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FEASIBILITY STUDY FOR TOLL ROADS
FOR THE KINGSTON AND ST. ANDREW'S
CORPORATION

PREPARED FOR:

HONORABLE RALPH BROWN
MINISTER OF LOCAL GOVERNMENT

By:

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Washington, D.C.

JULY 31, 1990

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
I. OVERVIEW OF TOLL ROADS	2
A. Establishment of Toll Roads	2
B. Relationship to State and Local Government	2
C. Popular Acceptance	2
D. Jurisdiction	3
E. Operations	4
F. Organizational Structure	6
II. POTENTIAL TOLL ROADS IN KINGSTON AND ST. ANDREW'S CORPORATION	7
A. Norman Manley Highway	7
B. Causeway/Mandela Highway	7
III. OPERATING COSTS	9
A. Operations	9
B. Maintenance	9
C. Administration	10
D. Total Personnel Needs	10
E. Other Than Personnel Services Costs	11
IV. CAPITAL INVESTMENT	12
A. Toll Plaza	12
B. Toll Collection Equipment	12
C. Service Buildings	12
D. Cost Estimates for Construction and Equipment	13

	<u>Page</u>
V. REVENUES AND TRAFFIC VOLUMES	14
A. Conclusions	15
VI. OTHER ISSUES	16
A. Alternative Routes	16
B. Tokens	16
C. Alternative Revenue Sources	16
D. Alternative Toll Scenarios	17
APPENDIX A - List of Officials	18
APPENDIX B - Terms of Reference	19
APPENDIX C - Proposed Work Plan	21
APPENDIX D - Toll Road Feasibility Study Outline	22

INTRODUCTION

The genesis of this consulting project was the interest expressed by the Mayor of the Kingston and St. Andrew's Corporation in establishing toll roads in the region. The impetus for this request was the increased need for financial resources by the Kingston and St. Andrew's Corporation to meet its growing responsibilities.

To explore this possibility, the Minister of the Local Government, the Honorable Ralph Brown, requested from the Agency of International Development, the services of a transportation professional experienced in toll system design and operations, to prepare a feasibility assessment of this project.

What follows is a review of the establishment and operation of toll roads and the specific requirements for such systems. The report includes assessments of traffic volumes in the Kingston area, and the costs of operating a system of toll roads in the area. A number of potential problems are referred to in the sections on toll road operations that must be considered in the current environment. Finally, a cost benefit analysis is included that indicates the potential revenues and costs at various levels of tolls.

I. OVERVIEW OF TOLL ROADS

A. ESTABLISHMENT OF TOLL ROADS

Throughout the world, toll roads are established to pay for the construction of the road itself. In almost all cases, tolls are imposed on a new facility as a means of retiring the debt that was incurred to build the facility and then to provide operating funds for the on-going operations and maintenance of the facility.

There are a few examples where the revenues generated by the toll road (in excess of expenses) are applied to other purposes. In these few cases the funds provide cross-subsidies to other transportation operations such as subways, commuter rail, airports.

B. RELATIONSHIP TO STATE AND LOCAL GOVERNMENT

Toll roads are usually established by governments. Their boards of directors are generally appointed by local political officials and they accept their political direction from the Chief Executive of the State or Local Government jurisdiction.

Typically, they are established as a separate entity, such as a public authority. This places them outside the civil service environment, allowing the authorities to attract the best available talent and pay the requisite salaries.

They are occasionally established as a part of local government. One example that comes to mind is the State of California, where the California Department of Transportation (CALTRANS) manages toll bridges in the State of California.

C. POPULAR ACCEPTANCE

Tolls are never popular. This is a very simple statement, but must always be borne in mind when considering the imposition or the increase of tolls for roads or bridges. Tolls are, at best, accepted by the local populace as a necessary evil to support the facility that is being tolled.

Therefore, it is important that there be a direct connection between the toll imposed and the service provided. Tolls can be used for the maintenance of the facility or for the construction of a new facility. Without this clear link between the toll and the explicit benefit of the toll, it is difficult to generate and sustain popular acceptance.

