Public-Private Partnerships
In the Malaysian
Transportation Industry
Fall Semester 2002 Inception Report

John Ward
Massachusetts Institute of Technology
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1. Introduction

In the past 20 years, Malaysia has transformed many areas of its economy from government-run enterprises to more competitive private firms, with a goal of being a developed country by 2020. The federal government, under the leadership of Prime Minister Mahathir Mohamad, has undertaken several initiatives to achieve the desired growth and sectoral transformations:

- Industrial diversification – automobiles, electronics, information technology
- Reducing government influence in industry through public-private partnerships and privatization
- Promoting a knowledge-based economy centered around the Multimedia Supercorridor
- Transportation and communications infrastructure improvements

This strategy has helped Malaysia become one of the leading economies in Southeast Asia. Malaysia’s strong response to the financial crisis of 1997 prevented the losses that its neighbors incurred and enabled it to rebound quickly.

This document provides a preliminary report on two of the economic growth initiatives, public-private partnerships in the provision of transportation infrastructure and the promotion of the national car project.

2. General Background on Public-Private Partnerships

Public-Private Partnerships are a method primarily intended to increase the cost-efficiency of services currently performed by the government by introducing market rigor to their provision. Growing out of the privatization push of the 1980s, partnerships are expected to achieve both government and market goals better through cooperation than by either the government or private sector performing the function by itself. This cooperation can take many forms ranging from a close, collaborative effort with both groups providing financial and human resources to a more distant relationship where the government provides a strategic framework and supervision while private industry concentrates on implementation. Partnerships cover a wide range of industries such as health care, automotive research, education, prisons, and transportation.

Since Public-Private Partnerships developed from privatization, there is bound to be some confusion between the two. Linder and Rosenau state succinctly, “As distinct from the first generation of privatizing efforts, partnering involves a sharing of both responsibility and financial risk.” In privatization, an agency that performed the function is incorporated or specific assets such as railroad tracks are sold. The government’s relationship with the newly privatized service provider is the same as with any other company. In contrast, a partnership indicates a special relationship between the government and the private firm and may include some government funding for the service, especially if social concerns such as equity or concern
for disadvantaged populations pose a threat to the profitability of the private sector partner. Responsibilities are also shared, usually with the private sector partner responsible for day-to-day tasks and the government responsible for a more strategic role. As an example from Linder and Rosenau, private firms may partner with a state to run a prison, performing incarceration and rehabilitation functions but the state will reserve the right to use force if the prisoners riot.

For the purposes of this report, a loose definition of partnership will be used as the term can cover a wide variety of arrangements while a strict definition of privatization will be kept. Privatization will refer only to the private incorporation of existing government assets or agencies. Incorporating a port as a private company responsible for returning a profit to shareholders and running and investing in its own operations would be considered privatization as the government divests itself of responsibility. Awarding a concession to a company to build and operate a toll road will be considered a partnership as the government and the company work together to achieve goals, namely much-needed transportation infrastructure at low-cost for the government and a profitable enterprise for the company.

Public-Private Partnerships have some weaknesses as noted by Rosenau that must be watched for in order to achieve a successful implementation. Cost-efficiency may result in loss of social equity, public participation, and accessibility. Certain less-profitable populations may not be able to obtain services from the partnership without government intervention. Public accessibility to the policy and operations of the partnership may be more limited than when operated only by the government. Conflicts of interest between the partners may result in the failure of the partnership if poor incentive schemes are developed. All of these problems may require an increase in regulation to prevent them from occurring. Also of concern is the difference between short-term and long-term cost efficiency. A company may reduce costs on a service by hiring more part-time workers with little benefits but these workers may require more welfare support later on.

**Transportation Public-Private Partnerships**

Public-Private Partnerships within the transportation industry can take many forms, such as build-operate-transfer (BOT) concessions or maintenance partnerships. A BOT concession is a contract with a private firm where the firm will build the infrastructure and then operate and maintain it for a time period outlined in the contract. At the end of this period, the infrastructure may be transferred to the government for it to operate and maintain, the contract may be renewed with the firm, or the government may have a bid process for a new contract with multiple firms. The firms will use their own funds to construct and operate the infrastructure with compensation outlined in the contract. This compensation may be a user fee like tolls or fares, a direct government payment, low-interest loans, favorable tax treatment, or some combination of these methods.

