

## **APPENDIX 6.4**

### **INTERCHANGES**

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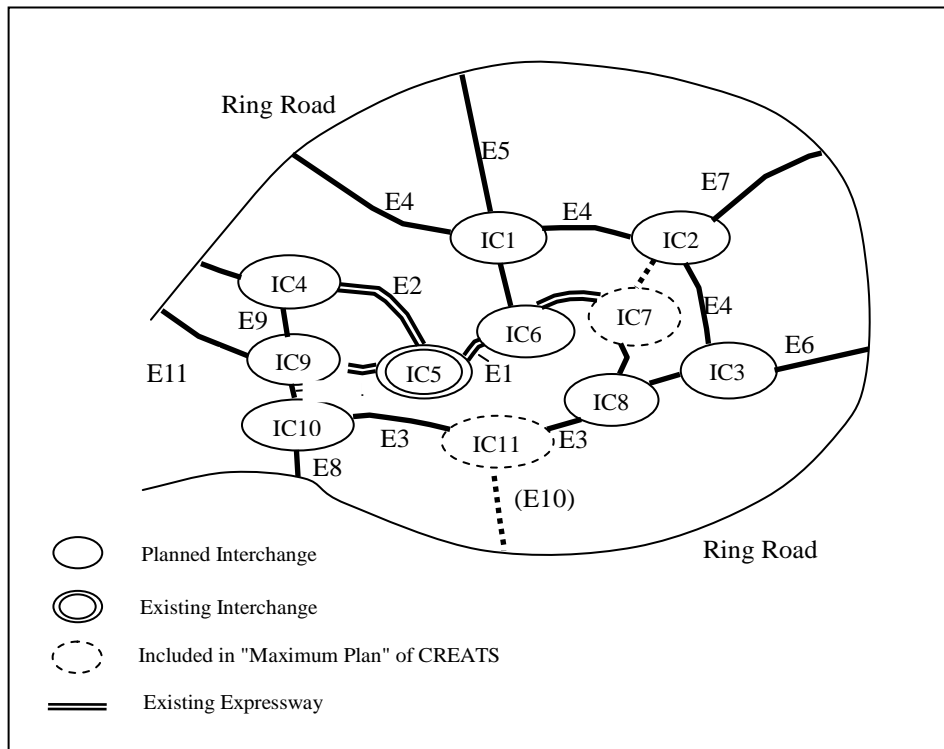


Figure A6.4-1 Schematic Illustration of Connection of Expressways and Interchanges

Table 6.4-1 List of Interchanges of Expressway Network

IC No.	Connected Expressway	Remarks
IC 1	E4 + E5	
IC 2	E4 + E7	
IC 3	E3 + E4 + E6	
IC 4	E2 + E9	
IC 5	E1 + E2	
IC 6	E1 + E5	Existing but in a incomplete form
IC 7	E1 + E7	Included in "Maximum Plan"
IC 8	E1 + E3	
IC 9	E3 + E9	
IC 10	E3 + E8	
IC 11	E3 + E10	Included in "Maximum Plan"

The physical constraints and points of design for the interchanges shown in the following figures are summarized as follows:

### IC 1

Major physical constraints at this location is the existing bridge on Ahmad Hilmi Street across Ismailiyah Canal, railroad station and bus terminal, and Ismailiyah Canal. Basic

concept of the design of this interchange is “half clover-leaf type” with loop ramps utilizing the space above the canal. The ramp for E4 (east-bound) → E5 (south-bound) has to be constructed spanning over the station area and needs more detailed study for locations of piers. The viaduct for E5 (north-bound) is to be constructed along the space between the railroad and the existing bridge. The viaduct for E5 (north-bound) is to be constructed over the railroad station area, and need more detailed survey.

#### IC 2

This interchange is planned at the intersection of Abubakar A’Sidiq St. and Aziz A’Masri St. There is a fly-over for Asiz A’Masri St. All the four corners of the intersection are bounded by buildings. The main carriageway of E4 is to cross over the existing fly-over and the ramps for E4 (east-bound) → E7 (north-bound) and E7 (south-bound) → E4 (east-bound) are to cross over the main carriageway of E4 (level 3). As options, ramps can be constructed for E4 (east-bound) → Aziz A’Masri St. (south-bound) and Azia A’Masri St. (north-bound) → E4 (east-bound).

#### IC 3

This interchange is planned at the intersection of Al Thawra St. and An Nasr St. There is a fly-over on An Nasr St. spanning over Al Thawa St. This fly-over can be integrated into E3 and ramps can be connected to this fly-over, reducing construction cost. Since the existing ROW of An Nasr St. is sufficiently wide in this area, the north end of E3 Expressway can come down to at-grade (from the standard height of viaduct) and can be connected to the existing fly-over.

There is an unused land on the northeast corner of the intersection and other three corners are used for public facilities. The interchange is designed as “trumpet type” with the loop on the unused land at the northeast corner of the intersection. The main carriageway of E6 – E4 is to cross over the fly-over.

#### IC 4

This interchange is to connect E1 and E9. There is a fly-over to cross the railroad. It seems that the existing viaduct of 26<sup>th</sup> July St. is to be extended and directly connected to this fly-over. Therefore, the ramps of IC 4 Interchange is planned to connect this fly-over to E9. Western side of the rail is densely populated and both sides of the existing fly-over on the west side of the railroad are confined by buildings. Ramps for E1 (east-bound) → E9 (south-bound) and E9 (north-bound) → E1 (east-bound) can be constructed at the same level with the existing fly-over (level 1) while the ramp for E9 (north-bound) → E1 (west-bound) is to cross over the existing fly-over.

The problem at this interchange is that the ramp for E1 (east bound) → E9 (south-bound) needs to be constructed at level 3. This will require considerable const.

The traffic volume flowing in this direction is estimated to be relatively small since there is an entrance on E9 (south-bound) about 1.5 km south of IC 4 allowing the smooth entrance from Mohandesin Area to E9. Considering these facts, the ramp for E1 (east bound) → E9 (south-bound) is omitted.

There is another problem for this interchange; construction of toll gate. The both sides of 26<sup>th</sup> July St. on the west of the railroad are fenced and there is very limited space for constructing the toll gate for entering the expressway network. One of the solutions may be to widen some section of E1 (east-bound) → E9 (south-bound) to construct the toll gate.

Further, there seems to be possibility of extending E9 in the north direction in the future. If E9 is to be extended, the ramp of E9 (north-bound) → E1 (west-bound) is better be constructed as level 3 to leave the space for the main carriageway of E9 to be extended north. However, since the extension of E9 is not certain, this scheme is not recommended.

#### IC 6

This interchange is to connect E5 with existing E1. The location is the north side of the Central Station of the railroad. There is a vast space above the railroads since many railroad lines are coming together. Survey of the available space cannot be done at this moment because it is difficult to survey across this huge railroad area. It is easy to assume that there are sufficient places for constructing piers of the ramps between the railroad lines, but it is very difficult to identify these places. Therefore, conceptual plan of the interchange is presented to show the possibility of constructing an interchange here.

The formation of the existing expressway (E1) is very high (more than 20m from street surface) at about 1.5 km northeast from the Central Station where there is the cable-stayed bridge of E1 Expressway over-pass the fly-over of Bur Said St which, in turn, over-passes the railroad lines. Very fortunately the formation of E1 expressway becomes much lower and become the level of ordinary fly-over (level 1) about 1 km from the cable-stayed bridge towards the Central Station. Therefore it is not difficult to construct the ramps of IC 5 to overpass converging with diverting from E1 Expressway.

#### IC 8

E3 and the south end of existing E1 are connected at this interchange. The most difficult problem here is that the ramps of E1 (south-bound) are high (level 2) to cross over the ramp of E1 (north-bound). The recommended solution to this problem is to construct the main carriageway of E3 over the existing ramps of E1 (as level 3). To set the main carriageway of E3 at level 3, it is necessary to examine the longitudinal slope of E3 because E3 needs to go underground at about 1 km east of the interchange (in front of the Memorial Monument). This arrangement turned out to be possible (see Section 5.4).

E3 can pass this interchange by going underground (tunnel) continuously from the underground section in front of the Memorial Monument. In this case, however, the tunnel needs to support the weight of the viaducts of E1 above. This is possible, of course, but is more technically complicated than constructing high pier viaducts. Therefore crossing at level 3 is recommended.

#### IC 9

The physical constraints here are (i) existing fly-over crossing the railroad, (ii) railroad station located at the southwest corner of the interchange, and (iii) buildings on northeast and southeast corner of the interchange. Possible configuration is half clover-leaf type as shown in the figure. In this case, two loop ramps are to be constructed on the east side of the railroad where Cairo University and a residential building are located.

The residential building on the northeast corner seems to be located about 50 m distant from the railroad. Thus it seems possible to construct a loop ramp with radius of curve of 40 m here.

There is a low (2 or 3-stories) building of Cairo University on the southeast corner. It seems to be possible to construct a loop ramp spanning over this building.

#### IC 5

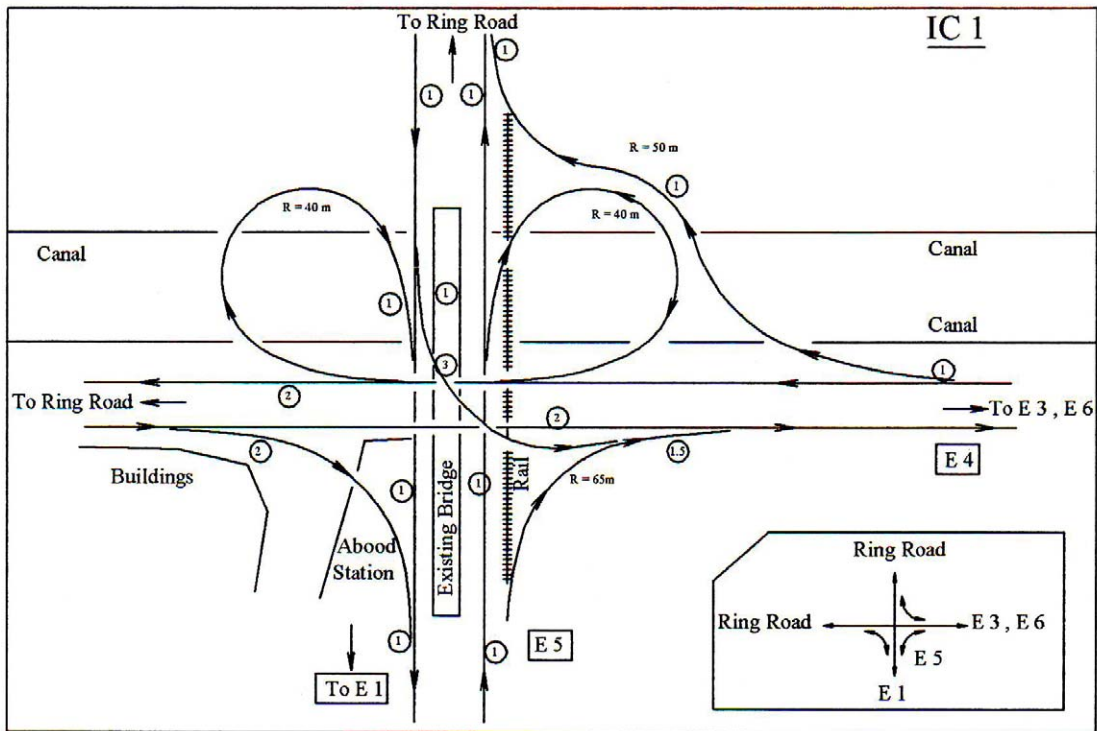
This is the interchange between exiting E1 and E2. The problem here is that the E2 is one-way from E1 and there is no way to comeback from E2 to E1. One of the solution to this is to construct another 2 (3) lanes for the direction from E1 to E2 above Shanan St. and Bulaq Al Jadid St., utilizing the existing exit of E1 and convert the existing 2 lanes of E2 to the direction from E2 to E1. In this case, the existing section of E2 adjacent to E1 needs to be improved to overpass E1 and then join E1 in east-bound direction.

#### IC 10

Planning of this interchange is most difficult because of many physical constraints; (i) complex structure and height of the existing viaducts, (ii) densely built-up area on the both sides of the existing streets, (iii) narrow ROW of the exiting streets, and (iv) necessity of crossing railroad. In addition, connection of E8 to Ring Road (RR) is also difficult hindered by the existing ramps of RR.

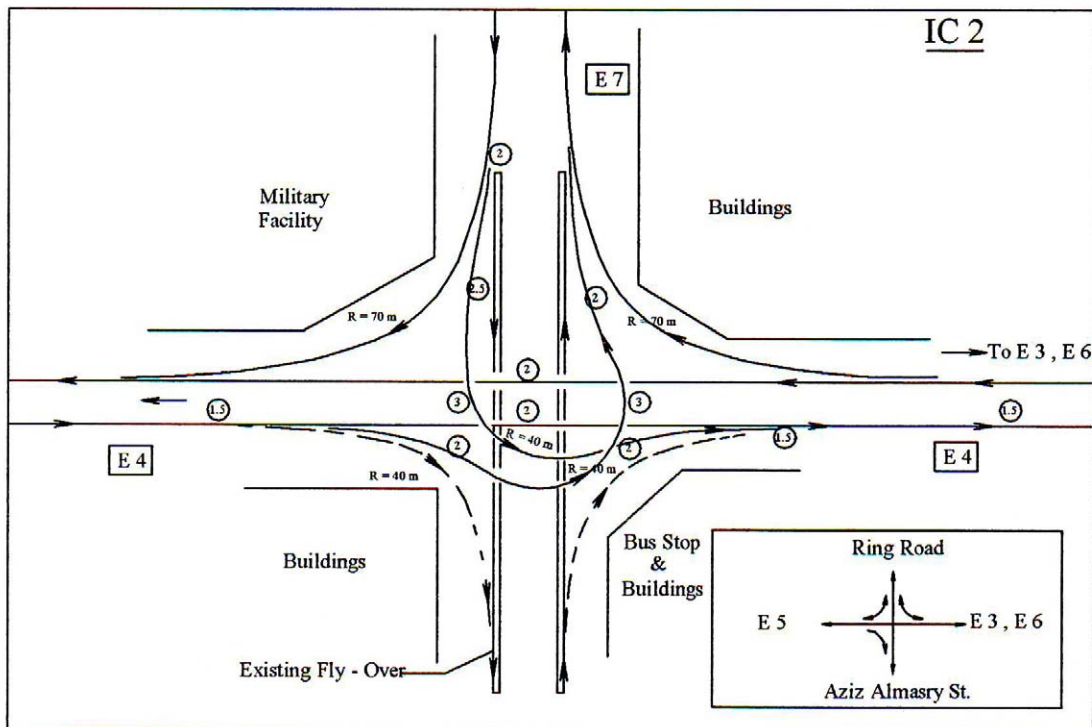
Solution to these problems are;

- (i) to plan the structure of IC 10 as double-deck above the existing viaducts,
- (ii) to utilize the space above the many streets, and
- (iii) construct north-bound direction and south-bound direction on different streets (Tallal Muh. Saad St. and Salah Salim St. and above railroad)



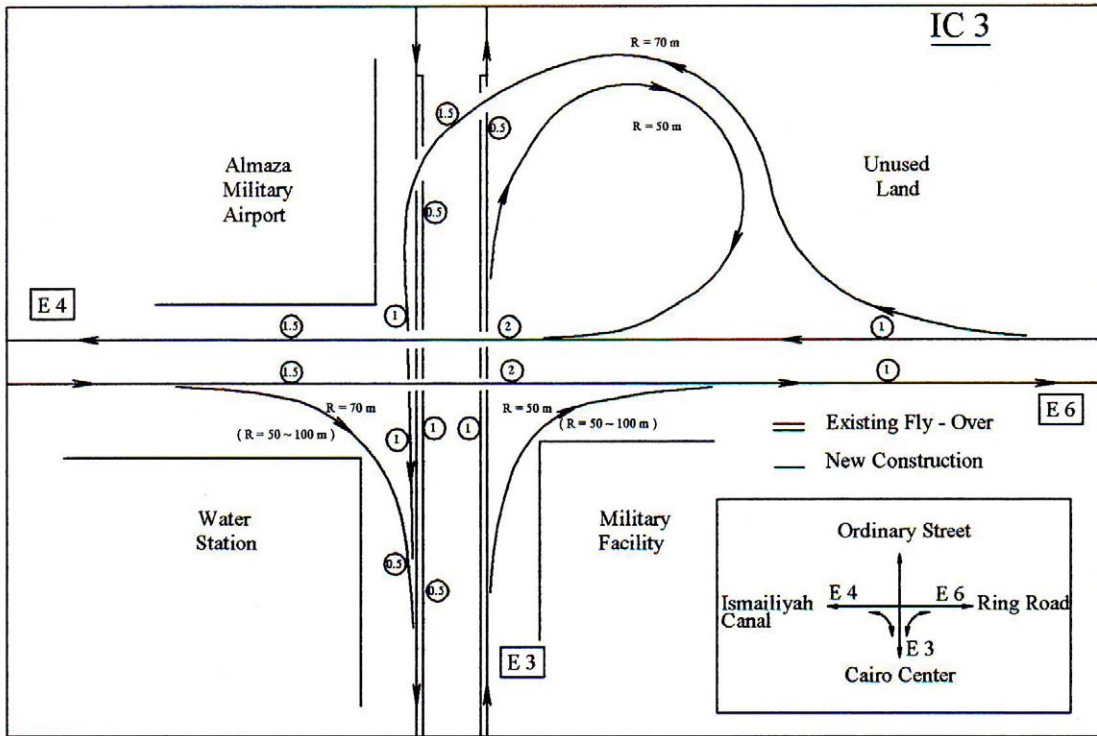
(Note: Numbers in ○ show levels of height)

Figure A6.4-2 Configuration of IC 1



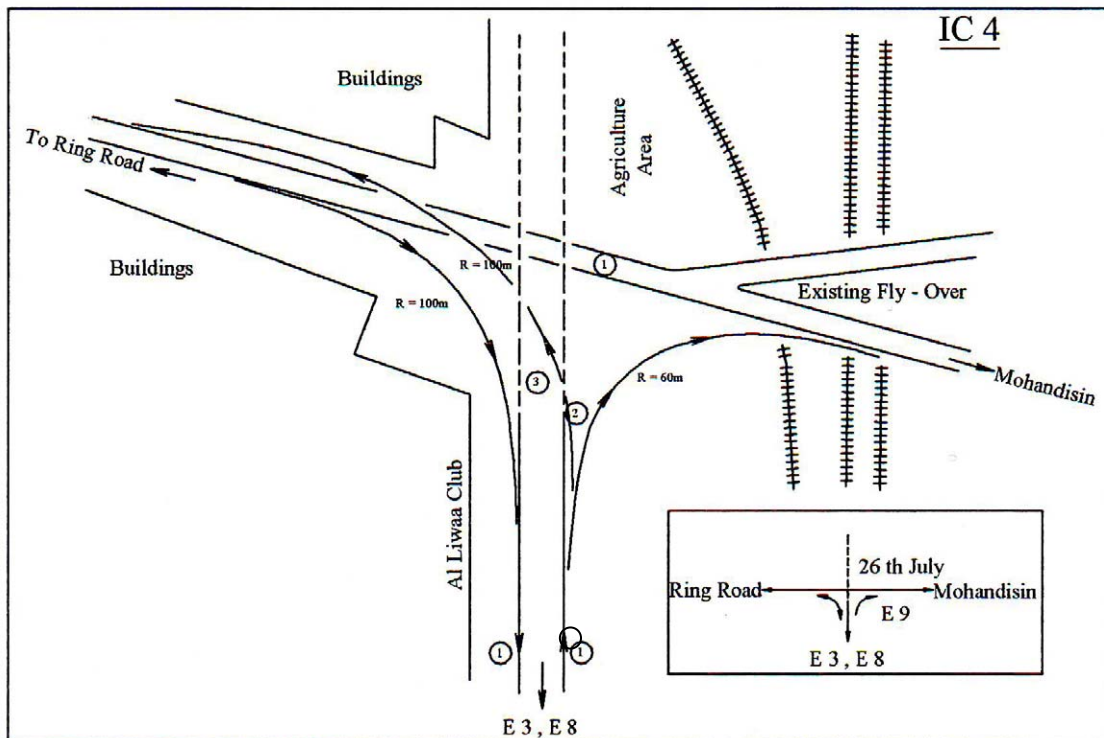
(Note: Numbers in ○ show levels of height)

