

**Traffic Engineering & Transport Planning Agency (TEPA),
Lahore Development Authority (LDA), Islamic Republic of Pakistan**

**THE PROJECT ON IMPROVEMENT OF
TRAFFIC MANAGEMENT CAPACITY
IN
LAHORE CENTRAL AREA
IN
ISLAMIC REPUBLIC OF PAKISTAN**

FINAL REPORT

March 2019

Japan International Cooperation Agency (JICA)

**METS Research & Planning, Inc.
CTI Engineering International Co., Ltd.**

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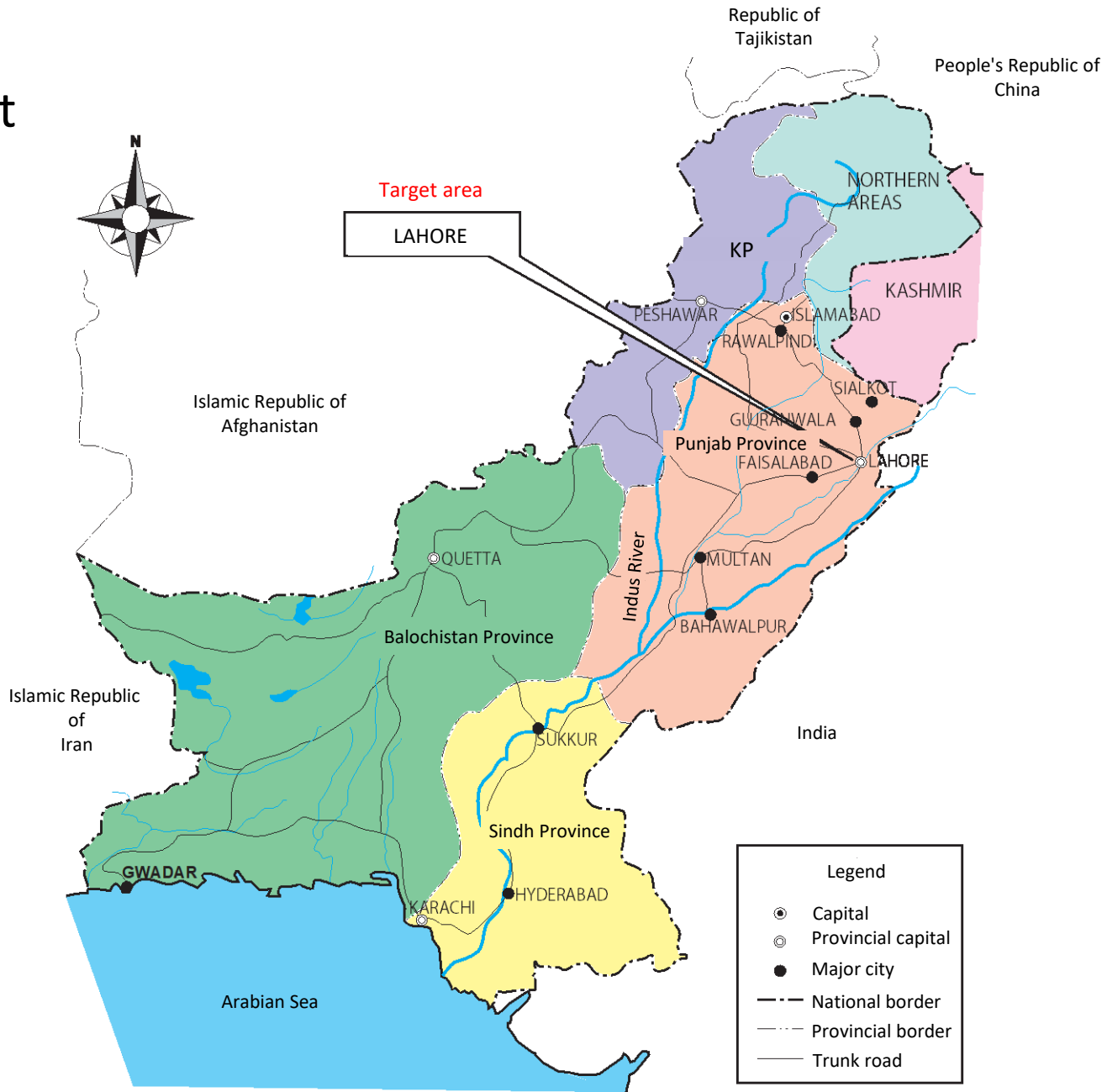
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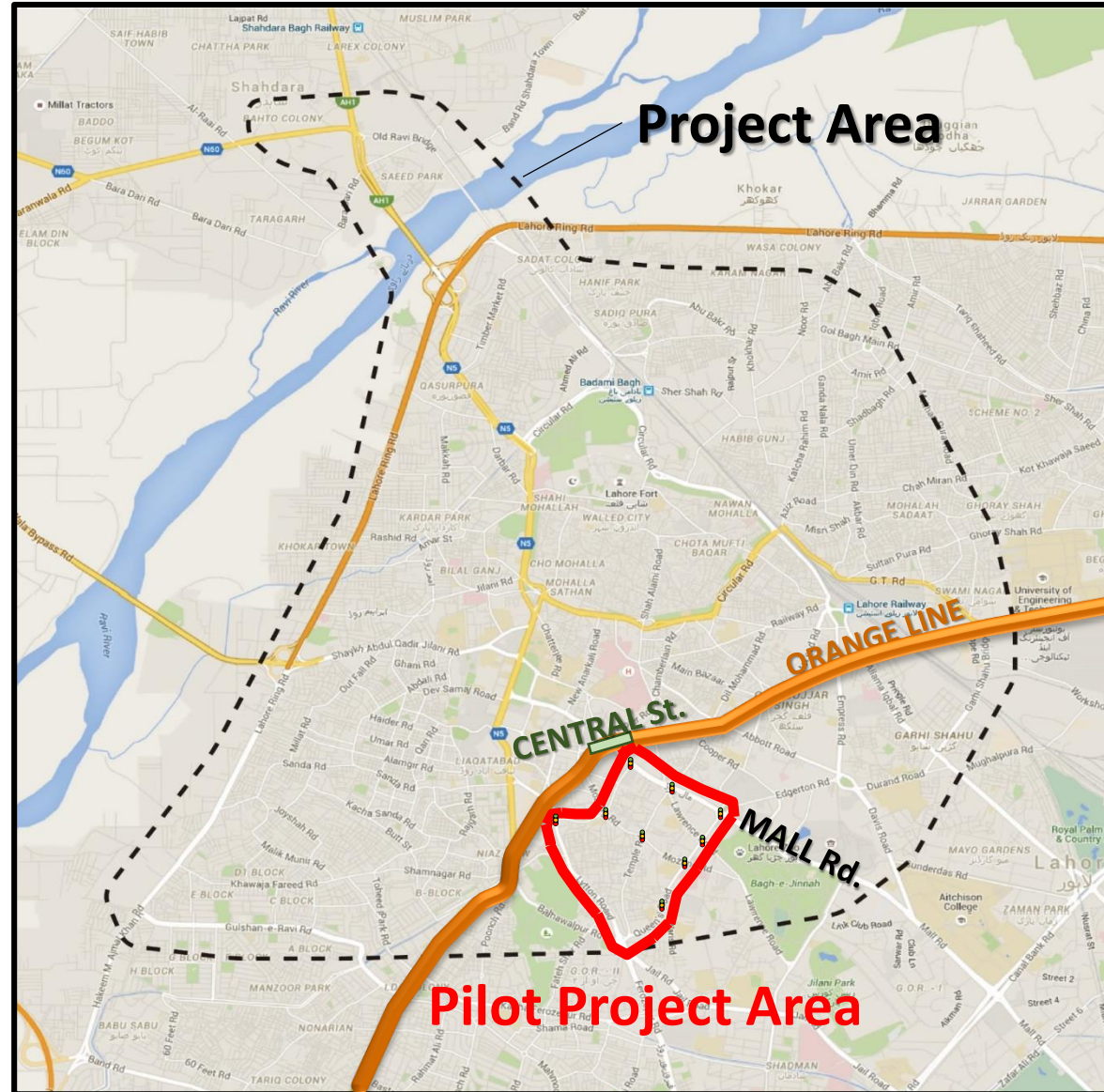
Abbreviations

AASHTO	American Association on of State Highway and Transportation on Officials
AD	Assistant Director
ADB	Asian Development Bank
BOT	Build Operate Transfer
CBD	Central Business District
CDGL	City District Government, Lahore
CNG	Compressed Natural Gas
CTPL	City Traffic Police Lahore
CWD	Communication & Works Department
DHA	Defence Housing Authority
DRTA	Lahore District Road Transport Authority
E&T	Excise and taxation Department
ED	Education Department
EPA	Environment Protection Agency
EPD	Environmental protection Department
ETC	Electronic Toll Collection
GDP	Gross Domestic Product
GIS	Geographic Information System
HIS	Household interview Surveys
HOV	High Occupancy Vehicle
HRT	Heavy Rapid Transit
HUD&PHED	Housing Urban Development and Public Health Engineering Department
ICT	Information and Communication Technology
ITS	Intelligent Transport System
LDA	Lahore Development Authority
LePark	Lahore Parking Company
LRMTS	Lahore Rapid Mass Transit System
LRR	Lahore Ring Road
LRT	Light Rail Transit
LSE	Lahore School of Economics
LTC	Lahore Transport Company
LUTMP	Lahore Urban Transport Master Plan
LPCL	Lahore Parking Company Limited
MCC	Manual Classified Count
MCL	Metropolitan Cooperation Lahore
MD	Managing Director
MRT	Mass Rapid Transit
NHA	National Highway Authority
PSCA	Punjab Safe City Authority
P&D	Planning & Development Department
PHA	Parks and Horticulture Authority
TD	Transport Department
TEPA	Traffic Engineering & Transport Planning Agency
TPU	Transport Planning Unit
UUPDD	Urban Unit Planning & Development Department

Location of Lahore Central District Pakistan



Project Area



Pilot Project Area

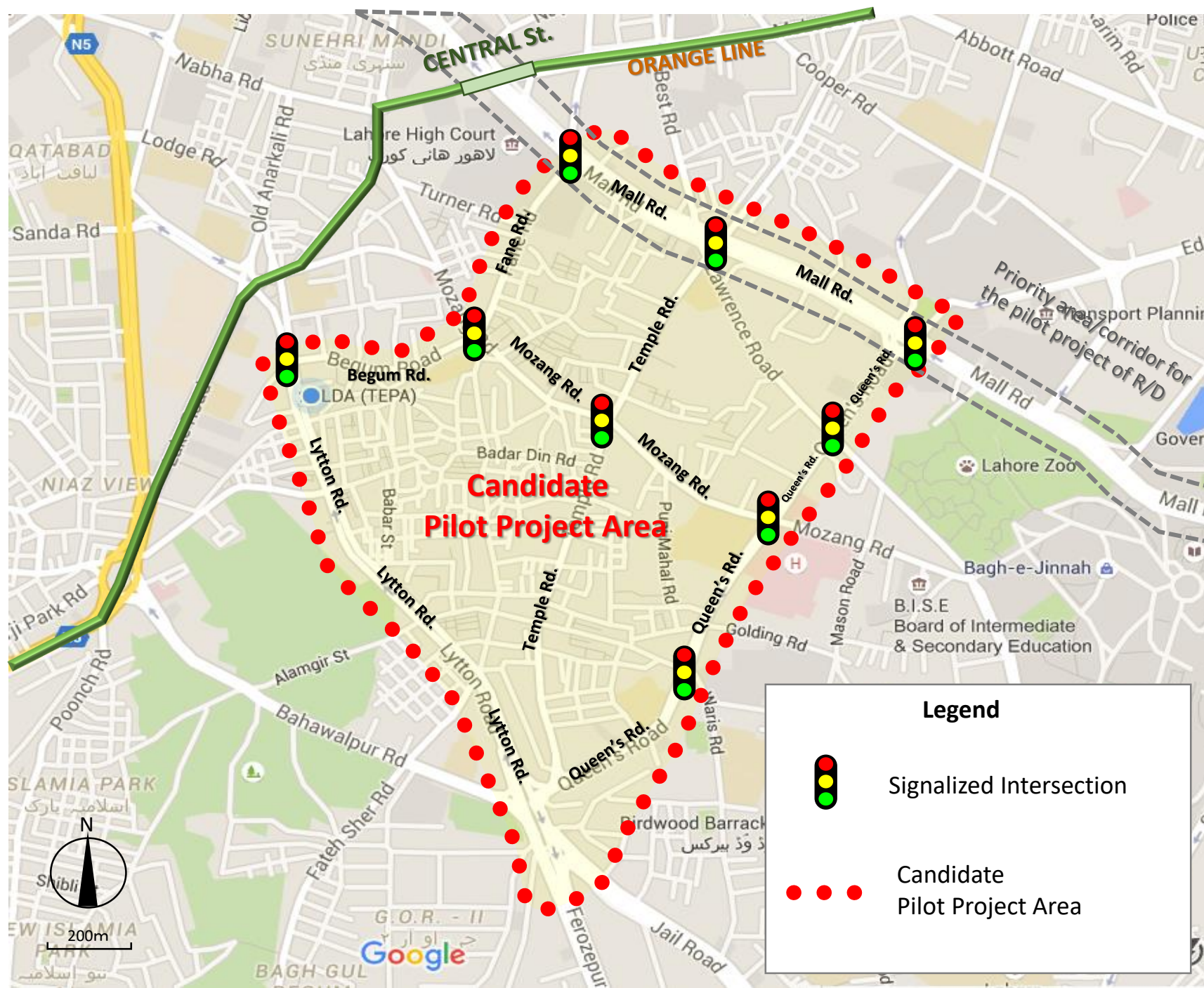
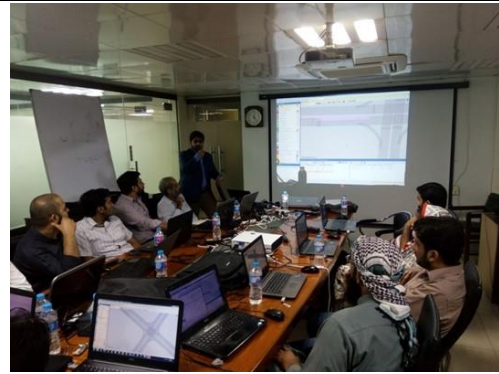


Photo Album (1)



Counterpart meeting. The capacity building training was held twice a week.



Traffic simulation operation method training



On-site training of signal controller



On-site training of traffic survey



Kick-off meeting (1st seminar)



C/P leader who presents at kick-off meeting (1st seminar). It was broadcasted on local TV news.



Discussion in the working group



Joint Coordination Committee

Photo Album (2)

<p>Project description for Degree college and request for Mobility management</p>	<p>Implementation of mobility management survey at Degree College</p>
<p>Mobility management lecture for children</p>	<p>Pilot Project · Traffic Safety · Campaign</p>
<p>Pilot project · Self-luminescence pedestrian crossing sign installation work</p>	<p>Pilot project · Color sidewalk painting work</p>
<p>Before</p> <p>After</p>	<p>Before</p> <p>After</p>
<p>Pilot project · Pushbutton type Japanese signal installed</p>	<p>Pilot project · Corridor management · sidewalk Implementation</p>

1 Outline

1.1 Background

Lahore, the provincial capital of Punjab, is the second largest city in Pakistan with a population of about 10million. The city’s population has been growing at an annual growth rate of about 3%. The city’s rapid population growth coupled with extremely high motorization growth (registered vehicles including motorcycles increased by 36.7% per annum between 2001 and 2008) has resulted in chronic traffic congestion.

To cope with this chronic traffic congestion in Lahore, JICA supported a project titled “The Project for Lahore Urban Transportation Master Plan Study in Pakistan (LUTMP)” which was undertaken from 2010 to 2012. LUTMP proposed, 1) Long Term Urban Transport Master Plan up to 2030, 2) Action Plan for identified priority projects up to 2020 and 3) development of mass transit system together with necessity of comprehensive urban transport measures.

BRT line (Metro Bus System (MBS)) was implemented with funding allocated by the Government of Pakistan and the MBS contributed to the decrease of traffic congestions along major transport corridor. However, traffic congestions in the Lahore Central Area still have increased because there are no effective countermeasures for the different aspects of traffic management.

Considering these circumstances, the Government of Pakistan requested the Government of Japan to support “The Project on Improvement of Traffic Management Capacity in Lahore Central Area (LITMC)” for improvement of the traffic management capacity to decrease traffic congestions in Lahore.

To cope with this, the detailed design study team for LITMC was dispatched in August 2013 by JICA. Through the detailed design study, implementation agencies of the Pakistani side were confirmed and an agreement was made on the activities of strengthening the planning and implementation capacity of the traffic management measures of Pakistani counterparts. Thereafter, the Record of Discussions (R/D) of the implementation of LIMTC was signed and exchanged between JICA and implementation agencies in March 2015.

1.2 Outline of the Project

The outline of the project is shown in Table 1.2-1.

Table 1.2-1 Outline of the Project

Project Purpose	1. TEPA will be able to formulate and implement countermeasures for traffic management. 2. Knowledge of related organizations on traffic management will be enhanced.
Outputs	1. Capacity Development for traffic management of TEPA and related organizations is conducted through training. 2. Institutional and personal capacity for traffic management of TEPA is enhanced 3. Pilot Project(s) are summarized into "handbook" to be shared among TEPA and related organizations as reference for other areas' improvement. 4. Traffic Management Improvement Plan in Lahore is developed.
Activities for Output 1	1-1 To conduct pre-evaluation on trainees who will participate in the traffic management training. 1-2 To develop training plan 1-3 To develop training materials. 1-4 To conduct training courses. 1-5 To conduct the evaluation test on the trainees. 1-6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations.
Activities for Output 2	2-1 To conduct traffic condition surveys in Lahore central area 2-2 To identify traffic management issues of traffic management 2-3 To plan Pilot Project(s) 2-4 To implement Pilot Project(s) 2-5 To conduct traffic surveys to evaluate the effectiveness of Pilot Project(s) 2-6 To evaluate the effectiveness of Pilot Project(s) by using micro-simulation "VISSIM" 2-7 To investigate the current state of organizational frameworks of TEPA. (legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)" 2-8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA. 2-9 To monitor the implementation of the institutional improvement plan 2-10 To develop traffic management plan including countermeasures
Activities for Output 3	3-1 To review the existing "handbooks" and "manuals" for traffic management. 3-2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Project(s). (data collection, analysis, development and implementation of countermeasure, geometric design and pedestrian facilities) 3-3 To distribute "handbook" and "manual" to traffic management to related organizations. 3-4 To hold workshops / seminars to transfer engineering knowhow to staff o related organizations
Activities for Output 4	4-1 To develop the traffic management plan in the Lahore Central Area.(Including Traffic Improvement Plan for Pedestrian, Traffic Demand Management Plan)
Project Area	Lahore Central Area (Refer to the Location Map)
The partner country officials	(1) Counterpart (C/P) • Traffic Engineering & Transport Planning Agency (TEPA), Lahore Development Authority (LDA) • Punjab Province Traffic Office (Transport Planning Unit (TPU), Transport Department (TD)) (2) Other related organizations • Traffic Police • City District Government, Lahore (CDGL) (3) Beneficiary • Direct beneficiaries : TEPA, TPU, Traffic Police, GDGL staff, a total of about 40 people • Indirect beneficiaries : Lahore City citizen which is about 10 million people, and about 2 million vehicles (including motorcycles)
Project period	From January 2016 until March 2019

1.3 Project Objective

The main objective of this Project is to extend technical cooperation to the Lahore City in its efforts in alleviating chronic urban traffic congestion problems. The approach of this Project however, focuses on building the capacity and strengthening the technical knowhow of engineers and officers in several agencies in charge of Lahore urban transport. To achieve this, a pilot project will be identified for implementation and the process in planning, implementation and management of such urban transport project can then be demonstrated and the knowhow passed on to agencies of engineers and officers.