D. JURISDICTION

Toll authorities always maintain the road on which they are collecting tolls. This is a particularly important issue in Jamaica while the KSAC has title to the roads in its jurisdiction, the Ministry of Construction has responsibility for maintenance of primary roads within the KSAC. The proposal, as outlined to the consultant, is for the Kingston and St. Andrew's Corporation to impose tolls on roads in the Kingston area, and yet these roads are maintained by the Central Government.

The Central Government would have to agree to allow Kingston and St. Andrew's Corporation to impose tolls on the roads and would also have to insure that the KSAC was in a position to provide road maintenance services as well.

KSAC has expressed interest in applying the proceeds of a toll road to street lighting maintenance, drainage maintenance, and other related tasks. The public may or may not see these essential services as having a direct link to the toll road. Without that connection, even if the funds are dedicated to essential services, the public's connection between tolls and their usage may not be effectively made in the minds of the citizens.

E. OPERATIONS

There are a number of concepts in the establishment and maintenance of a toll road that should be discussed before beginning a cost and benefit assessment for the KSAC area.

1. Plaza Design. A lane of traffic on an open highway can carry 1700 to 1800 vehicles per hour. A toll booth can process between 350 and 600 vehicles per hour.

Therefore, to handle the heavy traffic that occurs during a rush hour, there must be between three and four toll booths per lane of traffic. This leads to the creation of the traditional toll plaza, which, for a typical two-lane highway, may have six to eight toll booths.

It is important that unacceptably long queues are not created at the toll booth. Waiting a long period to pay a toll can be even more frustrating to the motorist than the toll itself, therefore the plaza must be designed to easily handle peak traffic volume.

2. Collection methods. There are two basic toll collection methods: manual and automatic. There are numerous variations on these two basic themes.

Manual toll collection depends upon a toll collector collecting funds from the motorist in the lane. Generally, manual toll collectors can process up to 350 vehicles per hour. If the lanes are designed to require the motorist to have exact change and the toll collector issues no receipt, they can process up to 600 vehicles per hour.

Sophisticated automatic coin machines can process 500 vehicles per hour with a very high degree of reliability. An idea of how accurate these machines are can be derived from the acceptance criteria for machines used by the Triborough Bridge and Tunnel Authority. No more than four unacceptable transactions per ten thousand is the acceptance standard.

It is also possible to combine an automatic coin machine with a change maker providing for a higher level of security in the booth with a commensurate higher operating cost.

3. Direction. Tolling can occur in one or both directions on a road. Two-way tolling is necessary when there are significant alternatives available in the alternative direction.

However, when all of the main roads into a central city are to be tolled, the opportunity exists to toll only in one direction. Tolling in one direction offers significant savings in operating expenses requiring half as many toll collectors.

Psychologically, it is appropriate to charge tolls as people enter the downtown area, allowing for free passage out of the city.

4. Accountability. One of the most important management principles in the operation of a toll authority is that of accountability. Toll collectors are in the unusual position of having people, sometimes literally, throwing money at them. It is a natural tendency for people in that environment to have the temptation to keep some of that money.

To prevent this, accountability systems must be developed that reconcile the number of vehicles passing through the toll booth and the dollars collected and deposited by the collector. To do this, treadles or counters are placed in the roadway that record the number of axle impressions through the lane and toll registration panels are installed in the booth and the toll collector records each vehicle passing through the lane. The total number of registration panel impressions and the number of vehicles recorded by the treadles are then reconciled to the dollars collected by the toll collector.

In addition to the accountability of the toll collectors, there is the issue of security of the toll facility from outside theft and from the possibility of motorists violating the system and running the toll. To provide for this, some outside security support will also be required.

5. Classification. Toll roads usually have different classes of vehicles that are subject to charges at different levels. The charge could be based on the damage caused by the vehicle or by the economic benefit attributed to the vehicle.

