THE PROJECT FOR CAPACITY ENHANCEMENT OF KCCA IN MANAGEMENT OF TRAFFIC FLOW IN KAMPALA CITY IN UGANDA

PROJECT COMPLETION REPORT

ANNEX-2

IMMEDIATE ACTION PLAN (IAP)

January 2022

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ORIENTAL CONSULTANTS GLOBAL CO., LTD.

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Pilot Project under the Project for Capacity Enhancement of KCCA in Management of Traffic Flow in Kampala City in Uganda Kampala Smart Traffic Project

Table of Contents

List of Figures & Tables

1 Background

1.1 Kampala Capital City Authority (KCCA) and the Japan International Cooperation Agency (JICA) commenced the technical cooperation project, "the Project for Capacity Enhancement of KCCA in Management of Traffic Flow in Kampala City in Uganda" (hereinafter referred to as the "Kampala Smart Traffic Project" or the "KSPT") aiming to enhance the capacity of traffic flow management in 2015.

1.2 At present Kampala city has only 9 junctions which are being operated by traffic lights. However, practically many junctions are required to be signalized to improve the traffic flow and to keep balance with the incremental yearly traffic volume. App. 200 junctions are identified which are needed to be signalized in the long run in order to ensure smooth traffic flow of Kampala under KSTP. It is realized the signalizing the junctions can improve the traffic flow and safety compared to non-signalized junctions. However, the traffic flow in Kampala has a drastic hourly and daily fluctuation. It is observed that considerable inbound traffic in morning peak and outbound traffic in evening peak on radius arterial road are the main causes of traffic congestion in Kampala.

1.3 In order to support smooth management of Kampala traffic the Urban Traffic Management Plan (UTMP) is prepared by KSTP. In this report, as one of the possible solutions to manage this fluctuated traffic demand caused by time, weather and incident, adaptive signal control is recommended. Adaptive signal control generates traffic signal parameters in accordance with actual traffic situation and it is able to cope with sudden incident rather than responsive control based on the pre-timed signal plan. To address the uncertain traffic flow situation of Kampala Area Traffic Control using MODERATO technology is also recommended in UTMP.

1.4 Out of 200 candidate junctions, real time adaptive type signals should be installed in around 50 junctions. In addition, it was also recommended that a central traffic control centre is also necessary to coordinate all 200 traffic signals smoothly.

1.5 However, the establishment of the centre is a big challenge for KCCA because KCCA has no skill for how to operate. Moreover, the establishment of the Centre is a huge investment that requires careful considerations with various viewpoints in selection of the system. The Central Control Centre would be a very useful tool in traffic controlling, yet it shall be with appropriate operation and maintenance set-up which need some time to take place.

1.6 The JICA Expert team and the C/P came up with an idea of the Pilot Project containing signalizing number of junctions and set up small scale traffic control system in order to

be familiar with operation by KCCA personnel.

1.7 In consideration of situation on ground, it is planned to carry out the pilot project in 2 phases. In first phase, junctions will be signalized and the effectivity of signalizing the junctions will be studied. After that in second phase the adaptive control system using MODERATO will be installed in these junctions and effectivity of introducing this kind of system in Kampala will be studied. It must be mentioned that this type of system will be the first in East Africa region.

2 Objectives

2.1 As mentioned in the background the pilot project is planned to implement in two phases the objectives for each phase are also a bit different. The objectives of signalizing the junction under phase 1 are:

- To regulate the traffic flow
- To improve the traffic safety specially pedestrian

2.2 The objectives of installing MODERATO system are:

- To improve the junction capacity reducing loss time where traffic volume is less
- To improve overall traffic flow of the area

2.3 In order to introduce a brand new system it is necessary to study the probable challenges and figure out the possible solutions. In this pilot project it is also aimed to focus on the capacity enhancement of KCCA in order to handle traffic control system. In addition, it is necessary to experience the operation and maintenance for the system by the KCCA staffs. Therefore some additional objectives of introducing MODERATO system are:

- Technical verification under the Uganda's traffic characteristics for MODERATO type ATC system
- Verification and identifying the challenges for materials considering the users, infrastructure, weather condition etc.
- Examination of human resources and capacities for practical operation & maintenance of ATC by setting up mini central traffic control centre
- Estimation of budget and system requirements for full-scale operation in future

3 Contents

3.1 From the experience of the social experiment under KSTP it was understood that only signal installation cannot improve the situation if the geometry of the junction is not suitable. Therefore, 4 junctions are selected to implement the pilot project and necessary geometric improvement, signing and markings are proposed be completed before setting

up the traffic signals. Under phase 1, it is decided the traffic signals will be active as fixed time cycle.


Traffic Light Vehicles


Traffic Light Pedestrians


Traffic Signal Controller


Ultrasonic Traffic Detector


Image processing Traffic Detector

Source: http://www.signal.co.jp/english/products/ & http://www.kyosan.co.jp/english/product/product03-04.html

Figure 1 Image of the Products Expected to be Installed under the Pilot Project

3.2 In Phase 2, in order to capture the real time traffic data necessary number of detectors will be set up at designated locations and the data will be sent to each signal controller. The detectors going to be used in the pilot project will be two types: ultrasonic type and camera type. Ultrasonic type detectors will be set up for each lane; however image processing traffic detectors can detect as many as 4 lanes together.

3.3 The signal phase will be changed in certain interval based on the real time traffic volume which will be counted by the detectors. The server using for MODERATO traffic control system is planned to be set up at KCCA from where the junctions will be operated and managed. The signal controller of target junctions will be connected through high speed internet with MODERATO server.

3.4 The server of KCCA will be connected in such a way so that the process can be supervised from Japan using Virtual Private Network (VPN) and in case any adjustment or intervention is required for the system also can be done. The overall concept of controlling the junctions using MODERATO under the pilot project is described in Figure 2.

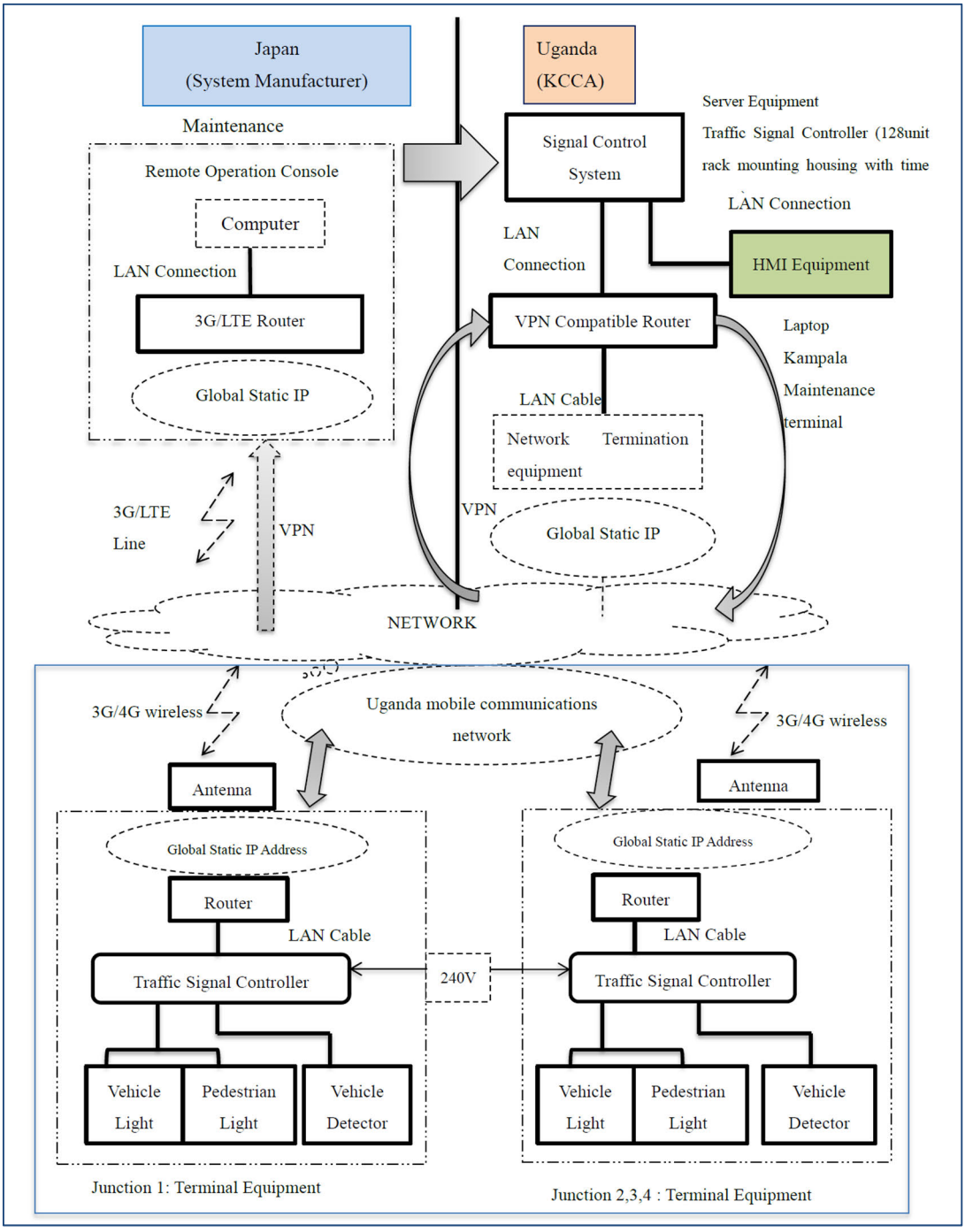


Figure 2 Concept Idea of Operation and Maintenance of the Junctions using Control System

4 Target Area

4.1 An area in central Kampala is selected where the junctions are closed located and where congestion is an issue during peak hour. The selection criteria of the planned area for the pilot project were decided as:

- Area where junctions covering multiple routes and with high traffic demand

- Junctions with significant congestion during peak hour
- Junctions where safety is a concern at present
- Junctions with minimum geometric design improvement civil works required
- Junctions which are not covered by any existing improvement plan under another projects

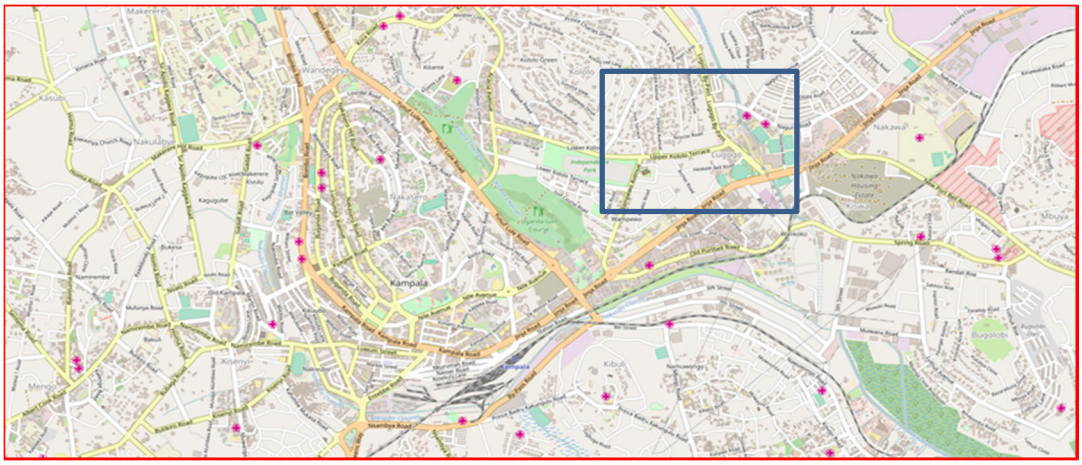


Figure 3 Location of Target Area for the Pilot Project in Kampala

4.2 The area which fulfilled the criteria is located in Upper Kololo and Lugogo bypass area. The targeted junctions are named as (1) Kololo Junction, (2) Naguru Junction, (3) Katikati Junction and (4) Game Jinja Road Junction.

4.3 The area and junctions were selected based on the series of discussion with the KCCA counterparts.

Figure 4 Target Junctions for the Pilot Project

5 Implementation Process

5.1 Planning Stage

5.1.1 **Field Observation Survey:** JICA Experts for this technical cooperation project investigated every junction and identified the present issues related with geometry which may be a concern for traffic flow and safety. The tentative locations for the installation of vehicle detectors are also selected based on the traffic movement.

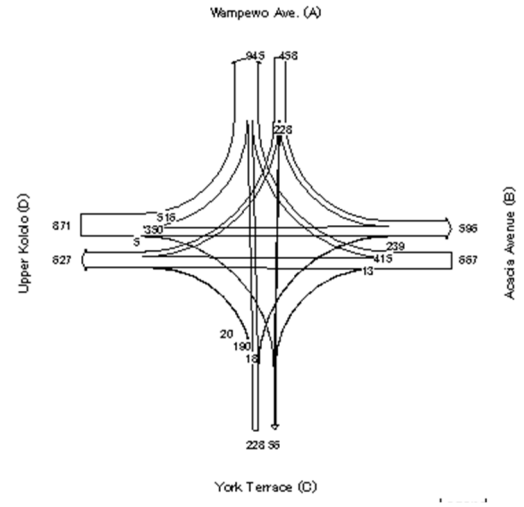
Figure 5 JICA Experts for Field Investigation

5.1.2 **Traffic Count Survey:** Traffic count surveys were carried out in each junction

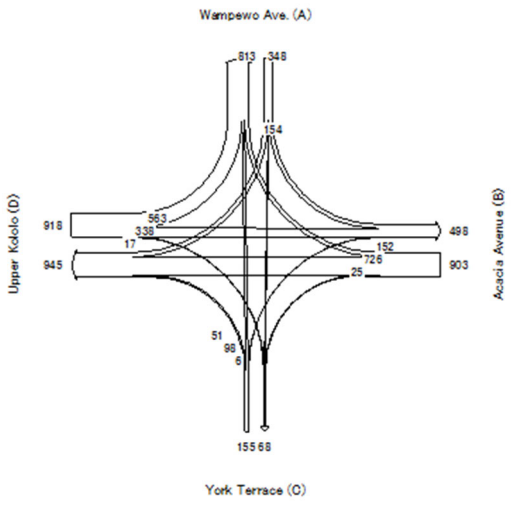
during June 2016. As traffic data is an important item for improvement of junction in order to get the accurate result precautions were taken accordingly.

- The survey was carried out in normal weekdays avoiding Monday and Friday.
- 3 hours video data were collected for morning peak (7:00 ~ 10:00) and evening peak (16:00 ~ 19:00) for each junction. The time duration for peak period is selected by studying the previous related reports.
- Directional traffic counts for every 15 minutes were carried out in-house watching the video data.

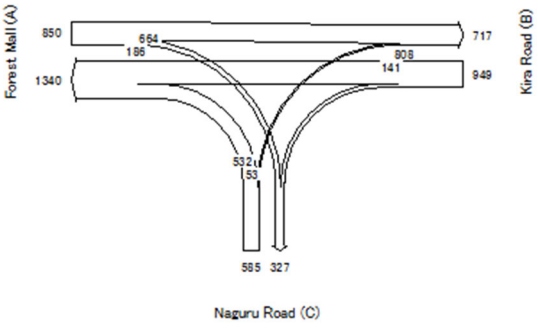
  Detailed traffic volume data can be found in Appendix 1.



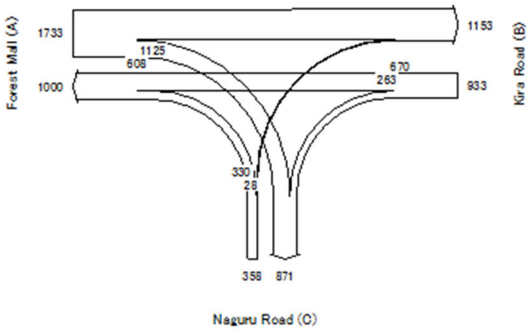
Junction 1 Morning (PCU/hour)



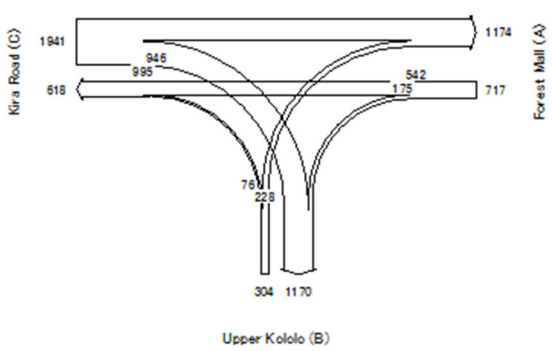
Junction 1 Evening (PCU/hour)



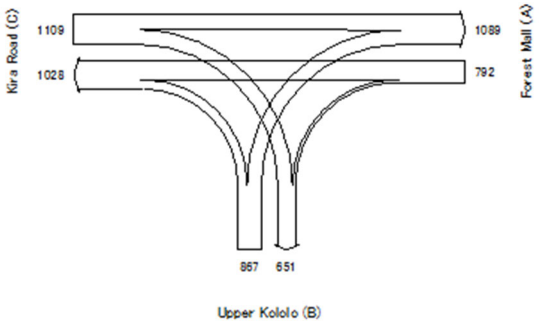
Junction 2 Morning (PCU/hour)



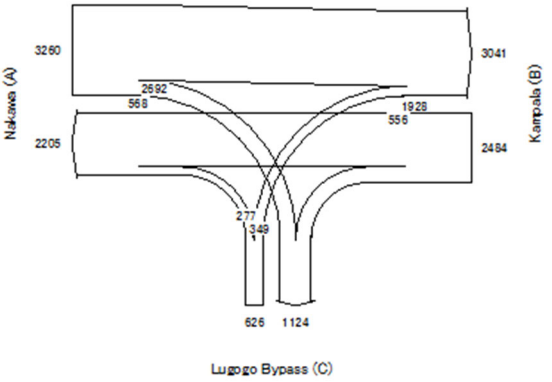
Junction 2 Evening (PCU/hour)



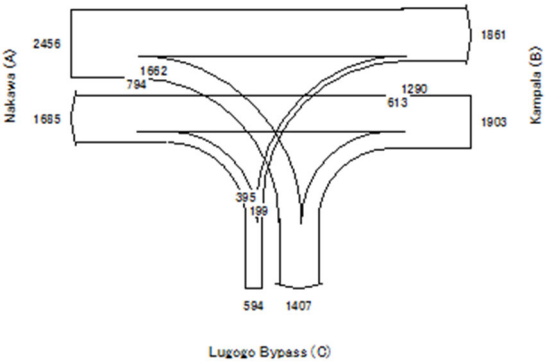
Junction 3 Morning (PCU/hour)



Junction 3 Evening (PCU/hour)



Junction 4 Morning (PCU/hour)



Junction 4 Evening (PCU/hour)

Figure 6 Directional Distributions of the Junctions under Pilot Project

5.1.3 **Travel Speed Survey:** Travel speed survey using free flow car method with handheld GPS was carried out in the pilot project area. In order to understand the traffic flow situation during morning peak, off-peak and evening peak the survey was carried out in normal business day. However, due to time and resource constraint, the survey was conducted using only one car for 1 day in total 8 times.

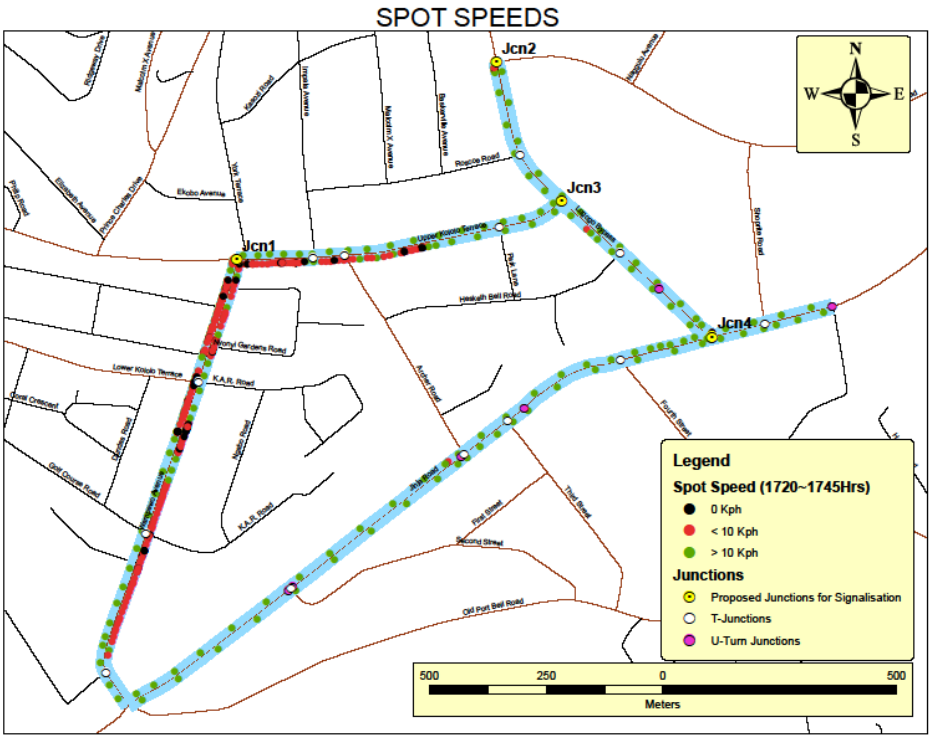


Figure 7 A Sample of Spot Speed Map Collected by Travel Speed Survey

5.1.4 **Signal Phase Design:** From the traffic count data it seemed in the morning the traffic volume is more so that preliminary signal phase timing was designed based on hourly average morning traffic flow of 7AM~10AM.