1.4 Basic Consideration of the Project

In drawing up the Work Plan for this Project, careful considerations are duly given to the technical and operation aspects of implementation such that the Project can be carried out in a smooth manner.

- The Project work follows strictly the time frames as prescribed in JICA's Project Outlines as well as in the Record of Discussions (R/D).
- The Project work is laid out based on the amount of work deemed necessary in achieving the Project Objective, as well as ensuring the Project can be carried out in a smooth manner.
- With consideration given to achieving the Project Objective, the Project work also takes into account the need to maximize opportunities/timings for On-the-Job (OJT) capacity building for the counterparts (C/P).
- To start the survey, the plan and implementation of the pilot project shall be just after the training sessions so that the lessons learned can be immediately applied to the site. In this manner, an effective technical capacity development to counterparts can be achieved.
- Joint Coordinating Committee (JCC) meetings are to be held every six (6) months. However, the timing of such meetings shall be further discussed with the C/P depending on the progress of the Project

1.5 Organization to Carry Out the Project

1.5.1 Implementation Structure of the Project

As agreed in R/D, Implementation Structure of the Project, the counterpart agency is the Traffic Engineering & Transport Planning Agency (TEPA).

The Project organization chart is illustrated in Figure 1.5-1. The roles and assignments of relevant organizations are as follows:

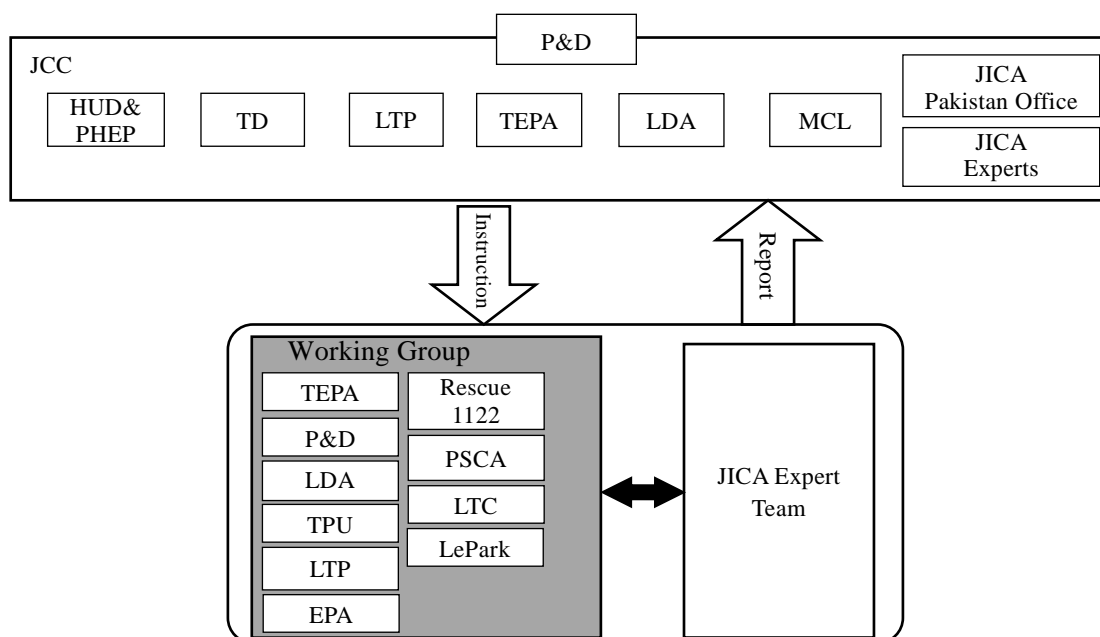


Figure 1.5-1 Implementation Structure of the Project

(1) Joint Coordinating Committee (JCC) members

Joint Coordinating Committee (hereinafter referred to as “JCC”) was established in order to facilitate inter-organizational coordination. JCC was held at least once a year and whenever deems it necessary. JCC approved the annual work plan, review overall progress, and exchange opinions on major issues that arise during the implementation of the project. The members of JCC are as follows.

Table 1.5-1 Joint Coordinating Committee (JCC) Members

	Designation	Position & Department
1	Chair person	Secretary, Planning and Development Department (P&D)
2	Member from Pakistan Side	Member, Planning and Development Department (P&D)
3	Member from Pakistan Side	Secretary, Housing, Urban Development and Public Health Engineering Department (HUD&PHED)
4	Member from Pakistan Side	Secretary, Transport Department (TD)
5	Member from Pakistan Side	Chief, Lahore Traffic Police (LTP)
6	Member from Pakistan Side	Chief Engineer, Transport Engineering and Planning Agency (TEPA)
7	Member from Pakistan Side	Director General, Lahore Development Authority (LDA)
8	Member from Pakistan Side	Mayer, Metropolitan corporation Lahore (MCL)
9	Member from Japanese Side	Representative of JICA Pakistan Office
10	Member from Japanese Side	Japanese experts
11	Member from Japanese Side	Personnel concerned to be decided by the Japanese side
12	Others	Persons who are invited by the Chairperson may attend the JCC meeting.

(2) Working Group (WG) members

Both sides agreed to establish a Working Group (hereinafter referred to as “WG”) to make implementation plans and to implement the Project’s activities. WG is composed of representatives of TEPA, TPU, Chief Traffic Officer, and Rescue 1122. Supposed number of representatives from TEPA to be assigned in WG is 5-6 persons. Working Group Members are as below.

Table 1.5-2 Working Group Members

	Designation	Position & Department
1	Chair person	MD/Chief Engineer, Traffic Engineering & Transport Planning Agency (TEPA)
2	Member	Designated Team Leader, Traffic Engineering & Transport Planning Agency (TEPA)
3	Member	Representative of Planning and Development Department (P&D)
4	Member	Chief Metropolitan Planner, Lahore Development Authority (LDA)
5	Member	Project Director, Transport Planning Unit (TPU)
6	Member	SP, Lahore Traffic Police (LTP)
7	Member	DG-Environmental Protection Agency (EPA)
8	Member	Representative of Rescue 1122
9	Member	Representative of Punjab safe cities Authority (PSCA)
10	Member	Representative of Lahore Transport Company (LTC)
11	Member	Representative of Lahore Parking Company (LePark)
12	Others	Persons who are invited by the Chairperson may attend the WG meeting.

(3) JICA Experts

The project will be carried out by a team organized by JICA. The Team members scheduled to participate in the study in Lahore Central Areal is composed of the following members:

Table 1.5-3 JICA Expert Members

	MEMBERS	POSITION/INCHARGE
1	KOTO Masato	Chief consultant / Traffic management (1)
2	UENO Ryuichi	Deputy chief consultant / Traffic management (2)
3	ONO Masazumi	Road facilities design
4	SANPEI Akihiro	Traffic signal design and operation
5	SHIRAI Osamu	Pilot project implementation and management
6	TERAOKA Yusuke/ MIYAZAKI Takahiro	Traffic survey / Analysis
7	SINARIMBO Nashreen	Capacity development planning / Organization improvement
8	MACHIDA Chikahiko	Training plan / Seminar
9	MIYAZAKI Takahiro	Project evaluation

1.5.2 Role of related organizations

The following are the related agencies of Punjab Province and Lahore City.

- (1) The Planning and Development Department (P&D) is the organization responsible for the planning function of the Punjab State, coordinating and monitoring the development program prepared by the other agencies concerned in the development of Punjab Province, analyzing the state's economic statistics and developing medium and long-term plans.
- (2) Lahore Development Authority (LDA) is the upper agency of Traffic Engineering & Transport Planning Agency (TEPA), and not only TEPA's traffic management measures but also many plan/design instructions are issued from LDA.
- (3) Transport Planning Unit (TPU) is an agency under the Transport Department (TD) which was established through the 2012 Urban Transportation Master Plan by JICA and is mainly responsible for Lahore's transportation plan.
- (4) Metropolitan Cooperation Lahore (MCL) is the Lahore City government and it is responsible for implementation and maintenance of roads in Lahore City.
- (5) Parks and Horticulture Authority (PHA) is the Urban Beautification Agency of Punjab Province.
- (6) Lahore Parking Company (LePark) is mainly responsible for maintenance, operation and management of on-street parking facilities.
- (7) Lahore Transport Company (LTC) is a Lahore Bus Company; it is responsible for the operation and maintenance of public bus transportation in the city.
- (8) Punjab Safe Cities Authority (PSCA) has taken over the responsibility for the traffic signal installation and maintenance from TEPA.
- (9) Water and Sanitation Agency (WASA) is a sewerage treatment agency under LDA.
- (10) EPA is an Environment Protection Agency of Punjab Province.
- (11) Rescue 1122 is an emergency medical team in Punjab Province; it also conducts aggregate analyses of traffic accident data.
- (12) Lahore Traffic Police (LTP) is a Lahore Traffic Police.
- (13) Education Department (ED) is the Education Department of Punjab Province.

2 Activity Achievement of the Project

2.1 Activity Achievement of the Project

2.1.1 PDM (final version)

The final version of PDM is as shown below. Project activities were implemented based on PDM. Details of the implementation status will be described in Section 2.2 to Section 2.5. In addition, the history of PDM shall be described in Chapter 4.

Project purpose		1) TEPA will be able to formulate and implement countermeasures for traffic management. 2) Knowledge of related organizations on traffic management will be enhanced.
Outputs		1. Capacity Development for traffic management of TEPA and related organizations is conducted through training. 2. Institutional and personal capacity for traffic management of TEPA is enhanced mainly through implementation of Pilot Project(s). 3. Pilot Project(s) are summarized into "handbook" to be shared among TEPA and related organizations as reference for other areas' improvement. 4. Traffic Management Improvement Plan in Lahore is developed.
Outline of Activities	Activity 1	1-1 To conduct pre-evaluation on trainees who will participate in the traffic management training. 1-2 To develop training plan. 1-3 To develop training materials. 1-4 To conduct training courses. 1-5 To conduct post-evaluation test on trainees after training course 1-6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations.
	Activity 2	2-1 To conduct traffic condition surveys in Lahore central area. 2-2 To identify traffic management issues. 2-3 To plan Pilot Project(s). 2-4 To implement Pilot Project(s). 2-5 To conduct traffic surveys to effectiveness of pilot project (s). 2-6 To evaluate the effectiveness of Pilot Project(s) using micro-simulation "VISSIM" 2-7 To investigate the current state of organizational frameworks of TEPA. (legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)" 2-8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA. 2-9 To monitor the implementation of the institutional improvement plan. 2-10 To develop traffic management plan including countermeasures.
	Activity 3	3-1 To review the existing "handbooks" and "manuals" for traffic management. 3-2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Project(s). (data collection, analysis, development and implementation of countermeasure, geometric design of the intersection and pedestrian facilities) 3-3 To hold workshops / seminars to transfer engineering knowhow to staff of related organizations. 3-4 To distribute "handbook" and "manual" to traffic management to related organizations.
	Activity 4	4-1 To develop the traffic management plan in the Lahore Central Area (Including Traffic Improvement Plan for Pedestrian and Traffic Demand Management Plan)

2.1.2 Activity Schedule (Achievement)

The activity schedule (achievement) is as shown below.

Project Title : The Project on Improvement of Traffic Management Capacity in Lahore Central Area in Islamic republic of Pakistan		2016																																				2017																																				2018																																				Monitoring																																						
Inputs	Plan	Jan												Feb												Mar												Apr												May												Jun												Jul												Aug												Sep												Oct												Nov												Dec												Remarks	Issue	Solution
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																																																																																																			
Inputs	Plan																																																																																																																																																			
KOZO Road	Plan																																																																																																																																																			
Chief consultant: traffic management (1)	Actual																																																																																																																																																			
SEMO Riyadh	Plan																																																																																																																																																			
Experts' chief consultant: traffic management (2)	Actual																																																																																																																																																			
CRD Islamabad	Plan																																																																																																																																																			
Asset facilities design / traffic simulation (1)	Actual																																																																																																																																																			
SAFETI Ankara	Plan																																																																																																																																																			
Traffic signal design and operation	Actual																																																																																																																																																			
TRSA Doha	Plan																																																																																																																																																			
Pilot project implementation and management	Actual																																																																																																																																																			
TEACCA Yaounde	Plan																																																																																																																																																			
Traffic survey / analysis	Actual																																																																																																																																																			
MAJOREN Soudabeh	Plan																																																																																																																																																			
Capacity development planning / organization improv ement	Actual																																																																																																																																																			
MAJOREN Islamabad	Plan																																																																																																																																																			
Training plan / Seminar / Traffic simulation (2)	Actual																																																																																																																																																			
MPPAAKAT Tashkent	Plan																																																																																																																																																			
Project evaluation / Traffic survey / analysis (2) / Traffic simulation (2)	Actual																																																																																																																																																			
Activities	Plan																																																																																																																																																			
Q1-Activities	Actual																																																																																																																																																			
Output 1: Capacity Development for traffic management of TEPA and related organizations is conducted through training.	Plan																																																																																																																																																			
1.1 To pre-evaluate to trainees to participate in the course of traffic management.	Actual																																																																																																																																																			
1.2 To develop training plan	Actual																																																																																																																																																			
1.3 To develop training materials	Actual																																																																																																																																																			
1.4 To conduct training courses	Actual																																																																																																																																																			
1.5 To conduct the post evaluation test to trainees after the training courses	Actual																																																																																																																																																			
1.6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations	Actual																																																																																																																																																			
Output 2: Institutional and personal capacity for traffic management of TEPA to enhance road safety through implementation of Pilot Projects.	Plan																																																																																																																																																			
2.1 To conduct traffic condition surveys	Actual																																																																																																																																																			
2.2 To identify traffic management issues of traffic management	Actual																																																																																																																																																			
2.3 To Plan Pilot Projects	Actual																																																																																																																																																			
2.4 To implement Pilot Projects	Actual																																																																																																																																																			
2.5 To conduct traffic surveys after Pilot Projects	Actual																																																																																																																																																			
2.6 To evaluate the effectiveness of Pilot Projects by using micro-simulation "VSSIM"	Actual																																																																																																																																																			
2.7 To investigate the current state of organizational frameworks of TEPA, (Legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)	Actual																																																																																																																																																			
2.8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA.	Actual																																																																																																																																																			
2.9 To monitor the implementation of the institutional improvement plan	Actual																																																																																																																																																			
2.10 To develop traffic management plan including cost-measures	Actual																																																																																																																																																			
Output 3: Pilot Projects are summarized into "handbook" to be shared across TEPA and related organizations as reference for other areas' development.	Plan																																																																																																																																																			
3.1 To review the existing "handbooks" and "manuals" for traffic management	Actual																																																																																																																																																			
3.2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Projects (Data collection, analysis, development and implementation of cost-measures, geometric design and pedestrian facilities)	Actual																																																																																																																																																			
3.3 To distribute "handbook" and "manual" to traffic management to related organizations	Actual																																																																																																																																																			
3.4 To hold workshops / seminars to transfer engineering knowhow to staff of related orgnizations	Actual																																																																																																																																																			
Output 4: Traffic management improvement plan in Lahore is developed	Plan																																																																																																																																																			
4.1 To develop the traffic management plan in the Lahore Central Area, (including Traffic Improvement Plan for Pedestrian, Traffic Demand Management Plan)	Actual																																																																																																																																																			
Monitoring Plan	Plan																																																																																																																																																			
Joint Coordinating Committee	Actual																																																																																																																																																			
Set up the Detailed Plan of Operation	Actual																																																																																																																																																			
Submission of Monitoring Sheet	Actual																																																																																																																																																			
Reports/Documents	Plan																																																																																																																																																			
Block Plan	Actual																																																																																																																																																			
Project Completion Report	Actual																																																																																																																																																			

2.2 Activity for Output 1

2.2.1 Needs Analysis for Trainees Who will Participate in the Traffic Management Course (Activity1-1)

(1) Introduction

Before the start of the formal capacity building/training (i.e. classroom lectures, actual field activities like traffic count survey), Needs Analysis Survey were carried out primarily to know the starting point for each topic to be learned by the C/Ps.

(2) Objectives/Purposes

The objective of the survey is to determine the knowledge/technical gaps (level of engineering knowledge on the topics covered by the Project) of the C/Ps in traffic management hence appropriate training program could be designed by the JICA Project Team. The result of the survey was the basis to formulate a training programme course.

(3) Target Participants

The target participants were the 10 TEPA C/Ps who worked with the JICA Project Team for the entire duration of the project.

(4) Topics Covered by the Survey

The topics are structured into seven (7) major subjects which were:

- a. Proficiency in Traffic Simulation and other useful softwares in planning
- b. Knowledge in Transportation Survey and Data Management
- c. Knowledge in Road and Intersection Planning and Design
- d. Knowledge in Traffic Signal Planning and Design
- e. Knowledge in Traffic Management and Control Systems
- f. Knowledge in Traffic Demand Management (TDM)
- g. Knowledge in Pedestrian Facilities and Parking Management

(5) Survey Date

The survey was carried out just one time on 7th March 2016.