In the Malaysian context that concentrates on BOT partnerships, the attraction is that a private firms pays for the high construction cost. By handing off the construction costs to private firms, a government can authorize more infrastructure projects and then either spread its scarce funds to cover projects less desirable to private firms or to other government services. Other government-touted benefits are quicker construction and technology transfer (Eighth Malaysia Plan, 184, 196).
Several methods exist for bidding on these projects. The government will first propose a project based on its own studies or from suggestions by private firms and list the preliminary parts of the contract, such as length of the concession, responsibilities for related facilities like stations or rest stops, and expected traffic or ridership. Existing companies or project-specific consortiums will then bid on the project. The bid may cover a single aspect like the toll or several aspects of the project and the bidding process may take multiple rounds. Whoever wins the bid will then negotiate the contract specifics, which may include the preliminary parts of the contract.

During the life of the project, the concession contract is sometimes renegotiated as unforeseen events occur, details need to be clarified, or the ruling political party decides some changes need to be made and this possibility is incorporated into a company’s bid. The possibility of renegotiations may be viewed as a positive aspect if the government has historically worked towards beneficial solutions to the concessionaire or renegotiations may be considered negatively if past actions have been detrimental to the concessionaires.

Transportation infrastructure providers face several sources of risk that may affect their bid:

- Expected economic conditions
- Past actions taken by the government with related projects
- Interest rates
- Growth plans along the corridor
- Likelihood of competitive infrastructure being constructed

The economic conditions have the greatest effect over the life of the project due to its influence on the entire system. A good economy leads to higher car ownership and traffic, benefiting toll road company revenues. Urban rail companies may benefit, as more money will be available to subsidize them or expand their systems.

On the cost side, a bad economy may lead to currency devaluation, reducing a company’s ability to pay its loans as revenues are in the local currency while loan payments are often in a stable foreign currency. This can be a significant problem given the high construction expense for these projects. One possible solution may be to raise tolls but the government may not allow this as it may anger the electorate. This often forces the company to take out a loan at unfavorable rates or with high equity requirements, affecting the desirability of future projects to companies, or the government may provide a low interest loan, reducing the cost advantage that public-private partnerships are supposed to convey. A worst-case scenario is that the debt problems are so severe that the government has to take control of the company and restructure the debt, as has happened in Malaysia with Star Light Rail and Putra Light Rail. Construction conglomerate United Engineers Malaysia also required government takeover but its toll road division reported profits after taxes for four out of the five years between 1997 and 2001.

Past governmental actions include the concession contract renegotiations discussed previously. Other actions may include the form of compensation payments, if any, delays of these payments, resolution of contract disputes, and uncompensated mandates like the use of a certain technology standard.
Corridor growth plans dictate the future market for the project. Mass transit projects will look for high-density, mixed-use corridors where driving will be slow and aggravating compared to mass transit use. Toll roads will look for plans for higher-income housing where users prefer driving. Along with this, companies will look at existing and possible future competition. Urban rail companies may not bid as much for a corridor if the government is intent on building a parallel freeway.

3. History of Malaysia Public-Private Partnerships

The Malaysian government initiated its privatization and partnership wave in the early 1980s. Currently, Malaysia considers all of its efforts as privatization although many can be considered partnerships. The most important legislation for the transportation industry was the Federal Roads Act of 1984 that allowed private developers to collect tolls on public roads. This legislation has been bolstered by the government’s economic plans, in the form of the long term Outline Perspective Plans (OPPs) and the medium term Five-Year Plans.

The historical goals of the OPPs as summarized by PLUS\(^7\) have been:
1. OPP1 (1971-1990): Road development in rural and under-developed regions.
3. OPP3 (2001-2010): Expand and integrate all transport modes and communications infrastructure.

While the OPPs provide a general, philosophical view of the government’s plans, the Five-Year Plans deal in greater specifics. Planned projects and expected government spending are outlined in the documents. The current Five-Year Plan, the Eighth Malaysia Plan, does not differentiate all of the planned projects between government projects and partnerships although it does note “various new projects are expected to be completed through privatization” and lists some initial candidate\(^8\).

The candidates for privatization or partnerships are identified through the Privatization Action Plan process\(^9\). This process involves a two-year rolling process. In the first year, projects are identified for privatization based on two criteria:
1. Feasibility – Attractiveness to the private sector and ease of restructuring or instituting legal changes to make the enterprise competitive.
2. Desirability to the government in terms of the benefits aiding the government’s economic goals.

