Lumpur Limestone
Station S26 (Serdang Raya North)	Kuala Lumpur Limestone
Station S27 (Serdang Raya South)	Interface of Kenny Hill and KL Limestone
Station S28 (Seri Kembangan)	Kuala Lumpur Limestone
Station S29 (UPM)	Interface of KL Limestone and Hawthornden Schist

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### 5.3.1.4 Geology along Southern Elevated Segment 2: UPM – Putrajaya

The whole segment from Serdang to Putrajaya is underlain by Kenny Hill Formation except a small stretch at the end of the alignment near Station S36 at Putrajaya Sentral which is located on the Jebebu Schist (**Table 5-4**).

**Table 5-4 Geology along the Southern Elevated Segment 2**

Station	Geological Formation
Station S30 (Taman Universiti)	Kenny Hill
Station S31 (Equine Park)	Kenny Hill
Station S32 (Taman Putra Permai)	Kenny Hill
Station S33 (16 Sierra)	Kenny Hill
Station S34 (Cyberjaya North)	Kenny Hill
Station S35 (Cyberjaya City Centre)	Kenny Hill
Station S36 (Putrajaya Sentral)	Jebebu Schist

### 5.3.2 Soil Profiles

The soil profiles were identified through boreholes carried out along the alignment. **Figure 5-4a - Figure 5-4d** show the locations of the boreholes. The information on the geology, soils and ground water along the SSP line was derived from the reports prepared for each segment (**Table 5-5**)

**Table 5-5 Available Reports on Geology, Soils and Ground Water**

Segment	Available Reports
Northern Elevated	Project Mass Rapid Transit Lembah Kelang – SSP Line (Elevated North) Technical Report - Preliminary Geotechnical Interpretative Report (Final). Revision 00. Prepared by Sepakat Setia Perunding Sdn. Bhd. in association with SMA Bersekutu Sdn. Bhd. dated 16/07/2014
Underground	Reference Design Consultancy Services for the underground section -Underground Section of the Klang Valley Mass Rapid Transit (KVMRT) Line 2 - Sungai Buloh - Serdang - Putrajaya Line Concept Geo Profile Drawings- prepared by MRT Corp/ARUP March 2015.
Southern Elevated 1	Project Mass Rapid Transit Lembah Kelang – SSP Line Technical Report - Preliminary Geological Write Up (Southern Elevated Alignment (Revision 00) prepared by SMHB Sdn. Bhd. dated 24/03/2015
Southern Elevated 2	Project Mass Rapid Transit Lembah Kelang – SSP Line (Serdang to Putrajaya). Technical Report - Preliminary Geotechnical Interpretative Report (Final) Revision 03 prepared by Sepakat Setia Perunding Sdn. Bhd. in association with SMA Bersekutu Sdn. Bhd. dated 24/03/2015

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### 5.3.2.1 Soil Investigation Works To Date

The soil investigation works carried out to date consist of deep boreholes sunk along the proposed alignment. The numbers of boreholes are described in the Geotechnical Interpretative Reports (**Table 5-6**).

**Table 5-6 Boreholes described in Geotechnical Interpretative Reports**

Segment	No of Boreholes	Description of Boreholes and bedrock encountered
Northern Elevated Segment	39	14 boreholes in Granite Formation
		20 boreholes in Limestone
		5 bore holes did not encounter bedrock
Underground Segment (Jalan Ipoh – Tun Razak Exchange (TRX))	62	10 Boreholes in Granite Formation
		29 Boreholes in Limestone Formation
		23 Boreholes in Kenny Hill Formation
Underground Segment (TRX – Bandar Malaysia (BM))		<i>Soil investigation works on-going</i>
Southern Elevated Segment 1 (BM - UPM)		<i>Soil investigation works on-going</i>
Southern Elevated Segment 2 (UPM – Putrajaya Sentral)	38	1 borehole in Limestone
		36 boreholes in Kenny Hill Formation
		1 borehole in Jelebu Schist

All the boreholes were carried out using wash-boring method for overburden subsoils and drilling method for rock. In-situ standard penetration tests (SPT) were carried out at every 1.5m intervals in depth inside the boreholes as boring progresses until bedrock. Disturbed soil samples were collected in SPT split spoon sampler and description of samples together with sample photos were recorded in the Soil Investigation factual reports. Undisturbed soil samples were collected using thin wall sampling tube of 1000mm length by 75mm diameter or Mazier samplers at specified depths. 50mm diameter rock core samples were also collected from core barrel for visual inspection and laboratory testing.

Soil samples and rock cores from the boreholes are tested in laboratories for determination of their characteristics. Typical tests carried out include:

- Classification Tests such as bulk densities, permeability, plasticity
- Chemical Tests such as PH values, total sulphate content, organic content and chloride content
- Strength Tests such as Isotropically Consolidated Undrained (CIU) Triaxial Test and Shear Box Test
- Rock strength using the unconfined compressive tests.



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Results from the soil investigation works are then analysed to prepare soil profiles, determine geotechnical parameters and identify geotechnical hazards and are used to develop engineering recommendations to overcome potential hazards.

### **5.3.2.2 Expected Subsoil Profiles**

A description of the expected sub-soil profiles and some typical sub-soil profile cross sections is given below.

#### **a) Northern Elevated Segment**

The Northern Elevated Segment is underlain by the Granite Formation, Hawthornden Formation and Limestone. The segment is underlain by the Granite Formation between Sungai Buloh Station and approximately half way between the Sri Damansara – Kepong Sentral station. The segment surrounding the Kepong Sentral Station is underlain by the Hawthornden Formation. The remainder of the segment is underlain by Limestone Formation.

#### **Northern Elevated Segment underlain by Granite Formation**

The overburden soil from Damansara Damai to Sri Damansara is mainly consists of sandy silt and silty sand with thickness about 3.5 m to 18 m. Generally, the depth of the Granite bedrock within this stretch varies between 3.5 m to 11.5 m. Deeper Granite bedrock (13 m to 25 m) may be encountered at the end of the stretch where there is changing of geological formation (i.e. Granite Formation and Hawthornden Formation) (**Figure 5-5**).

#### **Northern Elevated Segment underlain by Hawthornden Formation**

The overburden soil can generally be divided into two layers with the first layer of medium stiff to very stiff soil in the range of 15 m to 30 m thick and consists of predominantly cohesive materials (mainly sandy silt). Hard soil layers are encountered beneath the first soil layer. However, no bedrock was encountered although one of the boreholes was sunk to a depth of 70m.

#### **Northern Elevated Segment underlain by Limestone Formation Formation**

The overburden soil from Station S05 (Metro Prima) to Station S11 (Jalan Ipoh) generally consists of very loose/soft to very stiff/dense silty sand or sandy silt. The thickness of the overburden soil varies significantly between 4.5 m and 43 m due to the erratic Limestone bedrock. Standard Penetration Tests (SPT) 'N' values for the overburden ranges from 0 to 41.

Relatively deep limestone bedrock was found at/near to the interface between the two different formations. The limestone bedrock level is ranging from about 25m to about 44m. The Rock Quality Designation (RQD) and Total Core Recovery (TCR) values are generally in range of 46% to 100% and 0% to 100% respectively. Cavities were found in the Limestone bedrock from Station S05 (Metro Prima) to Station S08 (Sri Delima) (**Figure 5-5**).

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### b) Underground Segment

The subsurface condition for the underground section can generally be divided into Northern Limestone, Centre Kenny Hill and Southern Limestone.

#### *Underground Segment underlain by Northern Limestone (Jalan Ipoh to Sungai Kelang)*

Subsoil along the northern region of the proposed alignment is mainly underlain by KL Limestone formation. The bedrock level is highly variable and is expected to be from approximately 10m to 70m below ground or deeper. Granite intruded into this formation was encountered in some of the existing boreholes between Sentul West and Bulatan Pahang at approximately 5m to 30m below ground, as well as some Quartz vein was found within the Granite rock mass at the Titiwangsa and Bulatan Pahang areas.

Between Hospital Kuala Lumpur and Kampung Baru areas, it is noted that this area is shown as in Kuala Lumpur Limestone Formation based on the geology map of Kuala Lumpur. However, none of the existing boreholes near the proposed alignment encountered Limestone bedrock but encountered Kenny Hill formation at termination depth of 45 to 55m below ground level.

Some old mining land is expected at Kg. Baru and Titiwangsa areas. The backfilled materials of silty sand to sandy silt with low SPT-N value are also expected. Groundwater table is anticipated to be approximately 1m to 5m below ground level.

#### *Underground Segment underlain by Centre Kenny Hill (Sungai Kelang to Jalan Kia Peng)*

Subsoil along the centre region of the proposed alignment is mainly underlain by Kenny Hill Formation. Based on the available SI information, deep limestone bedrock (at depth >70m) was encountered in the Kenny Hill Formation and hard layer (SPT-N>50) was found from depth of 15m or deeper along this stretch. Predominantly granular (sand/gravel) and predominantly cohesive (clay/silt) material was found overlain on the hard layer. Groundwater table is anticipated to be approximately 1m to 5m below ground level.

#### *Underground Segment underlain by Southern Limestone (Jalan Kia Peng to TUDM)*

Subsoil along the southern region of the proposed alignment is mainly underlain by KL Limestone Formation. Some old mining land is expected at Jalan Chan Sow Lin and Jalan Sungai Besi. The backfilled materials of predominantly granular and predominantly cohesive material with low SPT-N value are also expected.

The bedrock level is highly variable in this area and is expected to be at shallow depth (5m to 10m). However, bedrock at some localised areas may be as deep as 30m below ground or more. High groundwater table is anticipated to be approximately 1m to 5m below ground. It is believed that the proposed alignment within the TUDM area runs along the interface between Kenny Hill and Kuala Lumpur Limestone Formation (**Figure 5-6**).

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Based on the available Soil Investigation information, limestone bed rock was encountered from 5m to 30m below ground or deeper. Overlying the bedrock is the combination of loose granular material and hard sandy silt. It is noted that in some boreholes hard soil layer (SPT-N>50) were encountered at approximately 10m to 30m below ground, however, no limestone bedrock was encountered at termination depth of 50m below ground level.

Extremely strong rock 'Skarn'; having compressive strength in excess of approximately 300MPa could be potentially encountered at interfacing contact zone of two different geological formations. 'Skarns' are most often formed at the contact zone between intrusions of granitic magma bodies and carbonate sedimentary rocks such as limestone and dolostone. Thus, more geophysical surveys and ground investigation boreholes would be required in particular at the granite intrusion (e.g. Sentul west) and limestone areas to confirm existence of this material along the planned alignment.

### c) Southern Elevated Segment 1

The Southern Elevated Segment 1 passes through four different geological formations namely the Kuala Lumpur Limestone, Kenny Hill Formation, Granite Formation and the Hawthornden Schist Formation. From the starting point of elevated south package to Kuchai Lama, from Kg Muhibah to Serdang Raya and from Serdang Raya to UPM are underlain by Kuala Lumpur Limestone which is approximately 55% of the total alignment. Triassic Granite is found at the areas between Kuchai Lama and Taman Salak South areas and it is approximately 3% of total alignment. Hawthornden Schist which is approximately 2% of total alignment is found from UPM to Taman Putra UPM. The rest of alignment which is approximately 40% of total alignment is underlain by Kenny Hill Formation.

#### *Southern Elevated Segment underlain by Limestone Formation*

The subsoils derived from limestone are normally found to be clayey sand/ sandy clay materials. The thickness of overburden soils varies significantly due to the irregular topography of the limestone bedrock or karst formation.

#### *Southern Elevated Segment underlain by Kenny Hill Formation*

The subsoils derived from Kenny Hill Formation basically varies from place to place depending on the parent rock (phyllite or quartzite). The phyllite soils are generally consists of clayey/sandy silt whereas the quartzite soils are generally consists of sandy/gravelly silt.

#### *Southern Elevated Segment underlain by Granite Formation*

The residuals soil derived from granitic rock generally consists of silty sand and sandy silt with traces of gravel. The overburden thickness of the granitic soil usually ranges from 15m to 30m although it sometimes can extend to 80 m depth.

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### *Southern Elevated Segment underlain by Hawthornden Schist Formation*

The overburden material of Hawthornden Schist generally consists of silt and sandy silt with high graphite or carbon content.

#### d) Southern Elevated Segment 2

The Southern Elevated Segment 2 is underlain by two different geological formations namely the Kenny Hill Formation and the Jelebu Schist Formation. A major part of the alignment traverses through the Kenny Hill formation. Only a small stretch at the end of this proposed alignment which is near to the Putrajaya Sentral is underlain by Jelebu Schist formation.

### *Southern Elevated Segment 2 underlain by Kenny Hill Formation*

Several soil layers are encountered and classified according to the soil stiffness. The classification of the soil layers are dependent on the Standard Penetration Test (SPT) 'N' values achieved. These are:

- Firm to Stiff Soil Layer ( $4 \leq \text{SPT}'N < 15$ )
- Stiff to Very Stiff Soil Layer ( $15 \leq \text{SPT}'N < 50$ )
- Hard Layer ( $\text{SPT}'N \geq 50$ )

These soil layers are generally found in increasing values of stiffness from the ground surface i.e. firm and stiff soils are normally found close to the surface followed by stiff to very stiff soils which is in turn underlain by hard layers. However there were found to be exceptions to this where within the stiff to very stiff soil layer the stiffness of the soil in this layer could drop from very stiff to medium stiff and occasionally drop from very stiff to firm or soft. In the Serdang to Putrajaya segment the depths of these layers varies widely in thickness and depth. For example for the alignment between Serdang and 16 Sierra the thickness of hard layers are generally about 1.5m to 18m except at localized borehole positions where the thickness of the hard layer for 5 boreholes is about 24.5m to 36m. In addition, results from boreholes also indicate that sandstone layers can be found interbedded in the hard layers (**Figure 5-7**).

Sandstone bedrock was found within the termination depths of all the boreholes located along the alignment except at one borehole where shale bedrock was encountered. The depths of sandstone bedrock from the existing ground level generally vary from 6.0m to 30.0m. However in several boreholes bedrock was found at a deeper depth of between 30.0 m and 56.0m depth. In two other boreholes which terminated at 45m depth bedrock was not encountered. It is likely that the bedrock level could be found at deeper depth in these boreholes.

The sandstone, shale and schist bedrock is generally very poor and highly weathered and fractured. The Rock Quality Designation (RQD) values generally are between zero to 20%. Total Core Recovery (TCR) values are in range of 0% to 100%.

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### Southern Elevated Segment 2 underlain by Jelevu Schists Formation

The overburden in the Jelevu Schist Formation can be divided into two layers. The first layer is a stiff to very stiff sandy silt layer with SPT'N values in the range of 10 to 43. However, the SPT'N results are not consistent with the increase of depth. The SPT'N values could drop from 50 to 10. The thickness of this layer is about 10.5m. The second layer consists of a hard layer of sandy silt with SPT'N values greater than 50 was found below the first layer. The thickness of this layer is about 31.5m (**Figure 5-7**).

Shale bedrock was encountered at depth of 42m below ground level. The Rock RQD and TCR values are in range of 0% to 28% and 73% to 100% respectively.

### 5.3.3 Groundwater

Standpipe piezometers were installed in designated boreholes and readings in the piezometers are taken on a weekly or fortnightly basis up to 1 or 2 months after the completion of the Soil Investigation works. Observations from standpipe piezometers for all the segments are tabulated in **Table 5-7**.

**Table 5-7 Groundwater Monitoring Results**

Alignment	Borehole Designation	Water Level Based on Standpipe Monitoring	
		m.b.g.l <sup>[1]</sup>	
		Highest	Lowest
Northern Elevated Segment (9 stations)	BH-NEL-P1	6.65	6.74
	BH-NEL-P5	2.70	2.84
	BH-NEL-P8	8.90	9.07
	BH-NEL-P10	3.65	3.68
	BH-NEL-P13	1.33	1.88
	BH-NEL-P15	3.00	3.60
	BH-NEL-P16	1.43	2.16
	BH-NEL-P18	4.58	5.88
	BH-NEL-P21	2.38	3.81
Underground Segment (19 Stations)	<b>Borehole Designation</b>	<b>Average Groundwater Table m.b.g.l</b>	
	BH-GA58(U)	1.29	
	BH-GA3(U)	2.92	
	BH-GA5(US)	5.09	
	BH-GA9(U)	6.97	
	BH-GA10(U)	5.45	
	BH-GA91(U)	3.37	
	BH-GA92(U)	1.30	
	BH-UG-P21A	1.45	
	BH-UG-P36A	6.36	
	BH-GA55(US)	2.89	
	BH-UG-P47	1.49	
BH-GA96(U)	5.08		
U2-BH-11	1.44		

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**Table 5-7 Groundwater Monitoring Results (Cont'd)**

Alignment	Borehole Designation	Water Level Based on Standpipe Monitoring	
		m.b.g.l <sup>[1]</sup>	
		Highest	Lowest
	BH-UG-P61	1.93	
	BH-UG-P59	1.17	
	BH-4 (P1584)	2.81	
	BH-5 (P1584)	6.79	
	BH-7 (P1584)	2.48	
	BH-8 (P1584)	3.68	
Southern Elevated Segment 2 (13 stations)	Borehole Designation	Highest	Lowest
	BH-PWL-01	2.21	2.52
	BH-PWL-05	10.12	10.27
	BH-PWL-09	4.00	4.00
	BH-PWL-10	5.20	5.32
	BH-PWL-16	17.33	17.79
	BH-PWL-19A	2.87	3.02
	BH-PWL-20	13.08	13.36
	BH-PWL-20B	7.21	8.79
	BH-PWL-22A	2.70	3.12
	BH-PWL-23	8.60	9.21
	BH-PWL-24B	4.17	7.02
	BH-PWL-25	0.70	0.83
BH-PWL-25A	3.75	7.21	

Note [1] m.b.g.l = metres below ground level. Monitoring carried out between July 2013 – Feb 2015.

### 5.4 LAND USE

The SSP Line passes through highly built-up and urbanized areas as well as areas that are undergoing rapid development. Some of the areas include Sri Damansara, Kepong, Sentul, KL city centre, Chan Sow Lin, Kuchai Lama, Sg Besi, Serdang, Seri Kembangan, Cyberjaya and Putrajaya.

The SSP Line traverses areas under the jurisdiction of six local authorities, namely:

- Dewan Bandaraya Kuala Lumpur (DBKL)
- Majlis Bandaraya Petaling Jaya (MBPJ)
- Majlis Perbandaran Selayang (MPS)
- Majlis Perbandaran Subang Jaya (MPSJ)
- Majlis Perbandara Sepang (MPSepang)
- Perbandaran Putrajaya (PPJ)

## **SECTION 5 : EXISTING ENVIRONMENT**

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### **5.4.1 Land Use along the SSP Line**

The existing land use along the SSP Line consists mostly of residential, commercial, industrial, institutional and public facilities/utilities areas. The land use information was obtained from site investigations and secondary sources such as local plans, cadastral plans as well as satellite images.

The existing land use along the alignment is described in the following sections. It should be noted that the lists provided below are not exhaustive and are valid during the preparation of the study, particularly for segments that traverse the city centre and built-up areas due to the large number of buildings located along these segments.

For better description of the land use, the SSP Line has been divided as follows:-

- Northern Elevated Segment 1 (NES1)
- Northern Elevated Segment 2 (NES2)
- Underground Segment 1 (UGS1)
- Underground Segment 2 (UGS2)
- Southern Elevated Segment 1 (SES1)
- Southern Elevated Segment 2 (SES2)

#### **5.4.1.1 Northern Elevated Segment (NES 1): Damansara Damai – Kepong Sentral**

This segment is located within MBPJ and MPS areas. The line mainly follows Jalan Kuala Selangor, Persiaran Dagang and Selayang – Kepong Highway. Some of the major townships along this segment are Damansara Damai, Saujana Damansara, Kepong Industrial Park, Bandar Menjalara, Taman Bukit Maluri and Taman Ehsan. The dominant land uses along this segment are residential, commercial and industrial (**Table 5-8a** and **Figure 5-8a**).

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-8a Land Use along Northern Elevated Segment (NES 1)  
(Damansara Damai – Kepong Sentral)**

Area		Damansara Damai –Bandar Sri Damansara– Kepong Sentral		
Land Use		Residential, commercial, industrial, public institution		
Right Corridor		Road/Highway/ Stations	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Saujana Damansara</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Damansara Damai Commercial Centre</li> <li>Prima Damansara Commercial Area</li> <li>Sri Damansara Club House</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Saujana Damansara</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Damansara Damai Commercial Centre</li> <li>NPNG Sports Centre</li> <li>Hotel Sri Damansara</li> <li>BH Petrol</li> <li>SSF building</li> <li>AIA building</li> <li>8trium building</li> <li>Sri Damansara Courts</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Balai Polis Damansara Damai</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>De Showroom</li> <li>Hotel Sri Sutra</li> <li>Wisma Lee Hoe</li> <li>BH Petrol Persiaran Dagang</li> <li>Continental Tyres</li> <li>Petron Persiaran Dagang</li> <li>Proton Service Centre</li> <li>Shoplots along Jalan 57</li> </ul>	<b>Jalan Kuala Selangor</b>  <ul style="list-style-type: none"> <li>Station S01 at Damansara Damai</li> <li>Station S02 at Sri Damansara West</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Sri Damansara Business Park</li> <li>Plant Nurseries</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>IGB International School</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Shell Persiaran Industri</li> <li>Sri Damansara Business Park</li> <li>Wisma Pico</li> <li>Cinerent (M) S/B</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Dewi Sri Maha Mariamman Temple</li> <li>IGB International School</li> </ul> <u>Industrial</u> <ul style="list-style-type: none"> <li>Audio Phonar</li> <li>Casanovas</li> <li>Hoe Heng Furnishing S/B</li> <li>GINTELL</li> <li>Cathay Motor Group</li> <li>Industrial area along Jalan Gangsa SD5/3</li> <li>Hiap Hock Leong S/B</li> <li>Vicson S/B</li> <li>Milen Raya S/B</li> </ul>



## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-8a Land Use along Northern Elevated Segment (NES 1)  
(Damansara Damai – Kepong Sentral) (Cont'd)**

Area		Damansara Damai –Bandar Sri Damansara– Kepong Sentral			
Land Use		Residential, commercial, industrial, public institution			
Right Corridor		Road/Highway/ Stations	Left Corridor		
100 m	50 m		50 m	100 m	
	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Honda Showroom</li> <li>• Twintech College</li> <li>• RDA Banquet Hall</li> <li>• Wisma FMM (Federation of Malaysian Manufacturers)</li> <li>• Syabas facility</li> </ul>	<b>Persiaran Dagang</b> <ul style="list-style-type: none"> <li>• Station S03 at Sri Damansara East</li> </ul> <b>Persiaran Dagang</b> <ul style="list-style-type: none"> <li>• Station S03 at Sri Damansara East</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Bandar Sri Damansara (Jalan Jati SD 4/1)</li> <li>• Bandar Sri Damansara (Jalan Dagang SD 2/1c,2/1d, 2/1e,2/1f)</li> <li>• Bandar Sri Damansara (Jalan Angsana SD 2/2a,2/2d,2/2e, 2/2f,2/2g,2/1a)</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Dataran Sri Damansara</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Bandar Sri Damansara (Jalan Jati SD 4/1,4/2,4/3,4/4, 4/5,4/6)</li> <li>• Bandar Sri Damansara (Jalan Dagang SD 2/1c,2/1d, 2/1e,2/1f)</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Dataran Sri Damansara</li> </ul>	
<u>Residential</u> <ul style="list-style-type: none"> <li>• Taman Bukit Maluri</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Desa Shopping Complex</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Taman Ehsan</li> </ul>	<b>Selayang – Kepong Highway</b> <ul style="list-style-type: none"> <li>• Station S04 at Kepong Sentral</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Puncak Desa Apartments</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Shophouses along Jalan 57</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Indah Water Bandar Sri Damansara facility</li> <li>• Kepong Sentral KTM Station</li> <li>• Kepong Chinese Cemetery</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Kepong Central Condominium</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• Kepong Chinese Cemetery</li> </ul>	

## SECTION 5 : EXISTING ENVIRONMENT

### 5.4.1.2 Northern Elevated Segment 2 (NES2): Metro Prima – Jalan Ipoh

The whole segment is located within DBKL local authority area. The line mainly follows Jalan Kepong and Jalan Ipoh. As the dominant land use along this segment is commercial, some of the key landmarks include AEON Metro Prima, Laman Rimbunan commercial area, Kepong Entrepreneur Park, Kepong Commercial Park and Kompleks Mutiara. Some of the major residential areas include Kg Batu, Kg Seri Delima, Taman Kok Lian, Taman Rainbow and Taman Kaya.

The dominant land uses along this segment are commercial, residential and industrial (**Table 5-8b** and **Figure 5-8b**).