In phase 1, the signal cycle and phase timings will be preinstalled based on the traffic count data. In order to design the signal phase present conflicting points around the junctions were also taken into consideration. Due to special request from KCCA, a dedicated pedestrian stage is decided to be installed. The reason behind that is the drivers of Kampala do not provide consideration for pedestrians even when the pedestrian green is on. Another important change was in order to reduce starting delay to introduce amber red for the direction which will be turned into green in the next stage. Therefore, the final phase design of the signal controller has been upgraded from 12 steps to 19 steps.

In total 6 patterns will be installed in order to adjust the timings based on traffic volume change for different time of the day. Pattern is the settings when the signal timings will be changed from one type to another.

In phase 2, the signal timing will be adjusted based on the proportion of real traffic flow in the field using MODERATO technology. However, in case any kind of

mechanical failure occurred such as disconnection with server the signals will be operated by using its pre-set up pattern.

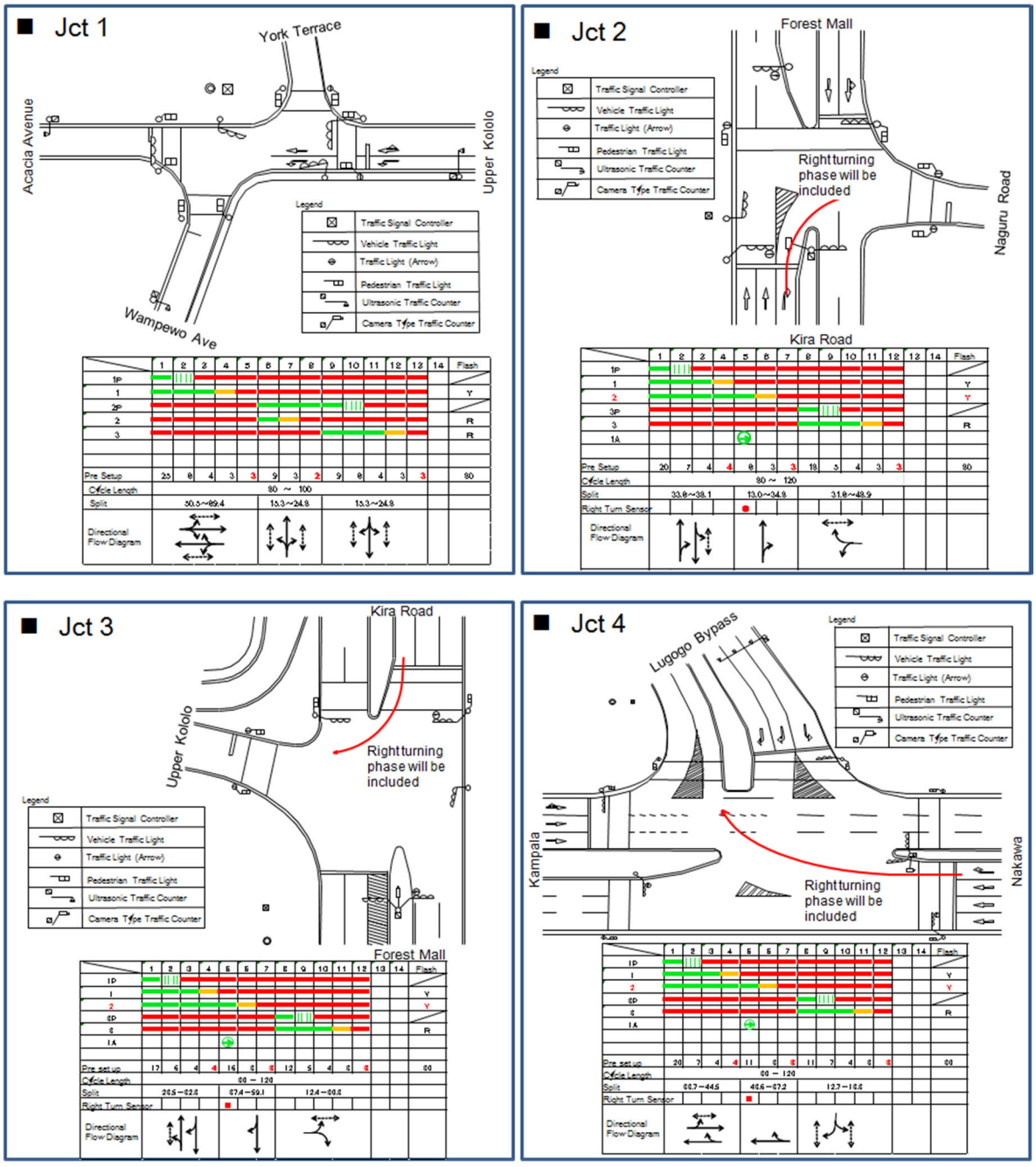
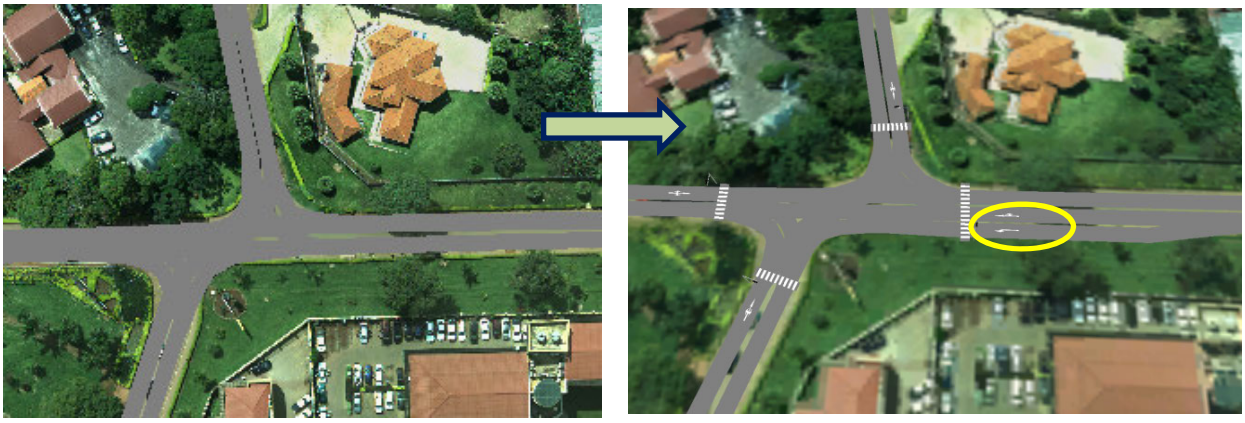


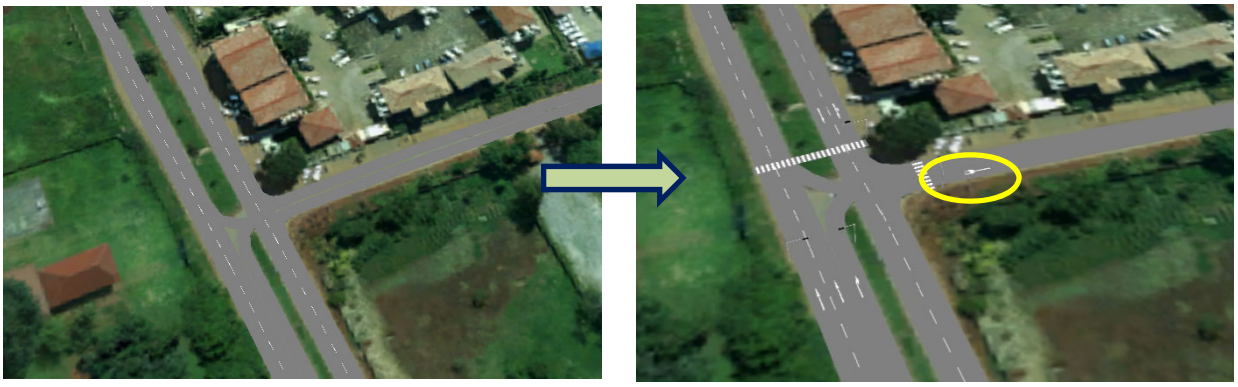
Figure 8 Preliminary Design Concept of Signal Phasing & Staging

5.1.5 **Improvement of Geometric Design:** Based on the peak hour traffic volume and preliminary signal phasing the geometric improvement design was prepared and proposed to KCCA. As the geometric improvement also may need other consideration such as utility transfer, therefore the geometric improvement has been

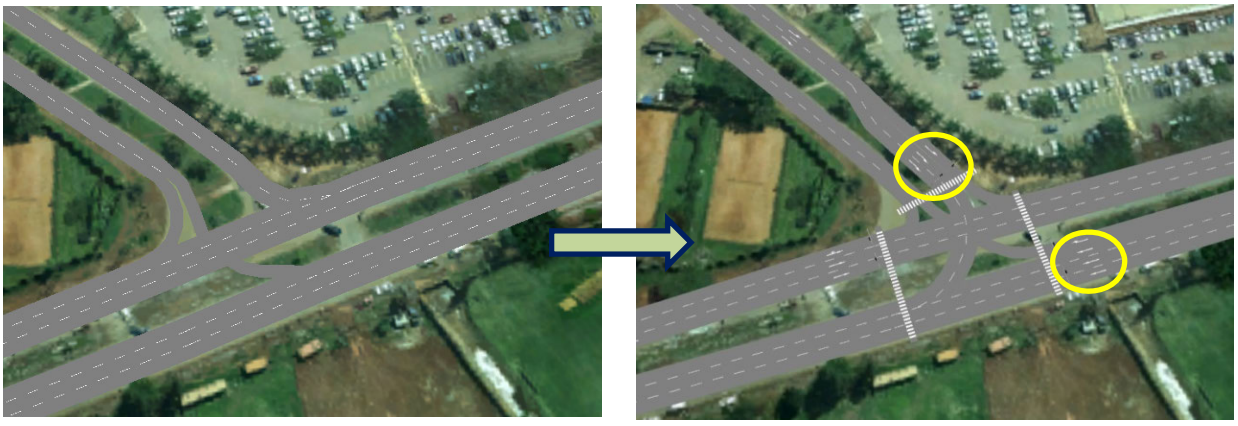
finalized by KCCA side based on JICA team's suggestion.



Jct 1 : Dedicated left turning lane from Upper Kololo to accommodate left turning vehicles



Jct 2: The vehicles from Naguru can turn right during green phase



Jct 4: Additional right turning lane from Jinja and right turning lane from Lugogo Bypass

Figure 9 Proposed Geometrical Improvement in Different Junctions (Vissim Image)

5.1.6 **Prepare Microsimulation Model:** 1 hour traffic simulation has been prepared using microsimulation software VISSIM in order to show the counterparts and stakeholders how the situation can be improved after installation of traffic signals. The simulation is prepared for 3 different cases: No signal (present), Traffic signal

fixed time (as of after implementation phase 1) and traffic signal controlled by MODERATO (as of after implementation phase 2).

The result shows the delay time can be reduced by 35% and average travel speed can be increased by 47% in the network compared to present if MODERATO type traffic control system can be introduced.

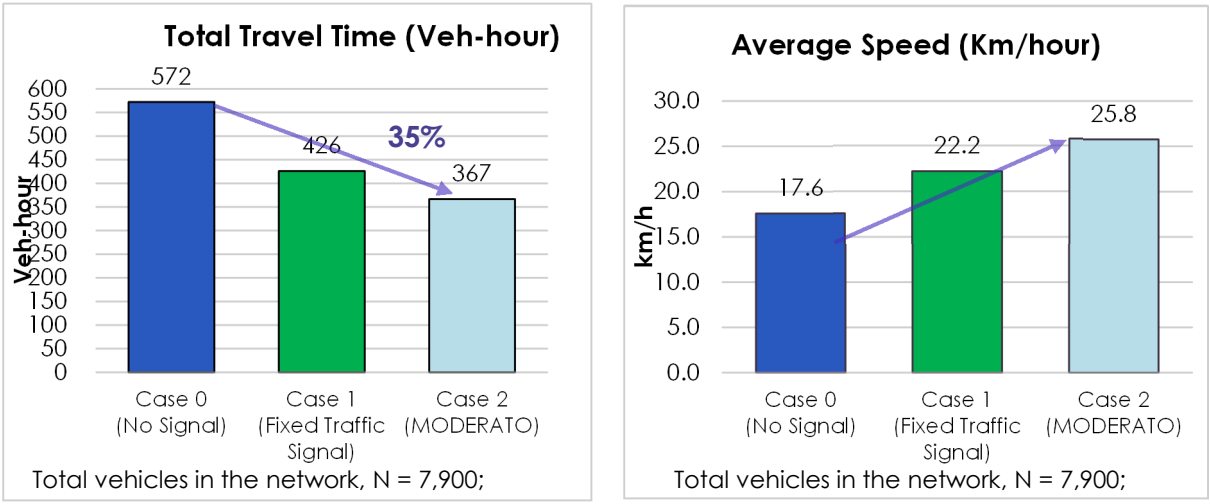


Figure 10 Result of Different cases using Micro Simulation

Figure 11 Image of Micro Simulation using VISSIM

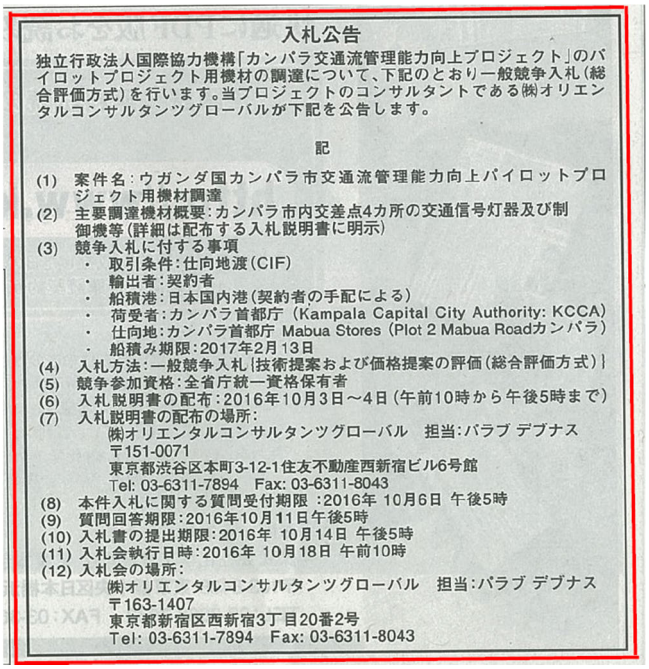
5.2 **Procurement Process:** Basically it was decided that traffic signal equipment will procured by Japanese side and installation and other civil works should be done by KCCA side. In addition, various types of poles, necessary cables and connection from each junction to central control system will also be installed by KCCA.

5.2.1 The procurement process by Japanese side was divided into 2 parts. Traffic lights and signal controllers for each junction will be purchased under the supervision of Oriental Consultants Global in phase 1 and traffic control system, server and detectors etc. will be directly procured in phase 2 by the JICA procurement department. Technical personnel to set up the whole system are expected to be in Kampala once the products of phase 1 arrived here.

5.2.2 The tendering of phase 1 has been completed in Oct 2016 in Japan. The key dates of the tendering process are described in Table 1.

Table 1 Key Milestone for Pilot Project Procurement by Phase 1

Dates	Activities
3 Oct '16	Tender was published in Japanese newspaper named 'The Daily Engineering and Construction News'.
3 - 4 Oct '16	Tender document distribution
6 Oct '16	Deadline to submit questions regarding the tender
10 Oct '16	Deadline to answer the questions to all bidders
14 Oct '16	Deadline to submit proposals (Technical and Financial separately)
18 Oct '16	Proposal evaluation and declaration of the successful bidder
11 Nov '16	Contract Signature



入札公告

独立行政法人国際協力機構「カンパラ交通流管理能力向上プロジェクト」のパイロットプロジェクト用機材の調達について、下記のとおり一般競争入札（総合評価方式）を行います。当プロジェクトのコンサルタントである㈱オリエンタルコンサルタンツグローバルが下記を公告します。

記

(1) 案件名：ウガンダ国カンパラ市交通流管理能力向上パイロットプロジェクト用機材調達
(2) 主要調達機材概要：カンパラ市内交差点4カ所の交通信号灯器及び制御機等（詳細は配布する入札説明書に明示）
(3) 競争入札に付する事項
・ 取引条件：仕向地渡（CIF）
・ 輸出者：契約者
・ 船積港：日本国内港（契約者の手配による）
・ 荷受者：カンパラ首都庁（Kampala Capital City Authority: KCCA）
・ 仕向地：カンパラ首都庁 Mabua Stores（Plot 2 Mabua Roadカンパラ）
・ 船積み期限：2017年2月13日
(4) 入札方法：一般競争入札｛技術提案および価格提案の評価（総合評価方式）｝
(5) 競争参加資格：全省庁統一資格保有者
(6) 入札説明書の配布：2016年10月3日～4日（午前10時から午後5時まで）
(7) 入札説明書の配布の場所：
㈱オリエンタルコンサルタンツグローバル　担当：パラブ デブナス
〒151-0071
東京都渋谷区本町3-12-1住友不動産西新宿ビル6号館
Tel: 03-6311-7894　Fax: 03-6311-8043
(8) 本件入札に関する質問受付期限：2016年 10月6日 午後5時
(9) 質問回答期限：2016年10月11日午後5時
(10) 入札書の提出期限：2016年 10月14日 午後5時
(11) 入札会執行日時：2016年 10月18日 午前10時
(12) 入札会の場所：
㈱オリエンタルコンサルタンツグローバル　担当：パラブ デブナス
〒163-1407
東京都新宿区西新宿3丁目20番2号
Tel: 03-6311-7894　Fax: 03-6311-8043

Figure 12Tender Publication on Japanese Newspaper for Phase 1

5.2.3 The success bidder for signal equipment supply was decided by combined evaluation of technical and financial evaluation using 2 envelop system. The weightage between technical and financial proposal was decided as 60:40. Interested parties were asked to submit the technical proposal regarding how these traffic lights can improve the traffic situation and operated by using MODERATO technology in future. In addition, previous experience of working in Africa region was also considered during technical evaluation.

5.2.4 2 companies collected the tender documents, however only one company submitted the proposals within the deadline called 'Nippon Signal Company Ltd.'. The company achieved 41 points out of 60 in the technical part. After the technical evaluation envelop for financial proposal was opened in front of representatives of the bidding party and JICA. As the quoted cost was below the estimated budget, Nippon Signal Company Ltd. was awarded the tender to supply the traffic lights and other equipment under phase 1.

5.2.5 The procurement of phase 2 by JICA procurement department has been completed and the Nippon Signal Company is awarded the contract for supplying the equipment for MODERATO system and other necessary items on August 2017.

5.2.6 Regarding the procurement of the civil works and necessary poles & cables KCCA engaged the contractor from June 2017 and all the civil works including the installation of poles and cables has been completed by January 2018.

5.3 **Overall Schedule:** Even though the procurement process under phase 1 has been completed as schedule due to various external issues the procurement of civil works and phase 2 has been delayed. Overall revised implementation schedule of the pilot project is described in Figure 13.