Figure A6.4-3 Configuration of IC 2



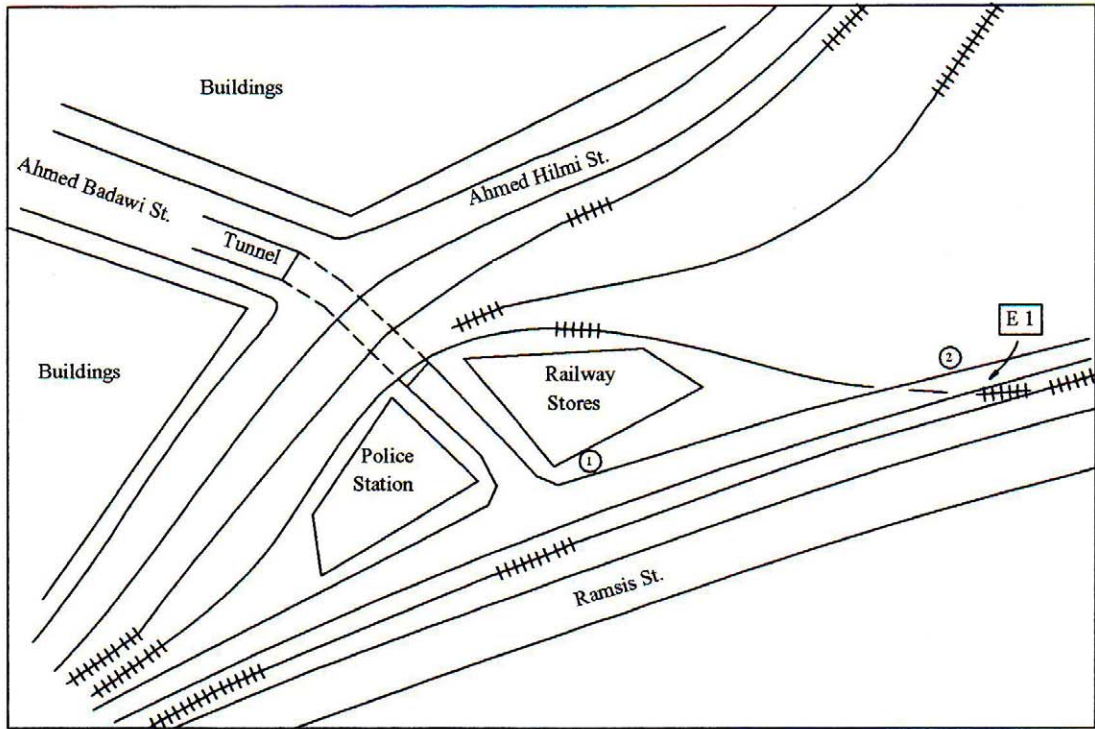
(Note: Numbers in  $\bigcirc$  show levels of height)

Figure A6.4-4 Configuration of IC 3

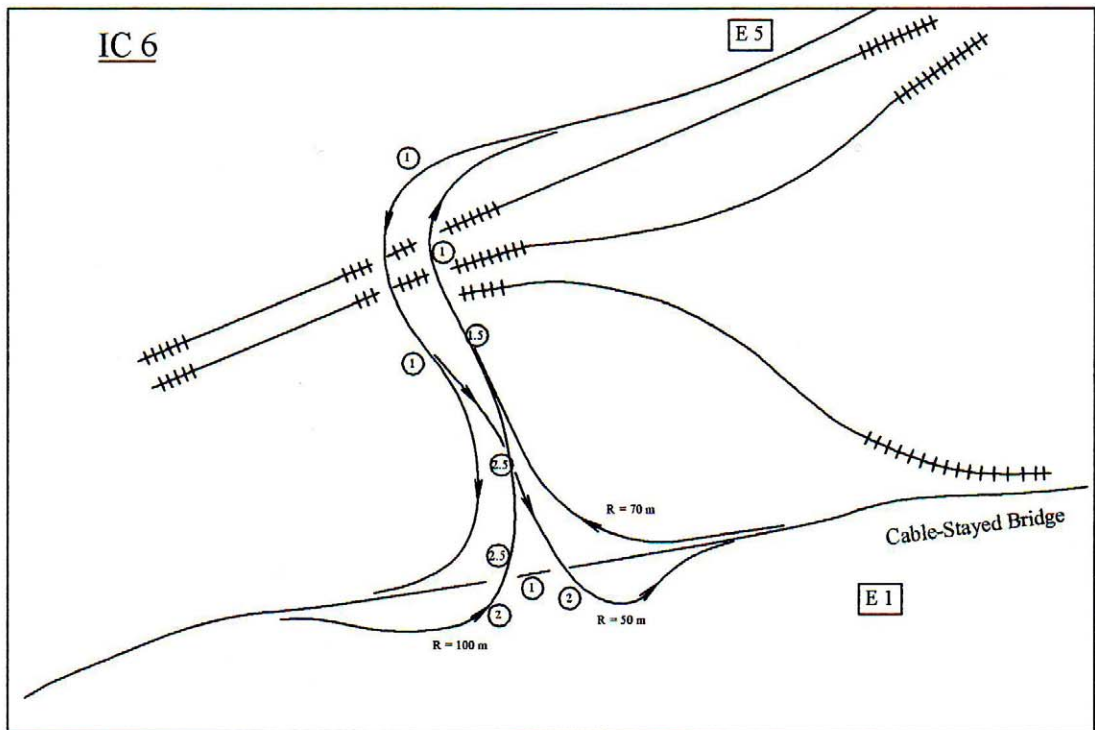


(Note: Numbers in  $\bigcirc$  show levels of height)

Figure A6.4-5 Configuration of IC 4



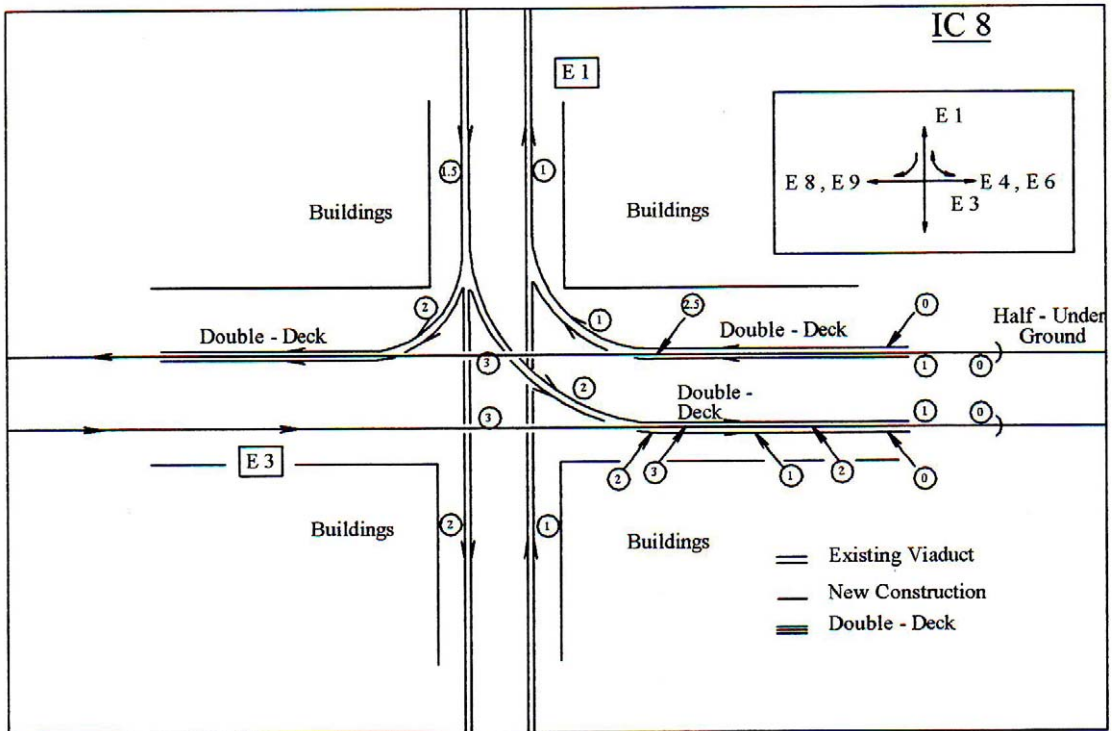
(a) Sketch of Existing Condition



(b) Schematic Configuration of IC 6

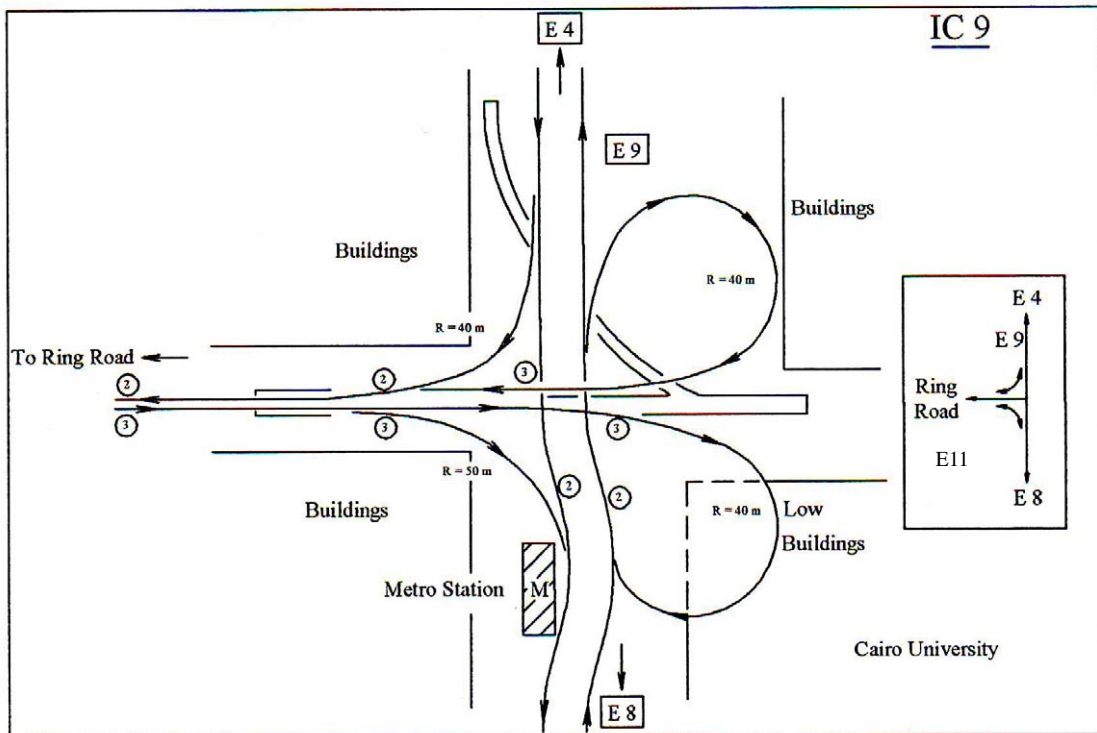
Figure A6.4-6 Schematic Configuration of IC 6





Note: Numbers in ○ show levels of height)

Figure A6.4-7 Configuration of IC 8



(Note: Numbers in ○ show levels of height)

Figure A6.4-8 Configuration of IC 9

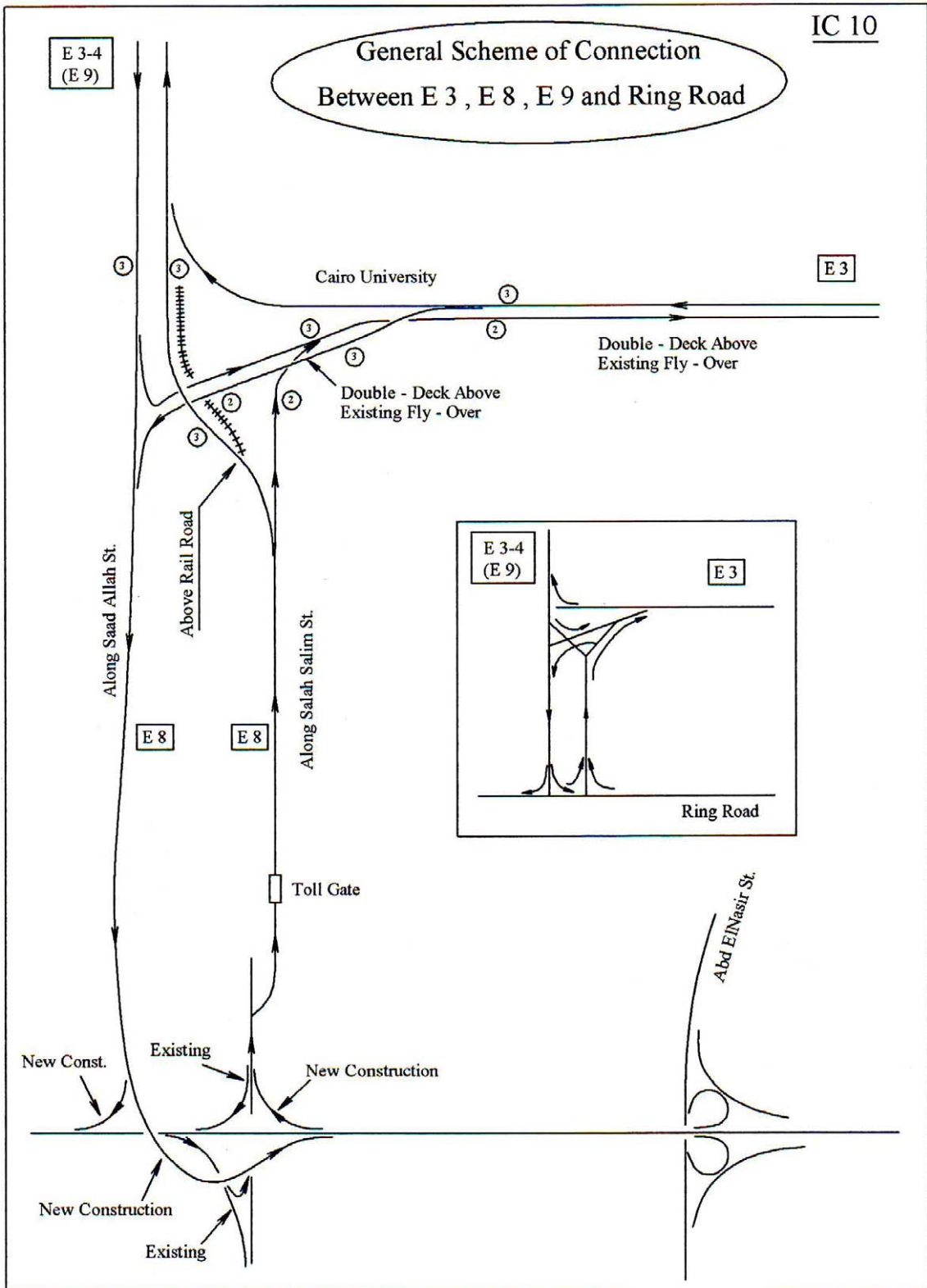
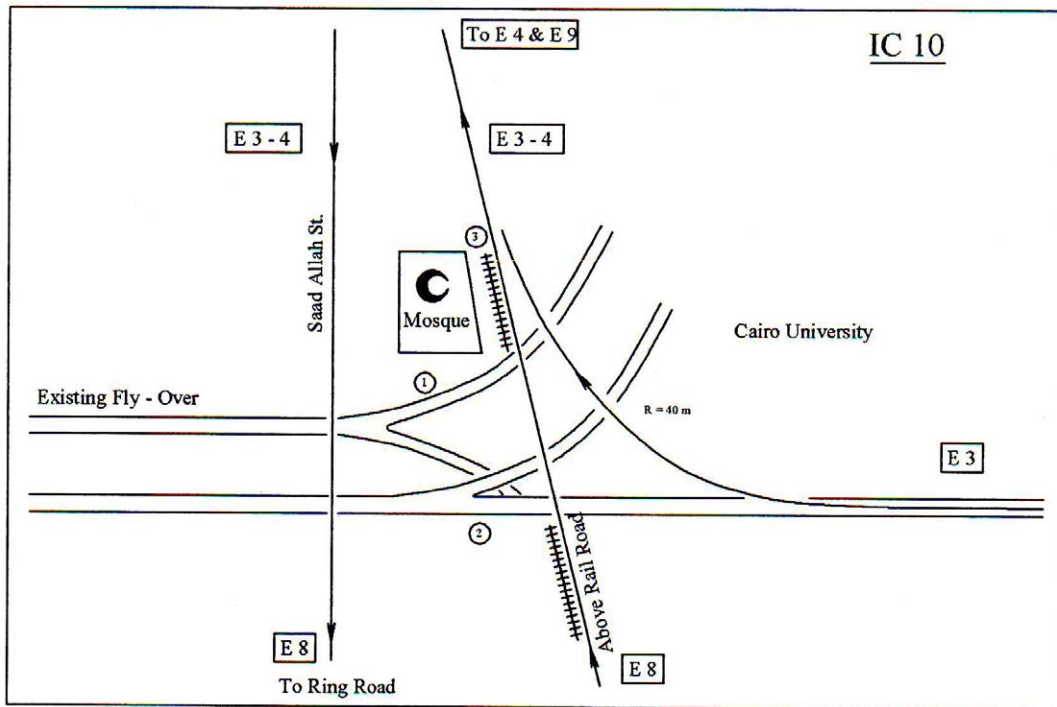
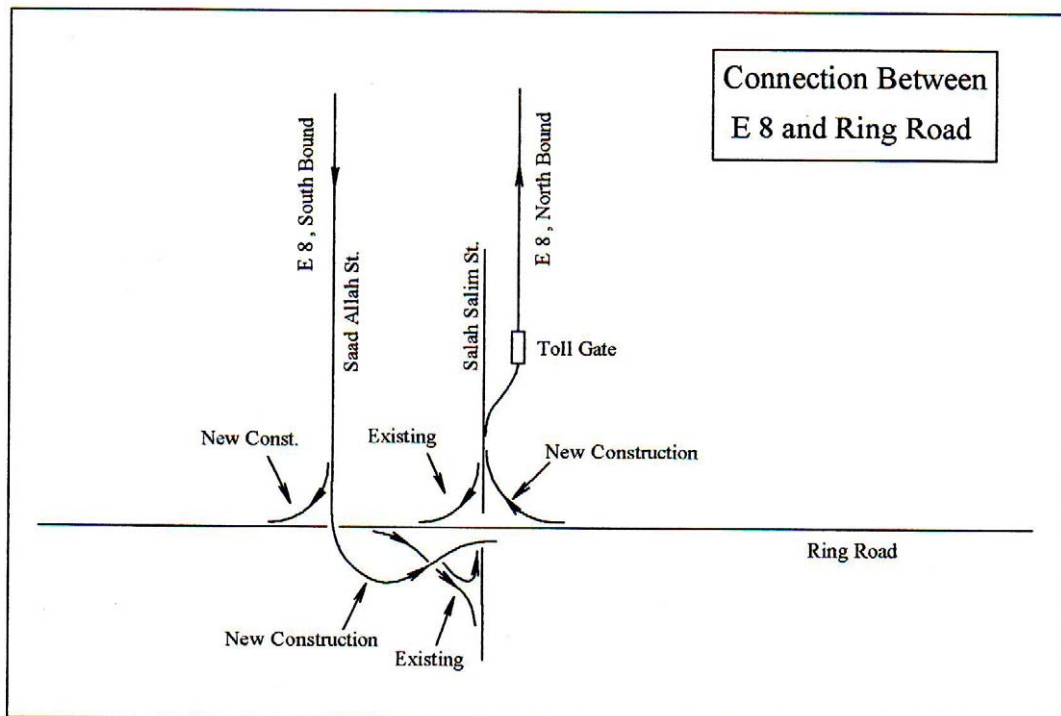


Figure A6.4-9 (1/3) IC10 : General Scheme of Connection between E3, E8, E9 & Ring Road



(Note: Numbers in  $\bigcirc$  show levels of height)

Figure A6.4-9 (2/3) General Configuration of IC 10



(Note: Numbers in  $\bigcirc$  show levels of height)

Figure A6.4-9 (3/3) Connection between E8 & Ring Road

## **APPENDIX 10.1**

### **SURVEY OF PPP PROGRESS BY AREAS**

**Survey of PPP Progress by Areas**

1) Italy

The overhaul of the legal framework for PPP in Italy in 2002 has promoted further development of PPP financing schemes. Key development areas are still traditional road and rail infrastructure. The central government is actively backing project financing, through its dedicated arm, the Project Finance Unit. Also in 2003 the Italian government created Infrastructure Spa (ISPA), a company set up specifically to finance large infrastructure projects. The state-owned financial institution Casa Depositi Prestiti was transformed into a limited liability company at the end of 2003 and was mandated by Italian government to fund local infrastructure projects that were potentially self-supporting. Thanks to these efforts, some of the larger road and rail projects are expected to be financed under project finance scheme including several toll road projects between the North and South of the country.