Projects ranked high in both criteria are identified for “immediate privatization”. Projects with high desirability but low feasibility are placed in the “priority restructuring” category and projects with the opposite traits are considered “back-burners”. These two categories may be dealt with at a later time after changes in the organization or market improve their outlook. Projects ranked low in the criteria are to be considered again in the future. During the second year, implementation is reviewed for those projects identified for privatization to ensure that the process will be completed as desired.
Malaysian partnerships are complicated by the involvement of the government in the private sector. A theoretical view would assume that the government and private sector are two independent entities with the government pursuing public goals and the private sector interested in maximizing profits or shareholder value. The Malaysian reality is that the two may not be independent as the government owns a large share of equity in many relevant companies through its various departments and may influence corporate policy to more closely match government policy. In some cases they are the company’s largest shareholder, as is the case with PLUS Expressways, Malaysia’s largest toll road company, and the national car company Proton. As the PLUS Expressways Prospectus states:

“In addition, UEM [the majority shareholder of PLUS] is currently ultimately controlled by the Government, through Khazanah and Danasaham [holding companies]… There can be no assurance that the corporate objectives and strategies of PLUS Expressways will not be substantially influenced by the policies of the Government in ways detrimental to PLUS Expressways’ shareholders.”

One major thread of the OPPs is an emphasis on social equity between the different ethnic groups. As the Eighth Malaysia Plan states, “emphasis will continue to be given on increasing effective Bumiputera [ethnic Malays] ownership and participation in the corporate sector, improving Bumiputera participation in high-income occupations, strengthening the development of the BCIC [Bumiputera Commercial and Industrial Community], narrowing income inequality and eradicating poverty.” This emphasis has been reduced in recent plans due to the decrease in disparities but it may be an important aspect when considering the historical relationships of private companies with the government. In Malaysian society, ethnic Chinese hold a much higher proportion of wealth than their share of population while Bumiputera have a smaller share of the wealth relative to their share of the population. These disparities also exist in the ethnic makeup of managerial and professional classes. The strategy to reduce the disparities takes three main thrusts:

- Poverty eradication – Targeted to help all groups.
- Corporate equity – The government has a target of 30% Bumiputera ownership in the corporate sector. Two policies to help this are that privatized projects had to provide 30% equity to Bumiputera and “30% of contract-works for major privatized projects to Bumiputera contractors.”
- Employment restructuring – Efforts by the government to increase education and opportunities to the Bumiputera in professional, managerial, and technical jobs. The growth of the economy has also increased private efforts in this area as well.

The push to upgrade the standing of Malays with handpicked managers for some of the partnerships has led to some cries of cronyism. Some of these firms went deep into debt and have had to go back to the government for help due to their overly optimistic expansion plans or poor management practices.

4. Toll Roads

Since the Federal Roads Act of 1984 was passed in 1984, 1,230 km of roads have been constructed as concessions to toll road companies. Project-specific companies run Malaysia’s concessions, although these companies are often subsidiaries of a larger firm such as United
Engineers Malaysia or Permodalan Nasional, with concessions running approximately 30 years. Some concession lengths have been increased as the result of lost income for the companies. The income loss may be from natural disaster or contract restructuring. Most toll roads run between 10 km and 60 km, with the North-South Expressway being an exception at 797 km, and are heavily concentrated in and around the Kuala Lumpur metropolitan area.

Limits on how often tolls can be set and for how much are outlined in the concession contracts. The government also has the right to further limit the tolls, although it must provide compensation to the concessionaire in this case. The form and timeliness of the compensation may have an effect on future investment. At least for PLUS, the compensation has changed from a cash payment to tax write-offs and reduction of the toll-sharing payment to the government. If the compensation is greater than the write-offs and toll sharing, then the excess can often be carried over to a future write-off. Assuming that the compensation can be fully used, the net effect should be the same but PLUS seems to prefer cash compensation as it can count it towards revenue. One advantage of tax write-offs is that companies may be able to use them as soon as needed while cash payments were sometimes delayed without interest. Other forms of compensation include interest-free loans and concession extensions.