(6) Methodology

A three (3) page survey questionnaire was prepared and distributed to the 10 C/Ps during the meeting. The purpose of the survey was explained to them emphasizing that it was not designed to measure their intelligence but rather it was just a guide to formulate a Training Programme. To ensure correctness of their answers, each item in the survey form was explained one by one and asked them to answer before moving into another question. Screen shot of the questionnaire is presented in Figure 2.2.1-1. An example question is provided below where each question has four (4) choices:

Question	Choices	Answer (pick one only)
1. Knowledge on road/highway design criteria and standard (road class, design speed, sight distance, vertical curve, horizontal curve, etc.)	[1] Zero knowledge / poor knowledge [2] Working knowledge (can operate but just basic and needs assistance) [3] Good knowledge (can work alone without assistance) [4] Highly Proficient	2

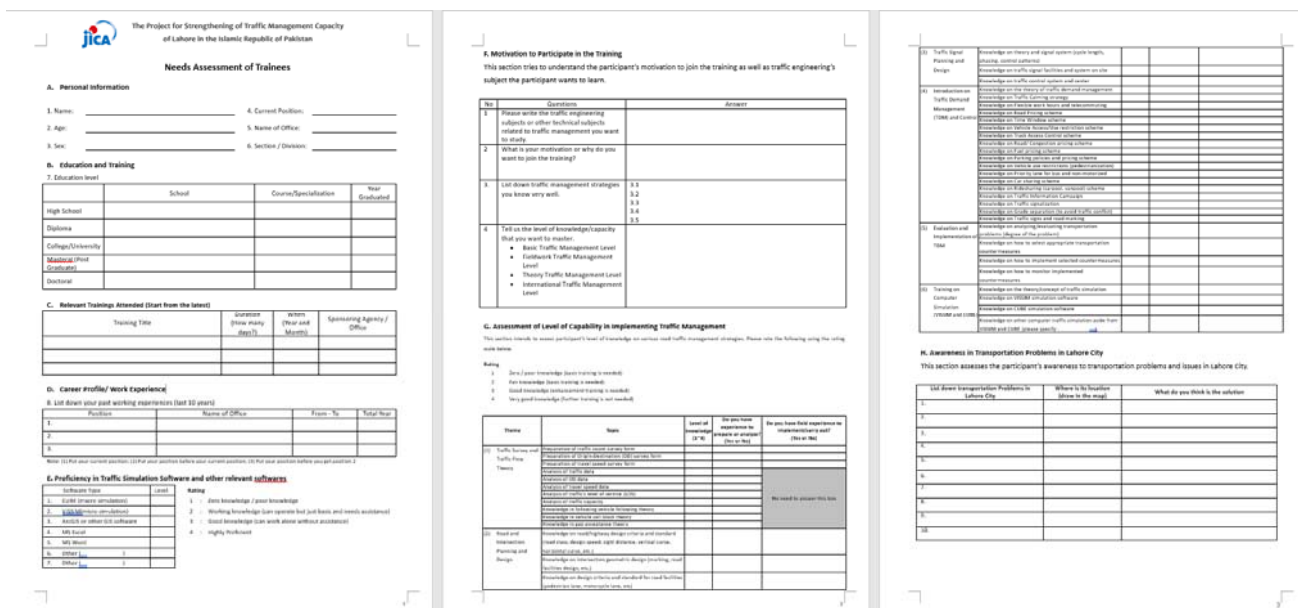


Figure 2.2.1-1 Screen Shot of the Survey Questionnaire

(7) Evaluation Method

Basically, the training programme designed by the JICA Project Team will start either of the following level: (i) Basic Training Programme, (ii) Enhancement Training Programme, and (iii) Refresher Training Programme depending on the result of the Survey. Definition of the three levels of training is shown in the table below and illustrated in Figure 2.2.1-2.

Table 2.2.1-1 Definition of the training programme

Level	Survey Results	Remarks
(i) Basic Level	<ul style="list-style-type: none"> - Poor knowledge - Working knowledge 	The training programme will start from Basic Level if most of the C/Ps current level of knowledge is either “poor” or “working knowledge”. This means that it will start from theory/concept, case studies, to practical application.
(ii) Enhancement Level	<ul style="list-style-type: none"> - Good knowledge 	The training programme will start from Enhancement Level if most of the C/Ps current level of knowledge is “good knowledge”. This means that it will start from case studies to practical application.
(iii) Refresher Training	<ul style="list-style-type: none"> - Highly proficient 	The training programme will start from Refresher Level if most of the C/Ps current level of knowledge is “highly proficient”. This means that it will start from practical application since C/Ps possessed knowledge in the fundamental theory and they had enough knowledge as well in case studies.

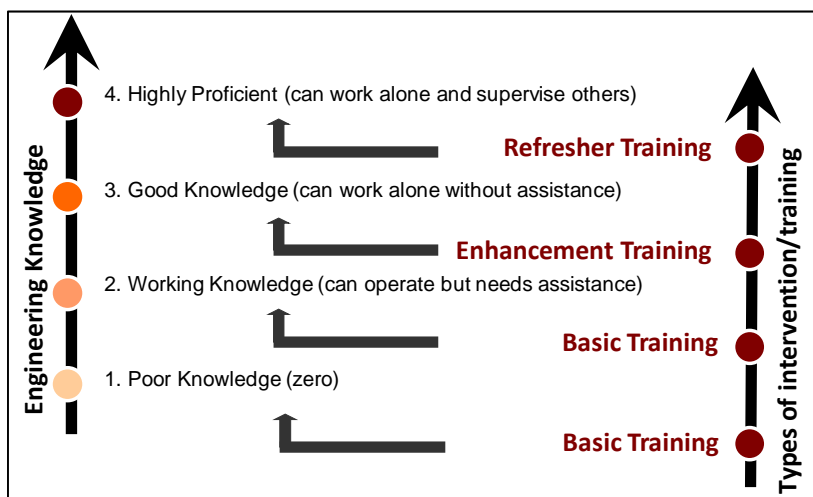


Figure 2.2.1-2 Level of Engineering Knowledge and Corresponding Intervention/Training Program

(8) Results of the Survey

The results of the survey per topic are presented in Table 2.2.1-2. In the same table, the recommended training programme per topic is indicated. Most of the topics required to start from the Basic Training Programme since most of the C/Ps' level of knowledge was either “poor” or “working knowledge”.

Table 2.2.1-2 Detailed Results of the Survey

Topics Covered	Results and Remarks
<p>a. Proficiency in Traffic Simulation and other useful softwares in planning</p>	<p>Sample number</p> <p>CUBE VISSIM ArcGIS AutoCAD MS Excel</p> <ul style="list-style-type: none"> Highly Proficient (can work alone and supervise others) Good Knowledge (can work alone without assistance) Working Knowledge (can operate but needs assistance) Poor Knowledge
<p>b. Knowledge in Transportation Survey and Data Management</p>	<p>Sample number</p> <ul style="list-style-type: none"> Poor Knowledge (Basic training is needed) Fair knowledge (basic training is needed) Good knowledge (enhancement training is needed) Very good knowledge (further training is not needed) <p>Preparation of traffic count survey Preparation of O-D survey form Preparation of Travel speed survey Analysis of traffic data Analysis of OD data Analysis of travel speed data Analysis of traffic's level of service Analysis of traffic capacity Knowledge in vehicle following theory Knowledge in vehicle cell block theory Knowledge in gap acceptance theory</p> <p>Preparation of Transportation survey forms ↑ Basic training + enhancement training</p> <p>Analysis of Transportation Data ↑ Basic training + enhancement training</p> <p>Knowledge in Traffic Flow Theory ↑ Fundamentals of traffic flow theory has to be taught</p>

<p>c. Knowledge in Road and Intersection Planning and Design</p>	<p style="text-align: center;">Basic Training for road (including intersection) design standards is indeed needed due to weak knowledge foundation in road design standards!</p> <p>Sample number</p> <p>Knowledge on road/highway design criteria and standard (road class, design speed, sight distance, vertical curve, horizontal curve, etc.)</p> <p>Knowledge on intersection geometric design (marking, road facilities design, etc.)</p> <p>Knowledge on design criteria and standard for road facilities (pedestrian lane, motorcycle lane, etc)</p> <p> ■ Very good knowledge (further training is not needed) ■ Good knowledge (enhancement training is needed) ■ Fair knowledge (basic training is needed) ■ Poor Knowledge (Basic training is needed) </p>
<p>d. Knowledge in Traffic Signal Planning and Design</p>	<p style="text-align: center;">-Basic training is needed -Those with very good knowledge will become focal person (support to JICA Project Team) in spreading knowledge to other counterparts</p> <p>Sample number</p> <p>Knowledge on theory and signal system (cycle length, phasing, control patterns)</p> <p>Knowledge on traffic signal facilities and system on site</p> <p>Knowledge on traffic control system and center</p> <p> ■ Very good knowledge (further training is not needed) ■ Good knowledge (enhancement training is needed) ■ Fair knowledge (basic training is needed) ■ Poor Knowledge (Basic training is needed) </p>
<p>e. Knowledge in Traffic Management and Control Systems</p>	<p style="text-align: center;">Training seems to be ideal to start from the Basic level</p> <p>Sample number</p> <p>Knowledge on Time Window scheme</p> <p>Knowledge on Vehicle Access/Use restriction scheme</p> <p>Knowledge on Truck Access Control scheme</p> <p>Knowledge on Priority lane for bus and non-motorized</p> <p> ■ Very good knowledge (further training is not needed) ■ Good knowledge (enhancement training is needed) ■ Fair knowledge (basic training is needed) ■ Poor Knowledge (Basic training is needed) </p>



(9) Recommended Training Programme based on the Survey Results

Figure 2.2.1-3 shows the summary of results of the C/Ps’ level of engineering knowledge on each topic to be covered by the training program. In the same figure, the recommended training programme is indicated per topic. In summary, the training programme per topic should start at Basic Level since the current level of knowledge of most of the C/Ps was “poor”.

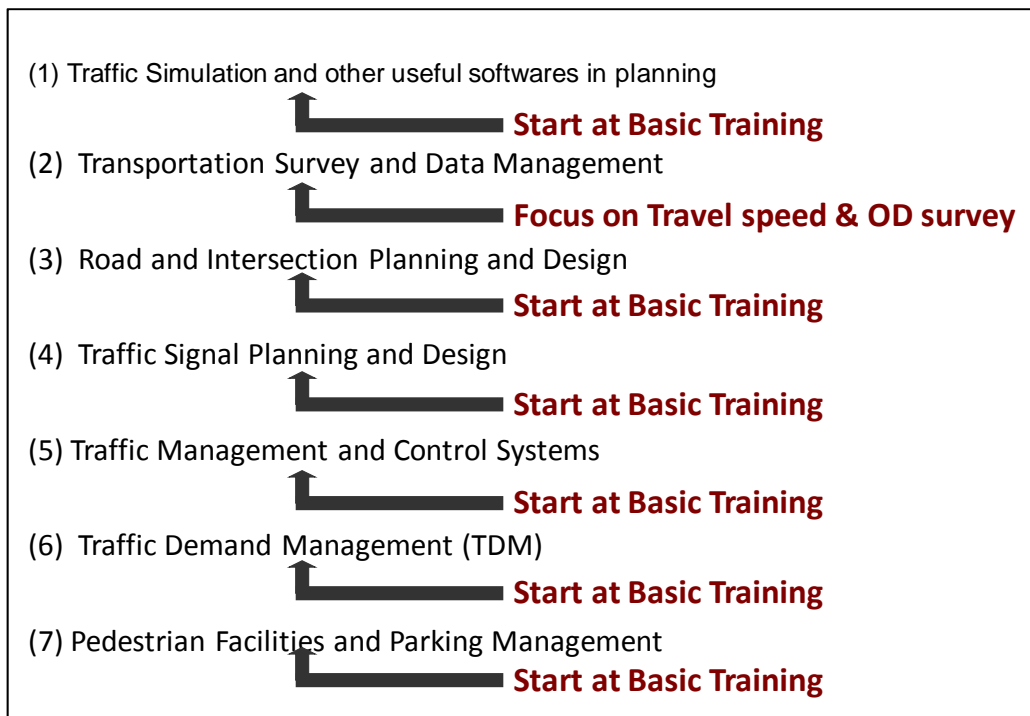


Figure 2.2.1-3 Recommended Training Programme

2.2.2 Development of Training Plan and Material (Activity 1-2, 1-3)

(1) Training Plan

Considering the baseline survey results of C/P skill and ability, the training program is formulated thought out the discussion with C/P. Training program has the following composition: purpose, period, module, target group and lecturer, like syllabus level description. Training theme covers topics to that would provide possible solutions on urban transport problems and improvement of organizational and human resource development. A training plan is as shown in Table 2.2.2-1.

Table 2.2.2-1 Tanning Plan

Assumption of instruction	Implementation items in this project (7 training programs)
	Training 1: Learning of traffic simulation and other software for traffic planning
	Training 2: Knowledge of traffic survey and data analysis
1) Intersection geometric design	Training 3: Knowledge of planning and design of roads and intersections
4) Traffic signal control	Training 4: Knowledge of traffic signal plan and design
2) One-way operation	Training 5: Knowledge of traffic management and traffic regulation system
3) Traffic demand management method	Training 6: Knowledge of traffic demand management (TDM)
5) Parking management	Training 7: Knowledge of pedestrian facilities and parking lot management

Training materials are developed based on the training plan. It is developed focusing on improving capacity of personnel in addressing transportation problems and applicable to daily work. For VISSIM training of cross traffic simulation software, advanced and specialized skills are required, and it is carried out by utilizing external human resources of instructor of Software Company.

(2) Training Method

Training courses is be conducted based on the training plans and materials. The trainings should lead to application for practical uses. It has four (4) steps: technical lecture at classroom, actual field survey, case study exercises, and follow-up classroom lecture. By implementing these four steps, learned knowledge in the classroom is further deepened by actual application in the field.

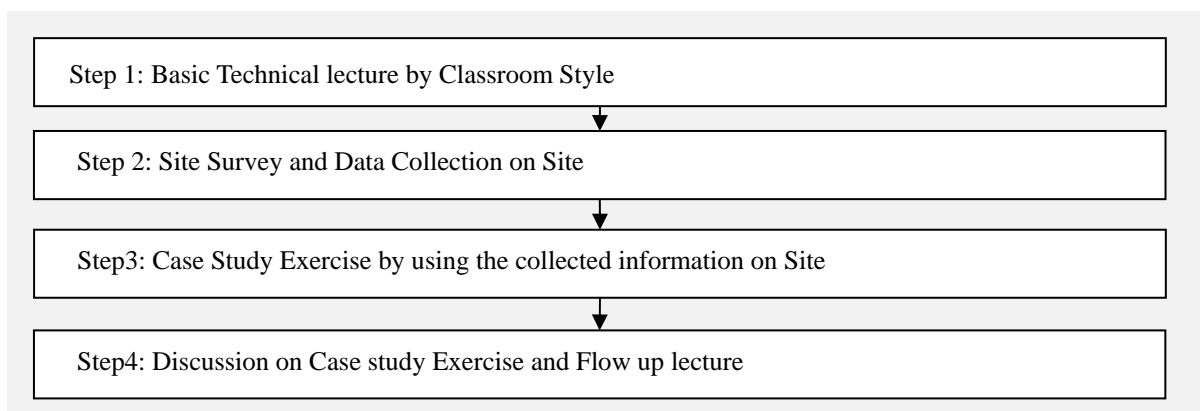


Figure 2.2.2-1 Technical Training Program by 4 Steps

2.2.3 Conduct of Training Courses (C/P Meeting) (Activity 1-4)

(1) Outline of the training

The main objective is to realize capacity development that can appropriately analyze and cope with practical tasks. We carried out training by classroom at the TEPA C/P meeting (Different from WG) held about twice a week, and on-site training during the pilot project period. 125 C/P meetings were held between February 2016 and February 2019. Main activities of the C/P meeting are shown below. The training number indicated in the activity content indicates which of the following training programs is supported.

Training 1: Learning of traffic simulation and other software for traffic planning

Training 2: Knowledge of traffic survey and data analysis

Training 3: Knowledge of planning and design of roads and intersections

Training 4: Knowledge of traffic signal plan and design

Training 5: Knowledge of traffic management and traffic regulation system

Training 6: Knowledge of traffic demand management (TDM)

Training 7: Knowledge of pedestrian facilities and parking lot management

Table 2.2.3-1 Training outline at C/P meeting

	Date	Main activities	C/P participant
#1	2016 20 Feb (Sat)	<ul style="list-style-type: none"> · Self-introduction · Discussions: Description of the project outline / Confirmation of status of LUTMP · Discussions: Schedule of kickoff, JCC meeting held 	7
#2	01 Mar (Tue))	<ul style="list-style-type: none"> · Discussions: Work plan, JCC, WG, etc. · Discussions: Institutional Assessment and Needs Assessment of Trainees Explanation 	7
#3	04 Mar (Fri)	<ul style="list-style-type: none"> · Discussions: Request to submit TEPA C/P list · Training 3: Problem Intersections and its factors 	6
#4	07 Mar (Mon)	<ul style="list-style-type: none"> · Discussions: Request for submission of Assessment of Trainees · Training 3: Problem Intersections and its factors 	6
#5	11 Mar (Fri)	<ul style="list-style-type: none"> · Discussions: TEPA staff organization chart is presented. · Training 2: Traffic volume survey candidate sites and survey time zones 	5
#6	14 Mar (Mon)	<ul style="list-style-type: none"> · Discussions: Training 2: Discuss travel speed survey route · Training 2: Amendment plan for traffic volume and parking lot survey site 	7
#7	18 Mar (Fri)	<ul style="list-style-type: none"> · Discussions: Explanation of the situation of the JCC meeting. · Training 2: Confirmation of the traffic volume survey candidate site 	7
#8	21 Mar (Mon)	<ul style="list-style-type: none"> · Training 2: Establishment of traffic volume survey site · Discussions: Request submission of past traffic survey results at Mall Road 	9
#9	25 Mar (Fri)	<ul style="list-style-type: none"> · Waqar sick leave, Abbas canceled for another work 	0
#10	28 Mar (Mon)	<ul style="list-style-type: none"> · Training 4: Confirming problems of traffic signals · Discussions: JCC Minutes progress check 	9
#11	01 Apr (Fri)	<ul style="list-style-type: none"> · Training 2: Explain the outline of the traffic survey · Training 2: Confirm the purpose, content and method of each survey 	7
#12	04 Apr (Mon)	<ul style="list-style-type: none"> · Training 6: Outline description of TDM interview survey · Discussions: Announce the weekly activities of the C/P next week. 	8
#13	08 Apr (Fri)	<ul style="list-style-type: none"> · Training 2: Traffic survey results at Mall Road submitted by TEPA. · Training 2: Review of the parking lot survey site (Situation of the Orange Line) 	7
#14	11 Apr (Mon)	<ul style="list-style-type: none"> · Discussions: Explain the C/P's weekly activities from Mr. Waqar · Training 2: Confirmation of traffic survey situation and site survey visitors 	9
#15	15 Apr (Fri)	<ul style="list-style-type: none"> · Training 2: Sharing and discussing consideration of traffic survey tour. · Training 2: Mr. Waqar added one additional proposal for parking lot survey 	9
#16	18 Apr (Mon)	<ul style="list-style-type: none"> · Discussions: Zahid Abbas reports C/P weekly activities · Training 2: Explain the outline of the survey form to be used for traffic survey 	9
#17	22 Apr (Fri)	<ul style="list-style-type: none"> · Discussions: Confirm the progress status of the project proposed in the master plan 	8
#18	25 Apr (Mon)	<ul style="list-style-type: none"> · Training 3: Discussion of intersection improvement plan based on field visit · Discussions: Presented the results of needs assessment survey 	6
#19	29 Apr (Thu)	<ul style="list-style-type: none"> · Training 2: About traffic volume survey · Training 2: Speed survey training 	7
#20	02 May (Mon)	<ul style="list-style-type: none"> · Training 2: Discussion on parking research proposals and speed survey proposals · Training 2: Explain the training of traffic survey 	8
#21	05 May (Thu)	<ul style="list-style-type: none"> · Discussions: Explain and discuss the Institutional Assessment 	8
#22	09 May (Mon)	<ul style="list-style-type: none"> · Discussions: Ms. Sajida reports C/P weekly activities · Training 2: Discussion on traffic survey 	9
#23	12 May (Thu)	<ul style="list-style-type: none"> · Training 5: About ITS (Case of Cambodia) Discussion · Training 5: Discussion on law and management in transportation 	9
#24	16 May (Mon)	<ul style="list-style-type: none"> · Discussions: Mr. Zaigham reports the C/P's weekly activities · Discussions: Discussions: Discussion on the up-load of this project on TEPA's website 	8
#25	19 May (Thu)	<ul style="list-style-type: none"> · Discussions: Explain the overall training plan and training on traffic survey analysis · Training 1: Training on VISSIM is proposed from TEPA 	8