**Table 5-8b Land use along Northern Elevated Segment 2 (NES2)  
(Metro Prima – Jalan Ipoh)**

Area		Metro Prima - Kepong Baru – Jinjang – Sri Delima – Kampung Batu – Kentonmen – Jalan Ipoh		
Land Use		Residential, commercial, industrial, public institution		
Right Corridor		Road/Highway/ Station	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Vista Mutiara Condominium</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Casa Prima Condominium</li> <li>Kg Batu Delima</li> </ul>	<b>Jalan Kepong</b> <ul style="list-style-type: none"> <li>Station S05 at Metro Prima</li> <li>Station S06 at Kepong Baru</li> <li>Station S07 at Jinjang</li> <li>Station S08 at Sri Delima</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Jinjang Utara</li> <li>Kg Batu Delima</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Jinjang Utara</li> <li>Taman Wahyu</li> </ul>
<u>Commercial</u> <ul style="list-style-type: none"> <li>AEON Metro Prima</li> <li>Caltex at Jalan Development</li> <li>BHPetrol near Kepong Industrial Area</li> <li>Petronas near Kepong Industrial Area</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>AEON Metro Prima</li> <li>Metro Prima Commercial area along Jalan 2/33b</li> <li>Best World Store</li> <li>Tomorrow Furniture Sdn Bhd</li> <li>Shell by West Road</li> <li>Commercial area along Jalan Jinjang</li> <li>Commercial shoplots along Jalan Kepong</li> </ul>		<u>Commercial</u> <ul style="list-style-type: none"> <li>AEON Big</li> <li>Commercial area along Jalan Metro Perdana Timur</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>AEON Big</li> <li>Commercial area along Jalan Metro Perdana Timur</li> </ul>
<u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>Tzu Chi Jing Si Hall</li> </ul>			<ul style="list-style-type: none"> <li>Commercial area of Laman Rimbunan</li> <li>Selangor Omnibus</li> <li>Petronas at Jalan Kepong</li> <li>Bottle Design Furnishing Trading</li> </ul>	<u>Public Facilities/ Institutions</u> <ul style="list-style-type: none"> <li>Balai Polis Kepong</li> <li>SRJK (C) Kepong 1&amp;2</li> <li>Balai Bomba Penyelamat Jinjang</li> <li>Dewan Serbaguna Jinjang Utara KL</li> <li>Wisma TNB Kepong</li> </ul>
<u>Industrial</u> <ul style="list-style-type: none"> <li>Kepong Industrial Area</li> </ul>			<u>Public Facilities/ Institutions</u> <ul style="list-style-type: none"> <li>Xian Tai Temple</li> <li>Hindu Temple</li> </ul>	

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-8b Land use along Northern Elevated Segment 2 (NES2)  
(Metro Prima – Jalan Ipoh) (Cont'd)**

Area		Metro Prima - Kepong Baru – Jinjang – Sri Delima – Kampung Batu – Kentonmen – Jalan Ipoh		
Land Use		Residential, commercial, industrial, public institution		
Right Corridor		Road/Highway/ Station	Left Corridor	
100 m	50 m		50 m	100 m
	<u>Public Facilities/ Institutions</u> <ul style="list-style-type: none"> <li>• Masjid Amaniah</li> <li>• Buddhist Temple</li> <li>• SMK Dato' Ibrahim Yaacob</li> </ul>			
<u>Residential</u> <ul style="list-style-type: none"> <li>• Viva Residency</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Commercial areas along Jalan Kampung Batu</li> <li>• Commercial area around Jalan Suppiah Pillay</li> <li>• Batu Complex Business Centre</li> </ul> <u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>• SMK Dato' Ibrahim Yaacob</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>• Commercial areas along Jalan Ipoh</li> <li>• Cantonment Exchange (U/C)</li> <li>• Wisma Jaya Bakti</li> <li>• Petronas</li> <li>• Sime Darby Auto Connexion</li> <li>• Nissan Service Centre</li> <li>• Kompleks Mutiara</li> <li>• Wisma Kah Motor</li> </ul> <u>Public Facilities/ Institutions</u> <ul style="list-style-type: none"> <li>• SMK (P) Jalan Ipoh</li> <li>• Sri Paranjothy Venayagar Temple</li> </ul>	<b>Jalan Ipoh</b> <ul style="list-style-type: none"> <li>• Station S09 at Kampung Batu</li> <li>• Station S10 at Kentonmen</li> <li>• Station S11 at Jalan Ipoh</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Alam Puri Condominium</li> <li>• Taman Impian</li> <li>• Sang Suria Condominium</li> <li>• The Maple Condominium</li> <li>• Taman Million</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Petronas near Brem Mall</li> <li>• Commercial areas along Jalan Ipoh</li> <li>• Perodua Service Centre</li> <li>• Shell at Jalan Vethavanam</li> </ul> <u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>• SK Kampung Batu</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Permai Ria Condominium</li> <li>• Taman Batu Permai</li> <li>• Taman Impian</li> <li>• Taman Rainbow</li> <li>• Taman Kaya</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Commercial area of Taman Impian</li> </ul> <u>Public Facilities/ Institutions</u> <ul style="list-style-type: none"> <li>• Chinese Temple</li> <li>• SK Batu 4 Jalan Ipoh</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

### 5.4.1.3 Underground Segment 1 (UGS1): Jalan Ipoh – Ampang Park East

The whole underground segment is located within the DBKL local authority area. The line mainly follows Jalan Ipoh, Jalan Tun Razak, Jalan Raja Muda Abdul Aziz and Jalan Ampang as it approaches the station at Ampang Park East. Some of the key landmarks include Istana Budaya, General Hospital Kuala Lumpur and Kampong Bharu.

The dominant land use along this segment is commercial and residential. Due to the number of buildings located along the line, only selected buildings are listed as shown in **Table 5-9a** and **Figure 5-8c**.

**Table 5-9a Land Use along Underground Segment (UGS1)  
(Jalan Ipoh – Ampang Park East)**

Area		Sentul – Titiwangsa – Kampung Baru – Ampang Park		
Land Use		Residential, commercial, public institution		
Right Corridor		Road/Highway/ Stations	Left Corridor	
100 m	50 m		50 m	100 m
<u>Commercial Area</u> <ul style="list-style-type: none"> <li>Plaza Pekeliling</li> <li>Commercial area by Plaza Pekeliling</li> </ul>	<u>Commercial Area</u> <ul style="list-style-type: none"> <li>Bestotel Hotel</li> <li>Plaza Permata</li> </ul> <u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>St James Church</li> <li>Sentul Police HQ</li> </ul>	<b>Jalan Sultan Azlan Shah</b> <ul style="list-style-type: none"> <li>Station S12 at Sentul West</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Million</li> <li>Housing along Jalan Union</li> </ul> <u>Commercial Area</u> <ul style="list-style-type: none"> <li>Commercial area along Jalan Sultan Azlan Shah</li> </ul> <u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>SK Sentul Utama</li> <li>SMK Sentul Utama</li> <li>Jabatan Bomba &amp; Penyelamat KL</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Million</li> </ul> <u>Public Facility/ Institution</u> <ul style="list-style-type: none"> <li>SK Sentul Utama</li> <li>SMK Sentul Lama</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-9a Land Use along Underground Segment (UGS1)  
(Jalan Ipoh – Ampang Park East) (Cont'd)**

Area		Sentul – Titiwangsa – Kampung Baru – Ampang Park		
Land Use		Residential, commercial, public institution		
Right Corridor		Road/Highway/Station	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Million</li> <li>Kampong Bharu</li> </ul> <u>Commercial Area</u> <ul style="list-style-type: none"> <li>Wisma Perkeso</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>General Hospital KL</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Million</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>General Hospital KL</li> </ul>	<b>Jalan Tun Razak</b> <ul style="list-style-type: none"> <li>Station S13 at Titiwangsa</li> <li>Station S14 at Hospital Kuala Lumpur</li> <li>Station S16 at Ampang Park</li> </ul>	<u>Commercial Area</u> <ul style="list-style-type: none"> <li>Menara Celcom</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Sentul Medical Centre</li> <li>Respiratory Medical Institute</li> <li>Medical Academies of Malaysia</li> <li>Istana Negara</li> <li>Balai Seni Lukis Negara</li> </ul>	<u>Commercial Area</u> <ul style="list-style-type: none"> <li>Pekeliling Business Centre</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Respiratory Medical Institute</li> <li>Istana Budaya</li> <li>Balai Seni Lukis Negara</li> <li>Pusat Darah Negara</li> <li>Institut Jantung Negara</li> </ul>
<u>Commercial</u> <ul style="list-style-type: none"> <li>Petronas at Jalan Raja Muda Abdul Aziz</li> <li>Wisma Perkeso</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>SK Jalan Raja Muda</li> </ul>	<u>Commercial</u> <p>Commercial area along Jalan Raja Muda Aziz</p> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>SK Jalan Raja Muda</li> </ul>	<b>Jalan Raja Muda Abdul Aziz</b> <ul style="list-style-type: none"> <li>Station S15 at Kampung Bharu North</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Setia Sky Residences</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Menara TH Selborn</li> <li>Yayasan Selangor</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Institut Jantung Negara</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-9a Land Use along Underground Segment (UGS1)  
(Jalan Ipoh – Ampang Park East) (Cont'd)**

Area		Sentul – Titiwangsa – Kampung Baru – Ampang Park		
Land Use		Residential, commercial, public institution		
Right Corridor		Road/Highway/ Stations	Left Corridor	
100 m	50 m		50 m	100 m
<u>Commercial</u> <ul style="list-style-type: none"> <li>• Cahaya Bumi Sdn Bhd</li> <li>• Megan Avenue 1</li> <li>• Plaza OSK</li> <li>• Menara Tokio Marine</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Menara Avenue Condo</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Perodua Showroom at Jln Sultan Yahya Petra</li> <li>• Commercial area along Jln Gurney</li> <li>• Wisma MRA Worldwide International Sales Centre</li> <li>• Megan Avenue 1</li> <li>• Plaza OSK</li> </ul>	<b>Jalan Tun Razak</b>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Residential area along Jalan Damai</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Menara 238</li> <li>• Menara Celcom</li> <li>• Commercial area along Jalan Gurney</li> <li>• Ampang Park Shopping Centre</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• UTM SPACE</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Kampung Dato' Keramat</li> <li>• Residential area along Jalan Damai</li> </ul>

### 5.4.1.4 Underground Segment 2 (UGS2): KLCC East – Bandar Malaysia South

A major portion of this segment is located within the Central Business District (CBD) areas of Kuala Lumpur. From Jalan Binjai, the line crosses Jalan Kia Peng, Jalan Conlay, Jalan Bukit Bintang and continues south to cross Jalan Tun Razak towards Cochrane. After Cochrane and Chan Sow Lin, the line crosses Jalan Loke Yew and Sungai Besi Highway towards Bandar Malaysia. Some of the key landmarks are KLCC, Menara Felda, Kompleks Budaya Kraf, TRX (under construction), Chan Sow Lin Industrial area and TUDM Sg Besi (Bandar Malaysia site).

The dominant land uses along this segment are residential and commercial. The listings of some of the buildings or identified areas are shown in **Table 5-9b** and **Figure 5-8d**.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-9b Land Use along Underground Segment 2 (UGS2)  
(KLCC East – Bandar Malaysia South)**

Area		KLCC – Conlay – TRX – Chan Sow Lin – Bandar Malaysia		
Land Use		Residential, commercial, industrial, public institution		
Right Corridor		Road/Highway/ Stations	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>• Binjai Residency</li> <li>• Park Seven Condo</li> <li>• Sri Kelantan</li> <li>• The Pearl</li> <li>• 1A Stonor</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• The Zon</li> <li>• Menara Citibank</li> <li>• Menara Worldwide</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• The Corinthian Condominium</li> <li>• The Troika</li> <li>• The Binjai on The Park</li> <li>• Stonor Park</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Intercontinental KL</li> <li>• KLCC Multi-Level Car Park @ Jalan Binjai</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Yayasan Tun Razak</li> </ul>	<b>Jalan Binjai</b> <ul style="list-style-type: none"> <li>• Station S17 at KLCC East</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Desa Kudalari</li> <li>• The Oval</li> <li>• Platinum Park</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Menara Binjai</li> <li>• PNB Darby Park</li> <li>• Menara Felda</li> <li>• Platinum Park</li> <li>• Ilham Baru Tower (U/C)</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Platinum Park</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Platinum Park</li> <li>• Menara Tabung Haji</li> <li>• G Tower</li> <li>• Menara PNB</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Embassy of Vietnam</li> </ul>
<u>Residential</u> <ul style="list-style-type: none"> <li>• 1A Stonor</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Yayasan Tun Razak</li> <li>• Menara Worldwide</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Yayasan Sarawak</li> <li>• Kompleks Budaya Kraf</li> </ul>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Kompleks Budaya Kraf</li> </ul>	<b>Jalan Kia Peng, Jalan Conlay</b> <ul style="list-style-type: none"> <li>• Station S18 at Conlay</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Ampersand</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Top Hat Restaurant</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Malaysia Design Development Centre</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Ampersand</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-9b Land Use along Underground Segment 2 (UGS2)  
(KLCC East – Bandar Malaysia South)**

Area	KLCC – Conlay – TRX – Chan Sow Lin – Bandar Malaysia			
Land Use	Residential, commercial, industrial, public institution			
Right Corridor		Road/Highway/ Stations	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>• 1A Stonor</li> <li>• One Stop Service Apartment</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Yayasan Tun Razak</li> <li>• Menara Worldwide</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Yayasan Sarawak</li> <li>• Kompleks Budaya Kraf</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Residential area along Jalan Inai, Jalan Jati, Jalan Kamuning</li> <li>• One Stop Service Apartment</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Commercial establishments along Jalan Inai, Jalan Jati, Jalan Kamuning</li> <li>• TRX (u/c)</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Kompleks Budaya Kraf</li> </ul>	<b>Jalan Tun Razak</b> <ul style="list-style-type: none"> <li>• Station S19 at TRX</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Villa Inai</li> <li>• The Forum Condo</li> <li>• Wisma Indah</li> <li>• PPR Laksamana 2A</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Top Hat Restaurant</li> <li>• Royal China Restaurant</li> <li>• Restaurants along Jalan Delima</li> <li>• TRX (u/c)</li> <li>• Al Rawsha Restaurant</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Royal Selangor Golf Club</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>• Commercial area along Jalan Delima</li> <li>• Menara AA</li> <li>• Al-Rawsha Restaurant</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>• Royal Selangor Golf Club</li> </ul>
<u>Commercial</u> <ul style="list-style-type: none"> <li>• Fraser Business Park</li> <li>• Pudu Commercial Area</li> <li>• One Stop office</li> <li>• Sg Besi Commercial Area</li> <li>• Pos Malaysia</li> <li>• Mitsubishi Motors</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>• Fraser Business Park</li> <li>• Pudu Commercial Area</li> <li>• One Stop office</li> <li>• Sg Besi Commercial Area</li> <li>• Pos Malaysia</li> <li>• Peugeot Service Centre</li> <li>• Restoran Siu Siu Sg Besi</li> </ul>	<b>Maju Expressway, Jalan Chan Sow Lin</b> <ul style="list-style-type: none"> <li>• Station S20 at Chan Sow Lin</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>• Pudu Commercial Area</li> <li>• Sg Besi Commercial Area</li> <li>• Honda Service Centre</li> <li>• Mazda 3S Centre</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• PPR Laksamana 2A</li> </ul> <u>Commercial Area</u> <ul style="list-style-type: none"> <li>• Menara J Corp</li> <li>• Cochrane re-development (u/c)</li> <li>• Sg Besi Commercial Area</li> <li>• JKR Workshop</li> </ul>



## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-9b Land Use along Underground Segment 2 (UGS2)  
(KLCC East – Bandar Malaysia South) (Cont'd)**

Area		KLCC – Conlay – TRX – Chan Sow Lin – Bandar Malaysia			
Land Use		Residential, commercial, industrial, public institution			
Right Corridor		Road/Highway/ Stations	Left Corridor		
100 m	50 m		50 m	100 m	
<u>Industrial</u> <ul style="list-style-type: none"> <li>Sg Besi Industrial Area</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Pudu Police Station</li> <li>Chan Sow Lin LRT Station</li> <li>Hindu Temple</li> </ul>	<u>Industrial</u> <ul style="list-style-type: none"> <li>Sg Besi Industrial Area</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Pudu Police Station</li> <li>Chan Sow Lin LRT Station</li> <li>Jabatan Perkhidmatan Pos</li> </ul>	<b>Maju Expressway, Jalan Chan Sow Lin</b> <ul style="list-style-type: none"> <li>Station S20 at Chan Sow Lin</li> </ul>	<u>Industrial</u> <ul style="list-style-type: none"> <li>Sg Besi Industrial Area</li> <li>Maju Holdings S/B</li> </ul>	<u>Industrial</u> <ul style="list-style-type: none"> <li>Sg Besi Industrial Area</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Akademi Binaan Malaysia</li> </ul>	
<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>TUDM Sg Besi</li> </ul>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>TUDM Sg Besi</li> </ul>	<b>Kuala Lumpur – Seremban Highway</b> <ul style="list-style-type: none"> <li>Station S21 at Bandar Malaysia (North)</li> <li>Station S22 at Bandar Malaysia (South)</li> </ul>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>TUDM Sg Besi</li> </ul>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>TUDM Sg Besi</li> </ul>	

### 5.4.1.5 Southern Elevated Segment 1 (SES1): Bandar Malaysia South – UPM

The Southern Elevated Segment 1 falls within DBKL and MPSJ local authority areas. After Bandar Malaysia South, the line largely runs parallel to the KL – Seremban Highway and Sg. Besi Highway as it moves towards Salak South, Pekan Sg Besi, Serdang Raya and Seri Kembangan as well as UPM areas.

For description purposes, the segment is divided into two parts which are Southern Elevated Segment 1a that host stations from Kuchai Lama to Serdang Raya North area and Southern Elevated Segment 1b that host stations from Serdang Raya South to UPM area.

The major land uses along Southern Elevated Segment 1a are residential, commercial and industrial (**Table 5-10a** and **Figure 5-8e**). The Kuchai Lama Industrial Area houses YTL Cement Plant, paper recycling factory, Malaysia Packaging Industry, Far East Offset Engraving Sdn Bhd, Golden Sun Club restaurant, Art System office as well as a few workshops.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-10a Land use of Southern Elevated Segment 1a  
(Kuchai Lama – Taman Serdang Raya)**

Area	Kuchai Lama – Salak South – Taman Naga Emas – Sungai Besi			
Land Use	Residential, commercial, industrial, public institution, mix-used, recreation and heritage.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Industrial</u> <ul style="list-style-type: none"> <li>• Kuchai Lama Industrial Area</li> </ul>	<u>Industrial</u> <ul style="list-style-type: none"> <li>• Kuchai Lama Industrial Area</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• Oxidation Pond Plant Room at Taman Desa</li> </ul>	<b>Between Jalan Kuchai Lama and KL-Seremban Expressway</b>  <ul style="list-style-type: none"> <li>• Station S23 at Kuchai Lama</li> </ul>	<u>Industrial</u> <ul style="list-style-type: none"> <li>• Kuchai Lama Industrial Area</li> </ul>	-
<u>Residential</u> <ul style="list-style-type: none"> <li>• Taman Naga Emas</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Taman Naga Emas</li> </ul>	<b>Jalan 4/140</b>  <ul style="list-style-type: none"> <li>• Station S24at Taman Naga Emas</li> </ul>	-	-
<u>Residential</u> <ul style="list-style-type: none"> <li>• Kampung Pinang Tambahan</li> </ul> <u>Commercial Area</u> <ul style="list-style-type: none"> <li>• Sri Petaling Golf Driving Range</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• Gurdwara Sahib Kuyoh Sikh Temple</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Kampung Pinang Tambahan</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Sri Petaling Golf Driving Range</li> <li>• Petron at Tol KL-Seremban Expressway</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• Gurdwara Sahib Kuyoh Sikh Temple</li> </ul>	<b>Kuala Lumpur-Seremban Expressway</b>	<u>Residential</u> <ul style="list-style-type: none"> <li>• Kampung Pinang Tambahan</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Petron at KL-Seremban Expressway</li> <li>• Petron at Tol KL-Seremban Expressway</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>• Gurdwara Sahib Kuyoh Sikh Temple</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>• One South</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>• Petron at KL-Seremban Expressway</li> <li>• Shell at Nouvelle Hotel</li> <li>• Petron at Nouvelle Hotel</li> <li>• One South</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-10a Land use of Southern Elevated Segment 1a  
(Kuchai Lama – Taman Serdang Raya) (Cont'd)**

Area	Kuchai Lama – Salak South – Taman Naga Emas – Sungai Besi			
Land Use	Residential, commercial, industrial, public institution, mix-used, recreation and heritage.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Kampung Baru Salak Selatan</li> <li>Taman Salak Selatan</li> <li>Taman Castlefield</li> <li>PPR Raya Permai Sg Besi</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>SRK Salak South</li> <li>University College Sedaya International</li> <li>Darul Taqwa Orphanage</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Kampung Baru Salak Selatan</li> <li>Taman Castlefield</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>SRK Salak South</li> <li>University College Sedaya International</li> </ul>	<b>Sg. Besi Highway</b>	<u>Residential</u> <ul style="list-style-type: none"> <li>Kampung Baru Salak Selatan</li> <li>Kampung Muhibah</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Petron at Sg. Besi Highway</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Muslim Cemetery</li> <li>Chee Wan San Temple</li> <li>University College Sedaya International</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Kampung Baru Salak Selatan</li> <li>Kampung Malaysia Raya</li> <li>Kampung Muhibah</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Petron at Sg. Besi Highway</li> <li>The Trillium</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Muslim Cemetery at Sg. Besi Highway</li> <li>Chee Wan San Temple</li> <li>Sekolah Tunas Bakti</li> <li>University College Sedaya International</li> </ul>
<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>LRT Station Sg Besi</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>LRT Station Sg Besi</li> </ul>	<b>Jalan Sungai Besi</b> <ul style="list-style-type: none"> <li>Station S25 at Sungai Besi</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Sg Besi Police Quarters</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Pekan Sg Besi</li> </ul>	<u>Heritage Area</u> <ul style="list-style-type: none"> <li>Sg Besi Heritage Town</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Pekan Sg Besi</li> </ul>

The land use along Southern Elevated Segment 1b includes residential, commercial, industrial, public institutions (Table 5-10b and Figure 5-8f).

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-10b Land use of Southern Elevated Segment 1b  
(Taman Serdang Raya – UPM)**

Area	Taman Serdang Raya - Seri Kembangan - UPM			
Land Use	Residential, commercial, industrial, public institution, mix-used, recreation and heritage.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Serdang Raya</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Petronas at Jalan Serdang Raya</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Taman Serdang Raya Commercial Area</li> <li>Petron at Jalan Serdang Raya</li> </ul>	<b>Jalan Serdang Raya</b> <ul style="list-style-type: none"> <li>Station S26 at Serdang Raya (North)</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Taman Serdang Raya Commercial Area</li> </ul>	-
<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Fa Yuen Shen Chinese Temple</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Shell at Jalan Utama</li> </ul>	<b>Jalan Utama</b> <ul style="list-style-type: none"> <li>Station S27 at Serdang Raya (South)</li> </ul>	<u>Commercial</u> <ul style="list-style-type: none"> <li>Shell at Jalan Utama</li> </ul>	-
-	<u>Commercial</u> <ul style="list-style-type: none"> <li>Petron at Jalan Besar</li> </ul>	<b>Jalan Besar</b>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>UPM</li> <li>MARDI</li> </ul>	<u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>UPM</li> <li>MARDI</li> </ul>
<u>Residential</u> <ul style="list-style-type: none"> <li>Kampung Baru Seri Kembangan</li> <li>Taman Kembang Sari Fasa 2</li> <li>Diamond Residence Serdang</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Diamond Square Serdang (Dataran Mutiara)</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Tmn Kembang Sari Fasa 2</li> <li>Kg Baru Serdang</li> </ul> <u>Commercial</u> <ul style="list-style-type: none"> <li>Diamond Square Serdang</li> </ul> <u>Industrial</u> <ul style="list-style-type: none"> <li>Kaw. Perindustrian Seri Kembangan</li> </ul> <u>Public Facilities/Institutions</u> <ul style="list-style-type: none"> <li>Surau Al-Firdaus</li> <li>Dewan Serbaguna Tmn Kembang Sari</li> <li>Kuil Sri Maha Kaliaman</li> </ul>	<b>Jalan Raya 1</b> <ul style="list-style-type: none"> <li>Station S28 at Seri Kembangan</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Police Quarters Seri Kembangan</li> <li>Bomba Quarters Seri Kembangan</li> </ul> <u>Public Facilities/Institution</u> <ul style="list-style-type: none"> <li>Balai Polis Seri Kembangan</li> <li>Bomba dan Penyelamat Serdang</li> <li>Kuil Sri Maha Kaliaman</li> </ul> <u>Industrial</u> <ul style="list-style-type: none"> <li>Taman Perindustrian Serdang</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Sg Besi Police Quarters</li> <li>Taman Sri Serdang</li> </ul> <u>Industrial</u> <ul style="list-style-type: none"> <li>Taman Perindustrian Serdang</li> </ul> <u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>Bomba dan Penyelamat Malaysia Seri Kembangan</li> </ul>

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-10b Land use of Southern Elevated Segment 1b  
(Taman Serdang Raya – UPM) (Cont'd)**

Area	Taman Serdang Raya - Seri Kembangan - UPM			
Land Use	Residential, commercial, industrial, public institution, mix-used, recreation and heritage.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Serdang Jaya</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>Taman Serdang Jaya</li> </ul>	<b>Jalan Raya 3</b>	-	-
<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>SJK (C) Serdang Baru 2</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>SJK (C) Serdang Baru 2</li> </ul>			
-	-	<b>Jalan Sapujaya</b>	<u>Residential</u> <ul style="list-style-type: none"> <li>UPM Quarters</li> </ul>	<u>Residential</u> <ul style="list-style-type: none"> <li>UPM Quarters</li> </ul>
<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>UPM</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>UPM</li> </ul>	<b>Jalan Keledang</b> <ul style="list-style-type: none"> <li>Station S29 at UPM</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>UPM</li> </ul>	<u>Public Facility/Institution</u> <ul style="list-style-type: none"> <li>UPM</li> </ul>

### 5.4.1.6 Southern Elevated Segment 2 (SES2): UPM – Putrajaya Sentral

This segment falls within three local authorities namely MPSJ, MP Sepang and Perbadanan Putrajaya (PPJ). After the station at UPM, the line mainly follows Jalan Putra Permai, Persiaran Alpina and Persiaran Sierra Utama as it passes Taman Putra Permai and 16 Sierra to continue south towards Cyberjaya. Within Cyberjaya, it follows Persiaran Apec and crosses Putrajaya – Cyberjaya Expressway towards Putrajaya Sentral.