There are two types of PPP process in Italy. The first one is the traditional DBOT (Design-Build-Own-Transfer) concession historically used on large scale infrastructure projects such as road and rail where the sponsors are paid out through some form of user charge. This process will put a developed specification out to tender and competition is principally on price. Finance will be typically 5 – 7 year construction finance. The second one is the project finance, PFI or promoter route which is described in Law No. 109/1994 (“Merloni Law”). The Merloni Law prescribes the procurement procedure for the promoter approach. This consists of three phases, namely, proposal, tender stage and negotiated procedure. The Target Act or “Legge Obiettivo” (Law No. 443/2001) provides a procurement route for the award of “Grandi Opere” (or strategic infrastructure projects of particular national importance, of which there are 19 as stipulated in the First Plan dated 21 December 2001 issued by the Italian government). Subordinate legislative decrees have given effect to, and further clarified aspects of, the Merloni Law. The Target Act is yet to be implemented and is currently facing certain political and economic obstacles. The second, promoter, process is relatively new and more in line with long term partnership. It will also be the route by which an estimated Eur20bn of transport and social infrastructure will be procured. In addition to the need to upgrade transport links, much of the need for social infrastructure spend has been driven by increased regulation and levels of liability for public buildings both at a national and local level. The promoter process is not as transparent as some would like, but once understood

sponsors view it as very attractive as it allows the selected promoter to match any lower bid in the subsequent competition and receive a refund of a percentage of development cost in the event that the preferred promoter is not finally awarded the contract. Within this process there should be room for both international and local sponsor/contractors. The optimal model for the public sector would be international sponsors and funders developing the project as promoter - and bringing all the value for money techniques learned elsewhere - and then the local contractors competing on the construction cost where their lower cost base would be an advantage. With regard to Italian PPP market, CRESME (Social Economic Research Institute for Construction) carried out an analysis on project finance tenders issued in the period January to November 2003. The results showed that, during 2003, 820 promoter route tenders have been issued for an amount equal to Eur9.6bn which represents 28% of the whole Italian market for public works. This shows significant increase in levels since 2002 and compares to 306 tenders for other types of concession process. The CRESME statistics show an overall decrease in the number of large-size public works projects - only 2% of all tenders issued in 2003 were for projects valued in excess of Eur50m. There is high demand for very small-scale municipal works projects such as car parks and leisure facilities but there is also an increase in larger municipal projects such as hospitals, government office accommodation and waste management, which should attract a wider range of non-domestic sponsor.

## 2) Spain

PFI and PPP have a long history in Spain, mainly in the toll road sector. A new concession law (Law 13/2003, complementing Public Administration Contracts Law RDL 2/2000 Titulo V) effective in August 2003 affects all current and future projects whether initiated by central, regional or municipal government. The new law modifies the existing law on concessions (8/1972) which remains in place. The new law shortens the maximum concession length, widens the scope for funding, affords the public authority step-in rights, allows sponsors to assign their rights in the concession (mortgage their interest), and allows sponsors to create security interests akin to property rights in assets which are in the public domain. This new concession legislation allows for the delivery of a broader type of public-infrastructure service through PPPs. In the toll road sector, 2004 was a breakthrough year as Autovia de los Vinedos, a shadow toll road in the Autonomous Community of Castilla la Mancha issued the first ever project toll road bond in Spain. The capital markets, which offer maturities of up to 30 years, could provide an alternative for refinancing toll road concessions initially financed via shorter-tenor bank loans in the early 1990s.

As a matter of fact, for the period 2007-2013, Spain is a net loser in terms of EU funding for large infrastructure projects - to the tune of Eur11.16bn. This makes the need for private finance even greater. The newly elected Labour Party (PSOE) is also broadly in favor of the increased use of private finance, but will probably take a workforce-led position on employee issues in the developing health market. The National Infrastructure Plan for 2000-2007 is very ambitious - Eur103bn in total for the Central Administration, of which 20% will be through private funding. If the sums required for municipal and regional projects are added, private funding requirements could reach Eur45bn. The sectors are; 1) road - real toll and shadow toll (expected to absorb 38.7% of funding planned), 2) rail - rail infrastructure (expected to absorb 39.4% of funding planned), 3) light rail - Barcelona, Tenerife, Seville, Malaga, 4) water and sewage - Lleida, Catalonia and 5) hospitals. In addition Madrid regional community is also considering schools.

### 3) Portugal

Portugal started a road program of 17 concessions (shadow toll roads) 10 years ago, the first initiative of private financing in public infrastructure. The road model in Portugal is a classic design/build/finance/operate (DBFO) model. As a general survey of PPP market in Portugal, road program declines while hospitals are now in procurement and prisons are being developed. As a result of the SCUT program, Portuguese sponsors are accustomed to international project finance structures and terms. Portugal is also one of the few European countries with experience of funding via a project bond.

The Portuguese government passed a PPP Law (Parcerias Público- Privadas) in April 2003 aimed primarily at ensuring better coordination of the government's approach to PPP across various sectors and between various ministries while ensuring value for money. The law imposes specific requirements to ensure that PPP-based projects are approved only if they involve a significant and effective transfer of risks. The new PPP Law separates responsibilities under the contract, make clear allocation of risk, establish a regime for sharing of costs and expenses, and ensure co-operation with national budget rules and more efficient use of public resources. Overall the legal framework is well structured with a clear process and rules for specific sectors. The law has been criticized, however, for introducing unnecessary supervision and control by the Ministry of Finance. The Ministry of Finance now has responsibility for controlling and supervising PPPs under the April 2003 law on Public Private Partnership. The Ministry of Finance appointed Parpública (a state holding company) as technical adviser to the government on PPP. The law applies to all projects by central and regional governments (except for those procured by Azores and Madeira regional

governments), but not to those by municipalities. In 2004 the government of Portugal announced that before long it would stop paying shadow tolls under long-term concession agreements and move toward payment of real tolls by users. At that time a rating agency warned serious repercussions this measure could have for the operators of the concessions and deterioration of their credit quality. The change of administration following the elections in February 2005 has postponed the resolution of this shadow toll road program issue.

#### 4) Germany

Many PPP projects in Germany are in the infant stage of project award or under construction. The recently established Federal Competence Centre (“FCC”) has limited ability to influence the PPP approach taken by each Land or region and municipality but establishing the FCC as a focal point for PPP is a move in the right direction. The FCC started work in summer 2004 directing PPP policy in relation to public building (transport PPP policy remains the remit of the Transport Infrastructure Financing Agency). The FCC has three tasks: 1) knowledge management – collecting experience on PPPs both nationally and internationally and making this available to the public sector, 2) formulation of recommendations for structuring the framework of PPPs in Germany and 3) recommendations for the methods to be used in actual projects. In the meantime almost every land has established its own competence center to support municipalities and counties with their PPP projects.

The most significant PPP initiative, the F-model for new road infrastructure has not been a full success story. Many scheduled F-projects did not take off at all and the one in operation, the Warnow Tunnel in Rodstock has only achieved 40% of projected traffic. Opening of the Herrentunnel in Lubeck later in 2005 may be more successful.

The other PPP initiative, the A-model, which is focused on road widening, was stalled due to the problems at Toll Collect. The A-model road which incorporates a 30-year concession with a 5-year build period is to be funded from the tolls collected by Toll Collect. The Toll Collect project introduced a national system for truck tolling. The system is still, however, not providing the revenues as expected due to evasion and people not paying. The technical problems at Toll Collect have a serious impact. In February 2005, however, the Minister of Transportation announced that five German highway expansion programs (Autobahn-Ausbau) would be tendered out as PPPs. The expansion program relates to the following highways:

- A8 in the State of Bavaria
- A4 in the State of Turingia



- A1/A4 in the State of North Rhine-Westphalia
- A5 in the State of Baden-Wuerttemberg
- A1 in the State of Lower Saxony

Private companies will be responsible for expanding, financing and operating already existing sections of federal highways. The first tender for the first model (A8) should kick off in March 2005 and the project in Thuringia is in the early planning stages according to the Ministry. About 37km of the A8 between the Cities of Munich and Augusburg is up for expansion, with estimated costs of Eur230million. The start of the construction for the A8 expansion to six from four lanes is expected in the second half of 2006, and completion is scheduled for 2010. The operator gets reimbursed via the toll, which is collected from the heavy trucks that use the expanded road section. In addition, the concessionaire receives start-up financing provided by the state, which acts as compensation for the light trucks and passenger cars, which also use the respective highway section.

#### 5) France

In France, Public-Private partnerships started in the 17th century with a concession for the Canal de Briare Project. The provision of French public facilities or infrastructure was in the past delivered principally through public procurement contracts or service contracts known as Delegation de Service Public, a category that includes concession agreements. While since the late 1980's the majority of the public transportation projects have been implemented under classical public procurement and management schemes, various projects have been implemented under different forms of public/private partnerships. Following the typical PPP structures adopted in France.

a) Affermage (also known as system concessions): It involves award of concession to a private enterprise to run a system for a period of years. The concessionaire receives all of the revenue and costs of the operation.

b) Concessions with public companies (SEMs - Societes d'economie mixte): In affermage the assets belong to the awarding authority (city, urban community etc.). In concession, however, they belong to the concession company.

c) Concessions with private companies: It is usually required that the shareholders of the private concessionaire are composed of a constructor, an operator and a rolling stock provider.

France is currently rapidly developing a PPP market particularly in the health and prisons sectors. The French approach to PPP has been measured - new enabling legislation has been introduced in 2004 (Ordonnance N°2004-559 du 17 juin 2004 / Law dated 9 December 2004) after the development of pilot projects in a range of sectors to see where it works best. This activity is being overseen by Les Partenariats Public-Privé Unit, an expert body established to advise parties on the conclusion of PPP partnership contracts. Under the “Ordonnance,” a new form of contractual relationship was created between the public and private sectors. This allows for the classic DBFO project finance model with a private party or consortium under which the contractor will be paid over time by the contracting public body. The contract legislation is also designed to improve security for those lenders with ownership rights over the assets involved. This codification will help facilitate project financing, including financing through the securitization of public sector revenues.

One of the structural issues facing implementation of PPP in France is the decentralised government structures and responsibility for public procurement. There was a large scale decentralisation in the 1980s and more is currently in hand. As more decisions are pushed down to different levels of government, control over policy and spending becomes increasingly difficult. Consequently the French market may have little room for growth past roads and prisons.

In July 2003 parliament adopted an “Enabling Law” allowing the government to enact by way of regulation (“Ordonnance”) a general framework for future PPPs by creating new forms of contracts, including comprehensive contracts for design, construction, refurbishment and financing of public infrastructures, the management of related services or combinations of these projects. Significantly these new contract forms allow the public sector to pay the service provider over the term of the contract rather than remuneration being tied to the revenues generated by the facility from end users. The Enabling Law has already been used in relation to hospital and prison infrastructures. To support the drafting process, the Minister for Economy and Finance has requested the state-owned financial institution Caisse des Dépôts et Consignations (“CDC”) to conduct legal and financial studies on a series of pilot projects from different sectors (eg the Université de Toulouse PPP Project) to determine where PPP structures will deliver best value for money.

## 6) Central and Eastern Europe

Many Central and Eastern European countries are taking a systematic approach to PPP that

involves making the appropriate policies and legislative changes to enable PPP provision and conducting broad feasibility studies to decide on which projects are amenable to the PPP format for investment. For example, after extensive policy consultations, Czech Republic has established PPP Centrum, a task force to support the public sector. A PPP Act, a new law that will amend the current public procurement legal framework, will facilitate the feasibility study for its PPP program. Prague is considering using PPP-financing for its Czech Ks20billion ring-road project. In addition the Slovakian government has conducted a feasibility study for its PPP program, which identified eight motorway sections for possible PPPs. The study has suggested the use of the DBFO model to procure the roads. Bulgaria, meanwhile, has reported making a national “fast-track” infrastructure plan that focuses on concession contracts and involves integrating the national railway infrastructure into the European intermodal transport. Hungarian government has passed a bill allowing the state company in charge of roads maintenance and toll charging to act as a public counterparty for construction contracts for motorways. Not all the going is smooth, however, as was demonstrated when the newly elected Romanian government reported reconsidering PPP contract awarded earlier.

In PPP the road sector has been most active. Hungarian government is using PPPs for the development of its motorway system: in 2004 the M6 project, an Eur470million concession-based PPP motorway linking Budapest with the southern part of the country, reached financial close. In Russia, the government has approved plans for the country’s 20 toll roads, including a \$6.2 billion highway between the Cities of Moscow and St. Petersburg. This is the first time Russia is seeking private money for a major infrastructure deal. Russian government will provide one-half of the funding, while the other one-half should be covered by private investors. Poland is also implementing significant road projects and utility-concession agreements.

#### 7) Australia

Australian PPPs continue to move ahead. A road project worth at least A\$1billion comes along every couple of years. So far A\$9billion worth of PPPs have been contracted and a further A\$4billion is up for grabs. Although PPP still constitutes a comparatively small share in total capital spending, the concept constitutes to gain currency in Australia. The States of Victoria and New South Wales lead the way and only the Australian Capital Territory and the State of Queensland have no project under way among the seven states and territories.

Delay of the City of Melbourne’s Spencer Street station overhaul has brought attention to the real risks in PPP projects. The constructor’s access to what constitutes to be a “working

station” is restricted to the small hours, making the timely fulfillment of contractual obligations a challenge. Late delivery will incur penalties from the government and ultimately could threaten financiers. With the project likely to overrun on cost and time, contractor Leighton has set aside A\$110million to cover penalties. The Spencer Street case has made it clear that governments are currently not willing to bend if contractors fail to meet requirements. Since Spencer Street, contractors are more cautious about the level of risk they are prepared to take on. PPPs have already brought tangible benefits to the Australian public. The road network has been improved by various projects: Melbourne’s City Link is operational (run by Transurban); and in Sydney, the Lane Cove Tunnel and West Sydney Orbital are near completion.

#### 8) Canada

In Canada, after lengthy developmental period in which a variety of obstacles slowed the progress of PPPs as a form of alternative public sector asset procurement, the signs of PPP traction appear to have taken hold in late 2004 and early 2005. To date, the majority of projects under PPP consideration are primarily focused on transportation and health care. Especially British Columbia has been the more notable proponent of PPP asset procurement and has established Partnership BC (similar to Partnership UK in UK) to assist in evaluation of potential projects, including whether or not PPPs offer value for money to taxpayers. The province of Quebec has also announced creation of an agency similar to Partnership BC. Large scale projects in British Columbia including the Sea-to-Sky Highway project which is a highway widening and rehabilitation project between North Vancouver and Whistler have selected a preferred proponent consortium to undertake a DBFO concession.

#### 9) Latin America

In Latin America, the initial impetus for PPP came from the toll road sector. The first wave of private investment in roads occurred during the 1990s. Severe economic crises that hit the region, however, revealed some deficiencies in the concession mechanism such as in Mexico in 1995. The second wave started at the end of the 1990s, and incorporated important lessons learned from those earlier projects that suffered setbacks: use of more conservative and appropriate financial structures and concession arrangements where the government does not seek to recover the asset in the shortest time possible. The second wave also saw the participation of experienced international toll-road builders and operators. With regard to finance, the local public debt markets in Chile and Mexico later emerged as a financing option,

taking different approaches: the Chilean market opted for financing toll road projects under a guarantee provided by international monoline insurers while the Mexican market accepted a standalone risk. Using local debt eliminates the risk of a severe currency devaluation rendering a project uneconomical.

PPP continues to gather pace in Latin America. The spread of its popularity is shown by the recent federal PPP law sanctioned by Brazil, which incorporates a number of amendments to facilitate investment. Brazil has put together a list of 23 priority projects to be progressed as PPPs in 2005. These include roads, railways, ports and irrigation projects. Chile has recently awarded the contract for its longest bridge, to be built on a PPP basis under a 30 year concession at a cost of about Eur400million.

#### 10) Asia

In Japan since PFI law was enacted in 1999, more than 200 PFI transactions have been completed or under way in variety of sectors but so far none in road sector. Besides developed markets, the momentum for PPPs seems to be picking up in emerging Asian economies such as China and India. In India, a significant part of the NHDP program for developing 13,000 km of roads is already being implemented through the PPP route and bids have been called for upgrading the airports of Delhi and Mumbai. Railways could be next on the PPP agenda. China already has a long history of PPP investment and continues to expand the role of private capital in the infrastructure sector. The MTCR has recently signed an agreement to build and run an underground railway in the City of Beijing.

## **APPENDIX 10.2**

### **BOT EXPERIENCE IN ASIA**

## BOT Experience in Asia

### Philippines

The key features of the Philippines experiences are:

- An early start in the private provision of roads
- An exclusive focus on build-operate-transfer (BOT) - though none were yet to open at the time of survey
- A strong focus on legal arrangements for private sector involvement
- The importance of the unsolicited bids
- The dominance of Metro Manila

The power crisis at the turn of 1990 was the origin of the current BOT process in Philippines. During the Ramos Administration (1992-98) Government policy has increasingly centered upon mobilizing the effective participation of the private sector in service delivery, to assist the Philippines in competing for business in globalize markets. This policy thrust is at the center of the next National Development Plan (1998-2004). The early thrust in the power sector has broadened and now transport is a major part of BOT program.

In the road sector the North and South Luzon Expressways (linking Manila with the north and south of Luzon Island) were constructed under World Bank loan assistance almost 30 years ago. An operating franchise was awarded under the Toll Regulatory Board (TRB) law to a private sector contractor Construction and Development Corporation of Philippines (CDCP) which were required to levy tolls and maintain the roads – until the capital cost was amortized. Following losses in the Middle East, CDCP became a predominantly public-owned company, now renamed Philippines National Construction Corporation (PNCC). Recently tolls were removed and the roads reverted to Government but because of a failure to maintain them, a further franchise was given to PNCC to collect tolls for maintenance.