	Date	Main activities	C/P participant
#26	23 May (Mon)	<ul style="list-style-type: none"> Discussions: Saeed reported C/P weekly activities Training 3: Begum intersection Analysis of traffic volume survey, discuss issues 	6
#27	26 May (Thu)	<ul style="list-style-type: none"> Training 7: Training on how to analyze parking survey results. Learn calculation method such as rotation rate of parking lot using sample data 	8
#28	30 May (Mon)	<ul style="list-style-type: none"> Training 2: Zaigham and Sajida explain traffic volume data analysis results Discussions: C/P determines pilot project area 	9
#29	02 Jun (Thu)	<ul style="list-style-type: none"> Training 5: Discuss the problems in the pilot project area Training 6: Training on the direction of the pilot project from the viewpoint of TDM 	9
#30	07 Jun (Tue)	<ul style="list-style-type: none"> Training 3: Mr. Usman and Mr. Saeed exhibit about the new two intersections Training 5: Organization of problems in the pilot project area 	7
#31	13 Jun (Mon)	<ul style="list-style-type: none"> Training 4: Training on the type of traffic lights in Japan 	8
#32	20 Jun (Mon))	<ul style="list-style-type: none"> Training 4: About the image when Japanese traffic signal were implement to Lahore Discussions: Confirmation of training contents and schedule 	7
#33	27 Jun (Mon)	<ul style="list-style-type: none"> Discussions: Discuss the budget plan of TEPA. Training 2: Discussion of summary of traffic survey results. 	8
#34	04 Jul (Mon)	<ul style="list-style-type: none"> Discussions: Methodology for organizational capacity improvement through pilot project Training 2: Analysis method of travel speed survey training 	7
#35	11 Jul (Mon)	<ul style="list-style-type: none"> Discussions: Weekly activities of C/Ps reported 	7
#36	14 Jul (Thu)	<ul style="list-style-type: none"> Training 2: Abbas reported traffic survey results. (20 intersections) Training 2: Usman reported the parking situation survey result. (4 sections) 	7
#37	18 Jul (Mon)	<ul style="list-style-type: none"> Training 6: Discussion on TDM interview survey results. 	8
#38	22 Jul (Fri)	<ul style="list-style-type: none"> Training 2: Report on travel speed survey result from C/P Training 3: Training on road design methodology in Japan 	7
#39	25 Jul (Mon)	<ul style="list-style-type: none"> Training 3: Discussion on the results of road survey results within the pilot project area. 	8
#40	28 Jul (Thu)	<ul style="list-style-type: none"> Training 2: Discussion on travel speed survey results within pilot project area 	8
#41	01 Aug (Mon)	<ul style="list-style-type: none"> Training 6: Discussion on mobility management to be implemented at pilot project 	9
#42	04 Aug (Thu)	<ul style="list-style-type: none"> Training 4: Training on overview of Japanese traffic signal system Training 4: Discussed traffic signaling system planned for Faisal chowk 	8
#43	08 Aug (Mon)	<ul style="list-style-type: none"> Training 3: Training based on safanwala chowk on Japanese intersection design method. 	6
#44	12 Aug (Fri)	<ul style="list-style-type: none"> Training 5: Outline of project cycle management training 	5
#45	15 Aug (Mon)	<ul style="list-style-type: none"> Training 5: Training on traffic safety campaign. 	8
#46	22 Aug (Mon)	<ul style="list-style-type: none"> Training 7: Training on pedestrian safety and pedestrian facilities. Training 4: Discussion about PSCA (Punjab Safe City Authority) project 	10
#47	29 Aug (Mon)	<ul style="list-style-type: none"> Training 4: Discussion about PSCA (Punjab Safe City Authority) project 	7
#48	01 Sep (Thu)	<ul style="list-style-type: none"> Training 6: Mobility management and traffic safety plan in the EU 	6
#49	05 Sep (Mon)	<ul style="list-style-type: none"> Training 6: Usman's presentation on mobility management Training 4: Discussion on the basics of traffic signal system 	6
#50	08 Sep (Thu)	<ul style="list-style-type: none"> Discussions: Person in charge of TEPA in Mobility Management Presentation 	7
#51	16 Sep (Fri)	<ul style="list-style-type: none"> Training 4: Discussion on the basics of traffic signal system 	6
#52	19 Sep (Mon)	<ul style="list-style-type: none"> Training 4: Discussion on the basics of traffic signal system 	8

	Date	Main activities	C/P participant
#53	22 Sep (Thu)	· Training 4: Discussion on the basics of traffic signal system · Training 6: Presentation by Sajida on mobility management	8
#54	26 Sep (Mon)	· Discussions: Rehearsal of the seminar presentation · Training 3: Discussion on improvement of Regal Chowk (request from C. E)	7
#55	29 Sep(Thu)	· Training 5: Discussion on pilot project · Training 4: Discussion on the basics of traffic signal system	6
#56	03 Oct (Mon)	· Training 5: Discussion on pilot project	5
#57	06 Oct (Thu)	· Training 5: Discussion on pilot project (Current situation, issue ideas for parking management)	8
#58	10 Oct (Mon)	· Training 5: Discussion on pilot project · Discussions: Mid-term evaluation of project evaluation test	6
#59	17 Oct (Mon)	· Training 5: Discussion on pilot project · Training 5: About ITS Master Plan	6
#60	20 Oct (Thu)	· Training 6: Mobility management, school travel plan · Training 5: Phnom Penh city transportation campaign video	6
#61	24 Oct (Mon)	· Training 6: Mobility management, school travel plan	5
#62	27 Oct (Thu)	· Training 3: About intersection improvement in pilot project area	5
#63	31 Oct (Mon)	· Training 1: Traffic flow theory (basic simulation theory, VISSIM)	6
#64	03 Nov (Thu)	· Training 4: Discussion on traffic signal planning	6
#65	07 Nov (Mon)	· Training 3 and 4: Intersection improvement plan / pilot project area discussion on traffic signal plan	7
#66	10 Nov (Thu)	· Training 3 and 4: Intersection improvement plan / pilot project area discussion on traffic signal plan	5
#67	17 Nov (Mon)	· Training 4: Discussion on traffic signal planning in the pilot project area · Training 3: Unit price and design standard for intersection improvement	5
#68	24 Nov (Thu)	· Discussions: Report on meeting with PSCA	6
#69	28 Nov (Mon)	· Training 3 and 4: 3 intersection improvement plan / Discussion of traffic signal plan · Training 5: Realization of pilot project	5
#70	2017 09 Feb (Thu)	· Training 4: Progress Report of PSCA Signal Project · Training 5: Discussion on pilot project · Discussions: About WG / JCC schedule	5
#71	13 Feb (Mon)	· Training 7: Discussion on pedestrian facility measures · Training 6: Approach method of mobility management	7
#72	16 Feb (Thu)	· Training 6: Scope of schools as candidates for mobility management, field survey such as gate location etc	2
#73	20 Feb (Mon)	· Training 6: Report on field survey results (selection of MM candidate schools) · Training 6: Approach method of mobility management	4
#74	23 Feb (Thu)	· Training 6: Queens Road Alleyway School Survey · Training 6: Mobility Management Presentation from C/P	5
#75	27 Feb (Mon)	· Discussions: Arrangements for WG and JCC	8
#76	02 Mar (Thu)	· Discussions: Result report of WG and confirmation of work for JCC · Discussions: Letter to MM candidate school, approach	6
#77	06 Mar (Mon)	· Training 3 and 4: Discussion on intersection improvement and signal improvement	7
#78	09 Mar (Thu)	· Training 6: About Terms of Reference of Mobility Management · Training 6: About meeting at school	5
#79	13 Mar (Mon)	· Training 2: On-site survey at three(3) intersections of pilot project	5

	Date	Main activities	C/P participant
#80	20 Mar (Mon)	· Training 5: Discussion on details of pilot project	3
#81	22 Mar (Wed)	· Training 5: Discussion on details of pilot project · Training 2: Survey result analysis at three(3)intersections of pilot project	6
#82	27 Mar (Mon)	· Training 3: Detailed design of pilot project pavement marking · Training 7: Street parking lot, details of sidewalk improvement	7
#83	02 May (Tue)	· Discussions: Toward the 3rd WG · Discussions: Toward the 2nd seminar	7
#84	05 May (Fri)	· Training 3: Aerial photographs and drone's Terms of Reference	6
#85	08 May (Mon)	· Training 3: Aerial photographs and drone's Terms of Reference	5
#86	11 May (Thu)	· Training 5: About traffic safety campaign · Discussions: 2nd seminar (Agenda, Presenter, Presentation material)	3
#87	15 May (Mon)	· Training 5: Presentation of traffic safety campaign · Discussions: About the 2 nd seminar (agenda, presenter)	6
#88	18 May (Thu)	· Training 5:About pilot project evaluation survey	5
#89	22 May (Mon)	· Training 5: Preparation for bidding for pilot project company · Training 5: About traffic safety campaign	4
#90	25 May (Thu)	· Discussions: 2nd seminar, pilot project part · Discussions: Candidate for corridor management	5
#91	02 Jun (Fri)	· Training 3: Survey map for corridor management implementation plan · Discussions: About the meeting with the Queen's Road shopping mall	5
#92	08 Jun (Thu)	· Training 5: Discussion on corridor improvement plan	6
#93	06 Jul (Thu)	· Training 5: Comments and modifications to the drawing at the last C/PM · Discussions: Pilot project work schedule	4
#94	10 Jul (Mon)	· Discussions: 2nd seminar program · Training 3: Modification of pilot project drawing	6
#95	17 Jul (Mon)	· Discussions: WG presentation materials draft · Training 1: Traffic simulation, aerial photography, stakeholder conference	7
#96	24 Jul (Mon)	· Training 5: Traffic management plan - review of LUTMP · Training 5: Introduction of public transportation system in Asia	6
#97	28 Jul (Fri)	· Training 5: Efforts in the pilot project area · Training 1: VISSIM training schedule	7
#98	02 Aug (Wed)	· Discussions: About the material of the WG	6
#99	10 Aug (Thu)	· Discussions: Project schedule · Training 3: Safanwala chowk & Mozang Ada chowk improvement plan	7
#100	11 Sep (Mon)	· Training 5: Traffic safety campaign · Training 1: Preparation for VISSIM training	5
#101	14 Sep (Wed)	· Training 5: Traffic safety campaign · Training 1: Preparation for VISSIM training	7
#102	25 Sep (Mon)	· Training 5: Traffic safety campaign	6
#103	12 Oct (Thu)	· Training 5: Progress of traffic safety campaign · Training 2: Progress of traffic survey	6
#104	19 Oct (Thu)	· Training 6: Mobility Management Investigation Form · Training 6: Traffic Demand Management (TDM) Plan	5
#105	27 Oct (Fri)	· Training 5: Mobility management pre-survey and future directions · Training 5: Final plan for traffic safety campaign	6
#106	30 Oct (Mon)	· Training 5: Detailed plan of pilot project and activity along Queens Road · Discussions: Overall construction schedule	5
#107	06 Nov (Mon)	· Discussions: Intersection design manual, pilot project handbook, traffic demand management (TDM) plan	5

	Date	Main activities	C/P participant
#108	09 Nov (Thu)	· Discussions: About the WG / JCC meeting · Discussions: Outline of Turkey Project	6
#109	14 Nov (Tue)	· Discussions: New training plan (weekly training initiative cycle) · Discussions: About training in Japan	7
#110	30 Nov (Wed)	· Discussions: New training plan (weekly training initiative cycle) · Discussions: About training in Japan	4
#111	04 Dec (Mon)	· Training 1: Case study of VISSIM simulation in JICA project	6
#112	07 Dec (Wed)	· Training 3: Analysis of traffic survey results at three intersections	7
	2018 End of Dec~	Training 5: On-the-job training conducted during pilot project construction	
#113	2018 01 Feb (Thu)	· Discussions: Progress status of pilot project construction · Discussions: Progress status of VISSIM simulation · Discussions: Progress status of mobility management	8
#114	15 Mar (Thu)	· Discussions: Purpose and process of C/P evaluation test · Discussions: Progress of Mobility Management	6
#115	31 Mar (Sat)	· Training 6: About Mobility Management Campaign	6
#116	07 Jun (Thu)	· Discussions: Intermediate Evaluation Survey	7
#117	28 Jun (Thu)	· Discussions: Future project schedule · Training 2 and 6: Future activities of post traffic survey and mobility management	6
#118	08 Aug (Wed)	· Discussions: Holding of WG and JCC, seminars · Training 6: About Mobility Management (Seminar at School)	5
#119	30 Aug (Thu)	· Discussions: About the 5th JCC agenda and presentation · Discussions: About the 3rd Seminar's agenda and presentation	7
#120	01 Sep (Sat)	· Discussions: The 5th JCC presentation rehearsal · Discussions: 3rd seminar presentation rehearsal	6-
#121	2019 11 Jan (Fri)	· Discussions: Future schedule (WG / SEMINAR / JCC) · Discussions: Exchange of opinions on pilot project handbook	6
#122	17-Jan (Thu)	· Discussions: C/P Members Comments on Pilot Project Handbook · Training 5: Small change improvement plan of Queens Road	7
#123	24-Jan (Thu)	· Discussions: Intersection Design Manual /Traffic Management Plan · Training 1: Traffic Simulation using VISSIM	5
#124	04-Feb (Mon)	· Discussions: The 6th WG Agenda and Presentation	6
#125	14-Feb (Thu)	· Discussions: The 5 th & 6 th JCC meeting Agenda and Presentation	7

(2) Enhanced capabilities at 125 C/P meetings

At the C/P meeting, there are eight training sessions on “Training 1: Acquisition of traffic simulation and traffic planning to other software”, 29 sessions on “Training 2: Knowledge of traffic survey and data analysis”, “Training 3: 22 training sessions on knowledge of planning and design of roads and intersections, 19 training sessions on “training 4: knowledge of traffic signal planning and design”, training on “training 5: knowledge of traffic management and traffic control system” 36 sessions, 22 training sessions on “Training 6: Knowledge of traffic demand management (TDM)”, and 4 training sessions on “Training 7: knowledge of pedestrian facilities and parking lot management” were conducted. As shown in Table 2.2.3-2, outputs of C/P have been strengthened. As a result of the pilot project preparation and implementation, capacity building centered on planning of various traffic

management measures and coordination with related organizations, C/P itself actively carried out traffic management work in other areas. C/P came to discuss with related organizations.

Table 2.2.3-2 Capacity building of C/P by training

Implementation items in this project (7 training programs)	Number of training sessions at C/P meeting	Training results
Training 1: Learning of traffic simulation and other software for traffic planning	8 (including VISSIM operation training)	2.13 (Baseline) → 3.38 (Terminal) 59% increased from the Baseline survey
Training 2: Knowledge of traffic survey and data analysis	29	2.00 (Baseline) → 3.69 (Terminal) 84% increased from the Baseline survey
Training 3: Knowledge of planning and design of roads and intersections	22	2.00 (Baseline) → 3.13 (Terminal) 56% increase from the Baseline survey
Training 4: Knowledge of traffic signal plan and design	19	2.31 (Baseline) → 3.38 (Terminal) 56% increased from the Baseline survey
Training 5: Knowledge of traffic management and traffic regulation system	36	1.88 (Baseline) → 3.25 (Terminal) 73% increased from the Baseline survey
Training 6: Knowledge of traffic demand management (TDM)	22	1.25 (Baseline) → 3.31 (Terminal) 165% increased from the Baseline survey
Training 7: Knowledge of pedestrian facilities and parking lot management	4	1.28 (Baseline) → 3.53 (Terminal) 176% increased from the Baseline survey

(3) Improvement of level of knowledge of CPs per topic covered by the project

As mention, the technical capacity of the CPs at the beginning of the project was low in all the topics as shown by their average score. They did not reach the score of 2.50 which is the entry score for medium knowledge. However, in the Intermediate Survey, except topics (3) and (6), the average scores of the CPs in all other topics reached 2.50 (medium knowledge) and in some topics, they even reached the score of high knowledge (3.75). This was indeed a confirmation that the objective of capacitating the CPs to become an asset of TEPA by executing their tasks efficiently have been achieved.

By turning the focus on the Terminal Survey scores of the CPs, it can be observed that they performed exceptionally well in all the topics (above 50%) and there were strong showing of improvement in topics (6) and (7). Measures under these two topics (e.g. Mobility management, parking management, pedestrian improvement, etc) were implemented at the Queens Road Pilot Project and the CPs were fully involved hence the observed very high improvement among them.

Table 2.2.3-3 Group Average of the CPs per topic from start to end of the project

Topics Covered	Baseline (April 2016)	Intermediate (October 2016) (May 2018)		Terminal (Jan 2019)		Growth Rate (Baseline→ Terminal)
(1) Traffic Simulation and other useful software in planning	2.13	3.75	76%	3.38	-10%	59%
(2) Transportation Survey and Data Management	2.00	3.19	59%	3.69	16%	84%
(3) Road and Intersection Planning and Design	2.00	2.44	22%	3.13	28%	56%
(4) Traffic Signal Planning and Design	2.31	2.56	11%	3.63	41%	57%
(5) Traffic Management and Control Systems	1.88	2.50	33%	3.25	30%	73%
(6) Traffic Demand Management (TDM)	1.25	2.19	75%	3.31	51%	165%
(7) Pedestrian Facilities and Parking Management	1.28	3.34	161%	3.53	6%	176%

- Note 1: For Intermediate Survey, in October 2016 and May 2018. Topics which had relation with the Queens Road Pilot Project such as Pedestrian facilities and parking management plan was undertaken in May 2018 after the execution of the Pilot Project for the CPs to learn the process of planning and execution.