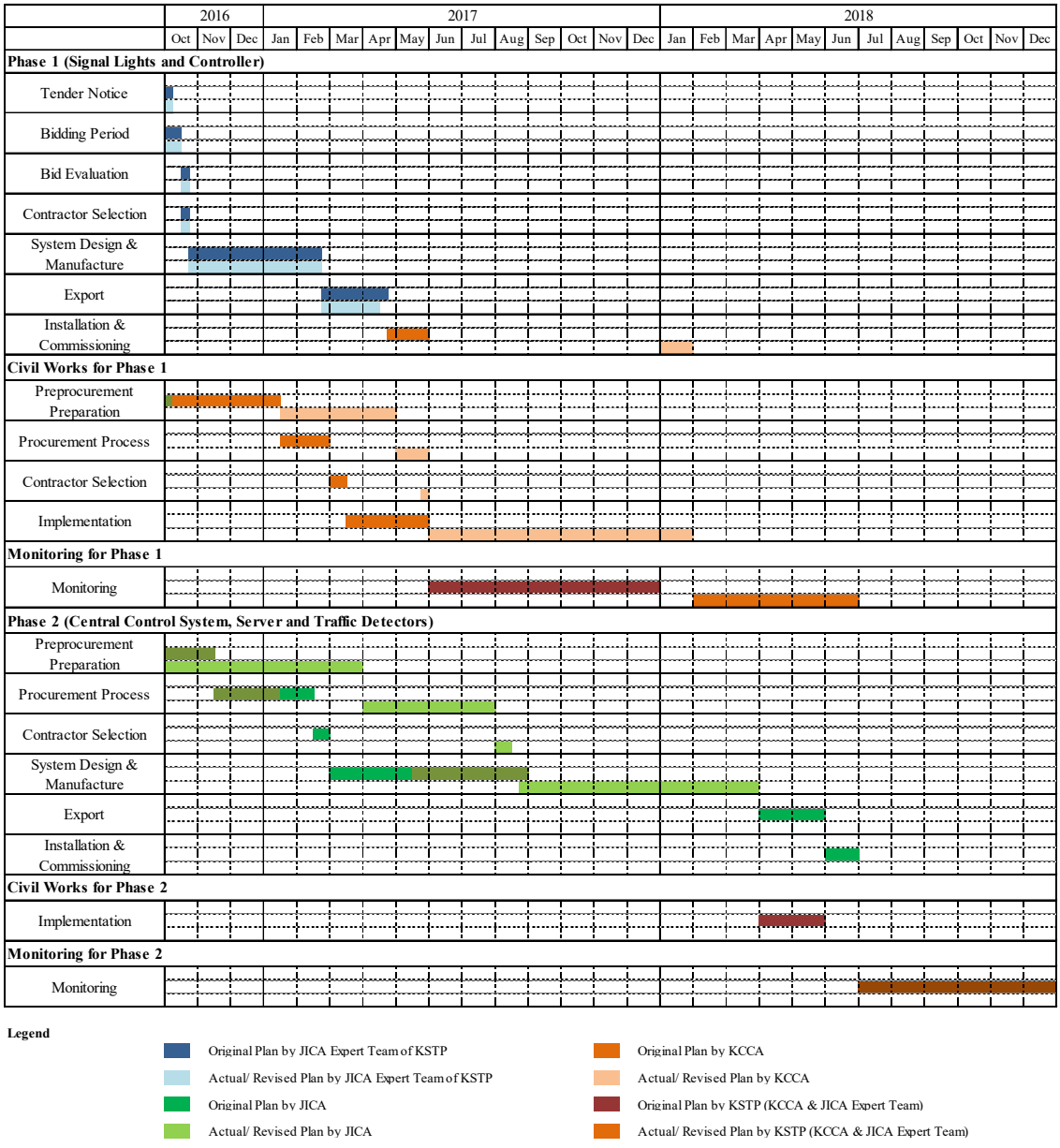


Figure 13 Overall Flow of Pilot Project Activities

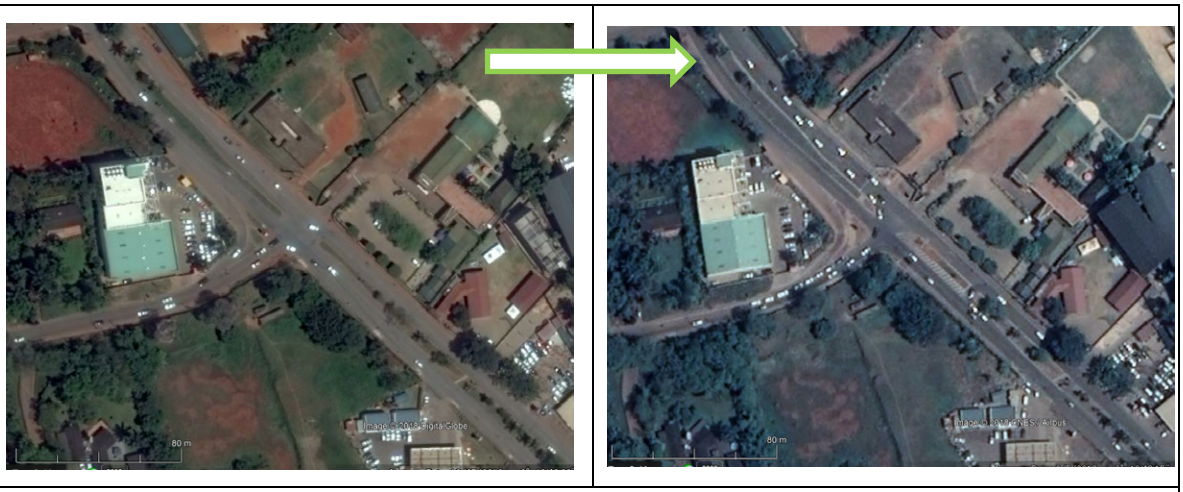
6 Installation & Commissioning

6.1 Civil works of junction improvement has been started from May 2017 and continued up to January 2018. Installation of electrical wires and other equipment have been started from November 2017 and simultaneously continued with civil works. Details of the completion of works are described in Appendix.

6.2 Major junction improvement works were taken place at junction 1 where the road width of Upper Kololo Road has been expanded for quite a long distance up to the intersecting point with Archer road. Major changes by geometrical improvement are shown at **Figure 9**.

Junction 1 Wampeo

Junction 2 Naguru

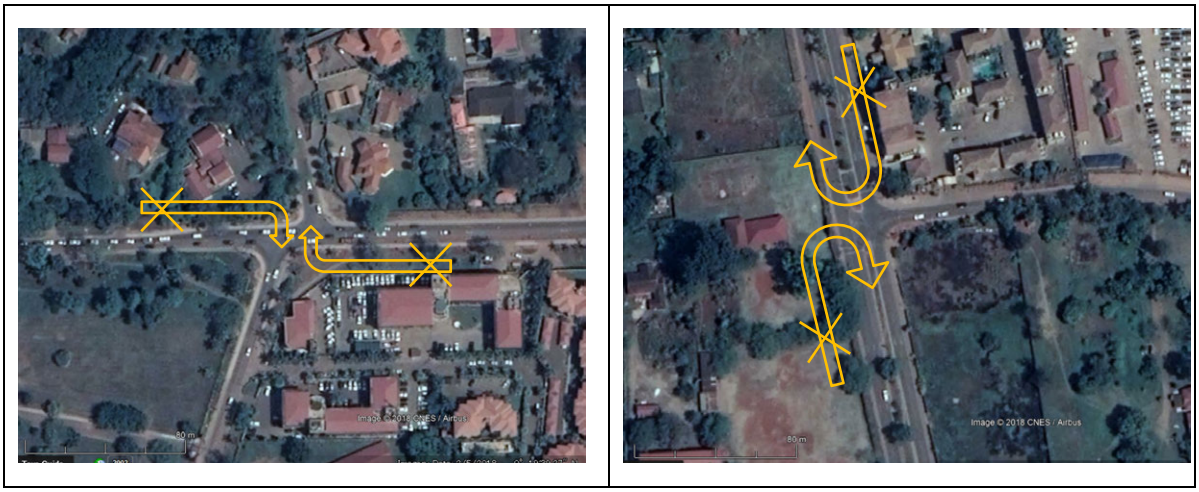


Junction 3 Katikati

Junction 4 Game (Jinja Road)

Figure 14 Geometrical Improvement of the Junctions (source: Google Earth Image)

6.3 Some new traffic regulations are also in effect in order to achieve better and smooth traffic flow at the junctions.



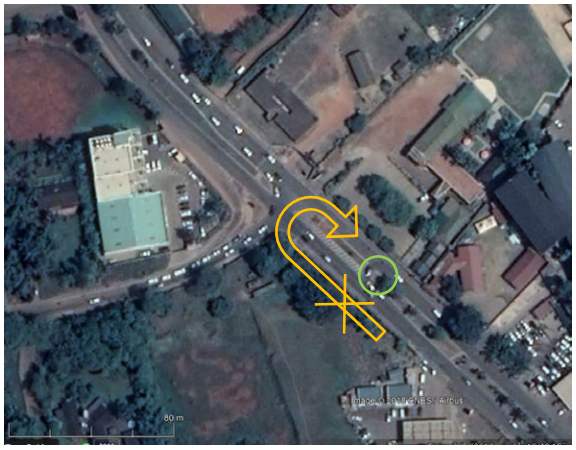
Right turn from both direction of Upper Kololo is banned	U-turn from both direction of Lugogo Bypass is banned
	
U-turn at the junction is banned as a U-turn lane is installed before the junction (green circle)	

Figure 15 Regulation in effect as the Signals are in Operation

6.4 Connections of signal lights are checked by JICA team at the end of January 2017 and connection errors are fixed by the sub-contractor. Signal timings are preinstalled by the supplier at the signal controllers. However, before operation KSTP team had intense discussion with KCC engineers and revised the signal timings for off peak and midnight. Prior to signal operation newspaper advertisements and social media campaigns were placed and people were aware of the forthcoming traffic control.


Figure 16 Modifying of the Signal Timings Using Control Panel

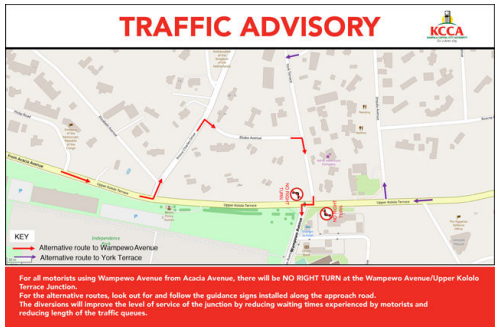
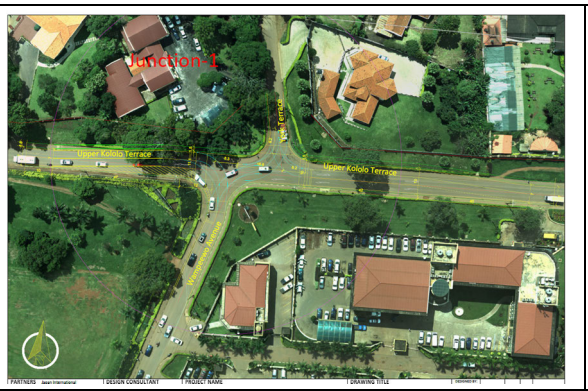
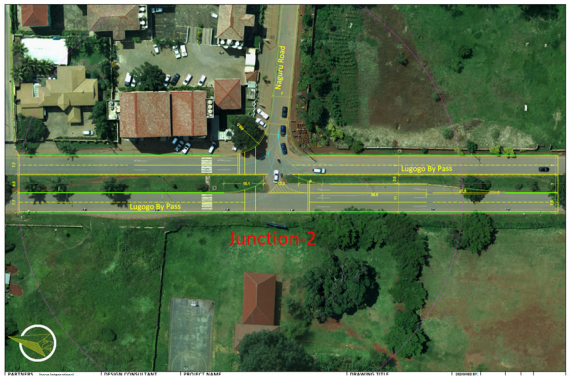
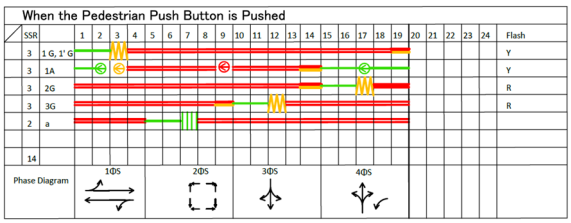
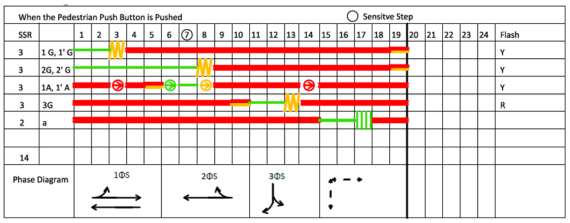


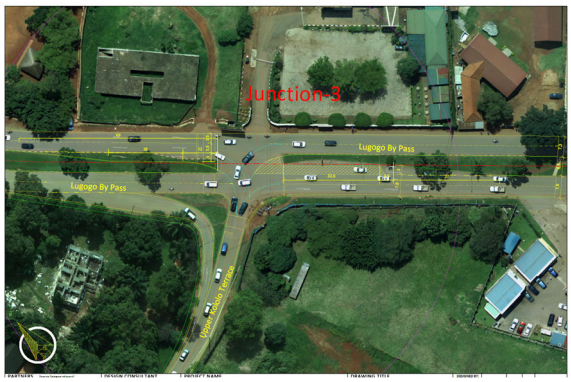
Figure 17 Social Media Campaign by KCCA for Traffic Advisory

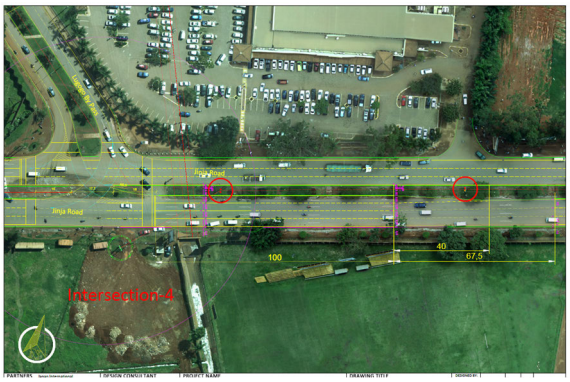












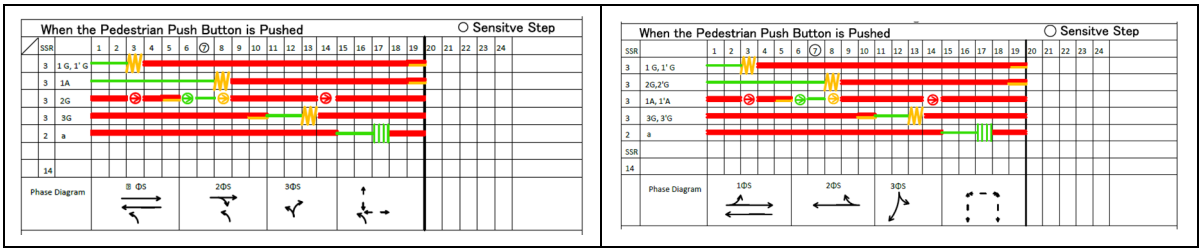
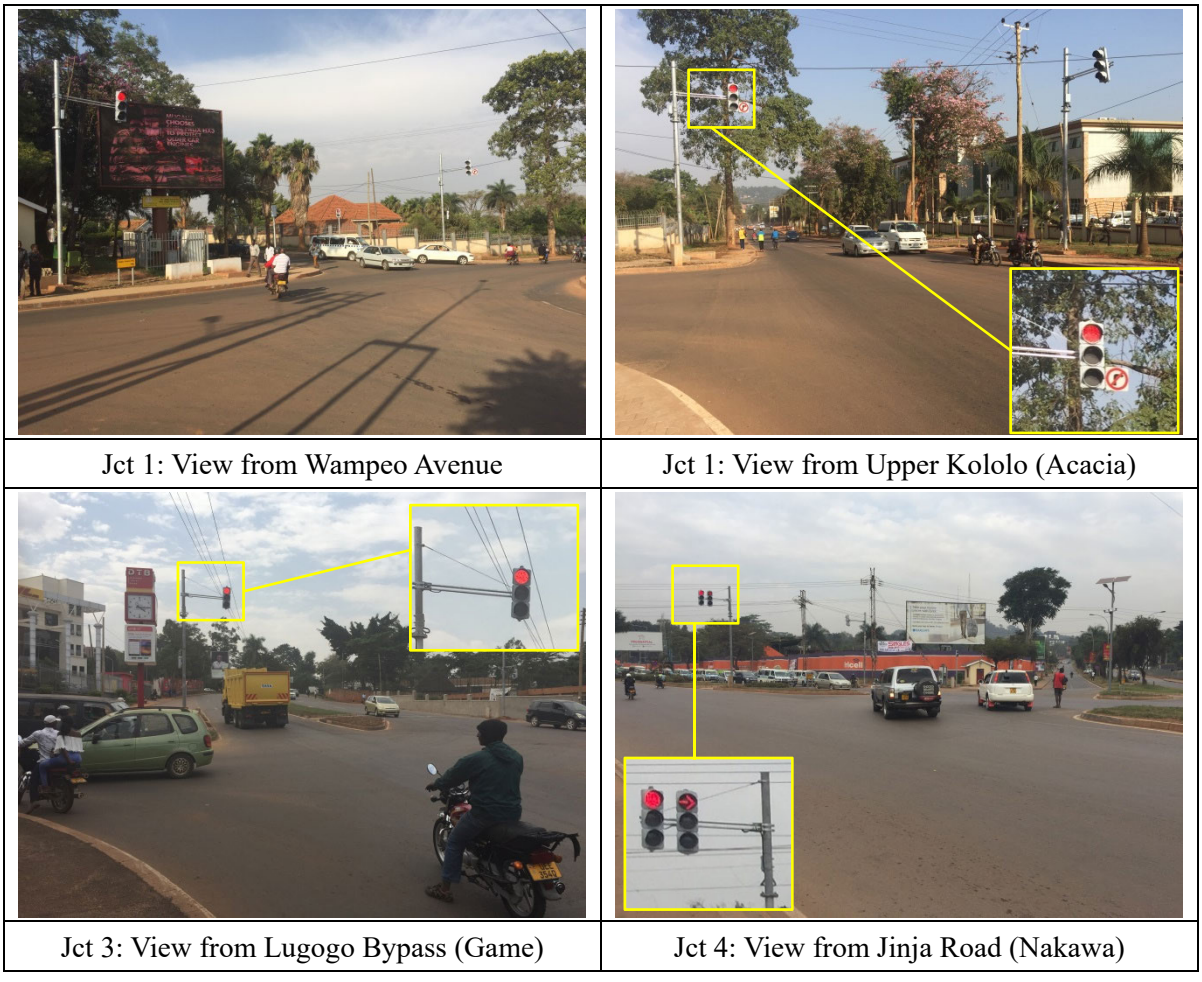


Figure 18 Final Junction Layout and Stage Diagram

6.5 Traffic lights of 3 junctions at Wampeo, Katikati and Game (Jinja Road) were switched on 2nd February and the vehicles are controlled by the lights only. Even in the peak hour when the junctions are congested due to heavy traffic the police are not interfering and the users are getting used to be regulated by the lights.



Jct 1: View from Wampeo Avenue	Jct 1: View from Upper Kololo (Acacia)
Jct 3: View from Lugogo Bypass (Game)	Jct 4: View from Jinja Road (Nakawa)

Figure 19 Installed Traffic Lights in Operation

7 Monitoring of Pilot Project

7.1 To check the performance of the traffic lights monitoring of the junctions will be done on regular basis. Due to capacity constraint junction 1 and due to traffic volume junction 4 are considered to be most critical out of 4.