The land use along this segment includes residential, commercial, industrial and public institutions (Table 5-11 and Figure 5-8g).

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-11 Land Use of Southern Elevated Segment 2 (SES2)  
(UPM – Putrajaya)**

Area	UPM - Taman Universiti - Equine Park - Taman Putra Permai - 16 Sierra – Cyberjaya - Putrajaya			
Land Use	Residential, commercial, institution and industrial.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Commercial Area</u> • Pusat Perdagangan Seri Kembangan	-	<b>Jalan Besar</b>	<u>Industrial Area</u> • Seri Kembangan Industrial Area	<u>Industrial</u> • Seri Kembangan Industrial Area
<u>Residential</u> • Taman Universiti Indah • Taman Dato Demang • O2 City @ Puchong South  <u>Commercial</u> • Equine Park Commercial Area • Petronas Equine Park • AEON Shopping Mall Taman Equine  <u>Public Facility/Institution</u> • NAHRIM	<u>Residential</u> • Taman Dato Demang • O2 City @ Puchong South  <u>Commercial</u> • Petronas Equine Park • AEON Shopping Mall Taman Equine  <u>Public Facilities/Institutions</u> • NAHRIM • Surau Al-Mawaddah	<b>Jalan Putra Permai</b> • Station S30 (Provisional) at Taman Universiti  • Station S31 at Equine Park  • Station S32 at Taman Putra Permai	<u>Commercial</u> • Putra Walk • Esso Pinggiran Putra • Pasar borong Selangor • Petronas at Bandar Putra Permai  <u>Public Facilities/Institutions</u> • UPM • MARDI	<u>Residential</u> • Taman Pinggiran Putra  <u>Commercial</u> • Putra Walk • Pasar borong Selangor • Giant Hypermarket • Petronas at Bandar Putra Permai • The Atmosphere  <u>Public Facilities/Institutions</u> • UPM • MARDI • Tzu Shi Chinese Temple
<u>Residential</u> • D' Alpinia	<u>Residential</u> • D' Alpinia	<b>Persiaran Alpinia</b>	<u>Commercial Area</u> • D' Alpinia	<u>Commercial Area</u> • D' Alpinia  <u>Public Facility/Institution</u> • Surau Baiturrahman
<u>Residential</u> • Sierra 1 • Sierra 6 • Sierra 8 • Sky Park (U/C)	<u>Residential</u> • Sierra 1 • Sierra 6 • Sierra 8 • Sky Park (U/C)	<b>Persiaran Sierra Utama</b> • Station S33 16 Sierra	<u>Residential</u> • LaThea Residence • Sierra 10	<u>Residential</u> • LaThea Residence • Sierra 10

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-11 Land Use of Southern Elevated Segment 2 (SES2)  
(UPM – Putrajaya) (Cont'd)**

Area	UPM - Taman Universiti - Equine Park - Taman Putra Permai - 16 Sierra – Cyberjaya - Putrajaya			
Land Use	Residential, commercial, institution and industrial.			
Right Corridor		Road/Highway	Left Corridor	
100 m	50 m		50 m	100 m
<u>Public Facilities/Institutions</u> • Limkokwing University of Creative Technology	<u>Public Facilities/Institutions</u> • Limkokwing University of Creative Technology	<b>Persiaran Apec</b> • Station S34at Cyberjaya (North) • Station S35at Cyberjaya City Centre	-	-
<u>Public Facility/Institution</u> Putrajaya Sentral	<u>Public Facility/Institution</u> Putrajaya Sentral	<b>Putrajaya Cyberjaya Expressway</b> • Station S36at Putrajaya Sentral	-	-
-	-	<b>Jalan P9</b>	<u>Public Facility/Institution</u> • Nadi Putra Bus and Taxi Terminal	<u>Public Facility/Institution</u> • Nadi Putra Bus and Taxi Terminal

In general, the land uses along the alignment are made up of public institutions or facilities (40%), residential areas (30%), commercial areas (10%) and other land uses (20%).

### 5.4.1.7 Land Use at Depot Area

The depot in Bukit Serdang will be located in an area of 44 ha within MPSJ area. The land use within 3km radius from the proposed depot is mainly agriculture and land for research purposes. The land for the proposed depot area belongs to Department of Agriculture and is deemed for permanent food production purposes. The site has been cleared. **Table 5-12** tabulates the existing land use. Overall, public institutions, commercial and residential properties are the dominant land use within this area (**Figure 5-9**).

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**Table 5-12 Land Use within 3km from the Depot Area**

Existing Land Use		
Within 1km	Within 2km	Within 3km
<b>Residential</b>		
<ul style="list-style-type: none"> <li>Taman Universiti Indah</li> <li>Taman Pinggiran Putra</li> </ul>	<ul style="list-style-type: none"> <li>Taman Universiti Indah</li> <li>Sunway Eastwood</li> <li>Taman Pinggiran Putra</li> <li>Villa Heights</li> <li>Taman Lestari Permai</li> <li>Taman Dato Demang</li> </ul>	<ul style="list-style-type: none"> <li>Taman Serdang Jaya</li> <li>Taman Bukit Serdang</li> <li>Equine Park Apartments</li> <li>Villa Avenue</li> <li>Taman Suria Tropika</li> <li>Permai Park</li> <li>Taman Lestari Perdana</li> <li>Alam Sanctuary</li> <li>Taman Puncak Jalil</li> <li>3 Elements</li> <li>Taman Prima Tropika</li> <li>Seri Kembangan New Village</li> <li>Taman Bukit Serdang</li> <li>Taman Desaminium</li> <li>Kota Perdana</li> <li>17<sup>th</sup> College UPM</li> </ul>
<b>Commercial</b>		
<ul style="list-style-type: none"> <li>Taman Universiti Indah Commercial Area</li> </ul>	<ul style="list-style-type: none"> <li>Pinggiran Putra Commercial Area</li> <li>Equine Park Commercial Area</li> <li>Putra Walk</li> <li>Petronas Equine Park</li> </ul>	<ul style="list-style-type: none"> <li>Pusat Perdagangan Seri Kembangan</li> <li>Shell Suria Tropika Esso Pinggiran Putra</li> <li>Bandar Putra Permai</li> <li>Permai Square</li> <li>Kompleks Pasar Borong Selangor</li> <li>Giant Hypermarket</li> <li>The Atmosphere</li> <li>Petronas Bandar Putra Permai</li> <li>IOI Resort</li> </ul>
<b>Public Facilities/Institutions</b>		
<ul style="list-style-type: none"> <li>University Putra Malaysia</li> <li>Seri Kembangan R&amp;R- KL Putrajaya Expressway</li> <li>MARDI HQ</li> <li>NAHRIM</li> </ul>	<ul style="list-style-type: none"> <li>University Putra Malaysia</li> <li>MARDI HQ</li> <li>Malaysia Agriculture, Horticulture and Agrotourism</li> <li>Alice Smith International School</li> <li>Surau Al Muttaqin Bandar Putra Permai</li> </ul>	<ul style="list-style-type: none"> <li>University Putra Malaysia</li> <li>Bukit Expo</li> <li>Putrajaya Power Station</li> <li>Surau Al-Mawaddah</li> </ul>
<b>Industrial</b>		
-	<ul style="list-style-type: none"> <li>Kawasan Perindustrian Serdang Jaya</li> </ul>	-
<b>Public Open Space/Recreational</b>		
-	<ul style="list-style-type: none"> <li>Wetlands Park Presint 13</li> </ul>	<ul style="list-style-type: none"> <li>Wetlands Park Presint 13</li> </ul>



## SECTION 5 : EXISTING ENVIRONMENT

### 5.4.2 Future Land Use

No major changes to existing land use are expected along the SSP Line as it passes through developed area. However, based on the local plans and “*Feasibility Study Report for MRT Lines 2 & 3*”, several areas in Kuala Lumpur have been identified for redevelopment or regeneration. Some of the major redevelopment areas include:

- Kentonmen
- Kampong Bharu
- Cochrane (under construction)
- Tun Razak Exchange (TRX) at Pasar Rakyat (under construction)
- Bandar Malaysia at TUDM Sg Besi

Apart from the major redevelopment or regeneration projects, other future developments proposed along each of the segment have also been identified as described below.

#### 5.4.2.1 Northern Elevated Segment

**Table 5-13** shows the major proposed projects located close to the northern elevated alignment.

**Table 5-13 Proposed Development along the Northern Elevated Segment**

Proposed Development	Status of the Development	Future Land Use	Nearest Station Location	Distance from the Station
Damansara Avenue	Under Construction	Mixed Development	S01 (Damansara Damai)	< 1 km
Batu Kentonmen	Planning	Mixed Development	S09 (Batu)	< 500 m

#### 5.4.2.2 Underground Segment

**Table 5-14** shows the major proposed projects located close to the alignment.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-14 Proposed Development along the Underground Segment**

Proposed Development	Status of the Development	Future Land Use	Nearest Station Location	Distance from Station
YTL Sentul West	Under construction	Mixed Development	S12 (Sentul West)	< 20 m
Tun Razak Exchange	Under construction	Mixed Development	S19 (TRX)	Right next to station
YTL Sentul West	Under construction	Mixed Development	S12 (Sentul West)	< 20 m
Tun Razak Exchange	Under construction	Mixed Development	S19 (TRX)	Right next to station

### 5.4.3 Southern Elevated Segment 1

**Table 5-15** shows the various major proposed projects close to the alignment in Salak Selatan, Sungai Besi dan Seri Kembangan.

**Table 5-15 Proposed Development along the Southern Elevated Segment 1**

Proposed Development	Status of the Development	Future Land Use	Nearest Station Location	Distance from the Station
University College Sedaya International	Planning	Public Institution	S24 (Taman Naga Emas)	< 200 m
Kampung Pinang Tambahan	Planning	Commercial Area	S25 (Pekan Sungai Besi)	< 800 m

Source: Draft KL City Plan 2020

#### 5.4.3.1 Southern Elevated Segment 2

**Table 5-16** shows various major proposed projects situated within close distance from the alignment in UPM and Cyberjaya.

**Table 5-16 Proposed Developments along the Southern Elevated Segment 2**

Proposed Development	Status of the Development	Future Land Use	Nearest Station Location	Distance from the Station
Food & Strategic Resources Tech Research Complex MARDI	Site Clearance	Public Institution	S30 (Taman Universiti)	< 50 m
V' Residence	Under Construction	Residential	S33 (16 Sierra)	< 1 km
Cyberjaya City Centre	Planning	Mixed Development	S35 (Cyberjaya City Centre)	< 50 m

## **SECTION 5 : EXISTING ENVIRONMENT**

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### **5.5 CLIMATE**

The general climate along the SSP line is characterized by high annual rainfall and relatively uniform high humidity and temperature. The climate for the SSP Line is interpreted based on data from three meteorological stations; namely Petaling Jaya (data from 1990 - 2013), Subang (data from 1966 – 2013) and KLIA Sepang (data from 1999 - 2013).

#### **5.5.1 Rainfall**

The mean annual rainfall at Petaling Jaya, Subang and KLIA Sepang are 3190 mm, 2551 mm, and 1993 mm. The average total annual raindays are 207 days, 199 days and 177 days for Petaling Jaya, Subang and KLIA Sepang respectively. The wettest month of the year is November for all three stations, with an average value of 397 mm for Petaling Jaya, 303 mm for Subang and 264 for KLIA Sepang. The average total rain days in the wettest month are 23 days for Petaling Jaya, 22 days for Subang and 21 days for KLIA Sepang (**Figure 5-10**).

#### **5.5.2 5.5.2 Temperature**

The mean annual 24-hour temperature at Petaling Jaya, Subang and KLIA Sepang are 27.7°C, 27.1°C and 27.6°C respectively (**Table 5-17**). 28.4°C, 27.8°C and 28.3°C were the highest average temperatures for Petaling Jaya, Subang and KLIA Sepang respectively, all in the month of May. The lowest temperatures were in the months of November and December for Petaling Jaya and KLIA Sepang with 26.9°C and 27.0°C respectively, and December for Subang with 26.5°C. KLIA Sepang recorded the lowest value with 27.0°C (**Figure 5-10**).

#### **5.5.3 Relative Humidity**

The average annual mean 24-hour relative humidity at Petaling Jaya, KLIA and Subang were 78.1%, 81.5% and 80.6% respectively. November had the highest relative humidity for all three stations with 82.0% for Petaling Jaya, 84.6% for Subang and 84.9% for KLIA. The lowest average relative humidity fell on different months for the three stations. For Petaling Jaya it was July with 76.1%, for Subang it was August with 79.9% and for KLIA it was February with 77.2% (**Figure 5-10**).

#### **5.5.4 Surface Wind**

Examination of the annual wind rose for the stations showed that the dominant wind is blowing from east to west (8.8%) for Petaling Jaya, northwest to southeast (12.6%) for Subang and north to south (15%) for KLIA Sepang. The percentage of calm conditions occurrences for Petaling Jaya, KLIA Sepang and Subang are 24.0%, 34.2% and 9.0% respectively. The annual wind speed range category is from 0.3 m/s to 1.5 m/s with percentage frequency of 28.4% for Petaling Jaya, 30.0% for Subang and 41.8% for KLIA Sepang (**Figure 5-11**).

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**Table 5-17 Climate Data for Subang, KLIA and Petaling Jaya Stations**

Parameters	Subang (1966 - 2013)	KLIA (1999 - 2013)	Petaling Jaya (1990 - 2013)
Mean Annual Rainfall	2551 mm	1994 mm	3190 mm
Average Annual Raindays	199	177	207
Wettest Month Of The Year	November (303 mm)	November (265 mm)	November (397 mm)
Mean Annual Temperature	27.1°C	27.6°C	27.7°C
Month with Highest Average Temperature	May (27.8°C)	May (28.3°C)	May (28.4°C)
Month with Lowest Average Temperature	Dec (26.5°C)	Nov & Dec (27.0°C)	Nov & Dec (26.9°C)
Average Annual Mean 24-hr Relative Humidity	81.5%	80.6%	78.1%
Dominant Wind Direction (Blowing From/To)	Northwest/Southeast (12.6%)	North/South (15%)	East/West (8.8%)
Percentage Of Calm Conditions	34.2%	9.0%	24.0%

### 5.6 HYDROLOGY AND WATER RESOURCES

#### 5.6.1 Rivers

The SSP Line traverses three river catchments areas namely Sg. Buloh, Sg. Klang and Sg. Langat (**Figure 5-12**). About 46.5km of the alignment is located within Sg Klang catchment, 4.9km within Sg. Buloh catchment and 0.8km within the Sg. Langat catchment.

##### Sg Buloh Catchment

Sg Buloh basin encompasses an area of around 450 km<sup>2</sup>. For SSP Line, the alignment runs along Sg Gasi river reserve near Damansara Damai area for a distance of about 3km.

##### Sg Klang Catchment

Sg Klang basin has a total catchment area of about 1,300 km<sup>2</sup> and extends into states which are Selangor and Federal Territory of Kuala Lumpur. The SSP Line crosses several tributaries which include Sg Keroh, Sg Batu, Sg Gombak, Sg Bonus, Sg Kerayong, Sg Kuyoh and Sg Gajah.

##### Sg Langat Catchment

Sg Langat has a large catchment area, covering area of about 2,350 km<sup>2</sup>. Its main tributaries include Sg Semenyih, Sg Beranang, Sg Labu and Sg Pajam. For SSP Line, a short stretch of the alignment, about 0.8 km, passes through Putrajaya which is located within the Sg Langat catchment.

## SECTION 5 : EXISTING ENVIRONMENT

### 5.6.2 Drainage System and River Crossing

Since the SSP line traverses highly built up areas in Kuala Lumpur and Selangor, the drainage system has been established along the alignment. However, most of the rivers have been channelized as part of urban drainage system. Due to the length of the Project, the alignment running across several rivers (**Table 5-18**) and along certain stretch runs close to some ponds (**Table 5-19**). Some of these ponds are part of flood mitigation measures.

**Table 5-18 River Crossings along the Alignment**

Catchment	River	Description
<b>Northern Elevated Segment</b>		
Sg Buloh	Sg Gasi	Alignment crosses Sg Gasi after the Sungai Buloh Toll Plaza
		Alignment crosses Sg Gasi near commercial buildings of Damansara Damai at Jalan PJU10/1A
		Alignment crosses Sg Gasi, right after Hotel Sri Damansara along Selayang-Kepong Highway
Sg Klang	Sg Keroh	Alignment crosses Sg Keroh; right between Kompleks Perniagaan Desa Jaya and Kepong Police Station
	Sg Batu	Alignment crosses Sg Batu right after the KTM Batu Station
<b>Underground Segment</b>		
Sg Klang	Sg Gombak	Alignment crosses under Sg Gombak adjacent to the existing Titiwangsa LRT and Monorail stations in Jalan Tun Razak
	Sg Bonus	Alignment crosses under Sg Bonus right behind SK Jalan Raja Muda building, Kampong Bharu
	Sg Klang	Alignment crosses under Sg Klang; adjacent to Jalan Gurney
	Sg Kerayong	Alignment crosses under Sg Kerayong; adjacent to Restoran Siu Siu in Jalan Sg Besi
<b>Southern Elevated Segment 1</b>		
Sg Klang	Sg Kerayong	Alignment crosses Sg Kerayong; adjacent to Desa Waterpark and IWK Oxidation Pond at Kuala Lumpur Seremban Expressway (E37)
	Sg Midah	Alignment crosses Sg Midah, adjacent to PPR Kg Raya Permai after LRT Sg Besi Station
	Sg Kuyoh (Point 1)	Alignment crosses Sg Kuyoh; adjacent to the Seri Kembangan Police Station in Jalan Raya Satu

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-18 River Crossings along the Alignment (Cont'd)**

Catchment	River	Description
<b>Southern Elevated Segment 1</b>		
Sg Klang	Sg Kuyoh (Point 2)	Alignment crosses Sg Kuyoh; adjacent to Kawasan Perindustrian Seri Kembangan
	Sg Kuyoh (Point 3)	Alignment crosses Sg Kuyoh; adjacent to Hindu Temple in Jalan Raya Tiga
	Sg Kuyoh (Point 4)	Alignment crosses Sg Kuyoh; adjacent to SJK(c) Serdang Baru 2
<b>Southern Elevated Segment 2</b>		
Sg Klang	Sg Gajah	Alignment crosses Sg Gajah; adjacent to the Skypark development at Persiaran Apec, Cyberjaya
	Sg Gajah Tributary	Alignment crosses Sg Gajah; adjacent to Limkokwing University at Persiaran Apec

**Table 5-19 Ponds along the Alignment**

Pond	Description
Damansara Damai Pond	The alignment runs along the Damansara Damai pond located next to the Saujana Damansara
Nanyang Pond	The alignment runs at the edge of this flood detention pond own by JPS; located next to Wisma TNB at Jalan Kepong
Fish Ponds	Alignment runs at the edge of two fish ponds located at Jalan 34 of Kg Baru Salak Selatan
Recreational Pond	Alignment crosses Recreational Pond; located within Sekolah Tunas Bakti Sg Besi near Taman Naga Emas
MARDI Pond	Crosses the pond; located within MARDI development area, own by MARDI
Pond	Crosses the pond; just before the shoplots in Taman Pinggiran Putra

### 5.6.3 Flood Prone Areas

Flash flood is a common problem in Kuala Lumpur and Selangor particularly after heavy rain. Based on annual reports prepared by Drainage and Irrigation Department (DID) for Selangor and Wilayah Persekutuan Kuala Lumpur, the main causes of flooding are due to inadequate capacity of the drains or rivers to accommodate the high flow during heavy downpour.

The contributing factors that affect the drainage capacity include sedimentation, dumping of wastes into the drains, presence of structures within the river reserve. With regards to linear development such as LRT, MRT and highways, the major concerns have always been the presence of piers within the reserve as this could affect the river flow.

## SECTION 5 : EXISTING ENVIRONMENT

Based on the reports by DID, areas where flash flooding have occurred within the vicinity of the proposed SSP Line have been identified. Within Kuala Lumpur, these areas are **Table 5-20** and shown in **Figure 5-13**.

**Table 5-20 Flood Occurrences in Kuala Lumpur (Year 2011, 2012 and 2013)**

Northern Elevated Segment			
River Catchment	Flood Areas	Date of Occurrence	Distance From the Alignment (m)
Sg Keroh	Jinjang Utara	10 Oct 2013	Within 300m
Underground Segment			
River Catchment	Flood Areas	Date of Occurrence	Distance From the Alignment (m)
Sg Batu	Kg Kasipillay	10 Oct 2013	Within 200m
		10 Apr 2013	
		21 Aug 2012	
		2 May 2012	
	Jalan Kolam Air	2 Dec 2012	Within 300m
		12 Oct 2012	
		21 Aug 2012	
		2 May 2012	
Sg Gombak	Bulatan Pahang	7 May 2013	Within 50m
	Jalan Ipoh	10 Apr 2013	Within 400m
	Jalan Batu Bata	10 Apr 2013	Within 250m
	Jalan Pekeliling	10 Apr 2013	Within 100m
		18 Sept 2011	
	Plaza Pekeliling	2 May 2012	Within 50m
	Jalan Tun Razak	13 Dec 2011	Within 100m
24 Feb 2011			
Underground Segment			
River Catchment	Flood Areas	Date of Occurrence	Distance From the Alignment (m)
Sg Gombak	Jalan Rahmat	3 Nov 2013	Within 350m
		10 Oct 2013	
		7 May 2013	

Meanwhile, several flood prone areas in Selangor have been identified which are close to the alignment (**Table 5-21**). These areas are sited mainly within the Southern Elevated Segment 1: Bandar Malaysia South - UPM.

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**Table 5-21 Flood Occurrences in Selangor (Year 2011, 2012 and 2013)**

Southern Elevated Segment 1			
River Catchment	Flood Areas	Date of Occurrence	Distance From the Alignment (m)
Sg Kuyoh	<b>Seri Kembangan</b> Jalan Kuyoh and Jalan SK9	21 Dec 2012	Within 70m
		25 Oct 2012	
		4 Sept 2012	
	<b>Seri Kembangan</b> Taman Kembang Sari	21 Dec 2012	Within 0m – 250m
		4 Sept 2012	
	<b>Taman Serdang Jaya</b> Jalan 4/4, Jalan 4/1A, Jalan 4/1B and Jalan Raya 6	24 Dec 2013	Within 150m – 400m
		21 Dec 2012	
		25 Oct 2012	
		4 Sept 2012	

### 5.7 WATER QUALITY

The water quality of the rivers in the Klang Valley generally range from Class II to Class V. The water quality status for Sg. Batu, Sg. Gombak, Sg. Jinjang, Sg. Keroh, Sg. Klang and Sg. Bunus for 2013 are published by Department of Environment in Environmental Quality Report 2013.

River water samples were collected between 4<sup>th</sup> December 2014 and 13<sup>th</sup> March 2015 (**Table 5-22; Figures 5-14a – 5-14d**) along the SSP Line, where it intersects the existing rivers, in order to obtain baseline data for the existing river water quality. The laboratory results are in **Appendix D**.

**Table 5-22 Locations of Water Quality Monitoring Points**

Station	River	Description	Coordinates
W1	Sg. Gasi(Point 1)	River crossing near Jalan PJU 10/1, Damansara Damai	N 03° 11' 58.00" E 101° 35'40.56"
W2	Sg. Gasi (Point 2)	River crossing near 8trium and Sri Damansara Club	N 03° 11' 52.84" E 101° 36'25.98"
W3	Sg. Keroh	River crossing at Jalan Kepong near Kepong Police Station and Masjid Amaniah	N 03° 12' 50.37" E 101° 37'57.93"
W4	Nanyang Pond	Water discharge from Nanyang Pond after the proposed Seri Delima Station	N 03° 12' 22.09" E 101° 40'04.96"
W5	Sg. Batu	Downstream of river crossing after the KTM Kg Batu Station, after the proposed Kampung Batu Station	N 03° 12' 13.94" E 101° 40'33.89"



## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-22 Locations of Water Quality Monitoring Points (Cont'd)**

Station	River	Description	Coordinates
W6	Sg. Gombak	River crossing near the existing Titiwangsa LRT and Monorail Stations	N 03° 10' 27.79" E 101° 41'41.14"
W7	Sg. Bunus	River crossing between Hospital Kuala Lumpur and SK Jalan Raja Muda Abdul Aziz	N 03° 10' 07.80" E 101° 42'27.88"
W8	Sg. Klang	River crossing as the line traverses from Jalan Gurney towards the proposed Ampang Park Station	N 03° 09' 57.00" E 101° 43'00.25"
W9	Sg Kerayong (Point 1)	Alignment crosses Sg Kerayong; adjacent to Restoran Siu Siu in Jalan Sg Besi	N 03° 7'13.33" E 101°42'26.92"
W10	Sg Kerayong (Point 2)	Alignment crosses Sg Kerayong; adjacent to Desa Waterpark right after the junction from NPE heading towards Kuala Lumpur Seremban Expressway (E37)	N 03° 5'45.64" E 101°41'41.61"
W11	Sekolah Tunas Bakti Sg Besi Recreational Pond	Alignment crosses Recreational Pond; located within Sekolah Tunas Bakti Sg Besi near Taman Naga Emas	N 03° 4'37.56" E 101°41'58.99"
W12	Sg. Kuyoh (Point 1)	River crossing between Kawasan Perindustrian Seri Kembangan and Balai Bomba along Jalan Raya Satu	N 03° 01' 10.94" E 101° 42'33.77"
W13	Sg. Kuyoh (Point 2)	Alignment crosses Sg Kuyoh; adjacent to Hindu Temple at Jalan Raya 3	N 03° 0'35.63" E101°42'26.56"
W14	MARDI Pond	Crosses the pond; located within MARDI development area, own by MARDI	N 02°59'59.11" E 101°41'16.60"
W15	Sg Gajah (Point 1)	Alignment crosses Sg Gajah; adjacent to the Skypark development along Persiaran Apec, Cyberjaya	N 02°57'6.85" E 101°39'24.22"
W16	Sg Gajah Tributary (Point 2)	Stream flows between Sky Park and Lim Kok Wing University of Creative Technology, before junction to Garden Residence	N 02° 56' 41.98" E 101° 39'33.08"

## **SECTION 5 : EXISTING ENVIRONMENT**

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### Water Quality Monitoring Results

#### **Station W1 – Sg. Gasi (Point 1)**

Station W1 is located at Sg. Gasi near Jalan PJU 10/1, Damansara Damai. The water quality at Station W1 is classified as Class III [Water Quality Index (WQI) status: polluted] via the National Water Quality Standard (NWQS). The BOD and COD levels were high at 13 mg/l and 69 mg/l, respectively (**Table 5-23a**). TSS level and *E. coli* count were also high (179 mg/l and 350 CFU/100 ml, respectively) while oil and grease was not detected. Chromium, copper, iron, manganese, nickel and zinc were 0.020 mg/l, 0.076 mg/l, 4.979 mg/l, 0.130 mg/l, 0.016 mg/l and 0.712 mg/l, respectively. Other heavy metals (arsenic, cadmium, lead and mercury) were not detected.

