

MENGABDI DENGAN KEAKHLIAN

INDONESIA RAILWAY INSTITUTE REVIEW

Juni, 2013

A large tunnel under construction, showing heavy machinery and workers. The tunnel is lined with concrete segments, and the interior is illuminated by bright lights. A yellow excavator and other equipment are visible in the distance.

**Menatap Era Baru
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Undang-Undang No.23 Tahun 2007 disusun atas dasar keinginan untuk mereformasi perkeretaapian di Indonesia, yang pada pokoknya bertujuan untuk melaksanakan : desentralisasi, multi operator dan privatisasi, agar perkeretaapian maju, berkembang, efektif dan efisien, aman, lancar dan terjangkau.

Setelah enam tahun dua bulan peraturan perundangan tersebut hadir, sektor perkeretaapian di Indonesia, jalan ditempat. Malahan, fungsi-fungsi pemerintahan dan kepengusahaan tampak rancu dan tumpang tindih, jauh dari hakekat yang mendasari diterbitkannya peraturan perundangan diatas. Sehingga, tidak berlebihan dan tidak salah, kalau anggapan sementara kalangan, bahwa, reformasi perkeretaapian di Indonesia dijalankan dengan setengah hati.

Pelaksanaan Undang-Undang tersebut menjadi mandeg dan mati suri, tak kala diterbitkannya Peraturan Presiden No. 83 Tahun 2011, 24 November 2011 tentang Proyek Kereta Api Bandara dan Jalur Lingkar Jakarta, yang menempatkan kembali PT.Kereta Api Indonesia (Persero), sekaligus sebagai regulator dan operator.

Indonesia Railway Institute Review edisi kali ini, menurunkan beberapa tulisan para ahli dan pemerhati perkeretaapian, yang menyorot fenomena diatas.

Disamping itu, kalau tidak ada aral melintang, Insyah Allah, pelaksanaan konstruksi Mass Rapid Transit Jakarta Utara - Selatan Phase I, yang telah ditunggu sejak tahun 1994, akan segera dimulai pada Oktober 2013.

Banyak imbas yang akan terjadi, dan diharapkan pengorbanan, pengertian dan keikhlasan masyarakat, pada masa konstruksi berlangsung. Sebab, mau tak mau akan menambah beban kemacetan lalu lintas Jakarta, yang tanpa itu pun, sudah sangat parah. Edisi kali ini, menyorot kondisi tersebut, dengan mengambil contoh dari pelaksanaan pembangunan serupa pada kota lain di dunia.

Untuk mengatasinya, diharapkan semua otoritas terkait, patut mengantisipasi akibat ini, sekaligus berupaya meminimalkan dampak lalu lintas, semasa pembangunan MRT berlangsung.

Begitu pula, edisi kali ini, menyuguhkan artikel-artikel yang membedah bagaimana perkembangan teknologi perkeretaapian yang diterapkan pada beberapa negara maju, dan diharapkan akan membuka cakrawala dalam menyongsong era baru perkeretaapian di Indonesia.(hf)

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Tulisan yang dimuat dalam jurnal ini belum tentu mencerminkan pendapat IRWI.

Redaksi mengundang para ahli di bidang perkeretaapian mengirimkan karyanya, baik dalam bahasa Indonesia maupun bahasa Inggris, untuk kami pertimbangkan dimuat dalam penerbitan ini.

Redaksi berhak untuk mengedit setiap tulisan yang diterima tanpa mengurangi maknanya.

Edisi kali ini



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Overview

Teknologi dan Konstruksi Kereta Api Bawah Tanah Manhattan - Long Island

PENTINGNYA MANAJEMEN DAN REKAYASA LALU LINTAS SEMASA KONSTRUKSI

Ayub PRAMUDIA ¹

Pembangunan Kereta Api Bawah Tanah Manhattan - Long Island sepanjang 5.2 km menghubungkan wilayah sebelah timur Manhattan dengan Long Island. Project ini menggunakan tunnel boring machine (TBM) serta metode drill and blast. Sedangkan, di Indonesia sendiri, MRT Jakarta juga akan memulai fase konstruksi. Tulisan ini bermaksud untuk mengilustrasikan proses pembangunan kereta api bawah tanah dengan perbandingan paralel pada pembangunan subway Manhattan - Long Island dengan pembangunan MRT Jakarta, terutama segmen Senayan - Hotel Indonesia.

Pada pembangunan MRT Jakarta, akan menemui masalah-masalah serupa yang diantaranya pembukaan daerah untuk konstruksi Open-Pit pada daerah pembangunan stasiun dan akses mobilitas alat-alat konstruksi, yang tentunya memerlukan manajemen lalu lintas yang handal untuk mengendalikan lalu lintas disekitar daerah konstruksi. Selain itu, pembangunan kereta api bawah tanah juga harus memperhitungkan bangunan eksisting di atasnya, jika akan melewati bangunan atau jalan dengan struktur pondasi dalam (jalan flyover atau bangunan gedung tinggi), maka tentunya hal ini akan memerlukan perlakuan khusus tersendiri.

¹ Ayub Pramudia, MT - Transport Planner Central
Jakarta Light Rail Transit Study, Indotek Engineering

Teknologi Konstruksi Bawah Tanah

Skenario Konstruksi

Metode konstruksi yang diterapkan dalam pembangunan jalan kereta api bawah tanah merupakan metode yang umum diterapkan diseluruh dunia, yaitu penggunaan Tunnel Boring

terkait. Jam kerja dapat beragam sesuai dengan target penyelesaian elemen pekerjaan dan lingkup tugas pekerja. Selain itu, kuantitas dari pekerja yang dimobilisasi secara bersamaan juga dapat beragam menurut aktifitas yang sedang dilaksanakan. Selama periode konstruksi, pengerjaan beberapa stasiun dilakukan bersamaan sementara penggalian terowongan untuk jalur kereta api dapat berjalan secara paralel.



Peluncuran Tunnel Boring Machine (TBM) pada East Side Access Project. Mesin serupa juga akan didayagunakan untuk pembangunan MRT Jakarta mulai dari Al Azhar sampai dengan Bunderan HI dengan trase bawah tanah sepanjang 5.9 km.

Machine (TBM) dalam penggalian terowongan, yang diterapkan sesuai dengan peraturan-peraturan yang mengatur pengendalian lalu lintas jalan raya, kebisingan, getaran dan debu.

Elemen utama dari pembangunan segmen kereta api bawah tanah terdiri atas terowongan, stasiun bawah tanah, fasilitas pendukung, jalan kereta api, perlengkapan ventilasi dan sistem pengoperasian, termasuk listrik traksi, kelengkapan komunikasi dan persinyalan. Pekerjaan konstruksi dapat dimulai pada beberapa titik secara bersamaan pada trase yang ditentukan, menyangkut elemen-elemen yang

Selain elemen utama dari pembangunan terowongan dan stasiun, berikut ini merupakan elemen-elemen lain yang menjadi tugas dalam pembangunan kereta api bawah tanah, yaitu:

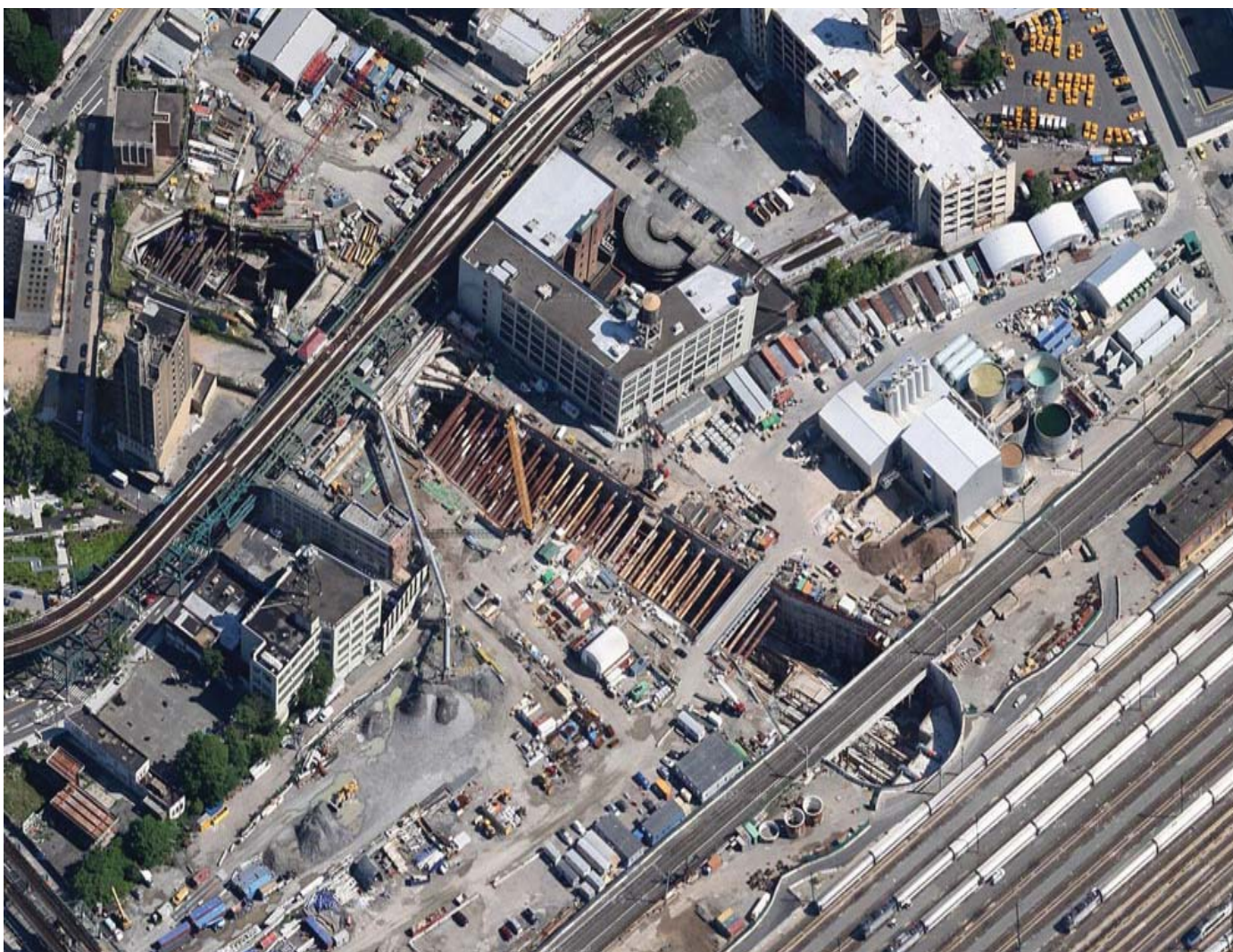
- Membangun struktur pelindung tanah, seperti: sheet piling atau perbaikan tanah untuk melindungi struktur dasar, jika dibutuhkan
- Pemindahan, perubahan atau perlindungan untuk fasilitas yang ada pada permukaan.
- Pembongkaran atau pemindahan struktur pada lokasi staging dan akses masuk stasiun.
- Pembangunan akses masuk stasiun
- Desain stasiun

- Sistem drainase permukaan dan bawah tanah
- Substation listrik traksi dengan sistem distribusi
- persinyalan dan telekomunikasi
- Sistem kelistrikan darurat
- Kelengkapan stasiun termasuk fasilitas ketiketian, elevator, escalator, lanskap dan fasilitas lainnya.
- Pengujian sistem terintegrasi dan simulasi pendapatan
- Komisioning terakhir

Pembangunan stasiun bawah tanah akan menggunakan teknik konstruksi cut-and-cover. Teknik ini biasanya dimulai dengan membuka permukaan tanah hingga kedalaman yang memadai untuk memungkinkan dukungan jalur utilitas yang ada dan menginstal tumpukan tentara, atau mempertahankan struktur bumi lainnya. Pembukaan permukaan kemudian ditutup dengan penghiasan jalan sementara sehingga lalu lintas dan pergerakan pejalan kaki dapat melanjutkan atas, sementara

hasil penggalian bawah penghiasan. Penggalian sementara akan disimpan oleh sistem pendukung penggalian disetujui, yang dikenal sebagai sistem menopang. Pondasi bangunan yang berdekatan juga akan didukung seperlunya. Struktur beton kotak stasiun ini kemudian dibangun dalam ruang digali, ditimbun sampai permukaan jalan, dan permukaan dipulihkan.

Pembangunan terowongan diharapkan akan dilakukan dengan bertekanan muka Tunnel Boring Machines (TBM). Jenis TBM digunakan untuk jangkauan yang berbeda dari terowongan akan dikenakan bervariasi, persyaratan spesifik lokasi, termasuk kondisi geologi. Misalnya, di mana hidrokarbon dan / atau gas diharapkan akan ditemui kemungkinan bahwa TBM akan diperlukan. Dimana ada sedikit kontaminasi, diharapkan bahwa baik Earth Pressure Balance (EPB) TBM akan digunakan untuk penggalian terowongan.



Pandangan dari atas pada lubang konstruksi dan akses terowongan di daerah Stasiun Queens Plaza, Pada area kiri bawah merupakan lokasi ekstraksi materi penggalian hasil dari penggalian terowongan. Pada konstruksi MRT Jakarta, situasi seperti ini akan dijumpai pada daerah Al Azhar, yang merupakan awal dari pembangunan segmen bawah tanah dari MRT Jakarta Tahap I.

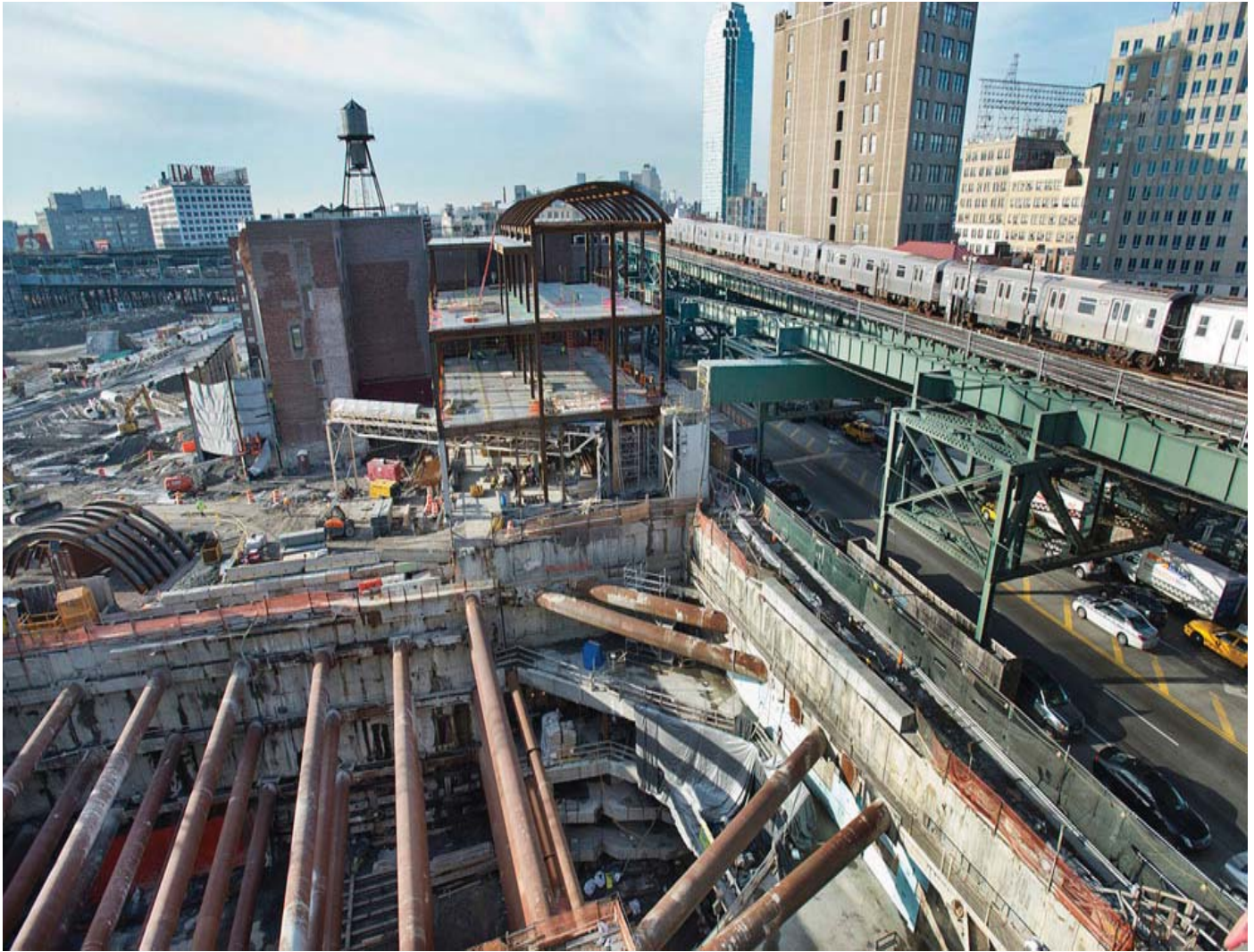


Foto ini menunjukkan gambaran situasi pada Stasiun antara Northern Boulevard dan Sunnyside Station. Balok horisontal digunakan mendukung lubang konstruksi besar (Construction Pit). Situasi serupa akan dijumpai ketika pembangunan MRT Jakarta, pada area Stasiun Dukuh Atas.

Area Staging, juga dikenal sebagai daerah terbuka, akan diperlukan untuk pembangunan stasiun bawah tanah, terowongan, pintu masuk stasiun, Crossover, struktur pertengahan-jalur, traksi listrik sub-stasiun (TPSS) dan ventilasi atau pintu keluar darurat.

Area Staging juga digunakan untuk penyimpanan dan persiapan segmen beton pracetak, penyimpanan tanah sementara, fasilitas pendukung pekerjaan bawah tanah (udara, air, listrik, merusak/mengangkat), pencampuran dan pengolahan beton untuk terowongan, dan pengolahan lumpur postexcavation (pemisahan), yang akan mencakup filter, sentrifugal dan peralatan vibrator. Selanjutnya, daerah-daerah tersebut akan digunakan untuk penyimpanan sementara material yang akan dipasang dan lumpur hasil penggalian sebelum diangkut ke pembuangan, jalur ventilasi dan jalur utilitas terowongan lainnya. TBM memerlukan area staging untuk perakitan, pemasangan, penyimpanan bahan, dan operasi. Biasanya, daerah-daerah tersebut akan berada di

area penggalian stasiun untuk memudahkan akses ke terowongan.

Pembebasan sementara sebagian dari trotoar, jalur lalu lintas, dan / atau area parkir mungkin diperlukan di berbagai lokasi untuk staging area. Pembukaan area ditengah jalan juga dapat dilakukan jika tidak terdapat area diluar jalan.

Manajemen Lalu lintas Semasa Konstruksi

Penerapan Manajemen Lalulintas

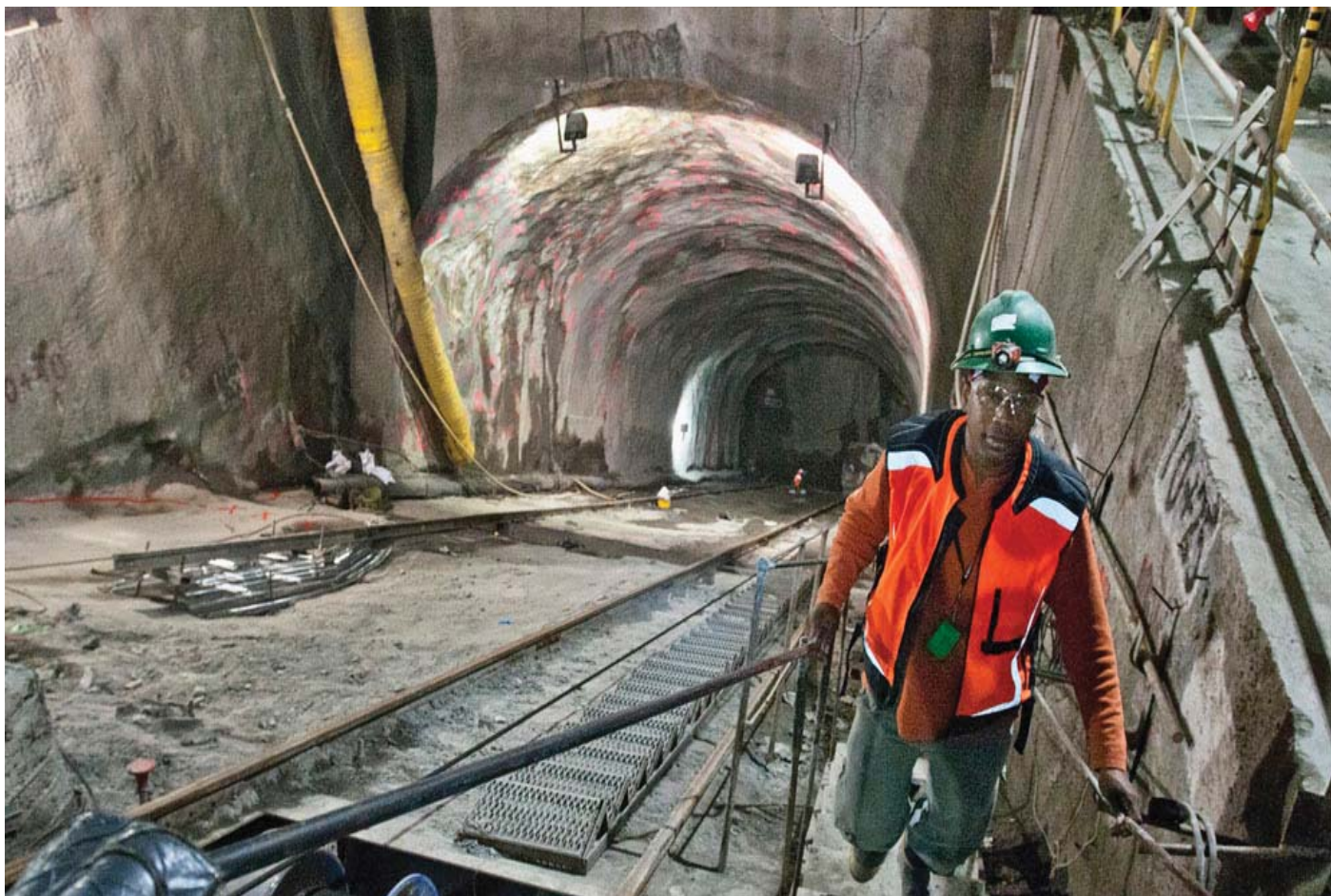
Kebijakan traffic manajemen yang akan diterapkan selama pekerjaan pembangunan menyangkut semua pihak yang terkena dampak dari pembangunan, meliputi : masyarakat ditempat tinggal, pengusaha dan pihak lain yang memiliki kepentingan terhadap akses lalu lintas pada area konstruksi.



Gambar diatas menunjukkan instalasi jaringan prasarana pendukung sebelum struktur rangka terowongan di lapisi dengan lapisan beton. Pembangunan jalur kereta api bawah tanah perlu memperhitungkan jaringan prasarana pendukung tersendiri.



Selain dilakukan penggalian untuk jalur kereta api, pada stasiun juga dilakukan penggalian untuk akses stasiun menuju ke permukaan. Pada beberapa stasiun besar, terdapat beberapa akses stasiun untuk mempermudah jangkauan pengguna, termasuk juga akses stasiun dari beberapa area komersial.



Pembangunan ruang akses untuk eskalator yang menghubungkan Stasiun Long Island yang baru dibangun dengan tingkat pertama bangunan stasiun tersebut yang merupakan bagian utama dari Stasiun Long Island. Pembangunan akses serupa akan dijumpai pada Stasiun Setiabudi yang merupakan stasiun intermoda dengan Terminal Trans Jakarta.

Beragam metode penerapan manajemen lalu lintas yang dapat dilaksanakan antara lain :

(a) Kendaraan bermotor

- Penutupan atau pengalihan lalu lintas
- Penutupan sebagian lajur pada jalan
- Pengaturan arah lalu lintas dan penutupan U-turn
- Pengaturan waktu sinyal lalu lintas
- Penetapan sementara batas kecepatan

(b) Pejalan kaki

Penyempitan atau penutupan sementara fasilitas pejalan kaki/trotoar dengan dialihkan ke jalur lain

(c) Penumpang Kereta Api

Peralihan akses stasiun serta alur sirkulasi keluar-masuk penumpang dari stasiun dalam area konstruksi

(d) Penumpang Bus Umum

Pengalihan trayek bus umum serta penutupan atau relokasi pemberhentian bus dalam area konstruksi

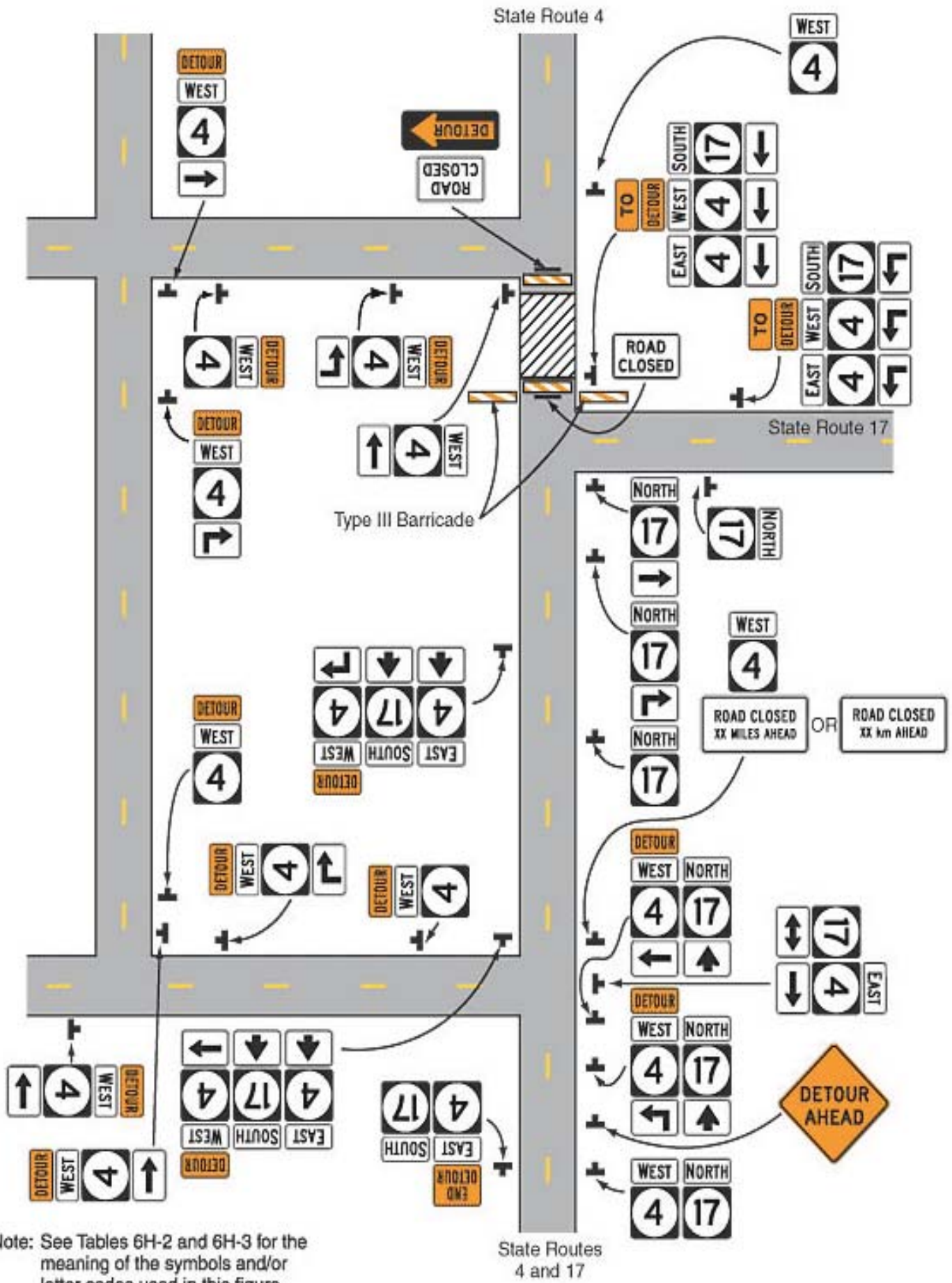
(e) Parkir

Pelarangan atau relokasi area parkir pada area konstruksi

Semua kebijakan manajemen lalu lintas yang akan dirancang dan diterapkan harus sesuai dengan peraturan-peraturan yang relevan dengan lalu lintas dan jalan raya, sekaligus mempertimbangkan mobilitas akses bagi penyandang cacat.

Perencanaan manajemen lalu lintas

Sebelum dimulainya masa konstruksi, rencana manajemen lalu lintas harus dipersiapkan dengan memberikan perencanaan rinci dari masing-masing area dimana pekerjaan konstruksi akan diadakan, hal ini dimaksudkan untuk menyelaraskan metode konstruksi dengan strategi umum pada manajemen lalu lintas. Setelah kontraktor pelaksanaan pekerjaan konstruksi ditunjuk, penanggung jawab manajemen lalu lintas mulai untuk menyusun perencanaan dengan mempertimbangkan arahan dari pihak otoritas jalan raya, pihak kepolisian, operator transportasi publik (pada koridor area konstruksi) serta pihak-pihak terkait lainnya. Arahan dan masukan dari pihak-pihak terkait akan menjadi bahan pertimbangan bagi kontraktor pada saat menyusun proposal teknis tentang pelaksanaan pekerjaan konstruksi, termasuk



Tipikal manajemen lalu lintas dan engineering semasa konstruksi dalam satu kawasan, dengan menggunakan metoda Overlapping Routes with Detour.

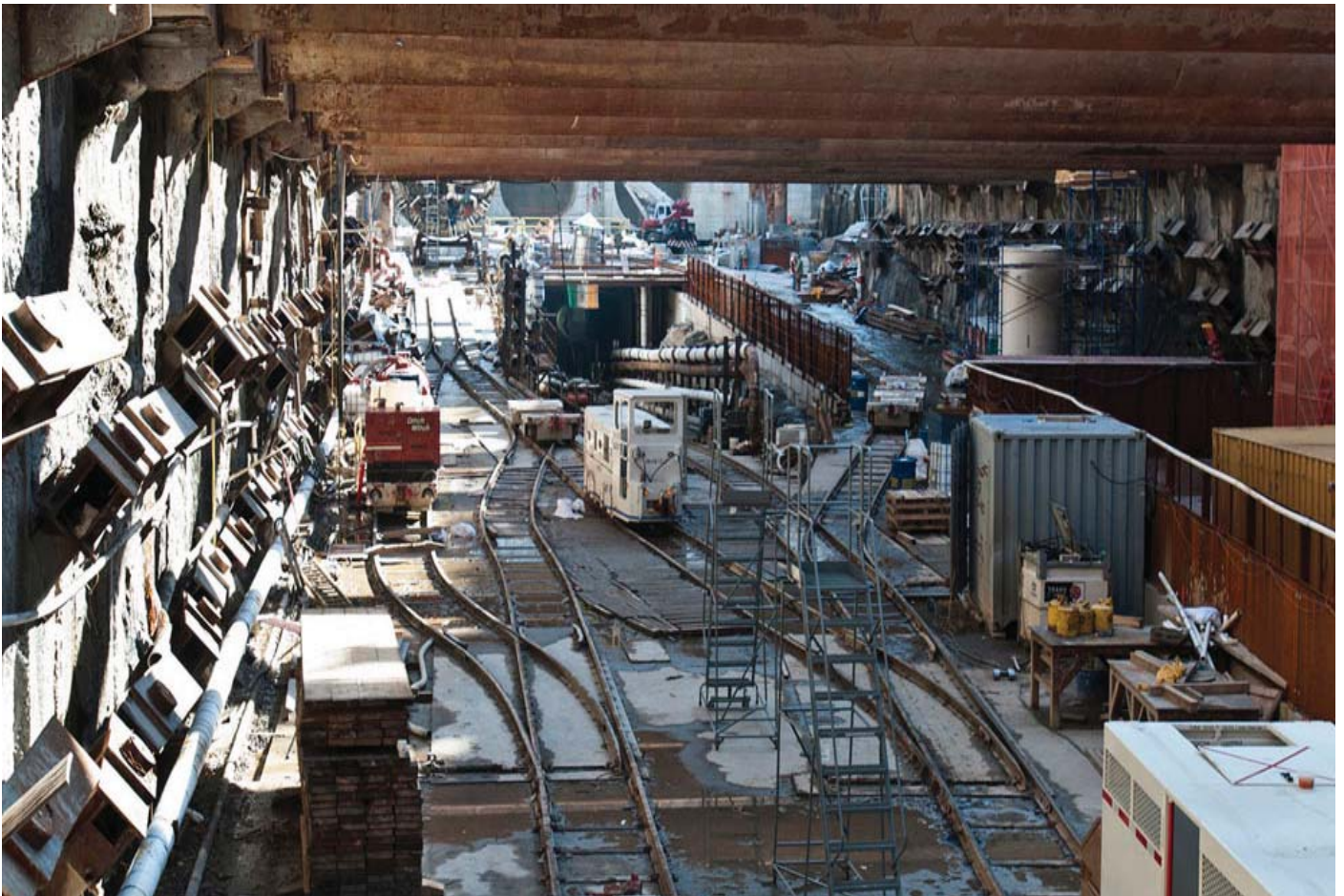
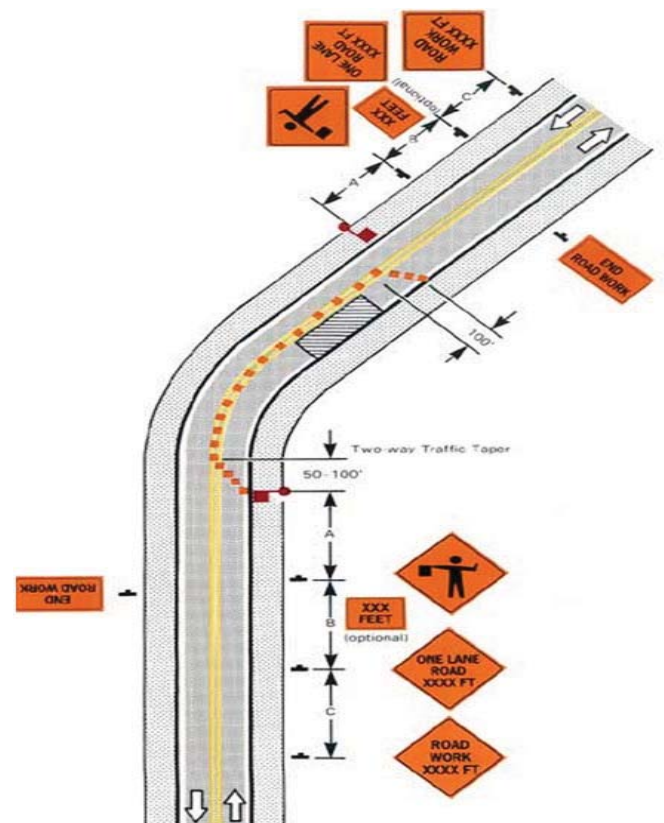


Foto diatas menampilkan ruang akses stasiun bawah tanah menuju terowongan kereta api bawah tanah tepat dibawah Terminal Utama Grand Central. Area ini direncanakan untuk menjadi titik pemberangkatan dan kedatangan kereta api dari Long Island. Pada masa pembangunan MRT Jakarta, situasi seperti ini akan dijumpai pada area pembangunan Stasiun Bunderan Hotel Indonesia.

metode pelaksanaan dan program kerja, yang kemudian di review untuk kesesuaian manajemen lalu lintas yang akan diterapkan.