- Note 2: Per Capacity Index (0-2.25=zero/very little knowledge) (2.5-3.75=fairly well/medium knowledge) (3.75-5.0=very well, perfectly/high knowledge)

2.2.4 Conduct of Assessment Test (Activity1-5)

(1) Introduction

An Assessment Test to each C/P member was also undertaken to serve as basis of monitoring the progress of each C/P in absorbing engineering knowledge being conducted by the JICA Project Team.

(2) Objectives/Purposes

To establish baseline data by determining current state of capacity of the C/Ps which was the basis in monitoring their progress.

(3) Target Participants

The target participants were the 10 TEPA C/Ps who worked with the JICA Project Team for the entire duration of the project.

(4) Topics Covered by the Survey

The topics covered were:

- a. Transportation Survey and Database
- b. Road and Intersection Planning and Design
- c. Traffic Signal Planning and Design
- d. Traffic Management and Control systems
- e. Traffic Demand Management (TDM)
- f. Pedestrian Facilities (Overpass, Underpass, Cross-walk and Sidewalk)
- g. Parking Management
- h. Transportation Planning Tools (Traffic Simulation)

(5) Survey Date and Frequency

The survey dates were as follows:

- April 2016 for Baseline Data
- October 2016 and May 2018 for Intermediate Data
- January 2019 for Terminal Data

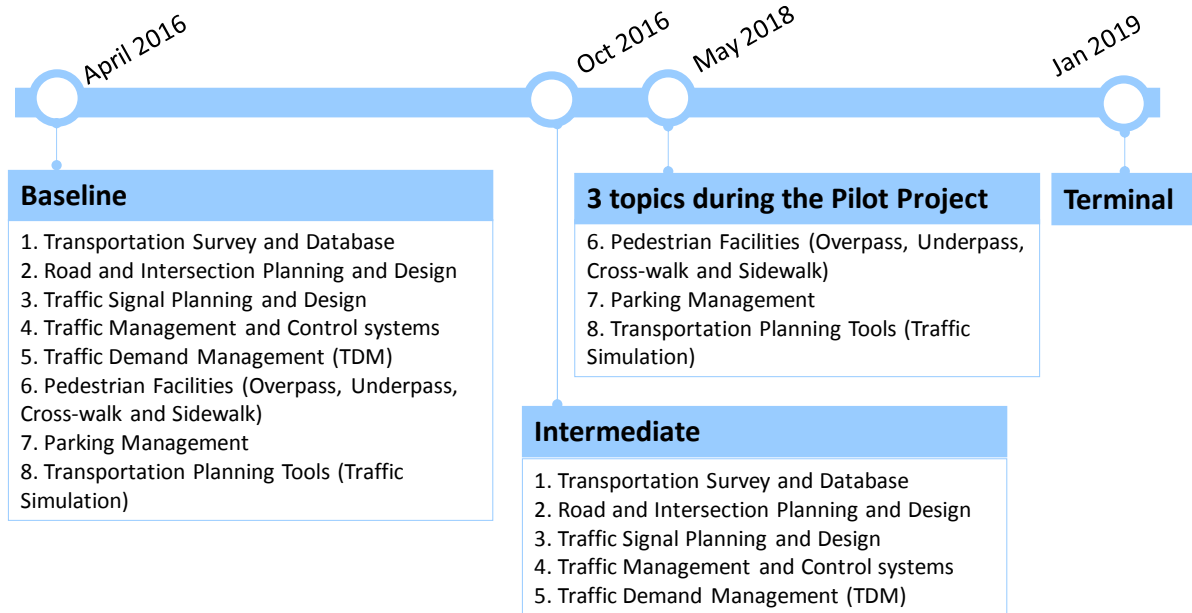


Figure 2.2.4-1 Time line of Assessment Test

(6) Methodology

A 5-page survey questionnaire were prepared and distributed to the 10 C/Ps during the meeting. The purpose of the survey was explained to them (i.e. it was designed to monitor the progress/absorption in engineering knowledge). Figure 2.2.4-2 shows the first page of the filled-up survey form by the C/P during the end of the project (Terminal Data). And below is an example of a question where the C/P may choose any of the five (5) choices depending on the level of his understanding of the subject.

Table 2.2.4-1 Example of answer entry

Question	Choices	Answer (pick one only)
2. How much do you understand about the different types of transportation surveys (traffic count, OD Survey, travel speed)?	[1] Not at all [2] Very little [3] Fairly well [4] Very well [5] Perfectly	

Survey for Counterpart Engineers (Terminal Data)

Date: _____

Personal Information

1. Name: _____ 4. Current Position: _____
 2. Age: _____ 5. Name of Office: _____
 3. Sex: _____ 6. Senior / Division: _____

Table 1. Transportation Survey and Database

Question	Options	Answer (tick one only)
1. How much do you understand about the effective type of transportation survey (traffic count, AD lanes, travel time)?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 2. Road and Intersection Planning and Design

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 3. Traffic Signal Planning and Design

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 4. Traffic Management and Control systems

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 5. Traffic Demand Management (TDM)

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 6. Pedestrian Facilities (Overpass, Underpass, Cross walk and Sidewalk)

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 7. Parking Management

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Table 8. Transportation Planning Tools (Traffic Simulation)

Question	Options	Answer (tick one only)
1. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
2. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
3. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
4. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
5. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	
6. How much do you understand about the use of the preparation of various transportation survey and database management?	<input type="checkbox"/> Not at all <input type="checkbox"/> Very little <input type="checkbox"/> Fairly well <input type="checkbox"/> Well <input type="checkbox"/> Very well	

Figure 2.2.4-2 Screen shot of the five-page Survey Form

(7) Evaluation Method

The handbook prepared by JICA in 2008 titled “Capacity Assessment Handbook (Project Management for Realizing Capacity Development)” was used as guide in the evaluation. Basically, the handbook classified capacities into three (3) as follows:

- Technical Capacity - Capabilities such as knowledge and skills (techniques) required for an individual and organization to undertake on their tasks are referred to as “technical capacity”.
- Core Capacity - The will, attitude, leadership, and management capabilities to activate technical capacity are referred to as “core capacity” and serve as core elements for capacity.
- Enabling Environment - Conditions that make it possible for the organization to utilize its capabilities to produce results. This includes policy frameworks, legal systems, political institutions, resources such as physical assets, capital, and social infrastructure also perceived as the enabling environment.

(8) Establishing Capacity Index

The Capacity Index was established to define the level of capacity of the C/P depending on the result of their individual data. The table below presents the range of each capacity level from low, medium to high.

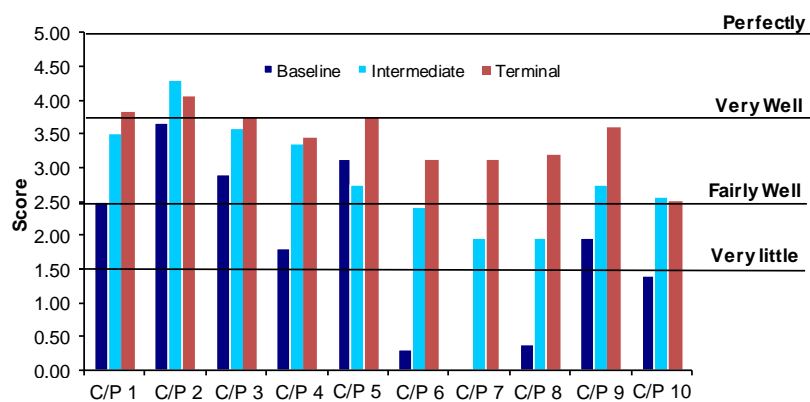
Table 2.2.4-2 Capacity Index

Item	Low	Medium	High
1. Technical Capacity	0 – 2.5	2.5 – 3.75	3.75 – 5.0
	Zero knowledge, very little	Fairly well	Very well, Perfectly
2. Core Capacity	0 – 2.5	2.5 – 3.75	3.75 – 5.0
	Negative, neutral attitude	Positive attitude	Leadership quality
3. Enabling Environment	0 – 2.5	2.5 – 3.75	3.75 – 5.0
	Uncertainty / Insufficient	→ Certainty / Sufficient	

Availability of resources and level of understanding on the issues which affect institutional efficiency

(9) Results of the Survey

Figure 2.2.4-3 illustrates the level of progress of each C/P. Basically, the question asked to them: how much level of understanding they have on each topic. The choices are: very little, fairly well, very well, and perfectly. At the beginning of the training program, only four (4) C/Ps have “Fairly Well” or good level of engineering knowledge on the topics covered by the training programme. At the terminal stage, all of the 10 C/Ps achieved “Fairly Well” level. Similarly, four (4) C/Ps broke out to the level of “Very Well” or high engineering knowledge.



Note: C/P No. 7 did not participate in the baseline survey

Figure 2.2.4-3 Progress of each engineer from project inception, intermediate stage and terminal stage for Technical Capacity

As a group output of the C/Ps, the result is encouraging as shown in Figure 2.2.4-4. The three elements of capacity building have shown remarkable growth.

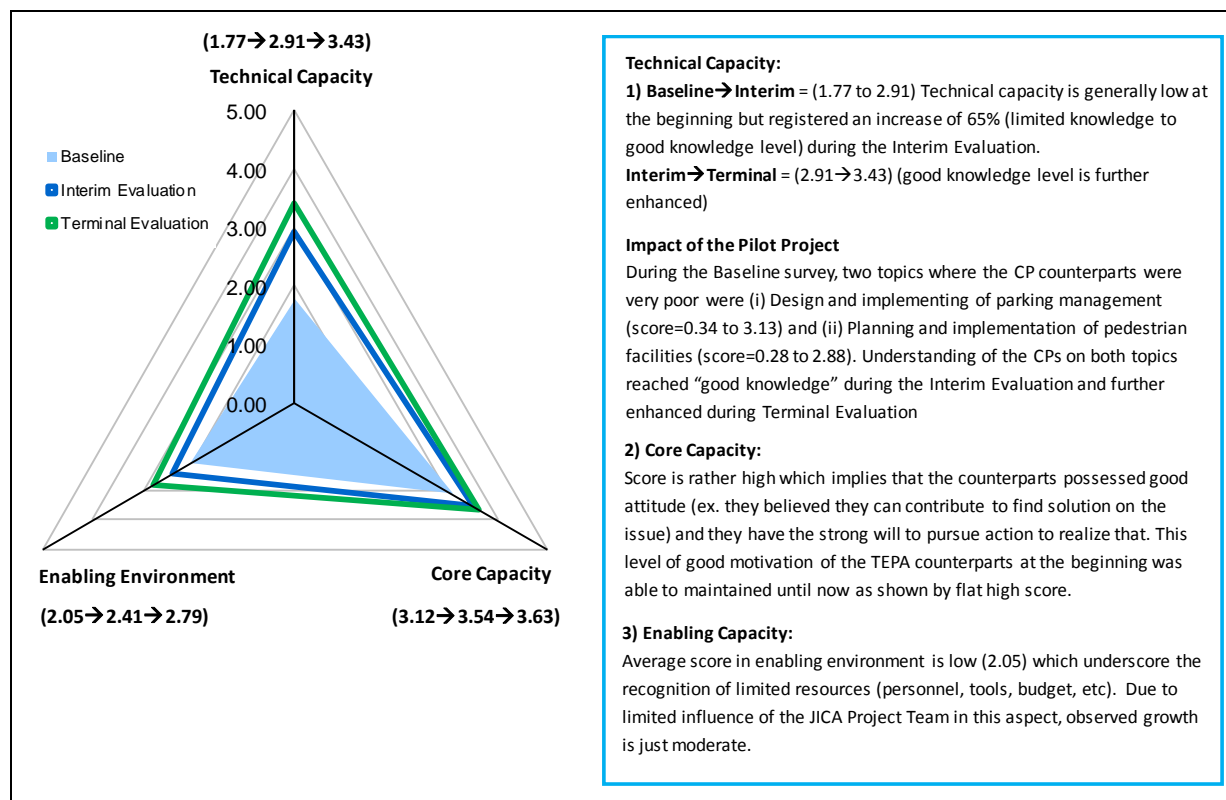


Figure 2.2.4-4 Capacity Growth of the C/Ps in Three Aspects: Technical Capacity, Core Capacity, Enabling Environment

(10) Future Capacity Development Plan

In view of the successful effort to capacitate the C/Ps, the following actions in the table below maybe pursued to continue and further enhanced the knowledge learned by the C/Ps. Similarly, the spreading the knowledge to other staff of TEPA and other relevant organization should be pursued as well.

Table 2.2.4-3 Future Capacity Development Plan

Item	Details
a. Transferring knowledge to other TEPA members	<p>Under this program, C/Ps under their Team Leader will re-echo what they have learned to other staff of TEPA whose task is related to transportation management.</p> <p>The first action in this direction is to consult the higher authority of TEPA to discuss on how to select members that will participate the re-echoing program. Due to busy schedule of most of the members, a twice a month lecture copying what had been done by the JICA Project Team might do. This is very practical and easy to execute since the JICA Project Team prepared several useful documents which were turn over to the TEPA C/Ps.</p>

b. Transferring knowledge to other related organizations	Just like the above program but this time the echoing program will involve staff of relevant organization such as LDA, LPC, PSCA among others. Since it involves different government agencies, perhaps the first step is an agreement among the heads of the agencies to pursue technical knowledge transfer. Once understanding is firmed up, selection of members to participate, schedule, and scope of subjects to be covered might follow.
c. Applying knowledge by executing corridor management in other roads of Lahore	To keep the technical knowledge learned by the C/Ps fresh and perhaps enhanced, execution of corridor improvement on the other roads of Lahore is a must. And since improving a corridor entails involving several agencies, those staff to be involved will surely learn the different stages of executing the project such as planning stage, operation stage, and monitoring stage. Under these stages, they will learn as well various activities needed to execute successfully a project under urban environment.

2.2.5 Conducts of Workshops/Seminars for Knowledge Transfer to Staff of Related Organizations (Activity 1-6, Activity 3-4)

(1) The Summary of the Seminar for Technology Transfer

The summary of the seminar for technology transfer is as follows.

Table 2.2.5-1 Summary of the Seminars for Technology Transfer

	Date	Attendees	Agenda	Summary of consultation
1 st Seminar (Kick off Meeting)	25-Feb 2016	46 people [No. of organization] 1) Government official : 10 2) Private Sector : 4 3) Academic:1	1. Project Objective, Scope and Outcomes 2. Existing Traffic Issues in Lahore	<ul style="list-style-type: none"> Strongly feel with a lack of coordination with the academies. This is very important to consider. Regarding Production of manuals. It will be also very interesting and useful if you try to incorporate our local factors in these kind of manuals. Will JICA give its knowledge, technical training, and software techniques to Pakistani professionals and engineers to become a better transport modeler?
2 nd Seminar	28-Sep 2016	66 people [No. of organization] 1) Government official : 10 2) Private Sector : 6 3) Academic:1	1. Conduct of Traffic surveys, Approach, Methodology and Quality Assurance 2. Survey Data Analysis and Problem Identification 3. Selection of Pilot project area, Traffic Safety Campaign 4. Traffic Management System	<ul style="list-style-type: none"> Is the parking you people mentioned is legal or illegal or both and what was its ratio? Legal and illegal parking is determined by Lepark who convert some road sections into parking stands. If some is parking inside the stands its legal and if park outside the stand its illegal.so all the sites which we selected we verified whether these are legalized by Lepark or not? Actually the purpose of our survey is not to find out legal or illegal our purpose was just to collect for example parking pattern and parking demands in that certain area.

	Date	Attendees	Agenda	Summary of consultation
3 rd Seminar	5-Sep 2018	65 people [No. of organization] 1) Government official : 12 2) Private Sector : 8 3) Academic:4	<ol style="list-style-type: none"> 1. Corridor Management along Queens Road 2. Evaluation of Pilot Project 3. Mobility Management Campaign 4. Traffic Safety Campaign 5. Lessons Learned from the Pilot Project 	<ul style="list-style-type: none"> • You are doing useful work. Next seminar also mentioned all over Lahore problems and install latest technology in Lahore. • I think plan should be made to install zebra crossing in front of all school gates and traffic rules should be part of our educational system.
4 th Seminar	12-Feb 2019	63 people [No. of organization] 1) Government official : 13 2) Private Sector : 4 3) Academic:4	<ol style="list-style-type: none"> 1. Corridor Management 2. Mobility Management 3. Traffic Safety Campaign 4. Lesson Learned from Pilot Project and Current Issues & Propose Action Plan 5. Traffic Simulation using VISSM 6. Pilot Project Handbook, Intersection Design Manual and Traffic Management Plan 7. Way Forward 	<ul style="list-style-type: none"> • JICA should not limit it in Lahore. Should be in other cities of Pakistan. • Involve all stake holders • More efforts should be made for educate people about parking, clear walk ways for pedestrians. • It was informative seminar. With coordination of all stakeholders maintenance of such improvement is needed. One of the major reasons that these improvements is not done and maintain is that all the related agencies did not do their job so we need proper formulated strategy to puss all agencies to do their job to make a project successful.

(2) Summary of Consultation at the Seminar

At the 1st seminar (kick-off meeting), participant shared broadly the project overview and Lahore's traffic problems. There were meaningful discussions such as administrative organizations, construction companies and professors of engineering universities, students, etc. attended and it was interesting to prepare manuals.

At the 2nd seminar, we analyzed from the method of conducting the traffic survey and shared information with stakeholders concerning traffic problem identification, and at the same time PSCA was planning to introduce PPIC 3 (Punjab Police Integrated Command Control & Communication) project and confirmed that we will cooperate with TEPA / JICA TEAM in the field of traffic signal system.

At the 3rd seminar, as a lesson to implement the pilot project, the street parking lot was not recognized and was not properly used. Garbage that was not properly handled scattered on the road and hindered traffic. It was pointed out that broken planters were neglected and not managed properly,

etc. As a result of consultation, no opinion was given against opposition as each action institution suggested that each of the related organizations respond to these as an action plan.

At the 4th seminar, we will share information widely about the summary of the activity report so far and the manuals, and as a Way Forward, we will examine the sustainability of the pilot project, 2. the development plan of the Intelligent Transportation System, 3. the Qartaba intersection improvement plan, 4. Proposal on cooperation of related organizations, no dissent was given as a result of consultation.

(3) Attendees

The occupations of attendees at each seminar are shown below.

1) 1st Seminar

46 people attended the 1st seminar.

Table 2.2.5-2 Attendees of 1st Seminar

Government official		31
TEPA	12	
City Traffic Police	2	
C&W Dept	1	
TPU	1	
ECSP	1	
JICA	6	
CDGL	2	
LTC	3	
LDA	1	
Le Park	2	
Private Sector		8
EA Consul	2	
NESPAK	4	
C42	1	
ALBAYRAK	1	
Academic		7
University of Engineering & Technology	7	
Total	46	

2) 2nd Seminar

66 people attended the 2nd seminar.