#### **Station W2 – Sg. Gasi (Point 2)**

Station W2 is located 2 km upstream of Station W1 on Sg. Gasi near 8trium and Sri Damansara Club, and has a Class III water quality (WQI status polluted). The BOD and COD levels were high at 18 mg/l and 94 mg/l, respectively (**Table 5-23a**). TSS level and *E. coli* count were also high at 130 mg/l and 450 CFU/100 ml respectively. Oil and grease was not detected. Chromium, copper, iron, lead, manganese, nickel and zinc were 0.008 mg/l, 0.061 mg/l, 2.827 mg/l, 0.006 mg/l, 0.102 mg/l, 0.025 mg/l and 0.481 mg/l, respectively. Other heavy metals (arsenic, lead and mercury) were not detected.

#### **Station W3 – Sg. Keroh**

Station W3 is located at Sg. Keroh at Jalan Kepong near Kepong Police Station and Masjid Amaniah. The water quality at Station W3 can be classified as Class III (WQI status: polluted). Station W3 has high BOD and COD levels which were 17 mg/l and 88 mg/l, respectively. TSS level and *E.coli* count were also high at 205 mg/l and 420 CFU/100 ml, respectively (**Table 5-23a**). Oil and grease was not detected. Cadmium, chromium, copper, iron, manganese, nickel and zinc were 0.001 mg/l, 0.011 mg/l, 0.042 mg/l, 3.592 mg/l, 0.106 mg/l, 0.021 mg/l and 0.504 mg/l, respectively. Arsenic, lead and mercury were not detected.

#### **Station W4 – Sg. Jinjang**

Station W4 is located along Sg. Jinjang near the discharge from Nanyang Pond. The water quality at Station W4 can be classified as Class II (WQI status: clean). The BOD and COD levels were low at 1 mg/l and 6 mg/l, respectively (**Table 5-23a**). TSS level and *E. coli* count were also low at 16 mg/l and 39 CFU/100 ml. Oil and grease was not detected. Cadmium, chromium, copper, iron, lead, manganese, nickel and zinc were 0.005 mg/l, 0.002 mg/l, 0.027 mg/l, 2.893 mg/l, 0.170 mg/l, 0.361 mg/l, 0.035 mg/l and 0.302 mg/l, respectively.

## SECTION 5 : EXISTING ENVIRONMENT

### Station W5 – Sg. Batu

Station W5 is located at Sg. Batu after the KTM Kg Batu Station. The BOD, COD and TSS levels were low at 1 mg/l, 6 mg/l and 12 mg/l, respectively (**Table 5-23a**). *E. coli* count was also low (22 CFU/100 ml). Oil and grease was not detected. Cadmium, chromium, copper, iron, lead, manganese and zinc were at 0.001 mg/l, 0.008 mg/l, 0.027 mg/l, 2.802 mg/l, 0.062 mg/l, 0.404 mg/l and 0.297 mg/l, respectively. The sample taken at this was surprisingly clean – which is not normally expected for Sg. Batu.

**Table 5-23a Water Quality at Stations W1 to W5**

Parameter	Unit	Station				
		W1	W2	W3	W4	W5
Date collected	-	4 December 2014				
Time collected	-	1.57 pm	1.20 pm	2.56 pm	3.27 pm	3.48 pm
pH	-	6.3	6.3	6.7	6.9	7.0
Temperature	°C	29.0	30.0	30.0	30	31.0
DO	mg/l	5.1	5.1	5.3	5.9	5.9
COD	mg/l	69.0	94.0	88.0	6	6.0
BOD <sub>5</sub>	mg/l	13.0	18.0	17.0	1	1.0
TSS	mg/l	179.0	130.0	205.0	16	12.0
Oil & Grease	mg/l	ND(<1)	ND(<1)	ND(<1)	ND(<1)	ND(<1)
NH <sub>3</sub> -N	mg/l	2.93	1.58	2.11	0.30	0.03
<i>E. coli</i>	CFU/100ml	350.0	450.0	420.0	39	22.0
Arsenic	mg/l	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)
Cadmium	mg/l	ND (<0.001)	ND (<0.001)	0.001	0.005	0.001
Chromium	mg/l	0.020	0.008	0.011	0.002	0.008
Copper	mg/l	0.076	0.061	0.042	0.027	0.027
Iron	mg/l	4.979	2.827	3.592	2.893	2.802
Lead	mg/l	ND (<0.006)	0.006	ND (<0.006)	0.170	0.062
Mercury	mg/l	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)
Manganese	mg/l	0.130	0.102	0.106	0.361	0.404
Nickel	mg/l	0.016	0.025	0.021	0.035	ND (<0.006)
Zinc	mg/l	0.712	0.481	0.504	0.302	0.297
WQI Status	-	Polluted	Polluted	Polluted	Clean **	Clean **

Note: 1) < means Less than 2) ND means Not Detected. \*\* unexpected results – to be verified during EMP.

## **SECTION 5 : EXISTING ENVIRONMENT**

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### **Station W6 – Sg. Gombak**

Station W6 is located at Sg. Gombak near the existing Titiwangsa Monorail Station. The water quality at Station W6 can be classified as Class II (WQI status: Clean). The BOD, COD and TSS levels were low at 2 mg/l, 9 mg/l and 16 mg/l, respectively (**Table 5-23b**). *E. coli* count was also low at 34 CFU/100 ml. Oil and grease was not detected. Heavy metals were mostly not detected except for chromium (0.010 mg/l), copper (0.016 mg/l), iron (3.507 mg/l), manganese (0.513 mg/l) and zinc (0.243 mg/l).

### **Station W7 – Sg. Bunus**

Station W7 is located along Sg. Bunus between Hospital Kuala Lumpur and SK Jalan Raja Muda Abdul Aziz. The water quality can be classified as Class I (WQI status: Clean). The BOD, COD and TSS levels were low at 1 mg/l, 6 mg/l and 18 mg/l. *E.coli* count was also low at 16 CFU/100 ml (**Table 5-23b**). Oil and grease was not detected. All heavy metals were low. The sample taken at this was surprisingly clean – which is not normally expected for Sg.Bunos..

### **Station W8 – Sg. Klang**

Station W8 is located at Sg. Klang as the line traverses from Jalan Gurney towards the proposed Ampang Park Station. The water quality can be classified as Class III (WQI status: Slightly Polluted). The BOD, COD and TSS levels were high at 17 mg/l, 81 mg/l and 214 mg/l, respectively. *E.coli* count was also high at 440 CFU/100 ml (**Table 5-23b**). Oil and grease was not detected. Chromium, copper, iron, lead, manganese, nickel and zinc were at 0.008 mg/l, 0.060 mg/l, 3.319 mg/l, 0.085 mg/l, 0.003 mg/l and 0.282 mg/l respectively.

### **Station W9 – Sg Kerayong (Point 1)**

Station W9 is located at Sg Kerayong @ Jalan Sg Besi. The water quality is classified as Class II (WQI Status: Clean). The BOD, COD and TSS levels were low at 3 mg/l, 16 mg/l and 4 mg/l respectively (**Table 5-23b**). *E. coli* count recorded at less than 1 CFU/100 ml. Oil and grease meanwhile is not detected. Some heavy metals such as arsenic, chromium, lead, mercury and nickel were not detected. Others such as cadmium, copper, iron, manganese and zinc recorded at low levels with 0.7 mg/l, 0.004 mg/l, 0.007 mg/l, 1.469 mg/l, 0.032 mg/l and 0.016 mg/l respectively.

### **Station W10 – Sg Kerayong (Point 2)**

Station W10 is located at Sg Kerayong near Desa Waterpark and IWK sewage treatment plant at KL-Seremban Expressway. The water quality at Station W10 is classified at Class II (WQI Status: Clean) (**Table 5-23b**). The BOD, COD and TSS levels were low at 4 mg/l, 23 mg/l and 3 mg/l respectively. Heavy metals were mostly not detected except for cadmium (0.006 mg/l), iron (1.121 mg/l), manganese (0.027 mg/l) and zinc (0.062 mg/l).

The water quality at several of the sampling stations was much better than normally expected. These results will need to very verified at the EMP stage.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-23b Water Quality at Stations W6 to W10**

Parameter	Unit	Station				
		W6	W7	W8	W9	W10
Date collected	-	4 Dec 2014			13 Mar 2015	
Time collected	-	4.07 pm	4.32 pm	5.03 pm	3.22 pm	2.49 pm
pH	-	7.1	6.9	6.3	6.4	6.3
Temperature	°C	27	29	30	29.0	29.0
DO	mg/l	5.8	5.9	5.1	6.0	6.4
COD	mg/l	9.0	6.0	81.0	16.0	23.0
BOD <sub>5</sub>	mg/l	2.0	1.0	17.0	3.0	4.0
TSS	mg/l	16	18	214	4.0	3.0
Oil & Grease	mg/l	ND	ND	ND	ND(<1)	ND(<1)
NH <sub>3</sub> -N	mg/l	0.22	0.02	0.08	0.7	0.08
<i>E.coli</i>	CFU/100ml	34.0	16.0	440.0	<1	<1
Arsenic	mg/l	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)
Cadmium	mg/l	ND (<0.001)	ND (<0.001)	ND (<0.001)	0.004	0.006
Chromium	mg/l	0.010	0.002	0.008	ND (<0.001)	ND (<0.001)
Copper	mg/l	0.016	0.046	0.060	0.007	ND (<0.001)
Iron	mg/l	3.507	4.592	3.319	1.469	1.121
Lead	mg/l	ND (<0.006)	0.053	0.102	ND (<0.006)	ND (<0.006)
Mercury	mg/l	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)
Manganese	mg/l	0.513	0.396	0.085	0.032	0.027
Nickel	mg/l	ND (<0.006)	0.010	0.003	ND (<0.006)	ND (<0.006)
Zinc	mg/l	0.243	0.250	0.282	0.016	0.062
WQI Status	-	Clean	Clean **	Slightly Polluted	Clean **	Clean **

Note: 1) < means Less than 2) ND means Not Detected. \*\* unexpected results – to be verified during EMP.

## **SECTION 5 : EXISTING ENVIRONMENT**

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### **Station W11 – Sek. Tunas Bakti Recreational Pond**

Station W11 is a pond located within Sekolah Tunas Bakti Sg Besi at Taman Salak Selatan. The water quality can be classified as Class II (WQI Status: Clean). The BOD, COD and TSS were 3 mg/l, 16 mg/l and 6 mg/l respectively (**Table 5-23c**). Most of the heavy metals were not detected at this station except for copper (0.011 mg/l), iron (1.046 mg/l), manganese (0.021 mg/l) and zinc (0.092 mg/l).

### **Station W12 – Sg. Kuyoh (Point 1)**

Station W12 is located along Sg. Kuyoh near Kawasan Perindustrian Seri Kembangan. The water quality can be classified as Class II (WQI status: Clean) of NWQS. The BOD and COD levels were moderate at 6 mg/l and 32 mg/l, respectively. TSS level and *E.coli* count were low at 14 mg/l and <1 CFU/100 ml (**Table 5-23c**). Oil and grease was not detected. Most metals were in low concentrations.

### **Station W13 – Sg Kuyoh (Point 2)**

The W13 is located at Sg Kuyoh near the SJKC Serdang Baru (2). The water quality can be classified as Class II (WQI Status: Clean) (**Table 5-23c**). The BOD, COD and TSS levels were low at 3 mg/l, 16 mg/l and 14 mg/l respectively. Oil and grease was not detected and *E. Coli* count was less than 1 (<1) CFU/100ml. Most of the heavy metals were not detected except for iron (1.137 mg/l), manganese (0.032 mg/l) and zinc (0.077 mg/l).

### **Station W14 – MARDI Pond**

The W14 is located at MARDI Pond within MARDI land. The water quality can be classified as Class II (WQI Status: Clean). The BOD, COD and TSS levels were low at 5 mg/l, 29 mg/l and 12 mg/l respectively (**Table 5-23c**). Heavy metals such as cadmium, copper, iron, manganese and zinc recorded at value of 0.004 mg/l, 0.009 mg/l, 1.192 mg/l, 0.075 mg/l and 0.074 mg/l respectively.

### **Station W15 – Sg Gajah (Point 1)**

The W15 is located at Sg Gajah adjacent to Skypark development (under construction) at Persiaran Apec, Cyberjaya. The water quality can be classified as Class II (WQI Status: Clean). The BOD, COD and TSS levels were low at 4 mg/l, 23 mg/l and 6 mg/l respectively (**Table 5-23c**). Oil and grease was not detected and *E. Coli* count was less than 1 (<1) CFU/100ml. The concentration of ammoniacal nitrogen and metals were low.

### **Station W16 – Sg Gajah (Point 2)**

Station W16 is located at stream flows between Sky Park and Lim Kok Wing University of Creative Technology, before junction to Garden Residence. The water quality can be classified as Class II (WQI status: clean) of NWQS. The BOD and COD levels were at 2 mg/l and 13 mg/l, respectively. TSS level and *E. coli* count were low at 10 mg/l and <1 CFU/100 ml (**Table 5-23c**). Oil and grease was not detected. Heavy metal concentrations were low.

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**Table 5-23c Water Quality at Stations W11 to W16**

Parameter	Unit	Station					
		W11	W12	W13	W14	W15	W16
Date collected	-	13 Mar 2015	5 Dec 2014	13 Mar 2015			5 Dec 2014
Time collected	-	2.15 pm	10.57 am	10.57 am	11.32 am	6.22 pm	11.32 am
pH	-	6.2	6.8	6.8	7.0	6.3	7.0
Temperature	°C	29.0	27.0	27	27	29.0	27
DO	mg/l	6.4	5.5	5.5	5.6	6.5	5.6
COD	mg/l	16.0	32.0	32	13	23.0	13
BOD <sub>5</sub>	mg/l	3.0	6.0	6	2	4.0	2
TSS	mg/l	6.0	14.0	14	10	6.0	10
Oil & Grease	mg/l	ND(<1)	ND(<1)	ND(<1)	ND(<1)	ND(<1)	ND(<1)
NH <sub>3</sub> -N	mg/l	0.22	0.06	0.06	0.45	0.57	0.45
<i>E.coli</i>	CFU/100ml	<1	<1	<1	<1	<1	<1
Arsenic	mg/l	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)	ND (<0.01)
Cadmium	mg/l	ND (<0.001)	0.003	0.003	0.002	0.001	0.002
Chromium	mg/l	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)
Copper	mg/l	0.011	0.009	0.009	0.011	0.018	0.011
Iron	mg/l	1.046	4.471	4.471	0.865	1.461	0.865
Lead	mg/l	ND (<0.006)	ND (<0.006)	ND (<0.006)	ND (<0.006)	ND (<0.006)	ND (<0.006)
Mercury	mg/l	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)	ND (<0.001)
Manganese	mg/l	0.021	0.220	0.220	0.195	0.032	0.195
Nickel	mg/l	ND (<0.006)	0.044	0.044	0.082	ND (<0.006)	0.082
Zinc	mg/l	0.092	0.195	0.195	0.031	0.059	0.031
WQI Status	-	Clean	Clean	Clean	Clean	Clean	Clean

Note: 1) < means Less than 2) ND means Not Detected

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### 5.8 AIR QUALITY

Air quality monitoring was carried out at 13 locations (**Refer Table 5-24 and Figure 5-14a to Figure 5-14d**) from 30 June 2014 to 15 January 2015. The detailed laboratory report is in **Appendix D**.

Parameters that were sampled include the following:

- Total Suspended Particulates (TSP)
- Particulate Matter 10 µm (PM<sub>10</sub>)
- Nitrogen Dioxide NO<sub>2</sub>
- Carbon Monoxide CO

**Table 5-24 Air Quality Monitoring Locations**

Station	Description	Coordinates
A1	Near Dewi Sri Maha Mariamman Temple	N 3°11'56.44" E 101°37'3.31"
A2	Near Kg Batu PPR Flat	N 3°12'11.05" E 101°40'20.66"
A3	Near Hospital Kuala Lumpur	N 3°10'9.29" E 101°42'16.76"
A4	Near Sekolah Kebangsaan Jalan Raja Muda, Kampong Bharu	N 3°10'4.75" E 101°42'29.40"
A5	Near Desa Green Service Apartments, Taman Desa	N 3° 6'22.62" E 101°41'41.70"
A6	Near The Leafz Apartment, Sungai Besi	N 3° 5'7.24" E 101°41'45.24"
A7	Within Taman Naga Emas	N 3° 4'39.12" E 101°41'56.70"
A8	Near Sungai Besi LRT Station	N 3° 3'52.63" E 101°42'30.63"
A9	Near Plaza Serdang Raya	N 3° 2'33.66" E 101°42'18.00"
A10	Near Masjid Al – Firdaus, Taman Kembang Sari	N 3° 1'13.29" E 101°42'31.57"
A11	Border of UPM and MARDI	N 3° 0'35.63" E 101°42'3.28"
A12	Near open space at Pinggiran Putra Petron Station, Equine Park	N 2°59'21.63" E 101°40'22.55"
A13	Near Amigo Clubhouse, Bandar 16 Sierra	N 2°58'10.74" E 101°39'17.20"



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From the result obtained (**Table 5-25a and Table 5-25b**), the concentrations of the parameters monitored were within the Malaysian Ambient Air Quality Guidelines (MAAQG).

The Total Suspended Particulates (TSP) concentration ranges from 65  $\mu\text{g}/\text{m}^3$  to 112  $\mu\text{g}/\text{m}^3$  with  $\text{PM}_{10}$  ranges from 3  $\mu\text{g}/\text{m}^3$  to 67  $\mu\text{g}/\text{m}^3$ . The ratio of  $\text{PM}_{10}$  to TSP ranges from 52% to 79%. The MAAQG 24-hour averaging time recommended limit for TSP and  $\text{PM}_{10}$  is 260  $\mu\text{g}/\text{m}^3$  and 150  $\mu\text{g}/\text{m}^3$  respectively.

The Nitrogen Dioxide ( $\text{NO}_2$ ) concentration at all sampling points were less than the detection limit of 2  $\mu\text{g}/\text{m}^3$ . The MAAQG 24-hour averaging time recommended limit for  $\text{NO}_2$  is 75  $\mu\text{g}/\text{m}^3$ .

The Carbon Monoxide (CO) concentrations range from non-detection (0 ppm) to 5 ppm which were well below the MAAQS recommended limit of 30 ppm for 1-hour averaging time.

**Table 5-25a Air Quality Monitoring Results (Station A1 – Station A6)**

Parameter	Unit	Station						MAAQG
		A1	A2	A3	A4	A5	A6	
Total Suspended Particulate (TSP)	$\mu\text{g}/\text{m}^3$	92	65	72	85	94	85	260 (24-hour)
Particulate Matter Less Than 10 microns ( $\text{PM}_{10}$ )	$\mu\text{g}/\text{m}^3$	60	34	38	67	58	53	150 (24-hour)
<b>Ratio <math>\text{PM}_{10}</math> to TSP</b>	-	<b>65</b>	<b>52</b>	<b>53</b>	<b>79</b>	<b>62</b>	<b>62</b>	-
Nitrogen Dioxide ( $\text{NO}_2$ )	$\mu\text{g}/\text{m}^3$	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	75 (24-hour)
Carbon Monoxide (CO)	ppm	5	1	1	ND (<0)	1	1	30 (1-hour)

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**Table 5-25b Air Quality Monitoring Results (Station A7 – Station A13)**

Parameter	Unit	Station							MAAQQ
		A7	A8	A9	A10	A11	A12	A13	
Total Suspended Particulate (TSP)	µg/m <sup>3</sup>	72	89	76	78	112	81	84	260 (24-hour)
Particulate Matter Less Than 10 microns (PM <sub>10</sub> )	µg/m <sup>3</sup>	45	55	46	44	62	62	65	150 (24-hour)
<b>Ratio PM<sub>10</sub> to TSP</b>	-	<b>63</b>	<b>62</b>	<b>61</b>	<b>56</b>	<b>55</b>	<b>77</b>	<b>77</b>	-
Nitrogen Dioxide (NO <sub>2</sub> )	µg/m <sup>3</sup>	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	75 (24-hour)
Carbon Monoxide (CO)	ppm	1	2	1	ND (<0)	1	ND (<0)	ND (<0)	30 (1-hour)

### 5.9 NOISE AND VIBRATION

#### 5.9.1 Noise Levels

Noise level monitoring was carried out at 67 locations from 23 February 2014 to 13 March 2015. The measurement locations were selected on a basis of potential noise sensitive areas in accordance to the DOE Environmental Noise Guidelines. These are typically:

- i) nearest residential area;
- ii) nearest school;
- iii) nearest institution; and/or
- iv) nearest place of worship.

Noise parameters obtained from the monitoring included  $L_{eq}$ ,  $L_{10}$ ,  $L_{90}$  and  $L_{max}$  levels. These parameters are defined as below:

- $L_{eq}$  - The equivalent continuous noise over a specified time period;
- $L_{10}$  - Noise level that is exceeded 10% of the time;
- $L_{90}$  - Noise level that is exceeded 90% of the time;
- $L_{max}$  - Instantaneous maximum noise level for the monitoring period.

Noise levels were sampled in one second intervals continuously for 24 hours, upon which the existing 24 hours noise climate were determined at the respective monitoring locations.

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### Monitoring Locations

The monitoring was conducted for 24 hours during typical working days for all the stations. At some locations that were identified as relatively more sensitive, monitoring was also conducted continuously over a working day and weekends. Measurement was undertaken at monitoring stations with existing human and road traffic activities or at the mixed land use which includes the typical commercial activities. The measurements were typically without major construction activities except for a location (N63) at SkyPark at Cyberjaya where there construction works nearby.

The monitoring locations are tabulated in **Table 5-26** and shown in **Figure 5-14a to Figure 5-14d**. Locations N1 to N22 are for the Northern Elevated Segment from Sg Buloh to Sentul, and locations N23 to N35 are for the Underground Segment (typically in close vicinity of the MRT Underground Stations. Locations N36 to N58 are for the Southern Elevated Segment 1, and N57 to N67 are for the Southern Elevated Segment 2.