Perencanaan manajemen lalu lintas harus memperhitungkan pelayanan dan akses terhadap lokasi-lokasi pemukiman maupun area komersial yang terkena dampak kegiatan konstruksi. Pihak kontraktor akan bekerjasama dengan perencana manajemen lalu lintas untuk memastikan kesinambungan komunikasi antara setiap pihak yang terkait dampak masa konstruksi. Warga pemukiman dan pemilik usaha pada sekitar area kegiatan konstruksi akan mendapatkan kepastian tentang tanggal dan durasi dari penutupan jalur dan rute alternatif pengalihan lalu lintas setidaknya dua minggu sebelum atau setelah disusunnya perencanaan rinci manajemen lalu lintas. Akses dan pelayanan jalan harus dipertahankan se-optimal mungkin dalam lingkup pekerjaan konstruksi yang berlangsung, selain itu keselamatan publik harus menjadi prioritas utama.



Salah satu skema manajemen lalu lintas dan enjinering semasa konstruksi, pada satu koridor jalan di area konstruksi jalan kereta api bawah tanah..

POTENSI ANGKUTAN JALAN REL SEBAGAI ANGKUTAN UMUM KOTA JAKARTA

Najid¹



1. Pendahuluan

Saat ini Jakarta telah menjadi kota terpadat ke 10 di dunia, dengan jumlah penduduk 9,6 juta jiwa kepadatan penduduk 13.000 jiwa/km². Pada siang hari dengan tingginya aktivitas di Jakarta dan tingginya perjalanan komuter maka jumlah penduduk Jakarta mencapai 12,2 juta jiwa dengan total perjalanan mencapai 20 juta orang perhari.

Kondisi seperti disampaikan di atas memicu terjadinya kemacetan lalu lintas ditambah lagi dengan kondisi rasio jalan yang kurang (6,2%) dan pelayanan angkutan umum yang buruk menyebabkan tingginya penggunaan kendaraan pribadi yang menyebabkan pergerakan lalu lintas menjadi tidak efisien.

Untuk mengatasi masalah kemacetan lalu lintas tersebut, Jakarta telah memiliki konsep rencana penanganan transportasi kota Jakarta yang telah ditetapkan melalui Peraturan Gubernur no.103 tahun 2007 tentang Pola Transportasi Makro. Salah satu strategi dalam pola transportasi makro tersebut adalah pengembangan sistem angkutan umum, yang diantaranya adalah pengembangan sistem angkutan berbasis rel yaitu Mass Rapid Transit (MRT) dan Monorel.

Namun pembangunan monorel yang dipercayakan kepada PT. Jakarta Monorel selaku investor terhenti pembangunannya sejak tahun 2004. Pemprov DKI Jakarta pada masa itu akhirnya memutuskan tidak akan melanjutkan pembangunan monorel. Sebagai gantinya, pemprov DKI akan mencari moda transportasi lain yang lebih baik dengan biaya pembangunan yang tidak terlalu tinggi serta harga tiket moda transportasi yang murah dan terjangkau masyarakat.

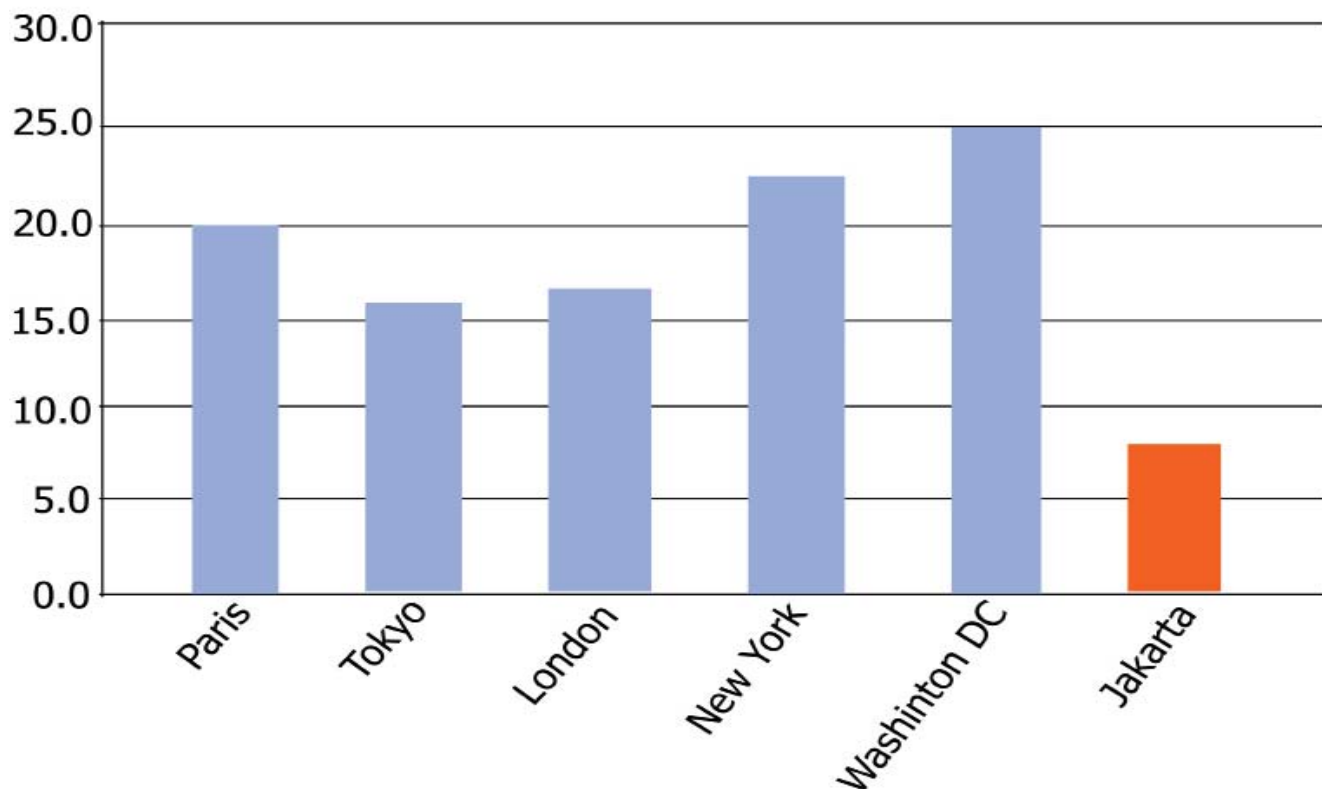
Pemerintah DKI Jakarta saat ini berniat untuk melanjutkan proyek monorel dan proyek pembangunan MRT. Namun tekad melanjutkan proyek monorel masih terkendala beberapa hal karena sifat angkutan umum apalagi yang berbasis rel, investasi infrastrukturnya yang sangat padat modal dan umumnya dianggap tertanam (sunk cost) tidak dapat dikembalikan dan pengoperasiannya kemungkinan membutuhkan subsidi pemerintah setidaknya pada tahap awalnya. Kegagalan pembangunan monorel yang lalu dan banyaknya keberatan warga terhadap rencana pembangunan MRT tentunya memberikan tambahan beban bagi rencana pembangunan angkutan umum berbasis rel di Jakarta.

2. Masalah Transportasi Kota Jakarta

Masalah transportasi di kota Jakarta tidak terlepas dari masalah lambatnya pengembangan angkutan umum massal dan perbaikan angkutan umum yang ada, sehingga tingginya

¹Dr. Ir. Najid, MT., Universitas Tarumanagara, Dewan
Transportasi Kota Jakarta

Gambar 2 : Rasio Ruang Jalan terhadap Ruang Kota
(sumber : Road Guidebook, MILT of Japan 2005, except Jakarta)



penggunaan angkutan pribadi tercatat tahun 2009 jumlah kendaraan bermotor DKI Jakarta mencapai \pm 6,7 juta unit

Tabel 1: Kondisi Pelayanan Angkutan Umum di Kota Jakarta

No	Jenis Angkutan	Jumlah Armada	Jumlah yang Operasi	Kapasitas Angkut	Jumlah Pnp yang diangkut/tahun
1	Transjakarta	381/198	579	100/200	110.499.919
2	Bus Besar	4.513	2.148	80	9.250.920
3	Bus Sedang	4.979	3.289	50	N.A
4	Bus Kecil	12.984	N.A	16	N.A

dengan perincian kendaraan pribadi mencapai 6,6 juta (98,5%:) dan Angkutan Umum mencapai 91.082 (1,5%), dengan pertumbuhan rata-rata dalam 5 tahun terakhir: \pm 8,1 % per tahun kurun waktu tahun 2004-2009.

Tabel 2: Rata-rata Waktu Tempuh Perjalanan

Moda Angkutan Umum	Rata-rata waktu perjalanan	
	Perjalan Komuter	Semua Tujuan
Trans Jakarta	40.0	46.5
Bus Besar (AC/Patas AC)	55.4	51.4
Bus Besar (Patas)	35.1	76.6
Bus Besar (Biasa)	50.2	Data tidak tersedia
Bus Sedang (Metro Mini, dll)	29.9	45.9
Bus Kecil (Angkutan, dll)	25.3	34.3
Kereta Api (Express)	40.3	53.0
Kereta Api (Ekonomi AC)	49.2	81.0
Kereta Api (Ekonomi)	51.5	Data tidak tersedia

Jumlah Kendaraan Pribadi sebesar 98,5% tersebut melayani 44% perjalanan dan Angkutan Umum yang hanya 1,5% harus melayani 56% perjalanan (diantaranya 3% dilayani

Tabel 3: Tarif Rata-rata Perjalanan Angkutan Umum

Moda Angkutan Umum	Rata-rata waktu perjalanan	
	Perjalan Komuter	Semua Tujuan
Trans Jakarta	56669.3	6127.9
Bus Besar (AC/Patas AC)	9412.4	2888.9
Bus Besar (Patas)	5569.4	5077.6
Bus Besar (Biasa)	6977.2	Data tidak tersedia
Bus Sedang (Metro Mini, dll)	3539.8	3548.0
Bus Kecil (Angkutan, dll)	2630.5	2930.8
Kereta Api (Express)	8836.2	14609.4
Kereta Api (Ekonomi AC)	10055.3	8305.1
Kereta Api (Ekonomi)	5523.0	Data tidak tersedia

KA/KRL Jabodetabek), dengan tingginya pertumbuhan kendaraan pribadi tersebut menyebabkan terjadinya kemacetan lalu lintas dan terjadinya pemborosan biaya operasional kendaraan sejumlah Rp. 17,2 Trilyun/ tahun

Selain tinjauan terhadap penggunaan angkutan umum, sebagai gambaran aksesibilitas kota dapat dilihat juga dari sisi perbandingan rasio luas jalan terhadap luas kota jika dibandingkan dengan rasio kota-kota di dunia seperti dapat dilihat pada Gambar 2 berikut ini:

Kondisi pelayanan angkutan umum saat ini di kota Jakarta dapat dilihat pada tabel 1 berikut ini:

Berdasarkan hasil survey rata-rata waktu perjalanan komuter dan tujuan lainnya yang menggunakan alternative moda

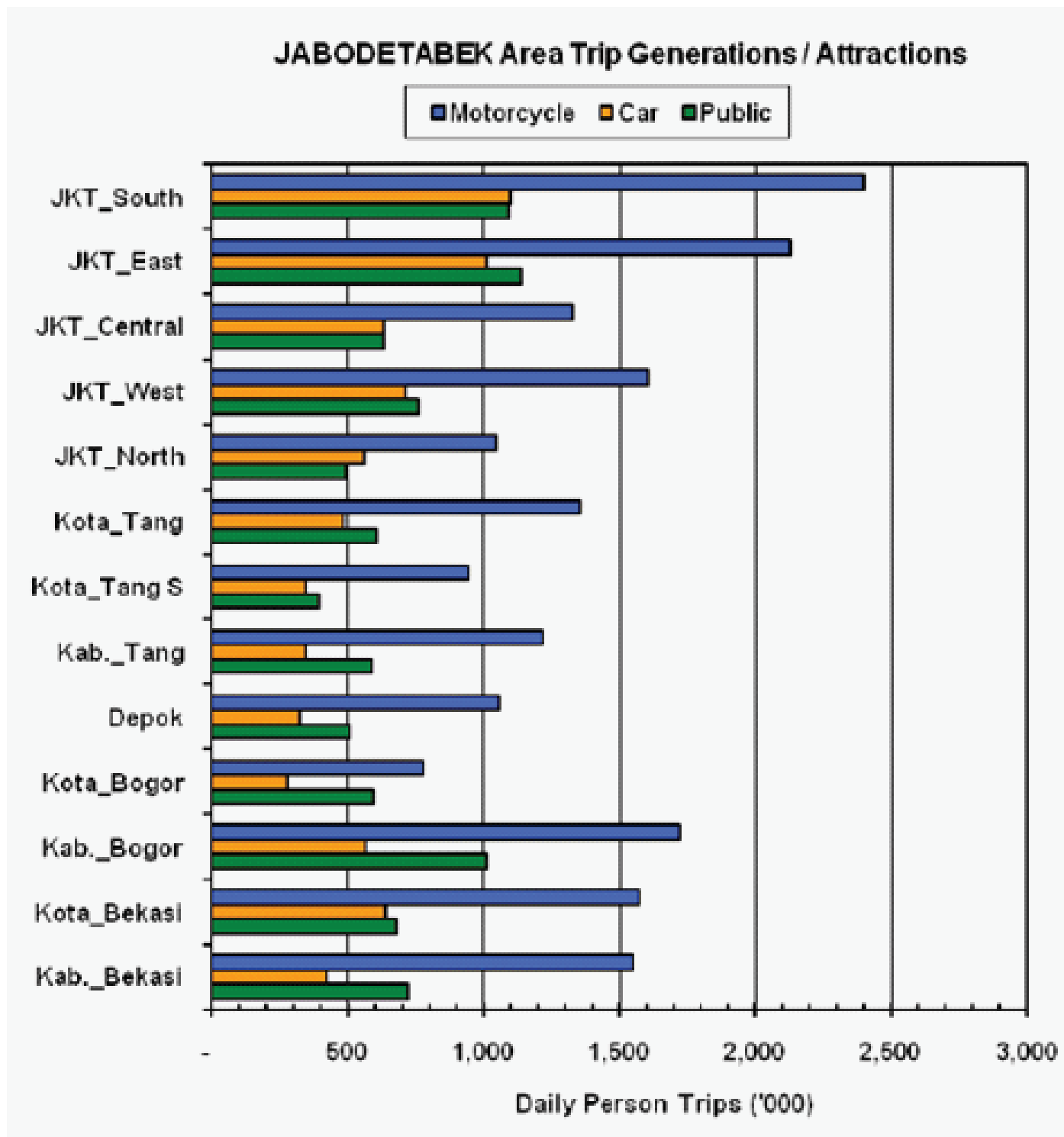
angkutan umum yang tersedia dapat dilihat pada tabel 2 berikut ini:

Biaya untuk membayar tarif rata-rata perjalanan komuter dan tujuan lainnya dengan menggunakan alternative moda angkutan umum yang tersedia dapat dilihat pada tabel 3 berikut ini:

Dari tabel 2 dan tabel 3 di atas terlihat Transjakarta merupakan angkutan umum yang cukup nyaman (AC), relatif cepat dan relatif murah, namun kapasitasnya belum dapat mengakomodasi kebutuhan pergerakan yang ada, sehingga pelayanan angkutan ini semakin lama terasa semakin menurun.

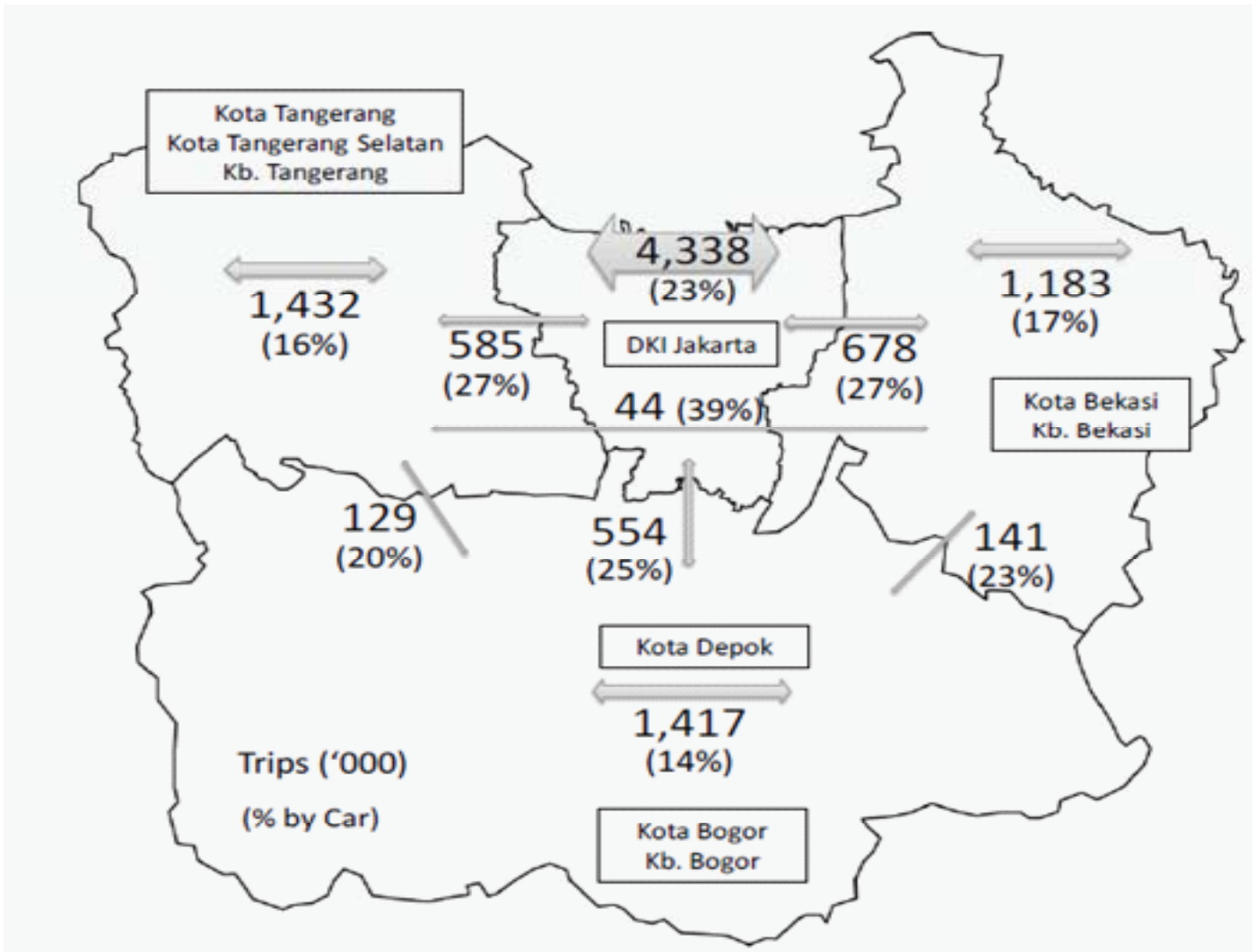
Tabel 4: Data Jumlah Penumpang KRL Jabodetabek

Tahun	Jumlah KRL Penumpang Jabodetabek
2006	104425
2007	118095
2008	119751
2009	124576
2010	124308
2011	121105
2012	134088

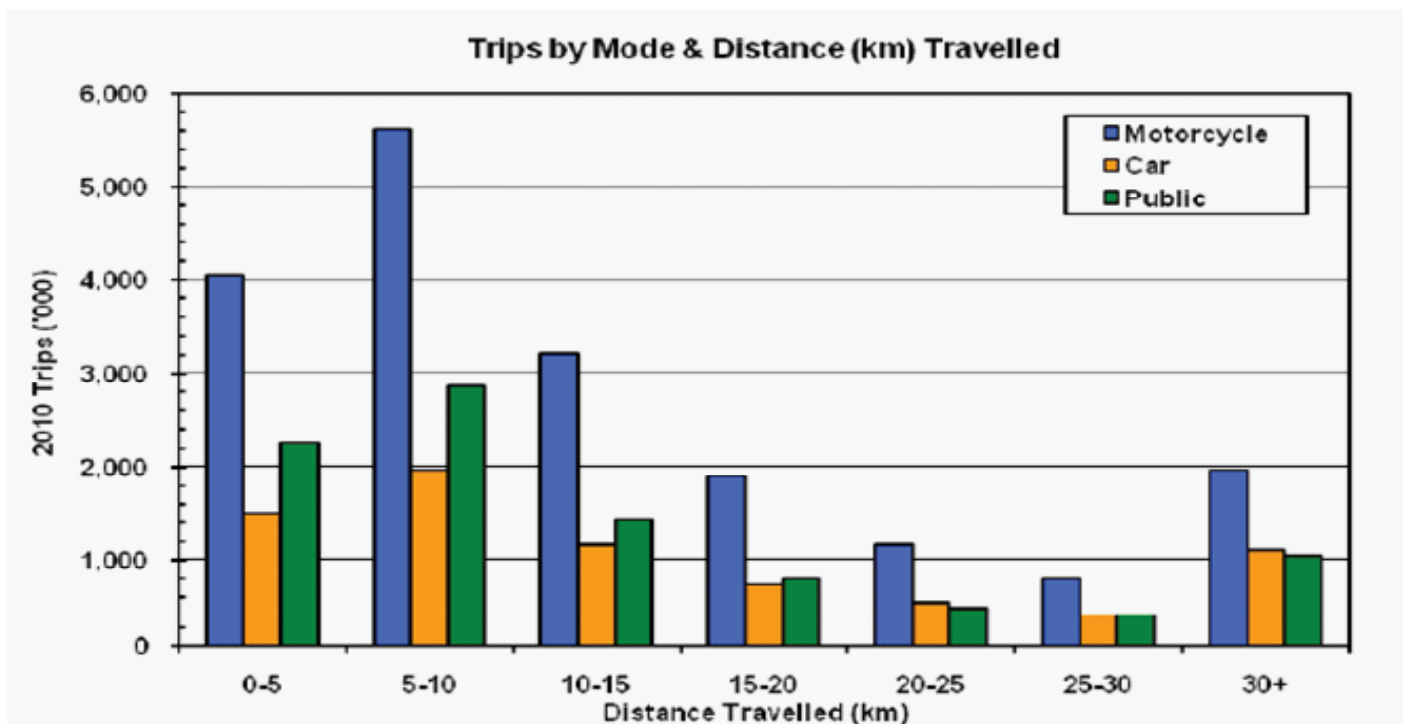


Gambar 3 : Pola Bangkitan dan Tarikan Perjalanan di Jabodetabek

Gambar 4: Pola Distribusi Perjalanan di Jabodetabek



Penggunaan angkutan sepeda motor, mobil dan angkutan umum berdasarkan kategori masing-masing panjang perjalanan dapat dilihat pada Gambar 5 berikut ini



Gambar 5: Penggunaan Masing-masing Jenis Angkutan Berdasarkan Jarak

3. Kebutuhan Perjalanan di Jakarta

Kebutuhan perjalanan di kota Jakarta harus dilihat berdasarkan kebutuhan perjalanan wilayah Jabodetabek yang mempunyai pengaruh kuat terhadap pola pergerakan di kota Jakarta. Pola pergerakan di Jakarta dapat dilihat pada Gambar 3 yang menggambarkan pola bangkitan dan tarikan perjalanan di Jakarta serta Gambar 4 yang menggambarkan pola distribusi perjalanan. Data jumlah penumpang Jabodetabek dari tahun 2006 – 2012 dapat dilihat pada tabel 4.

Dapat dilihat bahwa sebenarnya dengan penambahan kapasitas yang tidak berarti jumlah penumpang Kereta Api cenderung meningkat terutama tahun 2012, hal ini menunjukkan masyarakat menunggu pelayanan Kereta Api yang lebih baik lagi sebagai angkutan massal di Jabodetabek. Potensi kebutuhan pergerakan di Jabodetabek dapat dilihat dari distribusi perjalanan sebagaimana diperlihatkan pada Gambar 4.

4. Posisi Angkutan Umum Berbasis Rel dalam Sistem Angkutan Publik di Jakarta

Rencana pembangunan MRT dan Monorel di kota Jakarta terkendala beberapa hal yaitu:

- a. Masalah Ekonomi, perhitungan kelayakan ekonomi pembangunan proyek monorel dan masalah pembebasan lahan untuk proyek MRT.
- b. Masalah Rute, banyak usulan terhadap rute monorel walaupun rute monorel telah ditentukan pada studi sebelumnya yaitu jalur hijau dan jalur biru.
- c. Masalah belum jelasnya tata ruang di bawah tanah yang mengatur tentang hak dan kewajiban pemilik lahan di atasnya.

Sebagaimana diketahui angkutan berbasis rel merupakan angkutan umum yang termasuk massal dan jika dilihat seberapa massal masing-masing angkutan umum dapat dilihat

pada hirarki Angkutan Umum, yaitu sebagai berikut:

- MRT
- LRT
- Monorail
- Busway (BRT)
- Bus
- Metromini dan Kopaja
- Mikrolet dan Angkot
- Taksi
- Bajaj/ Bemo/ Andong/ Becak

Berdasarkan SK Gubernur no. 13 tahun 2007 tentang Pola Transportasi Makro di DKI Jakarta, angkutan umum berbasis rel berada di dalam rencana tersebut bersama dengan rencana-rencana lainnya yang dapat dikelompokkan dalam 3 kelompok yaitu:

- a. Pengembangan Angkutan Umum:
 - MRT / Subway
 - LRT / Monorail
 - BRT / Busway
 - Waterways
- b. Transport Demand Management
 - 3 in 1
 - Jalan berbayar
 - Pembatasan Parkir
- c. Peningkatan kapasitas jaringan
 - Park and Ride
 - Road Network
 - Pedestrianisasi/ NMV
 - ATCS / ITS

Jika dilihat dari biaya pembangunan seperti disampaikan pada Tabel 5 maka MRT menempati urutan tertinggi, kemudian Light Rail, Monorel dan terendah adalah Busway Transjakarta.

Angkutan berbasis rel mempunyai kelebihan dalam hal kecepatan dan daya angkut tetapi mempunyai kelemahan dalam

Tabel 5: Biaya Pembangunan Masing-masing Jenis Angkutan

Jenis Angkutan	Total Biaya	Biaya/km	Panjang Rute
MRT	17 Trilyun	940 Milyar/km	21 km
Light Rail	---	110 – 200 Milyar/km	---
Monorel	4 - 7 Trilyun rp	260 Milyar/ km	30 km
BRT	3 Trilyun rp	16 Milyar/km	184 km

penyediaan infrastrukturnya. Oleh karena itu pemerintah Pusat harus memberikan kontribusi lebih untuk pembangunan transportasi kota Jakarta yang merupakan ibukota dan pusat aktivitas pemerintahan termasuk pemerintah pusat.

Peran Pemerintah Pusat yang dibutuhkan untuk pembangunan transportasi kota Jakarta sebagai berikut:

- Sinkronisasi tarif BBG untuk transportasi umum (a.l Bus TransJakarta).
- Dukungan pengembangan dan perluasan pembangunan busway lanjutan.

- Optimalisasi KRL Loop-Line dan revitalisasi KRL Jabodetabek (Penambahan rangkaian gerbong dan jam operasi)
- Percepatan penyelesaian Peraturan Pemerintah untuk ERP.
- Implementasi Trans Jabodetabek.
- Implementasi pembangunan mass rapid transit (MRT).
- Pengembangan sistem jaringan monorel di Jabodetabek.

Simpulan

1. Angkutan Umum berbasis rel merupakan angkutan umum yang sangat dibutuhkan di kota Jakarta
2. Rute angkutan umum sebaiknya sejauh mungkin jadi rute yang terpanjang adalah rute yang lebih layak
3. Rencana MRT rute Lebak Bulus – bundaran HI dan rencana Monorel rute jalur hijau dan jalur biru merupakan rute yang diharapkan merupakan awal dari bangkitnya pembangunan sistem angkutan umum berbasis rel di kota Jakarta
4. Pengembangan konsep Transit Oriented Development (pengembangan kawasan sekitar stasiun) diperlukan untuk meningkatkan minat kepada angkutan berbasis rel.
5. Pembiayaan pengoperasian angkutan umum berbasis rel tidak bisa hanya mengandalkan dari tarif tetapi harus juga dari aspek pajak dampak pengembangan lahan dan pemanfaatan lahan di sekitar stasiun.
6. Demand Angkutan Umum di Jabodetabek merupakan suppressed demand atau demand yang menunggu sehingga seharusnya kita optimis dengan konsumen angkutan umum massal yang cepat.



CATALIZING ALLIANCES BETWEEN GOVERNMENT, RAILWAY OPERATOR AND PROPERTY DEVELOPER

IMPLEMENTING SUSTAINABLE URBAN TRANSIT FOR GREATER MOBILITY WHILE REALIZING TRANSIT ORIENTED DEVELOPMENT (TOD) SCHEME

Tri YANTONO¹ Adi SUSATIO²

Transit Oriented Development (TOD) is a relatively new type of urban and suburb development, where land use and the design of a neighborhood is closely tied to efficient and attractive public transportation. Homes and businesses can become connected in a transportation network that provides for all possible options: train, bus, car, bicycle and walking. It is mixed-use neighborhoods that are supportive and benefit from public transit by virtue of their location, planning and design. At its simplest level, TOD can be viewed as an effort to plan land use and organize physical development so that people can get to places they live, work and play by transit as well as by automobile. In this context TOD can enhance economic development and promote more sustainable patterns of urban growth.

TOD principles are appropriate for many urban and suburban situations, given contemporary problems of traffic congestion, air pollution, less dependence on expensive petroleum-based fuels, and rapidly changing demographics.

Definition of Transit Oriented Development

- TOD is an integrated Urban Railway - Property Development Model which represents a unique approach in handling the relationship between railways and land development.
- It is more than a simple combination of railway and property. It is not solely as the integrated railway and property development projects above stations, instead it gives a more comprehensive synergy in terms of social as well as economic value.