Table 2.2.5-3 Attendees of 2nd Seminar

Government official		32
TEPA	15	
Rescue 1122	3	
C&W Dept	1	
PSCA	4	

ECSP	1	
JICA	2	
Transport department	1	
LTC	1	
LDA	1	
Lahore Parking Company	2	
Private Sector		9
LDA	1	
Metro Associates	1	
NESPAK	3	
ALDO	3	
CAM	1	
ARUP	1	
Academic		25
University of Engineering & Technology	25	
Total		66

3) 3rd Seminar

65 people attended the 3rd seminar.

Table 2.2.5-4 Attendees of 3rd Seminar

Government official		40
TEPA	15	
Rescue1122	1	
C&W	1	
PSCA	1	
ECSP	3	
JICA Islamabad	1	
NHA	1	
LTC	1	
Traffic Police	7	
Le Park	2	
JICA Project team	5	
Security	2	
Private Sector		15
NESPAK	3	
AlHuda	2	
Media	5	
Osmani and Co.	1	
contractor	1	
AlBayrak	1	
Metro Associates	1	
GTC	1	
Academic		10
NUST	2	
University of central Punjab	1	
University of Tokyo	3	
UET	4	
Total		65

4) 4th Seminar

63 people attended the 4th seminar.

Table 2.2.5-5 Attendees of 4th Seminar

Government official		46
TEPA	26	
Rescue1122	1	
C&W	1	
PSCA	2	
ECSP	1	
LTC	1	
Traffic Police	3	
Le Park	2	
JICA Project team	4	
Security	1	
CTPL	2	
LDA	1	
MCL	1	
Private Sector		9
AlHuda	2	
Media	5	
LIMIT	1	
Echo Green	1	
Academic		8
University of Management and Technology	1	
Jinnah Degree College for women	1	
Fatima Jinnah Medical University	1	
UET	5	
Total		63

(4) Photo of the Seminar



Photo of Seminar (1st Seminar)



Photo of Seminar (3rd Seminar)

Figure 2.2.5-1 Photo of Seminar

2.3 Activity for Output 2

2.3.1 Conduct of Traffic Condition Surveys in Lahore Central Area (Activity 2-1)

(1) Purpose of the Traffic Condition Survey

Traffic condition surveys was planned and conducted for the selection of the pilot project and assessment of traffic condition in the study area. After the discussion with C/P and JCC, the scope of traffic study was finalized as describing in the following table.

(2) Survey Date

The Traffic Survey is conducted in April and May 2016.

(3) Survey Outline

The survey sites and routes of the travel speed survey were selected based on the past survey results data, preliminary on-site inspections and consultation results with C/P.

Traffic survey results were used to identify the traffic management problem and also select the countermeasures of traffic management in the study area. In addition, these results also used for the selection of the pilot project area, and traffic management plan.

Table 2.3.1-1 Scope of traffic survey

No	Survey Type	Objective	Content
(1)	Intersection Traffic Flow Survey	Achieve traffic volume and flow patterns at intersections	No of Location: 20 intersections Survey Time : Morning peak (7:00~10:00) 、 noon (13:00~15:00)、 Evening peak (16:00~19:00) Vehicle Classification: : 13vehicle type Survey Day : weekday from Monday to Thursday April – May 2016
(2)	Parking Survey	Achieve characteristics of parking situation	No of Location:4 Survey Time : 7:00~19:00
(3)	Travel Speed Survey	Identify traffic congestion points and the bottle neck	4 routes Survey Time : Morning peak (7:00~10:00) 、 noon (13:00~15:00)、 Evening peak (16:00~19:00)
(4)	Intersection Inventory Survey	Grasping geometric structure of the intersection, the location of road facilities	Survey location: 15 intersections Geometric structure of the 100 m section from the center of the intersection Location of road facilities, utilities Traffic Signal: cycle length, signal phasing
(5)	Interview Survey	Understand cooperation and participation intention for traffic demand management plan	No of Samples : 500 Target: Transport mode users of Metro Bus, Bus, Bike

(4) Location of Intersection Traffic Flow Survey

1) Survey methodology

Intersection Traffic Flow Survey was conducted to understand the traffic condition at the intersections. The Location of Intersection Traffic Flow survey is as shown in Figure 2.3.1-1 and Table 2.3.1-2.

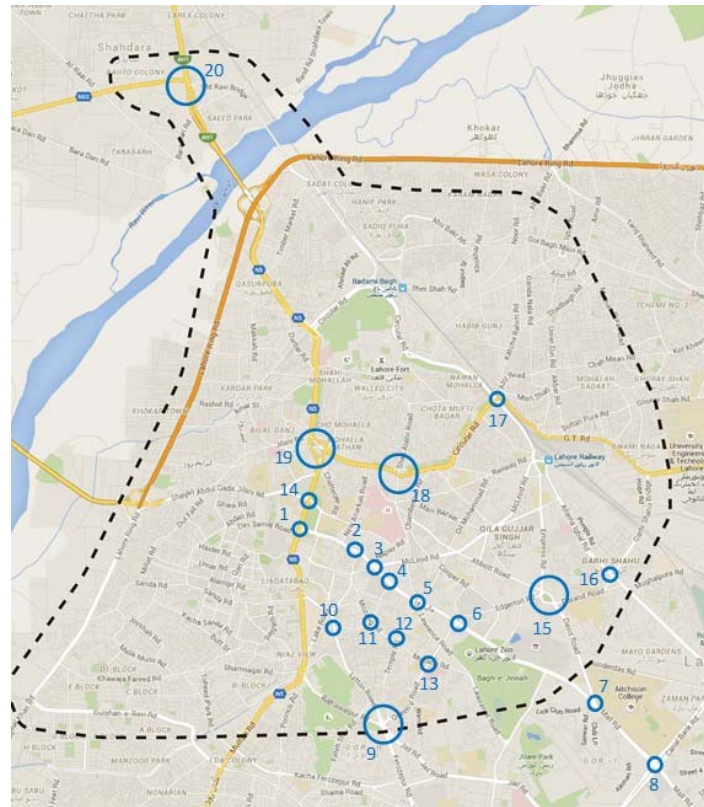


Figure 2.3.1-1 Location of Intersection Traffic Flow Survey

Table 2.3.1-2 List of Intersection Traffic Flow Survey and Survey date

No	Intersection Namee	Survey Date
1	P.M.G. (Mall Rd- Lower Mall)	2016/4/26
2	Bashir Sons (Mall Rd- Maclagan Rd)	2016/4/26
3	G.P.O. (Mall Rd- McLeod Rd)	2016/4/27
4	Lahore High Court (Mall Rd- Fane Rd)	2016/4/27
5	Regal Chowk (Mall Rd- Lawrence Rd)	2016/5/3
6	Faisal Chowk (Mall Rd- Queen's Rd)	2016/4/14
7	Davis Road (Mall Rd- Davis Rd)	2016/4/25
8	Mall Canal (Mall Rd- Canal Bank Rd)	2016/4/28
9	Qartaba Chowk (Litton Rd- Queen's Rd)	2016/4/13
10	Begum Road (Begum RD- Lytton Rd)	2016/4/12
11	Mazang Adda (Mozang Rd- Fane Rd)	2016/4/11

12	Safanwala Chowk (Mozang Rd- Temple Rd)	2016/4/11
13	Ganga Ram (Queen's Rd- Mozang Rd)	2016/4/12
14	District Court (Lower Mall- Katchery Rd)	2016/5/4
15	P.I.A. (Davis Rd- Durand Rd), and Shimla Hill	2016/5/5
16	Ghari Shahu (Allama Iqbal Rd- Queen Mary Rd)	2016/4/18
17	Aik Moria (G.T. Rd- Circular Rd)	2016/4/21
18	Shah Alam (Shah Alam Rd- Circular Rd)	2016/4/20
19	Data Darbar (Data Darbar Rd- Circular Rd- Lower Mall)	2016/4/19
20	Shahdara (G.T. Rd- Lahore-Sargodha Rd)	2016/5/2

2) Analysis Result

The intersection with the most traffic volume is more than 30,000 vehicles/hour in Qartaba Chowk. Even at other intersections the inflow traffic volume exceeds 10,000 vehicles/hour. Peak traffic volume has many intersections in the evening. The average vehicle composition is 61% for motorcycles, followed by passenger cars at 19%, and rickshaw 16%.

Table 2.3.1-3 Intersection In-Flow Traffic Volume

Sr. No.	Intersection Name	Morning	Mid-day	Afternoon
1	P.M.G	12,693	9,208	12,675
2	Bashir Sons	9,126	10,340	9,722
3	G.P.O	10,852	13,772	12,107
4	Lahore High Court	10,804	12,580	11,967
5	Regal Chowk	10,367	12,308	12,603
6-A	Chairing Cross (a)	11,177	12,625	14,071
6-B	Chairing Cross (b)	10,666	14,600	14,896
7	Davis Road	12,409	11,603	14,284
8	Mall Road & Canal	33,328	30,597	33,832
9	Qartaba Chowk	34,496	34,175	33,888
10	Lytton Road & Begum	13,209	13,950	12,794
11	Mazang Adda	5,319	6,237	5,536
12	Saffanwala Chowk	4,869	4,949	5,296
13	Ganga Ram	7,769	9,595	10,941
14	District Court	16,367	20,684	18,298
15	P.I.A - South of Shimla Hill	13,061	12,983	14,518
16	Ghari Shahu	11,357	13,050	11,344
17	Aik Moria	12,016	12,385	12,672
18	Shah Alam Chowk	9,949	9,671	10,266
19-A	Data Darbar (A)	6,122	10,239	10,540
19-B	Data Darbar (B)	6,439	9,319	10,009
20	Shahdara	17,115	13,092	17,774

[Legend]

Red frame: Peak hour traffic volume

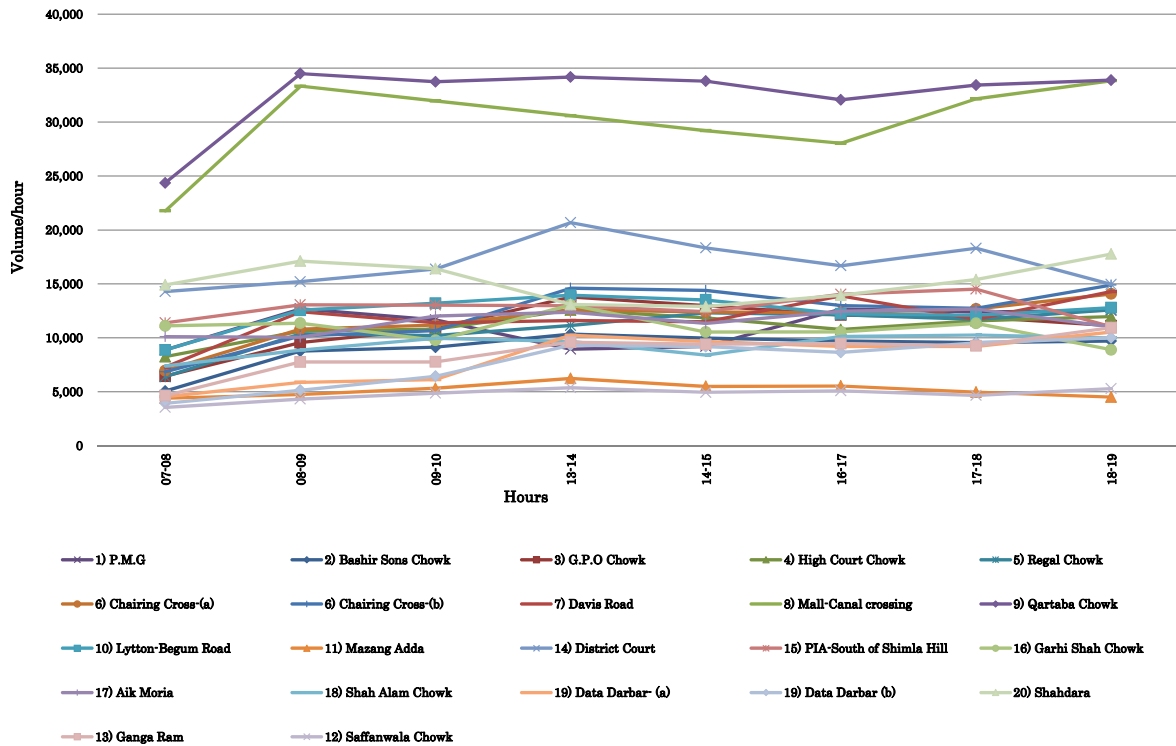


Figure 2.3.1-2 Traffic Volume Time Distribution

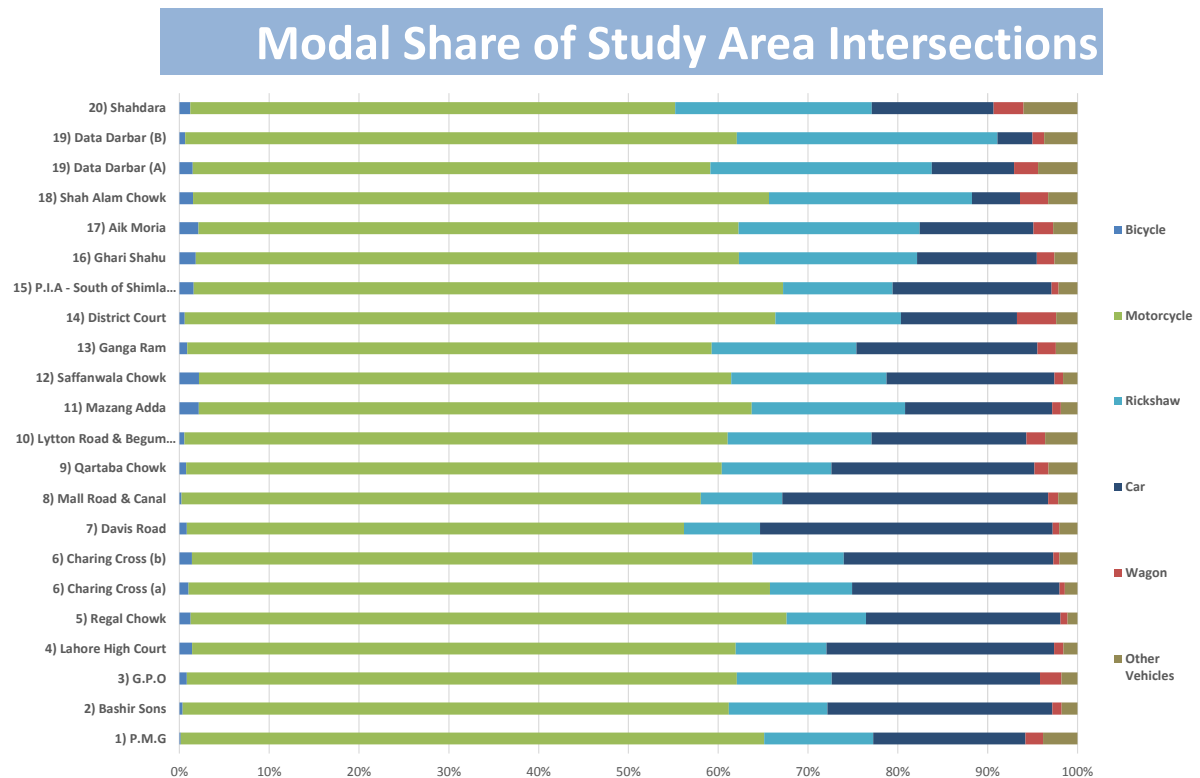


Figure 2.3.1-3 Modal Share of Intersection

(5) Parking Survey

1) Survey methodology

Parking survey was conducted for the purpose of improvement of technical knowledge of parking measure and Learning of parking survey method. The reasons for conducted this survey are as follows:

- i. Needs for training of this topic were high. (C/P's technical level regarding parking measures was very low).
- ii. Parking measures such as installation of on-street parking lots is in charge of TEPA and C/P should have to conduct parking survey and analysis, formulate an improvement plan by themselves

The Location of Parking survey is as shown in Figure 2.3.1-4 and Table 2.3.1-4.

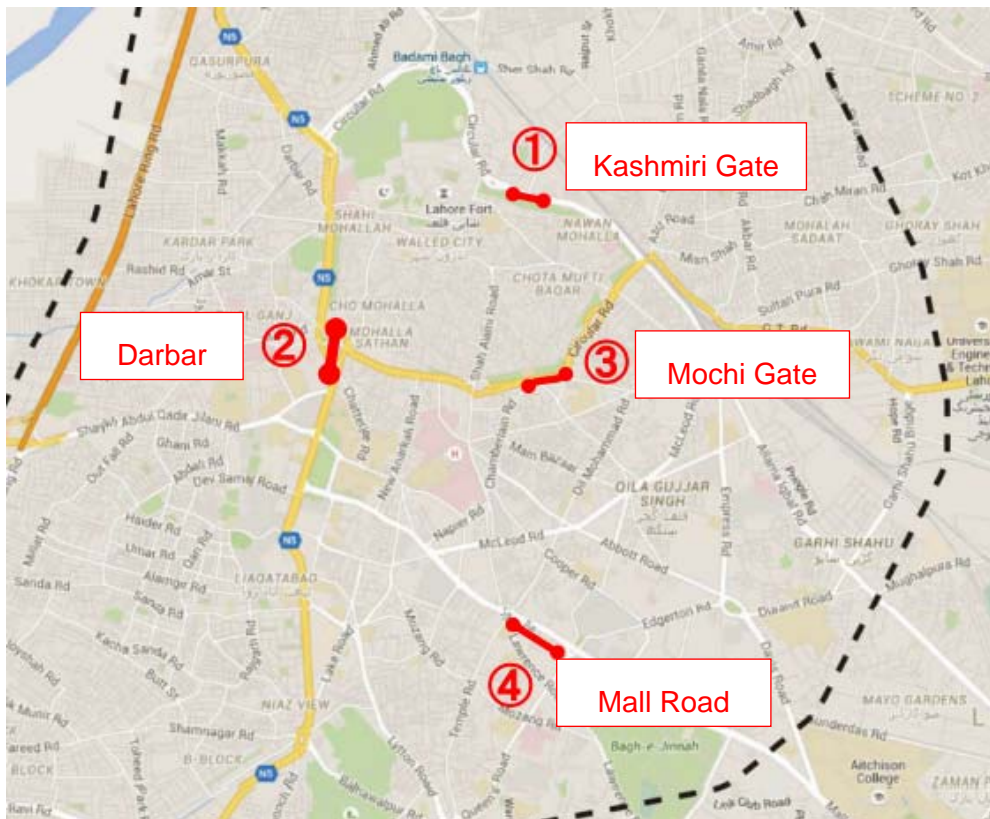


Figure 2.3.1-4 Location of Parking Survey

Table 2.3.1-4 List of Parking Survey Location and Survey Date

No	Loction	Survey Date	Survey Time
1	Kashimiri Gate	2016/5/11	7:00~19:00
2	Darbar	2016/5/10	7:00~19:00
3	Mochi Gate	2016/5/11	7:00~19:00
4	Mall Road	2016/5/10	7:00~19:00

2) Analysis Result

There is demand for parking at parking lots more than parking capacity. Commercial areas Darbar, Kashmiri Gate have many bikes. The peak demand for parking is around 14: 30-17: 00 pm. Survey results for each survey points are shown below.