**Table 5-26 Noise Level Monitoring Points**

Ref.	Location	GPS Coordinates		Description
N1	Jalan Sierramas Utama	03° 11' 56.21 N	101° 37' 22.27 E	Residential
N2	Jln PJU 10/11b, Damansara Damai	03° 11' 57.64 N	101° 37' 26.07 E	Residential
N3	Sri Damansara Hotel	03° 12' 13.38 N	101° 37' 39.54 E	Commercial
N4	Public Mutual/ Twintech College	03° 12' 36.89 N	101° 37' 46.09 E	Institution
N5	Sri Damansara Club House	03°11'55.03"N	101°36'56.09"E	Residential
N6	Persiaran Dagang, Menjalara	03°11'56.00"N	101°37'21.08"E	Residential
N7	Jalan Dagang SD2/1	03°11'58.06"N	101°37'25.06"E	Residential
N8	Jalan Dagang SD2/2	03°11'58.04"N	101°37'25.06"E	Residential
N9	Kepong Sentral Condo	03°12'36.4"N	101°37'45.03"E	Residential
N10	Jalan 55,Taman Sri Ehsan	03° 12' 43.13 N	101° 37' 46.86 E	Residential
N11	Casa Prima Condominium	03° 12' 48.26 N	101° 38' 11.74 E	Residential
N12	Jalan Prima 5, Metro Prima	03°12'50.01"N	101°38'30.06"E	Residential
N13	Vista Mutiara Condo	03° 12' 39.70 N	101° 38' 54.84 E	Residential
N14	Jalan Jinjang Aman 4, Jinjang Utara	03° 12' 36.35 N	101° 39' 25.55 E	Residential
N15	Jalan Jinjang Permai	03° 12' 30.28 N	101° 39' 45.34 E	Residential
N16	SMK Batu 5	03° 12'24.32 N	101°40'20.71 E	School
N17	Alam Puri Condominium	03° 12'27.32 N	101° 40'26.16 E	Residential
N18	Permai Ria Condo	03° 12' 22.19 N	101° 40' 32.15 E	Residential
N19	Sek Keb Batu 4, Jalan Ipoh	03° 12' 07.76 N	101° 40' 35.42 E	School
N20	Desa Alpha Condo	03° 11' 38.58 N	101° 40' 51.31 E	Residential
N21	Taman Kaya	03° 11' 23.84 N	101° 40' 53.03 E	Residential
N22	SMK (P) Jalan Ipoh	03°11'13.10"N	101° 40' 54.3"E	Residential
N23	Sang Suria Condo, Sentul	03° 11' 14.58 N	101° 40' 56.27 E	Residential

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**Table 5-26 Noise Level Monitoring Points (Cont'd)**

Ref.	Location	GPS Coordinates		Description
N24	The Maple Condo, Sentul	03° 11' 08.80 N	101° 40' 55.04 E	Residential
N25	Viva Residency, Jalan Ipoh	03° 10' 41.31 N	101° 41' 10.56 E	Residential
N26	Balai Polis Pekeliling	03° 10' 24.81 N	101° 41' 41.15 E	Residential
N27	UTM SPACE, Jln Tun Razak	03° 09' 40.53 N	101° 43' 08.29 E	Institution
N28	The Oval, KLCC	03° 09' 23.13 N	101° 43' 05.47 E	Residential
N29	1a Stonor Condo, Jln Conlay	03° 09' 00.01 N	101° 43' 04.55 E	Residential
N30	Jalan Conlay, Kraft M'sia	03° 09' 01.04 N	101° 43' 10.62 E	Residential
N31	Menara J Corp, Jln Delima	03° 08' 38.04 N	101° 43' 11.81 E	Commercial
N32	Help College, Chan Sow Lin Stn	03° 07' 40.42 N	101° 42' 53.36 E	Institution
N33	Apartment Angkasaraya, BM Stn	03°07'13.02"N	101°42'10.01"E	Residential
N34	Jalan 109f, Danau Desa	03° 05' 56.16 N	101° 41' 19.19 E	Residential
N35	Danau Permai Condo, Danau Desa	03°05'57.10"N	101°41'19.2"E	Residential
N36	Jalan 5, Kuchai Lama	03° 05' 21.48 N	101° 41' 33.68 E	Mixed use
N37	Kuchai Condominium	03° 05' 14.33 N	101° 41' 36.99 E	Residential
N38	Jalan 35,Kg Baru Salak Selatan	03°05'12.80"N	101°41'42.20"E	Mixed use
N39	Jalan 36, Kg Baru Salak Selatan	03° 05' 08.54 N	101° 41' 48.82 E	Mixed use
N40	SMK Salak Selatan	03° 04' 54.07 N	101° 41' 48.42 E	School
N41	Jalan 5/140,Taman Naga Mas	03°04'49.3"N	101°41'52.7"E	Residential
N42	Jalan 1/140, Taman Naga Emas	03° 04' 40.71 N	101° 41' 51.38 E	Residential
N43	Sri Petaling Station	03°04'41.10"N	101°41'56.30"E	Residential
N44	Sekolah Tunas Bakti	03°04'42.20"N	101°41'57.60"E	School
N45	Jalan Badang	03°04'27.3"N	101°42'11.40"E	Residential
N46	Condominium, Salak Selatan	03°04'16.9"N	101°42'22.8"E	Residential
N47	Jalan Pauh Kijang	03° 04' 30.10 N	101° 42' 16.82 E	Residential
N48	Masjid Jamek Sg Besi	03° 03' 50.04 N	101° 42' 32.24 E	Mosque
N49	PPR Kg Raya Permai	03° 03' 39.28 N	101° 42' 21.81 E	Residential
N50	Hotel Nouvelle, Sg Besi	03° 02' 56.42 N	101° 42' 20.18 E	Hotel
N51	Serdang Raya Station (N)	03° 02' 28.70 N	101° 42' 15.80 E	Residential
N52	Serdang Raya Station (S)	03° 01' 40.79 N	101° 42' 26.42 E	Residential
N53	Flat Taman Serdang Raya	03° 01' 35.97 N	101° 42' 30.41 E	Residential
N54	Quarters Balai Polis	03° 01' 20.48 N	101° 42' 32.48 E	Residential
N55	Jalan 1/2, Seri Kembangan	03° 01' 18.01 N	101° 42' 30.96 E	Residential
N56	Surau Al-Firdaus	03° 01' 13.78 N	101° 42' 32.19 E	Mosque
N57	SRJKC Serdang Baru (2)	03° 00' 44.74 N	101° 42' 35.59 E	School
N58	Jalan 18/46, Serdang Baru	03°00'41.0"N	101°42'40.2"E	Residential
N59	Taman Universiti Indah	03°00'32.60"N	101°41'38.50"E	Residential
N60	Jalan Indah 1	03°00'24.4"N	101°41'37.0"E	Residential
N61	Jalan Dd 3a/5, Equine Park	02°59'28.0"N	101°40'22.1"E	Residential
N62	Jalan Bpp 7, Equine Park	02°59'10.2"N	101°40'08.2"E	Residential

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-26 Noise Level Monitoring Points (Cont'd)**

Ref.	Location	GPS Coordinates		Description
N63	Jalan D'Alpinia	02°58'43.3"N	101°39'20.8"E	Residential
N64	16 Sierra, Puchong	02°58'15.7"N	101°39'16.1"E	Residential
N65	Sky Park, Cyberjaya	02°57'01.7"N	101°39'21.9"E	Residential
N66	Limkokwing University	02°56'29.1"N	101°39'43.8"E	Institution
N67	Jalan P9, Presint 9, Putrajaya	02°56'05.3"N	101°40'23.3"E	Residential

### Monitoring Results

The measured hourly  $L_{eq}$ ,  $L_{90}$  and  $L_{10}$  levels were obtained from the 24 hour continuous noise data. Computations were undertaken to obtain the day time (0700 to 2200 hours), night time (2200 to 0700 hours) and 24 hours (0700 to 0700) equivalent levels  $L_{Aeq}$ , and percentile  $L_{90}$  and  $L_{10}$  levels for reporting of results as per DOE Guidelines. A summary of key results are tabulated in **Table 5-27**.

**Table 5-27 Noise Level Monitoring Results**

Ref.	Location	Time	$L_{eq}$	$L_{10}$	$L_{90}$	$L_{max}$	Remarks
			dBA	dBA	dBA	High	
N1	Jalan Sierramas Utama	Day	66.0	68.7	56.8	88.1	
		Night	58.75	61.5	50.8	84.2	
		24 Hrs	64.4	67.7	51.8	88.1	
N2	Jalan PJU 10/11b, Damansara Damai	Day	63.5	64.7	59.7	82.3	Raining
		Night	58.6	61.3	52.7	78.1	
		24 Hrs	62.2	63.8	55.0	82.3	
N3	Sri Damansara Hotel	Day	71.4	73.1	68.4	87.9	
		Night	68.2	70.9	60.2	88.4	
		24 Hrs	70.4	72.6	63.5	88.4	
N4	Public Mutual/ Twintech College	Day	69.5	71.8	64.9	91.5	
		Night	66.5	69.6	57.9	89.5	
		24 Hrs	68.6	71.3	60.8	91.5	
N5	Sri Damansara Club House	Day	72.3	73.1	68.4	86.5	
		Night	70.1	70.9	60.2	88.0	
		24 Hrs	71.6	72.6	63.5	88.0	
N6	Persiaran Dagang, Menjalara	Day	62.1	64.2	51.6	86.1	
		Night	53.9	54.9	45.4	79.0	
		24 Hrs	60.4	62.5	47.3	99.2	
N7	Jalan Dagang SD2/1	Day	61.0	63.4	51.6	86.1	
		Night	53.4	54.0	47.8	82.4	
		24 Hrs	59.4	61.7	50.6	86.1	

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-27 Noise Level Monitoring Results**

Ref.	Location	Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>max</sub>	Remarks
			dBA	dBA	dBA	High	
N8	Jalan Dagang SD2/2	Day	66.5	68.8	58.6	93.6	
		Night	59.3	61.2	54.4	83.7	
		24 Hrs	65.0	67.2	57.4	93.6	
N9	Kepong Sentral Condo	Day	69.0	70.5	66.5	89.8	
		Night	65.3	67.7	59.0	85.2	
		24 Hrs	68.0	70.0	61.7	89.8	
N10	Jalan 55, Taman Sri Ehsan	Day	62.6	63.9	59.7	90.7	
		Night	59.7	60.9	56.1	80.9	
		24 Hrs	61.7	63.0	58.6	90.7	
N11	Casa Prima Condominium	Day	62.9	65.4	56.8	87.1	
		Night	59.0	61.8	49.7	85.0	
		24 Hrs	61.8	64.4	52.5	87.1	
N12	Jalan Prima 5, Metro Prima	Day	69.2	71.7	64.1	92.8	
		Night	66.2	68.6	56.6	91.2	
		24 Hrs	68.3	71	60	92.8	
N13	Vista Mutiara Condo	Day	73.5	75.7	68	97.7	
		Night	71.1	74	55.4	95.9	
		24 Hrs	72.8	75.2	60.9	97.7	
N14	Jalan Jinjang Aman 4, Jinjang Utara	Day	63.4	66.3	56.7	91.2	
		Night	59.4	61.3	53.7	97.5	
		24 Hrs	62.3	65.0	55.8	97.5	
N15	Jalan Jinjang Permai	Day	70.6	72.9	60.3	98.9	
		Night	66.5	68.6	53.3	92.3	
		24 Hrs	69.5	71.7	58.7	98.9	
N16	Taman Kaya	Day	53.0	55.8	47.6	82.5	
		Night	48.0	49.4	43.8	74.5	
		24 Hrs	51.7	54.4	46.5	82.5	
N17	SMK Batu Lima	Day	63.0	65.1	56.7	90.7	
		Night	59.7	62.8	53.8	81.7	
		24 Hrs	62.0	64.3	55.9	90.7	
N18	Alam Puri Condominium	Day	60.9	63.7	54.7	87.8	
		Night	54.0	55.1	50.0	79.2	
		24 Hrs	59.3	62.0	53.5	87.8	
N19	Permai Ria Condo	Day	63.6	66.0	53.8	93.3	
		Night	59.1	61.1	46.8	90.8	
		24 Hrs	62.4	64.7	52.3	93.3	

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-27 Noise Level Monitoring Results (Cont'd)**

Ref.	Location	Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>max</sub>	Remarks
			dBA	dBA	dBA	High	
N20	Sek Keb Batu 4, Jalan Ipoh	Day	72.0	74.2	66.1	95.1	
		Night	66.5	69.1	57.0	90.1	
		24 Hrs	70.6	72.9	64.4	95.1	
N21	Desa Alpha Condo	Day	61.2	69.9	62.5	86.1	
		Night	56.2	71.5	60.4	86.1	
		24 Hrs	59.9	70.4	61.1	86.1	
N22	SMK (P) Jalan Ipoh	Day	72.4	75.0	65.2	93.3	
		Night	69.2	72.4	59.6	95.0	
		24 Hrs	71.4	74.2	63.8	95.0	
N23	Sang Suria Condo, Sentul	Day	66.2	68.8	58.7	89.7	
		Night	59.7	62.2	50.4	85.6	
		24 Hrs	64.7	67.3	57.0	89.7	
N24	The Maple Condo, Sentul	Day	73.4	76.2	62.7	96.9	
		Night	67.3	69.9	54.0	98.6	
		24 Hrs	72.0	74.8	61.0	98.6	
N25	Viva Residency, Jalan Ipoh	Day	75.0	77.0	68.3	103.5	
		Night	70.18	72.2	59.4	101.6	
		24 Hrs	73.7	75.8	66.6	103.5	
N26	Balai Polis Pekeliling	Day	64.5	65.7	62.7	85.1	
		Night	62.2	63.2	60.2	87.5	
		24 Hrs	63.8	64.9	61.9	87.5	
N27	UTM SPACE, Jalan Tun Razak	Day	64.5	65.4	62.7	91.2	
		Night	61.0	62.1	58.9	80.9	
		24 Hrs	63.5	64.4	61.6	91.2	
N28	The Oval	Day	72.2	74.1	63.4	102.4	
		Night	65.1	67.1	54.1	93.4	
		24 Hrs	70.6	72.6	61.7	102.4	
N29	1a Stonor Condominium, Jalan Conlay	Day	65.7	67.1	57.0	97	
		Night	59.9	61.5	49.9	91.5	
		24 Hrs	64.3	65.7	55.4	97.0	
N30	Jalan Conlay	Day	62.4	64.5	52.3	96.1	
		Night	55.5	58.2	46.8	84.8	
		24 Hrs	60.8	63.0	50.9	96.1	
N31	Menara Jcorps	Day	65.3	68.7	57.3	96.4	
		Night	59.3	61.3	52.5	84.4	
		24 Hrs	63.8	67.1	56.0	96.4	

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-27 Noise Level Monitoring Results (Cont'd)**

Ref.	Location	Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>max</sub>	Remarks
			dBA	dBA	dBA	High	
N32	Help College	Day	62.1	63.8	57.8	83.8	
		Night	58.5	60.4	54.3	81	
		24 Hrs	61.1	62.8	56.8	83.8	
N33	Apartment Angkasaraya	Day	64.2	67.0	52.2	93.0	
		Night	57.9	59.5	48.7	89.3	
		24 Hrs	62.7	65.4	51.2	93.0	
N34	Jalan 109f, Danau Desa	Day	66.1	69.7	51.3	96.6	
		Night	59.1	61.9	44.7	92.0	
		24 hr	64.6	68.0	49.8	96.6	
N35	Danau Permai Condo Danau Desa	Day	68.6	71.4	57.5	90.4	
		Night	63.8	65.5	46.8	91.8	
		24 hr	<b>67.3</b>	<b>70.0</b>	<b>55.7</b>	91.8	
N36	Jalan 5, Kuchai Lama	Day	70.5	73.0	65.1	96.3	Raining
		Night	66.1	68.6	60.9	86.5	
		24 hr	69.3	71.8	64.0	96.3	
N37	Kuchai Condominium	Day	70.2	72.9	65.0	90.9	Raining
		Night	64.3	66.1	58.5	88.7	
		24 hr	68.8	71.4	63.5	90.9	
N38	Kuchai Condominium	Day	70.2	72.9	65.0	90.9	
		Night	64.3	66.1	58.5	88.7	
		24 Hrs	68.8	71.4	63.5	90.9	
N39	Jalan 35, Kg Baru Salak Selatan	Day	65.8	67.6	61.9	99.3	
		Night	58.8	60.4	56	72.9	
		24 Hrs	64.3	66.0	60.5	99.3	
N40	Jalan 36, Kg Baru Salak Selatan	Day	64.6	66.6	58.6	64.6	
		Night	57.7	58.8	54.5	57.7	
		24 Hrs	63.1	65.0	57.5	63.1	
N41	Jalan 5/140 Taman Naga Mas	Day	64.1	65.7	49.5	98.5	
		Night	57.4	58.2	46.1	86.5	
		24 hr	62.6	64.1	48.5	98.5	
N42	Jalan 1/140 Taman Naga Mas	Day	60.9	62.1	57.5	86.7	
		Night	54.1	55.6	51.9	75.1	
		24 hr	59.4	60.6	56.2	86.7	
N43	Sri Petaling Station	Day	62.4	64.5	52.3	96.1	
		Night	55.5	58.1	46.8	84.8	
		24 Hrs	60.8	63.0	50.9	96.1	



## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-27 Noise Level Monitoring Results (Cont'd)**

Ref.	Location	Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>max</sub>	Remarks
			dBA	dBA	dBA	High	
N44	Sek Tunas Bakti	Day	61.7	66.0	52.8	91.0	
		Night	51.6	53.5	48.3	81.5	
		24 Hrs	59.9	64.1	51.6	91.0	
N45	Penginapan Institut Sosial Malaysia	Day	62.1	63.8	57.8	83.8	
		Night	58.5	60.4	54.3	81.0	
		24 Hrs	61.1	62.8	56.8	83.8	
N46	Jalan Badang	Day	61.5	62.6	58.2	84.7	
		Night	65.3	68.3	54.5	92.9	
		24 Hrs	63.3	65.7	57.1	92.9	
N47	Jalan Pauh Kijang	Day	64.9	66.9	58.8	89.1	
		Night	61.2	63.7	53.6	86.6	
		24 Hrs	63.8	66.0	57.5	89.1	
N48	Masjid Jamek Sg Besi	Day	61.2	63.5	55.0	88.4	
		Night	59.8	61.7	49.4	87.1	
		24 Hrs	60.8	62.9	53.6	88.4	
N49	PPR Kg Raya Permai	Day	64.9	65.7	58.0	83.1	
		Night	60.0	60.9	53.6	82.4	
		24 Hrs	63.6	64.4	56.8	83.1	
N50	Hotel Nouvelle	Day	75.2	76.8	72.3	96.7	
		Night	72.7	75.1	67.5	94.6	
		24 Hrs	74.4	76.2	71.1	96.7	
N51	Serdang Raya Station (North)	Day	70.8	72.9	63.5	97.6	
		Night	68.2	70.6	58.7	103.2	
		24 hr	70.0	72.2	62.3	103.2	
N52	Serdang Raya Station (South)	Day	70.9	72.8	65.6	98.7	
		Night	67.6	70.4	58.9	92.4	
		24 hr	69.9	72.0	64.1	98.7	
N53	Flat Serdang Raya	Day	69.7	71.4	64.6	83.7	
		Night	66.6	68.1	59.9	82.3	
		24 hr	68.8	70.5	63.3	83.7	
N54	Kuaters Balai Polis	Day	72.0	74.4	64.1	98.1	
		Night	67.8	70.4	56.2	95.6	
		24 Hrs	70.9	73.3	62.4	98.1	
N55	Jalan 1/2, Seri Kembangan	Day	65.3	67.0	59.4	89.3	
		Night	59.9	62.6	50.2	86.9	
		24 Hrs	63.9	65.9	57.6	89.3	

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-27 Noise Level Monitoring Results (Cont'd)**

Ref.	Location	Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>max</sub>	Remarks
			dBA	dBA	dBA	High	
N56	Surau Al-Firdaus	Day	69.7	71.9	62.6	97.0	
		Night	65.5	68.7	53.1	92.8	
		24 Hrs	68.6	71.0	60.8	97.0	
N57	SRJKC Serdang Baru (2)	Day	66.1	60.3	49.9	95.3	
		Night	59.5	51.1	45.4	87.9	
		24 Hrs	64.6	57.6	47.3	95.3	
N58	Jalan 18/46, Serdang Baru	Day	59.4	60.3	49.9	94.4	
		Night	50.1	51.1	45.4	80.4	
		24 Hrs	57.7	57.6	47.3	94.4	
N59	Taman Universiti Indah	Day	66.9	69.5	53.6	97.4	
		Night	55.6	57.7	46.4	79.0	
		24 Hrs	65.1	67.7	52.0	97.4	
N60	Jalan Indah 1	Day	63.8	67.0	57.6	93.8	Raining
		Night	57.8	60.5	51.1	79.5	
		24 Hrs	62.4	65.5	56.1	93.8	
N61	Jalan Dd 3a/5, Equine Park	Day	62.8	64.7	57.8	87.1	
		Night	58.8	61.2	52.3	80.8	
		24 Hrs	61.7	63.7	56.5	87.1	
N62	Jalan Bpp 7, Equine Park	Day	63.2	65.3	57.7	92.1	
		Night	58.0	60.4	52.4	79.2	
		24 Hrs	61.9	64.0	56.3	92.1	
N63	Jalan D'Alpinia	Day	62.1	64.3	53.3	89.0	Raining
		Night	53.7	56.0	44.2	83.0	
		24 Hrs	60.4	62.6	51.5	89.0	
N64	16 Sierra, Puchong	Day	60.8	63.0	52.7	90.1	Raining
		Night	53.5	57.7	42.7	75.4	
		24 Hrs	59.2	61.7	50.9	90.1	
N65	Sky Park	Day	71.4	74.7	56.8	100.2	Construction activities
		Night	63.4	66.5	50.0	93.8	
		24 Hrs	69.7	73.0	55.2	100.2	
N66	Limkokwing University	Day	66.8	69.3	53.5	97.4	
		Night	55.6	57.7	46.4	79.0	
		24 Hrs	64.9	67.5	52.0	97.4	
N67	Jalan P9, Presint 9, Putrajaya	Day	64.1	66.5	56.9	86.4	
		Night	59.2	61.6	49.2	86.7	
		24 Hrs	62.8	65.2	55.2	86.7	

## SECTION 5 : EXISTING ENVIRONMENT

Noise levels measured at monitoring locations were consistent and representative of existing land use, local activities and local/surrounding traffic pattern. In general, major noise sources at these monitoring locations were local road traffic, and including adjacent highways where applicable, with prevailing human and commercial activities. There were no extraneous noise (noise level which atypical from normal condition of the monitoring stations) being measured, except where noted for specific locations with rainfall during specific hourly time periods, and nearby construction noise (at the SkyPark at Cyberjaya location N63).

In brief, noise monitoring locations were of two categories for assessment against limiting noise level, i.e.:

- i) urban/high density area; or
- ii) suburban/medium density area.

Schedule 1, Maximum Permissible Sound Level ( $L_{eq}$ ) by Receiving Land Use For Planning and New Development, Annex A of the *Planning Guidelines for the Environmental Noise Limits and Control* (Department of Environment, 2007) provides recommendations (target) noise limit in accordance to the land use categories (**Table 5-28**).

**Table 5-28 Schedule 1 - Maximum Permissible Sound Level ( $L_{eq}$ ) by Receiving Land Use For Planning and New Development**

Receiving Land Use Category	Day Time 7.00 a.m – 10.00 p.m	Night Time 10.00 p.m – 7.00 a.m
Noise Sensitive Areas, Low Density Residential, Institutional (School, Hospital), Worship Areas	50 dBA	40 dBA
Suburban Residential (Medium Density) Areas, Public Spaces, Parks, Recreational Areas	55 dBA	45 dBA
Urban Residential (High Density) Areas, Designated Mixed Development Areas (Residential – Commercial)	60 dBA	50 dBA
Commercial Business Zones	65 dBA	55 dBA
Designated Industrial Zones	70 dBA	60 dBA

Source: DOE Planning Guidelines for Environmental Noise Limits and Control 2007. Schedule 1.

Noise levels at all, except one of the monitored areas, exceeded the recommended limits for suburban residential area (55 dBA for daytime and 45 dBA during night time) and urban residential area (60 dBA during daytime and 50 dBA during night time). The only location where noise levels were within recommendations of Schedule 1 was at Taman Kaya (Location N16).

## SECTION 5 : EXISTING ENVIRONMENT

The measured noise levels were more consistent with limits recommended in the DOE Planning Guidelines for highways and road traffic Schedule 4: Limiting Sound Level ( $L_{eq}$ ) From Road Traffic (For Proposed New Roads and/or Redevelopment of Existing Roads).

**Table 5-29 Schedule 4 - Limiting Sound Level ( $L_{eq}$ ) From Road Traffic (For Proposed New Roads and/or Redevelopment of Existing Roads)**

Receiving Land Use Category	Day Time 7.00 a.m – 10.00 p.m	Night Time 10.00 p.m – 7.00 a.m
Noise Sensitive Areas, Low Density Residential Areas	55 dBA	50 dBA
Suburban Residential (Medium Density)	60 dBA	55 dBA
Urban Residential (High Density) Areas	65 dBA	60 dBA
Commercial, Business	70 dBA	60 dBA
Industrial	75 dBA	65 dBA

Source: DOE Planning Guidelines for Environmental Noise Limits and Control 2007. Schedule 4.

There were areas where the existing noise levels exceeded the recommended limits of Schedule 4 for road traffic noise, typically in high density urban areas that have high road traffic and/or located within mixed commercial land use areas with prevailing high noise levels, and in some locations with high noise levels even in the night time.

**Table 5-30** presents an assessment of existing noise levels at locations where existing noise levels exceed the high density residential limits (DOE Guidelines Schedule 4: 65dBA  $L_{eq}$  day, and 60dBA  $L_{eq}$  night) for road traffic noise are identified. Locations that had existing noise levels exceeding either the day or/and night time limits are highlighted. There was also one location at Taman Kaya (location 16) where existing noise levels were below planning limits for low density residential limits (Schedule 1). At other remaining locations, noise levels were typically within the permissible noise limit range for road traffic (high density and medium residential land use).