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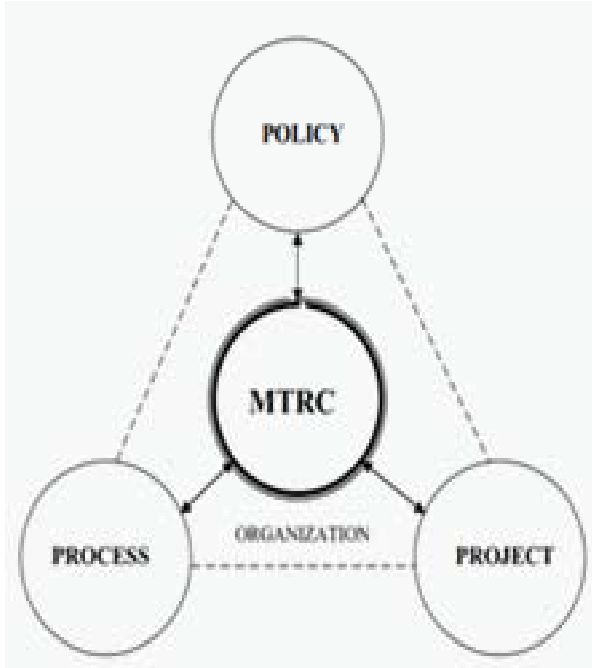
The Elements of the Model

The model has four principal elements as shown in the figure below:

- (a) Policy: Favorable government policy support in terms of its exclusive land grant to the SPC and its commitment in mass transit railway as an essential mode of public transport.
- (b) Process: Good planning, management and control procedures and effective development processes that seek to maximize the synergy between railway and property from the stages of project inception to completion.
- (c) Project: Development of high-quality real estate projects that contain high development density, appropriate land use diversity and attractive layout design and integrate well with

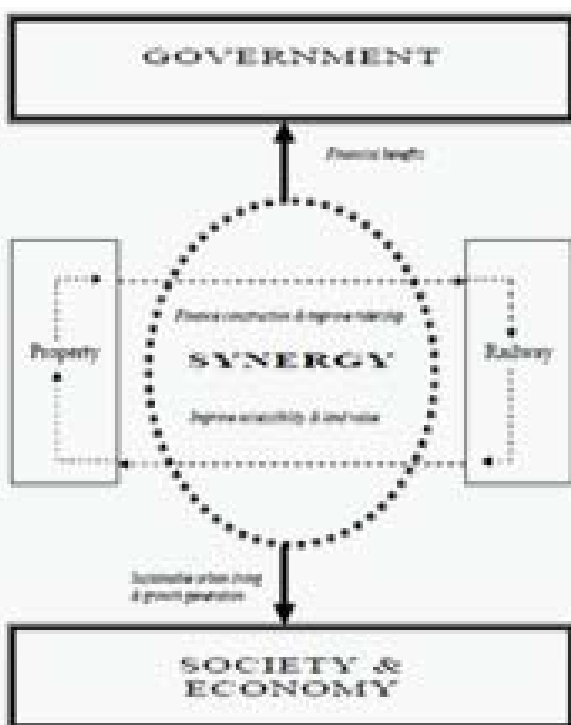
the railway facilities at the appropriate locations (stations and depot) and at the right timing.

- (d) Organization: A well-experienced and efficiently managed company (Special Purpose Company – SPC) that is committed to providing world class railway services and developing top quality property development projects in order to enhance the quality of life in Jakarta.



The benefits generated by the synergy of integrating Urban Railway and Property Development.

An integration of Urban Railway and Property Development as shown in the next figure.



Integration of Urban Railway and Property Development is expected to generate the following key social and economic benefits:

- (a) Railway - Urban rail transit will significantly improve the land value around the stations and depot. By capturing these values through property development and other means, the railway operator can finance the construction of the urban railway.
- (b) Property - Intensification of development density of the land around railway stations will improve the ridership of the railway and hence sustain its operational viability.
- (c) Government - The government can receive financial gains in terms of the land premiums generated from property development of the station and depot sites, a higher level of rates from private properties with improved accessibility and other monetary returns on railway operations (if owned by the government). Furthermore, the government is not required to subsidize the operations of the railway if it is financially sustainable.
- (d) Society & Economy - Society at large achieves a more sustainable form in terms of the compactness of urban development, more efficient use of scarce urban space, more open space, less urban sprawl, fewer roads, reduced air pollution from cars, and improved pedestrian-friendly environment. All these features can enhance the overall quality of urban life characterized by improving health, better convenience, greater diversity of life style and more time saving. The economy will equally be benefited as a result of the improved efficiency in transport and human activities.

The respective roles of the Government, the SPC, and the Property Developers under this integrated Urban Railway - Property Development Model, are :

- The Government creates a favorable incentive and constraint environment, sets major policy objectives of strategic and territorial nature that take into account the public interest in connection with the joint development of the mass transit railway and station property.
- The property developers are responsible for implementing the projects subject to the site-specific requirements and the deals agreed in connection with the joint development.
- The SPC acts as the intermediary between the government and the developers for coordinating



Compact Mixed Land Use Development around Chai Wan Station



Tierra Verde above Tsing Yi station

the implementation of the joint development projects, converting strategic objectives into site-specific requirements, transforming policies into deals and balancing possible conflicts between public and private interests.

The critical factors and conditions conducive to the successful implementation of integrated Urban Railway - Property Development

The benefit of integrated rail-property development does not come about naturally. It requires an appropriate institutional framework for successful implementation. This framework covers issues that are external and internal to the railway operator.

An institutional model shown in the figure below highlights the critical success factors to achieve such integration.

The success factors are:



(a) Urban Factors

- Healthy growth urban economy, especially a strong property market
- The public is generally receptive to compact, high-density development and the use of public transit

(b) Government Policy Support

- Supportive government policies in regional planning, land grant, high-density zoning

around railway stations and urban growth management

- Complementary public transport policies in controlling other alternative modes of transport such as automobile ownership, vehicle and taxation, parking, competing public bus services, transit subsidies, and so on.

(c) Railway Operations

- Provision of safe, convenient and reliable transport service commensurate with its fare
- Top-class management of railway services in terms of train frequency, transfer between different modes, cleanliness and security management.

(d) Property Planning & Design

- High development density around stations
- Attractive property/station design and land use mixes

The socio-economic benefits generated by the SPC integrated rail property development model

The model generates the following social and economic benefits:

- Increase MTR ridership, reduce road traffic and thus lessen the need for more road construction;
- Enable comprehensive planning and development of the station site and increase its overall property values;
- Concentrate land development and urban activities around the stations and reduce urban sprawl;
- Promote walking with the provision of safe, direct, efficient, convenient, weather-free and pleasant pedestrian connections with the stations;
- Enhance diversity of land uses and urban life;
- Enable travel time saving and road safety benefits;
- Create positive impacts on property values within the railway catchment;
- Generate financial gains to the government in terms of increasing property rates, taxes and land premiums;
- Achieve financially sustainable railway development and operation without the need of public subsidy;

- (j) Enhance environment health benefits in terms of reduction in roadside pollution (as a result of less road traffic), decrease in government medical expenditure and productivity gains (due to healthier workforce) ;
- (k) Encourage rejuvenation and redevelopment of the older urban areas along railway catchment;
- (l) Provide possible increase in employment opportunities;

**MTR CORPORATION LIMITED (MTRC)
HONG KONG**

The MTR Corporation (MTRC, Hong Kong) is one of the success stories which have adopted TOD or the integrated Urban Railway - Property Development Model, which entails an integration of urban mass transit railway and high-density property development at the station areas. This unique Hong Kong model has achieved high regard internationally. Many Mainland Chinese cities have shown a keen interest in adopting this model for building their urban mass transit systems.

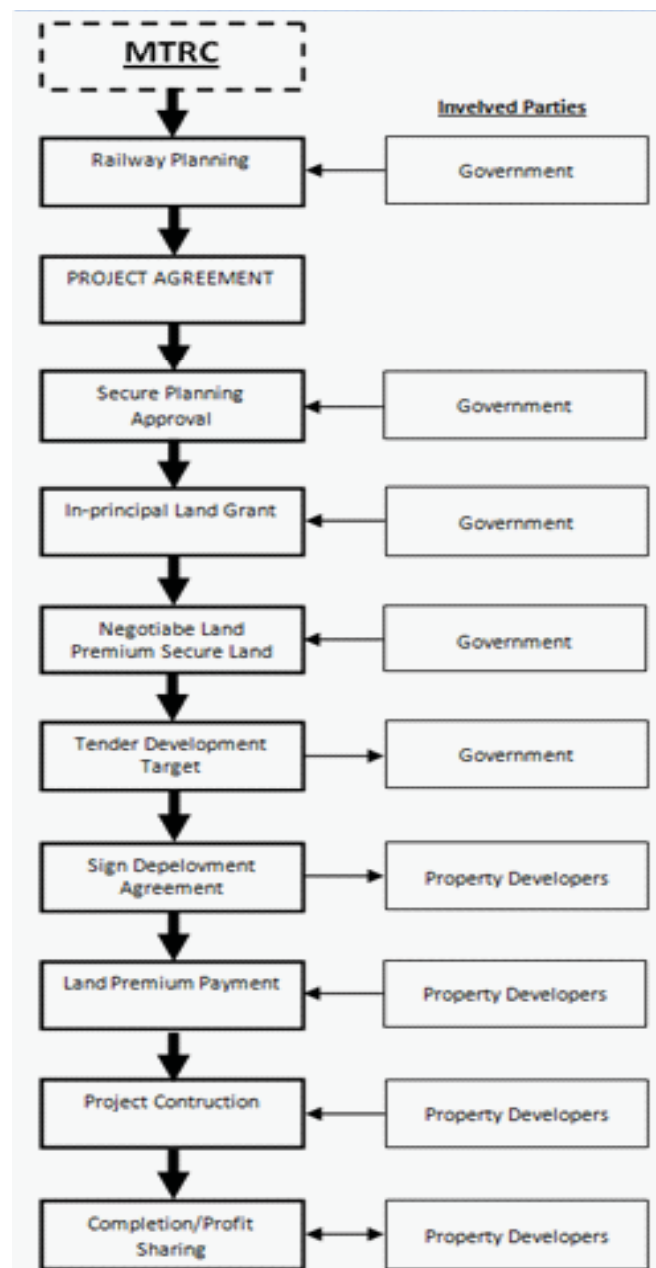
The MTRC is a highly reputable and profitable company. In 2003, its net profits reached HK\$4,450 million, an increase of 24.3% over 2002 (MTRC, 2004), and its credit ratings have consistently achieved the investment grades. Established since the mid-1970s, the MTRC has carried out its missions of constructing and operating, on prudent commercial principles, a mass transit railway, which now constitutes an integral part of the public transport system in Hong Kong. The Hong Kong Special Administrative Region (HKSAR) Government was the sole owner of the MTRC until October 2000, when about 23% of its shares have been privatized and traded in the stock exchange. Hong Kong MTR is undoubtedly one of the most successfully built-and-operated infrastructure projects by the world standards.

Opened since the late 1970's, the MTR has significantly transformed the intra-urban travel patterns in the territory. With a total route length of over 87 km, the MTR connects the airport and the densely populated corridors in the urban area. In 2003, it carried over 2.24 million passengers during an average weekday. This patronage took up around 24.3% (second to bus services) of the total market share within the franchised modes of public transport in Hong Kong (MTRC, 2004).

Apart from railway operations, the MTRC has also engaged in property development. Real property is expected to contribute to the business of the MTRC in two ways.

First, it provides an important source of income to finance the construction of the railway projects. Second, the completed property development creates immediate population catchment areas that contribute to the patronage of the railway. In joint venture with the private developers, the MTRC has been undertaking development of many high-density residential estates and up-market commercial projects in the territory. It has established a track record not only for planning but also managing the property development process on railway station areas.

MTRC Property Development Process: Key Aspects





Shopping Centers Connected to Chai Wan Station



BANGKOK MASS TRANSIT SYSTEM

Bangkok Mass Transit System Public Company Limited (BTSC), established in 1992, is the operator of the privately-financed mass rapid transit system in Thailand. The company operates the BTS under a 30-year design-build-own-operate-transfer (DBOOT) concession granted by the Bangkok Metropolitan Administration (BMA). Under the terms of the concession, the company has the right to collect fares and undertake all commercial activities on the system, including advertising and leasing space, throughout the term of the concession. The concession started when the system opened for commercial operations on 5 December 1999.

The company has faced financial difficulties since commencing operations. Operating performance was lower than expected because of lower ridership than forecasted, while debt increased substantially after the depreciation of the Thai baht, which resulted in a surge in interest expense. BTSC defaulted on its principal payments in 2002. Discussions with creditors on a debt restructuring plan have started since then, but no tangible progress was made. In 2006, BTSC decided to bring the issue to the Bankruptcy Court and filed for business rehabilitation on 20 February 2006.

Since the rehabilitation, the company ownership

structure was changed due to some debt to share swap arrangements. But for long term business sustainability these arrangements was considered inadequate. The company then, made diversification business that integrates with the railway business. Since then the company started to integrate with property development by acquiring two property developer companies. On 12 March 2009, the company signed a sale and purchase agreement to purchase two pieces of land on Nana and Phyathai roads from Thavee Asset Management Co., Ltd., a subsidiary of Bangkok Bank PLC.

Other than that, the company also acquire a plot of land with four unfinished structural buildings,



BTS Nana Skytrain Station

with an estimated total usage area of approximately 236,000 square meters (sq.m.) located on Phaholyothin road near Central Department Store (Ladprao Branch). On this site, the company through its subsidiary plans to develop a medium- to high-end residential condominium.

In May 2009, BTSC acquired another property developer company who owns two pieces of land situated on Surasak road and Phaholyothin road. The Surasak land has an area of 3,828 sq.m located on South Sathorn road, which can be linked to the BTS Surasak station. The land on Phaholyothin road has an area 25,052 sq.m located near the BTS head office.

These land developments along the routes as well as network expansions, are the driver factor that increase the train ridership in recent years



Siam Paragon Shopping Mall

Lessons from MTRC and BTS

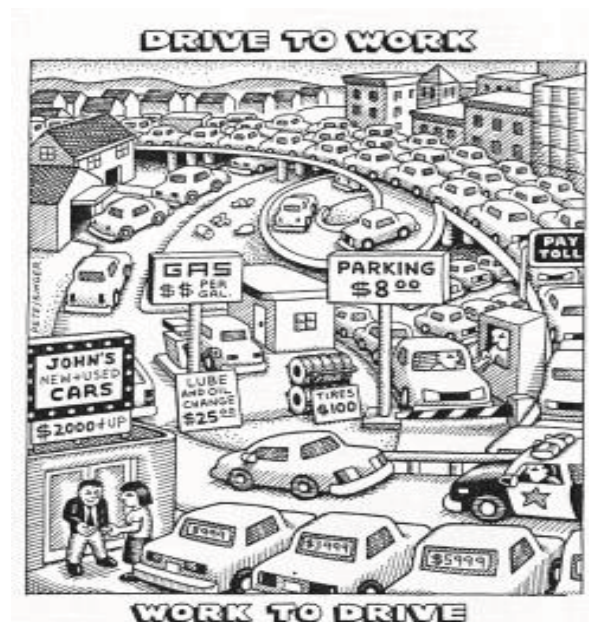
Securing financing for a TOD project may thus be more difficult than for conventional suburban subdivisions. Well-intentioned developers are frustrated by rules imposed by lending institutions that discourage mixed-use development. Lenders who finance such developments are also frustrated by having capital tied up in loans that are performing well but which cannot easily be resold in the secondary market because of the rigid underwriting requirements.

These secondary markets have been organized for many years around the same concepts as zoning ordinances – single uses separated out into different pods of development, such as most easily flowed to developments with a dominant single use. Some signs of flexibility are emerging, but changes in the thinking of financial institutions at this level are slow.

While it is difficult for local governments to overcome these barriers single handedly, they can serve as a catalyst to bring financial institutions and developers together to discuss ways to meet the requirements for more flexible lending standards. Local governments can also offer a Tax Allocation District and offer tax-exempt public bonds to finance construction of some or all of a TOD project. Using such an approach in combination of wide variety of lifestyle options suited to fast

changing demographics would be one good way to draw private investors into a Transit Oriented Development.

Implementation in Jakarta region, to be developed as accordingly to the policies which initiated by the Governor in realizing Transit Oriented Development. The foremost scheme will be started with developing residential areas utilizing land which owned by government in large scale, which are not optimally utilized thus far, by implementing the Transit Oriented Development approach which eventually intentioned to reduce passenger travel demand, and applying High Best Use (HBU) for mentioned land.



The Indonesia Railway: What Lies Ahead and How to Get There

Suyono DIKUN¹



I. Background

The Government of Indonesia has moved ahead with several policy actions following the issuance of Railway Law No. 23/2007. It is probably worthwhile at this moment to discuss several policy actions that have been delivered by the government in its efforts to revitalize railway sector and probably to prepare for a better future railway as mandated by the law and to remind all stakeholders that Indonesia railway had indeed been directed by the law and its associated regulations and policies into a future condition heading towards modern and efficient business and services.

According to the National Railway Master Plan and the Master Plan for the Acceleration and Expansion of Economic Development (MP3EI), government would also develop railway systems in other big islands to anticipate the regional economic growth and the development of the six economic corridors. Private sectors and local governments are expected to come and invest in the railway development, especially in the regions where railway is currently not in existence. This way, rail infrastructure, rolling stocks, network, and services would expand far beyond what it is now. Clearly, rail reforms must also be accompanied by new railway financing schemes to ensure the involving parties, the government, the SOEs, the private sectors, and local governments, play its specific role in achieving a developed, efficient, and reliable railway system in Indonesia. Despite of big changes in legal and regulatory frameworks, institutional settings, and sector management mandated by the law, nevertheless, rail sector reform seems to proceed very slowly in Indonesia.

¹Prof. Dr. Ir. Suyono Dikun, MSc. - *Professor in Transport and Infrastructure Policy and Management at University of Indonesia*

But all the policy initiatives seem to be insufficient and ineffective. More than six years had elapsed since the issuance of Railway Law and yet the overall condition of Indonesia railway has practically remained the same. Strategic policy and institutional actions mandated by the law have not been fully executed yet and there is no indication so far that government would move vigorously to do the railway reforms in a very near future in a rapid fashion manner. Practically, PT KAI remains as the monopoly holder and is still conducting its railway business in a vertically integrated manner, precisely the same conducts under the monopoly law. Although some advancement in the operation and corporate conducts had been made in the last several years, nothing significant had practically changed in the institutional setting and market structure and both government and the operator appear to be holding the *status quo* simply because there is neither incentive to do the changes nor there is a strong champion to trigger the reform movement, or simply because things had become so complex that do almost nothing is seemingly the most comfortable way to behave. The primary cause of this standstill condition appears to be the lack of strong leadership and championship in the railway and transport sector.

II. Law Number 23/2007 on Railways

Law Number 23/2007 is the first law in transport sector that starts a history by dismantling public monopoly in railway sector, which had been around for many decades, and opening

¹Badan Usaha could only be in the form of either *Persero* (PT), the limited liability entity, and *Perum* (Public Company). Railway Law does not mention PT KAI, the incumbent operator, in its deliberation, except that the current operator must continue to do usual business but after three years has to be in conformity with the Law.

rail market, industry, and services to private sector. Articles 23 and 31 respectively stipulates these by saying that both infrastructure and operation of railway services are provided by an economic legal entity or a corporation¹. An infrastructure corporation is interpreted as a track authority, an institution that on behalf of government is managing, maintaining, and operating the rail infrastructure services to be utilized by operator(s). Article 214 of the law provides a 3-year transition time for both the operator and the regulator to comply with the law. The 3-year time is also to be used by the government to improve the condition of the current operator, PT KAI, by taking such strategic actions as conducting a total audit of the operator, to do the inventory of infrastructure and rolling stocks, to clear up the status of Public Service Obligation (PSO) and Past Service Liability (PSL) of former government officials, and to make a new financial balance sheet of PT KAI. But six years have elapsed and both operator and regulator have not been complied with the law. The government has not even started to prepare the regulation and institution settings of the track authority. The incumbent operator does not seem to be ready to transform itself into a competition and still behaving as the vertical integration and monopoly holder.

The issuance of Railway Law Number 23/2007 will eventually change the Indonesia railway business configuration significantly. It is in fact a rail sector reform in which monopoly and its corresponding vertical integration is no longer permitted by law and where rail infrastructure would be managed separately by a track authority. The law also mandates the establishment of entities that own rolling stocks, operate and manage the rail services with and without cooperation with the incumbent operator. The long-term objective of the reform seems to be the creation of multi-operators, a logical policy given the great demand of economic mobility in the country and the current heavy reliance of national economic movements on road transport.

III. The Railway Revitalization Programs

In spite of the shortcomings, however, the Railway Law has paved the way for further railway sector reforms leading to multi-operators situation in which competition among operators could be created in healthy business environment. To prepare this, a National Railway Revitalization Team was established on April 3, 2008 with a decree of Coordinating Ministry for Economic Affairs No. KEP-18/M.Ekon/04/08 with the main tasks of coordinating the general policy of railway sector and finding strategies for the acceleration of Indonesia railway revitalization programs, and determining strategic actions to be executed in revitalizing the sector. In its Final Report, December 2009, the Revitalization Team recommended that the revitalization comprehensively covering revitalization in the sector, revitalization in the rail related institutions, corporate restructuring, and the development of strategic railway projects. In revitalizing the railway sector, the Revitalization Team strongly recommended that the railway must be closely linked with the economy by enlarging railway market for both passengers and freight. Railway in Indonesia shares only around 7 percent of the total national passenger market and a negligible 0.67 percent of the total cargo movements. Another reason for increasing rail market share is the fact that for long period of time economic mobility in Indonesia had been relied upon road networks which carried up to more than 90 percent of cargo movements,

especially in the developed regions of Java and Sumatera. It was recommended that government takes a championing role in the efforts to shift some burdens away from road to rail by means of regulations, institution, tariff setting, investment, and other fiscal and non-fiscal incentives.

Revitalizing the rail institutions is probably the hardest things to do that would require a champion, able to integrate different views from different agencies and to determine railway as the backbone of national transport system and in the same time as a core of a multi modal transport system in Indonesia. The Revitalization Team estimated that railway revitalization would require huge investment costs of around IDR 120-200 trillions until 2020, or about IDR 15 trillion per year. Executing this magnitude of investment will require a strong institution capable to absorb the funds and to deliver development projects. The regulator, i.e. the Directorate General Railways of Ministry of Transportation would need to be strengthened as to be able to prepare viable railway projects for local governments and private investors to invest in railway development. With the exception of special railways, the implementation of open market principles in the Law 23 would not immediately attract private investors to invest in public railways, even if infrastructure is to be made available by the government. There are some prerequisites for them to come in and government is supposed to make those conditions available and conducive. Capacity and quality in the institution that operate the railway system would also be critical in translating the policy, strategy, and programs into manageable and sustainable activities leading to modern railway system in Indonesia. One of the many pillars for the successful railway revitalization programs is therefore the strong commitment and political will of the government to build national railways with large capacity and high quality due to the fact that a major investment of rail infrastructure would become the obligation of the government. This, again, would need a strong government institution to carry the task and to deliver.

The Revitalization Team believed that the future of Indonesia railway would depend on the future of the incumbent operator, PT KAI. Articles 23 and 31 of Law 23/2007 stipulated that the provision of both infrastructure and rolling-stock operation would be provided by a separate entity both as a stand-alone entity or a consortium. In case there is no such rail entity exists, government or local government can behave as infrastructure or operation provider. The articles state explicitly about entity or company (*Badan Usaha*) and can be interpreted as a liberalization step to open the rail market for private sectors. Corporate restructuring of PT KAI is closely related with the options offered by the articles. In term of infrastructure provider, three possible options were observed: (i) PT KAI will stay as the vertical integration; (ii) A consortium between PT KAI and other entities; and (iii) Government establishes a new entity as infrastructure provider. The Revitalization Team had the opinion that whatever option is chosen by the government, it would be better-off if government takes an interim solution as a transition to keep continuity of rail operation. One of the interim solutions would be allowing PT KAI to form a division or sister company as an infrastructure entity. This entity could be regarded as an embryo for an infrastructure company and in due time could be transformed into an independent track authority (*Badan Usaha Prasarana Perkeretaapian, BUPP*). In the meantime,

market for rail operation could be opened up for new operators and the track access charges could be imposed.

IV. The Railway Strategic Plan

In April 2010, Ministry of Transportation released its Strategic Planning (*Renstra*) of Railway Sector 2010-2014. In the *Renstra*, government outlined its policy initiatives to continue reforms and restructuring of railway sector through 12 steps of policy actions including among others, the strengthening of regulations and institutions to execute the mandates of the Railway Law 23/2007, encouraging local governments and private sectors to participate in the long journey to multi operators through public-private partnership, and refining and enhancing the quality of PSO-IMO-TAC schemes. **Table 1** shows that in the *Renstra*, government

would rehabilitate, upgrade, and build railway infrastructure in Java and Sumatera, including programs in rolling stock, safety, institutional development and human resources with estimated total costs of Rp. 33.8 trillions. Infrastructure is the biggest proportion with an estimated budget of Rp. 27.8 trillions. In terms of specific railway financing, *Renstra* had also projected the PSO and IMO budgets based on macroeconomic measures and inflation as shown in **Table 2** below. In terms of railway development programs, **Table 3** depicts the budget required for railway development in Java, Sumatera, and Kalimantan covering rehabilitation, upgrading, and development of new tracks and safety programs.

V. The Railway Master Plan

The National Railway Master Plan has been officially declared by the Minister of Transport Decree No. 43/2011. The Master Plan serves as a national guidance for railway

Table 1: Estimated Budget for Railway Development Programs 2010-2014 (Rp. Billion)

Programs	2010	2011	2012	2013	2014	Total
Management	44.21	54.08	62.08	70.50	81.80	312.67
Rail Traffic	119.18	131.85	143.70	149.45	154.60	698.78
Rail Infrastructure	3,272.84	5,042.84	5,042.84	6,264.48	7,582.45	27,806.85
Rolling stocks and Safety Programs	293.23	816.21	816.21	1,246.09	1,531.36	4,974.23
Total Renstra	3,729.46	6,044.98	6,937.36	7,730.52	9,350.21	33,792.53

Source: Strategic Plans, 2010-2014, DGR-MoT, 2010

Table 2: Projected PSO and IMO 2010-2014 (Rp. Billion)

	2010	2011	2012	2013	2014	Total
PSO	668.66	709.00	755.00	806.00	864.00	3,802.66
IMO	1,000.00	1,100.00	1,200.00	1,300.00	1,400.00	6,000.00
Total Renstra	1,668.66	1,809.00	1,955.00	2,106.00	2,264.00	9,302.66

Source: Strategic Plans, 2010-2014, DGR-MoT, 2010

Table 3: Projected Railway Development Budget by Regions 2010-2014 (Rp. Billion)

	2010	2011	2012	2013	2014	Total
Java	3,342.78	5,888.10	6,548.43	9,711.67	12,289.59	37,780.58
Sumatera	748.27	2,239.58	11,503.05	17,361.61	18,614.22	50,466.73
Kalimantan	-	-	9,800.00	9,900.00	13,320.00	33,020.00

Source: Strategic Plans, 2010-2014, DGR-MoT, 2010

Note: For Sulawesi, railway development programs until 2014 will be focused on studies and preparation works for railway lines between Bitung-Manado, Makassar-Pare-Pare, and Gorontalo-Bitung. A study will also be conducted for urban railway in greater area of Makassar-Maros-Sungguminasa-Takalar.

development programs. It was recommended by the Revitalization Team that beside of physical development, the Railway Master Plan must also to the most extent possible contains the working agenda of the principles and policy reforms mandated by the law. The Master Plan, has nevertheless failed to do so and the projections of both rail markets and development projects are seemingly lacking of strong rationales and academic background. It is the consequence of the declaration that all programs listed in the Master Plan have to be subsequently reflected in the 5-year Strategic Plans and

the annual development program of the Directorate General of Railway (DGR) of the Minister of Transportation. The DGR might want to revise its Strategic Plans as to reflect the substance of the Master Plan in an annual basis along with its business, investment, and financing strategies.

The railway development programs (2011-2030) listed in the Master Plan is broadly depicted in **Table 4** below. The Railway Master Plan projected that until 2030 Indonesia would have a 12,000 km railway track distributed over 6,800 km network in Java, 2,900 km in Sumatera, 1,400 km

in Kalimantan, 500 km in Sulawesi, and 500 km in Papua. Around 4,800 unit locomotives and 67,615 unit railcars would also be needed to operate the enhance railway lines in Java and new lines in Sumatera, Kalimantan, Sulawesi, and Papua. These railway development programs include the creation of Trans Sumatera Railways and the development of High Speed Train in Java. All these programs are estimated to cost around

USD 67.2 billion consisted of USD 33.2 billion for rolling stocks and USD 34 billion for infrastructure.

The Master Plan, however, has no detail description on how this investment would be financed, program by program and project by project except mentioning casually the role of public-private partnership in railway development. Although

Table 4: Major Development Programs in the NRMP 2030

Regions	Track Length (km)	Rolling Stocks (Unit)		Urban Rail Track Length (km)	Urban Railcars (Unit)	Energy Need	
		Loco	Railcars			Diesel Fuel	Electricity
Java, Bali, Madura	6,800	3,595	45,940	2,206	3,072	2,300	30,657
Sumatera	2,900	905	16,605	1,144	2,432	338	4,498
Kalimantan	1,400	115	2,045	-	-	48	630
Sulawesi	500	155	2,510	310	512	115	1,532
Papua	500	30	515	-	-	8	72
Total	12,100	4,800	67,615	3,660	6,016	2,809	37,389

Source: NRMP 2030, DGR-MoT, 2011. Fuel in thousand liter/day and electricity in thousand KWh/day

it is probably true that Public Private Partnership and or Private Financing Initiative (i.e. the Special Railway) in Indonesia long-term railway development programs would constitute a critical part of the total project financing, the implementation, however, would require extensive improvements on regulations and government guarantee schemes.

VI. The Future of Indonesia Railway

Indonesia economy is advancing. The fundamental of economy is strong and resilience, and for the last several years macroeconomic indicators are stable and promising. Investment climate is improving significantly and was rated as Investment Grade by Fitch and Standard & Poor rating agencies. Government has also shown its decisiveness to accelerate and expand its economic development by some strategic plans at hand; the Economic Corridors, national logistics system, special economic zones, and a handful of sector master plans. All plans would in the end touch infrastructure development as a major means to accomplish the goals. Transport infrastructure-ports, roads, railways, and airports- are in the core of all economic plans, without which efficient economic movements are almost impossible to undertake. But it is highly recommended that government develops a political economy and takes a stern position in the balancing and financing of different modes of transport system networks in order to fully serve the future economic mobility generated by the strategic development plans. For such a promising climate of economic advancement, it is necessary to project what would be the advancement of Indonesia railway sector in order to position itself within the economic mainstream. The followings are examples of interfacing that would need to be created between the railway sector and the economy.

² In the Railway Law, a track authority is an economic entity or company that on behalf of government, the rail infrastructure owner, manages, maintains, and makes a contract with a third party for infrastructure maintenance and operation.

a.) *The Acceleration and Expansion of Economic Development*

With the issuance of Presidential Regulation (Perpres) Number 32/2011 on May 20, 2011, government launched the Master Plan for the Acceleration and Expansion of Indonesia Economic Development 2011-2025 (MP3EI). In the core of the Plan lies the concept of the Economic Corridors, the regional development type of Plan, with industry, mining, plantations, and manufacturing as the drivers of economy. The Plan has the spirit of not doing business as usual, meaning that the Plan must be implemented in such a rapid fashion manner with no or little bureaucratic hurdles and without too much depending upon the government budget. The Private investment is therefore imperative and would probably constitute more than half of the total investment in the corridors. The main objective of MP3EI is to enable Indonesia to convert itself to a developed economy with national GDP of around USD 4-4.5 trillion by 2025 and becoming the ninth largest economy in the world. It is projected that around 82 percent of national GDP would be contributed by the economic activities and productions in the economic corridors. This in turn would create spillover effects into other regions outside the corridors. The development of economic corridors in Indonesia is based on the potential and advantages inherent in each region throughout Indonesia.