The original PNCC franchise has a major impact upon the road sector to this day, for it referred to the named expressways together with links between them, extensions to them and links to them. In practice while open to interpretation, this includes many of Manila's proposed toll roads and each new road effectively extends to the original franchise for another 30 years. Another franchise was awarded to the Public Estates Authority (PEA) for the development of an expressway across reclamation in Manila Bay.

The Manila North and South Expressways were funded and implemented by Government (under World Bank loan assistance). Subsequently under the Marcos administration in 1977:

- Presidential Directive 1112 established TRB. The Directive authorized “the Establishment of Toll facilities on Public Improvements, Creating a Board for the Regulation Thereof and for Other Purposes.” TRB was required to approve all toll rates following public hearings.
- Then under President Directive 1113, CDCP was granted a 30 years franchise to operate, construct and maintain toll facilities in the North and south Luzon expressways.

In 1983, PNCC was granted a 30 year franchise to construct and operate a tolled expressway linking the North and South Expressways. The franchise also gave it “the right, privilege and authority to construct, maintain and operate any and all such extensions, linkages or stretches from any of these expressways.”

A first BOT law was passed in 1990 and a second “the Amended BOT Law” (Republic Act 7718) in 1994. Clear and comprehensive implementing rules and regulations accompanied the second law. Its salient features are;

- Government line agencies take responsibility for identification of priority BOT projects
- All projects are to be submitted to the Investment Coordination Committee
- Investment Coordination Committee must approve draft contracts for all large projects
- A transparent procedure for bidding and contract award
- A formal process for dealing with unsolicited proposals

In 1995 a BOT center was established under the Office of the President with the United States Agency for International development funding assistance to fast-track the BOT process.

TRB is required to approve toll rates from competitive bids (although approval ought to be automatic in this case) to negotiate toll rates with joint-ventures after holding public hearings, to approve toll increase also after public hearings and to oversee construction/implementation of joint-venture projects. The President holds final decision-making power, however, and can reverse TRB decisions to increase rates.

All projects are required to have an Environmental Impact Assessment, which is to be approved by the Department of Environment and Natural Resources. This process does sometimes influence the project identification. Relocation and resettlement are particularly big problems



for major projects in Philippines and are particularly true in Metro Manila.

Philippines has made huge efforts to attract private sector funding. After early success in the power sector, implementation of expressways is taking place with a pipeline of identified projects. Strong political purpose has resulted in a BOT Law that has secured substantial confidence in the investment community. This has been achieved in less than a decade.

The key issues in Philippines are:

- The absence of a soundly-based transport strategy, which is used as the basis for making decisions. This has meant that priority projects are not always identified and there have been conflicts among projects and agencies.
- The need for privately-funded expressways is primarily driven by a small public investment budget (“there is no alternative to turning to private funds”). There has been no discussion of the use of tolling strategy as a matter of transportation policy to improve efficiency of resources allocation, to promote social equity, etc.
- The absence of investment in project preparation. Project preparation is important since it maximizes the preparation of the private sector and allows project implementation to proceed with predictable consequences. However, in Philippines, Government has often tended to be reactive and little is yet done to prepare projects for private/public implementation.
- The failure to recognize the valid use of public support to secure the non-user benefits of expressways. The assumption is that expressways are profitable. Typically, however, expressways are only profitable if they have access to an external revenue stream or government support in one form or another.
- Local government opposition to national government plans. This has been particularly problematic for land acquisition.
- An absence of competition in contract award. In the case of the PNCC and PEA joint venture projects, there is no competitive bidding. In the case of unsolicited bids under the amended BOT Law, although price-matching is provided for, it is likely that its intent is being circumvented by project promoters.
- Tariffs are not defined as a matter of policy; instead they are the outcome of the bidding process and vary from project to project. The negotiated tariff escalation formulae similarly vary.
- The regulatory agency TRB is in substantial conflict with DPWH and also project concessionaires. This is in spite of the fact that the BOT Law transferred TRB to DPWH.

This is partly a matter of jurisdiction (the focus of technical regulation activities) and partly of personalities and history.

### **Malaysia**

The key features of the Malaysia experience are:

- The resounding success of the first project - the North-South Expressway (NSE)
- A large number of projects both completed and in the pipeline
- Limited Government involvement in project identification
- The absence of transparent legal frameworks for private sector involvement
- The heavy involvement of domestic banks
- The complication of multiple tolling technologies
- Financial difficulties for concessionaires and hence Government as the economy has faltered in the late 1990s.

Key to the Malaysian expressway experience is the first project in the sector: NSE. This project has influenced everything else. The road had originally been designed as a public sector project and Government built the first third (335km). In the mid-80s, the project was restructured as a BOT expressway. The existing road was transferred to PLUS, which were also given tolling rights over the whole roads. Hence, during construction of the remainder of the road between 1988 and 1994, PLUS had a revenue stream from the first section. The whole project has had a huge, positive impact upon economic and social geography of Malaysia and has attracted rapidly growing traffic. It has had a profound impact upon future BOT projects.

Malaysian expressway development has happened over a relatively short time. The results of the program are only now becoming clear. This concentrated period of project development has allowed no time in which to learn the lessons of experience. Financial problems for some of the projects are now contributing to the shock waves in the economy. Many of the projects relied on the property market for additional revenues and as that market weakens the knock on effects for expressways have become clear. Almost all of the projects now require some Government support.

There is no BOT law. Rather the system has usually operated in the following way:

- A project is developed to a pre-feasibility level by a private group, who request a letter of exclusivity from EPU to develop the project. EPU reviews the project concept and if the project is approved, a letter of exclusivity is issued.
- The project is subject to full feasibility study and a Privatization Proposal developed. This is

submitted to EPU for formal review. EPU usually convenes a Technical and a Financial Evaluation Committee involving the appropriate line agencies.

- Concessionaires may proceed to detailed design in expectation of approval in parallel with negotiation of the concession agreement.

Many different government agencies are involved in the process. The Malaysian Highway Authority signs the concession agreement and is responsible for technical regulation; while economic regulation is the remit of EPU and the Cabinet – who need to approve toll increases (even when their basis may be defined unambiguously in the concession agreement).

EPU has defined some clear policies for the sector:

- There should always be a parallel free road.
- Public transport should be encouraged to use expressways. Thus tariffs on buses are lower than for cars. This is an innovative approach to promoting social equity.
- Motorcycles have separate tracks, engineered into the design, along Federal Road 1. This reflects the large number of motorcycles, which are used by low/middle income people and also contribute to social equity.

Tariffs are derived from the concessionaire bid and negotiations, based on EPU's view of an acceptable rate of return (15% IRR at time of the survey). They are therefore based upon the need to repay the cost, rather than on transport policy objectives. Tolls are all par – km based. NSE tariffs have, in practice, set the benchmark and they were guaranteed an increase of 6% per annum resulting in a real increase when inflation rate was low. Toll rates for taxis and buses do not rise. Later government refused the application for an 'automatic' 6% increase. This came at an economically difficult time – with widespread resistance to toll increases, and compensation was discussed.

In the latest concession agreements the government is moving towards a system of:

- Restricting increases to every 5 years
- Only allowing an increase when revenues are no higher than forecast at the time of the concession agreement. This is part of government's effort to tilt the balance of reward back towards the government.

Malaysia has good reason to be proud of their early achievements, led by private sector entrepreneurship. But recently the system has shown signs of strain. Key points to note:

- Malaysia has achieved much in terms of completed projects, with more under construction

and in the pipeline

- Malaysia's private sector has shown that it can 'make projects happen.' This is a substantial achievement. It is because of: (i) very strong commitment from the top that this will happen; and (ii) large incentives to the private sector to carry out functions normally carried out by government.
- The Government has often not benefited from competition, nor has the investment been without substantial government support. The private sector has usually obtained high profits and avoided carrying significant risk. It is the public sector that has carried most of the risk, and a huge contingent liability – which is now being realized.
- Malaysia's privatization has been implemented under strong determination to benefit Bumiputras by creating large entrepreneurial conglomerates. The major beneficiaries have been the project developers and the banks. The former have shown their ability to develop innovative project concepts, quickly and to make construction profits with financial innovation.
- There has been little risk taking by banks which have been protected by the government guarantees. Also banks may be linked to the project developers or acting under government influence. The lack of risk has meant that the banks have often failed to carry out appropriate due diligence.
- Government has given support to assist project viability: land, soft loans and traffic guarantees (on the NSE).
- Government does not provide foreign exchange guarantees, which have not been an issue because virtually all debt has been domestic.
- There is no transparent BOT or concession process, no BOT Law and no published procedures.
- Profits for the project developers come from construction and sometimes latterly from listing the project on the KL Stock Exchange.
- Toll road projects, however, rarely make money without strong government support (in kind, investments and/or guarantees).

A conclusion may be that – as for Mexico – Malaysia has suffered from developing its network too quickly. It is only recently, when the main batch of projects started opening, that Government realized the scale of their contingent liability.

This realization together with the impact of the economic crisis is now leading to change. MOF is now taking a more central role because of the need to fund the government liabilities.

## Thailand

The key features of the Thai experience are:

- The dominance of Bangkok
- Institutional conflicts and lack of government planning
- Process difficulties and a changing process
- The difficulty of terminating concession agreements that are not implemented
- Financial difficulties for concessionaires and thereby for Government, as the economy faltered in the late 1990s.

All of the Thailand's existing expressways are in the Bangkok area, or on radial routes connecting to Bangkok. The conditions for successful expressways exist – high traffic flows, severe traffic congestion, a poorly developed existing road network and relatively high and increasing values of time.

Today a network of expressways has been developed. The process of development has been difficult with at least one project failing (Hopewell) and two other experiencing major contractual problems – Second Stage Expressway and Don Muang Tollway.

The network has developed in phases with the participation of several different government agencies. In the late 1970s government developed the First - Stage Expressway system. In the late 1980s, government policy was 'private sector first' – and individual government agencies were encouraged to contract BOT expressway and mass transit projects. The Second Stage Expressway, Don Muang Tollway and Hopewell were the first results; with other projects planned as BOT concessions. These were not coordinated and almost all major corridors had mega projects which conflicted with each other, often using the same airspace. The problems created at that time still cause severe problems today.

During the early 1990s, 3 significant events took place:

In 1993, the Anand Government introduced a law requiring compensation to be paid for land at market rates. This resulted in a huge increase in the Government cost of mega projects with two results.

- Conflict on the Second Stage Expressway leading to a collapse of the original shareholding in BECL (Kumagai Gumi and foreign lenders were replaced by Expressway and Rapid Transit Authority of Thailand (ETA) and Thai lenders). This undermined the confidence of the international community that the Government could administer a legally-binding

concession agreement.

- Increasing institutional conflicts between the two agencies in the sector; ETA and the Department of Highways (DOH). Increasing land prices forced ETA to adopt existing road alignments, to minimize land take. DOH owns the rights-of-way of several roads and considers they should develop them. This remains a serious problem with the agencies having sometimes developed 'competing' projects, creating difficulties and uncertainties.

A 1993 Royal Act created the current framework for private sector participation. This sought to ensure that the government agencies did not, in future, unilaterally contract BOT concession agreements; it applied to all large projects.

About the same time the cabinet decided that within a 25 square kilometer area of Central Bangkok, all transit lines should be underground. After appeal, 2 of the 3 transit schemes with concession agreements were allowed to remain elevated. Although expressways were not involved, the process caused uncertainty and difficulty given the network of actual and proposed expressways and MRT lines.

The Thai economic crisis began in mid-1997. The chaotic process by which BOT projects have developed may have been a contributory cause of that crisis.

There is no BOT Law and the existing BOT process is not yet regarded as fully transparent. There is a history of institutional conflict, with decisions often being resolved at Cabinet level. ETA and DOH have separately and independently prepared expressway programs without co-ordination. It is around the periphery of Bangkok that the major conflicts arise with the first agency to construct tending to force a delay or change the plans of the other agency.

No procurement strategy was announced for the new program. In the past, the Government has provided guarantees on an ad hoc basis, depending on the project and the sponsors. This has made it difficult for bidders, who may have had unrealistic expectations. In some cases evaluation has taken place and the decision submitted to Cabinet for approval only to find that the Cabinet has required the whole process start again. Substantial delay and frustration has sometimes been the result.

Projects developed under the Highway Concession Act will have a concession period of between 25 and 30 years based on the expected financial rate of return. There is no clear policy on toll rate increases, which is of concern to investors: 'the concessionaires may from time to

time request to adjust the toll rates so that they are fair to the company in light of changes in the economic situation.' Government support is to be considered at negotiation stage and assistance for land acquisition is promised. This too has undermined investor confidence.

After the early contracts, in which individual agencies signed sometimes with no competition, most projects have involved competition. This procurement, however, has not always been transparent, with charges of corruption sometimes cited as a reason for contract award; and this has reinforced institutional conflict.

Thailand is recognized as having particularly difficult institutional problems in the transportation sector. This is particularly so in the Bangkok region. There appears to be no effective mechanism for coordinating action other than the Cabinet.

Let us briefly review the three troubled expressway projects: the Second-Stage Expressway, Don Muang Tollway and Hopewell.

First, the Second-Stage Expressway. It was originally developed by foreign investors, namely Freeman Fox, Kumagai Gumi and CH Kanchang, which walked away because of ETA's insistence that it should collect the tolls. Subsequently there have been problems of failure in toll increase even though justified under the contract. In addition land acquisition proved to be a big problem because planned acquisition of the Section D was unfeasible.

In Don Muang, the government delayed the promised removal of flyovers on the competing parallel road for more than two years during which the Transport and Communications Ministry did not allowed toll increase. This resulted in a threatened bankruptcy of the sponsor due to decreased revenue being one-third of the originally anticipated. Renegotiation led to government's compensation and infusion of Bt3billion capital which made this project a quasi-government with its 40% stake therein.

In Hopewell, the funding was to be from land development and the tolled expressway. The project conflicted with parallel projects under implementation and froze many other projects. Crash in property market and the latest economic crisis have seriously compounded the problems caused by locating three expressways in a single corridor. After ineffective 8 years implementation the government terminated the concession.

Bangkok's expressways support one firm conclusion: they do not solve traffic congestion. Today there is a network of expressways which is well-used, but results in huge congestion,

often on the expressways and invariably when access to/from the expressways is required. Other lessons from Bangkok expressways are:

- A good procurement process is vital. In Bangkok, however, the absence of this has produced massive delays, losses for participating private sector companies and poor results.
- In spite of expectations, expressways are often unprofitable. Second Stage Expressway and Don Muang Expressway – two apparently very good projects – have both required substantial government investment.
- Land profits are unsafe as a basis for funding – abandonment of Hopewell is one example.
- Planning is necessary. Government agencies undertook identification in Bangkok but there was little co-ordination between. The conflicts have caused major problems.
- Investors, both foreign and domestic, have often been deterred from bidding by a combination of a perception of lack of transparency and corruption in contract award and an inability to administer legally-binding contracts.
- Land costs have made projects more and more costly to government – partly as a result of increasing prices and partly a result of paying proper compensation. This makes projects increasingly difficult to justify and reinforces the need for prioritization.

### **Hong Kong, China**

The key features of the Hong Kong, China experience are:

- The effectiveness of government planning
- The effectiveness of a transparent bidding process
- The need for a traffic policy on government-tolled facilities
- The use of different mechanisms for private sector involvement
- The problems of competition in tolling technologies
- Innovative mechanisms for establishing the toll rates
- Under-use of costly transport infrastructure.

For Hong Kong, China, the core objectives of private funding have been to release Government resources for other purposes and early implementation. Implementation is swifter under private management than Government and hence road users benefit from new infrastructure sooner.

All projects to date have been bid on the basis that under the terms of the bid toll and ancillary revenues will create profitable projects. There has been no consideration of negative concessions – in which the government explicitly provides support for unprofitable but



economically important roads.

Unlike the rest of Asia, Hong Kong, China has not only involved the private sector in BOT projects, but also in management contract for Government tunnels and latterly in a maintenance management contract for the Tsing Ma Control Area.

Hong Kong, China has 'learned by doing.' Its first BOT project was opened in 1972 with subsequent projects in 1989, 1991, 1997 and 1998. This has allowed the BOT process to be continuously improved.

The involvement of the private sector in infrastructure provision is not forced by funding imperatives and the case for BOT is less compelling than it might be, given the absence of inefficiency of the bureaucracy. Rather the Hong Kong, China view is that the private sector should be used where it can best deliver services and that where this is not possible, Government should be made more efficient - e.g. through creating government corporations. This is decided pragmatically. The railways are mostly corporations, which raise private finance. The airport has also been corporatized. Power, telecoms and ports have all been long-established private sector activities and recently BOT projects have been developed for refuse transfer stations, landfill sites and chemical waste treatment.

Hong Kong, China has a Legislative Council (Legco) comprising of elected representatives who are key to project implementation while the Executive Council and civil servants undertake project development. This creates problems for civil servants with the need for much lobbying to get decisions through Legco.

The Government has had no tariff policy. Bidders would propose the toll levels and the Government would confirm an acceptable level during bid evaluation and negotiation. However, a new system has now been introduced, following the Western Harbor Tunnel negotiations. This system guarantees that tariffs will be increased and is important support for private sector interest in the process.

Under the old system, it has been difficult for a concessionaire to obtain an approval for a toll increase. The original Cross Harbor Tunnel had a \$5 toll (cars), then in 1984 a further \$5 'passage tax' was imposed. Since 1984, the toll has not been increased despite lobbying from the concession company. This is because the tunnel is very profitable and 'it provides the people with choice' (and has become an almost un-tolled alternative).

The result is that both the Eastern and Western harbor tunnels have been adversely affected, the latter in particular carrying traffic which is only a small proportion of its capacity. The Eastern Harbor Tunnel took the matter of its toll increases to arbitration, as allowed under the concession agreement. It won the case, but the uncertainty associated with this provided a major disincentive to potential concessionaires.

The new system now provided includes:

- A schedule of defined tolls and years when increases will take place and the size of those increases.
- A range of allowable financial internal rates of return for the project.
- A range of net revenue projections over the concession period (revenues minus operation costs minus interest payments).
- A seat for government on the concession company board.

Each year the company is required to submit audited accounts and the resulting net revenue to the government, to compare with the projections. When the concessionaire's revenue is more than the amount projected, the excess is placed in a Toll Stability Fund. Government has the right to use this money to defer a toll increase which would otherwise fall due. When the concessionaire's revenue is less than projected, the government may use the fund to top up the concessionaire's revenue to the minimum agreed level. If the balance of the fund is insufficient to do this, the concessionaire may bring forward a toll increase, subject to vetting of accounts by the government. If moneys remain at the end of the concession period, they revert to the government exchequer.

The results of this approach are:

- Reduce downside risk to the concessionaires who may receive revenue support and/or is allowed to bring forward toll increases
- Provide upside cash for government.

The Hong Kong, China bidding process is drastically different from the rest of Asia with a thorough and effective process being led by the government. It follows on from the government feasibility study and preliminary design. A detailed project brief and conforming design is produced. The upcoming bidding is advertised and advised through consulates widely. The government lays down 3 imperatives:

- Investors must build the facilities to a fixed cost and within a fixed time.

- The shareholders must guarantee revenue in the first 5 years.
- Investors must fund their equity – and be joint-and-severally liable.