A further limit on tolls seems to be that concessionaires do not or cannot use congestion pricing. From information gathered from various concessionaires’ websites, tolls are based on vehicle size and constant throughout the day. Congestion pricing is one method to promote efficient use of the road system throughout the day by discouraging use during rush hour. The toll roads in the Kuala Lumpur region are equipped with Electronic Toll Collection systems so the basis to begin congestion pricing exists. Three of the reasons could be:

1. Contractual toll limits
2. Political undesirability
3. Private firms do not want to use congestion pricing

As noted in the previous paragraph, the concession contracts have toll price ceilings. The companies are already charging the maximum the government will allow so congestion pricing would require price cuts during uncongested times to achieve a tiered structure, reducing concessionaires revenues. If the price ceilings did not exist, private firms would probably engage in congestion pricing as they take advantage of their near-monopoly position. Drivers who do not want to pay the prices could take the slower city streets or public transportation but the increase in toll revenues would probably offset these losses.

Political undesirability is probably the primary reason that congestion pricing is not used. The concession contracts can be modified and the concessionaires are not going to prevent changes that increase their profits. As noted earlier, not only are there toll ceilings in the contracts but the government has in some cases prevented tolls from reaching the contractual level. The government’s reason seems to be that high tolls would limit economic growth. Further study could be done into this to see if other reasons include promotion of the automotive industry or the political strength of drivers.

One aspect of public-private partnerships is risk-sharing between partners. The Malaysian government’s approach with the toll road companies does not seem universal, although further research needs to be done in this area. In the Kuala Lumpur-Karak Expressway concession
contract, there is a reported minimum level of traffic set by the government for which it will compensate if not reached. This level also grows by 5% annually. PLUS Expressways’ prospectus lists volume of traffic as a risk factor and does not note any compensation for low traffic levels.

**CLIOS Diagram of the Toll Road Market**
Below is an initial diagram of the demand for more toll roads using the CLIOS framework. Demand is based on the number of users who push for more roads, the profitability of toll road ventures, and the current government policy. Profitability is just a function of the number of users, tolls, and costs – here approximated by the loan terms due to the high initial costs of building a toll road. The loan terms are not quite exogenous to the system as the government may lend part of the costs on favorable terms to concessionaires.

**Toll Road Demand**

**Technology Coordination Between Toll Roads**
While these partnerships have led to greater infrastructure investment than would have been possible with government financing alone, the fact that government has to deal with several private companies as well as its own agencies complicates issues when trying to construct a cohesive regional infrastructure. The prime example in this area is the eight different electronic toll collection (ETC) standards used by the 15 toll roads in the Kuala Lumpur region.
ETC is a natural technology for a toll road to implement as smoother traffic flow will draw more commuters. Over the past several years, companies implemented their own standards since government direction was initially lacking. When the government decided on a single standard a few years ago, some concessionaires requested more time, apparently to recoup the investment on their nonstandard equipment. The government finally moved to one standard to take effect on Jan. 1, 2003.

Several lessons can be drawn from this example where technology can increase the profits of a company.
- Companies will implement technology that is directly profitable on their own.
- The government must provide leadership to standardize the technology early in the process or it may take several years to implement the standard.
- Companies that have to replace their equipment for the new standard will delay implementation if they have to pay for it.

Technology that has high network effects or high benefits but it may be difficult for the firm to recoup the technology’s cost may be less difficult to create a common standard. Network effects are where a product’s benefits increases as it is more widely used. A telephone network is one example. If only a few people owned a phone, buying a phone would bring little benefit but with millions of phones in service, there are many benefits to purchasing one. A toll road may be unwilling to implement such technologies by itself due to the lack of profit incentive.

Under such circumstances, an industry consortium or the government may be able to create a common standard. In a consortium, the companies and other interested stakeholders could discuss a variety of solutions and develop an implementation plan and timetable so that all the companies benefit. Without knowing the relations between the companies it is difficult to evaluate the ease to which a consortium solution could be done. As the major stakeholder in the transportation system, the government would be involved in the creation of a standard with the companies but it would not force the issue. If a consortium is not viable or the government feels that the companies will not consider the interests of all stakeholders in its solution, it could use its position to create a standard.

With a consortium, it is assumed the companies would pay for the technology themselves. As the solution came out of the private sector, investment climate changes should be minor as the new technology is considered a cost of the industry. The financing for a government solution could change the desirability of investment in transportation infrastructure. A government subsidy should increase or have no effect on investment desirability for the industry. An unfunded mandate would have a less desirable effect as transportation will be considered a riskier investment. These effects are also influenced by the contracts between the government and the companies. Breaking part of the contract will not be seen favorably. The contracts could also allow for the government to impose these standards. The flexibility of the contracts in this area needs to be researched.