Parking at Kashmiri Gate

- Number of maximum parking is 208, almost capacity.
- Average occupancy is 79% from 7:00 to 19:00
- Peak time is 14:30, 72% is motorcycle
- This is an On-Street Parking

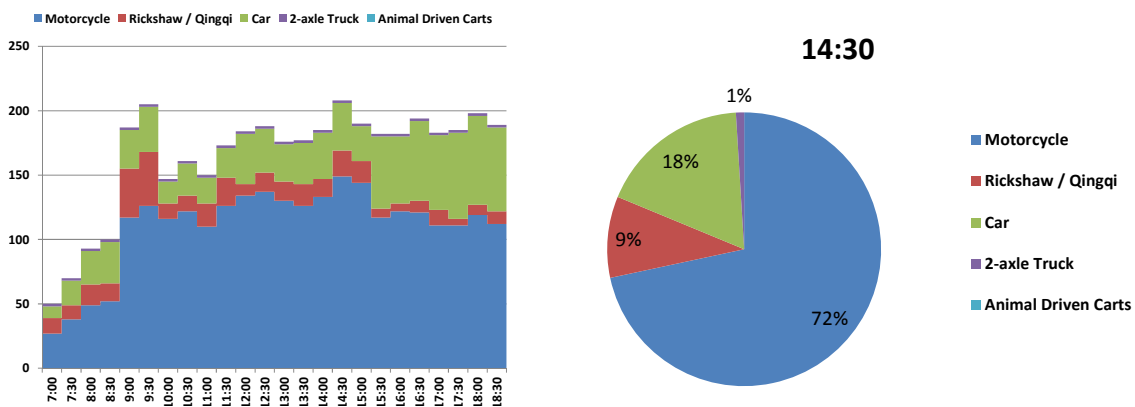


Figure 2.3.1-5 Parking Survey Result of Kashmiri Gate

Parking at Darbar

- Number of maximum parking is 149, almost capacity.
- Average occupancy is 66% from 7:00 to 19:00
- Peak time is 18:00, 42% is car, 30 % is motorcycle

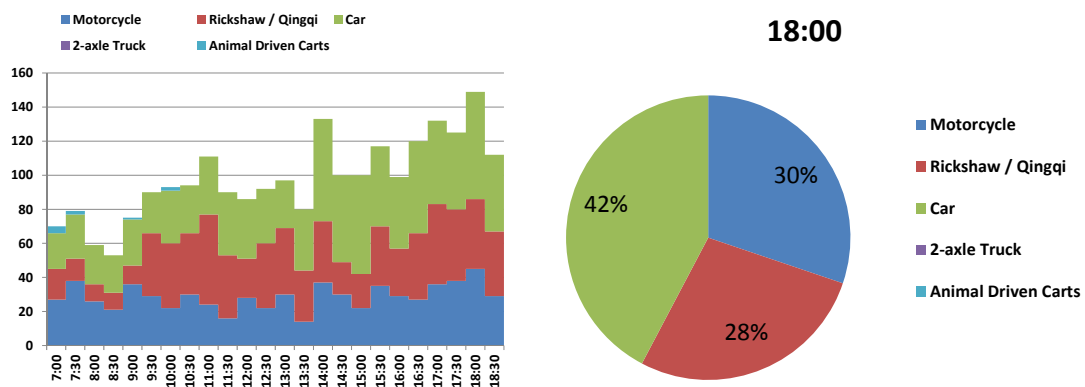


Figure 2.3.1-6 Parking Survey Result of Darbar

Parking at Mochi Gate

- Number of maximum parking is 100, almost capacity.
- Average occupancy is 63% from 7:00 to 19:00
- Peak time is 17:00, 94% is car.
- On-Street Parking

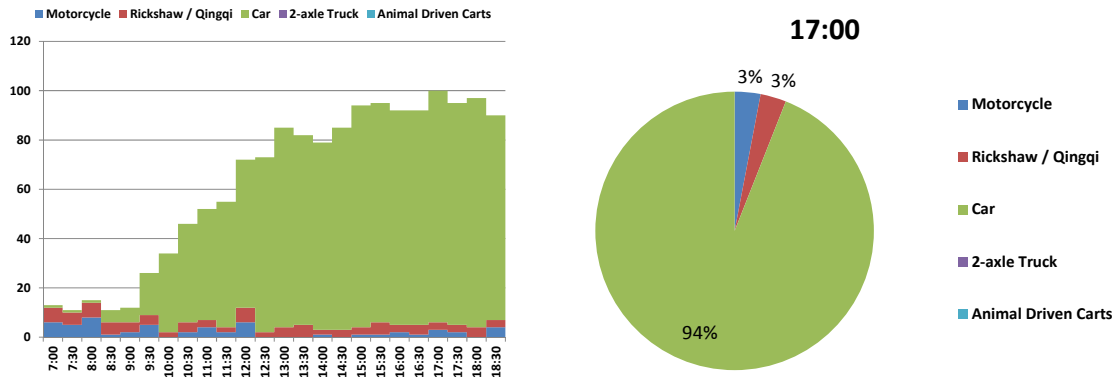


Figure 2.3.1-7 Parking Survey Result of Mochi Gate

Parking at Mall Road

- Number of maximum parking is 857, almost capacity.
- Average occupancy is 64% from 7:00 to 19:00
- Peak time is 17:30, 69% is motorcycle.
- Service Road Parking

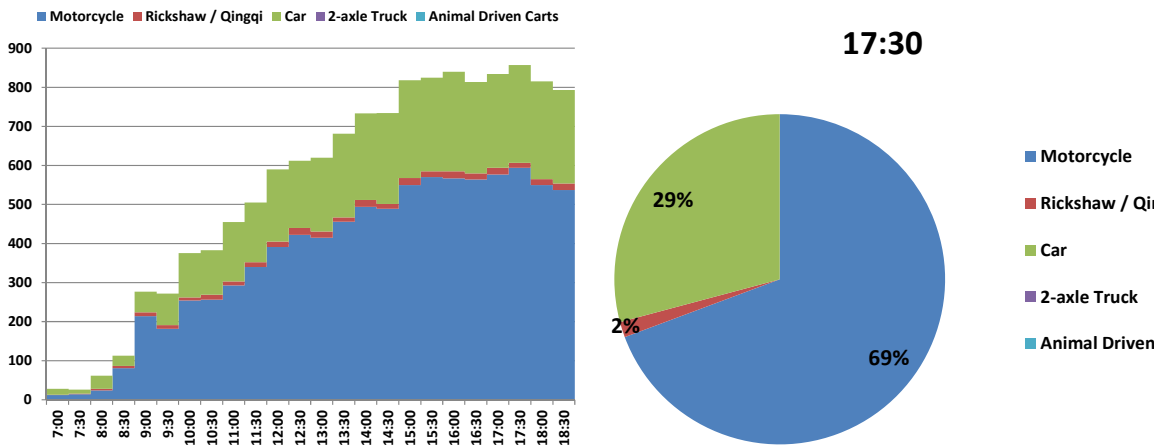


Figure 2.3.1-8 Parking Survey Result of Mall Road

(6) Travel Speed Survey

1) Survey Methodology

A travel speed survey was conducted to understand traffic congestion in Lahore. city. The route of Travel Sped survey is as follows.

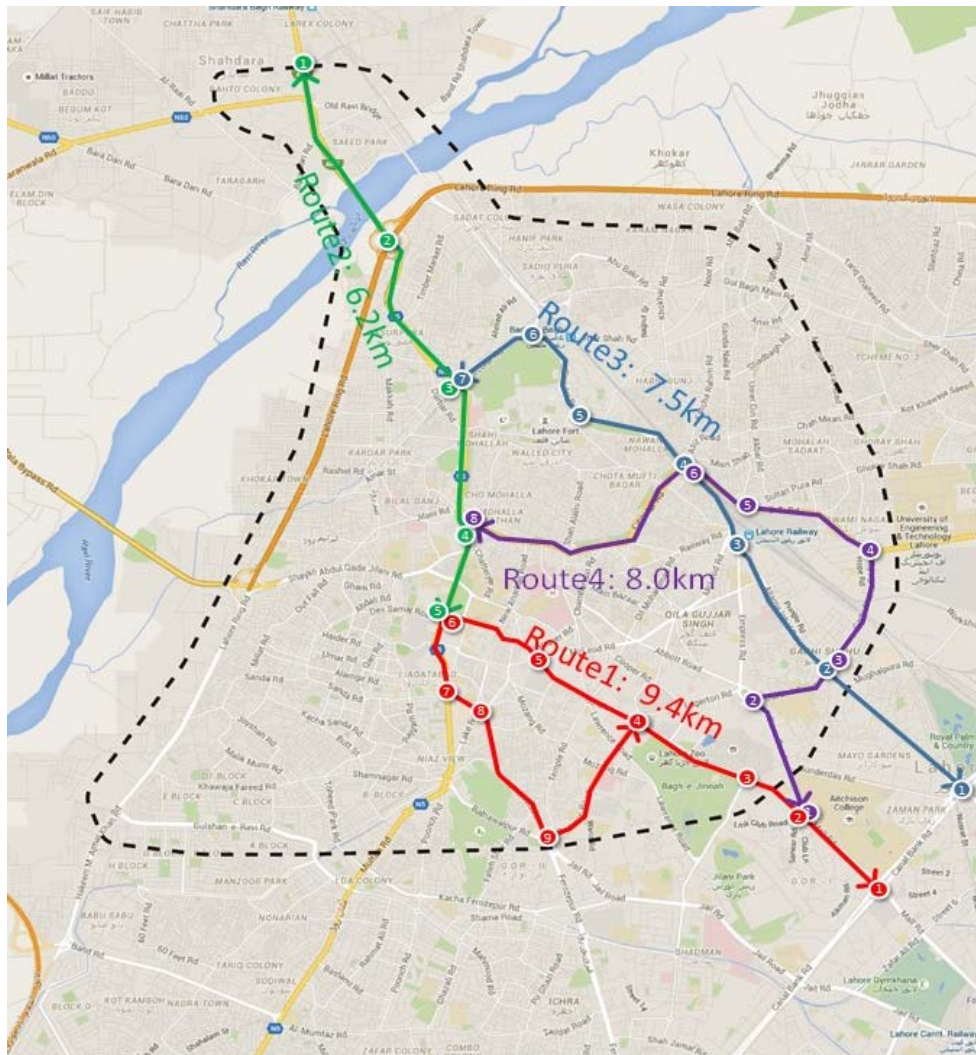


Figure 2.3.1-9 Travel Speed Survey Route

Table 2.3.1-5 List of Travel Speed Survey

No	Start	Middle Point	End	Survey Date
Route 1	Faisal Chowk (Mall Rd - Queen's Rd)	Mall Rd, Lytton Rd, Queen's Rd	Mall Canal (Mall Rd- Canal Bank Rd)	2016/5/9
Route 2	P.M.G. (Mall Rd - Lower Mall)	Lower Mall	Police Station Shahdara	2016/5/11
Route 3	Azdai Chowk (Circular Rd - Ravi Rd)	Circular Rd, Allama Iqbal Rd	Dharampura Canal (Allama Iqbal Rd- Mall Rd)	2016/5/12
Route 4	Bhati Chowk (Circular Rd - Data Darbar Rd)	Circular Rd, G.T.Rd, QueenMary Rd, Davis Rd	Davis Rd (Mall Rd- Davis Rd)	2016/5/10

2) Analysis Result

It was found that the traveling speed of each route is the fastest in the morning and tends to decrease as afternoon and evening. Traffic volume tends to increase with afternoon and evening in traffic volume results by intersection flow survey. In Lahore city, the traffic volume becomes the maximum in the afternoon or evening, and the traveling speed is considered to be decreasing as the traffic volume increases. The main cause of the decrease in running speed is as follows.

- Traffic congestions due to protest
- Traffic slow due to construction activity
- Congestion due to high volume of U- Turning traffic
- Traffic Congestion due to high volume of pedestrian and lack of pedestrian facilities
- Traffic Congestion due to narrow garishahu bridge and lack of channelization
- Traffic Congestion due presence of Education Institutes and absence of Pick and Drop lane for students

Bottleneck on Route 1 Result

- Traffic slow due to construction activity at Jan Mandar
- Traffic congestion due to protest at Faisal Choke

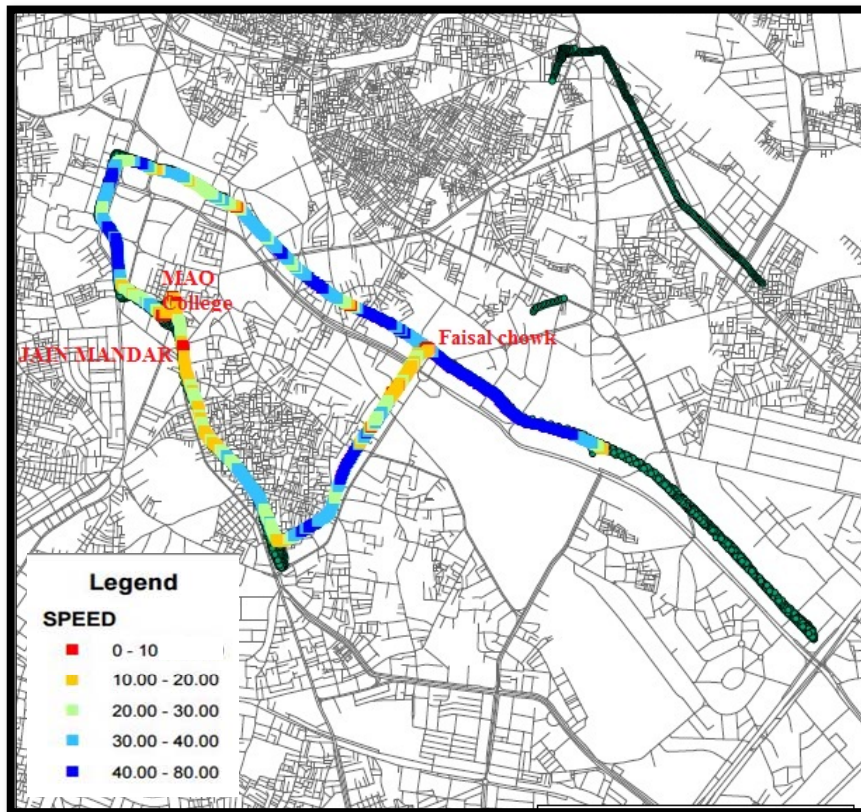


Figure 2.3.1-10 Travel Speed Survey Route 1 Result

Bottleneck on Route 2 Result

- Traffic Congestion due to high volume of pedestrian and lack of pedestrian facilities at Daata Dabar
- Congestion due to high volume of U- Turning traffic at Daata Dabar and DCO office

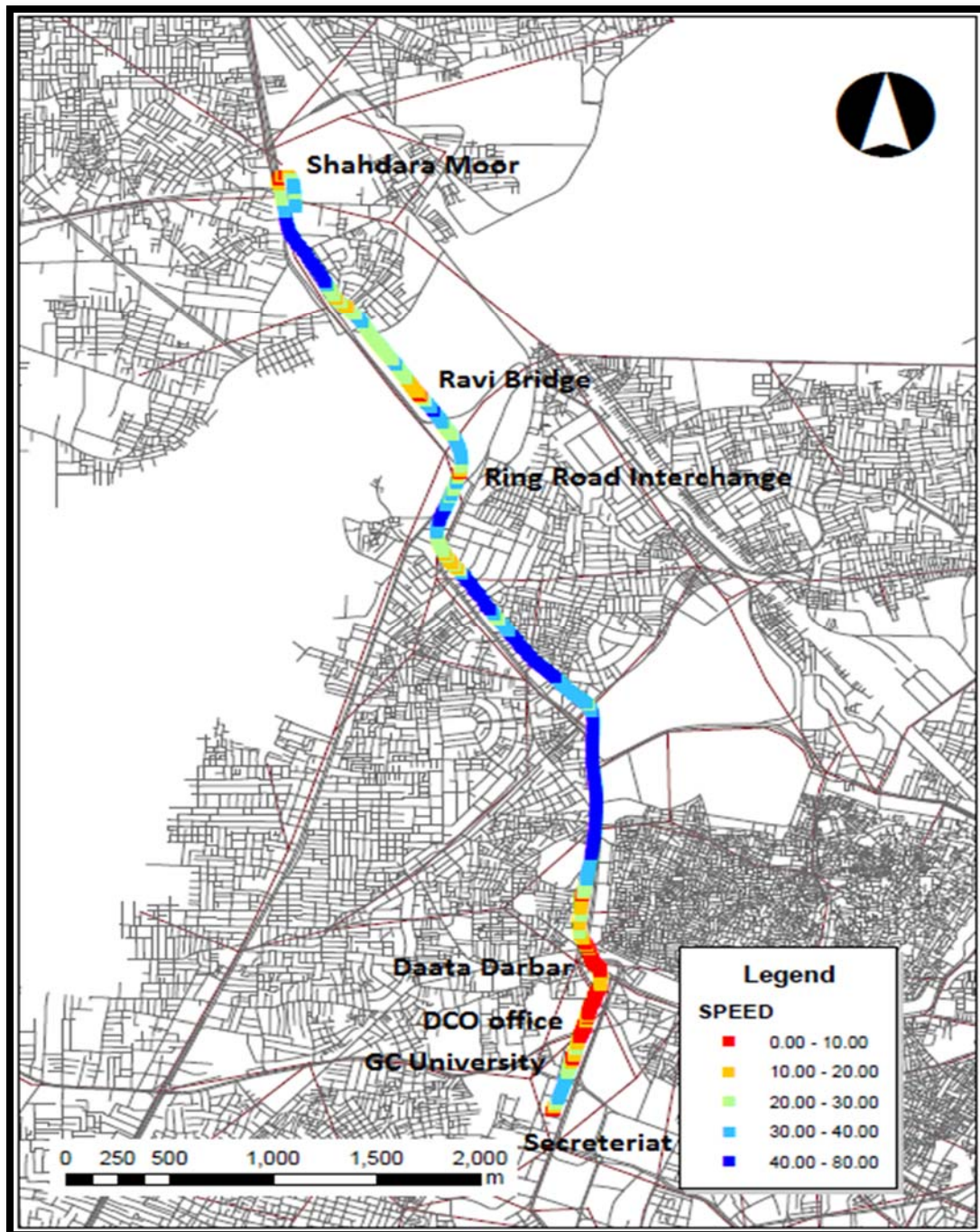


Figure 2.3.1-11 Travel Speed Survey Route 2 Result

Bottleneck on Route 3 Result

- Traffic Congestion due to narrow garishahu bridge and lack of chanelization
- Congestion due to Construction Activities near Railway Station