In areas where the existing noise levels exceeded the DOE Planning Guidelines for road traffic, noise limits will have to be determined based on the existing noise levels at the respective monitoring locations. In these situations, Schedule 3 of the DOE Planning Guidelines provide recommendations for permissible noise limits to be established based on the existing noise climate.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-30 Summary of Assessment of Existing Noise Levels**

Ref.	Location	Existing Noise Assessment	
N1	Jalan Sierramas Utama	Exceed	Schedule 4
N2	Jln PJU 10/11b, Damansara Damai	Within	Schedule 4
N3	Sri Damansara Hotel	Exceed	Schedule 4
N4	Public Mutual/ Twintech College	Exceed	Schedule 4
N5	Sri Damansara Club House	Exceed	Schedule 4
N6	Persiaran Dagang, Menjalara	Within	Schedule 4
N7	Jalan Dagang SD2/1	Within	Schedule 4
N8	Jalan Dagang SD2/2	Exceed	Schedule 4
N9	Kepong Sentral Condo	Exceed	Schedule 4
N10	Jalan 55, Taman Sri Ehsan	Within	Schedule 4
N11	Casa Prima Condominium	Within	Schedule 4
N12	Jalan Prima 5, Metro Prima	Exceed	Schedule 4
N13	Vista Mutiara Condo	Exceed	Schedule 4
N14	Jln Jinjang Aman 4, Jinjang Utara	Within	Schedule 4
N15	Jalan Jinjang Permai	Exceed	Schedule 4
N16	Taman Kaya	Within	Schedule 1
N17	SMK Batu 5	Within	Schedule 4
N18	Alam Puri Condominium	Within	Schedule 4
N19	Permai Ria Condo	Within	Schedule 4
N20	Sek Keb Batu 4, Jalan Ipoh	Exceed	Schedule 4
N21	Desa Alpha Condo	Within	Schedule 4
N22	SMK (P) Jalan Ipoh	Exceed	Schedule 4
N23	Sang Suria Condo, Sentul	Exceed	Schedule 4
N24	The Maple Condo, Sentul	Exceed	Schedule 4
N25	Viva Residency, Jalan Ipoh	Exceed	Schedule 4
N26	BP Pekeliling	Exceed	Schedule 4
N27	UTM SPACE, JlnTunRazak	Exceed	Schedule 4
N28	The Oval, KLCC	Exceed	Schedule 4
N29	1a Stonor Condominium	Exceed	Schedule 4
N30	JalanConlay	Within	Schedule 4
N31	Menara J Corp	Exceed	Schedule 4
N32	Help College	Within	Schedule 4
N33	Apartment Angkasaraya	Exceed	Schedule 4
N34	Jalan 109f, Danau Desa	Exceed	Schedule 4
N35	Danau Permai Condo, Danau Desa	Exceed	Schedule 4
N36	Jalan 5, Kuchai Lama	Exceed	Schedule 4
N37	Kuchai Condominium	Exceed	Schedule 4
N38	Jalan 35, Kg Baru Salak Selatan	Within	Schedule 4
N39	Jalan 36, Kg Baru Salak Selatan	Within	Schedule 4
N40	SMK Salak Selatan	Within	Schedule 4

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-30 Summary of Assessment of Existing Noise Levels (Cont'd)**

Ref.	Location	Existing Noise Assessment	
N41	Jalan 1/140, Taman Naga Mas	Within	Schedule 4
N42	Jalan 1/140, Taman Naga Emas	Within	Schedule 4
N43	Sri Petaling Station	Within	Schedule 4
N44	Sekolah Tunas Bakti	Within	Schedule 4
N45	Jalan Badang	Exceed	Schedule 4
N46	Condominium, Salak Selatan	Within	Schedule 4
N47	Jalan Pauh Kijang	Exceed	Schedule 4
N48	Masjid Jamek Sg Besi	Within	Schedule 4
N49	PPR Kg Raya Permai	Within	Schedule 4
N50	Hotel Nouvelle	Exceed	Schedule 4
N51	Serdang Raya Station (N)	Exceed	Schedule 4
N52	Serdang Raya Station (S)	Exceed	Schedule 4
N53	Flat Taman Serdang Raya	Exceed	Schedule 4
N54	Kuarters Balai Polis	Exceed	Schedule 4
N55	Jalan 1/2, Seri Kembangan	Exceed	Schedule 4
N56	Surau Al-Firdaus	Exceed	Schedule 4
N57	SRJKC Serdang Baru (2)	Within	Schedule 4
N58	Jalan 18/46, Serdang Baru	Within	Schedule 4
N59	Taman Universiti Indah	Exceed	Schedule 4
N60	Jalan Indah 1	Within	Schedule 4
N61	Jalan Dd 3a/5, Equine Park	Within	Schedule 4
N62	Jalan Bpp 7, Equine Park	Within	Schedule 4
N63	Jalan D'Alpinia	Within	Schedule 4
N64	16 Sierra, Puchong	Within	Schedule 4
N65	Sky Park, Cyberjaya	Exceed	Schedule 4
N66	Limkokwing University	Exceed	Schedule 4
N67	Jalan P9, Presint 9, Putrajaya	Within	Schedule 4

Legend :

Exceed	<i>Exceed either day or night time</i>
Exceed	<i>Exceed day and night time limits</i>

The noise climate along the SSP Line was thus sufficiently quantified by measurements to be representative of identified sensitive receptors at the monitoring locations. The measured levels were typically due to prevailing road traffic conditions as well as local activities at the monitoring stations. The resulted noise levels were then used as a basis of establishing recommended noise limit at the monitoring stations, and subsequently assessment of noise impact during construction and operation of Project at these identified locations.

## SECTION 5 : EXISTING ENVIRONMENT

### 5.9.2 Vibration Level

Vibration monitoring was undertaken to establish existing vibration levels from 23 February 2014 to 13 March 2015 at the same locations for noise monitoring (**Table 5-26** and **Figure 5-14a to Figure 5-14d**).

#### Measurement Locations

Baseline vibration measurements at the selected locations were measured on the ground (ground borne vibrations) in the open area. Measurements were undertaken during three different periods of the day (morning, afternoon and evening) at each location. The intent of the measurements was to obtain typical vibration levels at the receivers of concern from existing road traffic and activities (primarily human pedestrian traffic and road works away from the measurement site).

At selected locations which were identified as areas with potentially high concerns vibration monitoring was undertaken continuously for 15 hours day night duration.

#### Monitoring Results

For vibration monitoring, it was assumed that the vibration levels at monitoring stations were typical steady states and it was also assumed that the vibration levels during the day and night are the same (or with negligible difference).

'*The Planning Guidelines for Vibration Limits and Control*' Annex A: Schedule 5 (DOE, 2007) recommends limits for human comfort from steady state vibration for residential land use to be below Curve 2 to 4 (0.2mm/s to 0.4mm/s) during daytime and Curve 2 (0.2mm/s) at night for vibration assessed against Human Response and Annoyance Curves (**Table 5-31**).

**Table 5-31 Schedule 5 - The Planning Guidelines for Vibration Limits and Control' Annex A: Schedule 5**

Receiving Land Use Category	Day Time 7.00 a.m – 10.00 p.m	Night Time 10.00 p.m – 7.00 a.m
Vibration Sensitive Areas	Curve 1	Curve 1
Residential	Curve 2 to Curve 4	Curve 2
Commercial, Business	Curve 4 to Curve 8	Curve 4
Industrial	Curve 8 to Curve 16	Curve 8 to Curve 16

Source: DOE Planning Guidelines for Environmental Vibration Limits and Control 2007. Schedule 5.

Summary results of the measured vibration levels (in vertical, transverse and longitudinal orthogonal directions) are tabulated in **Table 5-32**.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-32 Vibration Monitoring Results**

Ref.	Location	Day			Evening		
		mm/s	mm/s	mm/s	mm/s	mm/s	mm/s
		Vertical	Trans.	Long.	Vertical	Trans.	Long.
N1	Jalan Sierramas Utama	0.302	0.079	0.127	0.254	0.079	0.127
N2	Jalan PJU 10/11b, Damansara Damai	0.143	0.079	0.079	0.143	0.079	0.079
N3	Sri Damansara Hotel	0.254	0.079	0.127	0.175	0.079	0.127
N4	Public Mutual/ Twintech College	0.556	0.302	0.333	0.079	0.064	0.064
N5	Sri Damansara Club House	0.175	0.270	0.413	0.143	0.095	0.095
N6	Persiaran Dagang, Menjalara	0.349	0.111	0.143	0.175	0.175	0.190
N7	Jalan Dagang SD2/1	0.095	0.064	0.079	0.143	0.095	0.127
N8	Jalan Dagang SD2/2	0.175	0.270	0.413	0.175	0.270	0.413
N9	Kepong Sentral Condo	0.159	0.127	0.111	0.333	0.095	0.206
N10	Jalan 55, Taman Sri Ehsan	0.347	0.493	1.160	0.366	0.535	0.555
N11	Casa Prima Condominium	0.429	0.175	0.254	0.317	0.175	0.159
N12	Jalan Prima 5, Metro Prima	0.302	0.079	0.127	0.159	0.079	0.111
N13	Vista Mutiara Condo	0.556	0.302	0.333	0.302	0.079	0.079
N14	Jalan Jinjang Aman 4, Jinjang Utara	0.302	0.079	0.079	0.270	0.095	0.095
N15	Jalan Jinjang Permai	0.556	0.302	0.333	0.079	0.064	0.064
N16	Taman Kaya	0.381	0.190	0.143	0.556	0.143	0.317
N17	SMK Batu 5	0.619	0.159	0.429	0.683	0.238	0.222
N18	Alam Puri Condominium	0.079	0.064	0.064	0.095	0.064	0.095
N19	Permai Ria Condo	0.429	0.175	0.254	0.365	0.095	0.095
N20	Sek Keb Batu 4, Jalan Ipoh	1.380	0.270	0.365	0.841	0.190	0.270
N21	Desa Alpha Condo	0.270	0.079	0.111	0.270	0.079	0.111
N22	SMK (P) Jalan Ipoh	0.397	0.159	0.175	0.429	0.175	0.254
N23	Sang Suria Condo, Sentul	0.349	0.111	0.143	0.175	0.175	0.190
N24	The Maple Condo, Sentul	0.222	0.079	0.127	0.222	0.079	0.127
N25	Viva Residency, Jalan Ipoh	1.435	0.610	1.771	0.287	0.075	0.114
N26	Balai Polis Pekeliling	0.571	0.127	0.143	0.286	0.159	0.190
N27	UTM SPACE, Jln Tun Razak	0.190	0.064	0.127	0.349	0.127	0.206
N28	The Oval, KLCC	0.317	0.143	0.190	0.333	0.095	0.206
N29	1a Stonor Condo, Jalan Conlay	0.303	0.099	0.130	0.580	0.420	0.360
N30	Jalan Conlay, Kraft Malaysia	0.571	0.127	0.143	0.286	0.159	0.190
N31	Menara J Corp, Jalan Delima	0.095	0.064	0.079	0.302	0.095	0.111
N32	Help College, Chan Sow Lin Stn.	0.222	0.063	0.095	0.27	0.0794	0.143
N33	Angkasaraya Flat, BM Station	0.317	0.571	0.889	0.302	0.127	0.238
N34	Jalan 109f, Danau Desa	0.567	0.125	0.134	0.277	0.145	0.179



## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-32 Vibration Monitoring Results (Cont'd)**

Ref.	Location	Day			Evening		
		mm/s	mm/s	mm/s	mm/s	mm/s	mm/s
		Vertical	Trans.	Long.	Vertical	Trans.	Long.
N35	Danau Permai Condo, Danau Desa	0.556	0.302	0.333	0.159	0.0794	0.143
N36	Jalan 5, Kuchai Lama	0.714	0.270	0.619	0.159	0.079	0.143
N37	Kuchai Condominium	0.714	0.27	0.619	0.556	0.175	0.222
N38	Jalan 35, Kg Baru Salak Selatan	0.206	0.127	0.111	0.381	0.0952	0.54
N39	Jalan 36, Kg Baru Salak Selatan	0.381	0.127	0.444	0.222	0.175	0.127
N40	SMK Salak Selatan	0.302	0.397	0.333	0.159	0.0794	0.222
N41	Jalan 1/140, Taman Naga Mas	0.206	0.222	0.127	0.159	0.0952	0.111
N42	Jalan 1/140, Taman Naga Emas	0.349	0.159	0.413	0.127	0.079	0.095
N43	Sri Petaling Station	0.222	0.175	0.238	0.254	0.127	0.127
N44	Sekolah Tunas Bakti	0.159	0.095	0.111	0.19	0.063	0.079
N45	Jalan Badang	0.27	0.143	0.19	0.27	0.143	0.19
N46	Condominium, Salak Selatan	0.444	0.0952	0.143	0.556	0.143	0.206
N47	Jalan Pauh Kijang	0.238	0.111	0.127	0.571	0.238	0.270
N48	Masjid Jamek Sg Besi	0.365	0.127	0.54	0.302	0.175	0.444
N49	PPR Kg Raya Permai	0.698	0.159	0.175	0.714	0.159	0.190
N50	Hotel Nouvelle	0.476	0.190	0.127	0.556	0.238	0.190
N51	Serdang Raya Station (N)	0.429	0.095	0.190	0.508	0.254	0.206
N52	Serdang Raya Station (S)	0.365	0.127	0.540	0.349	0.127	0.429
N53	Flat Taman Serdang Raya	0.365	0.127	0.540	0.349	0.127	0.429
N54	Quarters Balai Polis	0.556	0.143	0.206	0.302	0.222	0.302
N55	Jalan 1/2, Seri Kembangan	0.460	0.111	0.222	0.302	0.159	0.254
N56	Surau Al-Firdaus	0.27	0.175	0.111	0.111	0.302	0.444
N57	SRJKC Serdang Baru (2)	0.222	0.111	0.19	0.302	0.143	0.222
N58	Jalan 18/46, Serdang Baru	0.159	0.047	0.095	0.19	0.047	0.127
N59	Taman Universiti Indah	0.111	0.0794	0.111	0.175	0.175	0.19
N60	Jalan Indah 1	0.190	0.127	0.302	0.238	0.127	0.317
N61	Jalan Dd 3a/5, Equine Park	0.159	0.048	0.095	0.095	0.095	0.064
N62	Jalan Bpp 7, Equine Park	0.111	0.064	0.079	0.095	0.079	0.064
N63	Jalan D'Alpinia	0.127	0.143	0.079	0.238	0.143	0.079
N64	16 Sierra, Puchong	0.222	0.175	0.079	0.27	0.143	0.111
N65	Sky Park, Cyberjaya	0.603	0.143	0.206	0.302	0.095	0.143
N66	Limkokwing University	0.222	0.079	0.159	0.476	0.159	0.206
N67	Jalan P9, Presint 9, Putrajaya	0.27	0.222	0.127	0.302	0.127	0.175

## SECTION 5 : EXISTING ENVIRONMENT

Measured levels were representative of the existing vibration environment at the monitoring locations and were fairly dependent on local activities. The vibration levels as measured were well below levels of potential concern for building structural integrity. A tabulation of the resulting human response vibration curves and assessment against the DOE Vibration Guidelines are given in **Table 5-33**.

**Table 5-33 Assessment of Prevailing Vibration Levels**

Ref.	Location	Vibration Curves Assessment	
N1	Jalan Sierramas Utama	Within	Curve 4
N2	Jln PJU 10/11b, Damansara Damai	Within	Curve 4
N3	Sri Damansara Hotel	Within	Curve 4
N4	Public Mutual/ Twintech College	Within	Curve 8
N5	Sri Damansara Club House	Within	Curve 4
N6	Persiaran Dagang, Menjalara	Within	Curve 4
N7	Jalan Dagang SD2/1	Within	Curve 4
N8	Jalan Dagang SD2/2	Within	Curve 4
N9	Kepong Sentral Condo	Within	Curve 4
N10	Jalan 55, Taman Sri Ehsan	Within	Curve 4
N11	Casa Prima Condominium	Within	Curve 8
N12	Jalan Prima 5, Metro Prima	Within	Curve 4
N13	Vista Mutiara Condo	Within	Curve 8
N14	Jln Jinjang Aman 4, Jinjang Utara	Within	Curve 4
N15	Jalan Jinjang Permai	Within	Curve 8
N16	Taman Kaya	Within	Curve 4
N17	SMK Batu 5	Within	Curve 8
N18	Alam Puri Condominium	Within	Curve 4
N19	Permai Ria Condo	Within	Curve 8
N20	Sek Keb Batu 4, Jalan Ipoh	Exceed	Curve 8
N21	Desa Alpha Condo	Within	Curve 4
N22	SMK (P) Jalan Ipoh	Within	Curve 4
N23	Sang Suria Condo, Sentul	Within	Curve 4
N24	The Maple Condo, Sentul	Within	Curve 4
N25	Viva Residency, Jalan Ipoh	Exceed	Curve 8
N26	BP Pekeliling	Within	Curve 8
N27	UTM SPACE, Jln Tun Razak	Within	Curve 4
N28	The Oval, KLCC	Within	Curve 4
N29	1a Stonor Condo, Jln Conlay	Within	Curve 4
N30	Jalan Conlay, Kraft Malaysia	Within	Curve 8
N31	Menara J Corp, Jln Delima	Within	Curve 4
N32	Help College, Chan Sow Lin Stn.	Within	Curve 4
N33	Angkasaraya Flat, BM Station	Within	Curve 4
N34	Jalan 109f, Danau Desa	Within	Curve 8
N35	Danau Permai Condo, Danau Desa	Within	Curve 8

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**Table 5-33 Assessment of Prevailing Vibration Levels (Cont'd)**

Ref.	Location	Vibration Curves Assessment	
N36	Jalan 5, Kuchai Lama	Within	Curve 8
N37	Kuchai Condominium	Within	Curve 4
N38	Jalan 35, Kg Baru Salak Selatan	Within	Curve 4
N39	Jalan 36, Kg Baru Salak Selatan	Within	Curve 4
N40	SMK Salak Selatan	Within	Curve 4
N41	Jalan 1/140, Taman Naga Mas	Within	Curve 4
N42	Jalan 1/140, Taman Naga Emas	Within	Curve 4
N43	Sri Petaling Station	Within	Curve 4
N44	Sekolah Tunas Bakti	Within	Curve 4
N45	Jalan Badang	Within	Curve 4
N46	Condominium, Salak Selatan	Within	Curve 4
N47	Jalan Pauh Kijang	Within	Curve 4
N48	Masjid Jamek Sg Besi	Within	Curve 4
N49	PPR Kg Raya Permai	Within	Curve 8
N50	Hotel Nouvelle	Within	Curve 8
N51	Serdang Raya Station (N)	Within	Curve 8
N52	Serdang Raya Station (S)	Within	Curve 4
N53	Flat Taman Serdang Raya	Within	Curve 4
N54	Quarters Balai Polis	Within	Curve 4
N55	Jalan 1/2, Seri Kembangan	Within	Curve 8
N56	Surau Al-Firdaus	Within	Curve 4
N57	SRJKC Serdang Baru (2)	Within	Curve 4
N58	Jalan 18/46, Serdang Baru	Within	Curve 4
N59	Taman Universiti Indah	Within	Curve 4
N60	Jalan Indah 1	Within	Curve 4
N61	Jalan Dd 3a/5, Equine Park	Within	Curve 4
N62	Jalan Bpp 7, Equine Park	Within	Curve 4
N63	Jalan D'Alpinia	Within	Curve 4
N64	16 Sierra, Puchong	Within	Curve 4
N65	Sky Park, Cyberjaya	Within	Curve 4
N66	Limkokwing University	Within	Curve 4
N67	Jalan P9, Presint 9, Putrajaya	Within	Curve 4

Measurement results showed that overall vibration levels at monitoring locations were in the range of 0.079 mm/s to 1.44 mm/s in the vertical directions, and from 0.064 mm/s to 1.77 mm/s in the longitudinal directions. At all areas except for specific cases (at Jalan Ipoh, monitoring locations N20 and N25) were typically below 1.0 mm/s (up to 0.8mm/s, Curve 8). Vibration levels above 0.1 mm/s to 0.2mm/s (Curve 1 to Curve 2) would be feel able (above human perception), and are typically from heavy vehicles road induced vibrations and other human activities in close vicinity of the monitoring locations. Vibration levels above 1.0mm/s (at Jalan Ipoh) were attributable to heavy laden lorry pass by in close vicinity to the monitoring locations.

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The existing vibration levels at most locations were within recommended limits for human response in residential and commercial buildings, except for Jalan Ipoh (location N20 and N25), as highlighted in **Table 5-33**. The assessment table also identified other locations where measured vibration levels had human response curves within limits for commercial buildings but exceeded limits for residential buildings.

(It is to be noted that the vibration levels and rating curves as reported herein were for measurements undertaken outdoors. Vibration levels within the respective buildings of the receptors would be most instances be lower than the outdoor measurements on the ground).

Vibration levels as monitored and reported were dependent on activities and heavy vehicles, and not necessarily sustained at the reported levels over extended period of time as vibration events are primarily activities and/or events related.

Results from the vibration measurement exercise confirmed that vibrations at the monitoring locations to be within human comfort levels as assessed against recommendations of the DOE Guidelines, except for locations in close proximity to existing highways with road traffic induced vibrations from heavy vehicles and nearby construction activities.

### **5.10 ROAD TRAFFIC CONDITION**

In this section, existing road traffic along the proposed SSP Line is described. The traffic volumes of the roads along the SSP Line are reviewed, recognizing that these roads may be affected during construction. The current traffic volumes are sourced from a secondary database and reviewed against the existing road inventory, specifically the road capacity, resulting in the drawing up of a broad based volume capacity ratio. This is necessary to gauge the performance of these roads during the construction phase of the project.

**Table 5-34** tabulates the location of the stations, the type of stations and the roads where the stations are to be located.

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**Table 5-34 Roads Adjacent to Proposed Stations**

<b>Stn Name</b>	<b>Location</b>	<b>Type of Station</b>	<b>Road Adjacent to Station</b>
1	Damansara Damai	Elevated	Jalan Kepong-Kuala Selangor
2	Sri Damansara West	Elevated	Jalan Kepong-Kuala Selangor
3	Sri Damansara East	Elevated	Persiaran Dagang
4	Kepong Sentral	Elevated	Selayang-Kepong Highway
5	Metro Prima	Elevated	Jalan Kepong
6	Kepong Baru	Elevated	Jalan Kepong
7	Jinjang	Elevated	Jalan Kepong
8	Sri Delima	Elevated	Jalan Kepong
9	Kampung Batu	Elevated	Jalan 1/18b
10	Kentonmen	Elevated	Jalan Ipoh
11	Jalan Ipoh	Half Sunken	Jalan Ipoh
12	Sentul West	Underground	Jalan Sultan Azlan Shah
13	Titiwangsa	Underground	Jalan Tun Razak
14	Hospital Kuala Lumpur	Underground	Jalan Tun Razak
15	Kampung Baru North	Underground	Jalan Raja Muda Abdul Aziz
16	Ampang Park	Underground	Jalan Ampang
17	KLCC East	Underground	Jalan Binjai
18	Conlay	Underground	Jalan Conlay
19	Tun Razak Exchange (TRX)	Underground	Jalan Tun Razak
20	Chan Sow Lin	Underground	Jalan Chan Sow Lin
21	Bandar Malaysia North	Half Sunken	N/A (future development site)
22	Bandar Malaysia South	Half Sunken	N/A (future development site)
23	Kuchai Lama	Elevated	Jalan Kuchai Lama
24	Taman Naga Emas	Elevated	Jalan Merah Silu
25	Sungai Besi	Elevated	Sungai Besi Highway
26	Serdang Raya North	Elevated	Jalan Utama
27	Serdang Raya South	Elevated	Jalan Utama
28	Seri Kembangan	Elevated	Jalan Raya Satu
29	UPM	Elevated	Jalan Besar
30	Taman Universiti	Elevated	Jalan Putra Permai
31	Equine Park	Elevated	Jalan Putra Permai
32	Taman Putra Permai	Elevated	Jalan Putra Permai
33	16 Sierra	Elevated	Persiaran Sierra Utama
34	Cyberjaya North	Elevated	Persiaran Apec
35	Cyberjaya City Centre	Elevated	Persiaran Apec
36	Putrajaya Sentral	Elevated	Jalan P7

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### **a) Northern Elevated Segment: Damansara Damai - Jalan Ipoh**

There are 11 stations in this segment. The alignment travels on major roads and highways in Sungai Buloh and Kepong areas, namely Jalan Kepong-Kuala Selangor, Persiaran Dagang, Jalan Kepong, Jalan Ipoh, and Selayang-Kepong Highway. These are busy roads with high travel demand, during peak and off-peak periods, taking into cognisance that these roads function as primary and secondary distributors. The v/c ratio analysis shows that Jalan Sungai Buloh-Kepong and Selayang-Kepong Highway are congested with levels of service E.

#### Station S01 at Damansara Damai

The station is located at Jalan Kepong-Kuala Selangor which is a dual two carriageway with capacity of 1,800 veh/hr/lane. It is currently performing at LOS E (for west-bound direction towards Sungai Buloh) during morning peak hours. The roadway is over-saturated and performing poorly. Jalan PJU 10/1 is a dual three carriageway (2-lane dual carriageway with 1 auxiliary lane) with a capacity of 1,600 veh/hr/lane. It is currently performing at LOS D during peak hours. The local roads accessing to the stations are Jalan PJU 10/2a (LOS B), Jalan PJU 10/10b (LOS B), Jalan PJU 10/10a, and Jalan PJU 10/10e (LOS A). These roads are performing at acceptable levels of service.

#### Station S02 at Sri Damansara West

The station is located at Jalan Kepong-Kuala Selangor. It is a dual two carriageway with a capacity of 1,800 veh/hr/lane which is performing at LOS E during AM (east-bound towards Kepong) and evening (West-bound towards Sungai Buloh) peak hours. Other roads in the vicinity of the station are Persiaran Industri (LOS E), Persiaran Perdana (LOS D), Persiaran Cempaka (LOS B), and Persiaran Meranti (LOS D). The existing traffic conditions on these roads range from LOS B to E, which shows that they are performing unsatisfactorily during peak hours.

#### Station S03 at Sri Damansara East

The main arterial or distributor roads in the vicinity of the station are Persiaran Dagang and Kepong-bound serviced road. Persiaran Dagang is a 2-lane single local road performing at LOS C during peak hours. Other roads in the vicinity of the station are Persiaran Cemara (LOS B), Persiaran Industri (LOS C), and Persiaran Bukit Utama (LOS C). The existing traffic conditions on these roads range from LOS B to C, which shows that they are performing at acceptable levels during peak hours.

#### Station S04 at Kepong Sentral

The main distributor road in the vicinity of the station is Selayang-Kepong Highway towards Kepong, Persiaran Mahogani and Jalan Kepong Garden. The Selayang-Kepong Highway is a dual two carriageway with capacity of 1,800 veh/hr/lane and is currently performing at LOS E (southbound direction towards Sungai Buloh) during morning peak hours. Persiaran Mahogani is a two-lane two-way road that serves Bandar Sri Damansara and Jalan Kepong Garden is four lanes two-way

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roads being partially divided. Persiaran Mahogani is performing at LOS B while Jalan Kepong Garden is performing at LOS C during peak hours. Other roads in the vicinity are namely Persiaran Angsana (LOS A) and Persiaran Dagang (LOS B). The existing traffic conditions on these roads range from LOS A to E, which shows that they are performing at unsatisfactory conditions during peak hours.