The damage theory would argue that heavier vehicles should pay a much higher price than light vehicles and passenger cars since they cause a much greater amount of damage to the wearing surface. The alternate theory is that commercial vehicles provide a greater economic benefit to the community and therefore, should not be charged in proportion to the damages but in proportion to their value.

Many toll roads have balanced these two competing ideas and developed classification systems that charge based on the number of axles or simply charge trucks twice as much as passenger cars. In any event, classification systems should be kept as simple as possible.

For purposes of this analysis, the assumption has been made that all vehicles will be charged the same toll. There is a downside to this innovation, and that is the accountability for the toll collector becomes more difficult to assure.

- F. Organizational Structure. In establishing a toll authority, at least four operating departments must be created reporting to an Executive Director. They are: operations, maintenance, revenue control and administration.

An Operations Department consists of the toll collectors, their supervisors, and whatever support personnel is necessary to put toll collectors in the lanes and keep the lanes operating.

A Maintenance Department maintains the toll road itself and the facilities of the toll road which include toll booths and toll registration equipment.

A Revenue Control Department is responsible for auditing the collections of the toll collectors and providing accountability and security to the authority.

An Administration Department combines a number of functions. They include: hiring and training toll collectors, budgeting and financial planning, public affairs and external relations, procurement of materials and supplies, and others.

II. POTENTIAL TOLL ROADS IN KINGSTON AND ST. ANDREW'S CORPORATION

Let us introduce this section with a note on traffic counts. Traffic volumes can only be accurately determined using vehicle counts. For purposes of this study, the counts that were made available, in many cases, are several years old. The traffic counts are, therefore, approximate. Before a decision is made current traffic counts should be taken. In addition, traffic counts were only available for weekdays. It was necessary to estimate weekend traffic and this estimate is one half of weekday traffic. Thus the figure reported is of average annual daily traffic, while the studies made were of average daily traffic.

A. NORMAN MANLEY HIGHWAY

The Norman Manley Highway connects the airport and city of Kingston. When travelling from Port Royal or the airport to downtown Kingston, there are no alternatives to this two-lane roadway.

Traffic volume on the Norman Manley Highway is approximately 6,000 vehicles per day. Peak hour traffic is approximately 600 vehicles per hour. Counts on the Manley Highway were done in 1990 by the Ministry of Construction.

There is room at the roundabout to construct a toll plaza if this road were to be tolled.

B. CAUSEWAY AND NELSON MANDELA HIGHWAY

If tolls were to be imposed on commuter traffic into Kingston from the West, it would be advisable to place tolls on both the causeway and the Nelson Mandela Highway. To place tolls on only one of these roads would necessarily lead to diversions of significant amounts of traffic to the other road leading to congestion and traffic backups.

With both roads tolled, there are only limited alternatives into the city of Kingston. These roads, through the hills, are a much more indirect trip to the city and are not generally considered to be a reasonable alternative. In the event that tolls were imposed, there would be an increase in traffic in this area.

Counts on the Causeway were done in 1983 by the Urban Development Corporation and were projected into 1990. Counts on the Mandela Highway were done by the Urban Development Corporation in 1986.

Traffic volume at the two roads is approximately 25,000 vehicles per day in one direction.

	<u>AVERAGE ANNUAL DAILY TRAFFIC</u>	<u>PEAK HOUR</u>
Causeway	10,000	1,500
Mandela Highway	<u>15,000</u>	<u>2,500</u>
	25,000	4,000

A plaza could be located on the median strip on the Mandela Highway. The median strip is quite wide and in many locations could easily locate an expansion of the roadway for the placement of toll booths.

The causeway offers slightly more limited alternatives for toll booth construction: From a construction point of view the most attractive alternative is on the in-bound side of the causeway where there are two lanes of traffic in either direction.

From a psychological point of view it would be better to install the toll booth on the out-bound side of the causeway. However, in this area, it is not clear whether soil conditions would permit construction. This would require further engineering study.