The grand design of the economic corridors with all political supports attached to it would mean almost nothing without the massive development of transport infrastructure along the corridors to connect all the economic potential and products with the outlets (ports and airports). Besides roads and toll roads, railway transport, especially freight rail, would probably be a better means to transport the cargo. The MP3EI has provided some indications of the railway development projects in support for the economic corridors programs, as shown in **Table 5** below. Most of the projects would be financed through either government budget or state-owned enterprises, or both. It is still debatable, however, whether

government and SOEs financing could do it alone without private investment.

b.) Multi Operators

Law 23/2007 has paved the way for Indonesia railway to reach a condition of multi operators in which different entities

Table 5: Identified Railway Investment in the Economic Corridors

Regions	Projects	Funding	Time Schedule		Investment (IDR Tn)
			Start	Finish	
Java	North-South MRT Jakarta Phase I & II	G	2012	2016	40,000
	Manggarai-Bekasi Double Double Track and Electrification	G	2011	2019	8,300
	Surabaya-Pasar Turi-bandara Juanda Elevated Track (26 km)	G	2011	2015	0,760
	Railway Lapindo Substitute	G	2011	2015	0,760
	Surabaya Intercity (50 km)	G	2015	-	0,760
	Double Track & Electrification Duri-Tangerang (20 km)	G	2011	2015	0,665
	Serang-Maja-Rangkasbitung (32 km)	G	2011	2020	0,487
	Electrification Padalarang-Bandung-Cicalengka 45 km and Kiara Condong-Cicalengka (22 km double track)	G	2012	2019	0,304
	Electrification Citayam-Nambo (20 km)		2011	2014	0,304
	Jakarta Monorail Green Line (14.7 km)	SOE	2011	2014	9,100
	Jakarta MRT East-West Corridor	G & SOE	2015	-	30,000
	Double Track Semarang-Bojonegoro-Surabaya (185 km)	G & SOE	2013	2018	9,500
	Soekarno-Hatta Airport Rail Link	G & SOE	2012	2015	2,270
	Double Track Pekalongan-Semarang (88 km)	G & SOE	2012	2014	1,800
Sumatera	Sunda Strait Bridge	G	2011	2025	150,000
	Kertapati-Simpang-Tanjung Api Api	G	2012	2015	25,000
	Sigli-Bireun-Lhokseumawe (172 km)	G	2011	2015	5,175
	Araskabu-Kualanamu Airport (19 km)	G	2013	-	2,150
	Coal Rail South Sumatera-Lampung	G	2013	-	0,802
	Bandar Tinggi-Kuala Tanjung (18.5 km)	G	2012	2013	0,400
	Sei Mangke-Kota Lima Puluh	G	2011	2013	0,150
	Coal Rail Tj. Enim-Lampung dan Tj. Enim-Kertapati	G	2011	2014	4,000
	Muara Enim-Tanjung Carat incl. Coal Port Tanjung Carat	G & SOE	2012	2014	17,000
Tanjung Enim-Lampung (300 km)	G & SOE	2011	2015	15,300	
Kalimantan	Puruk Cahu-Tanjung Isuy (203 km)	G & SOE	2015	-	20,300
	Puruk Cahu-Bangkuang (185 km)	G & SOE	2015	-	15,000

Source: MP3EI, 2011. G = government, SOE = State Owned Enterprises

runs a market segment of rail operation for both passengers and freight services. The National Railway Master Plan has indicated the development of rail systems for Sumatera, Kalimantan, and Sulawesi, as well as for 12 urban rail systems. The MP3EI programs described above have also hinted the railway development along the economic corridors. All these new railway lines could very well be operated by different operators, be it state-owned enterprises, local government operators, private operators, or a consortium of operators. If government could work hard to make this happens then railway as an industry can grow rapidly as an actor in the economic undertakings

c.) Special Railways

Special Railways is stipulated in Article 5 of the Railway Law No. 23/2007 and is defined as the railway that is used for the purpose of supporting the economic activities of any economic entity and should not be used for public. The provision of Special Railway is regulated by the Minister of Transport Decree No. 91/2011. Article 3 of the decree specifically mentions mining, plantation, agriculture, and tourism as the sectors in which a special railway could be provided to transport the products and its associated economic activities from the production

site to the outlets. Most special railways would probably be developed using private financing initiatives that do not need government funding, except for land acquisition, permits, concession, and license. Special railways proposal could be either solicited or unsolicited. It is recommended, however, that government lays out the railway networks dedicated for special railways and to indicate whether the part of the networks should be financed by private sectors.

d.) National Logistics System

Government issued Presidential Regulation Number 26/2012 on the Blue Print of National Logistics System Development (SISLOGNAS). Seven categories of Action Plans were outlined in the Blue Print and one of them is the action plan category for transport infrastructure which contains 18 action plans. Action Plans Number 13 and 14 explicitly state the development of long-haul freight railways in Sumatera, Java, and Kalimantan, and the enhancement of railway capacity and services with the timeline between 2012-2015. Rail access to airports and ports, including to Tanjung Priok port, were stated in the Plans. This includes railway access to container terminals, dry ports, and industrial estates along the corridor lines. In the stage II of the logistics development plans (2016-2020), Trans Java and Trans Sumatera Railways have to be developed and freight rails must already be operational in the stage III, 2021-2025.

e.) Intermodal Transport System

Intermodal Transport System is a legitimate concept for supporting the logistics and distribution system in Indonesia. The intermodal system would function as the core of national logistics and distributional system and would ease cargo movement from industrial complexes and other special economic zones to ports and airports leading to export and import mobility. It is perceived that such an intermodal system would be constructed from different modes of transport, i.e., rail, road, short sea, and air, in such a way that each mode will play its unique own role and all modes will be integrated by a seamless flow of cargo movement from the hinterland to the outlets. Integration will also be taking place in the administration and documents following the freight movements. But Indonesia does not have such a system right now and cargo movements are heavily dependent upon road networks which itself had become more and more congested. Railway development and increasing role of railway in the economy would trigger the existence of multimodal transport system.

VII. INDONESIA RAILWAY FINANCING

a.) Annual Development Budget

Intermodal Transport System is a legitimate concept for

³ PT KAI has also allocated its own budget for some maintenance works and for purchasing new fleet of railcars and locomotives. It has also mobilized funds from external sources for capacity expansion. Due to lack of data the size of investment cannot be revealed here.

⁴ PSO, IMO, TAC stand respectively for Public Service Obligation, Infrastructure Maintenance and Operation, and Track Access Charges, a financial scheme originated from the World Bank's Railway Efficiency Project in 1999 but had never been implemented in full scale up to now.

supporting the logistics and distribution system in Indonesia. The intermodal system would function as the core of national logistics and distributional system and would ease cargo movement from industrial complexes and other special economic zones to ports and airports leading to export and import mobility. It is perceived that such an intermodal system would be constructed from different modes of transport, i.e., rail, road, short sea, and air, in such a way that each mode will play its unique own role and all modes will be integrated by a seamless flow of cargo movement from the hinterland to the outlets. Integration will also be taking place in the administration and documents following the freight movements. But Indonesia does not have such a system right now and cargo movements are heavily dependent upon road networks which itself had become more and more congested. Railway development and increasing role of railway in the economy would trigger the existence of multimodal transport system.

b.) The PSO-IMO-TAC Schemes

Table 7 depicts the PSO budgets from fiscal years 2008 to 2012 that have been allocated to MoT on the basis of Joint Ministerial Decree. The determination of PSO based on MoT Decree No. 34/2011 has created some problems due to lack of detail guidance on the size and segment of services, e.g. per service line or per passenger-km, and no clear separation between allowable and non-allowable costs. Also the determination of 70 percent load factor is against the real fact as rail passenger in Jabodetabek, for example, has always exceeded the available seating and standing capacity of the train.

The PSO, IMO, and TAC Scheme was originated from policy improvement program of the 1999 World Bank's Railway Efficiency Project Loan but had never been implemented by the government in a full scale basis due to such reasons as lack of clear and transparent costing structure, regulation, and lack of strong political will to advance railway sector. PSO is indeed paid by the government as a difference between predetermined tariff by the government and the real operating costs of running the economy class of passenger trains. IMO and TAC have been offset to each other leading to zero payment both from the operator and the government. In other words, the

Table 6: Railway Budget, 2009-2010, Rp. billion

Budget Items	2009	2010	2011
• Generalized Service	48.3	53.0	-
• Improvement of Accessibility of Railway Services	439.4	135.9	-
• Betterment and Development of Rail Infrastructure and Rolling Stocks	3,027.4	3,027.4	-
• Rehabilitation of Rail Infrastructure and Rolling Stocks	52.0	40.7	-
• Restructuring and Reforms of Railway Institution	40.1	43.9	-
• DGR Budget overall	-	-	4,197.51
Total	3,607.2	3,736.8	-

Source: A. Samosir, MoF, Policy Paper 2012

Note: Budget is the sum of routine budget, goods expenditure, and capital expenditures. The majority of the budget is allocated for rehabilitation, betterment, and development of infrastructure and rolling stocks. Note also that there is an allocation for restructuring and reforms of railway institution.

IMO and TAC had never been implemented according to the principle and cost structure of maintaining the infrastructure and the use of it. One of the stumbling blocks appears to be the unequal level playing field between rail and road.

Table 8 illustrates the historical calculation of IMO and TAC from fiscal year 2000 to 2010. From 2000 to 2003, TAC was bigger than IMO, literally means that PT KAI had to pay more to government than PT KAI received IMO contract from government. In 2004, TAC is smaller than IMO, and

Table 7: PSO Allocated to PT KAI, 2008-2012, Rp. billion

Budget Items	2008	2009	2010	2011	2012
• Long Distance Lines	162.10	167.26	175.08	194.45	256.20
• Medium Distance Lines	82.11	77.88	88.58	90.17	120.18
• Short Distance Lines	148.11	148.00	175.85	158.77	223.57
• Diesel Train Non-Jabo-detabek	20.63	18.13	17.00	9.73	34.01
• Electric Train Economy Class	131.69	123.70	78.46	182.29	136.14
• Lebaran Economy Class	-	-	-	4.18	-
Total	544.66	535.00	535.00	639.60	770.12

Source: A. Samosir, MoF, Policy Paper 2012

Note: Budget for 2012 fiscal year is the number in RAPBN

from 2005 on, TAC and IMO was cancelled to each other bringing the transaction of the two costing into a standstill. According to the 1999 Joint Ministerial Decree, $TAC = (IMO + Depreciation) * f$ where f is a coefficient determined by the government, perhaps arbitrarily set from 0.7 to 1.0. The use of this formula could result in a TAC being larger than IMO as shown in **Table 9** below.

The offsetting has probably been done by continuously changing the coefficient in such a way that $TAC = IMO$. Clearly the use of the coefficient does not have a strong rationale and the application of amortization into IMO could lead to the situation of TAC being larger than IMO. The offsetting between the two schemes since 2005 had contributed to the uncertainties of railway funding in which rail infrastructure maintenance (IMO) which in fact has always been done by the operator is treated like a barter for TAC which in fact has never been imposed. In addition, as non-tax revenue, TAC has never been well formulated since the beginning.

c.) *Public Private Partnership*

Railway sector in Indonesia has no tradition for private sector involvement, let alone public private partnership, in the development and provision of rail services. Not only that for many decades railway had been a public domain and heavily regulated, but also because railway development and provision require a huge investment costs, especially in rail infrastructure, that only government could play a role in the services. The dismantling of public monopoly and the opening of rail market to private sectors are not necessarily providing an attractive climate for private sectors to enter, simply because of non-cost recovery nature of public railway business and unclear regulations. Unlike the toll roads, PPP in public railways is probably still in a distant future, except for small business segments in the stations. But the massive

⁵ IndII Scoping Study. Financial Template for PSO-IMO-TAC, 2012

development of railway services in other regions would open ample opportunities for private sectors to participate in the public railways development programs.

d.) *Private Financing Initiatives*

Private Financing Initiative (PFI) in infrastructure development and provision is usually associated with unsolicited proposal from private sector to the government to build a certain facility based solely on private sector financing. In transport sector, PFI has come in the form of special facility such as special port, special airport, and special railway, developed in a special way to serve the economic activity of the private sector. As such, the facility proposed does not have to be listed in the government planning and the private sector will usually bear the burdens of development risks, including financial risk. In railway sector, PFI has entered the freight rail market by means of coal rails in Kalimantan and Sumatera. The special purpose railway has a great chance for private investment and government has to entertain this opportunity by such policy as a clarity in regulations and a provision of railway network for freight rails.

VIII. FURTHER POLICY CHANGES

Right now, PT KAI still operates in a monopolistic market as the only railway operator and doing its business in vertical integration manner. Despite of the Railway Law that mandates a lot of changes in institutional settings, the railway sector is practically unchanged from monopoly environments. Highly regulated but not well progressing in terms of sector advancement and still unclear to how government will embark on drastic policy frameworks as mandated by the Law. The followings are some policy changes that are necessary to undertake to lead the rail sector towards a modern and advanced rail industry and services. Table 10 shows some policy actions need to be done for railway financing, specifically for improving the PSO-IMI-TAC Schemes as indicated by IndII's Scoping Study. The time schedule in the policy actions had expired as government seems to behave too little too late to response to the recommendation. Further policy actions would be needed for reforming the rail institutions, an initiative triggered by the Law and serve as the prerequisite for a modern and advanced railway sector in Indonesia.

a.) *Asset Separation and Valuation*

Currently there is no very clear separation of assets ownership between the government and PT KAI. Most infrastructures were built during the colonial time and new assets procured after independence are mostly rolling stocks and many of them such as locomotives procured by loans. Clear ownership should be reflected in the Balance Sheet of PT KAI. Infrastructures assets, especially railway tracks belong to the government and in the future must be transferred to a company or Badan Usaha (BUPP) as mandated by the law. For rolling stocks, ownership is less clear as government in the past purchased locomotives and railcars and it is believed that they were recorded as equities of PT KAI. The task involves both the practical identification of assets as well as establishing principle concerning the ultimate assets ownership between the government and train operator and where assets to be transferred to PT KAI then the value of each asset must be determined consistently. In this

connection decision must be made by the government whether to use historical or replacement value. . The separation of assets and their valuation involve a number of steps including inventory of assets, valuation method to be used, valuation of each asset etc.

b.) The Establishment of Track Authority

As required by UU 23/2007, a body (BUPP) to manage rail infrastructures must be established not later than 3 years after the enactment of law No 23/2007. No clear indication at this moment about what steps that have been taken on this requirement of the law and as to when it will be likely established. The existing regulation requires that the level of TAC be determined as a function of the cost of infrastructures maintenance (including depreciation) through an adjustment factor as follows: $TAC = (IMO + depreciation) \times \text{policy adjustment factor}$. But in practice, for many reasons TAC has been treated as equals to IMO. This means that there is no resource/money transfer from PT KAI to government as payment of infrastructures use (TAC) and at the same time no payment received by PT KAI to reimburse the expenses incurred for IMO. How the IMO expenditures being financed and the share of PT KAI and DGR to finance them is not very clear. What types of works is considered as maintenance or operation? Since DGA receives annual budget from the government how then to ensure that there is no duplication of works budgeted between the DGR and PT KAI? Is there any overall plan for maintenance shared and agreed between DGR and PT KAI whereby agreement exists as to whom to finance what? The same question also applies to operation cost of the infrastructures. It is expected that BUPP as the Badan Usaha to manage the rail infrastructures will be responsible to proposed TAC level to the government (DGR?). The level of charges must be consistent with the policy objectives that will ensure 1) promotion of financially stable infrastructures provider; 2) providing effective price signals to users of rail infrastructures and effective competition (in the ultimate situation where there are multi operators). Establishing the BUPP is critical now and it is more so when the rail market in Indonesia has become competitive with multiple operates.

c.) Improved Accounting System

One critical need of PT KAI is to have an accounting system in place that can provide accurate data regarding the cost of producing each service on a timely and consistent basis. This is more so in a company such as PT KAI which has several Daops with separate accounting. An integrated accounting system should be developed as soon as possible so as to enable the system to consistently reflect the cost associated with the provision of each service provided. Furthermore, the modernized accounting system is a critical requirement in calculating PSO, IMO and TAC. The improved accounting must be able to provide data on each cost items following the formula/guidelines stipulated in DGR directives in a reliable fashion. The existence of such a system will eliminate the need for the related agencies (DGR, MoF and PT KAI) spending time and to argue on the appropriateness of data.

d.) Preparing Network Statement

A network statement is a document normally prepared by infrastructures operator setting out the facilities and services it offers, together with the terms and conditions on which it provides access to the facilities. The statement normally covers among others: 1) description of the networks, 2) responsibilities of the train companies using the net works, 3) responsibilities of the IMO contractor, 4) capacity allocation procedures and procedures for recovering from late running, 5) statement of access charges. This network statement is not urgently needed at the moment because the document will be required only if there are multiple operators using the networks. The network statement is to be prepared by the BUPP (under the supervision of DGR) as a single source of relevant information for current and potential train operators on a fair and non-discriminatory basis.

Table 8: IMO and TAC Relationship in 2000-2010, Rp. billion

Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
IMO	316	489	589	567	569	624	746	824	859	910	1,175
TAC	512	608	693	609	522	624	746	824	859	910	1,175

Source: PT KAI, 2011 in : A. Samosir, MoF, Policy Paper 2012

Table 9: TAC Calculation in 2000-2005, Rp. billion

Years	2000	2001	2003	2004	2005
Infrastructure Maintenance & Operation	316	489	589	569	624
Amortization	196	195	198	202	-
Total	512	684	787	771	-
Coefficient f	1.0	0.89	0.88	0.72	-
TAC	512	608	693	522	624

Source: PT KAI, 2011 in : A. Samosir, MoF, Policy Paper 2012

Tabel 10 Policy Action Needed

Action No.	Policy Actions	Time Interval	Responsible Agencies	Remarks
Immediate Actions (July - December 2012)				
1	Exercise on the Infrastructure Maintenance (IM) Costing and Calculation	July - December 2012	Planning Bureau MoT, DGR, PT KAI, MSOE, Bappenas, MoF	Government needs to prepare MoT Decrees on IM and to exercise academic background and rationales. This is to very necessary to gain acceptance from the stakeholders to come up with sound and legitimate basis for the decree.
2	Exercise on the Infrastructure Operation (IO) Costing and Calculation	July - December 2012	Planning Bureau MoT, DGR, PT KAI, MSOE, Bappenas, MoF	Government needs to prepare MoT Decrees on IO and to exercise academic background and rationales. This is to very necessary to gain acceptance from the stakeholders to come up with sound and legitimate basis for the decree.
3	Exercise on the amount, structure, and characteristics of Track Access Charge to be imposed to rail operator(s)	July - December 2012	Planning Bureau MoT, DGR, PT KAI, MSOE, Bappenas, MoF	Government needs to prepare MoT Decrees on TAC and to exercise academic background and rationales. This is to very necessary to gain acceptance from the stakeholders to come up with sound and legitimate basis for the decree.
4	Consolidated Financial and Costing Template	December 2012	Planning Bureau MoT, DGR, PT KAI, MSOE, Bappenas, MoF	All three exercises described above would lead to a consolidated Financial and Costing Template for PSO-IMO-TAC which is critically important to ensure that Perpres 53/2012 could be implemented properly and immediately beginning in 2013.
Further Strategic Actions (January - August 2013)				
5	Determination of Allowable and Non-Allowable Costs in the Costing of PSO	January – June 2013	Planning Bureau MoT, DGR, PT KAI, MSOE, MoF	Article 2(4) of Perpres 53/2012 stipulates the need for MoT to determine the allowable costs in PSO cost structure. The Perpres doesn't explicitly require for a decree. But the Allowable Costs is important to be determined in order to clear up what are the real, direct costs that constitute to PSO Costing and what costs are considered inappropriate
6	Refinement of MoT Decree No. PM 9/2011 on Minimum Performance Standard (SPM) of Passenger Rail Transport	January – June 2013	Planning Bureau and Legal Bureau MoT, DGR, PT KAI, MSOE	DGR might want to refine the determination of SPM for passenger rail transport when PSO and IMO have been properly and fairly implemented to enhance safety, comfort, and punctuality (Perpres 53/2012 Article 3)
7	Drafting MoT Decrees on IM, IO, and TAC	January – July 2013	Planning Bureau and Legal Bureau MoT, DGR, PT KAI, MSOE, Bappenas, MoF	Exercises had been done before and substances have presumably been agreed upon by stakeholders. Extensive discussion must be held between DGR, Legal Bureau and Planning Bureau of MoT, PT KAI, MoF, and Bappenas on the content and legal wording of the decrees
8	The Issuance of MoT Decrees on IM, IO, and TAC	August 2013	Planning Bureau and Legal Bu- reau MoT, DGR, MoF,	This is critically important to ensure that Perpres 53/2012 could be implemented properly and immediately beginning in 2013 or 2014. The decrees would serve as the legal basis for the provision of PSO-IMO-TAC Schemes and would be enhanced over time for keeping in touch with rail sector performance and other progress. (Articles 12(2), 19(1), and 22(1))
Strategic Actions for Multi Operator Circumstances (August - December 2013)				
9	Integrated Rail Maintenance and Rehabilitation Programs	December 2013	DGR	Future provision for IMO under Track Authority and multi operator circumstances must be based on a sound and legitimate rail infrastructure maintenance and operation programs. The IRMRP could also be utilized as a planning tool for budget purposes.
10	Analysis of using Replacement Cost in the depreciation of rail infrastructure	December 2013	DGR, MoT Planning Bureau, MoF	The application of Replacement Costs in the depreciation of rail infrastructure would change PSO and IMO configuration. In spite of the amount of PSO, however, this would lead to more realistic reflection of depreciation in term of rail investment rather than a historical, linear calculation.
11	Analysis of incorporating WTP/ATP in the PSO tariff structure and determination	December 2013	DGR, MoT Planning Bureau, MoF	There are some segment of railway market in which WTP/ATP could be higher than the current tariff level set by the government. The incorporation of the WTP/ATP could probably lead to tariff level that more reflecting the elasticity of demand and rationalize it accordingly.
12	Analysis of using multi-years contract in the provision of PSO-IMO-TAC	December 2013	DGR, MoT Planning Bureau, MoF	Although this is not an easy task to undertake, the multi-years contract is worth studying to establish certainty and sustainability in railway financing that could lead to sustainable rail services in an efficient and effective ways.
13	Academic Paper on Track Authority	December 2013	Bappenas, DGR, MoT Planning Bureau, MoF	This is the first step in preparation works toward the establishment of track authority. The exercise would include the full scale assessment on the regulation aspect as well as institutional setting, options which are available and possible, financing, and possible interim solutions.
14	Academic Paper on Track Authority	June 2014	Planning Bureau and Legal Bureau MoT, DGR, PT KAI, MSOE,	Complying with the Railway Law 23/2007, a track authority must have already been established before any form of multi operators comes into play. Study and exercise had been done and socialization would have to be conducted following the exercise.
15	Academic Exercise on Indonesia Rail Transport Under the Mu	June 2014	Bappenas, DGR	The projected growth of Indonesia economy and the concept of economic corridors would open the opportunity for rail transport to be developed and expanded to other big islands in Sumatera, Kalimantan, and Sulawesi. This is also in conformity with the National Railway Master Plan

XI. CONCLUSIONS

In general, railway sector in its position in future Indonesia's economy needs to be restructured in which clarity, certainty, and transparency of regulations, institutional setting, financing, and public and corporate governance would become critical issues leading to common understanding, perception, and agreeable sector reforms towards a modern and advanced railway sector. There are at least three main considerations. First, government must carefully consider the long-term economic benefits of railway services. Indonesia economic mobility, especially freight movements, shall no longer be hampered by increasing limitation of capacity and deteriorating quality of road network system. Indonesia's road networks, national, provincial, and even district roads, had long been in bad shape due to over-congestion, overloading, and poor maintenance. Major arterial national roads, especially in Java and Sumatera, had been carrying around 90 percent of economic mobility of the country, including economically strategic main trunk lines in North Java Corridor and Sumatera East Coast Corridor.

Do-nothing policy and keep ignoring railways' roles will have a detrimental effect to the economy as gridlocks and bottlenecking would exponentially build-up on major arterial and local roads and would eventually halt the economic movements and would in turn hamper the economic progress of the country. Government must make any effort possible to shift some of the burdens away from roads to other modes of transport. Railway, besides short sea, is the only possible alternative for shifting some of the burdens from road. This means that government must revitalize the railway to such an extent that it can efficiently shift some heavy traffic from road and interface with the economy. The old paradigm that railway is for social services only has died. The inevitable total gridlocks in Indonesia transport network are the consequences that nobody will like to see when all infrastructure networks are projected to be able to support a sustainably 7-8 percent economic growth for the next several years to come. The very basic concept of national connectivity and its economic corridors outlined in the MP3EI confirms this notion.

Second, the Railway Law Number 23/2007 has paved the way for rail sector reforms. Rail market, industry, and services are no longer vertical integration business under public monopoly but have been opened for private sectors to invest. This could very well be leading to multi operator environment in which the expansion of railway system into other big islands could be handled by separate rail operators. Private involvement in public railways perhaps requires several necessary conditions and would not happen in a very near future, but when it comes, a private corporation, the operator, whether it is the incumbent operator or prospective new operators, must consider financial viability of railway provision and services in order for them to sustain. This can only materialize when the services could be performed in a full-cost recovery basis with long-term business prospects. Thus, when government wants an operator to serve a railway line with tariff determined below the operating costs, subsidy becomes the only tools for such services to be sustainably performed. For railway lines, e.g. urban rail corridors and special railways, where commercial services are justified, the operators must be given freedom to determine tariff level based on full cost-recovery pricing. Both long-term macro economy

consideration and full-cost recovery principles confirm the absolutely necessary improvement and refinement of any financing scheme, including the PSO-IMO-TAC schemes from time to time.

Third, the determination of tariff setting by the public sector must take the willingness-to-pay (WTP) and affordability-to-pay (ATP) into accounts. There are some strong indications that ATP and WTP might be higher than the current tariff levels, especially for urban rail passenger services where middle-class people tend to shift away from heavy congested road network. The MoT might want to revise the methodology and determination of its tariff setting for future railway services for what is called "the economy class". It is recorded that, the national income per capita has grown in the last decade and it is logical to postulate that the ATP/WTP values have also grown higher than the current tariff level. People are now willing to pay more for a much better transportation service and in the urban areas where bottlenecks are growing they are also willing to shift away from private automobiles.

The development of Indonesia railway in other regions would still be pioneered by the government, including railway lines that are projected to support the economic corridors. Except for Special Railways, government would keep developing public railways in vertical integration mode or involving private sectors in which rail infrastructure is owned by government and rolling stocks and operation could be managed and provided by private. This politic of railway sector must also be translated into the politic of railway budget. For public railways and PPP-type railways (semi public railways), clear and workable policies on PSO, IMO, and TAC would become an instrumental financial and costing template for the sustainability of railway services. For a brand new railway line, Government might want to appoint a SOE or a consortium between SOE and Local Governments. Government as the owner of rail infrastructure would provide PSO and IMO while the new operators would pay the TAC to the government. On another type of investment, government and local governments could also form a consortium to build, owned, and manage rail infrastructure and would let a private company to operate the rolling stocks and provide the services. In this case, PSO-IMO-TAC scheme would also matter.



Era Baru Teknologi Pembangunan Perkeretaapian

Pengenalan Teknologi Jalan Kereta Api Jepang

Yukinori KOYAMA¹

Perkembangan teknologi konstruksi perkeretaapian

Negara Jepang hanya memiliki sebagian kecil dataran rendah, umumnya mengandung lapisan dataran alluvial pantai. pembangunan jalur kereta api dimulai pada awal zaman Meiji (1868-1912) dan karena teknologi konstruksi masih belum matang, jalur pertama yang dibangun adalah di daerah dataran pesisir. Jalan rel yang dibangun sebagian besar menitik beratkan pada struktur tanah, dengan timbunan dan galian. Namun, banyak juga jembatan sungai untuk kereta api yang dibangun pada masa itu. Secara bertahap, dengan kemajuan dalam teknologi tunneling, kereta api dapat dibangun untuk menghubungkan kota-kota yang sebelumnya terisolasi oleh pegunungan.

Pertumbuhan ekonomi yang pesat pada periode pasca-perang antara tahun 1950 dan 1960-an, terlihat permasalahan dalam menyediakan lahan di daerah perkotaan untuk pembangunan jalan rel kereta api baru. Selain itu, cepatnya penyebaran kendaraan bermotor menambah parahnya masalah perencanaan kota dengan lebih padatnya kemacetan lalu lintas akibat perlintasan kereta api, selain menambah resiko kecelakaan. Solusi untuk mengatasi masalah ini, kereta api perkotaan dibangun dengan elevated section.

Dengan kemajuan teknologi konstruksi, terutama teknologi pelapisan terowongan (shield tunneling), semakin menggalakan pembangunan jalur kereta api baru di bawah tanah.

¹ Mr Yukinori Koyama, General Manager of the Structure Technology Development Division at the Railway Technical Research Institute (RTRI). He joined JNR in 1971 after graduating from the University of Tokyo in Engineering, and transferred to RTRI in 1987.

Pada saat itu, sudah tidak memungkinkan untuk memperoleh lahan baru untuk pembangunan kereta api di kota-kota besar, meskipun permintaan kereta api masih meningkat.

Selain itu, semakin sulit untuk merencanakan pembangunan kereta api baru dibawah tanah karena telah maraknya struktur bangunan bawah tanah, termasuk kereta api bawah tanah eksisting.

Oleh karena itu, dimasa depan akan dikembangkan usaha dalam mengembangkan teknologi baru untuk menggunakan ruang bawah tanah yang lebih dalam, serta ruang atas pada jalur kereta api eksisting.

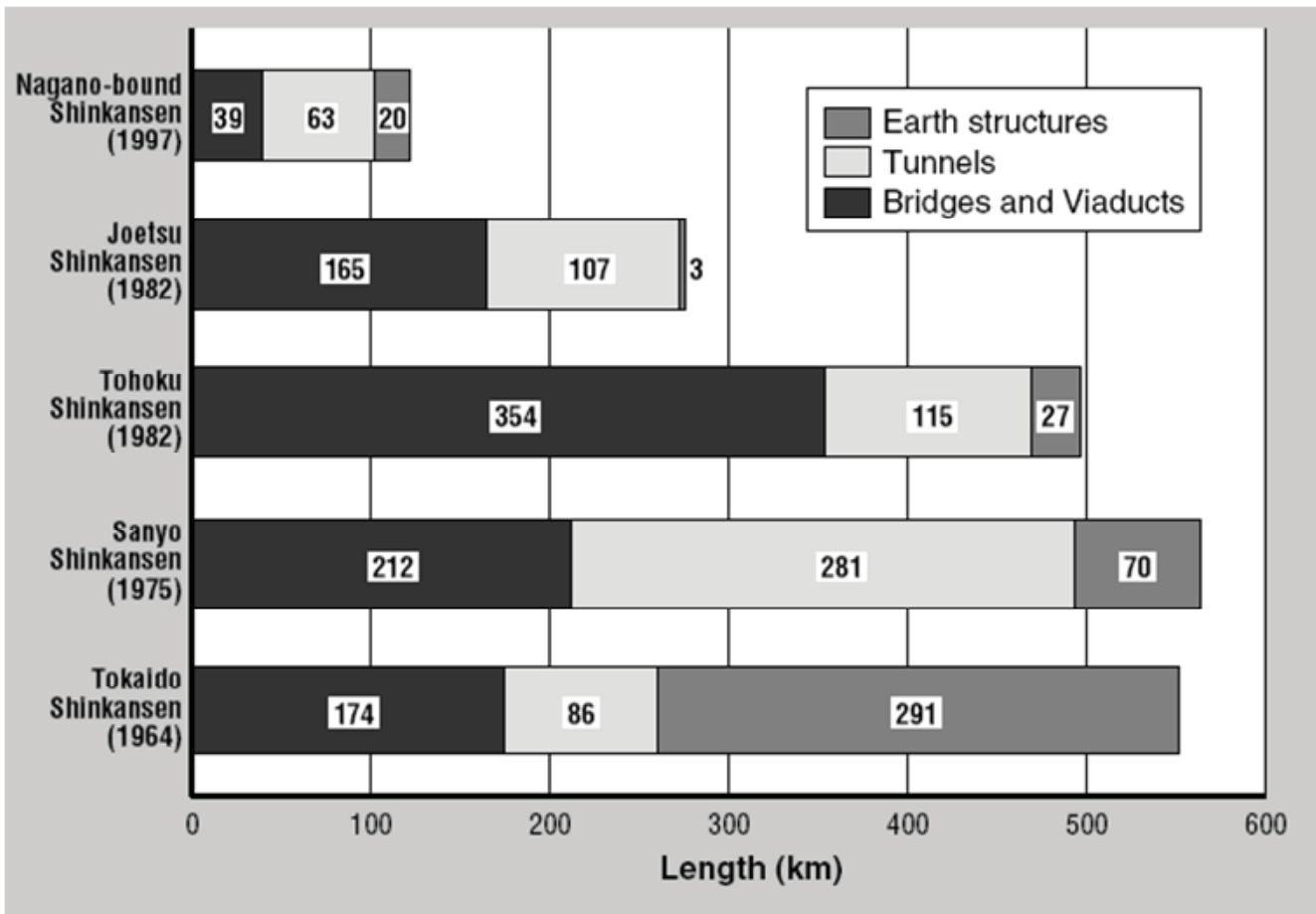
Perbandingan struktur jalur kereta api cepat

Pertama, artikel ini memperlihatkan perkembangan teknologi kereta api Jepang dengan membandingkan struktur jalan kereta api Shinkansen pada masa lalu dan saat ini.

Tokaido Shinkansen—kereta api berkecepatan tinggi pertama di dunia—sebagian besar dibangun dengan struktur permukaan tanah. Metode ini dipilih untuk memperpendek jangka waktu pengerjaan dan memotong biaya konstruksi. Mungkin juga dikarenakan biaya pemeliharaan struktur permukaan tanah tidak begitu tinggi pada saat itu dan tidak ada yang menduga bahwa Shinkansen akan beroperasi pada jadwal yang ketat seperti saat ini (headway sekitar 5 menit).

Sanyo Shinkansen, rangkum dibangun sekitar 10 tahun kemudian, jalurnya sebagian besar melalui daerah pegunungan. Akibatnya, lebih dari 80% dari jalur totalnya terdiri atas terowongan dan jembatan (termasuk viaduk).