In Hong Kong, China, there has been up-front government support, land has been provided free and approach roads beyond the immediate vicinity of the tunnels have been funded by government. Given this the financial viability of the concessionaires is summarized as follows:

- Cross Harbor Tunnel is hugely profitable. The 30-year franchise concludes in 1999 and the government is considering what to do then.
- Eastern Harbor Crossing is probably OK. Traffic was lower than forecast for the first 2/3 years because the linking infrastructure was not open but is now close to projections.
- Tate's Cairn Tunnel is in trouble. No dividends have been yet been paid to shareholders. It suffers from competition from Lion Rock Tunnel, which is government-tolled. The banks would suffer if there is no success in increasing revenues. The concession company has gone to great lengths to attract traffic – e.g., offering petrol tickets. They have tried reducing tolls – but lost revenue. Originally they attracted almost 100% of trucks but the Lion Rock Tunnel charges \$6 flat and Tate's Cairns now carries very few trucks.
- WHC is in trouble with revenue much lower than forecast. Its success depends on the Airport/Route 3 corridor and the government policy on tolling the Cross Harbor Tunnel. The financing is all non-recourse and the banks would suffer if it is not profitable.
- Route 3 opened late in 1998 and early routes are that traffic is much lower than forecast. Its HK\$15 toll has failed to attract motorists despite the considerable saving in time that the tunnel offers over the alternative free but much longer routes.

Thus at the time of observation, out of 5 projects, there is one definitely profitable, one or two probably profitable and 2 or 3 in trouble.

In conclusion in terms of process, Hong Kong, China's system is without doubt Asia's leader through its combination of:

- A territory which is amenable to BOT – because of hills and harbor which need crossing. The BOT projects comprise three harbor crossings.
- A government which has an effective integrated land use/transport planning system. This reduces uncertainty as to future development and the future transport network as well as allowing the suitable BOT projects to be identified.
- A government which over 25 years has learned pragmatically as projects have been developed.

The process has been improved to seek the right balance between:

- Government's interests in not providing guarantee or incentives.
- User interests in low tariffs.
- Concessionaires' interests in a reliable financial return.
- Lenders interests by putting a floor under downside risk.
- A dynamic market of investors, contractors, bankers and consultants.

Five major BOT projects have been completed, one every 5 years on average. Each has involved massive effort by the government throughout the planning, implementation and operational phases. It may be conjectured that in terms of person-months effort the Hong Kong, China Government and its advisers spend many times the effort of most other Asian governments in planning and procuring BOT projects. The results are projects which promote public policy, secure innovation and benefits of competition.

Hong Kong, China has in the past transferred the vast majority of risks to the concessionaires and provided no guarantees. This was very successful with the first project, the Cross Harbor Tunnel. Subsequent tunnels have not been so successful, requiring higher tolls to make them viable and problems from competition created by the cheaper tolls of the centrally-located Cross Harbor Tunnel. In the future, government recognizes it will have to assume a greater proportion of risk if private sector financing of road infrastructure is to be forthcoming.

## **APPENDIX 10.3**

### **DBFO ROAD EXPERIENCE IN UK**

### DBFO Road Experience in UK

#### 1) History of DBFO Road

Contracts for the first 8 DBFO projects (Tranches 1 & 1A) were all awarded in 1996. These involve the private sector in managing about 600km network and delivering 11 road improvement schemes with an estimated capital value in excess of £550m. Reimbursement on these contracts is primarily by means of shadow tolls paid according to usage of the project road, plus bonus elements for safety enhancements and charges for lane closures and penalty points for not achieving set operating standards.

#### **Tranche 1**

##### 1) A1(M) Alconbury to Peterborough

Outline	Upgrading of the existing A1 motorway between London and Newcastle
Length	21km
Cost	£128 million
Opening	October 1998
VFM	24.5%

##### 2) M1-A1 Lofthouse to Bramhan Link Road

Outline	Dedicated motorway link to provide a strategic connection between the M1 and M62 motorways and the A1 Trunk Road
Length	30km
Cost	£214 million
Opening	February 1999
VFM	32.6%

##### 3) A417/A419 Swindon to Gloucester

Outline	Route between the M4 and the M5
Length	52km
Cost	£110 million
Opening	December 1997
VFM	8.9%

4) A69 Carlisle to Newcastle Trunk Road

Outline	Major east-west route serving the North East of England
Length	84km
Cost	£9.4 million
Opening	May 1997
VFM	+8.7%

**Tranche 1A**

1) A19/A168 Dishforth to Tyne Tunnel trunk road

Outline	Route linking Tyneside, Wearside and Teesside to the A1(M)
Length	118km
Cost	£29.4 million
Opening	September 1998
VFM	23.3%

2) A30/A35 Exeter to Bere Regis

Outline	Part of the South Coast trunk road from the M5 at Exeter to the A31/A35 roundabout at Bere Regis
Length	102km
Cost	£75.7 million
Opening	April 1999/ February 2000
VFM	0.7%

3) A50/A564 Stoke to Derby Link

Outline	East-west connection between M6 and M1 Motorways
Length	57km
Cost	£20.6 million
Opening	March 1998
VFM	13.0%

4) M40 Denham to Warwick

Outline	Route between London and Birmingham and acts as an alternative to M1 and M6 Motorways between these two locations
Length	122km
Cost	£65 million
Opening	December 1998
VFM	34.1%

Subsequent to Tranches 1 & 1A, three DBFO projects (Tranche 2) were out to tender when the Accelerated Review was announced soon after the General Election in 1997. These were 1) **South Midlands Network**, 2) **Cumbria to Bradford** and 3) **Weald and Downland** roads. These projects were, however, cancelled subsequently. A number of other projects (**A40 West London Approach & A36 Wessex Link**) were also considered for DBFO status but rejected. Following the Post Tranche 2 DBFO projects;

1) A13 Thames Gateway DBFO

Outline	Vital link to assist regeneration in East London, improving east-west access to Docklands, the Lower Lea Valley and other parts of East London.
Length	20.5km
Cost	£146 million
Opening	July 2000

- This project is the first example of a DBFO reflecting the government's integrated approach to transport.

2) A1 Darrington to Dishforth DBFO

Outline	Part of a strategic link in the national network between Scotland, the North East and the South of England
Length	53km
Cost	£245M
Opening	Currently under construction
VFM	17.14%

- This project contains two upgrading and widening schemes with a capital value of about £245 million. Construction has commenced on this project.



### 3) A249 Stockbury to Sheerness

Outline	Trunk road between the Stockbury junction on M2 and Sheerness Docks
Length	17km
Cost	£80.8 million
Opening	Spring 2006
VFM	+2.04%

- It contains three improvement schemes with a capital value of about £80 million. The contract was signed in February 2004.

To date, all 11 DBFO contracts have been signed and construction is complete on the first 8. The **A13 Thames Gateway** contract has been transferred to Transport for London and is substantially completed. Construction has commenced on the **A1 Darrington to Dishforth** contract comprising two upgrading and widening schemes. The **A249** contract was signed in February 2004 and comprises 3 improvement schemes.

Under the DBFO method of procuring road improvements and maintenance, value-for-money savings averaging 20.23% have been delivered.

DBFO is not just a procurement option used in England. The Scottish Office awarded the A74(M)/M74 DBFO in April 1997 and the Welsh Office the A55 in December 1998. Both contracts are expected to deliver VFM savings, although in the case of the A74(M)/M74 DBFO, a National Audit Office (NAO) report concluded that the net benefits may be less than the £17 million calculated by the Scottish Office. The price, however, can be expected to remain VFM.

### 2) DBFO Structure

#### **A. DBFO Contract Period**

The DBFO contract period is for 30 years from the commencement date. The period was selected because finance for this type of project generally has a maximum repayment period of around 20 years and the payment mechanisms had to be structured to allow repayment of debt over a similar timescale (making allowance for a reduced payment stream in the initial years until the road scheme(s) are completed and a buffer period after anticipated debt repayment in the event that cash flows are less than, or come on stream later than, anticipated). Since 30 years is currently beyond the range of conventional debt, the choice of period also encouraged

financial innovation, use of alternative sources of funding and the possibility of re-financing after the completion of construction, all of which can provide financial benefits to the Agency. It was also important that the contract period was sufficiently long to allow DBFO Co to apply whole-life costing to the project road.

### **B. Payment Mechanism**

The Highways Agency uses a variety of mechanisms to pay DBFO companies. The first 8 contracts (Tranches 1 & 1A) primarily used the shadow toll payment mechanism, based on the number of vehicles using the road. In A13 Thames Gateway a new payment mechanism was introduced away from the all-vehicle shadow-toll payment mechanism used on previous DBFO contracts, replacing it with a combination of:

- Availability payments - designed to encourage the private sector to manage the maintenance program to avoid disruption to road users at peak times, and with greater financial incentives in respect of keeping bus lanes open and available for use
- Separate footway and cycleway availability payments - encouraging the private sector to recognize the needs of the non-motorized user by maximizing the availability of these facilities
- Long-vehicle shadow tolls - providing incentives to the private sector to manage public transport and heavy goods vehicle traffic effectively without encouraging increased car usage
- Safety payments - designed to encourage the private sector to reduce the number of accidents.

The **A1 Darrington to Dishforth** contract uses the Active Management Payment Mechanism. The **A249** contract mainly uses the Active Management Payment Mechanism combined with elements of the Availability Payment Mechanism used on the **A13 Thames Gateway DBFO Project**. Following is the summary of each toll payment mechanisms.

### **Shadow Toll Payment Mechanism**

The Highways Agency pays each DBFO Co an amount, which is based on the number and type of vehicles using the road, with adjustments made for lane closure and safety performance. These are known as shadow tolls as opposed to real tolls, as payment for usage is made by the Highways Agency rather than by the road user. The payment mechanism was structured to meet government policy objectives for the trunk road network and PFI requirements, and incorporates payment based on 1) usage/demand, 2) availability of service and 3) performance.

**a) Usage/demand:** Shadow toll payments are made per vehicle using a kilometer of the project road, in accordance with the tolling structure and increase over time in accordance with an indexation formula. Different payments are due for traffic within different traffic bands and dependant on the length of the vehicle.

**b) Availability of Service:** Where the project road consists of an existing stretch of road with one or more construction schemes along its length, then shadow toll payments will be made at a reduced level representing the cost and operation for the existing road.

**c) Performance:** Two elements form the basis of performance payments:

**a. Safety performance payments**

The DBFO Co is encouraged to suggest safety improvement schemes with incentives for improving safety on the Project Road. If approved, the DBFO Co constructs and pays for the scheme and is recompensed by receiving 25% of the economic cost of each personal injury accident avoided in the following five year period.

**b.Lane closure charges**

A deduction is made from the toll payment when lanes are closed. The size of the deduction is dependant upon the number of lanes closed, the duration of the closure, and the expected traffic at the time of the closure. Lane closures charges are only made for closures within the control of the DBFO Co.

**Availability Payment Mechanism**

This form of payment mechanism was used specifically for the **A13 Thames Gateway DBFO Project** due to its urban characteristics. The mechanism was refined in order to achieve policy objectives and to improve the incentives on the DBFO Co to optimize the availability of road space and generally to take steps to improve the level of service to the public. Under this mechanism payments would be based on 1) availability, 2) HGV/Bus shadow tolls, 3) safety payment mechanism and 4) bus journey time reliability.

**a) Availability**

It accounts for approximately 70 per cent of the DBFO company's income. Payments to the

DBFO Company will take account of the number of available carriageway lanes. Payments will depend on the time of the day; e.g. payments for keeping the road available during peak hours will be higher than the payments for off-peak hours. This method of making payments is an incentive for the DBFO Company to manage their maintenance programme to avoid disruption to road users at busy times. There are also separate payments for footway and cycleway availability. The DBFO Company will address the needs of the non-motorised user.

**b) HGV/Bus shadow tolls**

Shadow tolls for heavy goods vehicles and public transport give priority to effectively managing HGVs and public transport while providing no incentive to increase car commuting.

**c) Safety payment mechanism**

Incentives will be further developed to reduce accident rates.

**d) Bus journey time reliability**

The DBFO Company will be encouraged to keep bus lanes available during their hours of operation to assist in the reliability of bus journey times.

**Active Management Payment Mechanism**

The Active Management Payment Mechanism (AMPM) comprises of the following two elements; 1) Congestion Management and 2) Safety Performance Adjustment. The mechanism encourages the DBFO Co to actively manage the project road to reduce congestion and increase the reliability of road user journey times. It also retains the benefits of whole life costing, early delivery of schemes, consideration of safety, and proper planning of maintenance to minimize loss of availability of the road at peak periods. This is achieved by reducing payments for any times that congestion is experienced on the project road. It is considered that the DBFO Co can influence greatly the occurrence and levels of congestion through the effective management of the causes of congestion. The Active Management Payment Mechanism works in tandem with a Safety Performance Adjustment. This Adjustment is made to the DBFO Co.'s payment based on the number of personal injury accidents (PIA's) that occur on the Project Road when compared with a benchmark determined from the accident records of a comparator set of roads. This mechanism was developed for the **A1 Darrington to Dishforth project** and has also been used for the **A249 Stockbury to Sheerness project** where it also combines some elements of the Availability Payment Mechanism used on the **A13 project**.

The DBFO Co. is considered to be in a good position to control and reduce congestion. The DBFO Co will therefore be required to accept the risk of predictable congestion such as roadworks, special events, slow moving vehicles etc and the risk of unpredictable congestion such as that due to accidents, poor weather, etc. Management of these can be achieved through, for example: planning roadworks to be undertaken during off-peak times; liaising with the local authorities, police and other interested third parties to plan for impact of known events, having breakdown and response vehicles on standby; providing additional signing and break down vehicles during special events, placing temporary traffic management during emergencies etc.

It is recognised that the DBFO Co will have limited control over recurrent congestion caused by sheer volume of traffic demand approaching the nominal capacity of the road. The Payment Mechanism therefore makes allowances for this such that the DBFO Co's exposure to these risks are mitigated.

Tenderers will bid a single annual amount of money which will be indexed for the 30 year contract duration. The amount bid will be divided up into carriageway sections for each hour of the day. The allocated amount for each section and each hour will be directly proportional to the level of traffic. Payments are made as follows:

- Full payment will be made if speeds are above the target speed
- Should speeds fall the target speed, then the payment will be reduced
- Full payment will be made, however, if traffic exceeds the deemed capacity of the road section, even if the speed falls below the target speed
- There will be graduation of the level of deduction for both speeds between minimum and target speed and between 80 and 100% of capacity
- A bonus will be paid if flow exceeds 110% and speeds exceed the minimum speed
- The maximum bonus that can be earned is 20% of the payment for the hour and road section, if flow exceeds 120% of capacity and speed exceeds the target speed.

### **C. Risk Allocation**

Under a PFI contract, the private sector will generally be asked to take the following risks:

- Construction and operational cost overruns
- Delay in delivery of the service
- Design of the underlying asset not delivering the agreed service
- Changes of law, including tax law changes, which impose additional or increased costs on the operator (other than any change of law which discriminates against private sector

operators).

DBFO contracts are structured to leave these risks with DBFO Co. The allocation of risks which may be unique to DBFO contracts include Traffic Risk, Protestor Risk, Latent Defect Risk.

Principal risks transferred to the private sector in the first eight DBFO projects included construction cost (including unforeseen ground conditions), opening date, operation and maintenance over 30 years, and traffic. Risks retained by the Department for Transport (DfT) included completion of the statutory procedures, land assembly, additional works required by the Secretary of State and events such as extreme weather conditions.

### 3) Procurement Process

Following is the outline of procurement process of DBFO projects.

#### **Prequalification**

A Contract Notice is published by the Agency in the Official Journal inviting requests from interested candidates to prequalify with a view to later being invited to tender for a DBFO Contract in respect of the Project. Candidate to be selected to tender for the Project has the appropriate qualities and resources available to it, to undertake the tasks required of the DBFO Co. Candidates are selected in accordance with the negotiated procedure and are typically required to supply information regarding financial and economic standing, technical capability and approach, capability to secure appropriate technical, financial and legal advice for negotiating and finalising the contract, and avoidance of arrangements which could constitute a conflict of interest.

#### **Tender**

The Agency sends to Tenderers a set of tender invitation documents including a draft DBFO Contract, the Agency's position regarding the definition of obligations and the allocation of risk as well as existing design information. Tenderers are required to propose their own designs and are encouraged to incorporate innovative ideas which deliver good value for money. In addition Tenderers are required to stipulate the amount of DBFO Payments based upon the obligations and allocation of risk as set out in cash flow projections, which include forecast cost, revenue data and financing proposals. Tenderers are also encouraged to propose alternative obligations or allocations of risk.

### **Negotiation**

The Agency negotiates with Tenderers to refine and finalise definition of obligations, allocation of risk and attendant payments to be included in the DBFO Contract.

### **Award**

In conclusion DBFO Contract will be awarded to the most economically advantageous bid delivering greatest VFM, with criteria to be considered set out in the Tender Invitation Documents.

## **APPENDIX 11.1**

### **CAIRO URBAN EXPRESSWAY NETWORK PPP PROJECT**





## **APPENDIX 11.2**

**RELATED ISSUES OF  
HOLDING COMPANY STATED  
IN THE LAW NO. 203 1991**

**APPENDIX 11.2**

**RELATED ISSUES OF HOLDING COMPANY STATED IN THE LAW NO 203 1991**<sup>16</sup>

Article	Issue	Content
<b>Main part</b>		
1	Company form	Joint stock company Partnership limited by shares Limited liability company
4	Treatment of existing employees	Employees shall be transferred at their same positions, wages, allowances, leaves, and cash and in kind benefits and compensations.
5	Status of employment	Not public sector employees status
<b>Part I Holding company</b>		
1	Issuer of a decree	Issued by the prime minister upon a proposal by the concerned minister
	Capital	Fully owned by the state or by public corporate entities
	Necessary contents in a decree	Name, head office, duration, the purpose of its incorporation and capital
3	Management of a holding company	Board of directors
	Appointment of directors	Decision of the general assembly on a proposal by the chairman for three renewable years
	Number of board member	Less than 7 and not more than 11 members
6	Power of board of directors	Board of directors shall exercise all the powers necessary to discharge the company's affairs, and undertake all actions required for the accomplishment of the company's purpose, except for those powers assigned to the general assembly.

<sup>16</sup> Holding company is stipulated in the public business sector companies law (Law No.203 of the year 1991).

		<p>Lay out the general policies and specify the means required for their accomplishment.</p> <p>Manage the company's portfolio by selling and purchase of the shares, stocks, debentures and any other financial instruments and assets included in it.</p> <p>Propose establishment of joint stock companies by the company alone or in participation with public or private corporate personalities or individuals.</p> <p>Purchase or sell share of joint stock companies or participate in their capital</p> <p>Undertake all actions required to rectify financial structure and progress course of its insolvent subsidiary companies and to enhance their profitability and rationalize costs.</p>
		<p>Approve the draft balance sheet and the final accounts prior to submitting them to the general assembly of the company</p> <p>Approve the company's organizational structure and lay out internal statutes for financial, administrative, technical and other aspects.</p> <p>What the chairman of the general assembly or the chairman of the board deem necessary to be presented to the board.</p>
9	Role of general assembly (GA)	<p>Approve the board of director's report on Companies activities</p> <p>Approve the company's balance sheet and the financial account</p> <p>Approve the continuance of the board chairman and directors for another term in office or dismissing them by secret ballot</p> <p>Approve profits distributions</p> <p>Consider all that which the chairman of the general assembly or the board of directors deem necessary to be presented to it.</p>
9	A chairman of GA Concerned minister	
	Number of GA members	Not less than 12 and not more than 14
	Legal foundation	Presidential decree
Part – III		
39	Termination of a holding company	<p>Dissolution of the company</p> <p>Expiry of duration specified in the company's articles of association</p> <p>Completion of the purpose for which the company has been established</p>

		Amalgamation or division
40	Arbitration with private sector	Law on Civil and Commercial procedures shall be applied
Executive statutes		
2	Capital	Not less than 20 million LE Paid up capital shall be less than 50% on founding the company
4	Required documents to set up	Head of agreement The company's draft articles of association Certificate from the commercial register dept Certificate from an approve bank Declaration from the authorities

## **APPENDIX 11.3**

### **KEY ISSUES ON TARIFF SYSTEM FOR FURTHER STUDY**

### KEY ISSUES ON TARIFF SYSTEM FOR FURTHER STUDY

**Uniform tariff system** - Although toll fee basically should depend on driving distance with multiplication by unit fee per km called as distance basis tariff system, an uniform tariff system with two vehicle categories is recommended to be introduced into Cairo urban expressway network. Flat rate toll system and distance basis toll system are commonly called “open system” and “closed system” respectively. Visual concepts of the both tariff systems are shown in Figure A11.3-1. Tariff by vehicle categories usually depends on their contribution to pavement deterioration and congestion<sup>17</sup>.