III. OPERATING COSTS

A. OPERATIONS

The principal of toll booth staffing is the same as in any other fixed post operation. That is, for every location that must be staffed around the clock, seven days a week, five full-time employees must be hired. Since toll booths cannot be left unstaffed for even brief periods of time, a more useable ratio is six employees for every post. When booths are empty traffic backs up, or worse, goes through without paying.

At each toll road, at least one booth will require twenty-four hour a day, seven day a week staffing. Even late at night, the variable cost of a toll collector will generally be exceeded by the tolls collected. Booths, therefore, should be operated around the clock.

Other toll booths on each plaza will require a lower level of service with the lowest level of service being only one toll collector during the rush hour peak.

The following charts indicate proposed staffing levels for the three proposed toll roads.

<u>Toll Collection Operations</u>	<u># Booths</u>	<u># Collectors</u>	<u>Super-visors</u>	<u>Total Personnel</u>
Manley Highway	2	8	2	10
Causeway	4	12	3	15
Mandela Highway	<u>7</u>	<u>20</u>	<u>4</u>	<u>24</u>
	13	40	9	49

B. MAINTENANCE

	<u># Booths</u>	<u>Security Personnel</u>
Manley Highway	2	4
Causeway	4	5
Mandela Highway	<u>7</u>	<u>10</u>
	13	19

C. ADMINISTRATION

An administration support staff will be required for any toll road no matter how small. If all the roads are tolled, however, there would be some economies of scale in administration.

	<u>Manley Highway</u>	<u>Causeway/Mandela Highway</u>	<u>Total Personnel</u>
Directors	4	5	6
Human Resources	3	5	5
Administration (including Revenue Control)	<u>4</u>	<u>10</u>	<u>12</u>
	14	20	23

D. TOTAL PERSONNEL NEEDS

	<u>Toll</u>	<u>Mtc.</u>	<u>Sec.</u>	<u>Adm.</u>	<u>Total</u>
Manley Highway	10	2	4	14*	30
Causeway/Mandela	39	10	15	20*	84
<hr/>					
Combined Authority	49	12	19	23*	103

For purposes of the analysis, an average salary of JD\$25,000 a year is assumed, as is a fringe benefit rate of 25 percent.

<u>Personnel Costs</u>	<u>Total</u>	<u>@ JD\$25,000</u>	<u>Fringe .25</u>	<u>Total PS</u>
Manley Highway	30	750,000	187,000	937,500
Causeway/Mandela Highway	84	2,100,000	525,000	2,625,000
Combined	103	2,575,000	643,750	3,218,000

*This is not the sum of the needs for the individual two-road systems, since there are economies of scale.

E. OTHER THAN PERSONNEL SERVICES COSTS

In addition to the personnel costs, there are a number of other expenses a toll authority will incur.

The toll booths and the service building nearby will have to be maintained.

Toll collection and other equipment in the Authority will require maintenance.

Headquarter of the toll authority, if all roads are to be tolled, could be located in rented office space in downtown Kingston, reducing the need for new construction.

These Other Than Personnel Services costs include the following:

- OTPS - Office Rental
- Building Services
- Toll Counting and Collection
- Equipment Maintenance

Estimates are as follows:

Manley Highway	JD\$200,000
Causeway/Mandela Highway	JD\$500,000
Combined	JD\$700,000

IV. CAPITAL INVESTMENT

A. TOLL PLAZA

A toll plaza must be constructed with a sufficient number of toll booths and traffic lanes to accommodate rush hour peak traffic.

B. TOLL COLLECTION EQUIPMENT

Toll collection equipment is different for manual toll lanes and for automatic coin lanes.

Manual toll lanes require treadles, toll registration panels, patron fare displays and receipt printers.

- . Treadles are electro-mechanical devices for recording axle impressions as vehicles pass through the lanes.
- . Toll Registration Panels or button boxes are devices in the toll lane that record the number and classification of vehicles passing through the lane.
- . Patron Fare Displays are devices that indicate to patrons the amount they paid to the toll collector.
- . Receipt Printers provide receipts to patrons in the lanes.