Meningkatnya biaya perawatan jalur kereta api dikarenakan naiknya biaya tenaga kerja, menyebabkan lebih banyak



Gambar 1. Proporsi Komponen Struktural Jalan Kereta Api Cepat

penggunaan lapisan beton (concrete slab). Namun, karena lapisan beton diletakkan pada struktur permukaan tanah, memerlukan pengendalian yang ketat atas perubahan badan jalan (track bed), Tohoku Shinkansen dan Joetsu Shinkansen, keduanya rangkum dibangun pada tahun 1982 dibangun dengan struktur lapisan beton.

Untuk meminimalkan biaya konstruksi dan pemeliharaan jalur kereta api, Shinkansen pada daerah Nagano, yang dibuka pada tanggal 1 Oktober 1997, menggunakan beberapa teknik baru untuk penerapan lapisan beton pada struktur permukaan tanah untuk menghindari adanya kerusakan akibat beban kereta.

Embankment

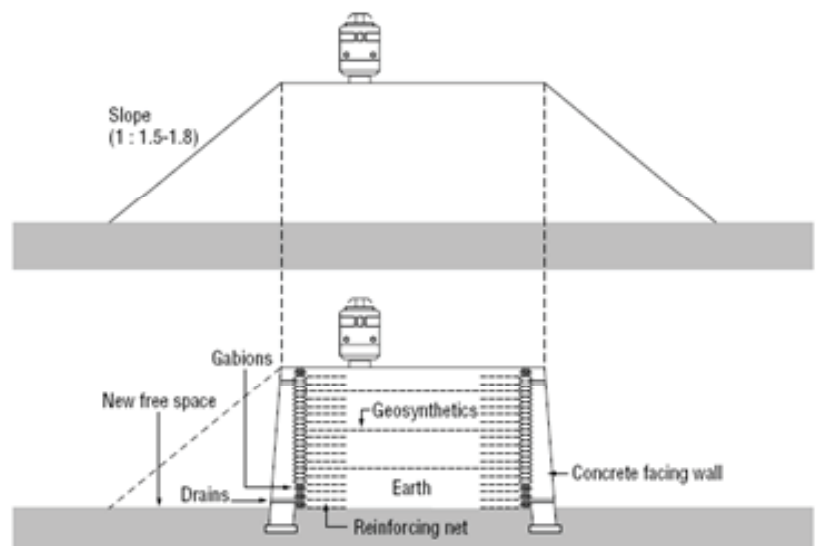
Embankment yang dibuat dengan penumpukan dan pepadatan tanah bersifat murah dan cepat pengerjaannya, telah lama digunakan di Jepang. Sebuah embankment umumnya memiliki penampang segiempat (Gambar 2).

Karena tanah tidak dapat dibentuk dengan ukuran sempurna, embankment pada kemiringan di kedua sisi memberikan stabilitas struktural, yang berarti bahwa embankment membutuhkan ruang lebih

banyak daripada yang sebenarnya dibutuhkan oleh jalur kereta api. Selain itu, embankment tanah mudah dipengaruhi oleh hujan lebat dan gempa bumi, yang merupakan masalah yang serius dan umum di negara Jepang. Akibatnya, struktur beton yang diperkenalkan pada 10 tahun terakhir untuk memberikan stabilitas lebih baik, tetapi masih belum memecahkan masalah ruang yang terbuang.

Baru-baru ini, embankment dengan kemiringan sudah tidak digunakan, diganti dengan embankment geosynthetic-diperkuat dengan dinding vertikal penahan beton. Dalam metode ini, tanah ditimbun berlapis dengan lembar polimer Geosynthetic dan seluruh struktur distabilkan oleh dinding vertikal

Typical (top) and Geosynthetic-Reinforced Embankments (bottom)



penahan beton, sehingga meniadakan ruang kosong pada kemiringan embankment. Selain itu, tidak diperlukan pondasi (tiang pancang, dll) bahkan pada tanah lunak, terlebih lagi dinding beton tidak dirusak oleh hujan. Oleh karena itu, metode baru ini sangat ekonomis dan memiliki stabilitas yang luar biasa. Embankment ini bahkan tetap bertahan ketika gempa bumi besar melanda Kobe pada Januari 1995.

Viaduk

Rangka kaku (rigid frame), beton bertulang (Reinforced Concrete), balok dan slab merupakan komponen viaduk yang

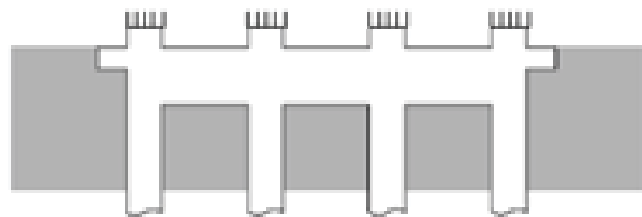
umum digunakan di Jepang, merupakan struktur monolitik dengan kolom dan balok rangka tegar dan slab sebagai jalan kereta api. Jenis viaduk ini ialah struktur yang paling ekonomis dan memiliki daya tahan tinggi terhadap gempa bumi.

Banyak jalan kereta api cepat dibangun menggunakan viaduk dengan rangka kaku untuk memotong biaya konstruksi dan waktu pengerjaan. Bahkan, viaduk tersebut mencakup 700 dari total 2000 km (35%) jalan kereta api cepat di Jepang.

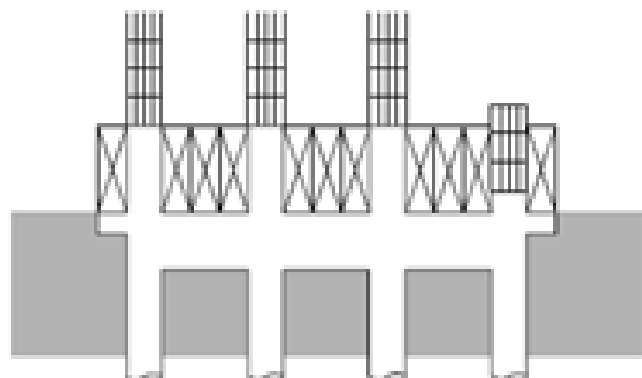
Gambar 3 menunjukkan prosedur untuk membangun

Construction of Rigid Frame Viaduct using Scaffold Shoring Method

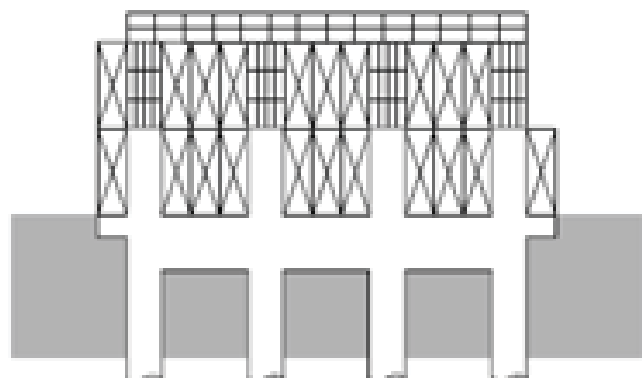
(a) Constructing foundation



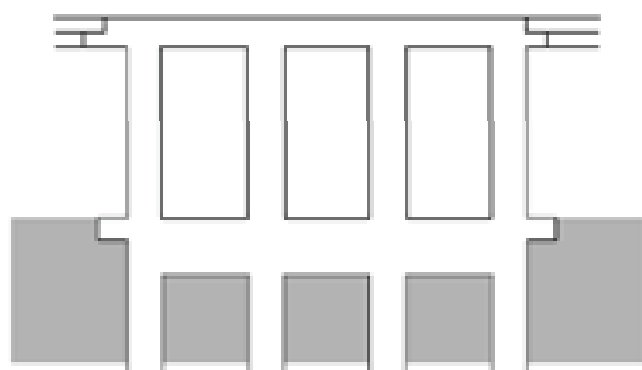
(b) Erecting scaffold shoring, reinforcing bars, and timber forms for lower columns, and pouring concrete



(c) Erecting scaffold shoring, reinforcing bars, and timber forms for beams, slab, and upper columns, and pouring concrete



(d) Finished viaduct



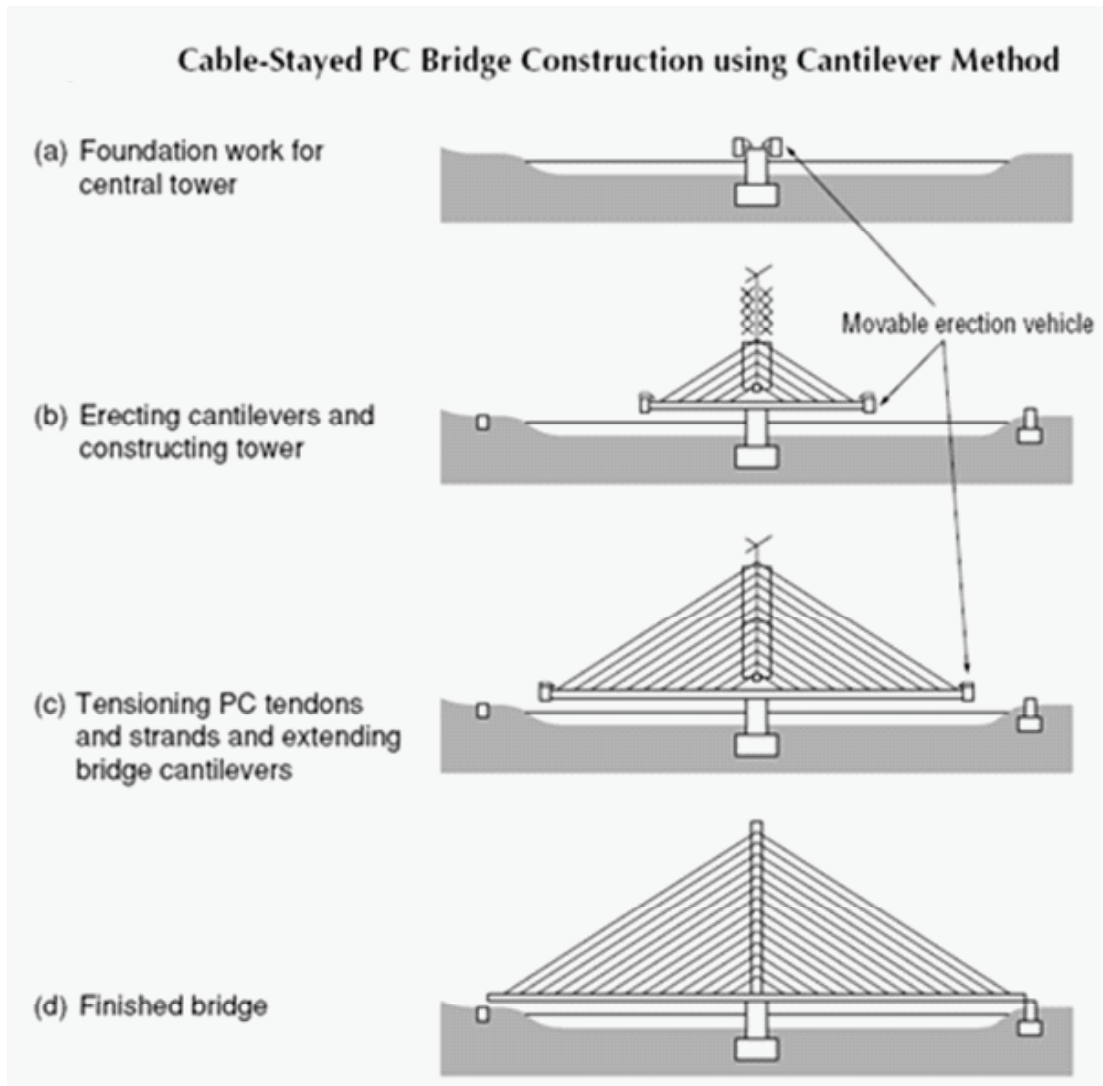
viaduk rangka kaku. Setelah pondasi selesai, bangunan atas (super structure) dibangun menggunakan metode dukungan scaffolding. Kolom, balok, dan pelat beton yang didirikan sesuai dengan urutannya. Pertama, scaffolding yang akan menopang didirikan. Kemudian, batang penguat dan kayu ditempatkan. Akhirnya, kolom, balok, dan pelat dituangkan dengan metode cor-di-tempat.

Jembatan

Jembatan beton

Jembatan kereta api bentang pendek (<25 m) yang dibangun menggunakan beton bertulang didukung dengan pilar (kolom, dll) pada kedua ujungnya. Gambar berikut menjelaskan metode scaffolding dalam pembangunan jembatan kereta api dengan balok beton bertulang. Jembatan bentang sedang (20 sampai 50 m), dibangun dengan menggunakan beton prategang (Prestressed Concrete) bukan dengan beton bertulang. Dalam hal ini, baik penopangan scaffolding dan crane digunakan dalam metode pembangunannya. Dalam metode ereksi

Gambar 4 menunjukkan prosedur kantilever



dengan menggunakan crane, blok beton prefabrikasi didirikan di tempat dengan menggunakan crane.

Jembatan bentang panjang (lebih dari 50 m), menggunakan rangka kaku beton prategang dengan struktur monolitik kolom dan balok, atau jembatan cable-stayed dengan beton prategang. Metode kantilever biasanya digunakan untuk membangun jembatan bentang panjang dengan beton prategang.

Girder didirikan dalam bagian 3 sampai dengan 5 m. Pertama, mesin ereksi bergerak dirakit di setiap sisi menara jembatan pusat. Selanjutnya, gelagar, baja tulangan, dan tendon beton pratekan dan pengikat mulai dirakit. Kemudian, beton dituangkan agar tendon beton pratekan serta pengikat dapat dikencangkan. Mesin erector kemudian bergerak ke

luar di kedua belah sisi untuk membangun bagian-bagian berikutnya. Begitu selanjutnya sampai jembatan mencapai kedua pangkal. Metode ini memungkinkan untuk membangun jembatan bentang panjang dengan menggunakan peralatan yang relatif sederhana.

Jembatan Baja

Baja jembatan kereta api secara umum dapat dibagi atas jembatan pelat girder (jembatan dengan rel di atas girder disebut jembatan pelat deck girder dan rel dibawah girder disebut melalui jembatan pelat girder) dan jembatan rangka baja (through-truss) dengan rel di bawah kerangka baja. Biasanya, jembatan kereta api baja sudah difabrikasi. Baja tersebut ditandai, dipotong, dan dilas atau bergabung dengan

baut kekuatan tinggi menjadi jembatan, yang kemudian didirikan pada tempatnya.

Kemajuan terbaru dalam bahan, desain, dan teknologi fabrikasi telah memungkinkan untuk mendirikan jembatan kereta api yang sangat besar. Sebuah contoh sederhana adalah rangkaian jalan dan jembatan kereta api antara *Honshu dan Shikoku* (dibuka tahun 1988) menyeberangi Laut Pedalaman Seto. Sepanjang 9,4 km menyeberangi selat terdiri dari tiga jembatan gantung, dua jembatan cablestayed, dan satu jembatan truss. Jembatan ini menggabungkan teknologi konstruksi terbaru dan termasuk diantara jembatan terpanjang di dunia.

Terowongan Pegunungan

Perkeretaapian nasional Jepang melewati memiliki terowongan pegunungan sejumlah 3800 unit dengan panjang terowongan 2.100 km, termasuk didalamnya ialah Terowongan Seikan (terowongan terpanjang di dunia) yang selesai dibangun pada tahun 1988. Metode Pembangunan Terowongan Austria (New Austrian Tunnelling Method - NATM), merupakan metode yang paling banyak dipakai saat ini untuk membangun terowongan gunung, terdiri dari tiga tahap sebagai berikut.

1. Penggalian - dengan cara peledakan dengan dinamit atau dengan menggali tanah dengan mesin, tanpa mengganggu

2. Perkerasan - baja pendukung dipasang di terowongan, beton disemprotkan ke dinding, dan baut bebatuan dipasang menembus beton sampai batu terowongan
3. Pelapisan - NATM menciptakan dukungan terowongan dengan menuangkan beton ke dalam bentuk terowongan, menggantikan dukungan baja dan tiang konvensional. Metode ini telah menjadi standar sejak pertama kali digunakan untuk Terowongan Nakayama di Joetsu Shinkansen (selesai dibangun tahun 1982).

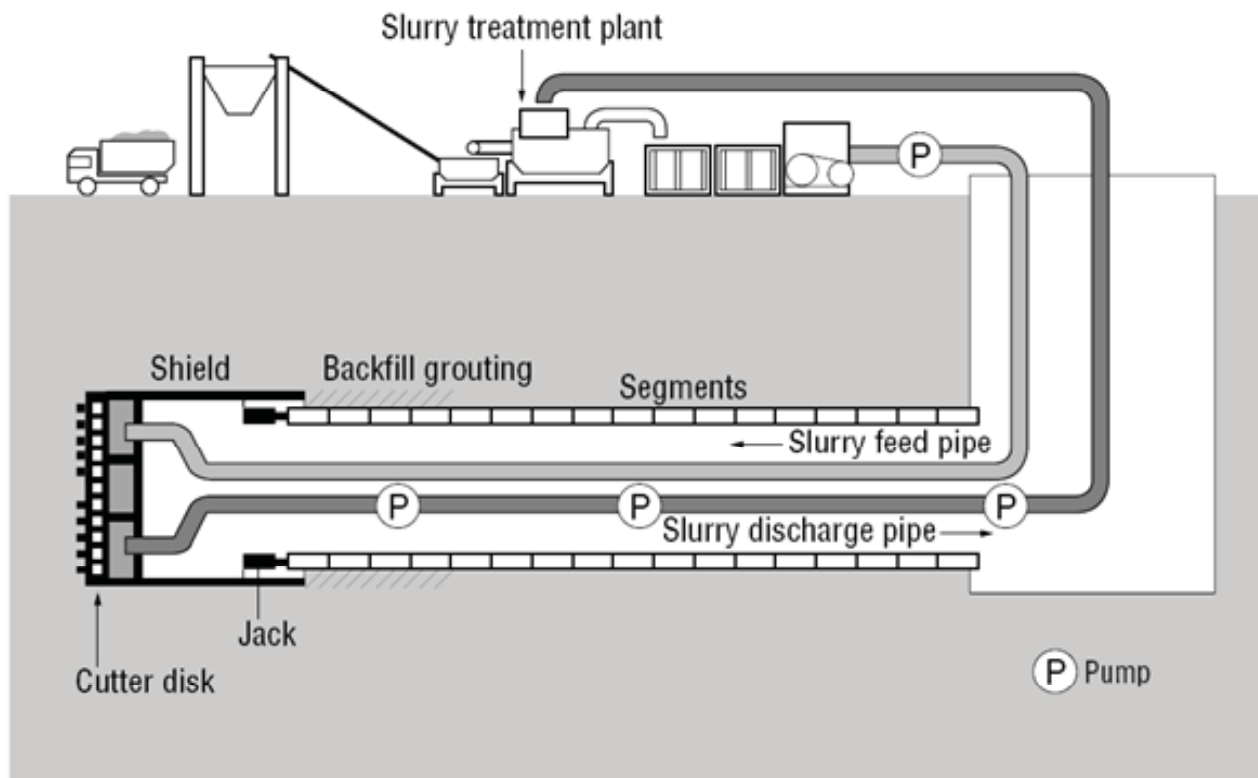
Baru-baru ini, penggalian terowongan telah menjadi semakin otomatis dan beberapa terowongan telah dibangun dengan menggunakan shield tunneling machine.

Kereta Api Bawah Tanah

Untuk beberapa waktu setelah pembangunan terowongan pertama, kereta bawah tanah yang dibangun menggunakan metode cut-dan-cover. Dalam metode ini, tanah dipotong untuk kedalaman terowongan, sehingga hanya dapat digunakan untuk terowongan yang relatif dangkal dan di mana tidak ada struktur pada atas atau di bawah tanah. Namun, metode pengeboran yang memungkinkan terowongan yang lebih dalam untuk digali secara horizontal, metode tersebut paling banyak digunakan saat ini.



Tunnel Construction using Shield Tunneling Machine (Pressurized Slurry Shield Type)



Metode cut and cover

Stasiun bawah tanah kompleks yang terutama dibangun menggunakan metode cut-and cover (Gambar 5). Pertama, struktur penahan bumi yang terdiri dari pilar baja, beton dan lainnya, dibangun dari permukaan tanah, selanjutnya lubang galian ditutupi agar tidak mengganggu lalu lintas di atas tanah.

Selanjutnya, tanah digali sampai kedalaman yang dibutuhkan dengan menggunakan dukungan struktur yang sesuai dan tidak merusak utilitas bawah tanah, seperti penyediaan air, limbah, dan pipa gas. Setelah stasiun dibangun, ruang atas kembali diisi untuk mengembalikan permukaan tanah.

Pelajaran yang dipetik

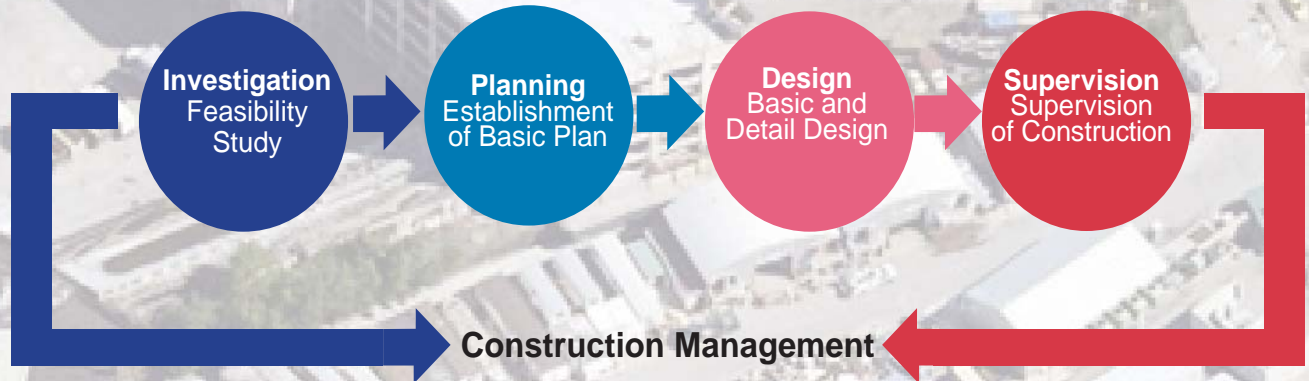
Jepang sebagai negara yang maju, menempatkan transportasi massal berbasis rel sebagai pemegang peranan strategis didalam mendukung laju pertumbuhan perekonomian di negaranya. Sebagai akselerator, tentunya dibutuhkan sistem transportasi dan sarana prasarana yang handal yang dapat berperan aktif dalam semua lini. Kenyataan tersebut harus disadari betul oleh Indonesia, sebagai negara yang membangun untuk terus menggalakan industri nasional yang bergerak dalam bidang transportasi dan mendukung kajian untuk penerapan teknologi perkeretaapian di Indonesia.

Perlu juga ditekankan akan pentingnya industri kereta api yang kuat dalam mendukung tercipta sistem transportasi massal yang kuat. Pemerintah dan lembaga teknologi, harus mampu memprediksi kebutuhan masyarakat akan sistem transportasi yang handal serta memanfaatkan peluang yang ada untuk dapat mendorong tumbuhnya sistem transportasi perkeretaapian Indonesia yang tangguh. Agar masyarakat Indonesia dapat membudayakan penggunaan kereta api sebagai salah satu transportasi massal yang menjanjikan.



Indotek carries out such diversified services as investigation, planning, design, supervision (both for design and construction) and construction project management in the entire fields of construction engineering for railways, city planning, urban transport, road transport, port & harbour and environment.

Business Activities



Investigation

Preliminary Investment / market survey and research / Socio-economic Investigation / Feasibility Study / Investigation of Legal and Administrative Restrictions / Research and Project Development / Field Survey

Planning

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Perkeretaapian Nasional : Antara Pragmatisme, Kosmetik dan Perubahan Struktural

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Abstrak :

Restrukturisasi perkeretaapian masih terus berlangsung di banyak negara, ada yang sukses, gagal, atau mandeg. Di Eropa sekalipun upaya mencari model dan proses bisnis KA yang terbaik masih belum tuntas dan terus berlanjut sampai sekarang. Pilihannya, apakah tetap melanjutkan pemisahan vertikal, antara manajemen roda (kereta) dan rel (infrastruktur) dengan harapan terbukanya kompetisi dan multi-operator, atau mempertahankan penyatuan (integrasi). Restrukturisasi perkeretaapian nasional termasuk kategori mandeg dan setengah hati. Berlakunya Undang-Undang no. 23/2007 tentang Perkeretaapian dimaksudkan untuk mereformasi sektor perkeretaapian agar lebih kompetitif, dapat memenuhi tuntutan kebutuhan pelayanan, mengikuti perkembangan terkini teknologi KA dan mendorong peran Pemda dalam pengembangan KA regional dan perkotaan. UU 23/2007 mengamanatkan agar fungsi pemerintahan (pengaturan) dengan fungsi pengoperasian (pengusahaan) dipisahkan. Tujuannya agar keterlibatan entitas swasta nanti baik sebagai badan usaha prasarana dan/atau badan usaha sarana nanti dapat terpayungi dengan tata kelola yang baik (good governance). Pertanyaannya adalah sudah sejauh apa amanah UU 23/2007 inidipenuhi ? Apakah sudah terjadi perubahan dan membaiknya pelayanan perkeretaapian kita ? Tulisan ini mencoba melakukan penilaian perihal perjalanan restrukturisasi perkeretaapian dan secara khusus tentang revitalisasi perkeretaapian nasional.

1. Pendahuluan

Dalam bahasa lain amanah UU 23/2007 dapat digambarkan ibarat naik perahu agar sampai ke tujuan, ada yang bertugas memegang stir “steering” (DJKA, Kemenhub dan KemenKeu) dan ada yang “rowing” (para operator, penyedia jasa, dan industri). Pemisahan fungsi yang dimaksud secara tegas, sampai hari ini belum terjadi, karena

disamping tugas utamanya sebagai regulator DJKA masih berperan ganda sebagai operator (membangun/memelihara infrastruktur dan mengadakan sarana). Tanpa ketegasan pemisahan kedua fungsi ini, dipastikan akan terus terjadi mis-alokasi anggaran dan sumber daya, sehingga perahu akan senantiasa oleng, dan tak pernah sampai ke tujuan.

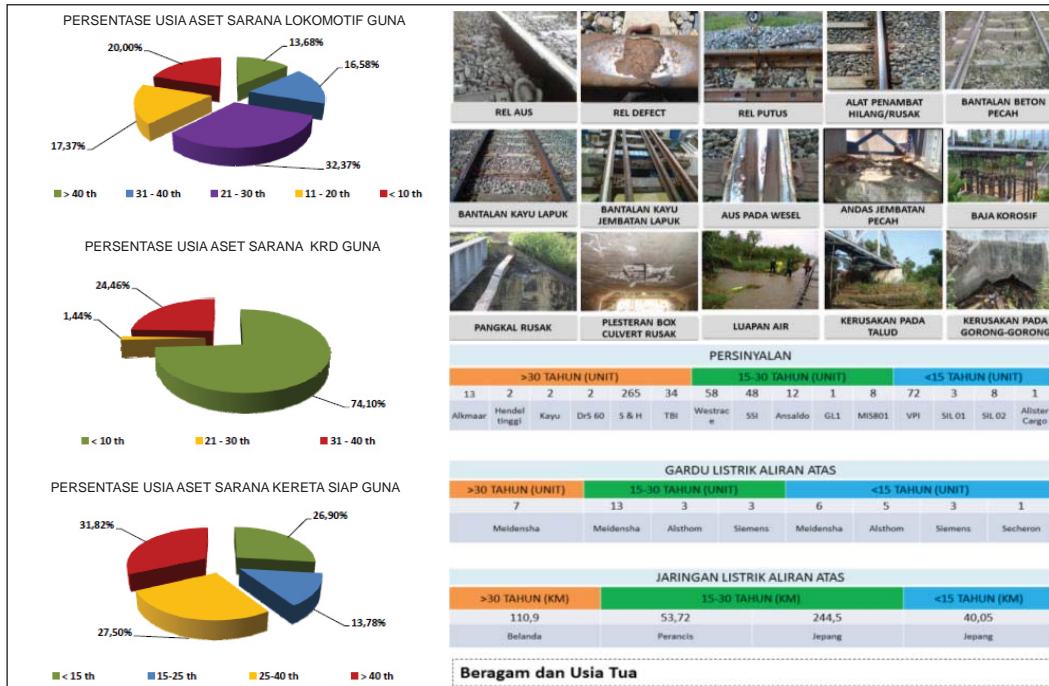
UU 23/2007 telah mengatur perihal bentuk dan harapan masa depan perkeretaapian yang mencakup manajemen operasi, pemeliharaan sarana dan prasarana, perijinan, sertifikasi dan sanksi-sanksi. Sampai saat ini telah dikeluarkan dua Peraturan Pemerintah (PP). PP 56/2009 dan PP 72/2009, masing-masing mengatur Penyelenggaraan Perkeretaapian dan Lalu lintas Angkutan KA. Isi kedua PP ini menjadi sorotan banyak kalangan karena berisi update secara parsial reglemen PJKA di jaman dahulu. Target kelengkapan Peraturan Menteri sedang berjalan. Hingga saat ini telah terbit paling sedikit sejumlah 38 Peraturan Menteri yang mengatur berbagai ragam norma penyelenggaraan perkeretaapian.

2. Kondisi Aset dan Kinerja Pelayanan KA

Setelah melakukan beragam investasi selama ini, saat ini kondisi aset perkeretaapian baik sarana maupun prasarana secara usia terangkum dalam Gambar 1. Terlihat usia sebagian besar sarana sudah sangat tua melebihi 30 tahun, dengan kedatangan pesanan lokomotif baru PT KAI populasi lokomotif usia lebih muda akan bertambah. Kereta penumpang masih dalam kondisi jelek, bahkan sangat jelek. Begitu pula kondisi prasarana sebagian melebihi 30 tahun, khususnya persinyalan terpasang dengan beragam produk teknologi, membahayakan operasi.

Gambar 2 dan Gambar 3 menyajikan pendapatan angkutan penumpang dan barang sejak tahun 2003 hingga 2012. Kinerja operasi dan pelayanan KA penumpang pasca 2010 terjadi peningkatan, produktivitas bertumbuh, laporan kinerja keuangan membaik dengan membukukan keuntungan setiap tahun, kecelakaan kereta menurun walaupun jenis peristiwa kecelakaan termasuk kategori sangat mengagetkan, seperti lokomotif “hantu” berjalan sendiri melintasi dua stasiun sepanjang 17,2 km di Semarang.

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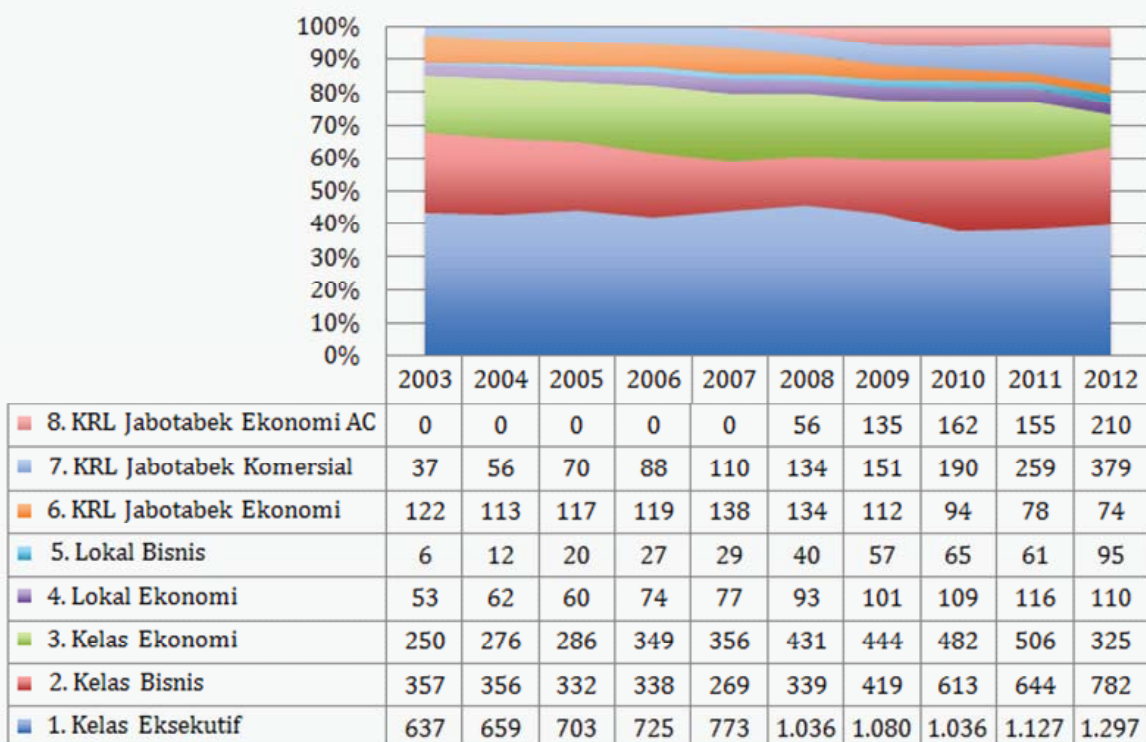


Gambar 1. Kondisi Asset Perkeretaapian (Sumber: PT KAI)

Secara umum pasca 2010 produktivitas angkutan barang meningkat, angkutan penumpang ekonomi menurun, bisnis dan eksekutif meningkat. Pada 2010, pendapatan PT KAI mencapai Rp 5,35 triliun dengan rincian dari angkutan penumpang Rp 2,73 triliun, angkutan barang Rp 1,72 triliun, dana pelayanan publik (Public Service Obligation/ PSO) Rp 534,79 miliar, dan properti dan lain-lain Rp 367,6 miliar. Sementara itu, sepanjang 2011, volume angkutan barang yang berhasil dicapai perseroan sebanyak 19,4 juta

ton dengan pendapatan sekitar Rp 2,1 triliun, produktivitas angkutan penumpang mencapai 200 juta, dengan pendapatan Rp 2,7 triliun. Volume angkutan barang tersebut tumbuh sekitar 25% dibanding realisasi volume angkutan barang 2010 yang mencapai 18,95 juta tpn dengan pendapatan Rp 1,72 triliun. Tahun 2011 kontribusi pendapatan dari angkutan barang untuk seluruh pendapatan perseroan mencapai 30% lebih, PT KAI berharap ke depan kontribusi pendapatan angkutan barang akan semakin meningkat, bahkan pada 2014 bisa sampai 60%.