7.2 As the pilot project is going to have 2 visible phases it was planned to monitor the junction performance in separate

7.3 Traffic volume after the signalization was compared with one with before the signalization.

Table 2 Traffic Volume before and after Signalization

Number of Vehicle (PCU/hour)

	AM Peak			PM Peak		
	2016	2019	% Change	2016	2019	% Change
Jct1	1,901	2,590	27%	2,068	2,374	13%
Jct2	2,348	3,197	27%	2,817	2,934	4%
Jct3	2,777	2,768	0%	2,589	2,876	10%
Jct4	5,764	6,046	5%	4,393	5,054	13%
	12,790	14,601	12%	11,867	13,238	10%

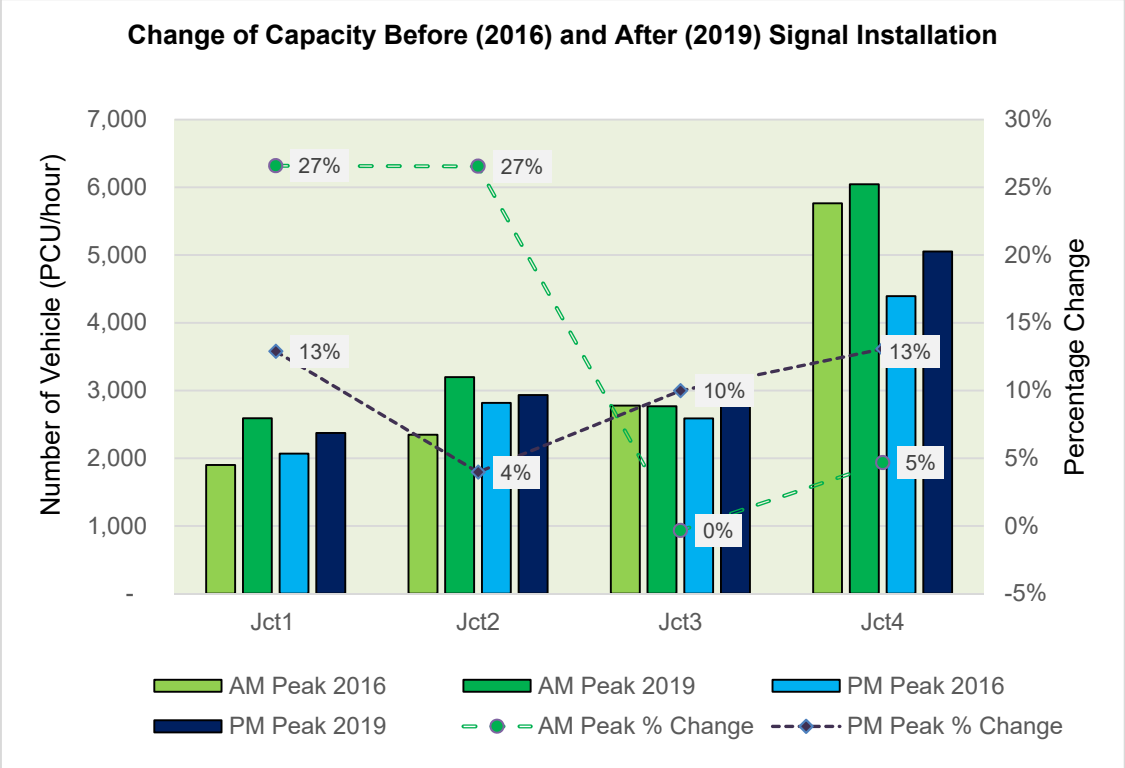


Figure 20 Traffic Volumes before and after Signalization

7.4 Improvement of 10% traffic capacity has been observed by a comparison between at

June 2016 (before signalization) and at June 2019 (after signalization).

7.5 Most improved junction was the junction No.1 by 27% at AM peak and 13% at PM peak.

7.6 A travel time survey of the network including the pilot junction was conducted in May 2020. The objective of the survey was to confirm the MODERATO control impact by comparing of the non-signalized, the pre-fixed signal control and the MODERATO control.

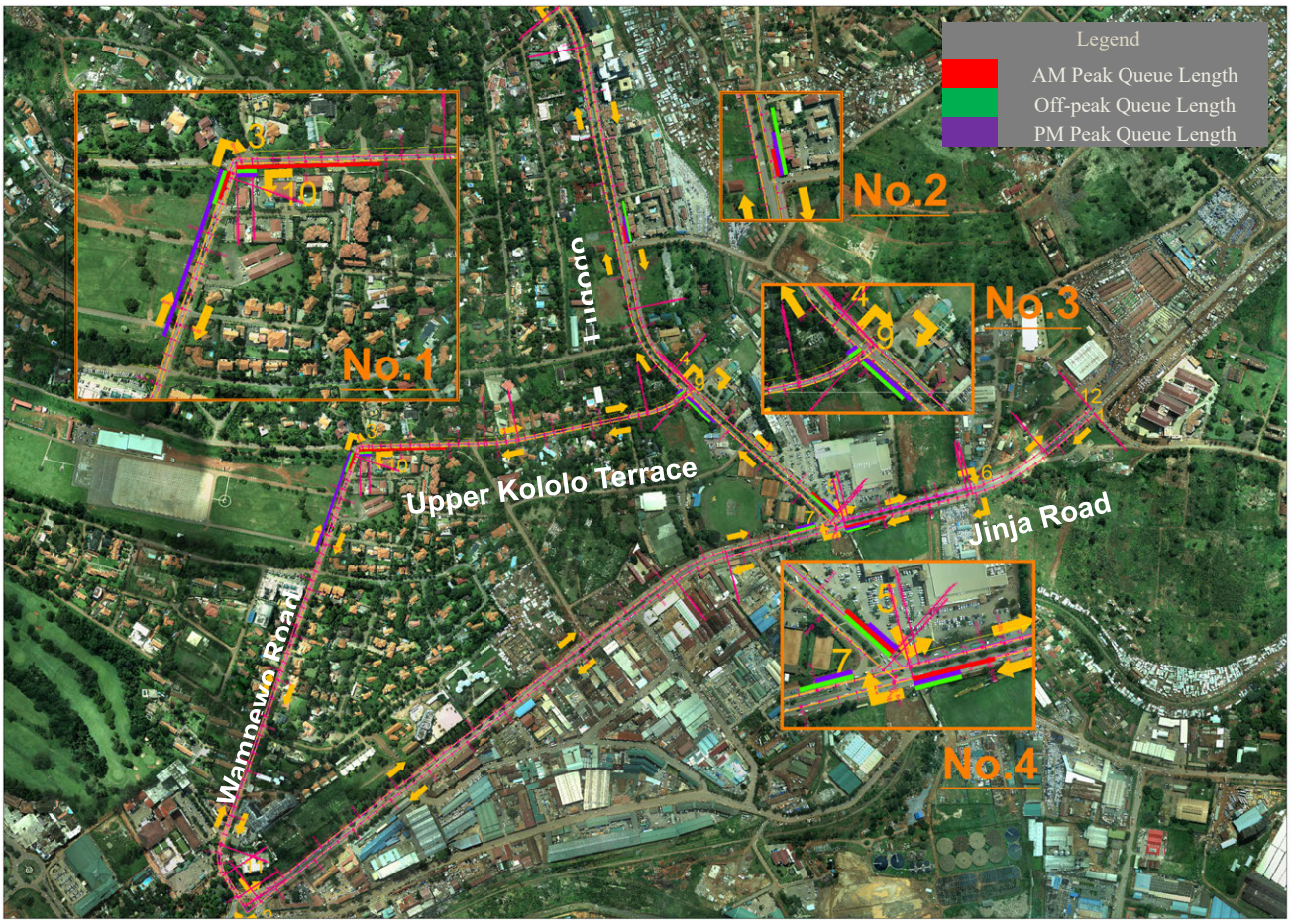


Figure 21 Travel Time and Queues Length Survey Results

Table 3The Travel Time Survey Results (Km/hr)

	2020 (MODERATO)	2019 (Stand-alone)	2016 (Un-signalized)
AM Peak	19.37	20.20	13.20
Off Peak	19.14	20.47	29.00
PM Peak	15.51	17.39	16.42
Peak Average	17.44	18.79	14.81

7.7 The speed is close to 60km/h in all the surveyed time periods except at the intersection, and it is judged that there is no shortage of capacity in the single road section of the

surveyed network.

7.8 As shown in Figure 7-7 and Table 7-3, the congestion at the junctions were also observed during the off-peak hours. (The off-peak travel time is almost the same as the morning peak). This can be interpreted to the presence of unnecessary pedestrian-demand in a single cycle, which resulted in a reduction of junction traffic capacity.

7.9 The purpose of the pedestrian-demand is to protect the vulnerable and to ensure the efficient operation of signalized junctions. Originally, pedestrian-only indications are activated by the operation of a push button when there is pedestrian traffic, and are omitted when there is no pedestrian traffic (the recall function of the controller). At present, the pedestrian demand time is activated even when there is no pedestrian traffic, because the push button is not installed.

7.10 Also, during the off-peak period, when the difference between the primary traffic and the secondary traffic is less, the split to the primary traffic is less, so the impact of the pedestrian demand phase is considered to be greater, resulting in the occurrence of congestion.

7.11 The reduction in speed during the peak time at the Junction 1 is significant and causes congestion. This is thought to be due to the geometric problem of the junction as does not have a right-turn lane.

7.12 In this survey, the advantage of the MODERATO Control was not fully confirmed. This may be due to the fact that the number of target junctions was only 4, which was not enough to confirm the effect of the Area Traffic Control, and the time loss impact by pedestrian-demand phase was significant. Further, the increase in traffic volume over year may have also affected the confirmation of the effect.

8 Expected Outputs

8.1 For the Road Users: The expected results from the pilot project for the drivers are concluded as below.

- The flow of traffic is expected to be improved compared to present. So that the average travel time within the network will be decreased and average travel speed will be increased. The verification is planned to achieve by carrying out travel speed survey using free flow car method before and after introduction of traffic signals.
- The safety for both pedestrians and the drivers will be enhanced at the junctions. In order to compare the result the traffic accident data will be collected from Police. Out of 4 junctions no.4 is considered to be the most vulnerable for the pedestrians as the traffic speed is very high in this arterial road. Therefore, to verify this indicator traffic data will be analysed for this junction.

The expected results from the pilot project phase 2 for the road users in particular the drivers are:

- The junctions is expected be better functioned compared to fixed type signal timing with respect to delay time during off- peak hour. The verification will be done by collecting travel speed data of before and after introduction of MODERATO system.

8.2 For KCCA: It is expected that the counterparts of KCCA will learn how to operate and manage the traffic control system in different traffic condition. They will also be able to identify the issues of the system and share their opinion with project team in order to improve further. By implementing the pilot project KCCA engineer will also be familiar with how the signal timings need to change and how to correct those in respond to traffic volume and flow. By practising through the pilot project the KCCA members will be trained how to supervise the routine maintenance work of the traffic signal lights, signal control system etc.

8.3 For Traffic Police: At present the traffic signals operating in Kampala are isolated and the performances of the signal are affected by the congestion of adjacent non signalized junctions. Therefore Kampala police are not quite satisfied with the performance of the traffic signals. By introducing an area based coordinated traffic control system the performance of signalized junctions can be improved.

8.4 For KSTP Team: KSTP team will be able to identify the practical issues during implementation of the pilot project. When the expansion of traffic signals using MODERATO technology in Kampala will be underway the challenges can be minimized based on the lessons learnt during the pilot project implementation.

9 Conclusion

9.1 KCCA is very much keen to improve the traffic situation of Kampala by installing traffic signals in the important junctions. They also experienced that isolated traffic signals sometimes cannot always ensure the smooth traffic flow. KCCA preferred to introduce comprehensive signal control system based on the real time traffic flow which is already reflected in UTMP. This pilot project under 2 phases showed us some indication how traffic signal can improve a non-signalized junction

9.2 In the long run, KCCA wants to have a complete full scaled traffic control centre and expand signalized junctions using MODERATO technology to certain numbers. It is understood that lane driving is a key factor for the ultrasonic detectors in order to count number of vehicles correctly. As the driving behaviour such is not very good in Kampala some kind of adjustments may be required for this kind of unique situation. So the pilot project can be lead to a way forward what kind of adjustments should be considered for Kampala and which are the products will be recommended for expansion in future.

Appendix 1 Traffic Count Data of the Junctions

- Junction1 Morning (7:00~10:00)

		From Wampewo Ave. (A)				From Acacia Avenue (B)				From York Terrace (C)				From Upper Kololo (D)				
		Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Total
7:00-7:15	Boda-boda	8	5	15	28	3	13	6	22	5	5	5	15	17	16	1	34	99
	4 Wheelers	20	7	30	57	15	36	30	81	8	29	6	43	26	77	3	106	287
	HVs	12	1	25	38				0				0	3			3	41
	Sub T	40	13	70	123	18	49	36	103	13	34	11	58	46	93	4	143	427
7:16-7:30	Boda-boda	12	7	5	24		17	2	19	3	3	3	9	19	2		21	73
	4 Wheelers	28	11	41	80	7	32	19	58	5	23	2	30	121	68	1	190	358
	HVs	1		1	2				0				0	3			3	5
	Sub T	41	18	47	106	7	49	21	77	8	26	5	39	143	70	1	214	436
7:31-7:45	Boda-boda	19	6	13	38	10	22	3	35	1	3	1	5	13	12		25	103
	4 Wheelers	47	10	48	105	5	70	27	102	13	70	10	93	146	56		202	502
	HVs	3		3	6	1	1		2				0				0	8
	Sub T	69	16	64	149	16	93	30	139	14	73	11	98	159	68	0	227	613
7:46-8:00	Boda-boda	8	4	3	15	5	15	7	27	1			1	18	16	3	37	80
	4 Wheelers	22	5	25	52	6	83	33	122	9	65	9	83	159	77		236	493
	HVs				0		3		3		3		3	1	2		3	9
	Sub T	30	9	28	67	11	101	40	152	10	68	9	87	178	95	3	276	582
8:00-8:15	Boda-boda	12	7	10	29	3	41	8	52		1		1	19	15	1	35	117
	4 Wheelers	22	3	19	44	2	70	30	102	4	70	8	82	115	51		166	394
	HVs	1		2	3		1	2	3				0		1		1	7
	Sub T	35	10	31	76	5	112	40	157	4	71	8	83	134	67	1	202	518
8:16-8:30	Boda-boda	28	10	9	47	6	18	1	25	1	7	1	9	11	13		24	105
	4 Wheelers	27	5	35	67	2	63	21	86	7	67	6	80	70	30	1	101	334
	HVs			4	4				0				0	1			1	5
	Sub T	55	15	48	118	8	81	22	111	8	74	7	89	82	43	1	126	444
8:31-8:45	Boda-boda	3	5	12	20	5	28	7	40	9	2	1	12	20	22	3	45	117
	4 Wheelers	25	7	40	72	5	68	50	123	10	100	8	118	90	48		138	451
	HVs			2	2			1	1	1			1	0	0	0	0	4
	Sub T	28	12	54	94	10	96	58	164	20	102	9	131	110	70	3	183	572
8:46-9:00	Boda-boda	15	7	18	40	7	35	6	48	1	10	5	16	10	11		21	125
	4 Wheelers	35		48	83		65	26	91	6	49	10	65	60	32		92	331
	HVs				0				0				0	1	2		3	3
	Sub T	50	7	66	123	7	100	32	139	7	59	15	81	71	45	0	116	459
9:01-9:15	Boda-boda	22	20	22	64	4	30	14	48	5	12	4	21	26	21	5	52	185
	4 Wheelers	30	12	30	72		86	50	136	8	79	5	92	123	55	1	179	479
	HVs			1	1		1	1	2	1			1		1		1	5
	Sub T	52	32	53	137	4	117	65	186	14	91	9	114	149	77	6	232	669
9:16-9:30	Boda-boda	33	18	19	70	3	25	3	31		4	2	6	4	6		10	117
	4 Wheelers	28	7	45	80	4	40	27	71	6	39	2	47	100	35		135	333
	HVs				0			1	1				0	1			1	2
	Sub T	61	25	64	150	7	65	31	103	6	43	4	53	105	41	0	146	452
9:31-9:45	Boda-boda	37	13	42	92	6	36	11	53	10	12	8	30	32	52	1	85	260
	4 Wheelers	42	7	32	81	2	94	55	151	3	45	3	51	120	67	1	188	471
	HVs	3		3	6		1	1	2				0	1	4		5	13
	Sub T	82	20	77	179	8	131	67	206	13	57	11	81	153	123	2	278	744
9:46-10:00	Boda-boda	40	8	33	81	3	18		21	8	10	14	32	10	7	2	19	153
	4 Wheelers	24	9	29	62	2	23	25	50		57	13	70	62	37	2	101	283
	HVs	1	2	2	5		1		1				0	1	2		3	9
	Sub T	65	19	64	148	5	42	25	72	8	67	27	102	73	46	4	123	445

- Junction 1 Evening (16:00~19:00)

		From Wampewo Ave. (A)				From Acacia Avenue (B)				From York Terrace (C)				From Upper Kololo (D)				
		Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Left	Straight	Right	Sub T	Total
16:00-16:15	Boda-boda	13	11	9	33	4	37	5	46	7	13	9	29	20	20		40	148
	4 Wheelers	15	5	17	37	6	170	30	206		35		35	115	76	1	192	470
	HVs				0				0		2		2	2	3		5	7
	Sub T	28	16	26	70	10	207	35	252	7	50	9	66	137	99	1	237	625
16:16-16:30	Boda-boda	3	3	9	15		25	4	29	3	7	4	14	13	17		30	88
	4 Wheelers	17	7	15	39	3	117	18	138		23	5	28	91	62		153	358
	HVs				0				0				0	1	1		2	2
	Sub T	20	10	24	54	3	142	22	167	3	30	9	42	105	80	0	185	448
16:31-16:45	Boda-boda	9	9	6	24	3	35		38	3	13		16	34	22		56	134
	4 Wheelers	24	6	23	53	3	160	29	192	5	10	2	17	115	65		180	442
	HVs		1		1		2	1	3	1	1		2	2	1		3	9
	Sub T	33	16	29	78	6	197	30	233	9	24	2	35	151	88	0	239	585
16:46-17:00	Boda-boda	12	8	10	30		20	7	27	6	4	2	12	6	8		14	83
	4 Wheelers	17	4	22	43		93	25	118	7	11	3	21	75	45	1	121	303
	HVs	1		1	2		3		3				0				0	5
	Sub T	30	12	33	75	0	116	32	148	13	15	5	33	81	53	1	135	391
17:00-17:15	Boda-boda	18	13	5	36	6	32		38	14	10	2	26	29	17	1	47	147
	4 Wheelers	25	4	41	70	5	170	38	213	10	20	1	31	130	76	4	210	524
	HVs	4			4		2		2		1		1	2	2		4	11
	Sub T	47	17	46	110	11	204	38	253	24	31	3	58	161	95	5	261	682
17:16-17:30	Boda-boda	16	7	4	27	2	18	8	28	1	5	1	7	21	8		29	91
	4 Wheelers	26	7	22	55	3	90	22	115	8	10		18	65	52	4	121	309
	HVs				0		1	2	3				0	1			1	4
	Sub T	42	14	26	82	5	109	32	146	9	15	1	25	87	60	4	151	404
17:31-17:45	Boda-boda	18	14	11	43	12	30	8	50	3	11		14	34	26		60	167
	4 Wheelers	30	6	30	66	3	157	27	187	15	15	1	31	95	73	1	169	453
	HVs	2		2	4		2		2		3		3	1			1	10
	Sub T	50	20	43	113	15	189	35	239	18	29	1	48	130	99	1	230	630
17:46-18:00	Boda-boda	13	7	12	32	5		2	7	2	9		11	30	24	4	58	108
	4 Wheelers	21	2	20	43		100	20	120	10	12	1	23	135	100	2	237	423
	HVs	1		1	2		4	1	5				0		2		2	9
	Sub T	35	9	33	77	5	104	23	132	12	21	1	34	165	126	6	297	540
18:01-18:15	Boda-boda	20	9	9	38		17	10	27	4	9	1	14	13	8		21	100
	4 Wheelers	27	6	49	82		178	26	204	14	26		40	99	74	2	175	501
	HVs	1		1	2		2		2	2			2	1			1	7
	Sub T	48	15	59	122	0	197	36	233	20	35	1	56	113	82	2	197	608
18:16-18:30	Boda-boda	13	9	7	29	6	12	9	27	2	7	1	10	18	5		23	89
	4 Wheelers	13	11	14	38		145	38	183	40	20	1	61	130	93	5	228	510
	HVs			1	1		3		3				0		2	1	3	7
	Sub T	26	20	22	68	6	160	47	213	42	27	2	71	148	100	6	254	606
18:31-18:45	Boda-boda	21	10	25	56		38	12	50	8	12	3	23	28	12	2	42	171
	4 Wheelers	20	6	23	49		110	48	158	20	37	2	59	119	75	7	201	467
	HVs			1	1				0				0				0	1
	Sub T	41	16	49	106	0	148	60	208	28	49	5	82	147	87	9	243	639
18:46-19:00	Boda-boda	13	9	8	30		18	5	23	12	23	5	40	24	8		32	125
	4 Wheelers	18	3	19	40		93	23	116	17	58	3	78	95	53	5	153	387
	HVs	3		1	4				0				0	2	1		3	7
	Sub T	34	12	28	74	0	111	28	139	29	81	8	118	121	62	5	188	519

- Junction 2 Morning (7:00~10:00)