Toll collection equipment can range as high as JD\$350,000 per lane. Costs are often lower, but a higher estimate has been used for this analysis.

Automatic coin lanes require an automatic coin machine to collect the toll, count the toll, and release a barrier or gate to allow the car to pass through. As a validation for the automatic coin machines accuracy, treadles are also installed in these lanes. This equipment costs approximately JD\$350,000 per lane. All of this equipment must be imported. Major manufacturers of toll equipment are the U.S., France and Japan.

C. SERVICE BUILDINGS

Toll plazas require service buildings that house the administrative staff for the plaza and also have secure locations for toll collectors to deposit the proceeds of their share. It is not possible, at this time, to estimate the import content of these structures.

D. COST ESTIMATES FOR CONSTRUCTION AND EQUIPMENT

All Estimates in JD\$000's

Toll Booths	(13)	JD\$ 500	JD\$ 6,500
Service Buildings	(3)		
2 at		5,600	11,200
1 at		2,800	2,800
			14,000
Toll Equipment	(13)	350	4,600

	<u>Booths</u>	<u>Toll Equipment</u>	<u>Service Buildings</u>	<u>Total</u>
Manley Highway	1,000	JD\$ 700	JD\$ 2,800	JD\$ 4,500
Causeway/Mandela Highway Combined	<u>5,500</u>	<u>3,850</u>	<u>11,200</u>	<u>20,500</u>
	6,500	JD\$4,650	JD\$14,000	JD\$25,100

Total Capital Cost: JD\$25,100,000

Capital Costs

For purposes of this report, assume a 20 percent cost of funds provided by Central Government Loans, repayable over a 30 year term, with interest and principal payments made every month.

Manley Highway	JD\$ 902,000 year
Causeway/Mandela Highway	JD\$ <u>4,110,000</u> year
Total	JD\$5,012,000 year

V. REVENUES AND TRAFFIC VOLUMES

TOLL ROAD FEASIBILITY STUDY
COST AND REVENUE PROJECTIONS

<u>COSTS</u>	<u>MANLEY HIGHWAY</u>	<u>CAUSEWAY/ MANDELA HIGHWAY</u>	<u>*COMBINED</u>
Annual Operating Cost	1,137,500	3,125,000	3,918,750
Annual Capital Repayment	<u>902,000</u>	<u>4,110,000</u>	<u>5,012,000</u>
TOTAL EXPENSES	2,039,505	7,235,000	8,930,750
 <u>REVENUES</u>			
JD\$1 Toll	1,872,000	7,800,000	9,672,000
JD\$2 Toll	3,744,000	15,600,000	19,344,000
 <u>INCOME</u>			
JD\$1 Toll	(167,000)	565,000	742,000
JD\$2 Toll	1,705,000	8,365,000	10,413,250

* Combined operating expenses reflect certain economies of scale and therefore are less than the sum for the two roads.

A. CONCLUSIONS

From a financial perspective only, at a JD\$2 toll, the project appears positive. With tolls set at JD\$1 the Manley Highway operates at a loss and the Causeway/Manela Highway operate at less than an 8% profit rate. Only at a JD\$2 toll do potential profits reach JD\$1.7 million on the Manley Highway and JD\$8.3 million on the Causeway/Mandela Highway. However, to generate the JD\$8.3 million, both roads must be tolled. There are a number of significant uncertainties that could undermine the project's viability:

- . The key assumption on revenue generation, is the number of vehicles that will pass thru the tolls each day. These numbers are soft and subject to wide variations in driver behavior.
- . The secondary assumption is the cost of construction and operation of toll facilities. Here again, there is no local experience operating toll facilities.
- . Fixed capital costs are very high, requiring a long term payback of costs. A significant falloff of traffic or significant traffic diversions makes the project very risky.

In addition to the financial perspective, there are significant public issues, discussed earlier, on the necessity and validity of a toll system that must be considered.