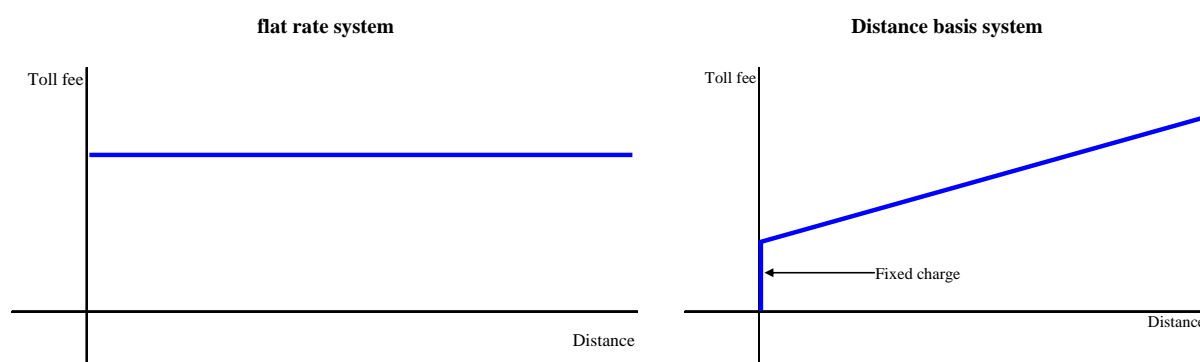


Figure A11.3-1 Comparison on two tariff system

The employment of uniform tariff system is justified by physical and operational reasons, which are to deal with urban huge traffic in the largest city Cairo and to address difficulty to secure large spaces for toll gates. Simplicity of uniform tariff enables short time toll collection and handle large traffic flow efficiently and smoothly. Uniform tariff makes the space of ramps smaller because the needless to check driving distance doesn't require ramps at exits<sup>18</sup>. On the other hand, distance basis system needs ramps not only at entrance but also at exit.

Secondly, it is rationale to secure equity in toll fee for similar driving distance in the network, whose routes differently cost in construction. This system pools all toll receipts from the entire network and uses them to repay the costs for the entire network rather than fixing toll rates for each route on the basis of the revenues and expenses for that route only. To avoid the inequity of the higher tolls on newer expressways resulting from higher construction costs in late stage of the development, therefore, the system sets a toll rate for the whole network at one appropriate level.

<sup>17</sup> If traffic levels approached the expressway capacity, tolls would increase.

<sup>18</sup> If electric toll collection system is adopted, distance basis system would be possibly introduced.

Thirdly, since long distance trip is relatively cheaper than short distance trip, uniform tariff system would restrain the short trip users and facilitate long trip users. This might allow both toll expressways and normal roads be utilized most effectively.

***Toll adjustment mechanism*** – Toll is collected for a considerably long period, such as 30 years, after the toll road network development is completed. It is highly possible that not low inflation occurs in developing countries during the long period. To cope with increase in inflation, the toll rate should be adjusted. Toll adjustment would be necessary as the new sections would be added to the network in order to cover construction costs of newly added sections.

Tariff structure basically should cover operating expenditure, debt service, capital cost and fair return with appropriate price indexation with consideration of efficiency factor. It may be expressed as the following equation:

$$\text{Toll} = \text{Approved base tariff} * \text{Inflation (RPI)}^{19} - \text{Annual productivity enhancement (X)}$$

If the government employs the above equation, there are four issues; (a) Approval mechanism and process on tariff adjustment (b) level of approved base tariff, (c) how to adjust which inflation index and (d) setting rule of annual productivity enhancement.

***Approval mechanism and process on tariff adjustment*** – Basically, tariff approval mechanism and process on tariff adjustment should follow independent and transparent rule to avoid political interference for the purpose of attracting investment and sustainable network development. As a new tariff system was introduced by law No. 93 of June 2003 replacing Law No. 119 of 1983, guaranteeing pricing freedom (in the past, tariff and budget of public corporations had to be approved by the parliament.)<sup>20</sup> in the airport sector, toll pricing freedom regarding regular inflation adjustment should be given to MEA.

In case of emergency situation such as unusual surge inflation increase, tariff adjustment mechanism might be suspended for the safety net to the people. However, emergency situation should be clearly defined and be public.

***Level of approved base tariff*** - The toll, determined based on consideration of total expressway costs – including construction costs, interest payments, operation cost, can be covered by toll receipts within a specified period (on average 30 to 50 years.) . According to the preliminary calculation of tariff to meet full cost recovery<sup>21</sup>, the tariff is to be set at more than 4.3 LE per small vehicle at the beginning of operation<sup>22</sup>.

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<sup>19</sup> RPI denotes Retail Price Index.

<sup>20</sup> Article 16 and 21 of the new law give the Ministry of Civil Aviation to set airport charges. Article 17 empowers the Minister to grant partial or full exemption of fees under conditions yet to be specified. Article 36 gives the Minister freedom to increase tariff rates within a 50 percent limit. Airport pricing decisions are subject to prior consultation with the Higher Council for the Pricing of Services (HCPS) created by Presidential decree.

<sup>21</sup> The maximum network is assumed to be constructed without subsidy by 2022.

<sup>22</sup> This is very preliminary and indicative figure for discussion because traffic demand is constant in the calculation.



However, toll system is always difficult to introduce, and toll increases are almost uniformly subject to political interference, as lessons from Thailand and Mexico imply. As shown in Table A11.3-1, the result of willingness to pay survey shows that people living in Cairo also prefers free of charge to toll fee payment for expressways. In case of 50 % time reduction by toll expressways, 61.0% of respondents don't accept the toll introduction and in case of 25 % time reduction, two third of them refuse to pay toll fee. In contrast, about 30 % accepts to pay for better service.

Table A11.3-1 Results of willingness to survey

25% time reduction case	Number of samples	%	50% time reduction case	Number of samples	%
1 LE/Trip	362	17.7%	1 LE/Trip	409	20.0%
2 LE/Trip	108	5.3%	2 LE/Trip	219	10.7%
3 LE/Trip	33	1.6%	3 LE/Trip	56	2.7%
4 LE/Trip	9	0.4%	4 LE/Trip	19	0.9%
5 LE/Trip	31	1.5%	5 LE/Trip	47	2.3%
> 5 LE/Trip	20	1.0%	> 5 LE/Trip	50	2.4%
Not Willing to Pay	1486	72.5%	Not Willing to Pay	1249	61.0%
<b>Total</b>	<b>2049</b>	<b>100</b>	<b>Total</b>	<b>2049</b>	<b>100</b>

Table A11.3-2 might suggest what the reasonable tariff level is at present if introduced. In, parts highlighted in yellow indicate majority preference of each income level categories and highlights in green represent the second majority for each. 1LE may represent the majority opinions of people living in Cairo, and 2 LE might be acceptable, even if it is not reasonable for the majority. Needless to say, 1LE or 2LE might be socially unacceptable according to willingness to pay survey in the previous section if the government introduces tariff system. As shown in the current implementation schedule, we presume that toll for ring road will be introduced in 2009.

Table 11.3-2 Reasonable payment level for 7 income classes and refusing respondent

25 % time reduction case	1 LE/Trip	2 LE/Trip	3 LE/Trip	4 LE/Trip	5 LE/Trip	> 5 LE/Trip	Total
less than 300 LE	62.5%	12.5%	25.0%				100%
301-500	83.1%	12.3%	1.5%	1.5%	1.5%		100%
501-1000	72.0%	19.0%	4.0%	1.0%	2.0%	2.0%	100%
1001-2000	57.4%	21.3%	10.2%	1.9%	5.6%	3.7%	100%
2001-5000	36.4%	36.4%	7.6%		16.7%	3.0%	100%
more 5000	12.5%	37.5%	8.3%	8.3%	16.7%	16.7%	100%
No Income	37.5%	25.0%	21.9%	3.1%	6.3%	6.3%	100%
Refuse	81.3%	10.0%	0.6%	1.3%	3.1%	3.8%	100%
<b>Total</b>	<b>64.3%</b>	<b>19.2%</b>	<b>5.9%</b>	<b>1.6%</b>	<b>5.5%</b>	<b>3.6%</b>	<b>100.0%</b>

50 % time reduction case	1 LE/Trip	2 LE/Trip	3 LE/Trip	4 LE/Trip	5 LE/Trip	> 5 LE/Trip	Total
less than 300 LE	50.0%	37.5%			6.3%	6.3%	100%
301-500	57.7%	29.5%	7.7%	2.6%	2.6%		100%
501-1000	59.2%	23.1%	7.7%	1.5%	6.2%	2.3%	100%
1001-2000	44.7%	32.2%	6.6%	2.6%	7.2%	6.6%	100%
2001-5000	30.4%	34.8%	8.7%	4.3%	9.8%	12.0%	100%
more 5000	16.1%	22.6%	9.7%	9.7%	12.9%	29.0%	100%
No Income	17.6%	20.6%	23.5%		17.6%	20.6%	100%
Refuse	64.4%	24.3%	4.1%	1.5%	2.2%	3.4%	100%
<b>Total</b>	<b>51.1%</b>	<b>27.4%</b>	<b>7.0%</b>	<b>2.4%</b>	<b>5.9%</b>	<b>6.3%</b>	<b>100.0%</b>

Table A11.3-3 shows estimated toll expressway cost relative to average household income in 2003 and 2009, range from 1 LE to 3 LE might be socially reasonable and acceptable in 2009. After introduction, MEA would install new routes to the network and level of base tariff should be reviewed and adjusted periodically in order to cover additional construction and capital cost cased by new routes construction.

Table A11.3-3 Toll cost per month (LE) and its share of household income (In 2003 and 2009)

Toll fee	Toll expressway cost per month (LE)	Share of estimated average household income as of 2003 (%)	Share of estimated average household income as of 2009 (%)
1 LE	60	14.6%	7.3%
2 LE	120	29.2%	14.5%
3 LE	180	43.8%	21.8%
4 LE	240	58.4%	29.1%
5 LE	300	73.1%	36.3%
6 LE	360	87.7%	43.6%
7 LE	420	102.3%	50.9%

Driving car cost is calculated as the following formula.

$$= (\text{toll fee} * 2 (\text{two ways}) ) * 30 \text{ days}$$

Estimated average household income is 679 LE as of 2003 and the average income as of 2008 is estimated at 786LE with calculation by assuming 5.0 % GDP annual growth.

**Adjustment of inflation**<sup>23</sup> – There are three types of index to be applied to the integrated network of expressways; consumer price index, wholesale price index and a new price basket which covers fare of related transport services in Cairo such as other toll roads, railway, metro, taxi, bus and so on.

According to Figure A11.3-2, inflation was relatively stable ranged from 1 % to 4% before 02/03 when the currency was sharply devaluated. In normal Egyptian business practice, business sector usually assume 5 - 10 % annual inflation for cash flow forecast.

However, local mass-medias and economists point out that the public notices a huge discrepancy between government announcements and prices at the nearest supermarket they discover. It is suggested that price index doesn't reflect the reality. Central Agency for Public Mobilization and Statistics (CAPMAS) conducts study on prices.

<sup>23</sup> More discussion is necessary with Egyptian side.

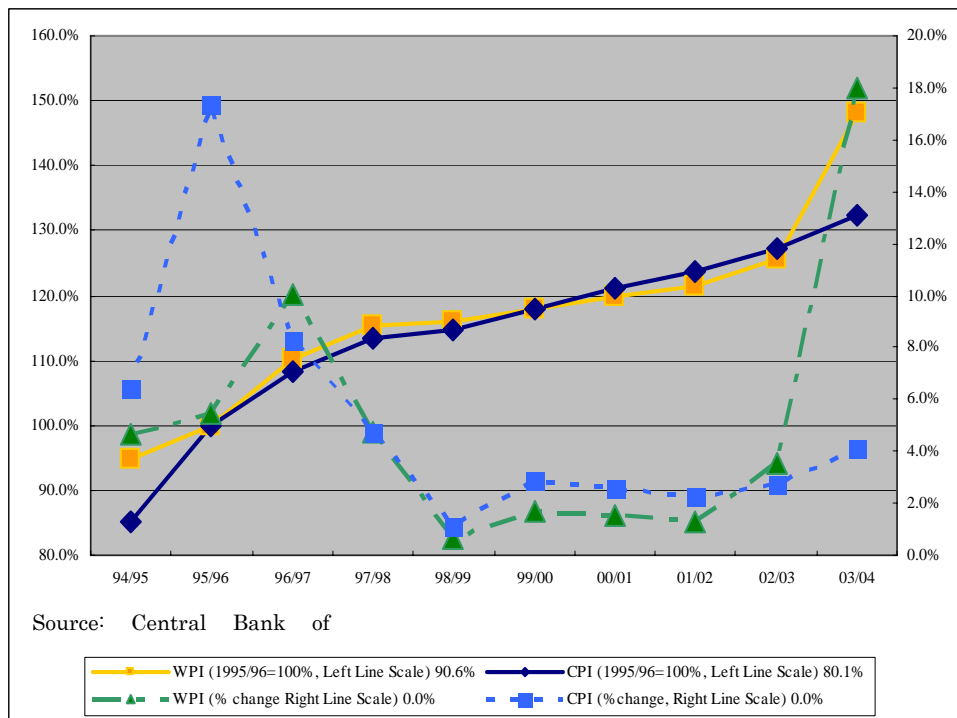


Figure A11.3-2 Whole sale price index and Consumer price index

**Annual productivity enhancement<sup>24</sup>** – Toll fee rate should be adjusted not only to cover price escalation but also to encourage monopolistic MEA to gain efficiency. Incentive regulation was developed to encourage regulated monopolies to function to the greatest degree possible as market-driven entities. This type of regulation has gained particular favor in the UK, where it is being used to regulate a number of privatized utilities.

Incentive regulation allows the regulated entity to realize all gains from efficiencies achieved beyond established targets for a given period. This form of regulation can also be described as performance-based regulation, and it is often referred to as RPI-X. In the RPI-X formula used to set the efficiency target, with "X" representing a productivity factor.

Under RPI-X regulation, MEA is typically subject to a regulatory cycle of three to five years. For each period, a regulator uses the RPI-X formula to set the maximum price the entity can charge in the period. If the regulator expects MEA to improve its efficiency, then the productivity factor, X, will be positive. Conceptually, that means MEA's charges to end-users are expected to increase less than the inflation rate.

If the entity can produce greater efficiency gains in the period than assumed by the X value, it will be able to keep any incremental profit that exceeds the efficiency target. When the regulatory cycle is completed, the regulator conducts a new review and sets new targets for

<sup>24</sup> More discussion is necessary with Egyptian side. While MEA would implement construction of expressways network from 2012 to 2022, MEA would and has to receive massive budget support from GOE. This is the big issue how to design annual productivity enhancement mechanism in line with keeping consistency with budget support.

future productivity gains. The regulator is then able to pass on some of the benefits of the realized efficiency gains to end-users.

RPI-X regulation is less bureaucratic and provides a strong incentive for increasing efficiency. However, there are no magic solutions to the problem of regulating monopolistic expressways operator. No matter which form of regulation is eventually adopted, the natural monopoly characteristics of MEA make the regulatory body's mission critically important. The regulator must actively police and monitor MEA and set incentives that encourage efficiency rather than simply condoning a continuation of the government entity's past practices.

## **APPENDIX 12.1**

### **RESULTS OF FINANCIAL PROJECTION FOR BASE CASE**



## **APPENDIX 12.2**

### **RESULTS OF FINANCIAL PROJECTION FOR REVENUE MAXIMIZE CASE**





## **APPENDIX 12.3**

### **RESULTS OF FINANCIAL PROJECTION FOR PRIORITY CASE**



## **APPENDIX 13.1**

### **CHECKLIST FOR CONCESSION ARRANGEMENTS**

## CHECKLIST FOR CONCESSION ARRANGEMENTS

### Parties to the arrangement

This section covers detailed issues surrounding who grants the concession (the grantor) and how the private sector counterpart (the concessionaire) is constituted.

#### The grantor

- Is the grantor the government, a state-controlled entity, a ministry, a municipality or several municipalities, an association of municipalities, or some other entity? How many of these entities should be parties to the contract? For example, depending on the legislation for the sector, the regulator may need to be a party to the concession contract even if it is not the grantor in order to gain directly enforceable rights against the concessionaire.
- Are the relevant assets or use rights to be transferred under the concession owned by different parties? If so, should two or more parties grant the concession?

#### The authority to grant permission to provide services

To ensure that no disputes would later arise regarding transfer of the assets from the government to the concessionaire, the entities that had transferred the assets to the government—the government and certain municipalities—all needed to be parties to the concession contract, waiving any claims or rights to the assets.

#### The authority of the grantor and the legal basis of the concession

- Does the grantor have the power to grant the concession, enter into the project agreements, and perform its obligations?
- What is the legal basis, statutory or otherwise, for the concession?
- Will the grantor accept responsibility for ensuring passage of necessary laws by the legislature?
- Can the concession be reviewed, overridden, or withdrawn, and if so, what options does the concessionaire have? In many civil law jurisdictions the concession contract is treated as an instrument under administrative law, so the grantor has the right to make unilateral amendments (against compensation where such amendments change the financial balance or equilibrium of the contract).

- What type of entity is granting the concession, and what happens if the entity winds up, becomes insolvent, has a receiver appointed, or is otherwise dissolved?
- Does the legal basis for the concession provide sufficient certainty for the project and security that financing can be raised?
- Is the agreement ambiguous in any way, particularly with respect to performance obligations and tariffs?
- Is there an independent regulator for public services? If so, what powers does the regulator have to affect the terms of the concession? How is independence assured?
- How are powers relating to managing services divided between national and local bodies?

#### The concessionaire

- What type of entity should be used as the concession vehicle—a local company, a partnership, a limited partnership, a joint venture?
- What are the tax and other consequences of the choice of concession vehicle such as for limited liability, management control, minority rights, and foreign exchange?
- What will be the timing for creating the concession vehicle?
- Does the grantor require a guarantor to be party to the concession?
- If a sponsor is not a party to the concession contract, what other forms of sponsor support may be required—comfort letters, undertakings, guarantees, letters of credit, subordinated loans?
- What is the relationship between the concession company and the other parties to the transaction, including the lenders, sponsors, project managers, construction companies, operating companies, insurers, and export credit agencies?
- How will conflicts of interest between sponsors be dealt with? Is a shareholders agreement appropriate?
- Does the agreement fully account for any restrictions on foreign ownership or participation?

#### The object and scope of the agreement

- What are the area and the limits of the concession?
- Will the concessionaire be granted exclusivity? If not, will the grantor undertake to not grant similar licenses or concessions or to prevent third parties from acquiring similar rights during the life of the concession? Will the grantor also undertake to not supply services itself? Will exclusivity lapse after a specified period if services are not provided?
- What services will be provided under the concession?
- Is the concession flexible enough to allow amendment as circumstances change?