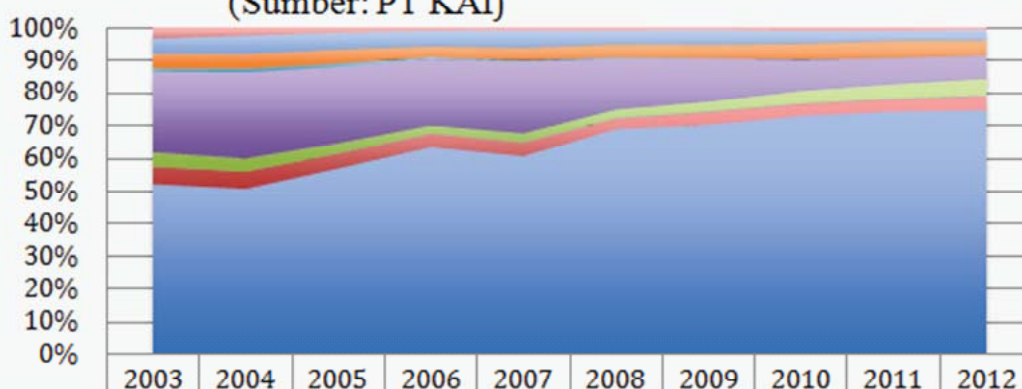
Gambar 2
Pendapatan Angkutan Penumpang (Milyar Rp. dan %-ase)
(Sumber: PT KAI)



Dengan pencapaian kinerja di atas dan perbaikan di sisi layanan, PT KAI mendapat apresiasi dari banyak pihak dan berhasil menggondol beragam penghargaan. Pencapaian ini memperbaiki citra perusahaan yang selama ini dianggap kusam di mata publik. Upaya ini bukan tanpa biaya, termasuk “hutang” perusahaan yang terus membengkak dan konflik yang berkepanjangan bersama regulator DJKA, menyangkut banyak komitmen regulasi yang tidak dapat dipenuhi pemerintah, salah satunya implementasi Perpres 53/ 2012 tentang PSO , IMO, TAC. Apakah peningkatan pelayanan yang dilakukan PT KAI akhir-akhir ini, hanya sebatas kosmetik semata ?

Investasi untuk peningkatan angkutan barang di Jawa dan Sumatera dijadikan program andalan dalam peningkatan pendapatan korporasi, bersama peningkatan angkutan penumpang eksekutif dan bisnis, saat yang sama dilakukan pengurangan porsi angkutan ekonomi di lintas *feeder* maupun komuter perkotaan. Dengan demikian porsi angkutan komersial meningkat dengan tarif angkutan yang dapat ditetapkan secara sepihak oleh PT KAI. Dalam batas kewenangannya, korporasi telah melakukan sesuatu, walau pun secara struktural dan regulasi masih terdapat hambatan dalam relasi *steering* (DJKA) dan *rowing* (PT KAI) dalam setiap pengambilan keputusan.

Gambar 3. Pendapatan Angkutan Barang (Milyar Rp & %-ase)
(Sumber: PT KAI)



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
8. Komoditi Lain	17	12	11	11	10	12	11	19	22	16
7. Hasil Perkebunan	24	31	35	52	57	58	70	63	61	76
6. Barang Retail	23	24	31	39	44	59	67	84	116	114
5. Pupuk	3	4	5	5	3	2	0	0	0	0
4. BBM	126	140	163	233	244	227	214	168	175	181
3. Peti Kemas	21	20	22	28	31	38	51	69	99	131
2. Semen / Klinker	27	28	31	47	47	44	60	61	82	106
1. Batubara	262	267	394	720	671	980	1.120	1.251	1.598	1.842

Isu kenaikan tarif KRL Ekonomi – AC Jabodetabek dan penarikan armada ekonomi baru-baru ini, misalnya, menuai masalah keadilan dalam penerapan mekanisme subsidi. Semua ini menjadi stigma bagi pemerintah (DJKA) untuk membentuk Perum KA Ekonomi, sekaligus ingin menyegerakan pembentukan Perum Prasarana, yang akan dibahas nanti dalam bagian terpisah. Sementara argumen lain dari PT KAI adalah karena uzurnya sarana dapat mengganggu utilisasi trek oleh kereta lain.

APBN dalam dua tahun terakhir banyak difokuskan untuk belanja modal penyelesaian agenda double track P. Jawa maupun double-double track Manggarai – Cikarang. Pelaksanaan proyek bertahun jamak ini tidak dapat secara langsung memperbaiki layanan KA. Manfaat investasi hanya dapat dirasakan bila juga dilengkapi dengan kebijakan menghilangkan distorsi kompetisi antar moda, terutama yang menyangkut angkutan logistik adalah perencanaan end-to-end fasilitas system intermodal supply chain serta

insentif yang mencukupi bagi angkutan barang agar terjadi perpindahan moda dari jalan raya ke moda lain khususnya ke moda KA untuk jarak menengah dan moda laut untuk jarak jauh.

Dari beragam gambaran kondisi perkeretaapian yang disajikan di atas, sebenarnya inti persoalan perkeretaapian kita saat ini adalah persoalan “*untrust*” yang terjadi pada dua tingkat. Tingkat pertama antara PT KAI dengan DJKA, saling curiga dan sandera, akibat historis dan psikologis pengelolaan aset KA. Tingkat kedua *untrust* antara DJKA dgn Kemenkeu, lebih jelasnya Kemenkeu kurang *trust* perihal kapasitas kelembagaan DJKA. Secara umum aset perkeretaapian masih tergolong *under utilized*, semestinya bisa lebih produktif bila ketiga unsur PT KAI, DJKA dan Kemenkeu bisa sinergis dalam berkordinasidan memiliki persepsi yg sama tentang arti dan peran strategis alat angkut KA bagi bangsa dan negara

3. Implementasi Pasal 214, UU 23/2007 Tak Telaksana

Dalam bab ketentuan peralihan, pasal 214 ayat (2) UU 23/2007 disebutkan “ Dalam waktu paling lama 3 (tiga) tahun sejak Undang-undang ini berlaku, penyelenggaraan prasarana perkeretaapian dan sarana perkeretaapian yang dilaksanakan oleh Badan Usaha sebagaimana dimaksud pada ayat (1) serta penyelenggaraan prasarana perkeretaapian milik Pemerintah wajib disesuaikan dengan ketentuan sebagaimana diatur dalam Undang-Undang ini.” Selanjutnya di dalam penjelasan pasal 214 dirinci bahwa waktu 3 (tiga) tahun dimaksudkan untuk menyesuaikan penyelenggaraan Prasarana Perkeretaapian oleh PT. Kereta Api Indonesia (Persero), atas Prasarana Perkeretaapian milik Pemerintah, dalam rangka memberikan kesempatan kepada Pemerintah memperbaiki kondisi PT. Kereta Api Indonesia (Persero) dengan mengambil langkah-langkah sebagai berikut:

- (a) Melakukan audit secara menyeluruh terhadap PT. Kereta Api Indonesia (Persero);
- (b) Melakukan inventarisasi aset prasarana dan sarana PT. Kereta Api Indonesia (Persero);
- (c) Menegaskan status kewajiban pelayanan publik (Public Service Obligation) dan kewajiban masa lalu penyelenggaraan program pensiun pegawai PT. Kereta Api Indonesia (Persero) eks Pegawai Negeri Sipil PJK/Departemen Perhubungan (Past Service Liability);
- (d) Membuat neraca awal PT. Kereta Api Indonesia (Persero).

Implementasi pasal 214 UU 23/2007 ini telah melewati batas waktu yang ditetapkan oleh UU 23/2007. Saat batas waktu itu terlampaui, diterbitkanlah Kepmenhub no. 219 / 2010 yang mendelegasikan kembali pengelolaan prasarana perkeretaapian umum kepada PT Kereta Api (Persero), sampai terbitnya pengaturan baru perihal manajemen kontrak penyelenggaraan prasarana antara Pemerintah dan PT KA. PT KA harus melaporkan secara berkala perihal pengoperasian, pemeliharaan dan pengusahaan prasarana kepada Direktorat Jenderal Perkeretaapian, Direktur Jenderal Perkeretaapian setiap tahun diharuskan melakukan evaluasi tentang pendelegasian ini, sebelum dibentuknya unit/badan usaha khusus penyelenggara prasarana perkeretaapian umum.

Implementasi pasal 214, terkait langsung dengan upaya revitalisasi perkeretaapian, notabene PT KAI. Timnas Revitalisasi Perkeretaapian dibentuk di bawah Kemenko Perekonomian untuk mengkordinir upaya-upaya perbaikan pada tingkatan kelembagaan, organisasi dan proyek. Dua proyek dipilih sebagai *showcases*: KA Komuter Jabodetabek dan KA Babaranjang Sumsel, masing-masing dengan pencapaian target produktivitas tertentu. Pada episode ini dimulai pragmatisme perencanaan dengan target-target yang ambisius seperti 4 juta orang perhari bagi KA Jabodetabek (1,2 juta pada tahun 2014), pengembangan dari 8 juta sampai 20 juta hingga 30 juta ton pertahun bagi produktivitas KA Babaranjang.

Khusus KA Komuter Jabodetabek dibentuk anak perusahaan PT. KCJ. Anak perusahaan ini hanya memiliki kewenangan dalam pelayanan di stasiun dan pelayanan informasi tentang KA Commuter. Aset yang dimiliki KCJ

hanya stasiun-stasiun yang murni dilewati KRL Commuter, serta beberapa set KRLAC. Perusahaan induk PT KAI masih mengoperasikan sarana, merawat sarana dan memiliki dipo serta sebagian besar KRL. Sehingga terdapat tiga pihak yang berbeda dalam sistem KA Jabodetabek, dimanastasiun dan pusat informasi dimiliki PT.KCJ, PT KAI memiliki dan mengoperasikan sarana, pegawai, pengaturan operasional c.q. DAOP 1, dan dipo, sementara rel dan jembatan dimiliki Pemerintah. Bila terjadi gangguan, komunikasi menjadi rumit, dan reaksi antarparapihak menyulitkan dalam mengatasi masalah.

Hubungan regulator versus operator KA belum terpayungi dalam kontrak manajemen yang adil. Benturan kepentingan tak terhindarkan, serta terjadi *moral hazard* di kedua lini, baik di DJKA sebagai regulator (*principal*) maupun PT KAI (*agent*). Alhasil, semua inefisiensi ditanggung pengguna jasa, lewat perantara operator (PT KAI). Peristiwa fatal rusaknya prasarana KA di stasiun Cilebut baru-baru ini melumpuhkan sebagian perjalanan warga Bogor, contoh nyata yang harus dipikul masyarakat dengan biaya pemulihan prasarana sementara diatasi oleh korporasi.

Singkat cerita, tahun 2009 Pemerintah pernah memperkirakan biaya revitalisasi untuk normalisasi pelayanan perkeretaapian mencakup prasarana maupun sarana adalah berkisar Rp 19 triliun, pada saat sebelumnya tahun 2005 PT KAI memperkirakan sekitar Rp 11 triliun hingga Rp 13 triliun, sekedar kembali ke kondisi pre-krisis. Bila dihitung secara kumulatif sejak terbentuknya DJKA tahun 2005 hingga 2013, belanja modal APBN dan RKA PT KAI sudah pasti melebihi perkiraan biaya revitalisasi. Bila pelayanan KA sampai hari ini masih belum kompetitif, waktu tempuh KA antarkota juga belum mengalami penurunan yang berarti, hanya ada dua kemungkinan: pertama belanja modal masih belum cukup banyak, atau yang kedua telah terjadi mis-alokasi investasi atau dengan perkataan lain telah terjadi ketidak-sinkronan investasi dengan target-target operasi dan pengembangan usaha. Mana yang betul ?

Tak lama berselang, terbit Perpres No 83/2011 yang mengugaskan PT Kereta Api Indonesia menyelenggarakan prasarana dan sarana KA Bandara Soekarno-Hatta Komuter dan jalur lingkaran Jabodetabek, tanpa dukungan dana publik. Terbitnya Perpres No 83/2011 adalah reaksi atas kemandekan manajemen prasarana KA selama ini. Mengembangkan jalan tol pun saat ini perlu dan sudah didukung dana pemerintah (APBN), bagaimana mungkin untuk KA tidak memerlukan APBN ? Implementasi Perpres ini khusus jalur lingkaran Jabodetabek masih sangat alot, mengingat terbatasnya kapasitas fiskal untuk percepatan membangun perlintasan KA tidak sebidang dengan jalan raya. KA Bandara Komuter dipastikan molor dan tidak mulus, dikarenakan keterbatasan akses dan penempatan stasiun akhir di sisi bandara.

4. Peristiwa Kecelakaan KA Masih Berlanjut !

Walaupun trend jumlah kejadian kecelakaan KA sedikit menurun dalam 4 tahun terakhir, penegakan keselamatan KA masih ditangani secara sangat reaktif oleh Pemerintah ketimbang preventif-sistemik. Pencapaian program

keselamatan KA masih jauh dari rencana dan target *ideal*, masih terjadi saling menyalahkan. Saat ini praktis berjalan tanpa target di sisi operator (PT KA) dan tanpa tujuan yang terukur di sisi regulator (Kemenhub). Kehati-hatian pembatasan kecepatan KA, menjadi kontra produktif dengan re-investasi prasarana yang sudah dilakukan – perbaikan trek menjadi idle dan *under-utilized*.

Ketika maraknya kejadian kecelakaan transportasi oleh Presiden SBY pernah dibentuk Timnas Keselamatan Transportasi, berlanjut dari situ Kementerian Perhubungan ketika dijabat Jusman S.D menyusun agenda Roadmap to Zero Accident (RZA) untuk setiap Direktorat Jenderal. Khusus Direktorat Jenderal Perkeretaapian pun sudah disusun program untuk mengisi agenda ini. Namun sampai dimana kemajuan dan hasilnya hampir nihil evaluasi, sosialisasi RZA ditingkat lapangan pun belum sempat nyambung ketika itu, kemudian terjadi pergantian Menteri Perhubungan ke Freddy Numberi.

Peristiwa kecelakaan KA masih terus beruntun terjadi. Kejadian di Pemalang Desember 2010, 36 orang meninggal. Parahnya pada hari yang sama terjadi peristiwa tabrakan di Solo menewaskan 1 orang, Beberapa hari setelah itu di Rangkasbitung, Jawa Barat gerbong KA terbakar tanpa langsung diketahui musababnya, dan beberapa hari setelah itu KA Jabodetabek menabrak/ditabrak truk ditengah kemacetan lalu lintas Jakarta. Baru-baru ini KRL Commuter Line anjlok di stasiun Cilebut, Bogor, diduga ada rel yang patah, saat yang sama tarif KRL baru dinaikan ! Baru-baru ini peristiwa lokomotif “hantu” di Semarang, yang berjalan sendiri melintasi dua stasiun sepanjang 17,2 km sungguh mengagetkan semua pihak, mengapa bisa sampai terjadi.

Semua kejadian demi kejadian ini menandakan belum berhasilnya implementasi perbaikan perkeretaapian seperti yang diamanahkan UU 23 / 2007 tentang Perkeretaapian. Komunikasi program keselamatan dan rencana aksi antara Ditjenka dan PT KA, perlu diperbaiki, hingga saat ini belum sinkron, satu jalan ke sana satunya lagi ke sini. DJKA hendaknya menyegerakan pengaturan *safety management system* (SMS) di sektor perkeretaapian, untuk membagi tanggung jawab yang jelas antara regulator dan badan usaha penyelenggara perkeretaapian.

5. Ripnas: Rencana Besar – Minim Kapasitas !

Rencana Induk Perkeretaapian sudah tersusun. Secara substansi sangat ambisius, tidak mengapa. Namun, dari perjalanannya, sangat menagukan akan terjadi konsistensi dalam pelaksanaan. Hal ini terutama karena masih sangat minimnya kapasitas SDM, lembaga publik serta kapasitas industri perkeretaapian nasional saat ini, termasuk belum munculnya operator prasarana dan sarana selain PT KA. Perlu upaya khusus untuk, mempercepat penguatan kapasitas kelembagaan, regulasi & standard pendukung, agar perjalanan pengembangan KA sesuai dengan tujuan dan arah rejim regulasi KA yang sudah ditetapkan.

Dalam Ripnas target pasar KA pada tahun 2030 telah ditetapkan sebesar 11%-13% (660 juta orang) untuk angkutan penumpang dari 6,7% (202 juta orang) pada tahun

2009. KA perkotaan akan mengangkut 275 juta orang/tahun di 15 wilayah perkotaan. Sasaran angkutan barang sebesar 15%-17% (4,4 miliar ton) dari <1% (18,95 juta ton) pada tahun 2009. Gambar rancangan fisik jaringan KA per pulau sudah disajikan, dengan target 12.100 km, termasuk 3.800 km KA perkotaan pada tahun 2030. Total biaya perwujudan implementasi Ripnas diperkirakan menelan biaya sebesar Rp 877 triliun, diharapkan 70% pendanaan berasal dari entitas swasta.

Agar dapat direalisasi Ripnas harus mendapat dukungan penuh dari para stakeholder perkeretaapian. Untuk itu, masukan dari beragam institusi publik lain yang terkait dengan perkeretaapian seperti Kemenkeu, KemenBUMN, Bappenas dlsb. perlu di dengar oleh DJKA secara seksama. Jangan-jangan Ripnas hanya berupa Rencana Induk KA ala DJKA, Kemenhub semata, bukan Ripnas ala NKRI. Tidak dapat dihindari, perlu lanjutan *roadshow* Ripnas, khususnya di internal lembaga publik untuk menampung validasi-validasi lanjutan dari industri. *Trust* terhadap kapasitas lembaga publik perkeretaapian dan kapasitas industri perkeretaapian menjadi modal utama untuk mewujudkan Ripnas. Sungguh belum terlambat, tergantung niat yang memimpin dan leadership yang mumpuni !

6. Perkembangan Terkini Pemisahan Vertikal di Eropa

Berikut ini disampaikan perkembangan restrukturisasi KA yang terjadi di beberapa negara Eropa. Baru-baru ini hasil review tentang perjalanan restrukturisasi KA di Uni Eropa yang sebelumnya telah mencanangkan pemisahan vertikal, hasilnya sangat bervariasi di antara negara-negara anggota. Dampak pemisahan ada yang negatif, positif, tidak *significant* dan ada yang tergantung kepadatan kereta. Disimpulkan bahwa tidak ada korelasi yang kuat antara bentuk organisasi yang dipilih (pemisahan atau integrasi) terhadap terbukanya tingkat kompetisi, pertumbuhan pasar angkutan kereta api, atau pun tingkat keamanan sistem. Namun, beberapa prinsip tata kelola dan proses bisnis yang baik, disepakati sebagai faktor kunci keberhasilan dalam reformasi kereta api. Lihat, misalnya “*Economic Effects of Vertical Separation in Railway Sector*” (van de Velde & Nash, 2012).

Secara umum dampak pemisahan vertikal terhadap kompetisi sangat positif di Eropa. Namun hipotesis bahwa dengan pemisahan vertikal akan bertumbuh operator baru, tidak benar sama sekali, dengan pemisahan ditemukan bahwa biaya transaksi naik menjadi tiga kali lipat, relatif terhadap ketika masih belum memisah (terintegrasi). Jepang memilih regionalisasi usaha dan mempertahankan model integrasi. Keuntungan model Jepang adalah kemudahan untuk menyelaraskan kepentingan dan proses bisnis internal (*economics of scope*).

Sampai sekarang di Uni Eropa, walaupun pemisahan vertikal sudah menjadi kesepakatan lama, sikap negara anggota berbeda-beda, Jerman, Austria, Italy dan negara-negara Baltic misalnya tetap memilih model integrasi, adapun Swedia dan Belanda cenderung memilih model pemisahan penuh. Inggris yang paling agresif melakukan

pemisahan bertahan untuk terus meningkatkan kebijakan *re-alignment insentif* biaya penggunaan prasarana bagi operator sarana. Sementara di Perancis antara RFF (manajer prasarana) dan SNCF (operator kereta) berbeda keinginan, SNCF condong ingin kembali ke model integrasi dan RFF meminta utuh sebagai manajer prasarana. Republik Ceko dan Slovenia cenderung menguat ke model integrasi, dan Polandia ke model pemisahan.

Dari literatur ditemukan efek pemisahan vertikal dalam hal kenaikan biaya akibat kesalahan pemberian (misalignment) insentif kepada operator sarana cenderung lebih besar dari kenaikan biaya transaksi. Mengatur biaya penggunaan prasarana (TAC) secara efisien sangatlah penting, tetapi ini tidak dapat dengan sendirinya menghasilkan alignment insentif yang benar sehubungan dengan target penggunaan kapasitas lintas yang efisien juga pemulihan investasi prasarana, apalagi untuk ekspansi pembangunan jaringan rel. Dalam penelitian sebelumnya dilaporkan bahwa meningkatnya kompetisi akan mengurangi biaya, setelah diperiksa kembali hasilnya tidak menunjukkan pola yang konsisten tentang dampak pemisahan vertikal terhadap biaya. Literatur juga tidak memberikan bukti kuat mengenai dampak reformasi KA pada pembagian moda transportasi (*modal split*). Tampaknya memang tidak ada bukti yang kuat bahwa pemisahan vertikal lebih *superior* atau *inferior* dari model lainnya.

***Bagaimana dengan perkeretaapian kita ?
Restrukturisasi KA nasional termasuk kategori mandeg
dan setengah hati. Mengapa ?***

7. Pembentukan Perum Prasarana KA

Tidak ada pasal khusus yang menganjurkan bentuk yang unik tentang struktur penyelenggaraan perkeretaapian. Pasal 17 UU 23/2007 menyatakan penyelenggaraan perkeretaapian umum sebagaimana dimaksud dalam Pasal 5 ayat (1) huruf a berupa penyelenggaraan: a) prasarana perkeretaapian; dan/ atau :b) sarana perkeretaapian. Sehingga kedua model baik pemisahan ataupun integrasi diperbolehkan untuk dibentuk, tergantung pasar angkutan dan karakteristik jaringan.

Restrukturisasi perkeretaapian sudah dimulai sejak lama dan dilakukan bertahap. Terhempas krismon, Proyek Efisiensi Perkeretaapian (PEP) yang tengah berjalan di bawah dorongan World Bank menjadi menggantung dan tak tentu arah. Baru tahun 2007 dengan terbitnya UU 23 tentang Perkeretaapian ada niatan kembali untuk mereformasi sektor perkeretaapian, sebelumnya didahului dengan terbentuknya regulator khusus perkeretaapian Direktorat Jenderal Perkeretaapian (DJKA) pada tahun 2005. Salah satu tujuan UU 23/2007 adalah untuk memisahkan secara tegas fungsi regulator pengaturan (DJKA) dan fungsi pengoperasian (PT KAI dan calon operator lain). Ketika penyusunan UU 23, PT KAI sudah berada dalam proses transisi menuju pemisahan “halus” sesuai rekomendasi PEP dengan membentuk divisi atau organisasi-organisasi fungsional terpisah. Memasuki tahun 2010 beragam divisi

yang telah terbentuk seperti Divisi Sarana dibubarkan kembali oleh manajemen PT KAI ketika itu.

Tujuan utama restrukturisasi adalah bagaimana agar terjadi perpindahan moda (*modal shift*) ke angkutan KA? Perpindahan moda hanya mungkin terjadi, bila moda KA lebih kompetitif dengan terpenuhinya 3 hal: i) pasar dibuka ii) Menghilangkan distorsi kompetisi antar-moda, agar *level-playing field*, dan iii) Revitalisasi dan modernisasi infrastruktur dan sarana KA.

Dengan kondisi prasarana dan sarana yang belum ideal maka pemisahan vertikal akan menambah beban negara dan biaya transaksi. Saat PJKA beralih menjadi Perumka juga telah membebani struktur biaya korporasi s.d 2064, sehingga PT KAI kurang kompetitif, disamping inefisiensi selama ini dengan biaya umum yang sangat tinggi. Untuk itu perlu disiapkan *roadmap* masa transisi yang paling menguntungkan bagi eksistensi dan peningkatan yang meneruskan pelayanan angkutan KA, bukan yang sebaliknya mengurangi keandalan layanan KA yang sudah mulai terasa membaik.

Transisi ke multi operator tidak mesti langsung serta merta menjadikan *full* pemisahan vertikal dengan membentuk Badan Usaha Prasarana baru. Alternatifnya bisa bertahap dengan membentuk divisi prasarana yang memiliki pembukuan keuangan tersendiri, kemudian berproses menjadi badan usaha (Manajer Infrastruktur) terpisah. Sambil berjalan, hendaknya sudah mulai disiapkan “*badan resolusi dispute*” sebagai embrio badan regulator independen untuk menangani keluhan-keluhan terkait alokasi kapasitas dan kejadian kecelakaan antar operator.

Mempertahankan bentuk kelembagaan PT KAI yang sekarang apa adanya bukanlah pilihan terbaik, mengingat pilihan *cross subsidy* antar unit usaha, bukanlah praktik yang baik dan berpeluang terjadi *moral hazard* perkeliruan pelaporan keuangan korporasi. Alternatif bentuk holding company (dari sejumlah anak perusahaan) atau pun melakukan regionalisasi usaha khusus di wilayah perkotaan dan antar kota p Jawa, perlu dikaji dan dipercepat keputusannya. Perjalanan PT KAI sekarang sangat berorientasi kepada keuntungan, upaya yang selama ini dilakukan pantas diapresiasi dalam peningkatan pelayanan KA, tetapi semua dilakukan dengan mengorbankan potensi produktivitas aset KA. Pilihan antara mendahulukan efisiensi versus produktivitas perkeretaapian, menjadi dilematis dalam konteks perkeretaapian Indonesia yang pasarnya sangat potensial berkembang. Pelayanan akan berkembang dan meningkat secara alamiah bila ada diperkenalkan derajat kompetisi, khususnya dalam perkeretaapian dikenal dengan “*competition for the market*”, berbarengan dengan itu disiapkan insentif yang mencukupi bagi perkeretaapian untuk meningkatkan daya saing antar moda.

8. Masa Depan PT KAI

Masa depan perkeretaapian Indonesia sangat tergantung dan berkorelasi positif dengan keberadaan dan masa depan metamorfosa PT KAI. Artinya semua program yang tertera dalam Ripnas sulit terealisasi tanpa menyertakan PT KAI,

dalam arti memperkuat kapasitas dan tata kelola PT KAI. Oleh karena itu penting bagi Pemerintah untuk segera menetapkan status PT KAI ini dalam peran sentralnya sebagai aset utama dan *key actor* dalam modernisasi perkeretaapian Indonesia kedepan. Termasuk bagaimana pemanfaatan kompetensi SDM PT KAI ke dalam lembaga publik, dengan membuat kemudahan “mutasi” penugasan sementara pegawai PT KAI atau BUMN ke lembaga pemerintah.

Terbitnya Perpres 83 / 2011 tentang penugasan kepada PT Kereta Api (Persero) untuk menyelenggarakan prasarana dan sarana KA Bandara Soetta dan jalur lingkaran Jabodetabek, sesungguhnya tidak *in-line* dengan arah reformasi KA. Lewat Perpres ini, sekilas memang ada penegasan pemisahan fungsi regulasi dan operasi antara pemerintah c.q. Ditjenka, Kemenhub dan PT Kereta Api (Persero). Dimaklumi, sebelumnya dan hingga saat ini pemerintah masih menjalankan fungsi ganda. Namun penegasan bahwa pelaksanaan Perpres 83 tidak diperbolehkan menggunakan APBN dan APBD, membuat semua menjadi absurd. Walaupun ini berupa strategi lapangan yang menguntungkan bagi PT KAI, bagaimanapun manakala PT KAI tidak mampu melaksanakan Perpres 83 akan diserahkan kembali urusannya ke Pemerintah. Kendali tarif, menjadi lepas, terkecuali Pemerintah menitipkan kembali pelayanan KA ekonomi, atau membuat unit penyelenggara khusus KA ekonomi.

Perpres ini adalah reaksi bagi kemandegan kebijakan manajemen prasarana KA. Mengembangkan jalan tol pun saat ini didukung dana pemerintah (APBN) – *viability gap funding*, khususnya di ruas-ruas tol yang kurus. Bagaimana mungkin KA tidak memerlukan APBN? Politik infrastruktur transportasi dan politik anggaran berjalan tidak sejalan. Patut disyukuri kisruh harga BBM bersubsidi bagi angkutan barang KA baru-baru ini telah lerai, sehingga masih membekas dalam ingatan kita, betapa birokrasi tidak berkomunikasi, walau saling bicara.

Penutup

Resolusi aset perkeretaapian sangat tergantung kepada model kelembagaan badan usaha perkeretaapian yang diinginkan dalam jangka panjang. Dengan terus berkepanjangannya penyelesaian aset, perlu ada jalan keluar bentuk perjanjian pengelolaan prasarana milik pemerintah kepada badan usaha prasarana PT Kereta Api (Persero) secara jelas.

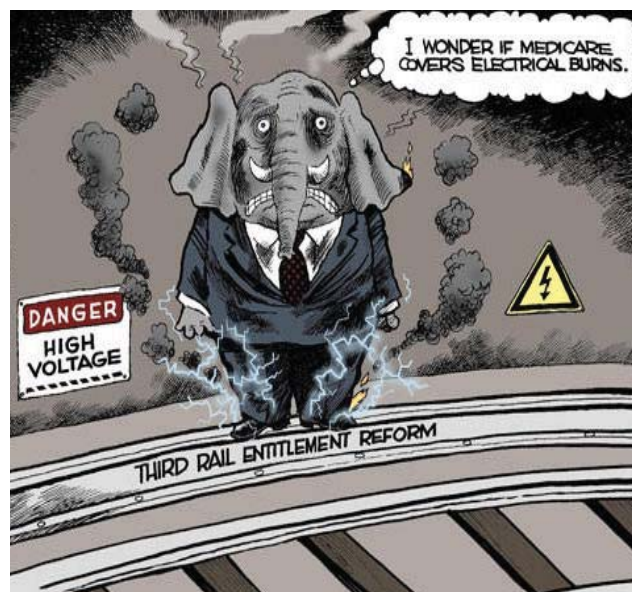
Pengembangan jaringan baru (*greenfields*) pelayanan perkeretaapian masih terbuka luas, ini masih perlu dilakukan upaya percepatan. Mengapa tidak dilakukan kontrak manajemen atau konsesi saja seluruh aset perkeretaapian eksisting di p Sumatera dan P Jawa kepada PT KAI, paling tidak aset di sepanjang lintas raya (*main lines*). Persyaratannya PT KAI menyiapkan proposal rencana bisnis dengan beban fiskal minimum. DJKA fokus mengembangkan jalan rel di luar Pulau Sumatera dan Jawa, baik untuk pasar penumpang maupun barang (mineral tambang dan kehutanan) juga mempercepat pembangunan kereta api cepat (HST) di pulau

Jawa, termasuk mempertahankan layanan *feeder-feeder* KA yang kurang komersial dan MRT perkotaan. Penugasan ini sangat memerlukan resource dan dukungan pemerintah yang fokus secara berkelanjutan agar terealisasi tidak terlalu lama.

Berlarut-larutnya *conflict of interest* dalam pengelolaan prasarana eksisting perkeretaapian umum milik pemerintah, termasuk re-aktivasi prasarana KA yang tidak beroperasi, perlu dicarikan model kontrak O&M prasarana (IO dan IM) antara pemerintah sebagai pemilik dan operator terpilih yang diukur berdasarkan kinerja (*performance based*) *multi-years*, atau pun bentuk kontrak konsesi O&M prasarana dalam jangka panjang, tanpa harus menunggu penuntasan resolusi aset.