**Future Trends**
Toll road expansion is slowing in Malaysia. There are fewer projects planned for the 2001-2005 period than the previous five year period and the new projects are not so Kuala Lumpur-centered.
Government spending is planned to be RM 5.1 billion\(^{27}\) ($1.3 bln) on new road projects but it is not known how much will be spent by the private sector. Private sector spending has been dropping. In 1991-1995, it was RM 15.2 billion ($4 bln) and then dropped to RM 7.9 billion ($2.1 bln) in the 1996-2000 period\(^{28}\).

The future of toll roads in the Kuala Lumpur region seems to be to better integrate them into the regional transportation system using ITS technologies. Given previous difficulties with electronic toll collection, this move must be well planned to gain support from stakeholders.

The future toll road market is in Malaysia’s other major cities like Johor Baru. Increasing populations and automobile ownership make them good future markets. With the financial problems of Kuala Lumpur’s light rail systems, toll roads are the most cost-effective investment in these cities. The interactions between the government and toll road companies should be watched so that future growth does not lead to a low-density automobile-dependent situation.

5. National Car Project

For two decades, an important part of Malaysia’s economic growth strategy has been the growth of a domestic automobile industry. The government’s reason for choosing this industry is that it has many linkages to other sectors that it would like to domestically develop, such as materials, manufacturing, and, increasingly, electronics, and the growth of the auto industry will help bring these other sectors along with it. The two major Malaysian automobile companies are Proton and Perodua, with new car market shares of about 52% and 28%, respectively, for years 1999-2001\(^{29,30,31}\). The current size of the market is an estimated 430,000-440,000 vehicles sold in 2002\(^{32}\).

The large market shares enjoyed by the national car companies are due to protectionist trade policies. Passenger cars sold by foreign companies face import duties ranging from 40-300% based on if it is assembled locally or not and on engine size. There is also a steeply graduated excise tax that is cut in half for the national cars.

An interesting aspect to consider is if the government promotes the national car companies at the expense of the public transportation companies. The high tax rates on vehicles, despite the discount for national cars, appear to limit the overall new car market. Several other measures are used in the Kuala Lumpur region as disincentives to car use. This is balanced by policies that reduce the operating cost of vehicles and promote vehicle infrastructure. The government’s 32% ownership of Proton is also a disincentive to harm its market too much.

One government policy that aids automobiles is its control of fuel prices, currently around $1.30 per gallon for gasoline and $0.75 per gallon for diesel. The Domestic Trade and Consumer Affairs Minister estimates that this was a subsidy of over $800 million in 2002, not including tax exemptions to oil companies\(^{33}\). These low costs create two main effects. First, people drive more when fuel is cheap than when it is expensive, increasing pollution. Second, it increases the population that can afford to purchase and operate a car. The added drivers, sensitive to operating costs, probably are not buying a new car but a used one that has higher emissions.
The ASEAN Free Trade Agreement (AFTA) will bring the current protection scheme to an end in 2005. While Malaysia is stating that it will drop tariffs to 20% in 2005 and then 5% at a later date, it will increase other vehicle taxes to compensate for the lost revenue. The new taxes will also apply to the national cars. Proton and Perodua vehicles should still maintain their price leadership, especially in the entry-level market, but the price differences will narrow despite the government’s statements to the contrary. An important thing to note about the government’s stance is that it wants car sales to not drop as people wait for lower prices. Sales have been softer than expected in the last quarter of 2002 and low interest rates along with other incentives have been used to maintain sales. Given that import tariffs will drop down to 20% and that the national car excise tax advantage will disappear, it is difficult to see how the price difference between national and foreign cars will not decrease.

**CLIOS Diagram**
This preliminary diagram for the Proton Market is shown below with Proton sales dependent on interest rates, consumer perceptions, and vehicle operating costs. Proton’s sales will affect the equipment offered and reliability which feed back into perceptions. Vehicle operating costs are functions of tolls, fuel costs, and reliability. Gas prices and tolls are shown as policy levers due to the high government control over them and this control is affected by how many drivers are on the roads. The rest of the new car market and the used car market also affect Proton’s market.

**Market for Proton**

**ITS Use by Proton**
Based on its website, the only ITS application that Proton offers is cruise control on its latest model, the Waja. There is a higher level of electronics in the Waja than in previous models.
offering such abilities as an adaptive automatic transmission, drive-by-wire throttle control, and an immobilizer system to prevent theft. If Proton continues to increase its electronics use, it may not be long before more driver applications like a navigation system are offered as options. The timeline of course depends on the market. Proton cars appear to be marketed as low and mid-market vehicles where expensive systems may not sell well. Given the small market size, it may be difficult for Proton to allot research and development funds for systems with a limited payoff.