- Will the grantor impose restrictions on the concessionaire's ability to build or improve infrastructure that is not part of the project?

#### Service Area

- Can the area be expanded during the lifetime of the concession?
- Is a map of the area annexed to the agreement?
- How will the infrastructure interface and interconnect with other road systems?
- Will road services be provided by different entities?
- What is the interface with other entities providing their own services?
- What are the rights and obligations of customers?

#### Duration of the concession and early termination

- Is the duration long enough to make the project "bankable"—that is, to allow repayment of loans from the revenue stream from customers?
- Can the grantor change the duration of the contract? In particular, can the contract be extended, and if so, how? If the contract is extended, can the public authority amend it?
- Under what conditions may early termination occur? How will compensation be determined in the event of early termination (for fault and without fault)?
- Does the concession period include construction time? If not, what happens if there are delays in construction?
- Is the duration contingent on certain events?
- What conditions apply upon expiry and will they be set out in the concession or imposed later?
- What factors would allow the grantor to extend the concession? Typical ones are force majeure events, political risk events (disruption of construction, strikes), delays caused by the grantor during construction or operation, and operating problems that are not under the control of the concessionaire and are not force majeure events (lack of appropriate materials and supplies).

#### Obligations of the concessionaire

- A concession typically contains many detailed requirements on the services to be provided, generally set out in an annex to the contract.

To monitor the concessionaire's performance in meeting these requirements, the grantor may wish to have some or all of the following rights:

- The right of access to the site and equipment.
- Supervisory control to regulate further investment and capital expenditure.

- The right to approve subcontracting for financing, construction, and operation.
- The right to approve all replacements, cancellations, and modifications of insurance policies and guarantees.

In defining such rights, a careful balance needs to be struck between conferring on the grantor the ability to monitor and enforce the spirit of the concession in the interest of consumers and ensuring that the concessionaire has the scope and incentives to deliver services efficiently, without undue interference.

#### Tolling Users

- Who is responsible for collecting tolls?
- How will nonpayment be dealt with?
- What authority will the contractor have to collect delinquent payments and enforce user sanctions?
- What regulations cover reconnection for delinquent users who have paid their debts to the utility? How will the government monitor compliance?

#### Capital investment

- Who will decide on investments in maintenance, repair, and upgrading of the system and in new infrastructure, and who will be responsible for carrying them out?
- Who is responsible for planning, coordination, supervision, and implementation of capital expenditure?
- What formulas will be used for asset depreciation to ensure that the concessionaire is adequately compensated at the end of the concession?
- What are the procurement procedures for new investment?
- Is competitive tendering required for works?
- What are the obligations and responsibilities relating to capital expenditure for major networks?
- Who is responsible for meeting requests from other government agencies for provision of networks?
- How will new construction be financed—from retained earnings from tolls, by direct government grants, by the operator, or from a combination of sources?
- If the government pays for new construction, how will it disburse the funds? Will it reimburse the operator upon presentation of invoices or advance it funds? Who will monitor the construction? Will the monitoring agent approve invoices before payment?

### Debt and equity

- How much equity should be contributed to the project vehicle to ensure that lenders will provide finance? May equity be contributed in kind?
- What shares of equity will the parties contribute and when?
- Is the equity sufficient to meet any required debt-equity ratios?
- What debt on the existing facilities will be assumed by the concessionaire?
- Will the shareholder agreement require the parties to retain their shares for a minimum period, such as until construction is completed?
- How will toll revenues be distributed? Will different classes of debt and equity have different priority for receiving revenue distributions?

### Technical specifications

- What quality of materials will be used?
- What safeguards will the private contractor have against changes in specifications?

Where possible, attention should be focused on specifying output, not inputs—that is, specifying the performance expected, not how to achieve it.

### Lenders' rights in concession contracts

Concession (and BOT) contracts are often developed without a good understanding of lenders' requirements. Even though lenders often provide more capital for road projects than the private sector participant, their interests are seldom considered until after the contract is awarded and its terms and conditions negotiated with the concessionaire. The result can be significant delays in financial closing, as lenders often require substantial changes in the concession contract to protect their interests.

To ensure that they have a secure interest in the project assets and that the concession contract allows them to attach or control this security, lenders will require that the contract include clauses that clearly define the concessionaire's ability to assign them project assets (toll revenues, property mortgages, leases). In some cases the lenders may require the right to approve a transfer or sale of shares in the concessionaire, although this right is covered in the shareholders agreement and is not necessarily included in the concession contract.

Lenders will also review the clauses in the concession contract that affect the project's ability to generate toll revenues. As a first step, they will ensure that the facility that generates the toll revenues is built on time and within budget and is operated properly, usually by appointing an independent engineer to review construction progress and operating efficiency. Lenders may also be given the right to request changes in the concessionaire's contractors, including its



operating contractor. This usually occurs when, in the lender's opinion, the contractor cannot comply with the terms of the contract and the noncompliance will substantially increase the project's cost.

The lenders will also want to ensure that the toll collection and adjustment mechanism protects their interest in toll revenues. They will carefully review the contract clauses on the regulatory procedures for toll collection and adjustment, especially the conditions that allow special adjustments, such as a change in environmental law or a significant shift in macroeconomic conditions.

The concession contract must also address default situations, such as when the borrower is unable to make a loan payment on time or declares bankruptcy. The contract should allow the lender to step in and assume control of the concession until the default is remedied or the lender appoints a substitute concessionaire. The concession contract should allow the substitute concessionaire to enter into the same contract. That gives the lender control of the concession—and the ability to improve management, company profitability, and thus the chances of loan repayment.

#### Performance monitoring

Concessions generally specify broad performance targets and a toll rule and then rely on incentives to compel the concessionaire to find the most efficient way—through technological and commercial innovation—of meeting the performance targets. Their central aim is to pass to the concessionaire the responsibility for working out how best to meet customer service objectives. The monitoring of a concession should therefore focus on the concessionaire's success in meeting the targets specified in the concession rather than on how it meets those targets. Whether realistic performance targets can be established will depend on the quality of information available about the system at the time the concessionaire takes it over. And whether the concessionaire's achievement of the targets can be adequately monitored will depend on the creation of a regulatory agency with real monitoring capacity and on the contractual requirements for reporting and monitoring.

#### Requirements for provision of information to grantor

- Will the concessionaire provide information as may be reasonably required by the regulator or grantor? What is the definition of reasonable?
- What are the mechanisms for independent verification of financial data, data on the condition of assets, and the achievement of performance targets?
- What is the goal of contract information requirements?
- What access will the grantor—or agent of the grantor—have to assets and records?

- Who will pay for independent financial auditors and technical auditors (reporters), and who will be responsible for their selection and training?
- What are the requirements for publication of financial information and performance standards?
- What reports will be used to verify the toll rate?
- Will the regulator require audits by an independent auditor?
- What technical information will the concessionaire be required to report?
- What financial information will the concessionaire be required to report?

#### Transfer of assets

- Who has good legal title to the assets to be transferred?
- What assets will be included in the concession? Are they sufficient to enable the concessionaire to provide the required services?
- Will the infrastructure and operating assets be split between different entities?
- To what extent can the assets be replaced, disposed of, and encumbered during the life of the concession? Can lenders be granted first-ranking security?
- Will the grantor enter into direct agreements with the lenders for remedies in the event of termination?
- Can security be created over the concession itself?
- How will transfer of the assets at the expiry of the agreement be handled?
- How will the value of assets, tangible and intangible, be determined?
- Can the concessionaire use the assets as security in a sale-leaseback or other lease financing structure?
- Can security be created over the insurance policy and insurance proceeds?
- Will the condition of the assets be assessed before the parties enter into the concession contract?
- If renovation and improvement (as opposed to maintenance in present condition) is required, will there be an asset management plan?
- Will the concessionaire be allowed to dispose of redundant assets? Will approval be required for the allocation of the sales proceeds?

#### Jurisdiction for dispute resolution

- Are the judgments of the chosen forum enforceable against all the parties?
- What is the appropriate method for resolving disputes-arbitration, court proceedings, appointment of experts, or alternative dispute resolution?
- If arbitration is chosen, which international rules should apply-those proposed by the International Center for Settlement of Investment Disputes (ICSID), the International

Chamber of Commerce (ICC), or the United Nations Commission on International Trade Law (UNCITRAL), or other rules?

- Are all the parties from countries that are signatories of the New York Convention on the Enforcement of Arbitral Awards, which provides for reciprocal enforcement of international arbitration awards?
- What are the local legal provisions in the countries in which the parties are resident regarding enforcement of such awards?

#### Governing law

- What are the advantages and disadvantages of the choice of law?
- Is the governing law other than the law of the country in which the dispute resolution proceedings are taking place recognized in the proceedings?

#### Provision of insurance

- Is there a transparent structure of local primary insurance, and is there access to the global markets for reinsurance?
- Who will be responsible for insurance, and what form should it take?
- What risks can be insured against?
- Who will be the loss payee?
- Who will be named on the insurance policy?
- Can environmental risks be insured against?
- To what extent can insurance policies be assigned?
- What types of insurance coverage will the contractor be required to carry—for example, workers compensation, comprehensive general liability, and automobile liability? What is the minimum coverage?

#### Force majeure provisions

- What events will trigger the force majeure provisions?
- Does the force majeure clause include political and labor risks, natural events, and operational risks?
- What events of force majeure may be under the control of the government? Will the public authority accept responsibility for such events?
- Does the force majeure clause include changes in the law that will affect the project?
- Does this clause deal with the consequences of force majeure, the parties' notification obligations relating to an event of force majeure, and provisions for mitigating the effects of force majeure?

### Termination provisions

- What are the termination rights of each party?
- To what extent can the contract be terminated in the initial stages?
- What are the provisions for compensation for early termination, and what are the limits to such compensation? How would this compensation be granted?
- In what circumstances would there be no compensation?
- How will the assets be transferred on termination?
- Does the agreement terminate on the termination of other agreements?
- Are there provisions enabling the grantor to intervene and run the project itself?
- What rights would the grantor acquire in relation to other contracts in cases of forfeiture?

### Sovereign immunity

- If the contract is to be granted by a government entity, will that entity waive its right to sovereign immunity, enabling the contractor to bring the grantor before the courts to enforce the rights and obligations under the agreement?

### Assignability

- Will lenders be given step-in rights in relation to the agreement?

### Miscellaneous provisions

- Will the contract include provisions regarding notices, invalidity, confidentiality, amendment, waiver, language, counterparts, and the entire agreement?

### Signer of the agreement

- Will the agreement be signed by authorized signatories of the parties?
- Where necessary, has the agreement been witnessed in the appropriate manner? Is notarization necessary?
- Does the agreement need to be registered?

## **APPENDIX 13.2**

### **CAIRO EXPRESSWAY WORK SHARING BETWEEN PUBLIC AND PRIVATE**

## CAIRO EXPRESSWAY WORK SHARING BETWEEN PUBLIC AND PRIVATE

CAB:Cabinet, MOT: Ministry of Transportation, Ministry of Planning: MOP, MOF: Ministry of Finance, MOI: Ministry of Interior including traffic police  
MOE: Ministry of Environment, MOHURC: Ministry of Housing, Utilities and Urban Communities, MOH: Ministry of Health, 3G:Three Governorates,  
MEA: Metropolitan Expressway Authority, CAO: Central Audit Organization, "Private" included public corporation and holding company owned by

Works			Responsibility sharing			Remarks
Top	Sub Category	No	Government	ME	Prv	
Establishing foundation for the integrated network of expressways in Cairo	Government approval to implement the integrated network of expressways in Cairo	1	MOT **			* MOT should increase awareness and understanding from MOHURC, MOI and three governorates in advance.
	Increase public awareness	2	MOT **			* Public awareness campaign including several stakeholders meeting must be necessary in advance of introduction of toll system with strong MOT initiative under mutual endorsement of the cabinet. * MOT should coordinate and get cooperation with mass media.
	Passage of MEA law [Decree]	3	MOT **			* Necessary and enough consultation should be taken place with stakeholders, with strong MOT initiative under mutual endorsement of the cabinet . * The MEA law is to create a single independent entity with necessary power and functions, by transferring power and functions, which has been delegated to MOT, MOHURC and three governorates.
	An amendment of existing public road law	4	MOT **			* [Decree on Public Road, Article 9] Toll system, including a level of toll, payment system, a principle and method to set up a toll level, and categories for a toll.
	Introduction of a toll	5	MOT **			* MOT needs to take a necessary measures for introducing a toll, including legislative, institutional, and financial matters.
	Establishment of MEA	6	MOT **			* MOT needs to take a necessary measures for establishing MEA, including legislative, institutional, and financial matters.
Common issues	Road network development excluding expressways in Greater Cairo	7	MOT MOP 3G **			* Success of Cairo urban expressway substantially depends on the integration with other existing road network consisting of urban primary arterial streets, urban secondary arterial streets, collectors/distributor streets and local streets. * Road improvements in and near the expressway corridor can impact substantially on its traffic. * If outer ring road is separated from Cairo urban expressway, integration with the competing outer ring road is important factor on revenue in terms of physical integration and tariff integration.
	Cairo urban expressway network development	8		**		* For smooth and efficient implementation, MEA should be responsible for initiating and implementing Cairo urban expressway network development with consultation with MOT, MOHURC, three governorates, MOI, MOP and MOF. * In the process of execution, institutional conflict may create great problem and waste of time, if several governmental organizations compete and neglect effective coordination. * No evidence that private groups developed strategic networks.
	Environmental regulation and monitoring	9	MOE **			* Regulating and monitoring environmental issues remain in MOE. * Noise, visual obstruction, emission, pollution, land acquisition and relocation might be major environmental issues for expressway projects.

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Works			Responsibility sharing			Remarks
Top	Sub Category	No	Government	ME	Prv	
Common issues	Executing environmental protection and meeting the regulation	10		*	**	* MEA, private concessionaire, and private contractors are required to comply with environmental regulation. * Effective monitoring implementation and penalty system are vital to enforce expressway operators.
	Traffic rule enforcement	11	MOI	**		
	Vehicle licensing	12	MOI	**		* Separate inappropriate cars which want to enter on the expressways might need collaboration with vehicle licensing. [Proper vehicle licensing may enable to exclude inappropriate cars from expressway. ]
	Contract with private sector and monitor its performance	13			**	* All contracts will be controlled by MEA to monitor private sector's performance.
	Auditing	14	CAO	**	**	*

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Works			Responsibility sharing			Remarks
Top	Sub Category	No	Government	ME	Prv	
Design and Construction	Feasibility study	15	MOT **	**		* Feasibility study for prioritised routes should be started as early as possible by MOT, with aiming at the earliest realization of the network to respond to an expected sharp traffic demand growth in future. * After the establishment of MEA, MEA should be responsible for
	Identify projects and package tender documents	16		**		
	Selecting a company for detailed design	17		**		* Consultants for detailed design would be separately selected section by section in line with the stage of network development.
	Detail design	18			**	* Although detailed design works might be tendered separately from construction works and operation in early stage, MEA should gradually integrate design, construction, and operation into one contract package. * Packaging design, construction, and operation enables more efficient operation and less cost.
	EIA	19	MOT **			* Environment Impact Assessment (EIA) would be conducted in line with feasibility study. * The environmental law states that an implementing agency for the project should execute EIA.
	Financing	20	MOF MOT *	**	*	* Cross subsidy would be used by MEA to form the integrated expressways network in Cairo. * MOF is responsible for subsidy for interest payment of MEA if it is necessary to keep MEA's financial health. * MOT is responsible for subsidy for construction if necessary, for example quick implementation is required or promotion of PPP. * Private sector is expected to finance initial cost and a part of construction cost if MEA employs PPP to some routes.
	Land acquisition of right of way	21		**		* MEA should be responsible for the function of land acquisition for efficient implementation.
	Construction management	22		*	**	* At an early stage, MEA will conduct construction management in order to accumulate experience in managing. * After PPP starts, construction management should be done by private sector.
	Construction work and its supervision	23		*	**	
Confirmation of construction completion	24		**		* MEA as an owner of expressway should be responsible for construction completion.	



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Works			Responsibility sharing			Remarks	
Top	Sub Category	No	Government	ME	Prv		
Operation	Patrolling	24		**		* Regular patrol is desirable to be uniformly done by MEA for efficient operation at a low cost.	
	Emergency traffic control	25	MOI	**		* With purpose of smooth moving for the President and national guest, traffic police must be responsible for traffic control. * To define events and situation that need emergency traffic control by traffic police.	
	Separation of inappropriate cars	26		** ?	** *	* Broken car stopping would increase danger on expressways and slow down traffic flow, in the worst case it might cause traffic accidents. * To discuss the definition of "inappropriate vehicles" that has higher probability of mechanical trouble on the expressways. Car inspection system might contribute to separation work of inappropriate vehicles. * Is it possible to refuse inappropriate cars entrance and preventing from continuous entry without paying?	
	24 hours emergency response	27			**	* It is better to be uniformly done by MEA for efficient and less costly operation.	
	Site inspection of traffic accident	28	MOI	**		* Site inspection and record of the cause of the accident are conducted by traffic police.	
	Clearance of accident vehicles and cleaning of expressways	29			** ?	**	* Cleaning of road surface and removal of accident vehicles in the network are uniformly done by MEA. * There are two PPP possibilities in later stage; one is separation of this function from MEA in order to create a new subsidiary company or privatize it, the other is to transfer this function to private sector's hand through outsourcing and so on. * Damaged expressway asset should be compensated by a person who caused an accident, insurance system might be required because compensation cost is extremely high.
	Emergency care services	30	MOH	**			* MEA asks for MOHURC to provide emergency care services on the expressways with number of dispatch basis payment.
	Supporting broken cars	31			**	?	* It is recommended that MEA uniformly provide services for efficient and less costly operation. * In principle, car owners is prohibited to repair cars on the expressways, causing traffic jam. * Users who receive service are required to pay to MEA.
	Power supply management	32			**		* MEA buys uniformly electricity from the state owned electricity company. * MEA should build emergency power supply facility to keep core operation of MEA's function.
	Toll collection	33			*	**	* At an early stage, although MEA might conduct in- house toll collection to accumulate experience and know-how to manage the private sector, the function of toll collection will be transferred to the private sector from the middle stage. * However, vehicles that pass toll gates should be counted by equipments by MEA to help recording correct toll revenues and reconciling with the private sector.

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MEA: Metropolitan Expressway Authority, CAO: Central Audit Organization, "Private" included public corporation and holding company owned by

Works			Responsibility sharing			Remarks
Top	Sub Category	No	Government	ME	Prv	
Operation	Traffic data collection	34		**		* MEA will collect data of the network for traffic information for users uniformly in an efficient and less costly way. * Counting traffic volume by vehicle detector is included in traffic data collection.
	Traffic data processing	35		**		* MEA will process traffic data of the network uniformly for efficient and less costly operation.
	Providing traffic information to users	36		**		* MEA will provide traffic information of the network uniformly for efficient and less costly operation.
Maintenance and Upgrading	Road inspection	37		*	**	* After PPP starts, it should be done by the private sector. * At an early stage, MEA may need to do road inspection because results of road inspection are the basis to formulate a maintenance plan and manage contracts with the private sector.
	Cleaning	38			**	* Private sector will conduct cleaning based on a contract with MEA.
	Planting	39			**	* Private sector will maintain plants based on a contract with MEA.
	Road lighting	40		**		* MEA will provide maintenance of road lighting of the network uniformly for efficient and less costly operation.
	Paving and lining	41			**	* Private sector will conduct paving and lining based on a contract with MEA.
	Maintenance management	42		*	**	* At the early stage, MEA will have maintenance management in order to accumulate experience in managing directly. * After PPP starts, maintenance management should be done by the private sector.
	Maintenance works	42			**	* Private sector would work on cleaning based on contract with MEA.
	Rehabilitation management	43		*	**	* At the early stage, MEA will do rehabilitation management in order to accumulate experience in managing directly. * After PPP starts, rehabilitation management should be done by private sector.
	Rehabilitation works	44			**	* Private sector will work on rehabilitation based on a contract with MEA.
	Upgrading planning	45		**		* MEA will plan upgrading.
	Upgrading works	46			**	* Private sector will conduct physical upgrading based on a contract with MEA.
	Upgrading tariff collection system	47		**		* MEA will be responsible for upgrade standardized tolling equipment and toll system which result in an integrated expressway network.
Upgrading traffic information system	48		**		* MEA will upgrade traffic information of the network for efficient and less costly operation.	