### Station S05 at Metro Prima

The station is located at Jalan Kepong. It is a dual three carriageway with a capacity of 1,800 veh/hr/lane and is performing at LOS C during peak hours. Other roads in the vicinity of the station are such as Jalan Metro Prima (LOS B), Jalan Metro Perdana Barat (LOS D), Jalan Metro Perdana Barat 1 (LOS A), Jalan Metro Perdana Barat 2 (LOS B), and Jalan Metro Perdana Barat 4 (LOS B). The existing traffic conditions on these roads range from LOS A to D, which shows that they are performing at an acceptable level during peak hours.

### Station S06 at Kepong Baru

The station is located at Jalan Kepong. It is a dual three carriageway with a capacity of 1,800 veh/hr/lane and is performing at LOS C during peak hours. Other roads in the vicinity of the station are Jalan Metro Perdana Timur (LOS A), Jalan Rimbunan Raya 1 (LOS A), Jalan Rimbunan Raya (LOS C), Jalan Ambong (LOS D), Jalan Ambong Kiri (LOS C), Jalan 5/33b (LOS D), and Jalan Kepong Baru (LOS D). The existing traffic conditions on these roads range from LOS A to D, which shows that they are performing at acceptable levels during peak hours.

### Station S07 at Jinjang

The station is located at Jalan Kepong. It is a dual three carriageway with capacity of 1,800 veh/hr/lane and is performing at LOS C during peak hours. Other roads in the vicinity are Pintasan Segambut (LOS B), Jalan Jinjang Utama (LOS B), Jalan Jinjang (LOS A), West Road (LOS B) and Jalan Jinjang Aman 2 (LOS A). The existing traffic conditions on these roads range from LOS A to D, which shows that they are performing at acceptable levels during peak hours.

### Station S08 at Sri Delima

This station is located along Jalan Kepong. It is a dual three carriageway with a capacity of 1,800 veh/hr/lane and is performing at LOS C during peak hours. Other roads in the vicinity are Jalan Jambu Jerneh (LOS D), Jalan Jambu Merah (LOS A), Jalan Jambu Gajus (LOS C). The existing traffic conditions on these roads range from LOS A to D, which shows that they are performing at acceptable levels during peak hours.

### Station S09 at Kampung Batu

The station is located at Jalan 1/18b which is a two-lane two-way single carriageway with a capacity of 1,800 veh/hr and is performing at LOS C during peak hours. The access to the station is planned on local roads that are currently serving the existing KTM station and residential areas in the vicinity. Other roads in the vicinity are Jalan 2/18a (LOS A), Jalan Ampat Tin (LOS D), and Jalan 2/12d (LOS

## **SECTION 5 : EXISTING ENVIRONMENT**

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C). The existing traffic conditions on these roads range from LOS A to D, which shows that they are performing at acceptable levels during peak hours.

### Station S10 at Kentonmen

The station is located at Jalan Ipoh which is a dual three carriageway with a capacity of 1,800 veh/hr/lane. It is performing at LOS B during peak hours. Other local roads that provide access to the station are Jalan Gunung Sembur (LOS A), Jalan Batu Kentonmen (LOS A), Jalan Cenderuh (LOS B), and Jalan Kangsar (LOS B). The existing traffic conditions on these roads range from LOS A to B, which shows that they are performing at satisfactory levels during peak hours.

### Station S11 at Jalan Ipoh

The station is located at Jalan Ipoh which is a dual three carriageway with a capacity of 1,800 veh/hr/lane. It is performing at LOS B during peak hours. Other local roads that provide access to the station are Jalan Kangsar (LOS B), Jalan Khalsa (LOS B), Jalan Vethavanam (LOS A), Jalan St Thomas (LOS C), and Persiaran Parkview (LOS A). The existing traffic conditions on these roads range from LOS A to C, which shows that they are performing at acceptable levels during peak hours.

## **b) Underground Segment: Jalan Ipoh- Bandar Malaysia South**

There are 11 stations proposed for this stretch of the alignment. The main roads involved are Jalan Perhentian, Jalan Tun Razak, Jalan Raja Muda Abdul Aziz, Jalan Conlay and Jalan Chan Sow Lin

### Station S12 at Sentul West

The station is located at Jalan Sultan Azlan Shah which is a dual three carriageway. It is performing at LOS C during peak hours. It shows that the road is performing at acceptable levels during peak hours which have sufficient capacity to accommodate future traffic growth.

### Station S13 at Titiwangsa

The station is located at Jalan Tun Razak which is a dual four (4) carriageway near the north of Jalan Bukit Bintang. It is performing at LOS E during peak hours in which significant queues and delays are observed.

### Station S14 at Hospital Kuala Lumpur

The station is located at Jalan Tun Razak which is a dual three carriageway near the south of Jalan Bukit Bintang. It is performing at LOS F during peak hours which show that the road has insufficient capacity to accommodate current traffic conditions.

### Station S15 at Kampung Baru North

The station is located at Jalan Raja Muda Abdul Aziz which is a dual two carriageway road. It is performing at LOS D during peak hours which is an acceptable levels.



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### Station S16 at Ampang Park

The station is located at Jalan Ampang which is a dual three carriageway. It is performing at LOS F during peak hours. This shows that the road segment is performing poorly and does not have sufficient capacity to cater for future traffic growth.

### Station S17 at KLCC East

The station is located at Jalan Binjai which is a dual two carriageway. It is performing at LOS C during peak hours which is an acceptable level. It has sufficient capacity to accommodate future traffic growth.

### Station S18 at Conlay

The station is located at Jalan Conlay which is a two lane single carriageway road. It is performing at LOS B during peak hours which shows that it is performing at a satisfactory levels of service. It has sufficient capacity to accommodate future traffic growth.

### Station S19 at TRX

The station is located at Jalan Tun Razak which is a dual three carriageway near the south of Jalan Bukit Bintang. It is performing at LOS F during peak hours which show that the road has insufficient capacity to accommodate current traffic conditions.

### Station S20 at Chan Sow Lin

The station is located at Jalan Chan Sow Lin which is a two-lane dual carriageway road. It is performing at LOS C during peak hours which are at acceptable levels.

## **c) Southern Elevated Segment 1: Bandar Malaysia South - UPM**

A total of 7 stations are proposed for this segment which passes through several major arterials such as Jalan Kuchai Lama, Jalan Gempita 3, Jalan Utama, Jalan Raya Satu, and a major highway, i.e. Sungai Besi Highway. These roads are also major roads conveying commuting trips during peak hours.

### Station S23 at Kuchai Lama

The station is located at Jalan Kuchai Lama which is a dual three carriageway. It is performing at LOS B during peak hours which show that it has sufficient capacity to accommodate additional traffic in the future.

### Station S24 at Taman Naga Emas

The station is located at Jalan Merah Silu which is a one lane two-way carriageway. It is performing at LOS B during peak hours which indicate that the road has capacity to accommodate for future growth.

### Station S25 at Sungai Besi

The station is located at Sungai Besi Highway which is a dual two carriageway. It is performing at LOS D during peak hours which is an acceptable level.

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### Station S26 & Station S27 (Serdang Raya North and Serdang Raya South)

The station is located at Jalan Utama which is a dual two carriageway. It is performing at LOS D during peak hours which is at an acceptable level.

### Station S28 at Seri Kembangan

The station is located at Jalan Raya 1 which is a one way five lane road. It is a local access road with a capacity of 1,500 veh/hr/lane. Currently, it is performing at LOS B during peak hours. Other local roads within the vicinity of the proposed station are Jalan Besar (LOS C) and Jalan SK 12/1 (LOS C). The existing traffic conditions on these roads range from LOS B to C, which shows that they are performing at satisfactory levels during peak hours.

### Station S29 at UPM

The station is located at Jalan Besar which is a dual two carriageway. It is performing at LOS F during peak hours. This shows that the road has limited capacity to accommodate traffic growth at the site. The other local road that provides access to the station is Jalan BS 3/1 (LOS A).

## **d) Southern Elevated Segment 2: UPM - Putrajaya**

There are 7 stations in Serdang/Cyberjaya/Putrajaya zones. The main roads involved are Jalan Keledang, Jalan Putra Permai, Persiaran Sierra Utama, Persiaran Apec, and Jalan P7. These roads are also major roads conveying commuting trips during peak hours.

### Station S30 at Taman Universiti

The station is located at Jalan Putra Permai which is a dual two carriageway. It is performing at LOS C during peak hours. The local roads in the vicinity of the station are Jalan Indah and Jalan Jelutong. The station is near to the commercial and residential area of Seri Kembangan and Taman Universiti Indah. School and institutional in the vicinity are Taman Universiti Indah Religious School, SK Taman Universiti and Universiti Putra Malaysia.

### Station S31 at Equine Park

The station is located at Jalan Putra Permai which is a dual two carriageway. It is performing at LOS C during peak hours. Other local roads that provide access to the station are Persiaran Lestari Perdana (LOS B) and Persiaran Pinggiran Putra (LOS B). The existing traffic conditions on these roads range from LOS B to C which shows that they are performing at satisfactory levels during peak hours. It also indicates that the roads have sufficient capacity to cater for future traffic growth.

### Station S32 at Taman Putra Permai

The station is located at Jalan Putra Permai which is a dual two carriageway. It is performing at LOS C during peak hours. Other local roads that provide access to the station are Jalan Atmosphere Utama 3 (LOS B), Jalan Atmosphere Utama (LOS

## **SECTION 5 : EXISTING ENVIRONMENT**

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A), Jalan Atmosphere Utama 1 (LOS A), Persiaran Kota Perdana (LOS A), and Persiaran Lestari Perdana (LOS B). The existing traffic conditions on these roads range from LOS A to C, meaning they are performing satisfactorily during peak hours. It also indicates that the roads have capacity to cater for future traffic growth.

### Station S33 at 16 Sierra

The station is located at Persiaran Sierra Utama which is a dual two carriageway. It is performing at LOS B during peak hours. Other local roads that provide access to the station are Persiaran Sierra Utama 1 (LOS A) and Persiaran Sierra Utama 2 (LOS A). The existing traffic conditions on these roads range from LOS A to B indicating that they are performing at satisfactory levels during peak hours.

### Station S34 at Cyberjaya North

The station is located at Persiaran Apec which is a dual two carriageway that is performing at LOS D during peak hours. Other local roads that provide access to the station is Jalan Teknokrat 1 which is performing at LOS B during peak hours. The existing traffic conditions on these roads range from LOS B to D, which shows that they are performing at acceptable levels during peak hours.

### Station S35 at Cyberjaya City Centre

The station is located at Persiaran Apec which is a dual two carriageway that is performing at LOS D during peak hours. Other local roads that provide access to the station are Jalan Teknokrat 1 which is performing at LOS B during peak hours. The existing traffic conditions on these roads range from LOS B to D, which shows that they are performing at satisfactory levels during peak hours.

### Station S36 at Putrajaya Sentral

The station is located at Jalan P7 which is a dual two carriageway. It is performing at LOS B during peak hours. Other local roads that provide access to the station are Jalan P7B (LOS A), Jalan P7D (LOS B) and Jalan P7E (LOS A). The existing traffic conditions on these roads range from LOS A to B, which shows that they are performing at satisfactory levels during peak hours. It also indicates that the roads have sufficient capacity to cater for future traffic growth.

## **e) Serdang Depot**

The depot is located to the south of Jalan Putra Permai, adjacent to Universiti Putra Malaysia (UPM). Jalan Putra Permai is a dual two carriageway road running in the north-south direction between Bandar Putra Permai and Serdang / Sri Kembangan area. It is performing at LOS B during peak hours. Other local roads that provide access to the station are Jalan Indah (LOS A). The existing traffic conditions on these roads range from LOS A to C, which shows that they are performing at satisfactory levels during peak hours.

**Table 5-35** illustrates the volume/capacity ratio and levels of service on the roads of the proposed stations for morning and evening peaks for both directions.

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-35 Existing Traffic Conditions**

No.	Road Section	No. of lanes Eastbound/ Northbound (Westbound/ Southbound)	Capacity Eastbound/ Northbound (Westbound/ Southbound)	Volume (v/c ratio)				Highest v/c ratio
				AM Peak		PM Peak		
				Eastbound/ Northbound	Westbound/ Southbound	Eastbound/ Northbound	Westbound/ Southbound	
1	Jalan Kepong-Kuala Selangor	2 (2)	3,600 (3,600)	1,830 (0.51 C)	3,422 (0.95 E)	1,063 (0.30 B)	1,839 (0.51 C)	E
2	Persiaran Dagang	1 (1)	1,800 (1,800)	364 (0.22 A)	983 (0.55 C)	202 (0.11 A)	829 (0.46 C)	C
3	Selayang-Kepong Highway	2 (2)	3,600 (3,600)	2,913 (0.81 D)	3,269 (0.91 E)	2,790 (0.78 D)	2,688 (0.75 D)	E
4	Jalan Kepong	3 (3)	5,400 (5,400)	2,420 (0.45 C)	1,604 (0.3 B)	2,419 (0.45 C)	2,137 (0.4 B)	C
5	Jalan 1/18b	1	1,800	947 (0.53 C)	NA	896 (0.50 C)	NA	C
6	Jalan Ipoh	3 (3)	5,400 (5,400)	1,239 (0.23 A)	2,098 (0.39 B)	2,115 (0.39 B)	1,090 (0.20 A)	B
7	Jalan Sultan Azlan Shah	3 (3)	5,400 (5,400)	2,257 (0.42 B)	2,547 (0.47 C)	2,715 (0.50 C)	2,796 (0.52 C)	C
8	Jalan Tun Razak	3 (3)	5,400 (5,400)	5,959 (1.11 F)	4,972(0.93 E)	4,138 (0.77 D)	4,041 (0.75 D)	F
9	Jalan Raja Muda Abdul Aziz	2(2)	2,000 (2,000)	1,037 (0.52 C)	1,325 (0.66 D)	1,291 (0.65 D)	1,130 (0.57 C)	D
10	Jalan Ampang (West and East of Jalan Tun Razak)	3 (3)	3,000 (3,000)	1,364 (0.45 C)	3,861 (1.29 F)	1,880 (0.63 D)	2,043 (0.68 D)	F
11	Jalan Binjai (North of Lorong Kuda)	2 (2)	1,900 (2,850)	827 (0.44 C)	963 (0.34 B)	490 (0.26 A)	1018 (0.36 B)	C
12	Jalan Conlay	1 (1)	900 (900)	174 ( (0.19 A)	351 (0.39 B)	373 (0.41 B)	259 (0.29 B)	B
13	Jalan Chan Sow Lin	2 (2)	1,900 (2,850)	1,000 (0.53 C)	1,000 (0.35 B)	500 (0.27 A)	1,000 (0.35 B)	C
15	Jalan Kuchai Lama	3 (3)	5,400 (5,400)	2,179 (0.4 B)	1,071 (0.2 A)	1,071 (0.2 A)	2,030 (0.3 B)	B

## SECTION 5 : EXISTING ENVIRONMENT

**Table 5-35 Existing Traffic Conditions (Cont'd)**

No.	Road Section	No. of lanes Eastbound/ Northbound (Westbound/ Southbound)	Capacity Eastbound/ Northbound (Westbound/ Southbound)	Volume (v/c ratio)				Highest v/c ratio
				AM Peak		PM Peak		
				Eastbound/ Northbound	Westbound/ Southbound	Eastbound/ Northbound	Westbound/ Southbound	
15	Jalan Kuchai Lama	3 (3)	5,400 (5,400)	2,179 (0.4 B)	1,071 (0.2 A)	1,071 (0.2 A)	2,030 (0.3 B)	B
16	Jalan Merah Silu	1 (1)	1,300 (2-way)	537 (0.41 B)		281 (0.22 A)		B
17	Sungai Besi Highway	2 (2)	3,600 (3,600)	2,648 (0.74D)	2,118 (0.59C)	1,877 (0.52C)	1,786 (0.50C)	D
18	Jalan Utama	2 (2)	3,000	567 (0.19A)	1,794 (0.60C)	693 (0.23A)	1,587 (0.53C)	C
19	Jalan Raya Satu	5 (1 way)	7500	1,812 (0.24 A)	NA	2,089 (0.28 B)	NA	B
20	Jalan Besar	1 (2)	1,500 (3,000)	1,636 (1.09 F)	1,196 (0.40 B)	1,372 (0.91 E)	1,877 (0.63 D)	F
21	Jalan Putra Permai	2 (2)	3,600 (3,600)	1,930 (0.54 C)	1,807 (0.50 C)	1,835 (0.51 C)	941 (0.26 A)	C
22	Persiaran Sierra Utama	2 (2)	3,000 (3,000)	377 (0.13 A)	289 (0.10 A)	709 (0.24 A)	813 (0.27 B)	B
23	Persiaran Apec	2 (2)	3,800 (3,800)	577 (0.15 A)	2,611 (0.69 D)	2,619 (0.69 D)	614 (0.16 A)	D
24	Jalan P7	2 (2)	3,600 (3,600)	1,348 (0.37 B)	698 (0.19 A)	697 (0.19 A)	1,287 (0.36 B)	B

Note: NA indicates no data available

Source: Traffic Impact Assessment Reports

## SECTION 5 : EXISTING ENVIRONMENT

### 5.11 SOCIO ECONOMIC ENVIRONMENT

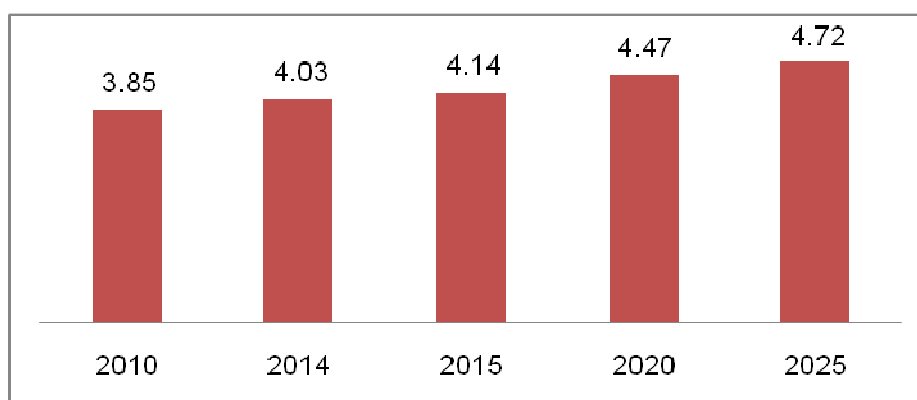
This section describes the current socio economic environment along the proposed alignment. The description is based on secondary data from published and unpublished information from the Department of Statistics, Structural Plans and from site visits.

#### 5.11.1 Regional Context

The proposed SSP Line is one of the measures needed to tackle the challenge of inadequate public transport in the Greater Kuala Lumpur (GKL). From the Population and Housing Census 2010, it was estimated that the population in the GKL had reached 6.3 million in 2010. The ETP targeted GKL population to increase to 10 million by 2020. With rapid population growth, GKL contributions to Gross National Income (GNI) would rise by 2.5 times from RM258 billion in 2010 to RM650 billion in 2020. This implies that 40% of GNI would be generated from GKL. To achieve this, the GKL NKEA identifies various measures to be undertaken. Among them is the implementation of a comprehensive MRT system to improve public transportation. The proposed SSP Line would complement the SBK Line which is presently under construction.

In 2010, total population of the 6 municipalities that serve as the regional corridor for SSP Line was estimated at 3.9 million (**Chart 5-1**). By 2015, the regional corridor population is estimated to rise to 4.1 million. By 2020, it would increase to 4.47 million or slightly less than half of GKL's 10 million target. In 2025, the regional corridor population is expected to increase to 4.7 million (The estimates consider state population projections undertaken by DOS (2040) and the target population for Selangor under the recent structural plan study of Selangor).

**Chart 5-1 Population of SSP Line Regional Coverage in 2020 and 2025 (in million)**



**Note:** Adjusted for under-enumeration  
Estimates from 2014 to 2022 based on projected DBKL and Selangor State population growth and DOS state population projections 2040  
**Sources:** 1) Department of Statistics, "Population Distribution by Local Authority Areas and Mukims, 2010"  
2) Department of Statistics, "Population Projections, 2040 by State" (Special Request)  
3) Laporan Tinjauan Kajian Rancangan Struktur Negeri Selangor 2035 (Restricted)  
4) Consultant's Estimates from 2014 to 2025.

## SECTION 5 : EXISTING ENVIRONMENT

### 5.11.1.1 Social Profile of the SSP Line Impact Zone

The impact zone of 400m from each side of the proposed alignment is subdivided into 4 major corridors, i.e. Northern Elevated, Underground, Southern Elevated 1 and Southern Elevated 2. The northern segment covers the stretch from Sungai Buloh/Damansara Damai to Jalan Ipoh. The underground corridor stretches from Jalan Ipoh through to KLCC to TRX to Jalan Chan Sow Lin up to the proposed development at Bandar Malaysia. The southern segment 1 covers Kuchai Lama to Serdang Jaya and the southern segment 2 stretches from Seri Kembangan to Cyberjaya and Putrajaya.

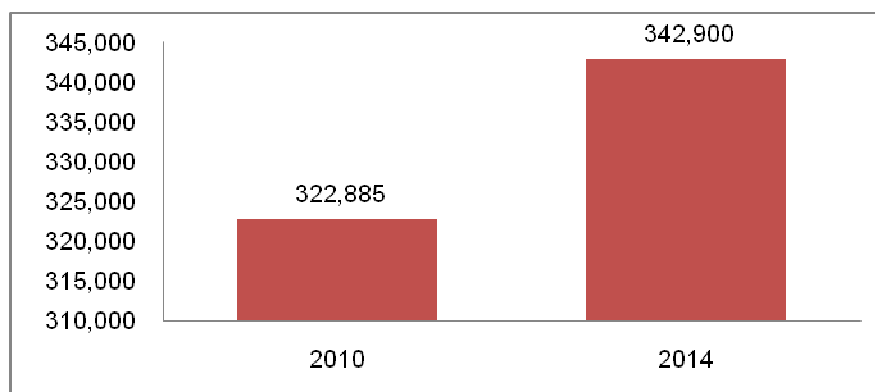
### 5.11.1.2 Total Population and Distribution

The total population in the impact zone in 2010 was estimated to be 322,885 (**Chart 5-2**). In 2014, overall population in the impact zone is estimated to have increased to 342,900, an increase of around 20,000 or 6.2% over the past 4 years.

Population distribution in the impact zone is as follows (**Chart 5-3**):

- 46% in the southern corridor (Kuchai Lama, Salak Selatan, Sungai Besi, Bandar Baru Seri Petaling, Serdang Jaya and Seri Kembangan)
- 23% in the northern corridor (Damansara Damai, Bandar Sri Damansara, Bandar Menjalara, Kepong);
- 21% in the underground corridor (Jalan Ipoh, Sentul, Kampong Bharu, city centre, TRX, Chan Sow Lin, Bandar Malaysia)
- 10% in the Putrajaya extension (Taman Equine through to Cyberjaya and Putrajaya Sentral)

**Chart 5-2 Population in SSP Line 400m Impact Zone, 2010 and 2014**



**Notes:** (1) All figures rounded to nearest 100

(2) 2014 is estimated based on population estimates by state from Department of Statistics

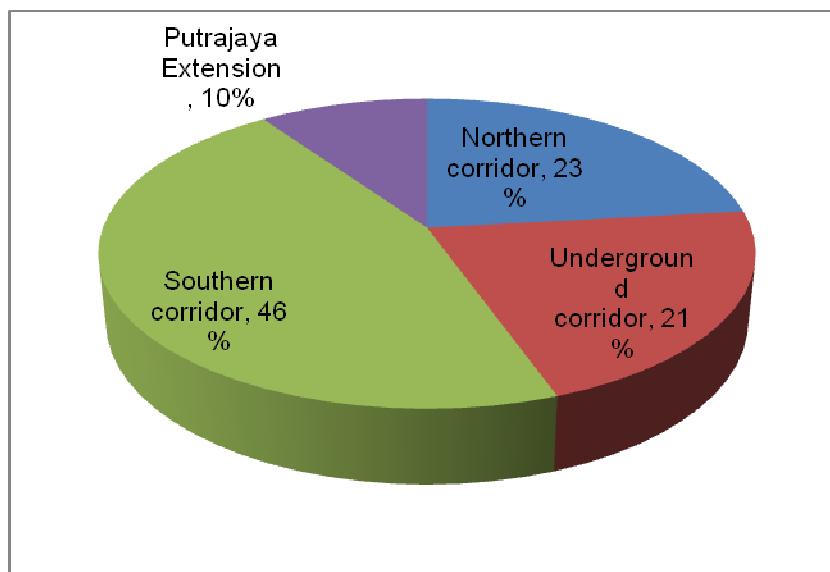
**Sources:** (1) Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

(2) Department of Statistics, "DOS Quick Info" ([pqi.stats.gov.my](http://pqi.stats.gov.my))

(3) Laporan Tinjauan Kajian Rancangan Struktur Negeri Selangor 2035 (Restricted)

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**Chart 5-3 Population Distribution in the Impact Zone by Corridor**



Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

The Southern Elevated Segment 2 has the lowest share because the stretch of land from Taman Equine through to Cyberjaya and Putrajaya Sentral is relatively underdeveloped, with lower population density. The Southern Elevated Segment 1 covers parts of Kuchai Lama, Salak Selatan, Sungai Besi, Bandar Baru Seri Petaling, Serdang Jaya and Seri Kembangan; most of these areas are densely built up which explains the huge concentration of population here.

The four main corridors are further subdivided into seven sub-corridors in line with its respective spatial characteristics (**Table 5-36**). The main population concentration areas are in Kepong-Jinjang sub-corridor (19%) and in Kuchai Lama-Salak South-Sg Besi sub-corridor (29%). Overall, population distribution is relatively uniform with the exception of Sri Damansara-Bandar Menjalara sub-corridor which has the lowest proportion of population at 6%.