Future Trends
The changes caused by AFTA may have many possible effects, depending on if the government can manage price expectations. If it can, the overall new car market may not change much since the prices at the low end of the market will be the same. The types of cars purchased will certainly change as consumers will be more likely to purchase foreign cars. In regards to the Kuala Lumpur regional transportation situation in this scenario, fleet composition is the thing to watch for.

There are two trends that may become important in fleet composition. The first is the increasing popularity of pickup trucks, which has gone from an insignificant portion of sales in 1999 to roughly 30,000 in 2002. Some of the demand may be due to their tax classification as a commercial vehicles which have lower tariffs and frequently use inexpensive diesel fuel but based on quotes in the Star Motoring article “Keep on Truckin’”, there is a definite group of consumers with American tastes in cars:

- “Now that I’ve been driving [a pickup] for about two years, I like the height (I have a better view of traffic) and I feel safer in the truck.” – Hong Keow, 41 year old female
- [Chris] Wee, 34, finds it easy to change lanes in his truck “because other drivers actually make way for you, more out of fear, rather than courtesy.” He adds with undisguised delight: “In it, I am the king of the road! Head and shoulders above lesser mortals in ordinary cars!”

The second trend that may develop with lower car prices is a move towards more powerful engines. The added power typically comes at the expense of fuel efficiency and has more pollution than less powerful vehicles. With advances in pollution control technology, the modern, powerful vehicle is probably producing less pollution than a less powerful vehicle built a decade ago. The net effect on regional pollution cannot be calculated without looking at changes in the total fleet. Some older vehicles may be scrapped and the pollution from these cars has to be compared with the new vehicles.

Import tariffs based on engine displacement, the easiest way to more power, and the national car companies preference for smaller displacement engines have limited growth in this area. Will the government introduce a displacement tax as one method to favor the national car companies who produce lower displacement cars as well as provide another way to limit pollution from new vehicles?

A more interesting scenario is what will happen if the government cannot maintain the new car market. As 2005 nears, consumers may decide to hold off on purchasing a new car. Instead of buying a Proton, which is everywhere, maybe the consumer could buy a higher quality or more prestigious car that is not ubiquitous by waiting a few months. If there is a surge in people buying new cars, this could lead to a glut in the used car market and allowing people who
previously could not buy a car to afford one now. This may have little effect on Kuala Lumpur since there is already a high car population in the region but it could increase motorization in other areas of the country.

The government’s reaction to a car sales slump could also be interesting. Will it back out of AFTA in order to protect one of its “Developed Nation by 2020” spearheads? Will it provide direct subsidies to the companies to protect them? Will the companies partner with foreign companies to increase their survivability? Proton is trying to mitigate the effects of any sales slump in Malaysia by increasing its foreign presence, especially in the Chinese and Middle Eastern markets. The Middle East market is particularly intriguing with Proton having the advantage of coming from a predominantly Muslim country.

6. Directions for Future Research

Integration of more ITS Technology into Private Toll Roads
As displayed by the Malaysian experience over electronic toll collection, integration of ITS technology can be difficult as each company introduces its own standard. This research would consider beneficial technologies for the Kuala Lumpur region and develop possible strategies to integrate them. The strategies would draw from past Malaysian experiences and the experiences of other countries that have tried to similar integrations. Also considered would be the profitability if a single concessionaire installs the system compared to if they all install it and its implications on keeping a uniform standard. See Sandi Lin’s inception report.

Impact of Past Government Actions on Future Toll Road Concessions
Companies making concession bids will include a risk factor to cover for untimely physical, economic, and political events. This research would focus on the impact of past political actions such as contract renegotiations, compensation, and a mandated electronic toll collection standard on the bid process and would ideally include findings for both the bidding companies and investors and lenders to the companies. Information would also be drawn from other countries’ experiences given the short history of Malaysian concessions. The government’s actions can be positive as well as negative. For example, Malaysia’s bailouts of transportation companies may increase future concessionaires’ accessibility to loans since lenders will have limited risk exposure. Bailouts may also increase risky behavior by companies and this cost must be balanced with the savings from other areas.