## **APPENDIX 13.3**

### **RISK MATRIX OF PPP IMPLEMENTATION FOR CAIRO URBAN EXPRESSWAY**

## Risk Matrix of PPP implementation for Cairo Urban Expressway

GOE: Government of Egypt, MOT: Ministry of Transportation, MOP: Ministry of Planning, MOF: Ministry of Finance, MOI: Ministry of Inertia including traffic police, MOE: Ministry of Environment, MOHURC: Ministry of Housing, Utilities and Urban Communities, MOH: Ministry of Health, 3G: Three Governorates, MEA: Metropolitan Expressway Authority, CAA: Central Audit Agency, CBE: Central bank of Egypt, Private: private entities and holding companies owned by GOE will participate in PPP projects regarding the integrated network of expressways in Cairo, RU: Road users

		What steps can mitigate/minimize the risk?			Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private	
<b>Political and Legislative Risks</b>							
The Ministerial Committee for Greater Cairo Region Transport is not formed or the decision is delayed	1	* MOT will initiate the formation of MCGCRT and coordinate with other ministries.	MOT	O MOT			
New Organization, MEA, for expressway management is not established or the decision is delayed	2	* MOT will initiate the establishment of MEA.	MOT	O MOT			
Deterioration of regional political stability and security	1	* The private sector will be entitled to terminate the contract if the government defaults. The government will pay compensation to the private sector.	GOE	O			
Breach or cancellation of the contract	2	* The private sector will be entitled to terminate the contract if the government defaults. The government will pay compensation to the private sector.	GOE	O			
Expropriation	3	* Compensation from GOE	GOE	O			
Strengthening the environmental policy and regulations	4	* Compensation from MOE/MEA	MOE	O MOE	O		
Changes of related laws (Public road laws and BOT laws) and strengthening related regulations	5	* Compensation from MOT	MOT	O MOT	O		
Changes of general business laws (including taxation policy, accounting rules) and regulations	6		-			MEA => Private	
Slow and delay in decision making, licensing and approvals by the government	7	* Depending on the approvals required, MOT or MEA will provide compensation.	MOT or MEA	O MOT	O		
Cancel licensing and approvals given by the government	8	* Depending on the approvals required, MOT or MEA will provide compensation.	MOT or MEA	O MOT	O		
Coordination failure between MEA and the government	9	* Clear and simple allocation of power and role in the government with simple coordination process * Delegating enough power and function to MEA * The above issues are secured by the passage of the MEA law or the amendment of public road law * MOT as a main shareholder will support MEA to coordinate with the government.	MOT	O MOT	O		
Government inability to meet its contractual obligations	10	* GOE commits to provide necessary guarantee in order to compensate default of the contractual obligations.	GOE	O			
Conflicts between jurisdictions	11	* Making a standard contract for PPP expressway project and define a governing law. * Setting public hearing process on contract draft with private sector in bidding process	MEA GOE			Shared between MEA and Private	

		What steps can mitigate/minimize the risk?			Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private	
<b>Economic and Financial Risk</b>							
<b>Currency nonconvertibility / nontransferability</b>	12	* Private sector is given hard currency exchange privilege for effective operation. * CBE will provide foreign currency availability commitment to private sector. * The above two points should be secured by law (Which law?).	GOE CBE	O			
<b>Capital transaction restriction</b>	13	* Private sector is free from capital transaction restriction for effective operation * The above point should be secured by law (Which law?).	GOE	O			
<b>Exchange rate risks (devaluation of local currency, fluctuation of foreign currencies)</b>	14	* Include security package hedging facilities against exchange rate risks, such as currency swaps, options	MEA Private		Shared between MEA and Private		
<b>Construction cost movement due to currency fluctuation</b>	15	* MEA pays for a large number of additional cost due to currency fluctuation. * A small amount should be imposed on private sector to bring out private sector's incentive to minimize the risk.	MEA		Shared between MEA and Private		
<b>Imported operational equipment and material cost movement due to currency fluctuation</b>	16	* The above will be stipulated in contracts.	MEA		Shared between MEA and Private		
<b>Finance cost increase due to currency fluctuation</b>	17	* MEA prioritizes local currency financing rather than foreign currency financing. * MEA pays for small amount of loss due to currency fluctuation, which incentives private sector to seek for the local. * The above will be stipulated in contracts. * Utilization insurance or guarantee from multilateral or bilateral institutions.	MEA		Shared between MEA and Private		
<b>Interest rate fluctuation</b>	18	* Introduce fixed rate loan and/or interest rate swaps to mitigate interest rate fluctuation.	MEA Private		Shared between MEA and Private		
<b>Construction cost increase due to Inflation</b>	19	* Automatic tariff adjustment mechanism is introduced and additionally stipulated in the public road law. * The mechanism enable tariff to contain inflation.	MEA		MEA=> Private		
<b>Operation and maintenance cost increase due to Inflation</b>	20	* Automatic tariff adjustment mechanism is introduced and additionally stipulated in the public road law. * The mechanism enable tariff to contain inflation.	MEA		MEA=> Private		
<b>Inability of refinance</b>	21	* MEA/Private sector will develop capacity to analyze and acquire appropriate funding source matching with the project cashflow.	MEA Private		MEA=> Private		
<b>Credibility of accounting information on local companies and banks</b>	22	* Audit will be required for the project implementing agency.	MEA => Private		MEA=> Private		
<b>Force majeure (Natural disasters, political embargos, riot, wars, invasions and civil disturbance)</b>	23	* MOF would provide budget support to MEA to compensate for private sector if it happens. * MEA will reserve funds.	MOF MEA	O			
<b>Insolvency of private participants, contractors, or members of consortium</b>	24	* MEA carefully examines financial positions of bidders in PPF bidding stage. * Substitution clause is necessary.	MEA		O	O	

		What steps can mitigate/minimize the risk?	Main Risk Taker			
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
<b>Design Risk</b>						
<b>Faults in tender specification</b>	25	* Require MEA to provide a remedy or compensate the project company.	MEA		O	
<b>Innovation</b>	26	* Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender in order to encourage private sectors to apply their advanced know-how and innovative skills.	MEA			O
<b>Design contractor fault</b>	27	* Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender. * Include provisions in the design contract requiring the (private) contractor to provide a remedy or pay damages (of insurance to	MEA => Private			MEA => Private
<b>Design change due to Government</b>	28	* GOE endorses the integrated network of expressways in Cairo in advance of starting implementation. * MEA has periodical consultation with GOE to keep them to be informed. * If GOE asks for a design contractor to change design, GOE must provide subsidy to cover the increase in cost to a design contractor.	GOE MEA	O		
<b>Increased construction or maintenance costs due to design</b>	29	* MEA sets common design standard for all expressways in the network. * When MEA selects a contractor, design work and construction work will be tendered as one package.	MEA			MEA => Private
<b>Incorrect geotechnical assumptions at design stage</b>	30	* MEA will provide all necessary information on geotechnical data. * In order to support design work, MEA would take permission from the prime minister office if digging is necessary. * In order to support design work, MEA will coordinate with concerned organizations, who supervise water line, telephone line, electricity line, subway and railroad	MEA			MEA => Private
<b>Failure of designer</b>	31	* Putting penalty clause in contract * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender.	MEA			MEA => Private
<b>Delay in approval procedure (including EIA) leads to increasing costs</b>	32	* Over half a year delay(what duration is appropriate?), MEA would provide compensation.	MEA			Shared between MEA and Private
<b>Land Acquisition Risk</b>						
<b>Delay in land acquisition (lawful used land)</b>	33	* Adequate consultations with settlers from the early stage * Timely budget allocation * Land acquisition is proceed to comply with Law No.10, 1999.	MEA		O	
<b>Delay in resettlement (lawful used land)</b>	34	* Adequate consultations with settlers from the early stage * Timely budget allocation * Land acquisition is proceed to comply with Law No.10, 1999.	MEA		O	
<b>Delay in land acquisition (unlawful used land)</b>	35	* Adequate consultations with settlers from the early stage * Timely budget allocation * Land acquisition is proceed to comply with Law No.10, 1999.	MEA		O	
<b>Delay in resettlement (unlawful used land)</b>	36	* Adequate consultations with settlers from the early stage * Timely budget allocation * Land acquisition is proceed to comply with Law No.10, 1999.	MEA		O	
<b>Claims and protest from settlers due to land acquisition</b>	37	* Adequate consultations with settlers from the early stage * Enough compensation * MEA law does not allow MEA starting construction without completion of land acquisition and resettlement.	MEA		O	

		What steps can mitigate/minimize the risk?		Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
<b>Construction Risk</b>						
<b>Completion risk with regard to not meeting specifications and design requirements</b>	38	* Fixed amount contract for construction work with good record company * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender.	MEA			MEA => Private
<b>Completion risk with regard to delay of construction</b>	39	* Turnkey contract for construction work with good record company * Require liquidated damages from the turnkey contractor under the construction contract (sufficient to cover interest due to lenders and fixed operating costs). * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender.	MEA			MEA => Private
<b>Cost increase due to contractor failure</b>	40	* MEA will provide for cost overrun in fixed lump sum price in the construction contract with good record company * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender. * Contractor can include early warning clause in the contract.	MEA => Private			MEA => Private
<b>Cost increase due to government failures or orders</b>	41	* MOT pays for the increase. * Contract says the MOT obligation to pay for the increase.	MOT	O		
<b>Cost increase due to third party</b>	42	* MEA pays for the increase. * Contract says the MEA obligation to pay for the increase.	MEA			MEA=> Shared between MEA and Private
<b>Cost increase due to force majeure</b>	43	* MOF pays for the increase. * Contract says the MOF obligation to pay for the increase. * MOF will reserve appropriate funds for force majeure.	MOF	O		
<b>Cost increase due to changes in safety requirements</b>	44	* MOT will be responsible for requirements setting, but MEA pays for the increase. * Contract says the MEA obligation to pay for the increase. * MEA will be required to reserve funds.	MOT	O MOT	O	
<b>Cost increase due to change in environmental regulation</b>	45	* MOE will be responsible for regulation setting, but MEA pays for the increase. * Contract says the MEA obligation to pay for the increase.	MOE	O MOE	O	
<b>Problems with quality of labor, materials, and road to meet performance criteria</b>	46	* Require liquidated damages payable by the private construction consortium, supplemented by insurance.	MEA => Private			MEA => Private
<b>Problems with sub contractor</b>	47	* Use own business relation, due diligence skill and conducting market survey.	MEA => Private			MEA => Private
<b>Import of equipment and materials for construction is not allowed</b>	48	* Law allows private sector to import necessary for construction of the network. (Which law?, Which ministry?) * MEA will carefully examine the availability of necessary equipment and material before it fixes tender documents.	GOE MEA	O	O	
<b>Defect liabilities</b>	49	* Fixed amount contract for construction work with good record company * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender.	MEA			MEA => Private

		What steps can mitigate/minimize the risk?		Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
Adverse weather condition	50	* MEA pays for some extent of cost increase due to adverse weather condition. * Contract should say the above.	MEA		Shared between MEA and Private	
Labor problems	51	* Good relationship with employees.	MEA => Private		MEA => Private	
Death or injuries on site	52	* Private sector insures workers accident insurance. * The above should be stated in contract.	MEA => Private		MEA => Private	
Interference from third parties e.g., protesters and NGOs	53	* MEA conducts public awareness campaign, implement land acquisition in good manner and enforce itself and private sector to meet environmental requirements. * MEA represents to handle this issue if it occurs.	MEA			MEA
Unforeseen ground conditions	54	* Before construction, MEA carefully examines ground conditions and supervise design work to avoid the risk.	MEA			MEA
Traffic diversion problems (congestion, deter etc.)	55		-			RU
Negative environmental impacts due to construction works	56	* Public awareness activities should be conducted by MEA. * In order to enforce private contractor to follow environmental regulations, penalty clause in case of contractor failure is put into contract. * Invading privacy around the network, noise and visual obstruction are possible negative impacts.	MEA		MEA => Private	
<b>Traffic Demand and Revenue Risk</b>						
Traffic volume is lower than expected	57	* Risk depends on extent of government support. Use of shadow toll, or minimum guarantee leaves the demand risk to the Government. * Identify scope of free users in advance as most of government related persons don't pay for toll at present. * Accurate assessment is required on how users will react both to the presence of a new piece of road and to the application of a toll.	MEA	Shared among MOT, MEA and Private		
Failure of introducing toll system	58	* MOT conducts public awareness campaign to get understanding from the public under strong commitment cabinet commitment. * MOT chooses reasonable tariff level and tariff system at the beginning.	MOT	O MOT		
Toll increases do not happen	59	* MOT conducts public awareness campaign to get understanding from the public under strong commitment cabinet commitment. * Tariff increase is in line with service level up such as installation of new routes. * Privileged tariff is applied to shared bus to favor low income	MOT MEA	O MOT		
Adversary affect of toll increase on traffic demand	60	* Risk depends on extent of government support. Use of shadow toll, or minimum guarantee leaves the demand risk to the Government. * Absorbing adverse effect by employing cross subsidy system	MOT MEA	Shared among MOT, MEA and Private		
Strengthening environmental regulations deter traffic	61	* Absorbing adverse effect by employing cross subsidy system	MEA	Shared among MOT, MEA and Private		



		What steps can mitigate/minimize the risk?		Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
<b>Failure in construction of planned routes in Cairo urban expressway network</b>	62	* MEA carefully manage overall schedule, procedure, contractors and so on. * Absorbing the loss by employing cross subsidy system	MEA		O	
<b>Failure to improve local road access deters traffic</b>	63	* MEA coordinate closely with MOHURC and three governorates. * Absorbing losing expected revenue by employing cross subsidy system	MOT MEA	O MOT		
<b>Improvements in other competing roads reduce traffic</b>	64	* Absorbing adverse effect by employing cross subsidy system	MOT MEA	O MOT		
<b>Improvements in competing modes reduces traffic</b>	65	* MEA carefully assess effect from other transportation development in Cairo. * If necessary, MEA changes priority of routes. * Absorbing adverse effect by employing cross subsidy system	MOT MEA	O MOT		
<b>Change of network development plan</b>	66	* Absorbing adverse effect by employing cross subsidy system	MOT MEA	O MOT		
<b>Government increase taxes, duties of vehicles use</b>	67	* Absorbing adverse effect by employing cross subsidy system	MEA			MEA => Private
<b>Loss of expected revenue due to free of charge for specific road users such as military officials</b>	68	* All users should be imposed to use expressways. * Law or regulation enforce the imposition. * Toll collection should be outsourced to private sector, which doesn't have conflict of interest with military and police.	MOT MEA	O		
<b>Increase in fuel price deters traffic</b>	69	* Absorbing adverse effect by employing cross subsidy system	MEA			MEA => Private
<b>Nonpayment by expressway users</b>	70	* To register and report dishonest nonpayment users to police and penalize them with cooperation from traffic police * Refusing dishonest nonpayment users entering the expressways with effective law enforcement * Performance based payment might be put into contract with private sector in charge of toll collection to minimize nonpayment.	MEA => Private			MEA => Private
<b>Pilferage by toll staff</b>	71	* MEA installs automatic vehicle counting machine and providing with data on vehicle numbers. * Revenue for private sector in charge of toll collection reflects the vehicle numbers by MEA.	MEA			MEA => Private
<b>Illegal payments to toll staff deters expected revenue</b>	72	* MEA installs automatic vehicle counting machine and providing with data on vehicle numbers. * Revenue for private sector in charge of toll collection reflects the vehicle numbers by MEA.	MEA			MEA => Private
<b>Decrease in revenue due to macro external factors such as deterioration of regional political stability and economic crisis</b>	73	* Absorbing adverse effect by employing cross subsidy system	MEA			Shared among MOT, MEA and Private
<b>Start other businesses</b>	74	* Regulate MEA's rights and responsibilities at the beginning of the project and require MOT/GOE's consent for MEA to start other businesses.	MOT		O	
<b>Suspension of operation ordered by GOE</b>	75	* MOF supports MEA to compensates for rational costs and claim damage requested by private sector.	MOF	O		

		What steps can mitigate/minimize the risk?		Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
<b>Operation and Maintenance Risk</b>						
Labor cost increase	76	* Strengthening automation system to reduce labor work.	MEA => Private			MEA => Private
Operation cost increase	77	* Entity in charge on concerned operation pays for cost increase * Linking and consolidating design, construction and operation as much as possible as one package when MEA consider to tender.	MEA => Private			MEA => Private
Import cost increase (excluding exchange rate change)	78	* Entity in charge on concerned operation pays for cost increase.	MEA => Private			MEA => Private
Traffic management requirements increase costs	79	* MEA utilizes existing resources and increase in efficiency.	MEA		O	
Cost increase due to strengthening environmental regulations	80	* Entity in charge on concerned operation pays for cost increase.	MEA => Private			MEA => Private
Cost increase due to third party	81	* Entity in charge on concerned operation pays for cost increase.	-			Shared between MEAand Private
Change in level of services required by the government/MEA	82	* Clear requirements and specifications of service is announced by MEA from bidding stage to not only private sector but also GOE. * MEA concludes and signs contracts, which states clear requirements and specifications of service, with private sector. * Require Government to provide a remedy or compensation under the contract.	MEA	O	O	
Unexpected additional cost	83	* Entity in charge on concerned operation pays for cost increase.	-			MEA => Private
Force majeure - catastrophic event (earthquake, terror, accident)	84	* MOF will provide budget support to MEA if it happens. * MOF will reserve funds for force majeure.	MOF	O MOF		
Damage on expressway users due to road accident	85	* Expressway road users should be required to insure drive damage insurance. * MEA promotes public awareness campaign for drive damage insurance for expressway. * Necessary to check drive damage insurance market and regulation in Egypt.	MEA			RU
Damage on expressway asset due to road accident	86	* Expressway road users should be required to insure drive damage insurance. * MEA promotes public awareness campaign for drive damage insurance for expressway. * Necessary to check drive damage insurance market and regulation in Egypt.	MEA			RU
Demand decrease and cost increase due to unexpected weather	87	* Entity in charge on concerned operation pays for cost increase.	-			MEA => Private
Non compliance with operation and maintenance requirements by private sector	88	* MEA concludes and signs contracts, which states clear requirements and specifications of service, with private sector. * MEA monitors performance done by private sector and adjustment revenue of private sector in response to the performance. * MEA includes a penalty clause in the operating contract.	MEA			O
Negative environmental impacts due to operation	89	* Entity in charge on concerned operation pays for cost increase.	-			MEA => Private
Import of equipment and materials for operation	90	* Law allows private sector to import necessary for construction of the network. (Which law?, Which ministry?)	GOE		O	

		What steps can mitigate/minimize the risk?		Main Risk Taker		
Lower Category	No	Mitigation Measures	Steps by	GOE	MEA	Private
Power supply	91	* Sign contract with the state owned power company. * Construct and maintain own emergency power supply facility.	MEA		O	