Merancang masa transisi unit *track authority* (manajer prasarana) jelmaan dari bagian organisasi PT Kereta Api (Persero) yang dipisahkan secara akunting penting disiapkan, seperti model Divisi. Unit ini nanti yang akan menjelma menjadi Badan Usaha Prasarana perkeretaapian secara terpisah dalam jangka panjang. Pada masa transisi, derajat akses Badan Usaha Sarana lain ke jaringan rel milik pemerintah yang dikelola oleh manajer prasarana cukup berdasarkan negosiasi akses ataupun mandat dari pemilik prasarana, bukan model *open access*.

Pembelajaran restrukturisasi KA Eropa mengingatkan bahwa dampak pemisahan vertikal tidaklah serta merta menjamin keterbukaan pasar dan kompetisi, juga tidak menunjukkan bukti yang kuat bahwa membuka pasar KA akan terjadi perpindahan moda angkutan (*modal shift*) yang significant ke KA. Tampaknya memang tidak ada bukti yang kuat bahwa pemisahan vertikal lebih *superior* atau *inferior* dari model lainnya. Namun, beberapa prinsip tata kelola yang baik disepakati sebagai faktor kunci keberhasilan dalam restrukturisasi kereta api. Bagi Indonesia ini akan membutuhkan waktu, pendanaan, modal politik serta kepemimpinan (*leaderships*) yang kuat agar berhasil menjalankan reformasi KA secara struktural.



UNDERGROUND SPACE USER'S PERCEPTION IN JAKARTA (COMPARE TO JAPAN AND KOREA) ANALYZED BASED ON OPINION SURVEY

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Study for underground space user's perception has been analyzed by the authors based on the opinion survey at the major existing underground space facility, such as underground commercial shops, parking area or passing ways, in the city center area of Jakarta, Indonesia. In addition, this study result is compared with the similar study in Japan and Korea conducted during year 2003 and 2004 and the difference of underground space user's perception among three countries is identified as the results. These study results would become the useful indication for underground space planning or underground station designing, which are implemented by Jakarta Mass Rapid Transit Project in the near future. Survey for this study was implemented on 2008 and been published within previous editions. We consider this topic is exceptionally relevant to be reappointed, especially considering the Jakarta MRT, which among its segment will utilize underground construction. Major flooding disaster in Jakarta, which has caused fatalities in UOB Plaza and the cave-ins of underground construction in Freeport mine (Papua) is a meaningful lesson. Must be kept in mind, whether amounting of financial losses which afflicted by property owners, will not be comparable to the losses which suffered by victims. These catastrophe can be noted as an important lesson for underground structures planning to securing point at a certain depth. Similarly, recognizing local human characters can be used as an essential references in design and campaign for the use of underground space, to prevent such recurring fatalities.

Key Words: *Indonesia, Opinion Survey, Underground Space, Disaster and Safety*

1. JAKARTA DISASTER RECORDS

1.1 Natural Disaster

Flood has been a natural disaster common to Jakarta. Each year, there are areas always receive flood in rainy season due to the rain fall ranging from 2000 to 4000 mm/year. Yearly 80% of rain fall occurs in November through May, having its climax in January. Of the 65.000 hectare of total area of Jakarta, 40% is made up of such relatively lower lands along the lines of the rivers: Angke, Pesangarahan, Sekretaris, Grogol, Krukut, Mampang, Ciliwung, Cipinang, Sunter, Buaran, Jati Kramat, and Cakung so that they are exposed to inundation and flood.

1.2 Earthquak

From result of seismic observation conducted in the past 95 years, Jakarta is recorded to the most moderate of any regions in Indonesia. Only three earthquakes in medium and small scale have recorded at a radius of 100 km from Jakarta region during the past 95 years. The first occurred on July 13, 1963 with Ms=5.2 with depth of 133 km in epicenter distance of 70 km from Jakarta. The second one occurred on November

24, 1964 with Ms=5.3 with depth of 130 km in epicenter distance of 88 km. The last occurred on October 9 1985 with Ms=5.9 with depth of 103 km in epicenter distance of 67 km. Same as superficial earthquake, this observation shows that seismic medium depth of the Jakarta is moderate.

1.3 Outbreaks of Fire

Outbreaks of fire were slightly decreased from 888 times to 805 times. Those burning accidents caused about 3.112 units of housing/welling complex damaged, and 584 units of public/industrial buildings ruined. While the number of motor vehicles burned was 71 units, and those fire accidents also caused 112 persons lead to dead or injured.

Electrical shortage is the most frequent cases on fire. About 56.65 percent of outbreak of fire was caused by electrical shortages (456cases). The rest, about 10.31 percent, was caused by stove explosion. Then about 5.47 percent was caused by cigarettes recklessness, and about 26.58 percent was caused by unspecified cases.

1.4 Traffics Accidents

In the last two years, 2003 and 2004, rate of traffic accident is sharply increased, ether with respect to the number of accident, losses of life, and property. The causes of traffic accidents are largely categorized into four groups, namely driver's mistake, lack of vehicle maintenance, lack of road maintenance and bad weather. About three fourth of traffic accidents are attributed to the driver's mistake, consisting

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of “careless driving (26.3 percent), “Violation of traffic law (24.7 percent), unskilled driver (15.0 percent), “and so forth. In order to reduce the traffic accidents caused by a driver’s mistakes or carelessness, traffic safety education should be enhanced..

2. JAKARTA AREA UNDERGROUND SPACE USING FACILITY

2.1 Geotechnical Condition of Jakarta Area

Geotechnical condition of areas in Jakarta represented by SPT (Standard Penetration Test). The SPT data will show zones indicating depth level of cone force $> 150 \text{ kg/cm}^2$ made with interpolation of 700 spots of earth test in Jakarta areas (Budi Susilo, 1996). Most areas in Jakarta have a lower SPT value of 10 (within a depth of 10m). The highest value (60) is found in northern part of Senayan area (within a depth of 10m).

The grounds in Jakarta areas are generally quite stable within a depth of $>20\text{m}$, like areas in Cilincing-Merunda, Menteng, Thamrin, Cideng, Tomang through Grogol, Tambora-Jelambar, Kapuk-Kalideres

2.2 Underground Space Planning Guideline

In 2001, the Jakarta local government issued The Underground Space Planning Guideline, which includes:

- a. Guideline for underground space use within the Jakarta Region
- b. Guideline for future utilization and control of underground space
- c. Guideline for development of underground infrastructure system, which includes public, trade and service facilities (transport, telecommunication, spaces for residing, trading, recreation, sport, office, supermarket).
- d. Guideline for development of underground infrastructure system, such as industrial infrastructure (industrial zone, underground space, power plant space, liquid fuel reservoir space).

One of the aspects in the Underground Space Planning is to consider the depth of underground space constructions which include: (a) value of SPT (Standard Penetration Test) within cone force $>150\text{kg/cm}^2$, (b) actifier depth, (c) building height, (d) types of soil / stones.

It is also noted in the Underground Space General Planning that the underground space use must be same as the use of space aboveground. The Guideline also prescribes the following;

- the use of underground space building must be open for public
- any underground space building which has depth exceeding 20 m is subject to governor’s permission.
- The underground boundary distance from road may not exceed the aboveground boundary.
- Management of underground space which may take the form of a district shall be performed independently or in integrated system.
- The underground space building must observe the provision of the Basement Site Coefficient (KTB, Koefisien Tapak Basement)

2.3 The Use of the Existing Underground Space

Despite the fact that the Jakarta Local Government just issued the Guideline and Underground Space Planning in 2001, development of underground space has been widely initiated since 1990. Buildings with underground spaces for commercial purposes have been available in most of the prioritized area (except for most of the areas in Pantai Utara and Tanjung Priok) and highly intense prospective area (except for much of Senen Area and few of Jl. Gajah Mada/Hayam Wuruk).

Of the 38 buildings observed development of the underground spaces is generally made in support of the building users’ activities. The underground spaces dominantly serve as parking facility, while office, shop and entertainment are still limited in number to do activities in underground space. Depth of these underground spaces from the ground level ranges from 5 to 20 meters. In addition to the entrance and exit passage for vehicles, the underground spaces have also been completed with escalators and stairs connecting to the aboveground spaces of the buildings. Fire extinguishers and great sign boards are also placed in these spaces.

Up to this date, there has been no significant disaster occurred in underground spaces, except for the car bomb in 2001 exploded in a building in Senayan Area by terrorists which claimed casualties and damage to vehicles but caused no fire or significant damage to the building. And despite the severe flood hit Jakarta in 2001 and 2005, there was no report on any collection of water in underground spaces.

2.3 Underground Space Planning

There is now some major planning for the development of underground spaces to take place in Jakarta. Among of them are the Mega Kuningan Town Park (63 floors overground and 6 floors underground) in Kuningan area (Casablanca), and The Park Tower 3 and 4 (each 35 floors overground and 5 floors underground, and 5 floors underground) planned to finish by the end of 2006.

In addition, one of the major planning for the use of underground spaces is the construction of the 21,7 km Mass Rapid Transit (MRT) South-North (Lebak Bulus-Kota). The construction work will be done in phases, namely Phase I Lebak Bulus - Dukuh Atas ($L = 14,3 \text{ km}$) and Phase II Stage 1 Dukuh Atas - Monas danand Phase II Stage 2 Monas – Kota.

The MRT is planed as a heavy rail transit system, operating in North-South 14,3 km corridor between Lebak Bulus and Dukuh Atas with elevated/underground guide-ways. For the Phase I, there will be five elevated stations and five underground stations at approximately 1 to 1.5 km intervals. Guide-ways will be constructed over or under the public right-of-way. The elevated guide-way will be constructed almost 12 m above the ground while the underground one will be almost 10 m below. Gradients are limited to a maximum of 3.5%. The minimum curvatures are 300 m horizontally and 3,000 m vertically. The following Figure 1 shows the route and geology profile of the MRT, that is a new transportation system to be introduced first time in Jakarta or in Indonesia generally.

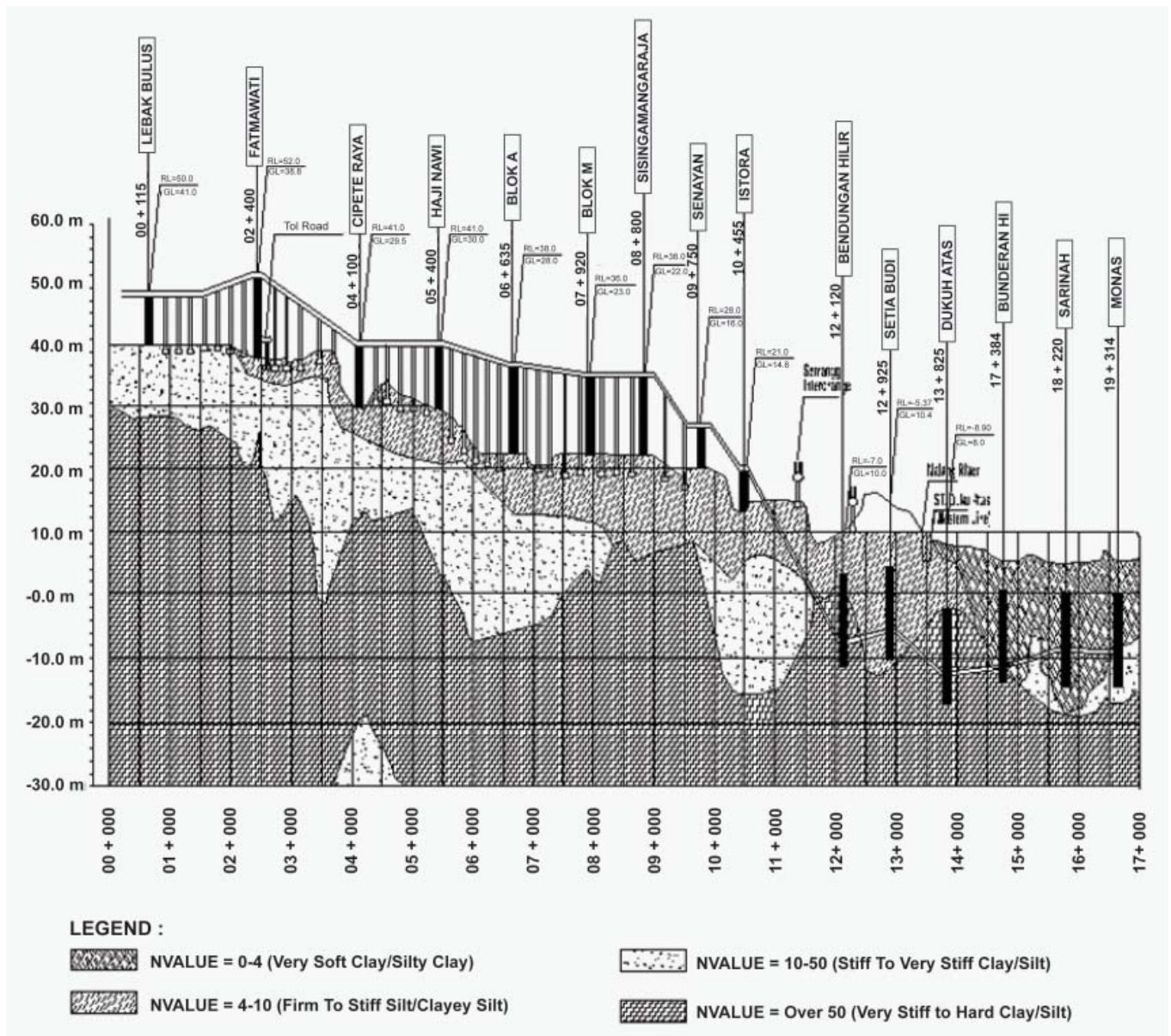


Figure 1 Route and Geology Profile, MRT Lebak Bulus - Monas

3. UNDERGROUND SPACE USER'S PERCEPTION SURVEY IN INDONESIA

3.1 Survey Point

The survey was conducted in eight buildings which have been completed with facility of underground spaces, namely: (1) Blok M Mall, (2) Taman Angrek Mall, (3) Plaza Indonesia, (4) Plaza Hayam Wuruk (5) WTC Mangga Dua, (6) Atrium Senen, (7) Senen Station, (8) Mall Kelapa Gading. Except for Atrium Senen and Senen Station, the survey points are located in different areas as shown in Figure 2.

As observed, characteristics of visitors to any of the buildings are made up of various segments. Visitors of the Plaza Indonesia come from middle and upper class communities, while visitors of Kelapa Gading Mall, Hayam Wuruk Plaza, Taman Angrek Mall come from middle class communities. WTC Mangga Dua, Atrium Senen, and Blok M Mall are mostly visited by middle and lower class communities, and the Senen

Station is mostly visited by lower class communities which is in line with the its function as the station for economic class trains. The following Table-1 presents the technical specification and facilities of the respective survey points.

3.2 Implementation of the Survey

The survey was conducted on each of the locations during business days and holidays within one week period in different hours (09.00 – 10.00, 12-00 – 13.00, 17.00 – 18.00, 20.00-21.00). The survey was performed by two surveyors using interview technique. The questionnaire was prepared both for local employees and the visitors. The respondents were also selected according to classes of ages (<15, 15-25, 25-30, 30-40, 40-50, >60) of male and female. Result of the survey indicates that most of the respondent are responsive to the survey and only a few of the respondents (averagely less than 2% of the respondents) gave less response to the questions provided, except for the question about the existence of Emergency Exit and Fire Extinguisher, 11.4% of the respondents gave no concern about them.

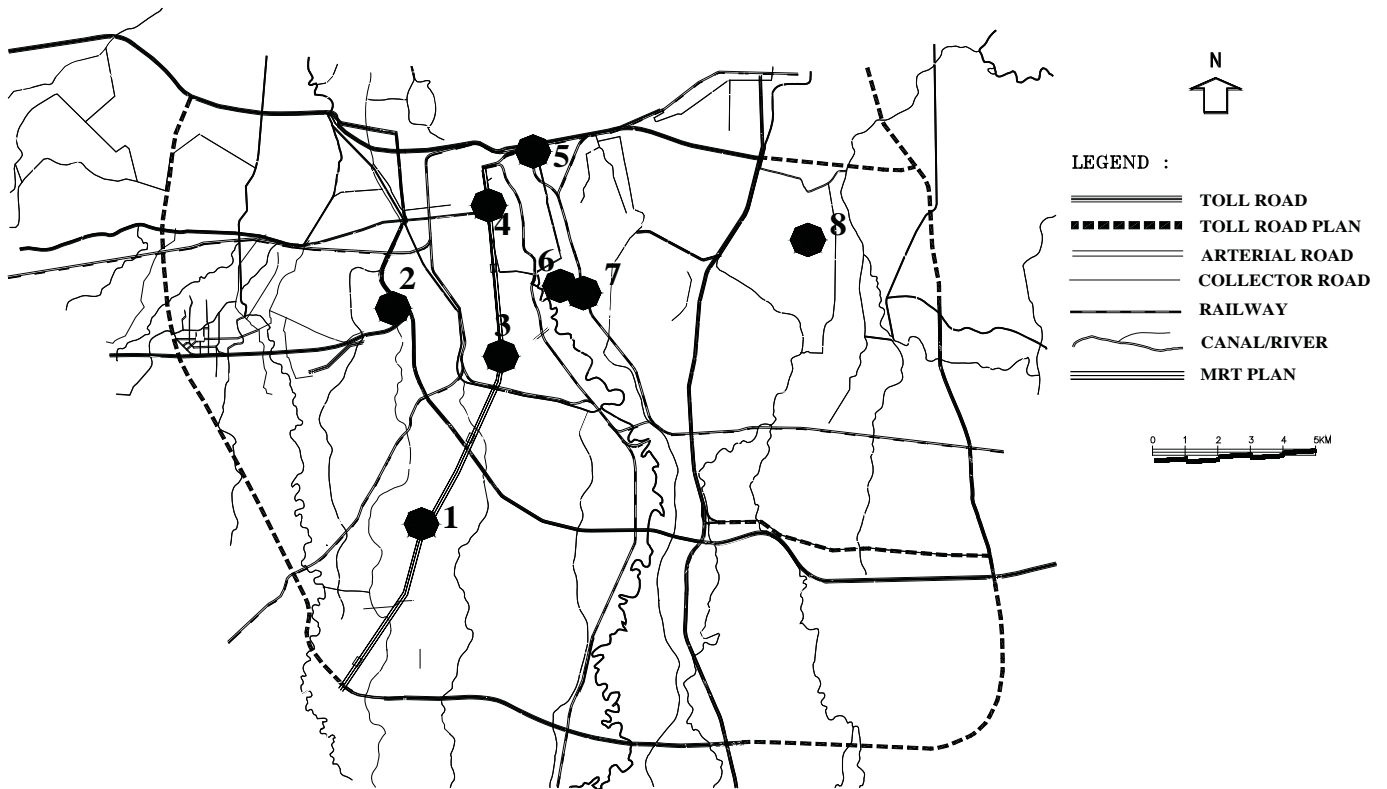


Figure 2 Summary Map of Survey Point

Table -1 Summary List of Survey Points and Underground Space Facility

No.	Survey Points	Survey Points Location	Underground Space Purpose (m ²)	Depth from Ground Level (m ²)	Surround Area Condition
1	Blok M Mall	Blok M	32,928	0 - 5	Basement 1 : Shop, Lobby and Parking
				5 - 10	Basement 2 : Shop, Restaurant and Parking
2	Taman Anggrek Mall	Taman Anggrek	58,328	0 - 4.5	Basement 1 : Shop
				4.5 - 9	Basement 2 : Shop, Parking
3	Sogo/Plaza Indonesia	Thamrin	46,875	0 - 4	Basement 1 : Shop and Entertainment
				4 - 8	Basement 2 : Parking and Entertainment
				8 - 12	Basement 3 : Parking
				12 - 16	Basement 4 : Parking
4	Hayam Wuruk Plaza	Hayam Wuruk	4,500	16 - 20	Basement 5 : Parking
				0 - 5	Basement : Parking
5	Gedung WTC Mangga Dua	Mangga Dua	94,500	0 - 4.5	Basement 1 : Shop
				4.5 - 9	Basement 2 : Shop, Parking
				9 - 13	Basement 3 : Parking
6	Atrium Senen	Senen	11,844	0 - 5	Basement 1 : Shop and Parking
				5 - 10	Basement 2 : Parking
7	Stasiun Senen	Senen	210	0 - 4	Basement : Passenger Transit
8	Kelapa Gading Mall	Kelapa Gading	23,400	0 - 4.3	Basement 1 : Parking and Shop
				4.3 - 8.5	Basement 2 : Parking
				8.5 - 13	Basement 3 : Parking

Photos of the survey point view of the respective locations taken upon the survey are provided below:



Blok M Mall (basement 1), survey point view



WTC Mangga Dua Mall, survey point view



Taman Angrek Mall (basement 1), survey point view



Taman Angrek Mall (basement 1), survey point view

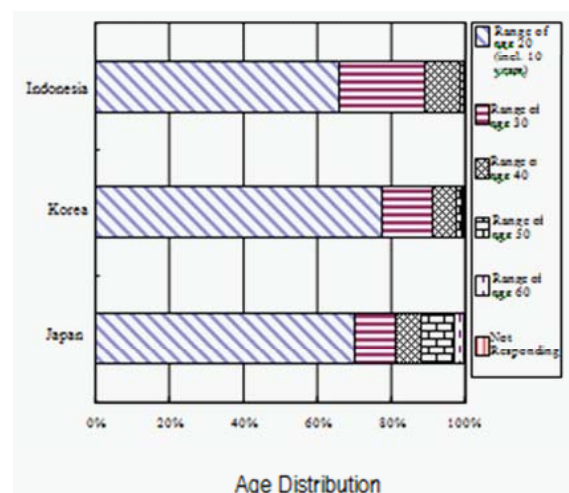
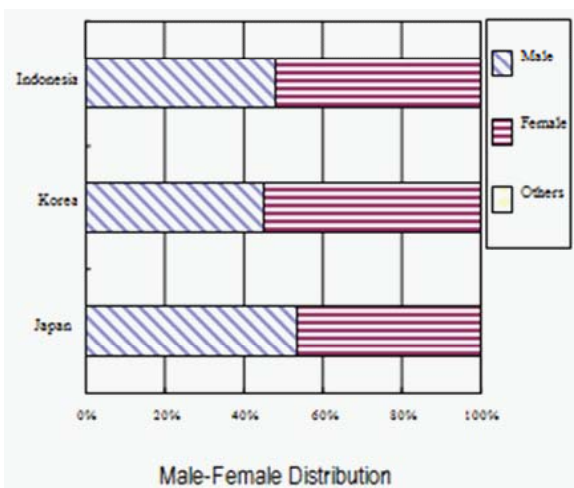
Figure-3 Survey point view photos

4. COMPARISON OF UNDERGROUND USER'S PERCEPTION AMONG INDONESIA, JAPAN AND KOREAN

4.1 Survey Target

In three countries where there have been conducted survey based on composition of age and sex, the Jakarta was

counted to have 48% male nearly as much as the percentage in Korea and Japan. For the differences in the manner of questionnaire survey process with respect to age composition, the specification is provided in table 1. As seen in table 2 below, the younger age of 20 years old in these three countries, they almost take the position in the table and followed by the younger age of 30 years old.



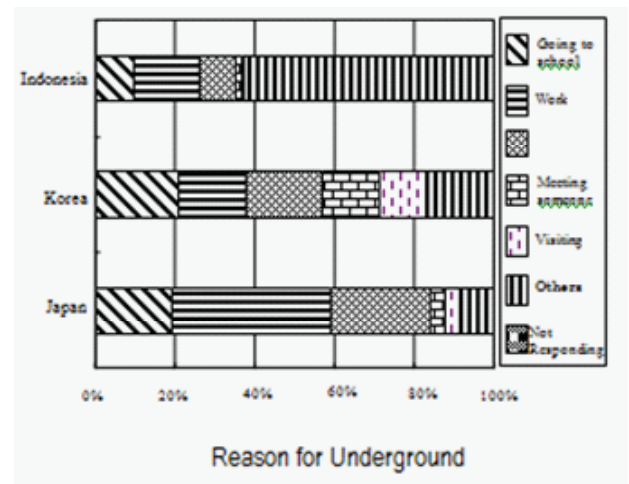
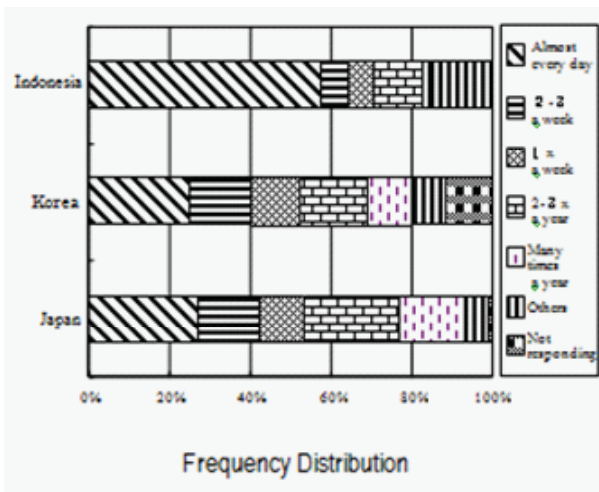
4.2 Underground Use Condition

Questionnaires in Japan and Korea, on the basis of underground use service, have made comparison on three kinds of underground uses, which are: the use of underground floors of a building, underground shopping centers, subway trains, except for Jakarta which was targeted to underground floor of building as there is a plan for development of subway train.

(A) Purpose and frequency of the use of underground floors of a building

It is indicated that rate of the people using the underground floor of a building is 57.4% and use frequency

of the underground floor prone to high because the use is almost two times compared with Korea and Japan. On the other side, however, rate of the people not using underground floor of a building is 15.8% which means that there is significant difference between people using and those not using the underground floor of a building. Also, the use of underground floor of a building for shopping holds the first position in Jakarta, and the same tendency is also seen in Japan. It may be understood that there is a great tendency for the use of the underground floor of a building for business or commercial purposes. We noted in Korea that people use of the underground floor of a building is for many purposes, such as going to work, going to school, shopping and eating, which almost have the same ratio.

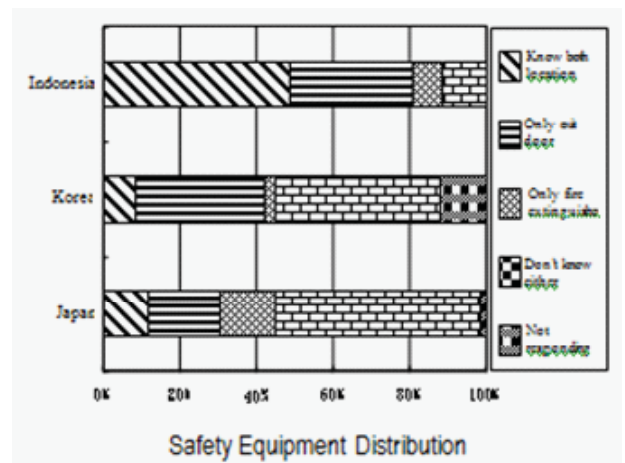
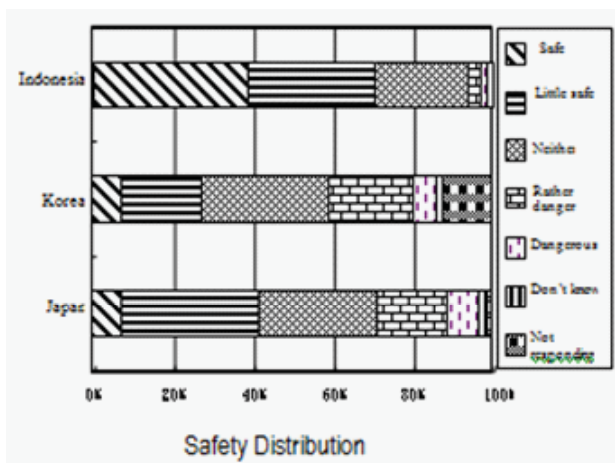


(B) Validity of disaster prevention facility and assessment on the safety of underground floor of building

With respect to the safety of underground floor of a building, rate of people responding 'safe' in Jakarta reached 38.9% and if combined with those responding 'very safe' it would reach 70.3%. In Japan, people responding 'safe' reached 7.1%, those responding 'very safe' reach 34.4%, which would be 41.5% all together. While in Korea, people responding 'safe' reached 7.6%, those responding 'very safe' reach 20.0%, which would be 27.6% all together. Also, regarding the rate of disaster prevention facilities, people responding to know both

of the locations, fire extinguisher and exit door are 48.9%. While people responding 'only know one location is counted to be very high at 88.6%.

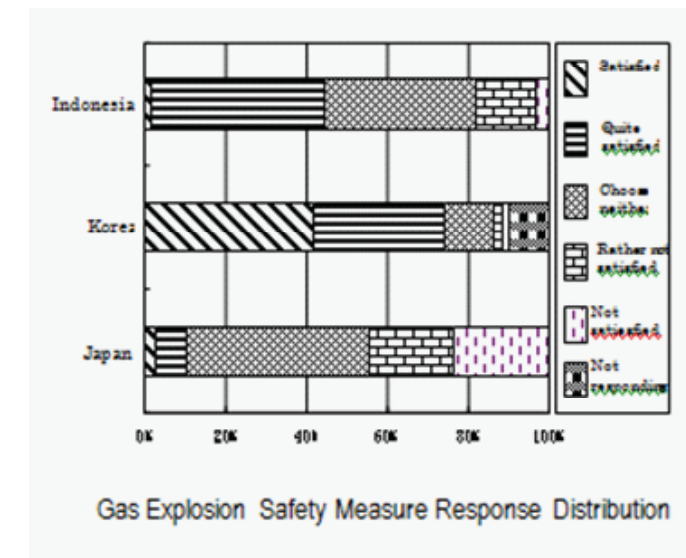
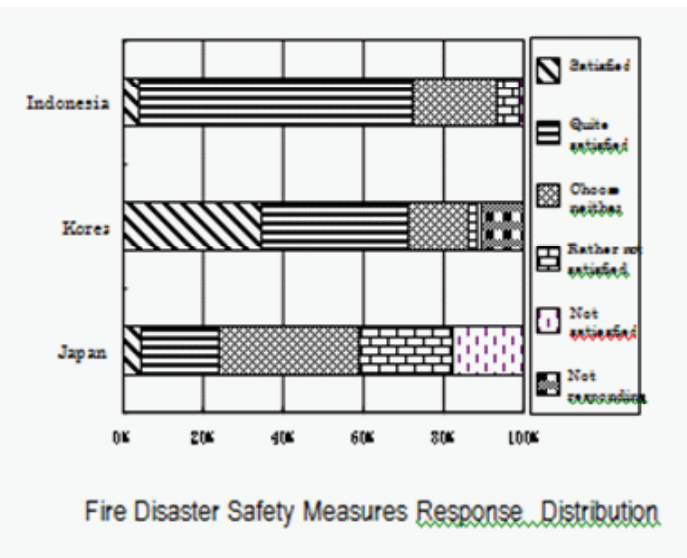
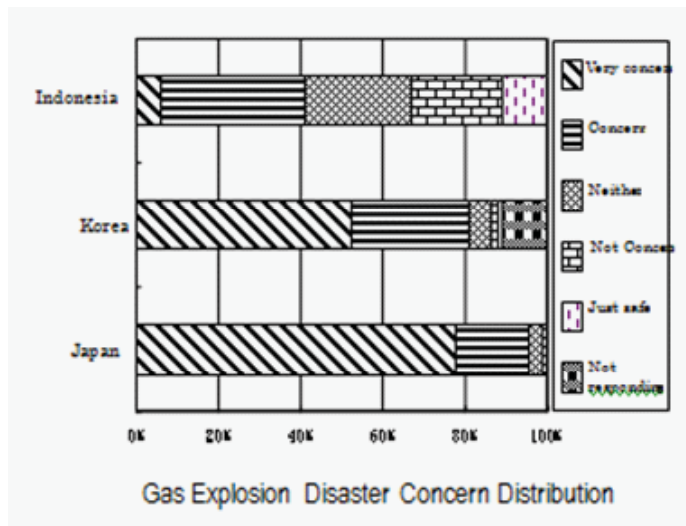
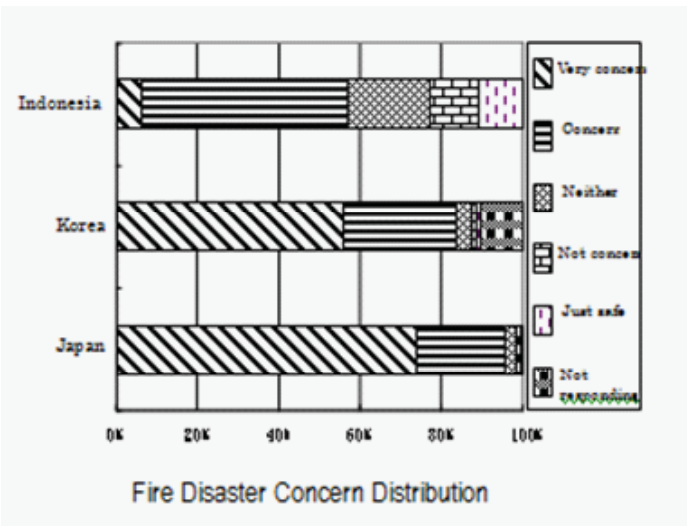
In Japan, rate of the people who know about the location of the prevention facilities is 11.5% and in Korea is 8.3%. While those who only know one location of the facilities, even if the amounts are combined, remained at a lower rate of 30.6% for Japan and 42.0% for Korea. The survey conducted in Korea, which had no relation to the burning of the subway train in Tegu, the rate remain high. We noted that level of concern, knowledge, etc about the disaster prevention facilities are high.