		From Forest Mall (A)				From Kira Road (B)				From Naguru Road (C)				
		U-turn	Straight	Right	Sub T	Left	Straight	U-turn	Sub T	Left	-	Right	Sub T	Total
7:00-7:15	Boda-boda		87	16	103	49	80	1	130	13		25	38	271
	4 Wheelers	4	84	19	107	12	148		160	88			88	355
	HVs		4		4	1	4		5	2		1	3	12
	Sub T	4	175	35	214	62	232	1	295	103	0	26	129	638
7:16-7:30	Boda-boda		109	15	124	31	92	1	124	22		40	62	310
	4 Wheelers	14	85	20	119	14	161		175	144		1	145	439
	HVs		4	1	5				0				0	5
	Sub T	14	198	36	248	45	253	1	299	166	0	41	207	754
7:31-7:45	Boda-boda		104	18	122	33	122	2	157	31		38	69	348
	4 Wheelers	29	118	32	179	14	209		223	102			102	504
	HVs		6	1	7		5		5	1			1	13
	Sub T	29	228	51	308	47	336	2	385	134	0	38	172	865
7:46-8:00	Boda-boda	1	141	23	165	55	161	2	218	29		55	84	467
	4 Wheelers	24	121	32	177	16	160		176	123			123	476
	HVs		3		3	1	4		5	1			1	9
	Sub T	25	265	55	345	72	325	2	399	153	0	55	208	952
8:00-8:15	Boda-boda		152	18	170	66	158	3	227	37		61	98	495
	4 Wheelers	10	133	33	176	22	158		180	118		1	119	475
	HVs		1		1		5		5	3			3	9
	Sub T	10	286	51	347	88	321	3	412	158	0	62	220	979
8:16-8:30	Boda-boda	1	152	25	178	65	155		220	33		48	81	479
	4 Wheelers	6	130	47	183	16	176		192	110			110	485
	HVs		8		8	2	2		4	3			3	15
	Sub T	7	290	72	369	83	333	0	416	146	0	48	194	979
8:31-8:45	Boda-boda	1	131	26	158	63	150	1	214	30		44	74	446
	4 Wheelers	3	125	43	171	24	140		164	121		1	122	457
	HVs		3		3	3	7		10	4			4	17
	Sub T	4	259	69	332	90	297	1	388	155	0	45	200	920
8:46-9:00	Boda-boda		148	19	167	46	128	2	176	34		58	92	435
	4 Wheelers	2	120	42	164	31	168		199	113			113	476
	HVs		2	1	3	3	9		12	2			2	17
	Sub T	2	270	62	334	80	305	2	387	149	0	58	207	928
9:01-9:15	Boda-boda	1	127	27	155	59	138	4	201	23		49	72	428
	4 Wheelers	2	120	39	161	25	164		189	115			115	465
	HVs	1	4	2	7	2	3		5	2			2	14
	Sub T	4	251	68	323	86	305	4	395	140	0	49	189	907
9:16-9:30	Boda-boda		101	15	116	58	107	1	166	26		45	71	353
	4 Wheelers	2	112	41	155	18	152	1	171	100			100	426
	HVs		3	3	6	1	11		12	4			4	22
	Sub T	2	216	59	277	77	270	2	349	130	0	45	175	801
9:31-9:45	Boda-boda		99	17	116	40	75	1	116	24		41	65	297
	4 Wheelers	2	122	42	166	20	155		175	93			93	434
	HVs	1	6	1	8	2	4		6	2			2	16
	Sub T	3	227	60	290	62	234	1	297	119	0	41	160	747
9:46-10:00	Boda-boda	2	72	20	94	46	107		153	29		29	58	305
	4 Wheelers	2	104	44	150	23	158		181	115			115	446
	HVs		4	2	6	3	12		15	5			5	26
	Sub T	4	180	66	250	72	277	0	349	149	0	29	178	777

- Junction 2 Evening (16:00~19:00)

		From Forest Mall (A)				From Kira Road (B)				From Naguru Road (C)				
		U-turn	Straight	Right	Sub T	Left	Straight	U-turn	Sub T	Left	-	Right	Sub T	Total
16:00-16:15	Boda-boda	1	82	26	109	38	82		120	38		30	68	297
	4 Wheelers		177	91	268	21	155		176	65			65	509
	HVs		4	2	6	3	11		14	1			1	21
	Sub T	1	263	119	383	62	248	0	310	104	0	30	134	827
16:16-16:30	Boda-boda	2	122	23	147	43	87	2	132	42		46	88	367
	4 Wheelers	4	144	118	266	26	143		169	77			77	512
	HVs		12		12	3	7		10				0	22
	Sub T	6	278	141	425	72	237	2	311	119	0	46	165	901
16:31-16:45	Boda-boda	1	114	14	129	42	103	5	150	40		37	77	356
	4 Wheelers	3	177	82	262	21	133		154	93			93	509
	HVs		8	3	11	3	8		11	1			1	23
	Sub T	4	299	99	402	66	244	5	315	134	0	37	171	888
16:46-17:00	Boda-boda	1	110	27	138	40	89	1	130	58		32	90	358
	4 Wheelers	2	185	97	284	38	113		151	63		2	65	500
	HVs		11	2	13	1	8		9	2			2	24
	Sub T	3	306	126	435	79	210	1	290	123	0	34	157	882
17:00-17:15	Boda-boda	1	82	23	106	19	83		102	32		20	52	260
	4 Wheelers	2	172	94	268	18	101		119	54			54	441
	HVs		11	2	13		5		5	6			6	24
	Sub T	3	265	119	387	37	189	0	226	92	0	20	112	725
17:16-17:30	Boda-boda		123	15	138	34	116	4	154	53		30	83	375
	4 Wheelers	2	172	126	300	44	144		188	78		1	79	567
	HVs		10	4	14	3	13		16	4			4	34
	Sub T	2	305	145	452	81	273	4	358	135	0	31	166	976
17:31-17:45	Boda-boda		169	11	180	58	116		174	42		32	74	428
	4 Wheelers	5	207	137	349	42	132		174	81			81	604
	HVs		11	3	14	1	7		8	1			1	23
	Sub T	5	387	151	543	101	255	0	356	124	0	32	156	1055
17:46-18:00	Boda-boda		156	13	169	44	147	1	192	42		35	77	438
	4 Wheelers	1	215	147	363	47	128		175	69			69	607
	HVs		14	1	15	4	4		8	2			2	25
	Sub T	1	385	161	547	95	279	1	375	113	0	35	148	1070
18:01-18:15	Boda-boda	1	106	17	124	57	117	2	176	51		28	79	379
	4 Wheelers		179	113	292	39	93		132	60			60	484
	HVs		8	3	11		2		2				0	13
	Sub T	1	293	133	427	96	212	2	310	111	0	28	139	876
18:16-18:30	Boda-boda		147	7	154	43	98		141	31		37	68	363
	4 Wheelers	3	197	130	330	38	101		139	59			59	528
	HVs		4		4	2	9		11				0	15
	Sub T	3	348	137	488	83	208	0	291	90	0	37	127	906
18:31-18:45	Boda-boda		85	18	103	47	118	1	166	55		38	93	362
	4 Wheelers	2	176	128	306	36	86		122	54			54	482
	HVs		3		3		6		6				0	9
	Sub T	2	264	146	412	83	210	1	294	109	0	38	147	853
18:46-19:00	Boda-boda		96	10	106	37	103	1	141	33		37	70	317
	4 Wheelers		162	108	270	37	86		123	50		1	51	444
	HVs		5	4	9	1	5		6				0	15
	Sub T	0	263	122	385	75	194	1	270	83	0	38	121	776

- Junction 3 Morning (7:00~10:00)

		From Forest Mall (A)				From Upper Kololo (B)				From Kira Road (C)				
		Left	Straight	-	Sub T	Left	-	Right	Sub T	-	Straight	Right	Sub T	Total
7:00-7:15	Boda-boda	6	49		55	4		11	15		81	25	106	176
	4 Wheelers		119		119	13		10	23		85	183	268	410
	HVs				0				0			2	2	2
	Sub T	6	168	0	174	17	0	21	38	0	166	210	376	588
7:16-7:30	Boda-boda	4	28		32	5		10	15		100	20	120	167
	4 Wheelers	14	119		133	14		18	32		108	228	336	501
	HVs				0				0				0	0
	Sub T	18	147	0	165	19	0	28	47	0	208	248	456	668
7:31-7:45	Boda-boda	5	53		58	13		14	27		85	23	108	193
	4 Wheelers	40	135		175	20		35	55		130	235	365	595
	HVs				0				0		2		2	2
	Sub T	45	188	0	233	33	0	49	82	0	217	258	475	790
7:46-8:00	Boda-boda		53		53	8			8		120	45	165	226
	4 Wheelers	32	159		191	25		45	70		152	195	347	608
	HVs	29			29				0		2		2	31
	Sub T	61	212	0	273	33	0	45	78	0	274	240	514	865
8:00-8:15	Boda-boda	15	79		94	12		13	25		115	43	158	277
	4 Wheelers	50	204		254	20		32	52		103	213	316	622
	HVs				0				0				0	0
	Sub T	65	283	0	348	32	0	45	77	0	218	256	474	899
8:16-8:30	Boda-boda	17	65		82	3		22	25		110	30	140	247
	4 Wheelers	24	137		161	10		28	38		134	230	364	563
	HVs		2		2				0			3	3	5
	Sub T	41	204	0	245	13	0	50	63	0	244	263	507	815
8:31-8:45	Boda-boda	6	60		66	10		12	22		133	44	177	265
	4 Wheelers	40	121		161	17		42	59		210	240	450	670
	HVs	1	1		2			5	5				0	7
	Sub T	47	182	0	229	27	0	59	86	0	343	284	627	942
8:46-9:00	Boda-boda	7	58		65			8	8		85	28	113	186
	4 Wheelers	37	99		136	15		17	32		195	234	429	597
	HVs	1	3		4				0				0	4
	Sub T	45	160	0	205	15	0	25	40	0	280	262	542	787
9:01-9:15	Boda-boda	13	31		44	10		28	38		60	23	83	165
	4 Wheelers	45	126		171	18		32	50		90	135	225	446
	HVs	1	4		5				0		2	2	4	9
	Sub T	59	161	0	220	28	0	60	88	0	152	160	312	620
9:16-9:30	Boda-boda	6	34		40	5		20	25		69	23	92	157
	4 Wheelers	48	97		145	18		31	49		95	165	260	454
	HVs	2	4		6				0			2	2	8
	Sub T	56	135	0	191	23	0	51	74	0	164	190	354	619
9:31-9:45	Boda-boda	14	55		69	16		24	40		33	28	61	170
	4 Wheelers	43	109		152	25		37	62		65	120	185	399
	HVs		2		2	1		1	2				0	4
	Sub T	57	166	0	223	42	0	62	104	0	98	148	246	573
9:46-10:00	Boda-boda	10	70		80	17		15	32		39	19	58	170
	4 Wheelers	44	127		171	35		37	72		85	113	198	441
	HVs				0	2			2		2		2	4
	Sub T	54	197	0	251	54	0	52	106	0	126	132	258	615

- Junction 3 Evening (16:00~19:00)

		From Forest Mall (A)				From Upper Kololo (B)				From Kira Road (C)				
		Left	Straight	-	Sub T	Left	-	Right	Sub T	-	Straight	Right	Sub T	Total
16:00-16:15	Boda-boda	16	50		66	25		18	43		62	32	94	203
	4 Wheelers	63	160		223	38		69	107		120	163	283	613
	HVs	2	3		5	1			1		4	3	7	13
	Sub T	81	213	0	294	64	0	87	151	0	186	198	384	829
16:16-16:30	Boda-boda	27	51		78	18		17	35		48	23	71	184
	4 Wheelers	55	164		219	50		48	98		97	99	196	513
	HVs	2	2		4	2			2		2	5	7	13
	Sub T	84	217	0	301	70	0	65	135	0	147	127	274	710
16:31-16:45	Boda-boda	12	60		72	10		26	36		30	12	42	150
	4 Wheelers	33	147		180	73		78	151		118	77	195	526
	HVs		3		3	2		1	3		2	2	4	10
	Sub T	45	210	0	255	85	0	105	190	0	150	91	241	686
16:46-17:00	Boda-boda	18	65		83	4		16	20		43	23	66	169
	4 Wheelers	44	144		188	65		68	133		103	133	236	557
	HVs		5		5	1		3	4			2	2	11
	Sub T	62	214	0	276	70	0	87	157	0	146	158	304	737
17:00-17:15	Boda-boda	17	60		77	8		23	31		51	48	99	207
	4 Wheelers		165		165	60		75	135		107	103	210	510
	HVs		4		4	3		2	5		3	7	10	19
	Sub T	17	229	0	246	71	0	100	171	0	161	158	319	736
17:16-17:30	Boda-boda	15	65		80	14		18	32		60	25	85	197
	4 Wheelers	24	135		159	73		85	158		113	130	243	560
	HVs		3		3	2			2		7	3	10	15
	Sub T	39	203	0	242	89	0	103	192	0	180	158	338	772
17:31-17:45	Boda-boda	22	60		82	10		18	28		70	33	103	213
	4 Wheelers	23	165		188	20		85	105		140	150	290	583
	HVs	3			3	1			1		4	2	6	10
	Sub T	48	225	0	273	31	0	103	134	0	214	185	399	806
17:46-18:00	Boda-boda	10	85		95	10		29	39		48	29	77	211
	4 Wheelers	25	144		169	84		120	204		127	130	257	630
	HVs		4		4			2	2		2		2	8
	Sub T	35	233	0	268	94	0	151	245	0	177	159	336	849
18:01-18:15	Boda-boda	29	70		99	12		7	19		65	33	98	216
	4 Wheelers	35	169		204	54		94	148		77	117	194	546
	HVs	1			1	2			2			3	3	6
	Sub T	65	239	0	304	68	0	101	169	0	142	153	295	768
18:16-18:30	Boda-boda	17	95		112	12		33	45		68	30	98	255
	4 Wheelers	38	218		256	55		60	115		60	93	153	524
	HVs		3		3				0		2		2	5
	Sub T	55	316	0	371	67	0	93	160	0	130	123	253	784
18:31-18:45	Boda-boda	10	30		40	10		12	22		67	28	95	157
	4 Wheelers	28	118		146	45		99	144		109	140	249	539
	HVs				0	1		2	3			3	3	6
	Sub T	38	148	0	186	56	0	113	169	0	176	171	347	702
18:46-19:00	Boda-boda	13	33		46	18			18		55	24	79	143
	4 Wheelers	43	158		201	35		110	145		95	128	223	569
	HVs				0				0				0	0
	Sub T	56	191	0	247	53	0	110	163	0	150	152	302	712

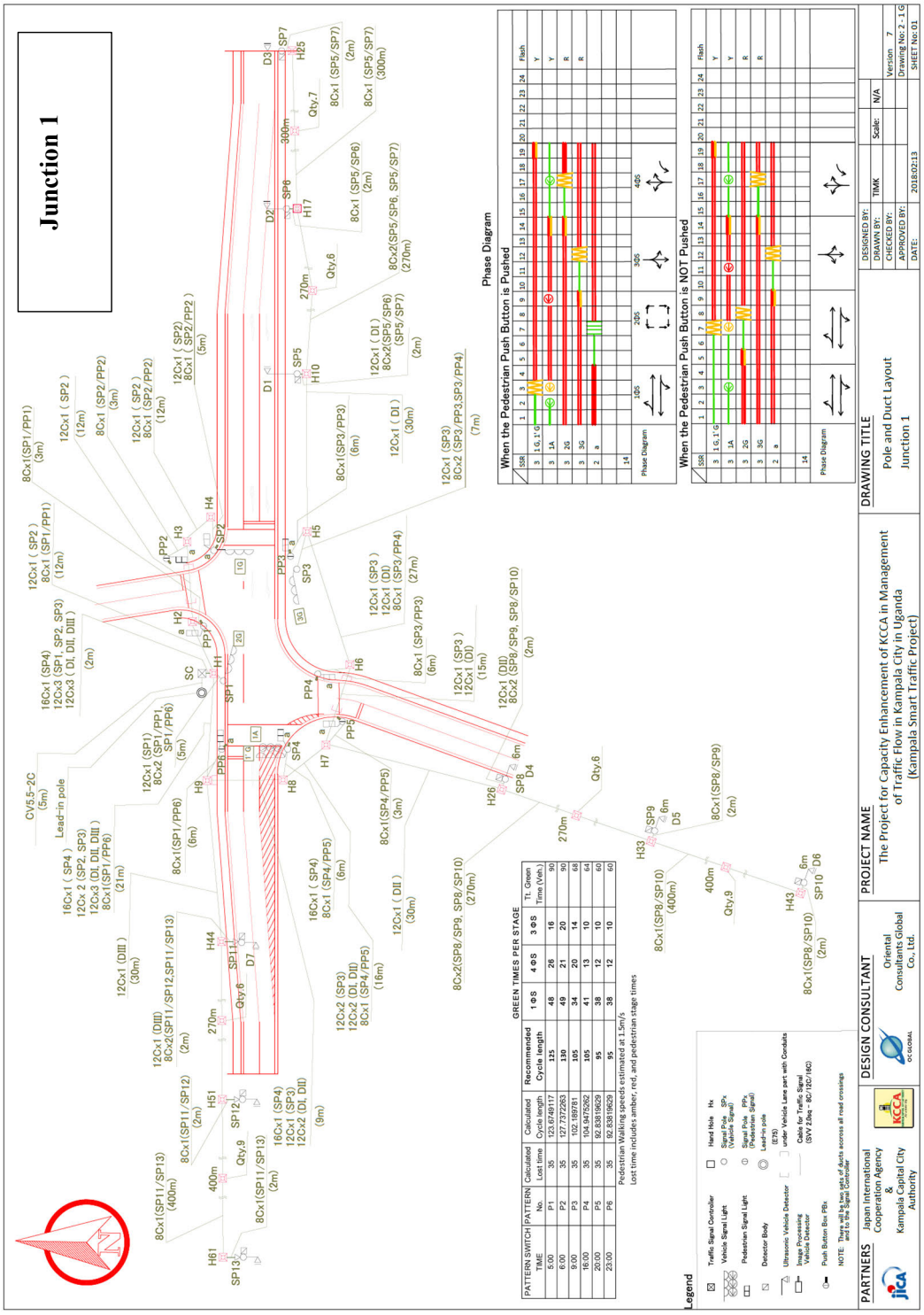
- Junction 4 Morning (7:00~10:00)