VI. OTHER ISSUES

A. ALTERNATIVE ROUTES

Many of the people interviewed for this report suggested that if a toll road were to be established in Jamaica, that it would only be fair to give people an alternative access road that was free. This comment was made by several of the officials interviewed. This runs very much counter to a philosophy of toll roads in the U.S. It would be considered poor planning to toll the facility if there was an easily available alternative. This leads to extensive diversions of traffic and consequent delays on the alternative routes, and obviously results in a loss of revenue.

B. TOKENS

A number of people have suggested the possibility of using tokens on a toll system in Jamaica. It must be borne in mind that tokens are valuable and should be treated exactly like cash. Tokens add an additional level of accountability problem to any toll system.

C. ALTERNATIVE REVENUE SOURCES

There are a number of municipal programs that could generate revenue for the local government that might be more successful than the toll road alternative. They are enforcing truck weight rules, enforcing parking regulations in downtown Kingston, and installation and maintenance of a parking meter program.

- . Truck Weight - enforcing truck weight regulations with scales and enforcement officers.
- . Parking Endorsement - enforcing restrictions against double parking and other violations in the downtown section.
- . Parking Meters - charging for parking in congested areas and issues fines when they are violated.

The key to a successful enforcement program is an effective enforcement system. A violator must know that there is a very high probability that he will actually be charged the fine that was imposed. Fines should be at a painful enough level to be a deterrent and if not paid should lead to a penalty such as a hold on vehicle registrations or even the towing of the vehicle, holding it for redemption and, if necessary, selling it at auction.

D. ALTERNATIVE TOLL SCENARIOS

An alternative toll scheme would include two-way tolls on the Nelson Mandela Highway, keeping the Causeway free. Toll could only be imposed for a 12 hour daylight period. This scenario would not significantly improve the financial outlook, but could introduce significant traffic diversions and consequent traffic congestion on other roads.

APPENDIX A

List of officials interviewed for this project:

Superintendent Roach	Traffic Division
Victor Parkins	Deputy Financial Secretary, Ministry of Finance and the Public Service
Colin Ifill	Director of Taxes
Ron Brown	Permanent Secretary, Ministry of Construction (Works)
Alfonso Marshall	Ministry of Construction (Works)
John Clark	Director of Technical Affairs, Ministry of Construction (Works)
Marie Atkins	Mayor, KSAC
Phillip Duncan	Town Clerk, KSAC
John Pereira	Chief Engineer, Urban Development Corporation
Howard Taylor	General Manager, Airports Authority of Jamaica
George Deikun	RHUDO, U.S. Agency for International Development
Thomas McAndrews	RHUDO, U.S. Agency for International Development

APPENDIX B

TERMS OF REFERENCE

ASSESSMENT OF PROPOSAL TO ESTABLISH A ROAD TOLL SYSTEM
FOR THE KINGSTON METROPOLITAN AREA

I. Background

The Kingston and St. Andrews Corporation (KSAC) has recently taken the decision to explore the possibility of establishing a toll system for several major thoroughfares in the Kingston Metropolitan Area (KMA). This action was taken in response to increasing demand for additional budgetary resources for the Corporate area, which are composed of both resources generated locally by the corporation and additional support from the central government budget. This proposal is currently under review by local and central government officials of the Ministry of Local Governments.

II. Objective

The overall purpose of this consultancy is to make a series of recommendations to the KSAC and Minister of Local Governments (MLG) on how a KMA road toll system could be established with due consideration to the financial, administrative and technical elements.

III. Detailed Tasks

A. KMA Road Toll System Appraisal

In formulating recommendations to the KSAC and MLG, the consultant will be expected to make a preliminary assessment of the expected costs and benefits of at least the following elements of a proposed KMA road toll system:

1. administrative and hardware start-up costs
2. recurrent operating costs
3. availability of appropriate administrative and technical personnel in the KSAC and Jamaica to maintain and operate a toll system efficiently
4. possible schedule to establish a toll system
5. to the extent possible, review of current thinking and proposals and make suggestions for improvements in the system design, including the placement of toll booths, which are most appropriate in the KMA context and which could maximize potential profits.