Demand for Expressways and Impact on Other Modes
The current Five-Year Plan, the Eighth Malaysia Plan, does not plan for any mass transit projects to be undertaken, focusing on various expressways instead. This change from the previous decade could be studied to gain a better understanding of the project selection process in Malaysia. Some questions in this field are:

- Is there no need for further major mass transit projects?
- How do the profitability of at least PLUS among the toll roads and the losses incurred by the light rail lines affect the choice in projects from both a government perspective and a prospective private builder/operator?
- How much political power do the different types of commuters wield in this process?
Some preliminary notes are that the Eighth Malaysia Plan was written before 2001 so the light rail losses may have limited effects. The next largest Malaysian cities with roughly half a million people each may be poor candidates for expensive urban rail projects at this time and would be better served by expressways.

**Use Proton and the Multimedia Supercorridor as an ITS Testbed**

The Malaysian government is in an interesting position as the largest shareholder of Proton and a promoter of the Multimedia Supercorridor, both of which are to lead Malaysia to developed nation status by 2020. As AFTA is phased in beginning in 2005, Proton will lose many of the barriers that help maintain its market share. The government can use its power to create a testbed for in-vehicle ITS technologies that Proton can market as one way to maintain its hold on the market. The testbed could be operated as a government-sponsored joint venture between Proton, MUST, and the MSC operator. Elements of this research would be looking at promising technologies, the ability of Proton to become and remain competitive in this market, and an institutional framework that would best achieve these goals. A component may also include implications of AFTA and the WTO on a government-sponsored venture that greatly benefits one company. Before this can be done, it must be ascertained as to what involvement there currently is or is planned to be between the government, Proton, and the Multimedia Supercorridor.

**Effects of AFTA on Kuala Lumpur Fleet and the Spread of Motorization Throughout Malaysia**

The effects of AFTA may be minor as the government hopes or major as automobile importers hope. The high motorization of Kuala Lumpur with 1.2 million cars for a population of about 1.4 million may prevent major changes in that market but other areas of the country will experience higher automobile ownership rates. This may cause severe congestion, pollution, and safety problems in areas that may not be fully prepared. A scenario analysis could help identify strategies to accommodate changes caused by AFTA, whether major or minor.

7. Data Needs

**Vehicle Fleet Data**

Basic data can be found on the current number of automobiles and motorcycles but there is much less on the fleet composition in all of Malaysia and by region. Data that would be useful would include pre-1999 car sales and pre-2001 car registrations overall and by state. This way a better idea could be found on how the fleet is growing in other areas, how the fleet is aging, and if there are any possible phenomena like used cars from Kuala Lumpur ending up in other parts of the country.

**Commuter Attitudes/Surveys**

The efficacy of any policy recommendations cannot be judged without having an idea of how people will react to them and most available data seems to be anecdotal. How strongly do commuters prefer cars to other forms of transportation? What political resistance may crop up if tolls or gas prices are increased? What is the average consumer’s willingness to pay for a Proton vehicle with an in-vehicle ITS application beyond electronic toll collection?
Relationships Between Transportation Companies and the Government
More information on how the management of various transportation companies is related to the
government would be useful in understanding the interactions between the two. Were the
executives picked by the government to manage the companies? The status of some companies
and if they are partially owned by the government is also difficult to ascertain from internet
sources, especially with many of the recent changes in the market. A Malaysian counterpart may
have an easier time finding this type of information.

Relationships Between Transportation Companies
Developing future strategies will require knowing how well the transportation companies work
 together. Do they see each other as friendly rivals since they have pseudo-monopolies over
 transit corridors and would have little problem working with each other or is the transportation
system flexible enough that they do directly compete for many commuters? What industry
groups currently exist?

Proton’s Use of ITS
From Proton’s website, leading edge ITS technology such as navigation systems, adaptive cruise
control, or a traveler aid system similar to GM’s On-Star is not offered and no hint is given as to
when they may become part of the product line. An information link could be established with
them, perhaps through the marketing department. A marketing source would not be the most
desirable source as it will be prone to overstating Proton’s abilities in order to increase its market
share. Proton will also probably not reveal the full extent of its research so it does not tip its
hand to its competitors.

Legal Framework of the Concession Contracts
The concession contracts are understood on very general terms. Research could be done to
understand what rights and responsibilities they give the government and the concessionaire and
how flexible is their interpretation. Implementation of ITS and impacts on future infrastructure
investments depend on the language of the contract. Past history will be the important factor in
evaluating flexibility.

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