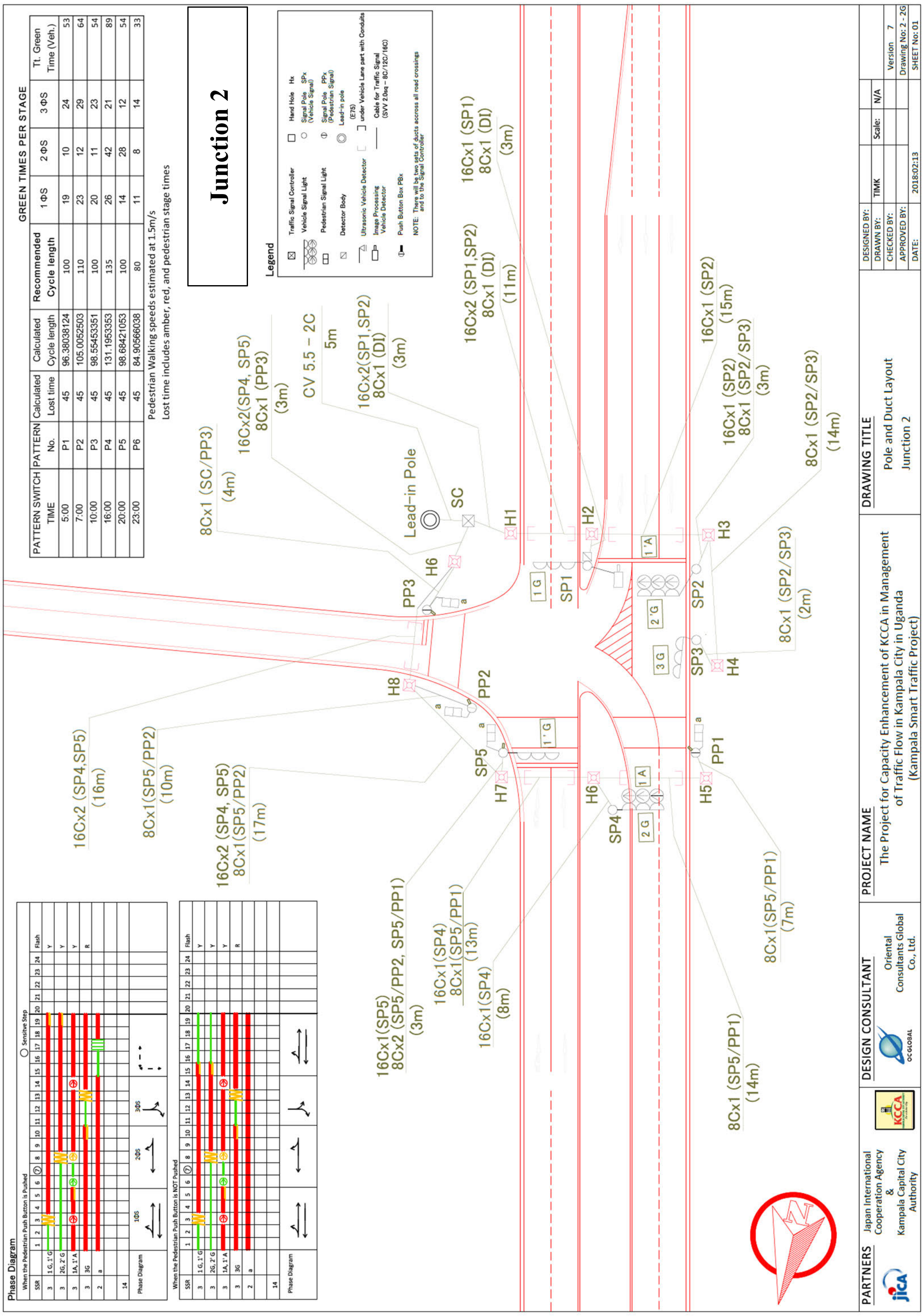
		From Nakawa (A)				From Kampala (B)				From Lugogo Bypass (C)			
		-	Straight	Right	Sub T	Left	Straight	-	Sub T	Left		Right	Sub T
7:00-7:15	Boda-boda		170	70	240	10	43		53	15		26	41
	4 Wheelers		93	115	208	52	231		283	10		123	133
	HVs		176	40	216	2	22		24	0		4	4
	Sub T	0	439	225	664	64	296	0	360	25	0	153	178
7:16-7:30	Boda-boda		214	75	289	13	120		133	51		12	63
	4 Wheelers		95	125	220	56	203		259	0		124	124
	HVs		209	43	252	5	27		32	0		1	1
	Sub T	0	518	243	761	74	350	0	424	51	0	137	188
7:31-7:45	Boda-boda		222	35	257	30	195		225	69		9	78
	4 Wheelers		156	85	241	103	278		381	53		83	136
	HVs		189	20	209	12	66		78	1		1	2
	Sub T	0	567	140	707	145	539	0	684	123	0	93	216
7:46-8:00	Boda-boda		205	23	228	19	110		129	71		5	76
	4 Wheelers		144	110	254	75	230		305	21		91	112
	HVs		92	26	118	6	75		81	1		3	4
	Sub T	0	441	159	600	100	415	0	515	93	0	99	192
8:00-8:15	Boda-boda		75	45	120	45	141		186	46		16	62
	4 Wheelers		118	120	238	95	250		345	0		125	125
	HVs		173	35	208	3	68		71	1		2	3
	Sub T	0	366	200	566	143	459	0	602	47	0	143	190
8:16-8:30	Boda-boda		164	20	184	55	172		227	45		17	62
	4 Wheelers		120	90	210	65	325		390	0		90	90
	HVs		11	20	31	8	50		58	0		4	4
	Sub T	0	295	130	425	128	547	0	675	45	0	111	156
8:31-8:45	Boda-boda		181	50	231	27	151		178	62		25	87
	4 Wheelers		124	125	249	75	354		429	0		106	106
	HVs		102	20	122	3	63		66	0		3	3
	Sub T	0	407	195	602	105	568	0	673	62	0	134	196
8:46-9:00	Boda-boda		150	85	235	7	91		98	22		47	69
	4 Wheelers		135	80	215	20	255		275	0		95	95
	HVs		128	4	132	6	48		54	2		2	4
	Sub T	0	413	169	582	33	394	0	427	24	0	144	168
9:01-9:15	Boda-boda		160	36	196	8	135		143	50		30	80
	4 Wheelers		129	70	199	35	270		305	0		108	108
	HVs		109	3	112	13	25		38	1		6	7
	Sub T	0	398	109	507	56	430	0	486	51	0	144	195
9:16-9:30	Boda-boda		124	33	157	8	146		154	29		31	60
	4 Wheelers		157	100	257	15	280		295	0		73	73
	HVs		52	20	72	3	37		40	0		6	6
	Sub T	0	333	153	486	26	463	0	489	29	0	110	139
9:31-9:45	Boda-boda		123	32	155	25	137		162	43		25	68
	4 Wheelers		184	55	239	30	255		285	0		93	93
	HVs		66	16	82	4	38		42	0		5	5
	Sub T	0	373	103	476	59	430	0	489	43	0	123	166
9:46-10:00	Boda-boda		124	35	159	25	118		143	66		6	72
	4 Wheelers		111	70	181	52	299		351	24		100	124
	HVs		73	8	81	3	49		52	2		5	7
	Sub T	0	308	113	421	80	466	0	546	92	0	111	203

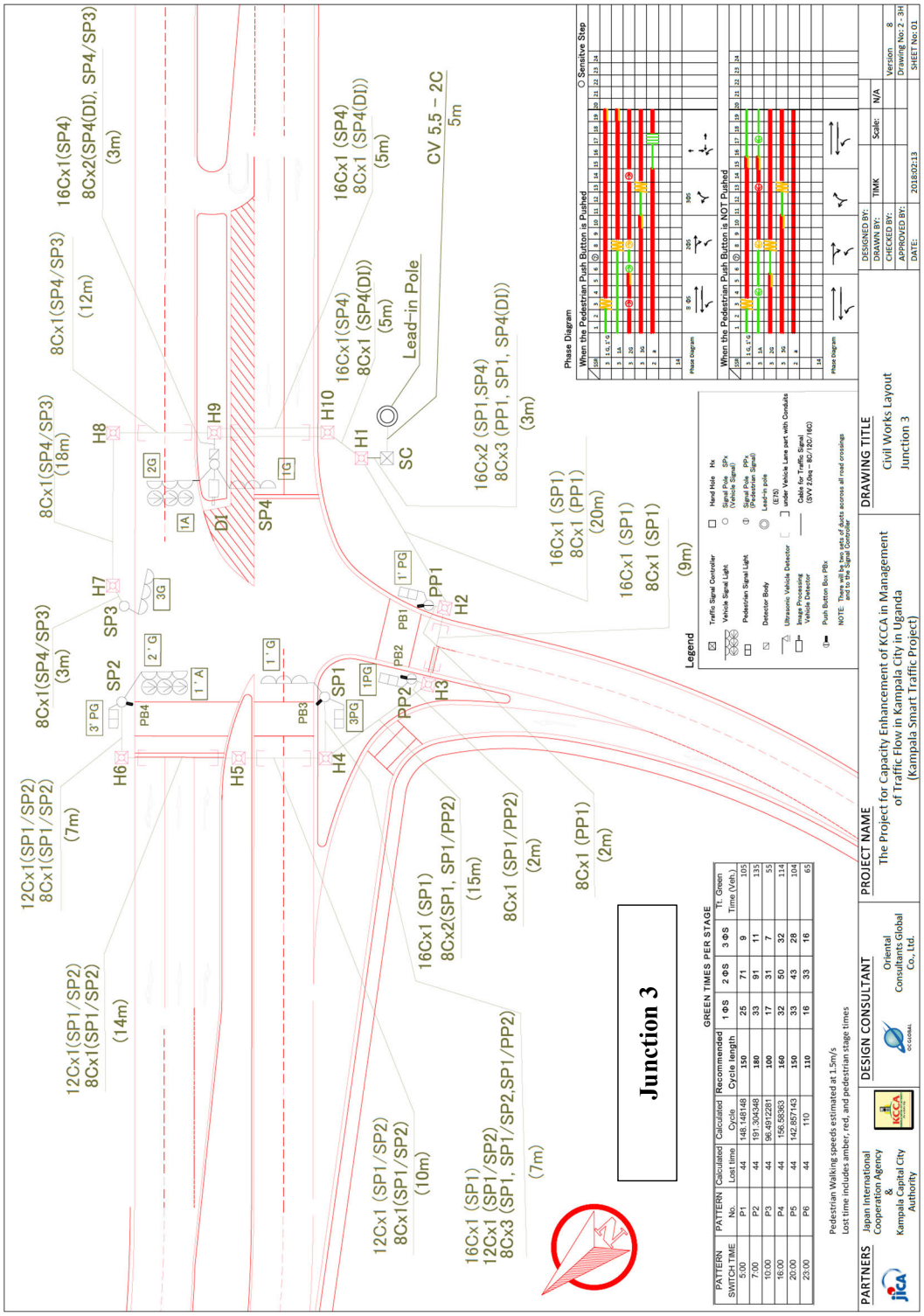
- Junction 4 Evening (16:00~19:00)

		From Nakawa (A)				From Kampala (B)				From Lugogo Bypass (C)				
		-	Straight	Right	Sub T	Left	Straight	-	Sub T	Left		Right	Sub T	Total
16:00-16:15	Boda-boda		145	65	210	68	70		138	10		44	54	402
	4 Wheelers		232	165	397	143	265		408	21		93	114	919
	HVs		0	1	1	7	23		30	3		4	7	38
	Sub T	0	377	231	608	218	358	0	576	34	0	141	175	1359
16:16-16:30	Boda-boda		95	45	140	65	50		115	8		47	55	310
	4 Wheelers		163	175	338	123	288		411	16		79	95	844
	HVs		22	10	32	5	18		23	3		3	6	61
	Sub T	0	280	230	510	193	356	0	549	27	0	129	156	1215
16:31-16:45	Boda-boda		105	80	185	39	67		106	36		29	65	356
	4 Wheelers		272	175	447	138	279		417	89		29	118	982
	HVs		49	3	52	3	12		15	1		6	7	74
	Sub T	0	426	258	684	180	358	0	538	126	0	64	190	1412
16:46-17:00	Boda-boda		95	30	125	44	73		117	20		37	57	299
	4 Wheelers		157	195	352	103	210		313	13		101	114	779
	HVs		15	5	20	4	27		31	6		5	11	62
	Sub T	0	267	230	497	151	310	0	461	39	0	143	182	1140
17:00-17:15	Boda-boda		113	70	183	20	58		78	31		28	59	320
	4 Wheelers		177	180	357	2	360		362	21		103	124	843
	HVs		19	2	21	2	38		40	0		3	3	64
	Sub T	0	309	252	561	24	456	0	480	52	0	134	186	1227
17:16-17:30	Boda-boda		61	37	98	28	54		82	21		46	67	247
	4 Wheelers		87	133	220	109	333		442	0		117	117	779
	HVs		10	3	13	2	19		21	0		6	6	40
	Sub T	0	158	173	331	139	406	0	545	21	0	169	190	1066
17:31-17:45	Boda-boda		73	73	146	23	43		66	16		60	76	288
	4 Wheelers		228	195	423	88	269		357	27		99	126	906
	HVs		27	1	28	3	33		36	0		3	3	67
	Sub T	0	328	269	597	114	345	0	459	43	0	162	205	1261
17:46-18:00	Boda-boda		108	78	186	23	43		66	31		47	78	330
	4 Wheelers		126	179	305	103	403		506	48		83	131	942
	HVs		12	5	17	3	16		19	2		3	5	41
	Sub T	0	246	262	508	129	462	0	591	81	0	133	214	1313
18:01-18:15	Boda-boda		134	85	219	23	53		76	6		58	64	359
	4 Wheelers		210	217	427	68	303		371	28		98	126	924
	HVs		17	7	24	5	18		23	4		1	5	52
	Sub T	0	361	309	670	96	374	0	470	38	0	157	195	1335
18:16-18:30	Boda-boda		58	33	91	13	43		56	34		44	78	225
	4 Wheelers		97	123	220	38	329		367	27		91	118	705
	HVs		2	3	5	2	15		17	0		6	6	28
	Sub T	0	157	159	316	53	387	0	440	61	0	141	202	958
18:31-18:45	Boda-boda		101	63	164	18	43		61	52		30	82	307
	4 Wheelers		160	190	350	59	458		517	52		95	147	1014
	HVs		22	3	25	3	31		34	0		4	4	63
	Sub T	0	283	256	539	80	532	0	612	104	0	129	233	1384
18:46-19:00	Boda-boda		101	44	145	23	39		62	33		23	56	263
	4 Wheelers		150	163	313	53	368		421	48		62	110	844
	HVs		20	2	22	2	25		27	2		2	4	53
	Sub T	0	271	209	480	78	432	0	510	83	0	87	170	1160

Appendix 2 As Built Drawings of the Junctions



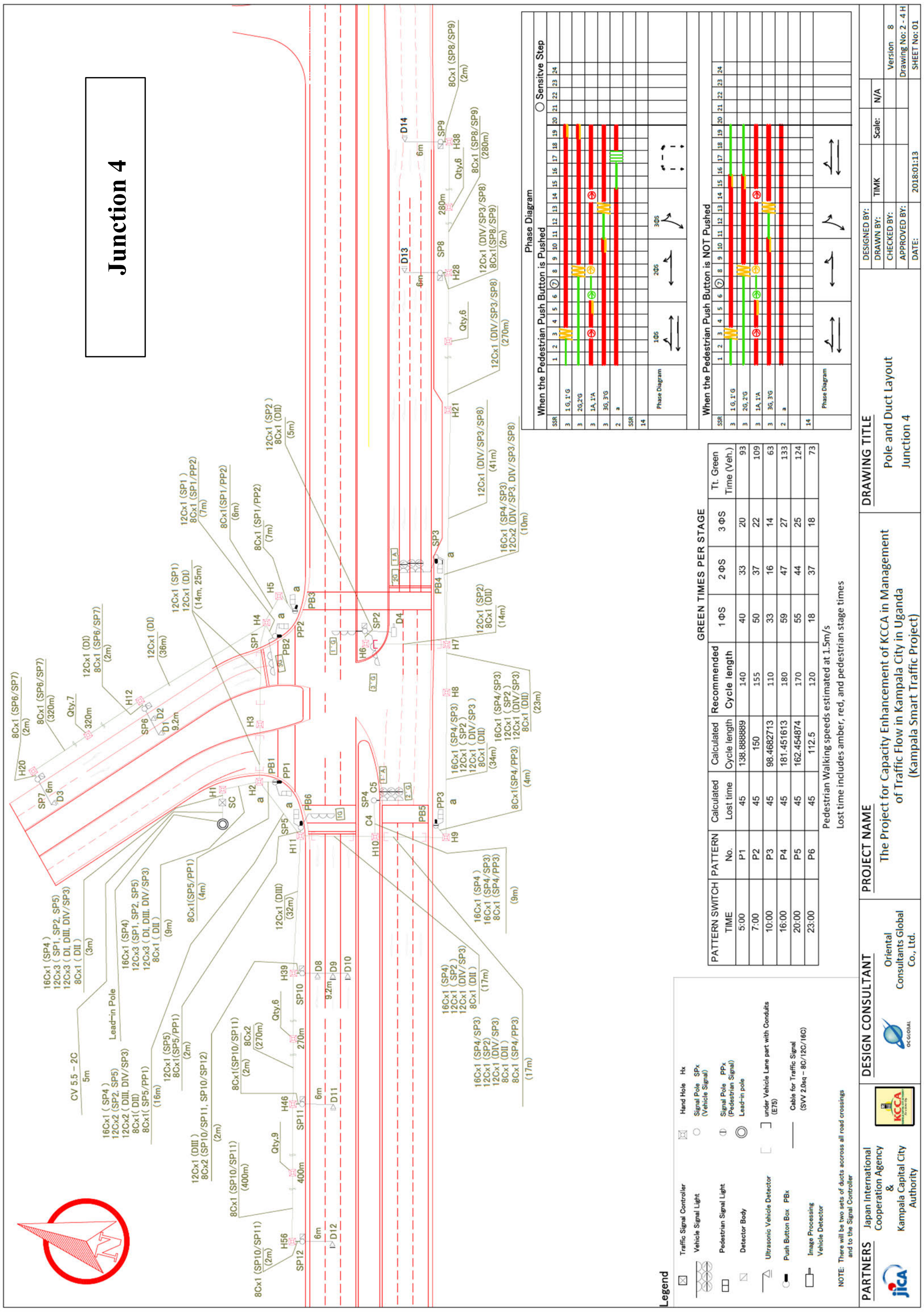

Junction 2
GREEN TIMES PER STAGE
Pedestrian Walking speeds estimated at 1.5m/s
Lost time includes amber, red, and pedestrian stage times
Legend
Lead-in Pole
SC
Phase Diagram
PARTNERS
Japan International Cooperation Agency & Kampala Capital City Authority
DESIGN CONSULTANT
Oriental Consultants Global Co., Ltd.
PROJECT NAME
The Project for Capacity Enhancement of KCCA in Management of Traffic Flow in Kampala City in Uganda (Kampala Smart Traffic Project)
DRAWING TITLE
Pole and Duct Layout
Junction 2
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:
TIMK
2018:02:13
Scale:
N/A
Version 7
Drawing No: 2 - 2G
SHEET No: 01