6. to the extent possible, estimate of potential revenues, using the best available estimates on traffic flows in the proposed toll locations
7. to the extent possible, estimate of the potential annual profit to the KSAC of a road toll system (potential revenues less recurrent operating and amortized start-up costs)

This is an indicative list of areas to be assessed by the consultant. The assessment and recommendations are not meant to be based upon an exhaustive feasibility analysis but rather, should be undertaken with the view toward providing some initial recommendations and benchmarks to provide a basis upon which Jamaican institutions can make a decision to go forward or not with a KMA road toll system.

IV. Personnel Requirements

The services of a transportation planner or related profession with previous experience in toll system design is required for a period of up to nine days (up to seven days of fieldwork and two days of report writing time).

V. Reporting Requirements

The consultant will prepare a paper summarizing his/her findings and recommendations for presentation to USAID/Jamaica and the Ministry of Local Governments in Jamaica. Prior to departing Jamaica the consultant will prepare a draft report of his/her major findings and recommendations and brief USAID/Jamaica and the Minister of Local Governments. The consultant will prepare and submit to USAID/J a full draft report within two weeks of departure from Jamaica. This draft report will be finalized within two weeks of receipt of any comments from USAID on the draft.

VI. Schedule

The consultant will begin work in Jamaica o/a ^{April 17} ~~March 12~~, 1990.

Memorandum

DATE April 24, 1990

TO Mrs. Alexander
Permanent Secretary

FROM Ministry of Local Government

RE Lawrence Yermack
Proposed Work Plan

I will be in Kingston April 30-May 4 to explore the potential for toll roads in the metropolitan area. I hope to hold a series of meetings with local government officials in both policy and operating departments. The following are the areas I wish to explore:

1. Potential Toll Roads/Facilities

- Location of Toll Stations
- Availability of Alternative Routes
- Traffic Volume - Current and Projected
- Origin and Destination of Vehicles
- Elasticity of Demand
- Potential Gross Revenue From Toll Roads

2. Capital Investment

- Toll Facility
- Toll Collection Equipment
 - . Manual Lanes
 - . Automatic Coin Machine
 - . Toll Registry Equipment

3. Operating Costs

- Toll Collection
- Audit and Security
- Staff Training and Equipment
- Administrative Services
- Road Maintenance
- Road Improvements

4. Cost and Revenue Projections

5. Timetable

TOLL ROAD FEASIBILITY STUDY
KINGSTON AND ST. ANDREW CORPORATION
OUTLINE PRESENTED MAY 4, 1990

- I. OVERVIEW OF TOLL ROADS
 - A. Establishment of Toll Roads
 - B. Relationship to State and Local Government
 - C. Political Acceptance
 - D. Jurisdiction
 - E. Operations:
 - 1. Plaza Design
 - 2. Collection Methods and Direction
 - 3. Accountability and Security
 - 4. Vehicle Classification
 - F. Organization Structure
- II. POTENTIAL TOLL ROAD LOCATIONS IN KSAC:
 - A. Norman Manley Highway
 - B. Causeway/Nelson Mandela Highway
- III. OPERATING COSTS:
 - A. Operations
 - B. Maintenance
 - C. Security & Enforcement
 - D. Administration
- IV. REQUIRED CAPITAL INVESTMENT:
 - A. Toll Plaza
 - B. Toll Equipment
 - C. Service Building
 - D. Source of Funds

V. TRAFFIC VOLUME AND REVENUES:

- A. Traffic Volumes
- B. Potential Tolls
- C. Projected Revenues

VI. COST AND REVENUE PROJECTIONS/RECOMMENDATIONS

VII. OTHER ISSUES:

- A. Vehicle Classification
- B. Alternative Routes
- C. Alternative Revenue Sources

Doc. 0120J(p. 91-92)5/3/90