4.3 Perception toward Concern about some types of disasters.

We offered question about disasters, like gas explosion, flood, fire, earthquake and disasters caused by human acts, such as terrorist action and the other disasters which is very dangerous when using underground space. If compared among the three countries, Jakarta, Japan and Korea, the rate is found to be alarming. In Japan, the rate is high for all disasters felt to be scary and in Korea, only fire and gas explosion are felt

to be scary. While Jakarta has a lower rate if compared with Japan and Korea. But particularly for fire disaster, they are at the same rate. For gas explosion and fire disasters, Japan has high level of concern, people's feeling of concern reaches nearly more than 95% which may be counted to be 70%. Korea also shows level of concern with these two disaster over 80%. While in Jakarta, a significant concern is about fire disaster, which reaches 6.28%, which is in fact low, but if calculated, the number of those feel concern is more than a half, that is 57.3%.



4.4 Perception toward Actions taken for Safety of Disasters

We offered question about perception against concern/panic which would may happen on many types of disaster. But the main point is that we offered question whether assessment on the safety measures towards disaster has been satisfactory?

Korea has a high reaction to safety measures taken against all disasters. Jakarta and Japan is said to have the same estimation, that is quite satisfactory. In Japan, the respondents which are said to be unsatisfied are more than 40% of combination between those responding unsatisfied with those responding rather unsatisfied.

For some disasters occurred in Jakarta, such as terrorist attack, flood, earthquake, etc., a high percentage is shown by those responding the estimation of safety measures to be unsatisfied or rather satisfied compared to the other countries which is over 60%.

Regarding the fire disaster, rate of those responding rather satisfied in Korea is 36.8% combined with those responding satisfied is 34.7%, rate of estimation of safety measures reaction is high, namely 71.5%. While in Jakarta, rate of those responding rather satisfied is 68.1% combined with those responding satisfied is 4.1%, rate of estimation of safety measures reaction is also high, namely 72.2% and for the other disasters is predicted to be high.

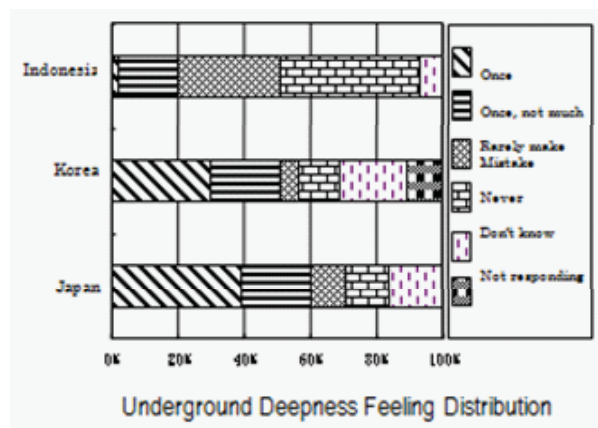
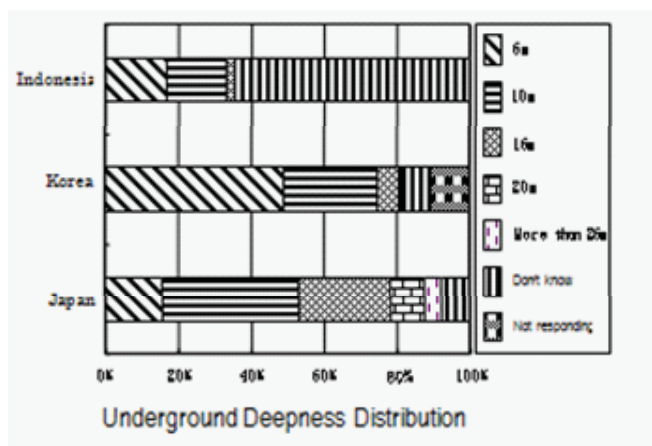
4.5 Application to the Depth of Underground Space

We offered a question on the depth of underground space which has constantly used. As seen from the response to the application of underground space in Jakarta Cit for a depth of 5 m to 10 m, almost half of the respondents said to have no knowledge about it rated to be 64.6%. This might occur in Jakarta because they don't realize the application of the underground space.

In Korea, a high rate of 48.7% is shown for a depth of 5 m, while in Japan, the spaces mostly used are those 10 m in depth and followed by depth of 15 m. An increasing rate of the use of subway train occurs in Japan and Korea and predictably,

there is a tendency that the percentage of the use of most of the subways is getting deeper.

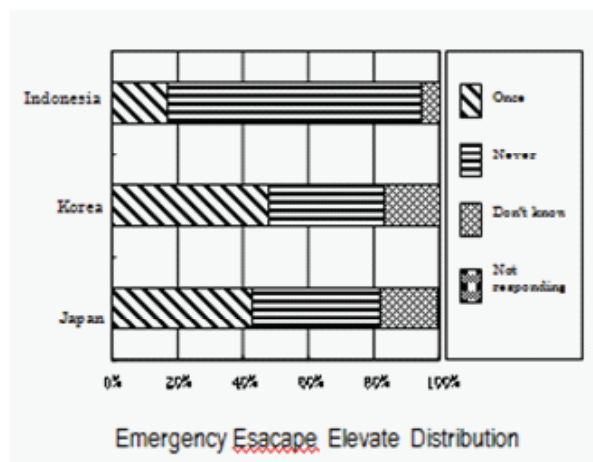
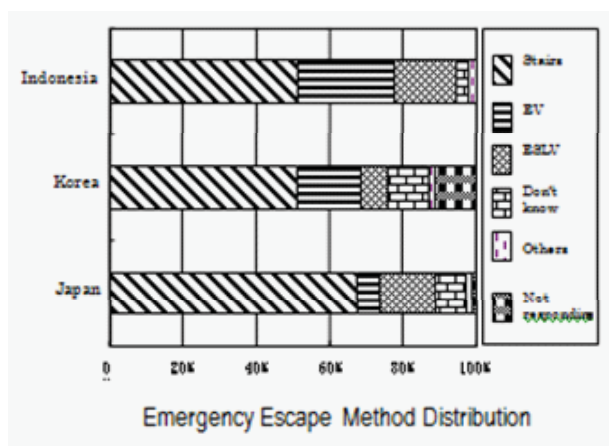
In Japan, there is mobility with significant level of depth, and based on this matter, we offered a question if there is a difference between the underground space –with level of depth 45 m- and the underground space constantly used. The response was that if those who only think are combined with those who think about the result is that: Japan reached 60.4%, Korea 50.6% and Jakarta City 19.9%, and in fact, if the use of underground depth is applied, there would be difference in each countries because the possibility in the high use of escalator, etc.



4.6 Evacuation Method

We made depth estimation on a 15 floors building, which is 45 m height above ground level. There is difference in perception toward deeper underground space, according to the country, region, etc. Based on this matter, we offered a question about evacuation. In Japan, people responding to

use stairs as a means of evacuation is 67.4%, in Korea is 51.1% and in Jakarta has higher rate of 51.2%. Most of the respondent in Jakarta and Korea used elevator but in Japan mostly used escalator. In Jakarta, the use of escalator and elevator has higher rate compared with Korea and Japan. For the question whether the use elevator for evacuation? There is higher rate for those responding not using such means.



4.7 Disaster Prevention Training

Regarding the question about underground space disaster prevention training, rate of respondent joining the training in

Japan is 29.8%, Korea is 4.5% and Jakarta is 21.3%. In Japan a high rate of 72.6% is reached when the respondents are the merchants doing business in underground spaces and this has significant effect.

5. CONCLUSION AND FURTHER STUDY THEME

5.1 Survey Result Implementation

Result of underground space user's perception among Indonesia, Japan and Korea is summarized by Schematic Differential (SD) test as shown in Figure 5-1. From this

result, it is pointed out that the Indonesian people has the positive impression on the use of underground space. This result also will be referred as the practical planning procedure of underground space developments, including Jakarta MRT Project.

5.2 Government Role and Responsibility

In order to realize such major projects as the MRT, there must be a strong and practical support from the government such as policies and regulations formulation based on public consultation process. This must be done in order to overcome, both the public's negative habits and their dissatisfaction on the limited number of safety measures which must be considered in the early planning stage, design engineering, procurement and construction activities, and operation management. In turn, this endeavor will alleviate the ridership.

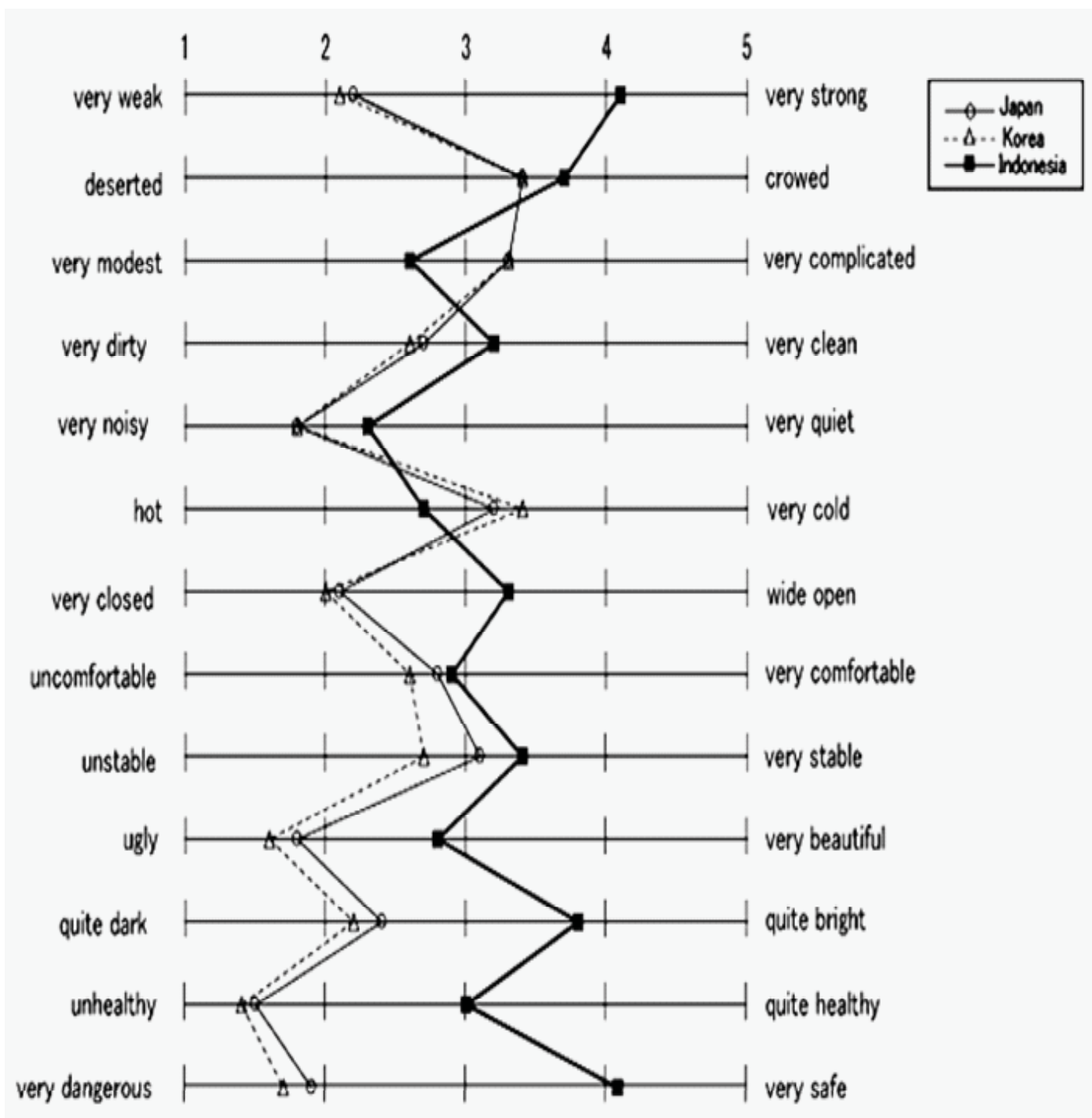


Figure-5 Comparison of SD-profiles among three countries for underground space.

Ground Breaking MRT Jakarta



Peletakan batu pertama (groundbreaking) pembangunan mass rapid transit (MRT) tahap I rute Lebak Bulus– Bundaran Hotel Indonesia (HI) akan dilakukan Juli mendatang.

Wakil Gubernur DKI Jakarta Basuki Tjahaja Purnama mengatakan, peletakan batu pertama pada Juli itu merupakan kelanjutan dari pengumuman pemenang tender konstruksi sipil tahap satu untuk segmen bawah tanah (underground) dari Sisingamangaraja–Bundaran HI. "Sebelum groundbreaking akan dilakukan penandatanganan kontrak antara PT MRT Jakarta dan pemenang tender konstruksi sipil," katanya di Balai Kota kemarin.

Basuki memastikan, untuk pembangunan MRT akan ada penertiban 180 bangunan di kawasan Fatmawati, Jakarta Selatan. Bangunan tersebut dianggap melanggar garis sepadan bangunan (GSB). "Semua data bangunan itu telah ada dengan kita. Nantinya akan ditertibkan," ujarnya.

Sebelumnya, Kamis (2/5) lalu, Pemprov DKI Jakarta soft launching pembangunan MRT dan mengumumkan pemenang tender di Bundaran HI, Jakarta Pusat. Setelah soft launching, selanjutnya pembangunan fisik sarana transportasi massal tersebut diserahkan sepenuhnya kepada PT MRT Jakarta dan para pemenang tender. Proyek yang akan dikerjakan yakni MRT tahap I koridor Selatan–Utara (Lebak Bulus– Bundaran

HI), yang terdiri atas delapan paket pekerjaan.

Pemenang tender konstruksi adalah Sumitomo Mitsui Construction Company (SMCC)-Hutama Karya Joint Operation dan Shimizu- Obayashi-Wijaya Karya-Jaya Construction Joint Venture. Kedua konsorsium perusahaan asing dan badan usaha milik negara (BUMN) ini menang untuk pengerjaan tiga paket pekerjaan senilai Rp3,6 triliun. Sebelumnya kontrak untuk supervisi dan manajemen konstruksi yang dimenangkan oleh Oriental Consultants dan asosiasinya asingnya yang terdiri dari - Japan International Consultant for Transportation Co., Ltd, Pacific Consultant Co., dan Ltd, Padeco Co., Ltd, serta asosiasi lokalnya yang terdiri atas PT. Inti Era Cipta, PT. Pamintori Cipta, PT. Irec Reka Yasa, PT. Kutami Manajemen Teknologi, PT. Indotek Engineering, dan PT. Perentjana Djaja, telah rangkum dinegosiasikan pada bulan Mei yang lalu.

Direktur Utama (Dirut) PT MRT Jakarta Dono Boestami mengaku belum mengetahui rencana peletakan batu pertama tersebut. Pihaknya saat ini masih menyiapkan semua proses pembangunan MRT Jakarta. "Kami terus bekerja dan tidak bisa menjanjikan kapan waktu pelaksanaan groundbreaking tersebut. Berikan kami kesempatan untuk bekerja. Tidak mungkin progres ini kami sampaikan ke wartawan tiap hari," ujarnya.

Pengerjaan double track jalur utara sudah 70 persen

Pengerjaan proyek jalur ganda kereta api (double track) Jakarta-Surabaya sudah mencapai 70 persen, dengan ruas Jakarta-Semarang ditargetkan sudah bisa difungsikan pada Hari Raya Idul Fitri tahun ini.

“Itu perkiraan pengerjaan double track secara kumulatif. Ada di titik-titik tertentu yang lebih besar capaiannya,” katanya Direktur Jenderal Perkeretaapian Kementerian Perhubungan Tunjung Inderawan usai seminar “Keselamatan di Perlintasan Sebidang” di Semarang, Senin.

Ia mencontohkan pengerjaan proyek jalur rel ganda KA di petak Cirebon-Brebes dan Pekalongan-Semarang, meski masih ada beberapa petak yang masih menyelesaikan proses pembebasan lahan dengan masyarakat setempat. Namun, kata dia, proyek jalur ganda KA memang digarap sistem segmen, dalam artian mana lahan yang sudah dibebaskan segera dis-

yang masih dalam proses. “Sebagai contoh, pembebasan lahan di petak Cirebon-Brebes sudah mencapai 97 persen, kemudian di petak Pekalongan-Semarang sudah mencapai 80 persen. Masing-masing petak bervariasi,” katanya.

Berkaitan kendala yang ditemui dalam pengerjaan double track, ia mengaku memang ada, seperti pemasangan wesel, yakni konstruksi rel KA yang bercabang atau bersimpangan dari track lama ke yang baru.

Dari target pemasangan wesel ke track yang baru sebesar 80 persen, kata dia, sampai saat ini sudah terealisasi 60 persen, kemudian kendala juga ditemui pada pembangunan jembatan serta persinyalan. “Namun, kami menargetkan pengerjaan double track dari Jakarta sampai Surabaya rampung pada akhir 2013. Kemudian, target antara track sampai Semarang bisa difungsikan pada Lebaran tahun ini,” kata Tunjung



lesaikan penggarapannya, tidak menunggu seluruh lahan dibebaskan.

Ditanya ada masyarakat yang menuntut harga lebih tinggi dari tawaran untuk pembebasan lahan, ia mengakui hal itu sebagai suatu variasi kendala yang ditemui di lapangan, tetapi bisa diselesaikan secara baik. “Mungkin ada saudara-saudara kita yang minta lebih sedikit. Ya tetapi tim kami terjun ke lapangan secara door to door memberi pengertian, kalau double track itu juga untuk kepentingan masyarakat,” katanya.

Menurut dia, para tim mencoba memberi pengertian kepada masyarakat untuk proses pembebasan lahan itu sampai tercapai kata sepakat, meski sampai sekarang ini masih ada petak

Solo - Surabaya double track

Untuk pengembangan jalur double track tengah, rencananya akan terhubung mulai Surabaya (Stasiun Wonokromo) hingga Solo, dengan panjang 221 km. Sesuai rencana, maka pihak Dirjen Perkeretaapian telah menyelesaikan DED pada 2011 lalu untuk jalur Surabaya (Wonokromo) hingga Mojokerto yang mencapai 57 km. Setelah itu, pihaknya pada tahun ini akan mengusulkan dana untuk DED mulai Mojokerto hingga Madiun.

Rencananya, pembangunan fisik akan menggunakan dana pinjaman dari China, meliputi pembangunan track kedua, perbaikan track yang lama serta modernisasi sistem persinyalan dan telekomunikasi, secara terpadu.

Pembangunan Rel KA Kalteng, Sudah ada Izin Trase Menhub



Rencana Pembangunan Rel Kereta Api (KA) di Kalimantan Tengah (Kalteng) yang digulirkan Gubernur Kalteng-Agustin Teras Narang sejak beberapa tahun silam, sedikit menjadi titik terang. Trase (rute pembangunan) rel KA dari Puruk Cahu (Kabupaten Murung Raya) menuju Batanjung (Kabupaten Kapuas) belum lama ini sudah mendapat izin dan sudah diterbitkan Surat Keputusan (SK) oleh Menteri Perhubungan Republik Indonesia, E.E. Mangindaan.

Teras Narang kepada sejumlah Wartawan di Palangkaraya mengungkapkan bahwa untuk trase rel KA dari Puruk Cahu-Batanjung izin dan SK nya sudah diterbitkan Menhub RI dan selanjutnya pembangunan rel KA yang diperkirakan akan menelan dana sebesar Rp. 50 Triliun itu tinggal menunggu proses lelang antar 4 konsorsium yang tersisa dari hasil seleksi sebelumnya dan Teras menargetkan pembangunan rel tahap pertama ini akan dilakukan peletakan batu pertama pada 2014 tahun depan.

Teras Narang bertekad bahwa jalur rel KA ini dibangun untuk mengangkut hasil sumber daya alam seperti Batu Bara, Kelapa Sawit dan hasil bumi lainnya dari sentra-sentra produksi di pedalaman menuju pelabuhan-pelabuhan dengan waktu yang cepat dan volume tinggi.

Adapun skema pembangunan rel ini menurut Teras Narang adalah menggunakan Public Private Partnership. “Setelah dikelola pihak konsorsium

selama 20-25 tahun, nantinya rel KA itu akan menjadi milik pemerintah provinsi Kalteng dan bisa dimanfaatkan sepenuhnya untuk kepentingan rakyat.” Jelas Teras Narang.

Deputi Bidang Sarana dan Prasarana Badan Perencanaan Pembangunan Nasional (Bappenas) Dedy Priatna menyatakan sudah terdapat 4 konsorsium kontraktor yang menjadi penawar dalam lelang pengadaan proyek rel kereta api Kalimantan Tengah. Proyek rel sepanjang 185 kilometer tersebut itu diperebutkan oleh konsorsium yang berisi kontraktor dari dalam dan luar negeri.

Empat konsorsium bersaing untuk proyek pembangunan kereta api (KA) batubara Puruk Cahu – Bangkuan di Kalimantan Tengah senilai US\$ 2,3 miliar. Keempat konsorsium tersebut adalah Itochu Toll, Drydocks World LLC – PT MAP Resources Indonesia, PT Bakrie – SNCLavalin – Thyssen Krupp dan China Railway Group Limited – PT Mega Guna Ganda Semesta – PT Royal Energi, Mereka tengah memasuki masa tender setelah lolos prakualifikasi

Prospek proyek ini memang cukup menjanjikan. Dengan nilai investasi lebih dari US\$ 2,5 miliar proyek pembangunan jalur kereta api dari Puruk Cahu-Bangkalan- Batanjung ini bisa mengangkut batu bara hingga sebanyak 30 juta ton, sekaligus akan menggabungkan lima kabupaten di Kalimantan Tengah..



Perkembangan Pembangunan Double-Double Track Manggarai-Cikarang

Pengerjaan proyek jalur kereta api double-double track (DDT) yang menghubungkan Manggarai-Bekasi memanfaatkan dana pinjaman dari Jepang dan obligasi syariah (sukuk).

Proyek pembangunan senilai Rp8,3 triliun tersebut terdiri atas empat paket, di antaranya dua paket pendanaan dari Japan International Cooperation Agency (JICA) dan dua paket berasal dari Anggaran Pendapatan dan Belanja Negara (APBN) melalui penerbitan sukuk. "Sebagian dari empat paket itu sudah mulai berjalan dan masih ada yang dalam proses pembebasan lahan," kata Direktur Jenderal Perkeretaapian Kementerian Perhubungan Tundjung Inderawan di Jakarta kemarin.

Tundjung mengatakan, empat paket tersebut meliputi elektrifikasi Bekasi-Cikarang (Paket B1), pembangunan DDT dan stasiun antara Manggarai- Jatinegara (A), peningkatan track existing-pembangunan Depo Cipinang (B2-1), dan pembangunan DDT antara Jatinegara- Bekasi (B2-2). Tundjung menjelaskan, pembangunan elektrifikasi jalur KA Bekasi-Cikarang telah memasuki masa kontrak dan ditargetkan bisa selesai pada 2015 mendatang.

Sementara, sisanya masih dalam tahapan pengadaan lahan, pelelangan, dan pengusulan sukuk. "Terutama, untuk pembangunan DDT antara Jatinegara-Bekasi yang masuk paket B2-2," kata dia. Menurut dia, program DDT dimaksudkan untuk memisahkan jalur pelayanan kereta

jarak jauh dan pelayanan kereta api komuter. Nantinya, jalur keretanya ada empat yakni masing-masing dua jalur untuk kereta jarak jauh dan dua jalur lagi untuk komuter Jabodetabek.

Elektrifikasi Rel Ganda Bekasi - Cikarang
Konstruksi pembangunan elektrifikasi rel ganda atau double double track (DDT) ruas Bekasi-Cikarang sepanjang 17 kilometer (km) segera dibangun menyusul penandatanganan kerja sama Ditjen Perkeretaapian Kementerian Perhubungan (Kemenhub) dan Mitsubishi Sumitomo Joint Operation.

Proyek senilai Rp2,6 triliun tersebut akan dikerjakan selama 45 bulan.

Penandatanganan dilakukan pejabat pembuat komitmen satuan kerja pembangunan DDT Kemenhub Makjen Sinaga dan Authorized Representative Mitsubishi Sumitomo Joint Operation Koichi Azetsu di kanto Kemenhub Jakarta, Rabu (10/10).

Dirjen Perkeretaapian Kemenhub Tundjung Inderawan mengungkapkan, total investasi pengerjaan paket ini sebesar Rp2,6 triliun yang terbagi atas pendanaan dalam mata uang Jepang sebanyak 11,86 triliun yen dan Rp1,12 triliun.

"Semua pendanaan ini bersumber dari pinjaman dari Japan International Cooperation Agency (JICA)," tandas dia se usai penandatanganan kesepakatan tersebut.

Pekerjaan konstruksi elektrifikasi ini merupakan bagian dari program pembangunan DDT Manggarai-Cikarang yang terbagi dalam beberapa paket. Untuk paket A1 meliputi modernisasi Stasiun Manggarai, struktur ke Stasiun Gambir, dan pekerjaan jalur lintas jarak jauh menuju Stasiun Matraman.

Paket A2 adalah modernisasi Stasiun Jatinegara dan pembangunan Stasiun Matraman, sedangkan paket B1 elektrifikasi perkeretaapian Bekasi-Cikarang 17 km, dan paket B2 pembangunan DDT antara Jatinegara-Bekasi. Lingkup pekerjaan paket B1 ini antara lain pembangunan jembatan baja dan beton lintas Bekasi-Cikarang, modifikasi trek antara Bekasi-Cikarang, pembangunan Stasiun Bekasi, Bekasi Timur, Tambun, Cibitung, dan Cikarang, serta penambahan gardu listrik aliran atas baru di Buaran, Cakung, Bekasi Timur, dan Cikarang.

Selain itu, penggantian dan modifikasi interlocking di Manggarai, Jatinegara, Cipinang, Bekasi, dan Cikarang serta pemasangan wayside signal dan fasilitas telekomunikasi

Bekasi-Cikarang.

Tundjung menambahkan, pembangunan DDT bertujuan memisahkan pengoperasian antara kereta utama jarak jauh dari Jawa ke Jakarta dan sebaliknya. DDT juga untuk memperpanjang jalur kereta rel listrik hingga mencapai Cikarang dari sebelumnya hanya sampai Bekasi. “Ini juga bantu mengatasi kemacetan di wilayah Jabodetabek,” paparnya.

Sementara itu, Makjen Sinaga menambahkan, proyek ini sudah dilakukan prakualifikasi pelelangan umum pada 2006. Dari enam investor yang berminat, hanya lima investor yang mengembalikan proposal.

Setelah dinilai ada tiga rekanan yang dinyatakan lulus prakualifikasi, yakni Mitsubishi dan Marubeni Corporation. Sedangkan satu investor mengundurkan diri. “Namun, akhirnya Mitsubishi lulus tender untuk mengerjakan proyek ini,” terang dia.

Dua Jalur Kereta Api Bandara Soekarno-Hatta

PENGEMBANGAN kereta api bandara Soekarno-Hatta, akan dibangun dua jalur untuk melayani akses jalan masyarakat dari wilayah Jakarta dan Tangerang.

Dirjen Perkeretaapian Tundjung Inderawan mengungkapkan, KA Bandara pertama adalah Commuter Line dari Batu Ceper ke Bandara Soekarno – Hatta (sepanjang 12.19 Km) yang ditugaskan PT KAI.

Sedangkan lainnya KA BandaraExpress Line lintas Halim – Bandara Soekarno-Hatta sepanjang 33.86 Km yang saat ini ditugaskan kepada PT. Sarana Multi Infrastruktur (PT. SMI) (Persero).

“PT SMI memfasilitasi Penanggung Jawab Proyek Kerjasama (PJK), dalam hal ini Kementerian Perhubungan, dalam rangka penyiapan proyek perkeretaapian Bandara Soekarno-Hatta,” ujar Tundjung di Jakarta, Selasa (9/4/2013).

Ruang lingkup fasilitasi penyiapan proyek perkeretaapian Bandara Soekarno-Hatta oleh PT.SMI (Persero) ditambahkan Tundjung meliputi kegiatan diantaranya penyusunan pra-studi kelayakan, penyiapan dokumen pelelangan, pelaksanaan pengadaan badan usaha, dan dukungan tercapainya perolehan pembiayaan (financial close).

Seperti diketahui, program pembangunan perkeretaapian Bandara Soekarno-Hatta merupakan salah satu dari

program pembangunan perkeretaapian nasional, yang akan dilaksanakan dengan skema Public Private Partnership (PPP) - Kerjasama Pemerintah dengan Swasta (KPS).

“Dengan pembangunan KA Bandara Soekarno Hatta, nantinya masyarakat mempunyai alternatif moda transportasi ke dan dari Bandara Soekarno Hatta. moda KA Bandara merupakan pilihan yang tepat karena bebas dari kemacetan dan waktu tempuh yang lebih cepat dan terukur,” kata Tundjung Inderawan.



Mengintip Stasiun Kereta Bandara Pertama RI Medan-Kuala Namu



Kereta Bandara Kuala Namu terhubung dari Medan ke Kuala Namu berjarak 29 km. Proyek kereta ini digarap oleh PT Railink yang merupakan perusahaan patungan antara PT Kereta Api Indonesia (Persero) dengan PT Angkasa Pura II, masing-masing kepemilikan saham 60% dan 40%. PT Railink akan fokus mengurus kereta-kereta bandara yang dioperasikan oleh PT Angkasa Pura II.

Dikatakan Direktur Utama PT Kereta Api Indonesia (KAI) Ignasius Jonan, Stasiun Medan sudah siap untuk mengoperasikan kereta Bandara Kuala Namu yang rencananya bakal beroperasi September tahun ini.

“Stasiun Medan sudah siap tinggal menunggu pengoperasian Bandara Kuala Namu. Stasiun Medan dipugar untuk melayani penumpang pesawat terbang sehingga disesuaikan dengan kualitas Bandara Kuala Namu,” tutur Jonan kepada detikFinance, Senin (15/4/2013).

Siap Beroperasi September 2013

Tampak depan Stasiun Kereta Medan yang akan melayani kereta Bandara Kuala Namu. Stasiun ini telah dipugar oleh PT Railink sehingga terlihat lebih bagus sebagai kereta bandara pertama di Indonesia.

Serba AC dan Nyaman

Dikatakan Jonan, semua fasilitas di stasiun Medan, mulai dari lounge dan check in hall dilengkapi dengan AC. Fasilitas Customer Service juga dibuat senyaman mungkin, dan terlihat bahwa customer service berbeda dengan stasiun-stasiun kereta pada umumnya. Para penumpang pesawat di Kuala Namu

bisa melakukan check in di stasiun Medan ini.

Memakai Tiket Elektronik

Stasiun Medan ke Kuala Namu telah dipersiapkan menggunakan tiket elektronik. Gerbang untuk tiket elektronik ini sudah dipasang dan siap digunakan. Kereta bandara dari Medan-Kuala Namu mulai beroperasi September 2013. Waktu tempuh antara Medan-Kuala Namu atau sebaliknya yang berjarak 29 km ditempuh 30-40 menit dengan tarif Rp 80.000/orang.

Tarif kereta Bandara Kuala Namu merupakan tarif komersial alias non subsidi. Besaran tarif ditetapkan oleh operator kereta, melalui pemberitahuan ke Kementerian Perhubungan.

Untuk tahap awal PT Railink akan menyediakan 26 perjalanan kereta api, yaitu 13 perjalanan dari Kuala Namu-Medan dan 13 perjalanan kereta Medan-Kuala Namu. Sehingga dengan volume layanan per hari tersebut maka interval kedatangan kereta setiap 1 jam sekali.

Luas, Bersih, dan Ada Hotel Bintang 3

Selain fasilitas kereta, Jonan mengatakan, Stasiun Medan saat ini menyediakan hotel berbintang 3 dengan 20 kamar untuk penumpang transit. Terlihat di gambar, suasana stasiun berbeda dengan stasiun-stasiun kereta di Indonesia pada umumnya. Rencananya, kereta untuk melayani penumpang dari Medan ke Bandara Kuala Namu dan sebaliknya bakal berasal dari Korea Selatan. Kereta yang dipakai akan menggunakan bahan bakar diesel, bukan KRL (kereta rel listrik).

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Percayakan pekerjaan track kepada kami



Kami berpengalaman dalam bidang Jalan dan Jembatan Kereta Api, Drainase, Pemukiman, Jalan Raya dan Bangunan Gedung dan Pabrik, didasarkan pada metode yang ramah lingkungan dan memberdayakan Golongan Usaha Ekonomi Kecil.

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