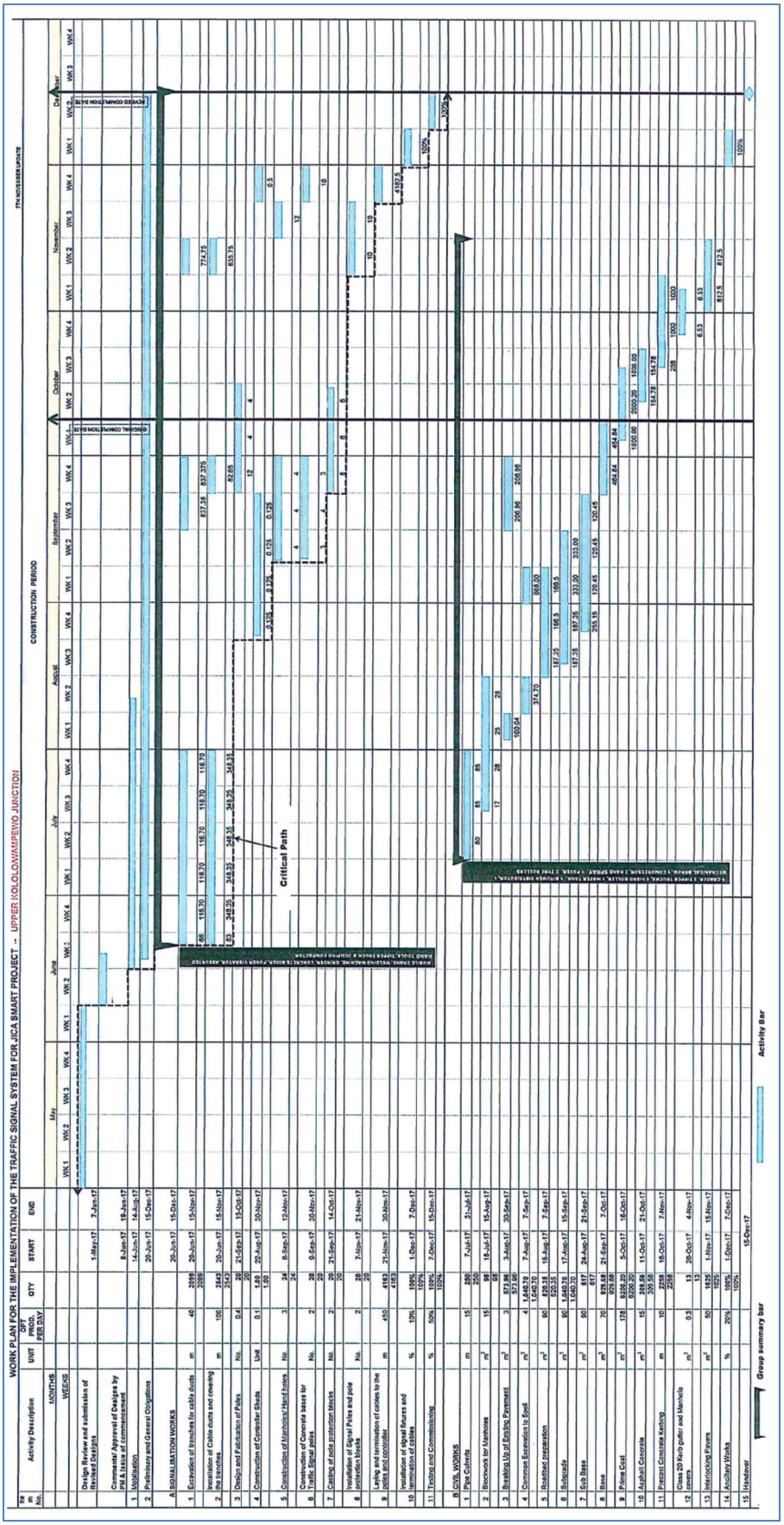
GREEN TIMES PER STAGE

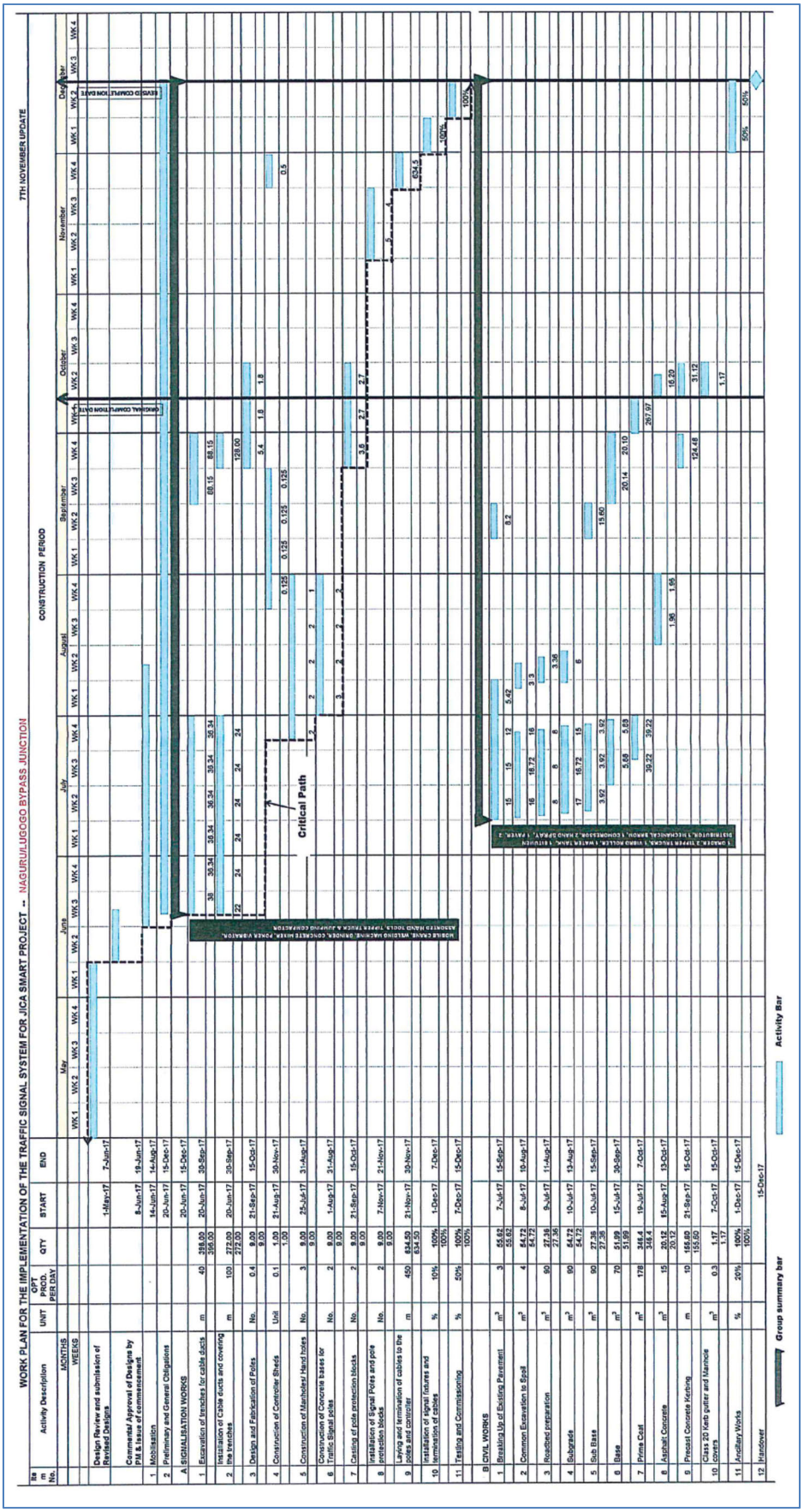
PATTERN SWITCH TIME	PATTERN No.	Calculated Lost time	Calculated Cycle	Recommended Cycle length	1 Ø S	2 Ø S	3 Ø S	Tt. Green Time (Veh.)
5:00	P1	44	148.148148	150	25	71	9	105
7:00	P2	44	191.304348	180	33	91	11	135
10:00	P3	44	98.4912281	100	17	31	7	55
16:00	P4	44	156.58363	160	32	50	32	114
20:00	P5	44	142.857143	150	33	43	28	104
23:00	P6	44	110	110	16	33	16	65

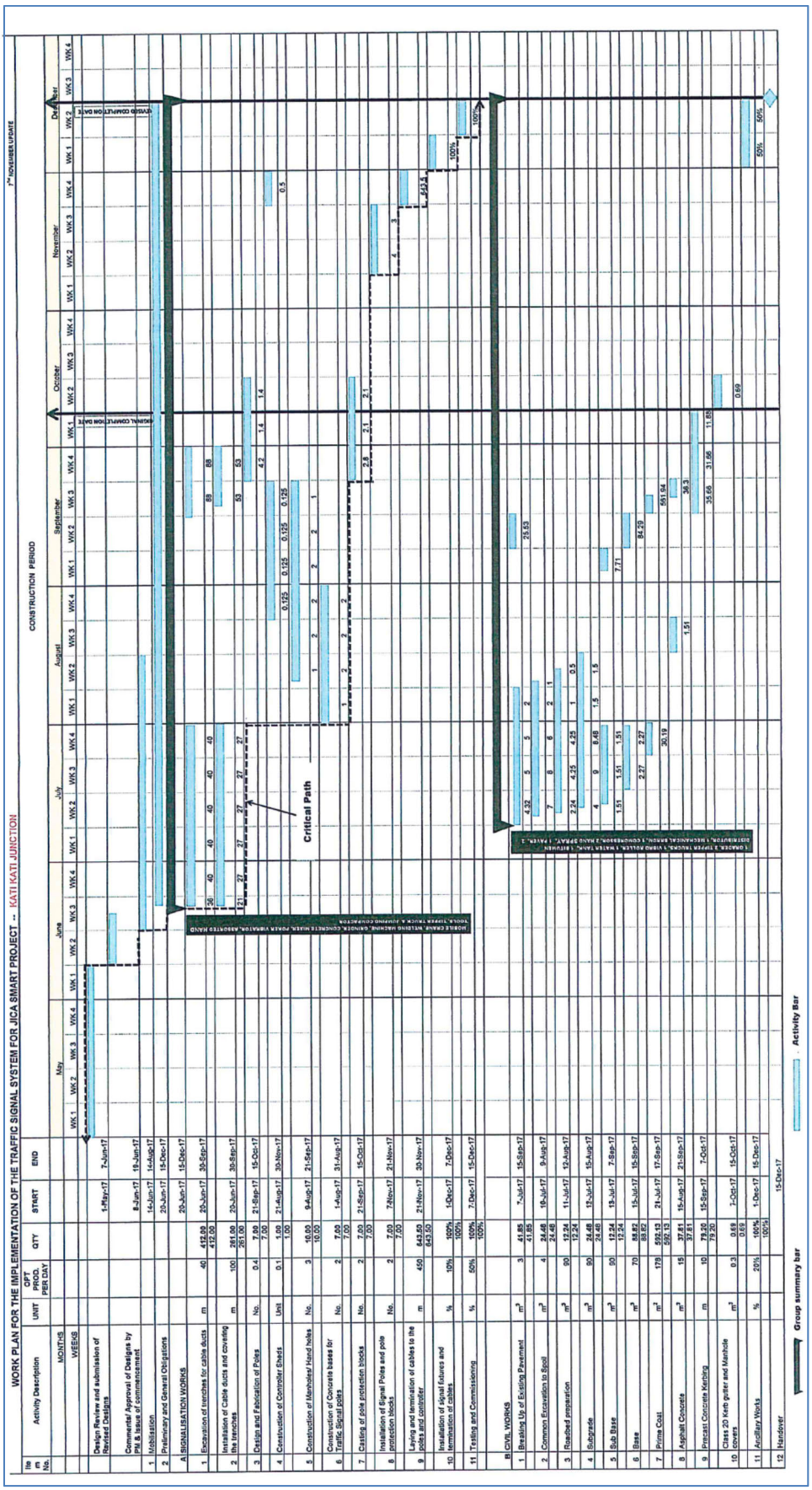
Pedestrian Walking speeds estimated at 1.5m/s
Lost time includes amber, red, and pedestrian stage times

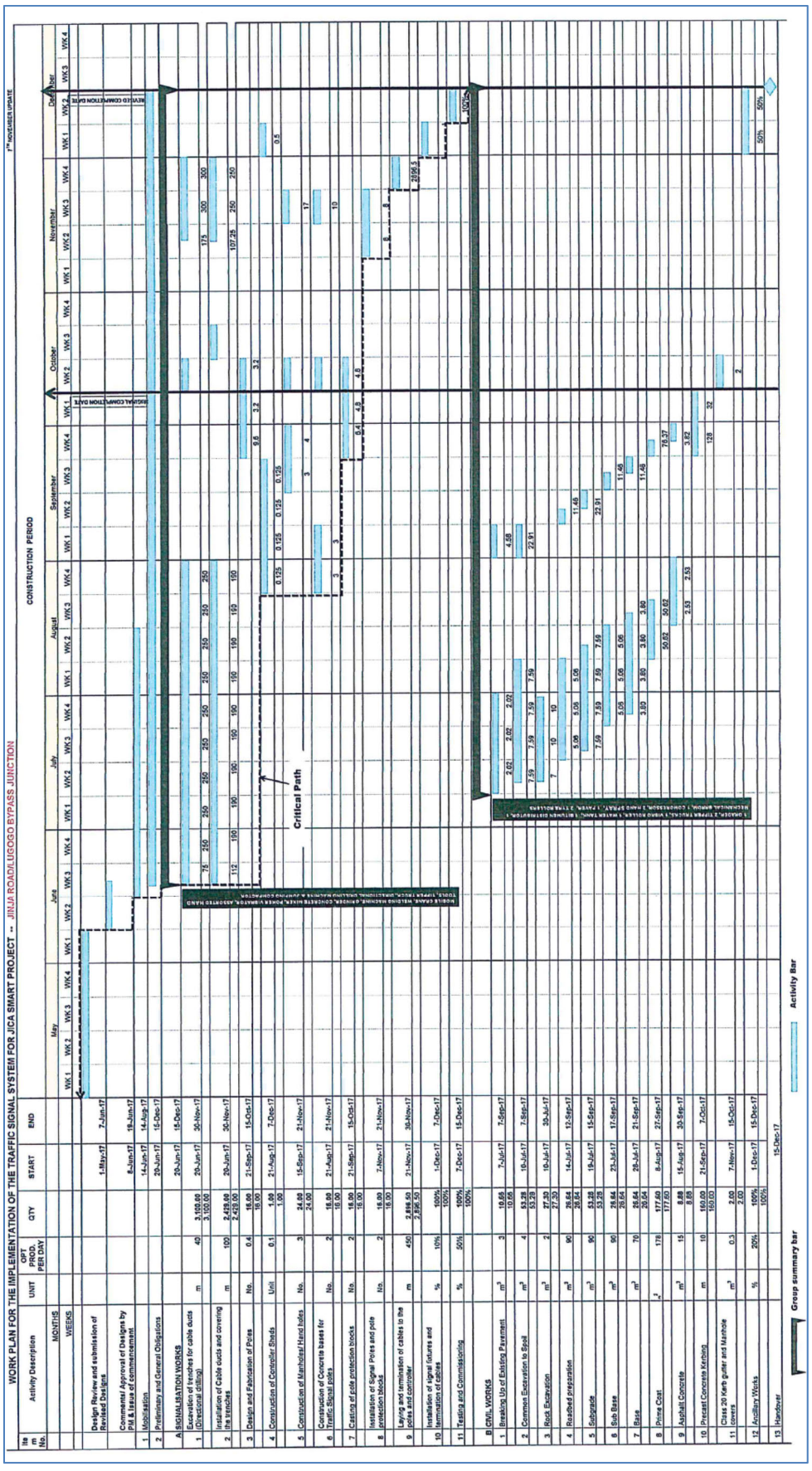

Junction 4
GREEN TIMES PER STAGE
Phase Diagram
When the Pedestrian Push Button is Pushed
When the Pedestrian Push Button is NOT Pushed
Sensitve Step
Pedestrian Walking speeds estimated at 1.5m/s
Lost time includes amber, red, and pedestrian stage times
Legend
PARTNERS
Japan International Cooperation Agency
&
Kampala Capital City Authority
DESIGN CONSULTANT
Oriental Consultants Global Co., Ltd.
PROJECT NAME
The Project for Capacity Enhancement of KCCA in Management of Traffic Flow in Kampala City in Uganda
(Kampala Smart Traffic Project)
DRAWING TITLE
Pole and Duct Layout
Junction 4
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:
2018.01.13
Scale:
N/A

Appendix 3 Progress of Work by the Contractor till December 2017




WORK PLAN FOR THE IMPLEMENTATION OF THE TRAFFIC SIGNAL SYSTEM FOR JICA SMART PROJECT -- NAGURURU,UGGOO BYPASS JUNCTION
7TH NOVEMBER UPDATE
CONSTRUCTION PERIOD
Critical Path
Group summary bar
Activity Bar


WORK PLAN FOR THE IMPLEMENTATION OF THE TRAFFIC SIGNAL SYSTEM FOR JICA SMART PROJECT -- KATI KATI JUNCTION
1ST NOVEMBER UPDATE
CONSTRUCTION PERIOD
Item No.
Activity Description
UNIT
OPT PROD. PER DAY
QTY
START
END
May
June
July
August
September
October
November
December
WEEKS
MONTHS
Design Review and submission of Revised Designs
Comments/ Approval of Designs by PM & issue of commencement
1 Mobilisation
2 Preliminary and General Obligations
A SIGNALISATION WORKS
1 Excavation of trenches for cable ducts
2 Installation of cable ducts and covering the trenches
3 Design and Fabrication of Poles
4 Construction of Controller Sheds
5 Construction of Manholes/ Hand holes
6 Construction of Concrete bases for Traffic Signal poles
7 Casting of pole protection blocks
8 Installation of Signal Poles and pole protection blocks
9 Laying and termination of cables to the poles and controller
10 Installation of signal fixtures and termination of cables
11 Testing and Commissioning
B CIVIL WORKS
1 Breaking Up of Existing Pavement
2 Common Excavation to Spoil
3 Roadbed preparation
4 Subgrade
5 Sub Base
6 Base
7 Prime Coat
8 Asphalt Concrete
9 Precast Concrete Kerbing
10 Class 20 Kerb gutter and Manhole covers
11 Ancillary Works
12 Handover
Critical Path
Group summary bar
Activity Bar


WORK PLAN FOR THE IMPLEMENTATION OF THE TRAFFIC SIGNAL SYSTEM FOR JICA SMART PROJECT -- JINJA ROAD/LUGOGO BYPASS JUNCTION
1st revision update
CONSTRUCTION PERIOD
Item No.
Activity Description
UNIT
OPT PRODN PER DAY
QTY
START
END
May
June
July
August
September
October
November
December
MONTHS
WEEKS
WK 1
WK 2
WK 3
WK 4
Design Review and submission of Revised Designs
Comments/ Approval of Designs by PM & Issue of commencement
Mobilisation
Preliminary and General Obligations
A SIGNALISATION WORKS
Excavation of trenches for cable ducts (Directional drilling)
Installation of Cable ducts and covering the trenches
Design and Fabrication of Poles
Construction of Controller Sheds
Construction of Manholes/ Hand holes
Construction of Concrete bases for Traffic Signal poles
Casting of pole protection blocks
Installation of Signal Poles and pole protection blocks
Laying and termination of cables to the poles and controller
Installation of signal fixtures and termination of cables
Testing and Commissioning
B CIVIL WORKS
Breaking Up of Existing Pavement
Common Excavation to Spoil
Rock Excavation
Roadbed preparation
Subgrade
Sub Base
Base
Prime Coat
Asphalt Concrete
Precast Concrete Kerbing
Class 20 Kerb gutter and Manhole covers
Ancillary Works
Handover
Critical Path
Group summary bar
Activity Bar

Appendix 4 Progress of Each Junction as of December 2017 by economical value

PROGRESS FOR WAMPEWO JN UP-TO END OF DECEMBER 2017

INDEX	BOQ Amount	Unit	Weight	Total Qty	Cum. Qty	Percentage Complete	Weighted Progress	Start date	End date	Overall Duration(days)	Progress as at	Duration up to End of December 2017 (days)	Planned Value	Planned Progress	Earned Value
WHOLE PROJECT	**1,707,965,669**		**100%**				**80.55%**	**1/May/17**	**7/Oct/17**	**160**	**31/12/2017**	**160**	**1,707,965,669**	**100.00%**	**1,414,596,948**
Relocation of services	150,000,000		8.78%	100%	100.00%	100.00%	8.78%				31/12/2017		150,000,000	8.78%	150,000,000
DRAINAGE WORKS	**264,688,759**	**%**	**15.50%**				**12.97%**	**7/Jul/17**	**31/Jul/17**	**25**	**31/12/2017**	**25**	**264,688,759**	**#########**	**260,376,259**
Excavation for pipe culverts	12,187,500	m	0.71%	100%	100.00%	100.00%	0.71%	7/Jul/17	31/Jul/17	25	31/12/2017	25	12,187,500	0.71%	12,187,500
Concrete pipe culverts 600 mm diameter	77,500,000	m	4.54%	100%	100.00%	100.00%	4.54%	7/Jul/17	31/Jul/17	25	31/12/2017	25	77,500,000	4.54%	77,500,000
Backfilling	23,079,094	m	1.35%	100%	100.00%	100.00%	1.35%	7/Jul/17	31/Jul/17	25	31/12/2017	25	23,079,094	1.35%	23,079,094
Concrete blockwork Class 25 concrete	11,817,656	m	0.69%	100%	100.00%	100.00%	0.69%	18/Jul/17	15/Aug/17	29	31/12/2017	29	11,817,656	0.69%	11,817,656
Formwork	1,750,000	m	0.10%	100%	100.00%	100.00%	0.10%	18/Jul/17	15/Aug/17	29	31/12/2017	29	1,750,000	0.10%	1,750,000
Plaster	1,969,609	m	0.12%	100%	100.00%	100.00%	0.12%	18/Jul/17	15/Aug/17	29	31/12/2017	29	1,969,609	0.12%	1,969,609
Steel reinforcement (mild and high tensile bars)	4,162,500	m	0.24%	100%	100.00%	100.00%	0.24%				31/12/2017		4,162,500	0.24%	4,162,500
Service ducts	5,500,000	m	0.32%	100%	100.00%	100.00%	0.32%				31/12/2017		5,500,000	0.32%	5,500,000
Pre-cast concrete kerbs	63,180,000	m	3.70%	100%	100.00%	100.00%	3.70%	18/Oct/17	7/Nov/17	21	31/12/2017	21	63,180,000	3.70%	63,180,000
Concrete lining for covered drains	20,417,400	m	1.20%	100%	100.00%	100.00%	1.20%	1/Nov/17	15/Nov/17	15	31/12/2017	15	20,417,400	1.20%	20,417,400
Interlocking pavers Grade 30 50mm thick	43,125,000	m	2.52%	100%	90.00%	90.00%	2.27%	1/Nov/17	15/Nov/17	15	31/12/2017	15	43,125,000	2.52%	38,812,500
CLEARING, GRUBBING AND REMOVAL OF TOP SOI	**1,700,000**	**m**	**0.10%**	**100%**	**100.00%**	**100.00%**	**0.10%**				**31/12/2017**		**1,700,000**	**0.10%**	**1,700,000**
COMMON EXCAVATION TO SPOIL	**9,367,500**	**m**	**0.55%**	**100%**	**100.00%**	**100.00%**	**0.55%**	**7/Aug/17**	**7/Sep/17**	**32**	**31/12/2017**	**32**	**9,367,500**	**0.55%**	**9,367,500**
ROCK EXCAVATION	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**				**0**
BREAKING UP EXISTING PAVEMENT LAYERS	**21,749,400**	**m**	**1.27%**	**100%**	**100.00%**	**100.00%**	**1.27%**	**3/Aug/17**	**30/Sep/17**	**59**	**31/12/2017**	**59**	**21,749,400**	**1.27%**	**21,749,400**
REMOVING EXISTING KERBS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**				**0**
ROADBED PREPARATION	**5,245,800**	**m**	**0.31%**	**100%**	**100.00%**	**100.00%**	**0.31%**	**15/Aug/17**	**7/Sep/17**	**24**	**31/12/2017**	**24**	**5,245,800**	**0.31%**	**5,245,800**
FILL LAYERS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**	**17/Aug/17**	**15/Sep/17**	**30**	**31/12/2017**	**30**	**0**	**0.00%**	**0**
MECHANICAL MODIFICATION OF SUB-BASE WITH 40% CRR (FINAL THICKNESS = 150 MM)	**60,467,391**	**m**	**3.54%**	**100%**	**100.00%**	**100.00%**	**3.54%**	**24/Aug/17**	**21/Sep/17**	**29**	**31/12/2017**	**29**	**60,467,391**	**3.54%**	**60,467,391**
WALKWAY BASE	**6,718,599**	**m**	**0.39%**	**100%**	**100.00%**	**100.00%**	**0.39%**				**31/12/2017**		**6,718,599**	**0.39%**	**6,718,599**
CRR BASE (150 MM)	**50,122,800**	**m**	**2.93%**	**100%**	**100.00%**	**100.00%**	**2.93%**	**21/Sep/17**	**7/Oct/17**	**17**	**31/12/2017**	**17**	**50,122,800**	**2.93%**	**50,122,800**
PRIME COAT	**10,342,800**	**m**	**0.61%**	**100%**	**100.00%**	**100.00%**	**0.61%**	**5/Oct/17**	**18/Oct/17**	**14**	**31/12/2017**	**14**	**10,342,800**	**0.61%**	**10,342,800**
ASPHALT CONCRETE SURFACING	**107,565,120**	**m**	**6.30%**	**100%**	**100.00%**	**100.00%**	**6.30%**	**11/Oct/17**	**21/Oct/17**	**11**	**31/12/2017**	**11**	**107,565,120**	**6.30%**	**107,565,120**
ANCILLARY WORKS	**67,980,000**	**m**	**3.98%**	**100%**	**80.00%**	**80.00%**	**3.18%**	**7/Nov/17**	**15/Nov/17**	**9**	**31/12/2017**	**9**	**67,980,000**	**3.98%**	**54,384,000**
Signalisation works	**952,017,500**	**m**	**55.74%**	**100%**			**39.61%**	**20/Jun/17**	**15/Dec/17**	**179**	**31/12/2017**	**179**	**952,017,500**	**55.74%**	**676,557,279**
Supply and installation of cables	108,787,750	m	6.37%	100%	62.50%	62.50%	3.98%	20/Jun/17	30/Nov/17	164	31/12/2017	164	108,787,750	6.37%	67,992,344
Ducting and termination box	407,917,250	m	23.88%	100%	85.24%	85.24%	20.36%	20/Jun/17	30/Nov/17	164	31/12/2017	164	407,917,250	23.88%	347,708,664
Controller shed	126,065,000	m	7.38%	100%	83.84%	83.84%	6.19%	22/Aug/17	30/Nov/17	101	31/12/2017	101	126,065,000	7.38%	105,692,896
Traffic signal poles	224,962,500	m	13.17%	100%	39.00%	39.00%	5.14%	21/Sep/17	21/Nov/17	62	31/12/2017	62	224,962,500	13.17%	87,735,375
Installation works	84,285,000	m	4.93%	100%	80.00%	80.00%	3.95%	1/Dec/17	7/Dec/17	7	31/12/2017	7	84,285,000	4.93%	67,428,000