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**Table 5-36 Distribution of Population in Impact Zone by Sub-corridor**

No.	Sub-corridor	Pop (2010)	%
1	Damansara Damai, Sri Damansara & Menjalara	18,771	6
2	Kepong, Jinjang , Delima & Batu	56313	17
3	Underground -Jalan Ipoh, Sentul, Pekeliling, City Centre	38,764	12
4	Underground from TRX, Chan Sow Lin to TUDM Sg Besi (Bandar Malaysia)	29,845	9
5	Kuchai Lama/Salak South/Pekan Sg Besi	84,670	26
6	Serdang Raya/Seri Kembangan/Sri Serdang	62,983	20
7	Taman Universiti Indah, Taman Equine, Putra Permai, Cyberjaya, Putrajaya	31,539	10
	<b>Total</b>	<b>322,885</b>	<b>100</b>

**Source:** Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

The Northern Elevated Segment that runs from Damansara Damai to Jalan Ipoh falls under three different municipalities, DBKL, MBPJ and MPS, but most of it falls under DBKL jurisdiction. This area is segmented into 2 parts, i.e. Damansara Damai/Sri Damansara and Menjalara which fall under MBPJ and MPS, and the other part which is under DBKL comprises Kepong/Jinjang and Batu right up to the northern tip of Jalan Ipoh before Segambut. Total population in this sub-corridor in 2010 was around 75,100; it is estimated to increase to 79,700 in 2014 (**Table 5-37**).

**Table 5-37 Northern and Underground Corridors - Population 2010 and 2014**

Corridor	2010	2014	% Share of Impact Zone
Damansara Damai, Sri Damansara & Menjalara	18,800	19,900	6
Kepong, Jinjang & Batu	56,300	59,800	17
<b>Northern Corridor</b>	<b>75,100</b>	<b>79,700</b>	<b>23</b>
Underground - Jalan Ipoh, Sentul, Pekeliling, City Centre	38,800	41,200	12
Underground - TRX, Jalan Chan Sow Lin, Sg Besi Airfield (Bandar Malaysia)	29,800	31,700	9
<b>Underground Corridor</b>	<b>68,600</b>	<b>72,900</b>	<b>21</b>
<b>Total Northern and Underground Corridors to Total Impact Zone</b>			<b>44</b>

**Note:** 2014 is estimated based on population estimates by state from Department of Statistics  
**Sources:** (1) Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)  
(2) Department of Statistics, "DOS Quick Info" (pqi.stats.gov.my)  
(3) Laporan Tinjauan Kajian Rancangan Struktur Negeri Selangor 2035 (Restricted)

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The Underground Segment runs through the east of Kuala Lumpur city centre and through the city centre before turning south-west to two key areas earmarked for urban regeneration and redevelopment at the TRX, which is proposed as the future financial district in Kuala Lumpur, and the proposed Bandar Malaysia development at the TUDM Sg. Besi. This zone falls under DBKL. It supports a combination of activities ranging from commercial to residential, with a stronger emphasis on commercial and institutional activities.

Residential areas here include those in Sentul, Kampong Bharu and institutional quarters as well as some residential areas in the city centre and around Jalan Chan Sow Lin and SgBesi Airfield. In 2010, it was estimated that there were around 38,800 people in the northern underground segment and 29,800 people in the south-western underground sub-corridor. Combined, its total population was 68,600 (**Table 5-37**). In 2014, it is estimated that the population here has increased to 72,900. Its share of population in the impact zone is 23% compared to 25% for the northern sub-corridor.

In the Southern Elevated Segments 1 & 2, the SSP Line is extensive as it crosses over the jurisdictions of 4 local authorities, from DBKL, MPSJ, MP Sepang and PPJ. This extensive coverage helps to create the much desired linkages for SSP Line with other transport lines such as the SBK Line, LRT and ERL and eventually the High Speed Rail (HSR) in the proposed development at Bandar Malaysia and Putrajaya. Connectivity to the HSR is a significant benefit to SSP Line as it would be able to connect travellers using the HSR to other parts of GKL which could not be accessed via HSR. Population along this stretch of the impact zone is estimated at 222,500 in 2014, about 6% higher than 2010 population of 129,400 (**Table 5-38**). Most of the population is concentrated in Kuchai Lama, Salak South, Bandar Seri Petaling, Sg Besi, Serdang Jaya, Seri Kembangan and Sri Serdang. Together with the Putrajaya extension, the impact zone in the southern corridor plus Putrajaya extension accommodates more than half its population (53%).

**Table 5-38 Southern and Putrajaya Extension Corridors - Population 2010 and 2014**

Corridor	2010	2014	% Share of Impact Zone
Kuchai Lama/Salak South/Pekan Sg Besi	84,700	89,900	26
Serdang Raya/Seri Kembangan/Sri Serdang	63,000	66,900	20
<b>Southern corridor</b>	<b>147,700</b>	<b>156,800</b>	<b>46</b>
Taman Universiti Indah, Taman Equine, Putra Permai, Cyberjaya, Putrajaya	31,500	33,500	10
<b>Total Southern and Putrajaya Extension Corridors</b>	<b>153,400</b>	<b>162,900</b>	<b>56</b>

**Note:** 2014 is estimated based on population estimates by state from Department of Statistics

**Sources:** (1) Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

(2) Department of Statistics, "DOS Quick Info" (pqi.stats.gov.my)

(3) Laporan Tinjauan Kajian Rancangan Struktur Negeri Selangor 2035 (Restricted)

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### 5.11.1.3 Households and Living Quarters

The total population of more than 323,000 is comprises of 85,471 households. The household size of 3.8 persons per household is smaller when compared to the national average of 4.2 persons per household (**Table 5-39**). Over the past ten years, the average household size in Malaysia has fallen from an average of 4.6 persons in 2000 to 4.2 persons in 2010. In Selangor, the reduction in household size has been relatively pronounced, with the average household size reduced to 3.9 persons in 2010. In Kuala Lumpur, the decline in average household size in 2010 was more pronounced at 3.7 persons in 2010. In Putrajaya, the average household size was observed to be even lower at 3.5 persons per household, largely due to the high concentration of single families comprising of workers. All these affect the mean household size in the Impact Zone which resulted in an average size that is smaller than the national average

**Table 5-39 Impact Zone-Households and Living Quarters by Corridor, 2010**

Corridor	Household (HH)	HH Size	Living Quarters (LQ)	LQ/HH
Northern	20,364	3.69	23,004	1.13
Underground	17,225	3.98	19,447	1.13
Southern	39,010	3.79	42,479	1.09
Putrajaya Extension	8,872	3.55	10,115	1.14
<b>Total-Impact Zone</b>	<b>85,471</b>	<b>3.78</b>	<b>95,045</b>	<b>1.11</b>

Source: Department of Statistics, Population & Housing Census 2010, "Special Request"  
(December 2014/February 2015)

Across the different corridors, the corridor with the highest mean household size of 4 persons per household is the Underground Segment, which includes Kuala Lumpur city centre. This is found in the area from Jalan Ipoh through to Sentul, City Centre, TRX and Jalan Chan Sow Lin. The presence of a high concentration of low income households in affordable public low-income housing the city may have contributed to this.

The average household size in the southern segment at 3.8 persons is higher than that in the northern corridor which has an average of 3.7 persons per household. Larger household size indirectly implies density is higher, leading to greater traffic congestion. It also implies that more people could be affected when acquisition occurs in these areas where acquisition is likely to affect more than two-person or 3-person families. In this case, the more sensitive areas fall within the underground corridor where acquisition is minimal and lesser number of households would be negatively impacted upon by relocation.

The analysis on living quarters shows that there are more living units available than occupied. Living quarters refer to homes and shelters and would include institutional housing. On the average, the ratio is 1.11 living quarters to one household.

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A surplus of 11% is estimated, suggesting the presence of vacant premises. The incidence of vacancy is higher in the Northern Elevated Segment and in the Southern Elevated Segment 2 compared to elsewhere in the impact zone.

### 5.11.2 Ethnic and Gender Distribution

The dominant ethnic group in the impact zone is the Chinese who make up 46% of the total population here (**Table 5-40**). The second largest group is the Malay and other Bumiputera with a share of 34%. The Indians and Others have a combined share of 9%. The non-Malaysian citizens are relatively large, at 10% of the population in the impact zone.

The Chinese are predominantly found in the northern and southern corridors of the route (**Table 5-40**). They are also found in large numbers in the underground corridor at around Jalan Chan Sow Lin. The Malays and Other Bumiputera are mostly concentrated in the Putrajaya extension sub-corridor although they contribute slightly more than a third of the population in the underground and southern corridors. The Non-Malaysians citizens are mostly in the underground sub-corridor, with a share of about 18% of its population.

**Table 5-40 Impact Zone - Population Distribution by Corridor and Ethnicity, 2010**

Corridor	Malay & Other Bumiputera (%)	Chinese (%)	Indians (%)	Others (%)	Non Malaysian Citizens (%)
Northern	23.7	58.9	9.4	0.5	7.5
Underground	32.7	39.7	9.2	0.6	17.7
Southern	37.5	44.7	8.4	0.3	9.1
Putrajaya Extension	51.3	28.2	8.2	0.6	11.7
Impact Zone	34.6	45.3	8.8	0.5	10.8

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

At the sub-corridor level, the Chinese are mostly concentrated in Kepong, Jinjang, Jalan Chan Sow Lin, Kuchai Lama, Salak South, Sg. Besi and Serdang Raya (**Table 5-41**). The Malay and Other Bumiputera population are concentrated in the Putrajaya extension stretch and contribute about a third of the population in sub-corridors like Jalan Chan Sow Lin, Kuchai Lama/Salak South/Sg Besi, Jalan Ipoh/Sentul/KLCC/TRX and Serdang Raya.

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**Table 5-41 Impact Zone -Distribution of Population by Sub-corridor and Ethnicity, 2010**

Sub-corridor	Malay & Other Bumiputera (%)	Chinese (%)	Indians (%)	Others (%)	Non Malaysian Citizens (%)	Total
Sri Damansara & Menjalara	27.3	55.0	7.9	0.7	9.1	100.0
Kepong/Jinjang/Batu	22.5	60.2	9.9	0.5	6.9	100.0
Underground Jalan Ipoh, Sentul, City Centre	32.0	32.4	11.3	0.8	23.5	100.0
Underground TRX/Chan Sow Lin/TUMD Sg Besi	33.7	49.1	6.5	0.4	10.3	100.0
Kuchai Lama/Salak South/Pekan Sg Besi	38.3	47.3	9.1	0.2	5.1	100.0
Serdang Raya/Seri Kembangan/Sri Serdang	36.5	41.2	7.5	0.4	14.4	100.0
Taman Universiti Indah, Taman Equine, Putra Permai, Cyberjaya, Putrajaya	51.3	28.2	8.2	0.6	11.7	100.0

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

In terms of gender distribution, the average sex ratio of 108 males per 100 females is higher than the universal gender ratio of 106 males per 100 females (**Table 5-42**). Within the impact zone, the observed sex ratios vary across the corridors. In the northern corridor, there are more males than females and the sex ratio is higher at 111 males per 100 females whereas in the underground corridor, the sex ratio is lower at 103 males per 100 females, suggesting a stronger presence of female population staying here. In the southern corridor and in the Putrajaya extension corridor, the sex ratio remains relatively high at 109 males per 100 females. In Serdang Raya and Seri Kembangan, the sex ratio is observed to be similar to that of Putrajaya extension corridor.

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**Table 5-42 Impact Zone -Distribution of Population by Sub-corridor and Gender, 2010**

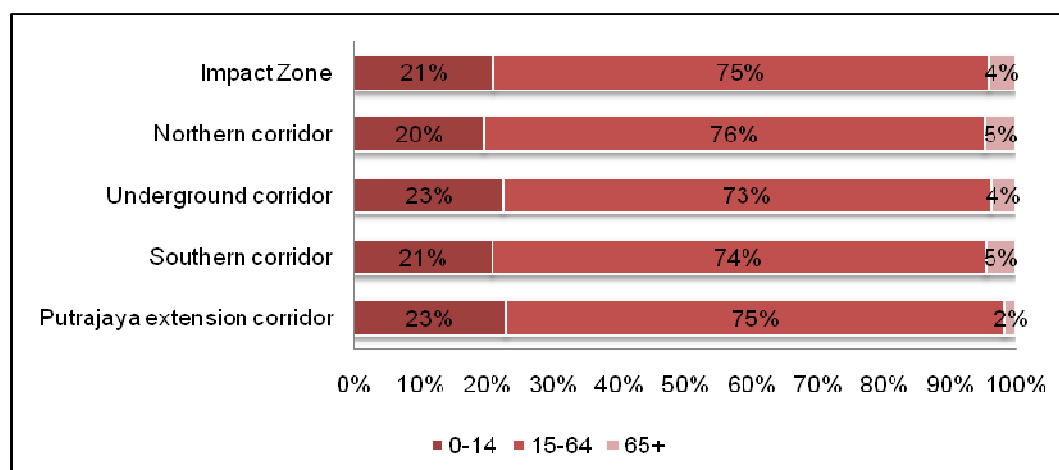
Sub-corridor	Male (%)	Female (%)	Sex Ratio
Sri Damansara & Menjalara	53.8	46.2	117
Kepong & Jinjang & Batu	52.3	47.7	109
<b>Northern corridor</b>	<b>52.6</b>	<b>47.4</b>	<b>111</b>
Sub-corridor	Male (%)	Female (%)	Sex Ratio
Underground Jalan Ipoh, Sentul, City Centre to TRX	50.9	49.1	103
Underground Chan Sow Lin/TUDM Sg Besi	50.4	49.6	101
<b>Underground corridor</b>	<b>50.6</b>	<b>49.4</b>	<b>103</b>
Kuchai Lama/Salak South/Pekan Sg Besi	51.3	48.7	106
Serdang Raya/Sri Kembangan/Sri Serdang	53.5	46.5	115
<b>Southern Corridor</b>	<b>52.3</b>	<b>47.7</b>	<b>109</b>
Taman Universiti Indah, Taman Equine, Putra Permai, Cyberjaya, Putrajaya	52.2	47.8	109
<b>Putrajaya Extension corridor</b>	<b>52.2</b>	<b>47.8</b>	<b>109</b>
<b>Total Impact Zone</b>	<b>52.0</b>	<b>48.0</b>	<b>108</b>

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

### 5.11.3 Age Composition

The population in the impact zone is relatively young. This is because a fifth of them are below 14 years (**Chart 5-4**). The majority are also in the working age group, aged between 15 years and 64 years (74%).

**Chart 5-4 Impact Zone-Age Composition of Population by Corridor**



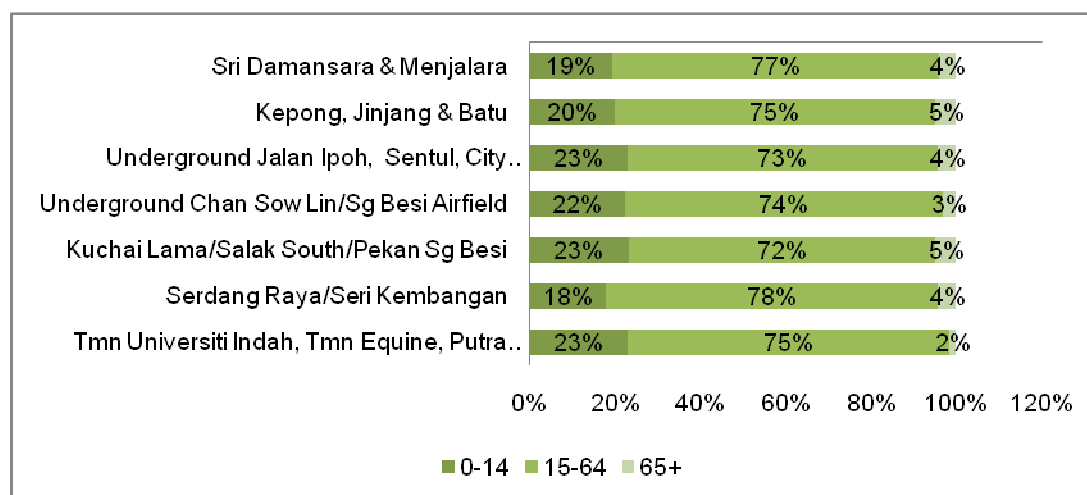
Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

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At least three-quarters of the people staying in most corridors are in the working age group except for the underground and southern corridors where the proportions are marginally lower (**Chat 5-4**). As a result, the proportion of elderly, at 4% of total population, is relatively low in the impact zone. In fact, in the Putrajaya extension corridor, it is exceptionally low at 2%, suggesting that currently, a large proportion of public sector retirees do not stay here in the corridor. As almost all corridors have high proportions of working –age population ranging from 73% to 76% it does justify having the MRT alignment passing through here because this group would be the most likely beneficiary of having access to a comprehensive public transportation.

**Chart 5-5** shows the distribution of population by age groups across the sub-corridors. The age composition is almost similar although slight variations can be observed across all sub-corridors in the impact zone. Serdang Jaya/Seri Kembangan sub-corridor has the highest proportion of working-age population (78%). That of Sri Damansara/Menjarala is also the same. However, in Kuchai Lama/Salak South/Sg Besi sub-corridor, the share of the working age population is the lowest at 72%. Here, the share of the elderly population is observed to be higher at 5%. A similar observation is made for Kepong/Jinjang/Batu which has a 5% share of elderly population and a slightly smaller proportion of young people aged below 14 years (20%).

**Chart 5-5 Impact Zone -Age Composition of Population by Sub-corridor**



Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

With a large working-age group and low proportion of older and younger people, the dependency ratios in these areas are found to be relatively low. The impact zone itself has a low dependency ratio of 34% and a low median age of about 23 years, indicating that the area has relatively young people (**Table 5-43**).

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**Table 5-43 Median Age of Population by Sub-corridor, 2010**

<i>Sub-corridor</i>	<i>0-14</i>	<i>%</i>	<i>15-64</i>	<i>%</i>	<i>65+</i>	<i>%</i>	<i>Dependen cy Ratio</i>	<i>Median Age</i>
Sri Damansara & Menjalara	3,589	19	14,428	77	754	4	30.1%	24
Kepong Jinjang	11,128	20	42,396	75	2,789	5	32.8%	24
Underground Jalan Ipoh/Sentul/KLCC/TRX	8,846	23	28,201	73	1,717	4	37.5%	23
Underground Chan Sow Lin/TUDM Sg Besi	6,674	22	22,197	74	974	3	34.5%	22
Kuchai Lama/Salak South/Pekan Sg Besi	19,550	23	60,903	72	4,217	5	39.0%	25
Serdang Raya/Seri Kembangan/Sri Serdang	11,233	18	49,085	78	2,665	4	28.3%	22
Putrajaya extension	7,204	23	23,808	75	527	2	32.5%	23
<b>Impact Zone</b>	<b>63,584</b>	<b>21</b>	<b>221,060</b>	<b>74</b>	<b>12,428</b>	<b>4</b>	<b>34.0%</b>	<b>23</b>

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (December 2014/February 2015)

### 5.6.1 Employment and Occupational Skills

The overall employment-population ratio in the impact zone is relatively high at about 52%, indicating that more than half the population here is economically productive (**Table 5-44**). The huge concentration of economically active population in the impact zone is significant for the MRT as its major target group is likely to be the employed workers who need to access an efficient mode of transportation like the MRT.

**Table 5-44 Impact Zone-Economically Active Population by Sub-corridor, 2010**

<b>Sub-corridor</b>	<b>Population</b>	<b>Employment</b>	<b>Employment- Population Ratio (%)</b>
Sri Damansara & Menjalara	18,771	9,790	52.2
Kepong & Jinjang	56,313	29,358	52.1
Underground Jalan Ipoh/Sentul/KLCC/TRX	38,764	19,549	50.4
Underground Chan Sow Lin/TUDM Sg Besi	29,845	15,627	52.4
Kuchai Lama/Salak South/Pekan Sg Besi	84,670	43,380	51.2
Serdang Raya/Seri Kembangan/Sri Serdang	62,983	30,893	49.0
Putrajaya Extension	31,539	18,920	60.0
<b>Impact Zone</b>	<b>322,885</b>	<b>167,517</b>	<b>51.9</b>

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (January/February 2015)

The distribution of employment by main economic sector shows that services contribute significantly to employment in the impact zone. Almost 3/4 of employed population are engaged in services (**Table 5-45**).



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Services are especially important in the underground sub-corridor of from TRX-Jalan Chan Sow Lin (85.4%), indicating that this area has successfully converted from manufacturing into services.

A similar pattern is found in Kuchai Lama/Salak South/Sg Besi (81%) and in Putrajaya Extension (78%). Manufacturing contributes around 12% of jobs among the people in the impact zone. Industrial activities are limited in Kuala Lumpur, with most of these being changed to service industries that are usually related to the automotive industries. The sub-corridors that have relatively high proportion of people engaged in manufacturing are in Sri Damansara and Bandar Menjalara (18.6%); the underground sub-corridor of Jalan Ipoh/Sentul/KLCC/TRX (16%), and Serdang Jaya/Seri Kembangan (13.7%). The manufacturing areas in the impact zone are found in Sri Damansara, Kepong/Jinjang, upper Jalan Ipoh, west and south of Jalan Chan Sow Lin, Kuchai Lama, Sg Besi and Seri Kembangan. Many of these areas are small industrial areas, occupied mostly by small and medium enterprises (SMEs), which are engaged in service-oriented industry such as car or metal workshops.

**Table 5-45 Employment by Industry of Origin by Sub-corridor, 2010 (%)**

Sub-corridor	Main Economic Sector (%)				
	Agriculture, forestry, fisheries	Mining	Manufacturing	Construction	Services
Sri Damansara & Menjalara	1.8	1.0	18.6	11.4	67.2
Kepong, Jinjang & Batu	0.3	0.1	12.4	17.7	69.5
Underground Jalan Ipoh, Sentul, KLCC	0.1	0.3	16.0	18.9	64.8
Underground TRX, Jalan Chan Sow Lin/TUDM Sg Besi	0.1	0.1	9.4	5.1	85.4
Kuchai Lama/Salak South/Pekan Sg Besi	0.1	0.3	7.7	10.9	81.1
Serdang Raya/Seri Kembangan/Sri Serdang	0.3	0.2	13.7	14.3	71.5
Putrajaya Extension	0.5	0.2	11.8	9.9	77.6
<b>Impact Zone</b>	<b>0.3</b>	<b>0.2</b>	<b>11.9</b>	<b>13.0</b>	<b>74.6</b>

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (January/February 2015)

The employed population is grouped by skill types, i.e. highly skilled, skilled, semi-skilled and unskilled.<sup>1</sup> The majority of employed persons in the impact zone (56%) are semi-skilled workers (**Table 5-46**). A very small proportion is in the unskilled category (8%). Most of the unskilled workers are found around Jalan Chan Sow Lin (12.7%), and in Serdang Raya/Seri Kembangan (12.7%).

<sup>1</sup> Highly skilled refer to managers and professionals; Skilled refer to technicians and associate professionals; Semi skilled refer to clerical support, sales and administrative, machine operators, etc. Unskilled refer to elementary occupations

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The highly skilled made up only 20.5% of the workforce in the impact zone; they are mostly in Kuala Lumpur city center, in Chan Sow Lin and in Kuchai Lama/Salak South/Sg Besi. Some of these areas have contrasting combinations –a relatively high proportion of highly skilled workers combined with relatively high proportions of unskilled workers, indicating availability of a high diversity of occupations here. Combining the semi-skilled and unskilled, more than two-thirds of the employed population (64.5%) in the impact zone have low occupational skills. It implies that in the impact zone, there is a strong presence of people in the lower income group who may be able to benefit most from having the MRT nearby.

**Table 5-46 Employment by Occupational Skill by Sub-corridor, 2010**

Sub-corridor	Highly Skilled (%)	Skilled (%)	Semi-Skilled (%)	Unskilled (%)	Total (%)
Sri Damansara & Menjalara	19.5	13.9	58.9	7.8	100.0
Kepong, Jinjang & Batu	17.3	13.9	61.1	7.7	100.0
Underground Jalan Ipoh, Sentul, KLCC, TRX	23.9	18.4	46.6	11.1	100.0
Underground Chan Sow Lin/TUDM Sg Besi	23.3	8.0	56.0	12.7	100.0
Kuchai Lama/Salak South/Pekan Sg Besi	20.5	14.0	57.4	8.1	100.0
Serdang Raya/Seri Kembangan	19.4	19.8	50.7	10.1	100.0
Putrajaya Extension	19.9	15.7	56.0	8.4	100.0
Impact Zone	20.3	15.2	55.3	9.2	100.0

Source: Department of Statistics, Population & Housing Census 2010, "Special Request" (January/February 2015)

### 5.12 ECOLOGY

The SSP Line passes through urban and semi-urban areas where the dominant land uses are residential, commercial and industrial areas as well public facilities and institutions. As such the SSP Line does not pass through any ecologically sensitive areas such as forest reserves.

The proposed depot site is located within MARDI and UPM land where the site mainly comprises of grasslands, agricultural plantations and secondary forest. The area to the north and east of the depot has been cleared for agricultural purposes such as for oil palms and fruit crops. Fruit orchards can be found near the MARDI Headquarter where research on variety of fruits trees and vegetable crops are being carried out. The secondary forest can be found at the center and south of the proposed depot site.

Big mammals are not expected at the depot site as the existing landscape and vegetation types in the area are unlikely to support these types of animals. Nevertheless, small mammals such as macaque, squirrels, rodents etc. are expected in the secondary forest and oil palm plantations. The oil palm plantation and fruit orchards support variety of bird species. No endangered or rare flora and fauna are expected at the depot site.

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