PROGRESS FOR NAGURU JN UP-TO END OF DECEMBER 2017

INDEX	BOQ Amount	Unit	Weight	Total Qty	Cum. Qty	Percentage Complete	Weighted Progress	Start date	End date	Overall Duration(days)	Progress as at	Duration up to End of December 2017 (days)	Planned Value	Planned Progress	Earned Value
WHOLE PROJECT	**577,809,450**		**100%**				**89.32%**	**1/May/17**	**7/Oct/17**	**160**	**31/12/2017**	**160**	**577,809,450**	**100.00%**	**516,115,080**
Relocation of services	10,000,000		1.73%	100%	75.00%	75.00%	1.30%				31/12/2017		10,000,000	1.73%	7,500,000
DRAINAGE WORKS	**10,815,480**	**%**	**1.87%**				**1.87%**	**17/Aug/17**	**7/Sep/17**	**22**	**31/12/2017**	**22**	**10,815,480**	**1.87%**	**10,815,480**
Excavation for pipe culverts	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017			0.00%	0
Concrete pipe culverts 600 mm diameter	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Backfilling	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Concrete blockwork Class 25 concrete	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Formwork	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Plaster	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Steel reinforcement (mild and high tensile bars)	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Service ducts	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Pre-cast concrete kerbs	8,892,000	m	1.54%	100%	100.00%	100.00%	1.54%	21/Sep/17	15/Oct/17	25	31/12/2017	25	8,892,000	1.54%	8,892,000
Grouted stone pitching	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017			0.00%	0
Concrete lining for covered drains	1,923,480	m	0.33%	100%	100.00%	100.00%	0.33%	7/Oct/17	15/Oct/17	9	31/12/2017	9	1,923,480	0.33%	1,923,480
Interlocking pavers Grade 30 50mm thick	0	m	0.00%	100%	0.00%						31/12/2017			0.00%	0
CLEARING, GRUBBING AND REMOVAL OF TOP SOIL	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
COMMON EXCAVATION TO SPOIL	**1,368,000**	**m**	**0.24%**	**100%**	**100.00%**	**100.00%**	**0.24%**	**8/Jul/17**	**10/Aug/17**	**34**	**31/12/2017**	**34**	**1,368,000**	**0.24%**	**1,368,000**
ROCK EXCAVATION	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
BREAKING UP EXISTING PAVEMENT LAYERS	**3,301,440**	**m**	**0.57%**	**100%**	**100.00%**	**100.00%**	**0.57%**	**7/Jul/17**	**15/Sep/17**	**71**	**31/12/2017**	**71**	**3,301,440**	**0.57%**	**3,301,440**
REMOVING EXISTING KERBS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
ROADBED PREPARATION	**766,080**	**m**	**0.13%**	**100%**	**100.00%**	**100.00%**	**0.13%**	**9/Jul/17**	**11/Aug/17**	**34**	**31/12/2017**	**34**	**766,080**	**0.13%**	**766,080**
FILL LAYERS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**	**10/Jul/17**	**13/Aug/17**	**35**	**31/12/2017**	**35**	**0**	**0.00%**	**0**
MECHANICAL MODIFICATION OF SUB-BASE WITH 40% CRR (FINAL THICKNESS = 150 MM)	**7,619,760**	**m**	**1.32%**	**100%**	**100.00%**	**100.00%**	**1.32%**	**10/Jul/17**	**15/Sep/17**	**68**	**31/12/2017**	**68**	**7,619,760**	**1.32%**	**7,619,760**
WALKWAY BASE	**0**	**m**	**0.00%**	**100%**	**0.00%**	**0.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
CRR BASE (150 MM)	**5,745,600**	**m**	**0.99%**	**100%**	**100.00%**	**100.00%**	**0.99%**	**15/Jul/17**	**30/Sep/17**	**78**	**31/12/2017**	**78**	**5,745,600**	**0.99%**	**5,745,600**
PRIME COAT	**1,185,600**	**m**	**0.21%**	**100%**	**100.00%**	**100.00%**	**0.21%**	**19/Jul/17**	**7/Oct/17**	**81**	**31/12/2017**	**81**	**1,185,600**	**0.21%**	**1,185,600**
ASPHALT CONCRETE SURFACING	**12,330,240**	**m**	**2.13%**	**100%**	**100.00%**	**100.00%**	**2.13%**	**15/Aug/17**	**13/Oct/17**	**60**	**31/12/2017**	**60**	**12,330,240**	**2.13%**	**12,330,240**
ANCILLARY WORKS	**37,050,000**	**m**	**6.41%**	**100%**	**80.00%**	**80.00%**	**5.13%**	**1/Nov/17**	**15/Nov/17**	**15**	**31/12/2017**	**15**	**37,050,000**	**6.41%**	**29,640,000**
Signalisation works	**487,627,250**	**m**	**84.39%**	**100%**			**75.43%**	**20/Jun/17**	**15/Dec/17**	**179**	**31/12/2017**	**179**	**487,627,250**	**84.39%**	**435,842,880**
Supply and installation of cables	26,126,250	m	4.52%	100%	81.26%	81.26%	3.67%	20/Jun/17	30/Nov/17	164	31/12/2017	164	26,126,250	4.52%	21,230,191
Ducting and termination box	155,761,000	m	26.96%	100%	89.36%	89.36%	24.09%	20/Jun/17	21/Nov/17	155	31/12/2017	155	155,761,000	26.96%	139,188,030
Controller shed	122,690,000	m	21.23%	100%	86.14%	86.14%	18.29%	21/Aug/17	30/Nov/17	102	31/12/2017	102	122,690,000	21.23%	105,685,166
Traffic signal poles	98,765,000	m	17.09%	100%	90.79%	90.79%	15.52%	21/Sep/17	21/Nov/17	62	31/12/2017	62	98,765,000	17.09%	89,668,744
Installation works	84,285,000	m	14.59%	100%	95.00%	95.00%	13.86%	1/Dec/17	7/Dec/17	7	31/12/2017	7	84,285,000	14.59%	80,070,750

PROGRESS FOR KATI KATI JN UP-TO END OF DECEMBER 2017

INDEX	BOQ Amount	Unit	Weight	Total Qty	Cum. Qty	Percentage Complete	Weighted Progress	Start date	End date	Overall Duration(days)	Progress as at	Duration up to End of December 2017 (days)	Planned Value	Planned Progress	Earned Value
WHOLE PROJECT	532,008,715		100%				88.28%	1/May/17	7/Oct/17	160	31/12/2017	160	532,008,715	100.00%	469,653,294
Relocation of services	10,000,000		1.88%	100%	0.00%	0.00%	0.00%				31/12/2017		10,000,000	1.88%	0
DRAINAGE WORKS	6,378,360	%	1.20%				1.20%	17/Aug/17	7/Oct/17	52	31/12/2017	52	6,378,360	1.20%	6,378,360
Excavation for pipe culverts	0	m					0.00%				31/12/2017			0.00%	0
Concrete pipe culverts 600 mm diameter	0	m					0.00%				31/12/2017			0.00%	0
Backfilling	0	m					0.00%				31/12/2017			0.00%	0
Concrete blockwork Class 25 concrete	0	m					0.00%				31/12/2017			0.00%	0
Formwork	0	m					0.00%				31/12/2017			0.00%	0
Plaster	0	m					0.00%				31/12/2017			0.00%	0
Steel reinforcement (mild and high tensile bars)	0	m					0.00%				31/12/2017			0.00%	0
Service ducts	0	m					0.00%				31/12/2017			0.00%	0
Pre-cast concrete kerbs	5,244,000	m	0.99%	100%	100.00%	100.00%	0.99%	15/Sep/17	7/Oct/17	23	31/12/2017	23	5,244,000	0.99%	5,244,000
Grouted stone pitching	0	m	0.00%	100%	0.00%	0.00%	0.00%				31/12/2017			0.00%	0
Concrete lining for covered drains	1,134,360	m	0.21%	100%	100.00%	100.00%	0.21%	15/Sep/17	7/Oct/17	23	31/12/2017	23	1,134,360	0.21%	1,134,360
Interlocking pavers Grade 30 50mm thick	0	m	0.00%	100%	0.00%						31/12/2017				
CLEARING, GRUBBING AND REMOVAL OF TOP SO	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017			0.00%	
COMMON EXCAVATION TO SPOIL	612,000	m	0.12%	100%	100.00%	100.00%	0.12%	10/Jul/17	9/Aug/17	31	31/12/2017	31	612,000	0.12%	612,000
ROCK EXCAVATION	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017			0.00%	0
BREAKING UP EXISTING PAVEMENT LAYERS	1,476,960	m	0.28%	100%	100.00%	100.00%	0.28%	7/Jul/17	15/Sep/17	71	31/12/2017	71	1,476,960	0.28%	1,476,960
REMOVING EXISTING KERBS	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017			0.00%	0
ROADBED PREPARATION	342,720	m	0.06%	100%	100.00%	100.00%	0.06%	11/Jul/17	12/Aug/17	33	31/12/2017	33	342,720	0.06%	342,720
FILL LAYERS	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017				
MECHANICAL MODIFICATION OF SUB-BASE WITH 40% CRR (FINAL THICKNESS = 150 MM)	3,408,840	m	0.64%	100%	100.00%	100.00%	0.64%	13/Jul/17	7/Sep/17	57	31/12/2017	57	3,408,840	0.64%	3,408,840
WALKWAY BASE	0	m	0.00%	100%	0.00%	0.00%	0.00%				31/12/2017			0.00%	0
CRR BASE (150 MM)	2,570,400	m	0.48%	100%	100.00%	100.00%	0.48%	15/Jul/17	15/Sep/17	63	31/12/2017	63	2,570,400	0.48%	2,570,400
PRIME COAT	530,400	m	0.10%	100%	100.00%	100.00%	0.10%	21/Jul/17	17/Sep/17	59	31/12/2017	59	530,400	0.10%	530,400
ASPHALT CONCRETE SURFACING	5,516,160	m	1.04%	100%	100.00%	100.00%	1.04%	15/Aug/17	21/Sep/17	38	31/12/2017	38	5,516,160	1.04%	5,516,160
ANCILLARY WORKS	42,890,000	m	8.06%	100%	80.00%	80.00%	6.45%	1/Nov/17	15/Nov/17	15	31/12/2017	15	42,890,000	8.06%	34,312,000
Signalisation works	458,282,875	m	86.14%	100%			77.91%	20/Jun/17	15/Dec/17	179	31/12/2017	179	458,282,875	86.14%	414,505,454
Supply and installation of cables	26,667,500	m	5.01%	100%	82.74%	82.74%	4.15%	20/Jun/17	30/Nov/17	164	31/12/2017	164	26,667,500	5.01%	22,064,690
Ducting and termination box	146,277,875	m	27.50%	100%	93.91%	93.91%	25.82%	20/Jun/17	21/Nov/17	155	31/12/2017	155	146,277,875	27.50%	137,369,552
Controller shed	122,690,000	m	23.06%	100%	86.14%	86.14%	19.87%	21/Aug/17	30/Nov/17	102	31/12/2017	102	122,690,000	23.06%	105,685,166
Traffic signal poles	79,397,500	m	14.92%	100%	88.54%	88.54%	13.21%	21/Sep/17	21/Nov/17	62	31/12/2017	62	79,397,500	14.92%	70,298,547
Installation works	83,250,000	m	15.65%	100%	95.00%	95.00%	14.87%	1/Dec/17	7/Dec/17	7	31/12/2017	7	83,250,000	15.65%	79,087,500

PROGRESS FOR JINJA ROAD JN UP-TO END OF DECEMBER 2017

INDEX	BOQ Amount	Unit	Weight	Total Qty	Cum. Qty	Percentage Complete	Weighted Progress	Start date	End date	Overall Duration(days)	Progress as at	Duration up to End of December 2017 (days)	Planned Value	Planned Progress	Earned Value
WHOLE PROJECT	**1,071,620,645**		**100%**				**65.76%**	**1/May/17**	**7/Oct/17**	**160**	**31/12/2017**	**160**	**1,071,620,645**	**100.00%**	**704,723,403**
Relocation of services	20,000,000		1.87%	100%	100.00%	100.00%	1.87%				31/12/2017		20,000,000	1.87%	20,000,000
DRAINAGE WORKS	**18,488,000**	**%**	**1.73%**				**1.73%**	**17/Aug/17**	**7/Sep/17**	**22**	**31/12/2017**	**22**	**18,488,000**	**1.73%**	**18,488,000**
Excavation for pipe culverts	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Concrete pipe culverts 600 mm diameter	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Backfilling	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Concrete blockwork Class 25 concrete	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Formwork	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Plaster	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Steel reinforcement (mild and high tensile bars)	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Service ducts	0	m	0.00%				0.00%				31/12/2017			0.00%	0
Pre-cast concrete kerbs	15,200,000	m	1.42%	100%	100.00%	100.00%	1.42%	17/Aug/17	7/Sep/17	22	31/12/2017	22	15,200,000	1.42%	15,200,000
Grouted stone pitching	0	m	0.00%	100%	0.00%	0.00%	0.00%				31/12/2017			0.00%	0
Concrete lining for covered drains	3,288,000 -	m	0.31%	100%	100.00%	100.00%	0.31%	22/Aug/17	7/Sep/17	17	31/12/2017	17	3,288,000	0.31%	3,288,000
Interlocking pavers Grade 30 50mm thick	0	m	0.00%	100%	100.00%	100.00%	0.00%				31/12/2017				
CLEARING, GRUBBING AND REMOVAL OF TOP SOIL	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
COMMON EXCAVATION TO SPOIL	**1,332,000**	**m**	**0.12%**	**100%**	**100.00%**	**100.00%**	**0.12%**	**10/Jul/17**	**30/Jul/17**	**21**	**31/12/2017**	**21**	**1,332,000**	**0.12%**	**1,332,000**
ROCK EXCAVATION	**6,006,000**	**m**	**0.56%**	**100%**	**100.00%**	**100.00%**	**0.56%**	**10/Jul/17**	**30/Jul/17**	**21**	**31/12/2017**	**21**	**6,006,000**	**0.56%**	**6,006,000**
BREAKING UP EXISTING PAVEMENT LAYERS	**3,973,800**	**m**	**0.37%**	**100%**	**100.00%**	**100.00%**	**0.37%**	**7/Jul/17**	**31/Jul/17**	**25**	**31/12/2017**	**25**	**3,973,800**	**0.37%**	**3,973,800**
REMOVING EXISTING KERBS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
ROADBED PREPARATION	**745,920**	**m**	**0.07%**	**100%**	**100.00%**	**100.00%**	**0.07%**	**14/Jul/17**	**7/Aug/17**	**25**	**31/12/2017**	**25**	**745,920**	**0.07%**	**745,920**
FILL LAYERS	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**				
MECHANICAL MODIFICATION OF SUB-BASE WITH 40% CRR (FINAL THICKNESS = 150 MM)	**7,419,240**	**m**	**0.69%**	**100%**	**100.00%**	**100.00%**	**0.69%**	**23/Jul/17**	**14/Aug/17**	**23**	**31/12/2017**	**23**	**7,419,240**	**0.69%**	**7,419,240**
WALKWAY BASE	**0**	**m**	**0.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**				**31/12/2017**			**0.00%**	**0**
CRR BASE (150 MM)	**5,594,400**	**m**	**0.52%**	**100%**	**100.00%**	**100.00%**	**0.52%**	**28/Jul/17**	**17/Aug/17**	**21**	**31/12/2017**	**21**	**5,594,400**	**0.52%**	**5,594,400**
PRIME COAT	**1,154,400**	**m**	**0.11%**	**100%**	**100.00%**	**100.00%**	**0.11%**	**8/Aug/17**	**21/Aug/17**	**14**	**31/12/2017**	**14**	**1,154,400**	**0.11%**	**1,154,400**
ASPHALT CONCRETE SURFACING	**12,005,760**	**m**	**1.12%**	**100%**	**100.00%**	**100.00%**	**1.12%**	**15/Aug/17**	**31/Aug/17**	**17**	**31/12/2017**	**17**	**12,005,760**	**1.12%**	**12,005,760**
ANCILLARY WORKS	**83,660,000**	**m**	**7.81%**	**100%**	**0.00%**	**0.00%**	**0.00%**	**1/Sep/17**	**21/Sep/17**	**21**	**31/12/2017**	**21**	**83,660,000**	**7.81%**	**0**
Signalisation works	**911,241,125**	**m**	**85.03%**	**100%**			**58.60%**	**20/Jun/17**	**15/Dec/17**	**179**	**31/12/2017**	**179**	**911,241,125**	**85.03%**	**628,003,883**
Supply and installation of cables	79,353,250	m	7.40%	100%	50.00%	50.00%	3.70%	20/Jun/17	30/Nov/17	164	31/12/2017	164	79,353,250	7.40%	39,676,625
Ducting and termination box	416,190,375	m	38.84%	100%	70.00%	70.00%	27.19%	20/Jun/17	21/Nov/17	155	31/12/2017	155	416,190,375	38.84%	291,333,263
Controller shed	129,440,000	m	12.08%	100%	76.05%	76.05%	9.19%	21/Aug/17	7/Dec/17	109	31/12/2017	109	129,440,000	12.08%	98,439,120
Traffic signal poles	203,007,500	m	18.94%	100%	65.00%	65.00%	12.31%	21/Sep/17	21/Nov/17	62	31/12/2017	62	203,007,500	18.94%	131,954,875
Installation works	83,250,000	m	7.77%	100%	80.00%	80.00%	6.21%	1/Dec/17	7/Dec/17	7	31/12/2017	7	83,250,000	7.77%	66,600,000