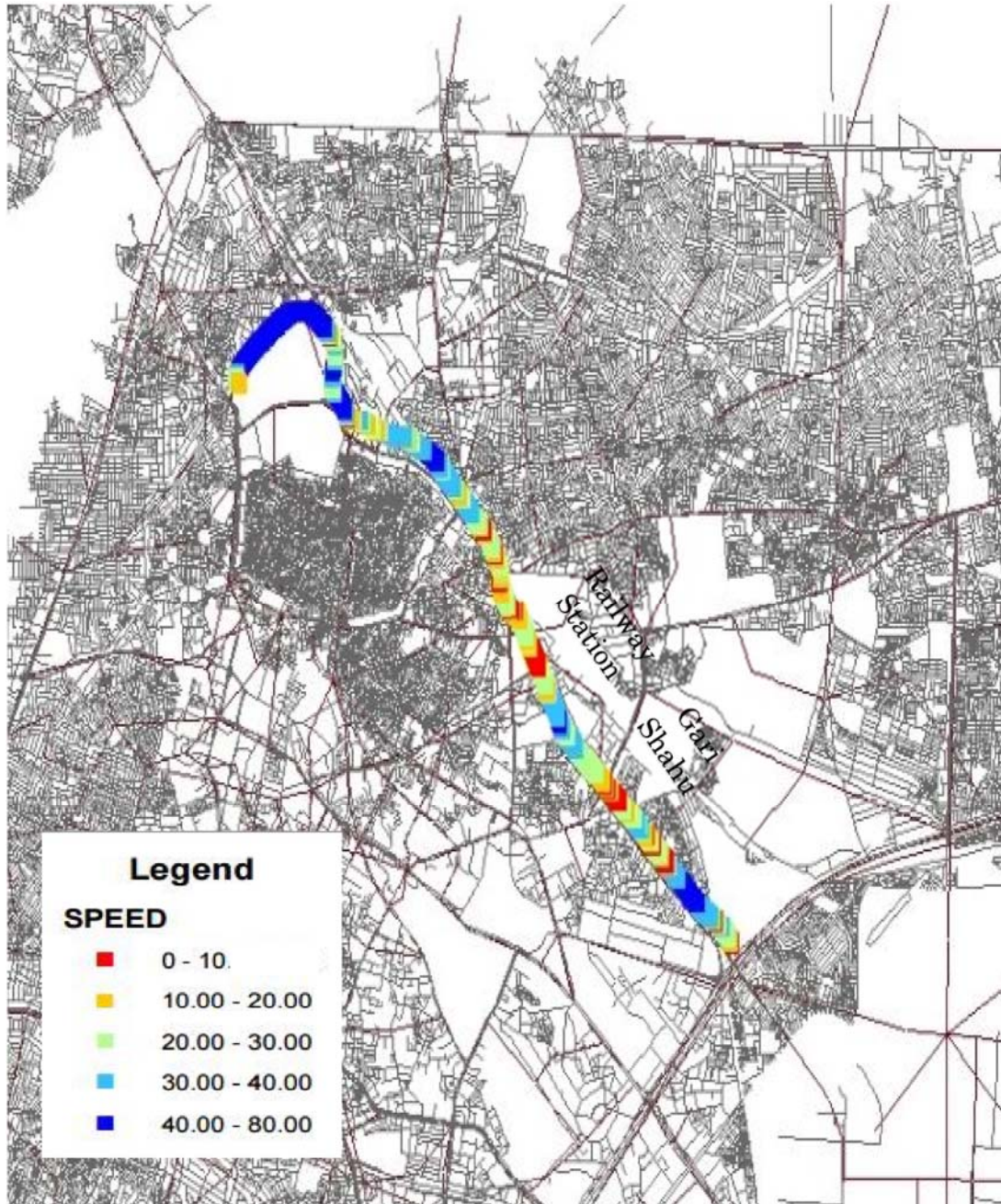


Figure 2.3.1-12 Travel Speed Survey Route 3 Result

Bottleneck on Route 4 Result

- Traffic Congestion due presence of Education Institutes and absence of Pick and Drop lane for students at Queen Marry
- Traffic congestion near intersection by encroachment and parking at Do Moria and Coper Stone

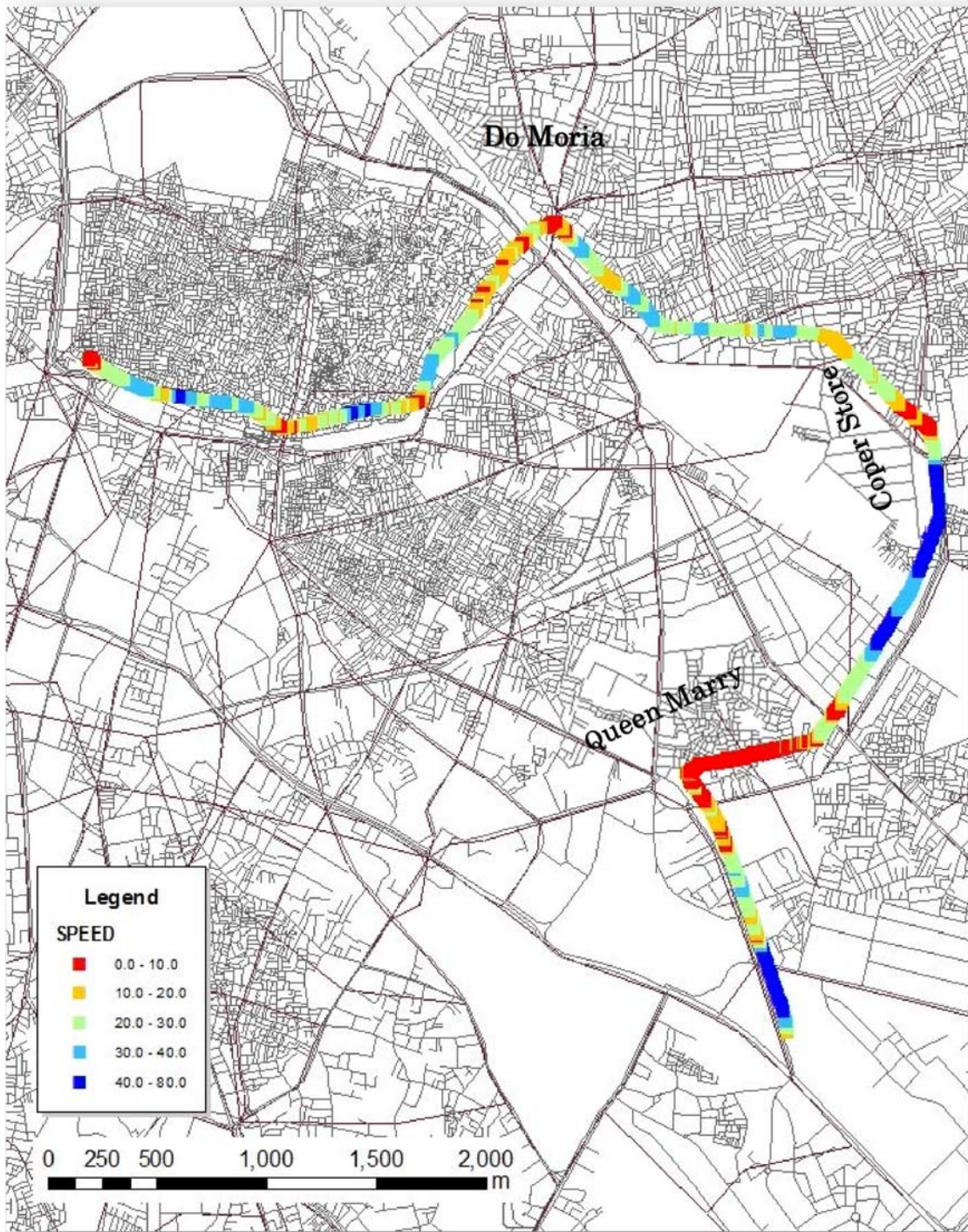


Figure 2.3.1-13 Travel Speed Survey Route 4 Result

(7) Interview Survey

1) Survey Methodology

The interview survey is conducted on traffic conditions and traffic issues etc. in order to grasp the intention of traffic users of Lahore city concerning traffic conditions. The survey was conducted for 7 days from 9th (Monday) to 15th (Sat) from 2016. The place, date, the number of people surveyed, and the survey items are shown below.

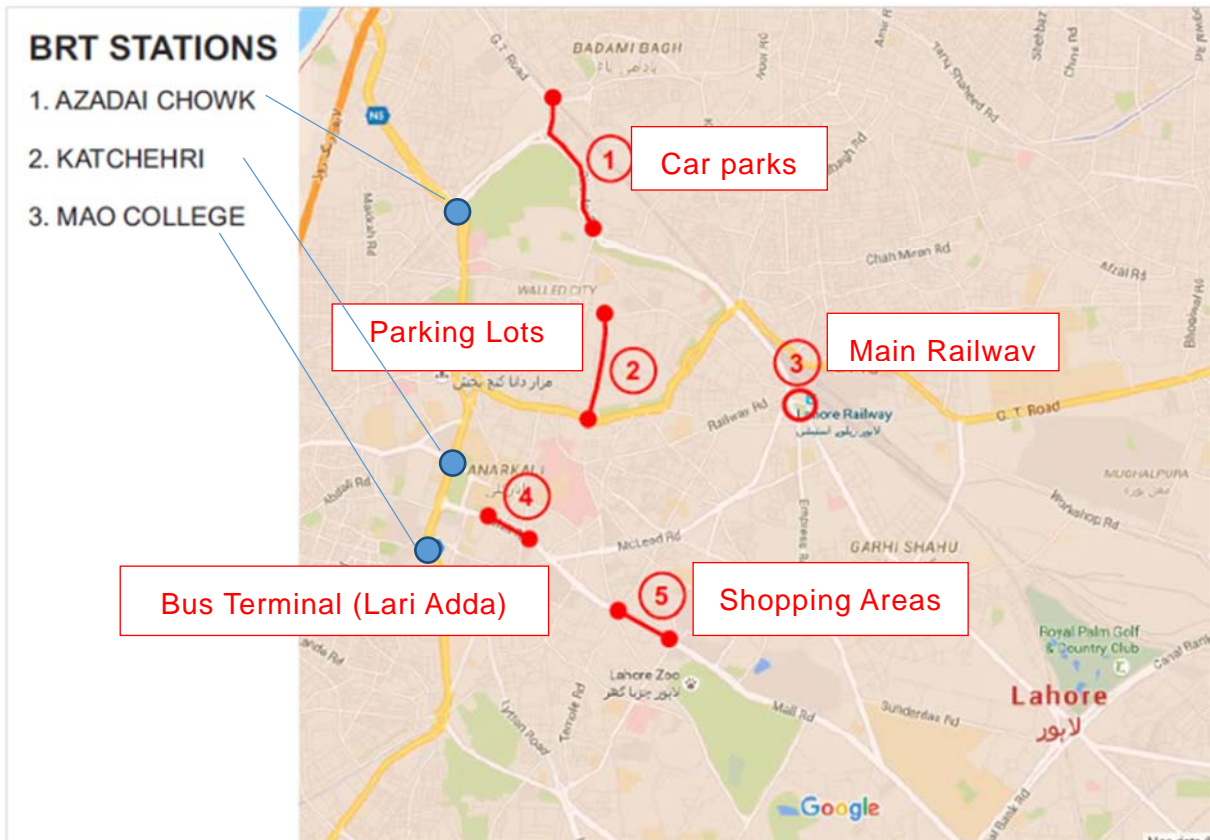


Figure 2.3.1-14 Location of Interview Survey

Table 2.3.1-6 Date of Interview Survey

Mode	Location		Date
Car Drivers	Car Parks		2016/5/12 - 15
Motorcycle Drivers	Parking Lots		2016/5/12 - 15
BRT Users	Metro Bus Station	Azadi Chowk	2016/5/10
		MAO College	2016/5/12
		Katcherey	2016/5/11
Bus Users	Main Railway Station		2016/5/9
	Bus Terminal (Lari Adda)		2016/5/9
Others	Other Shopping Areas Mix-mode		2016/5/12 - 13

Table 2.3.1-7 No of Interviewees

Mode	Location		Mode Choice of Interviewee					Total	
			Car	Motorcycle	Metro	Bus	Other		
Car Drivers	Car Parks		122	–	–	–	–	122	
Motorcycle Drivers	Parking Lots		–	142	–	–	–	142	
BRT Users	Metro Bus Station	Azadi Chowk	–	–	48	–	–	48	
		MAO College	–	–	35	–	–	35	
		Katcherey	–	–	70	–	–	70	
Bus Users	Main Railway Station		–	–	–	24	–	24	
	Bus Terminal (Lari Adda)		–	–	–	–	25	25	
Others	Other Shopping Areas Mix-mode		–	–	–	–	27	27	
Total			122	142	153	24	25	27	493

Table 2.3.1-8 Interview Items

No.	Item	Contents
1	Personal Information	Gender, Age, Job, Income
2	Trip Characteristics	Traffic Mode, Time, Driver License, Vehicle holding
3	Opinion on Traffic Management	Traffic Issues, TDM possibility

2) Analysis Result

The analysis of interview surveys is summarized below.

a) Priority Issues for Solving Traffic Problems

As priority issues for solving traffic problems, the most commonly items were "parking", then "pedestrian crossing facilities", "traffic signals".

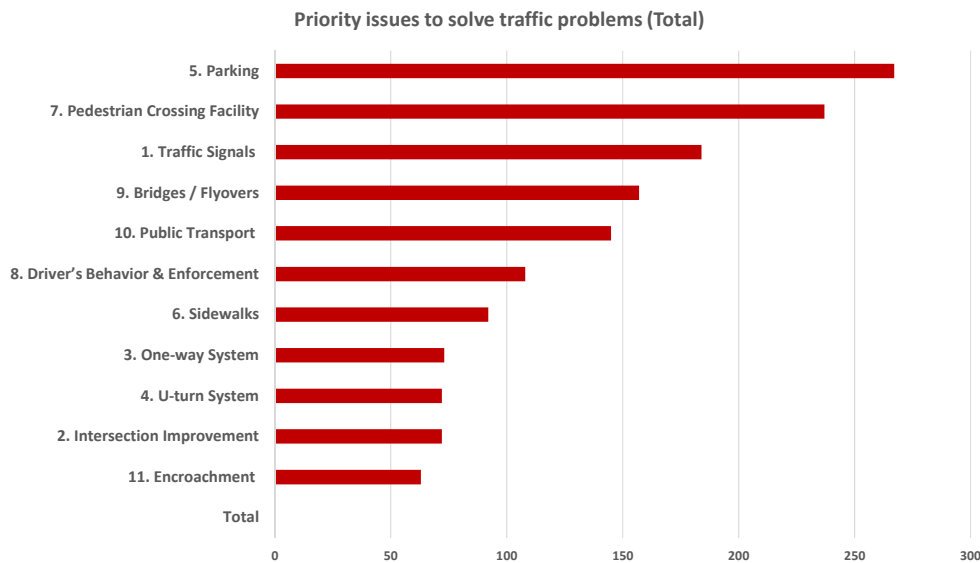


Figure 2.3.1-15 Priority Issues for Solving Traffic Problems

b) Evaluation for Individual Transportation Issues

The individual transportation issues are as follows.

- For the signal, there were many opinions that the red time of the signal is long. For such issues, it can be considered that improvement of user satisfaction can be aimed at by signal indication corresponding to traffic demand by direction.
- For intersections, it was found that the intersection shape was recognized as a problem. For necessary parts, measures to facilitate traffic flow by reviewing the geometric structure, etc. can be considered as countermeasures.
- As for sidewalks, occupation of sidewalks was pointed out as a major issue. Since the sidewalks in Lahore city are occupied by encroachment on the street and parked vehicles etc. By ensuring the continuity of sidewalks, it can be considered that improvement of pedestrian satisfaction and safety can be achieved.
- For parking, street parking was mentioned as a problem. The cause may be shortage of parking lot and parking space. It is thought that if the number of parking vehicles on the roadway decreases by carrying out appropriate road parking countermeasures, it will lead to smooth traffic.

What do you think is the problem of the Parking? (choose that apply)

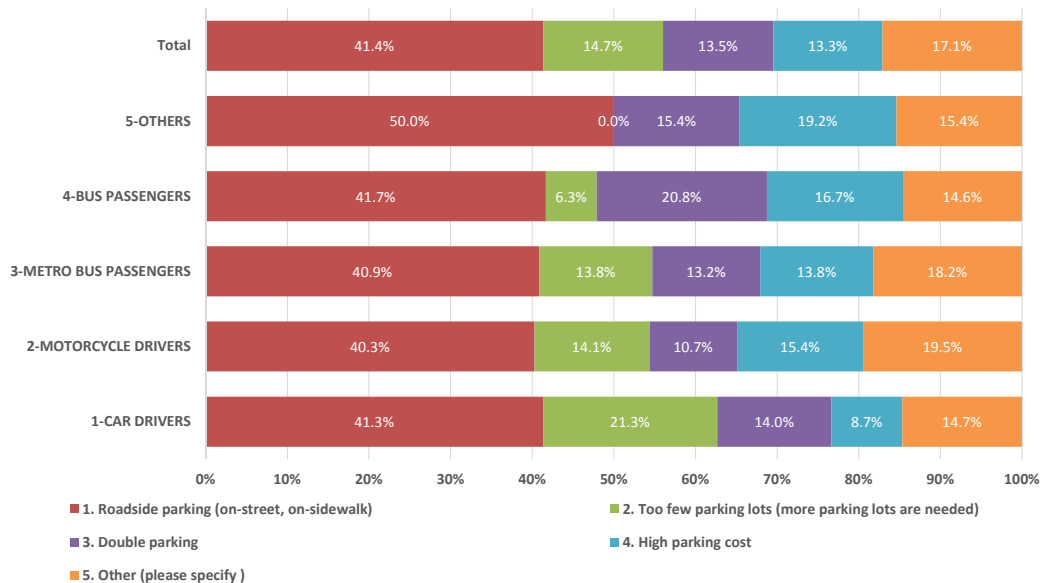


Figure 2.3.1-16 Parking Issues

c) Applicability of TDM Method

Regarding the applicability of the TDM method, "Carpooling" and "installation of ITS" were important. Since the TDM method is strongly influenced by cultural and social influences, it is necessary to consider not only the interview results but also the possibility of introducing various methods.

Please choose the measures which you think are helpful for addressing traffic congestion in Lahore?

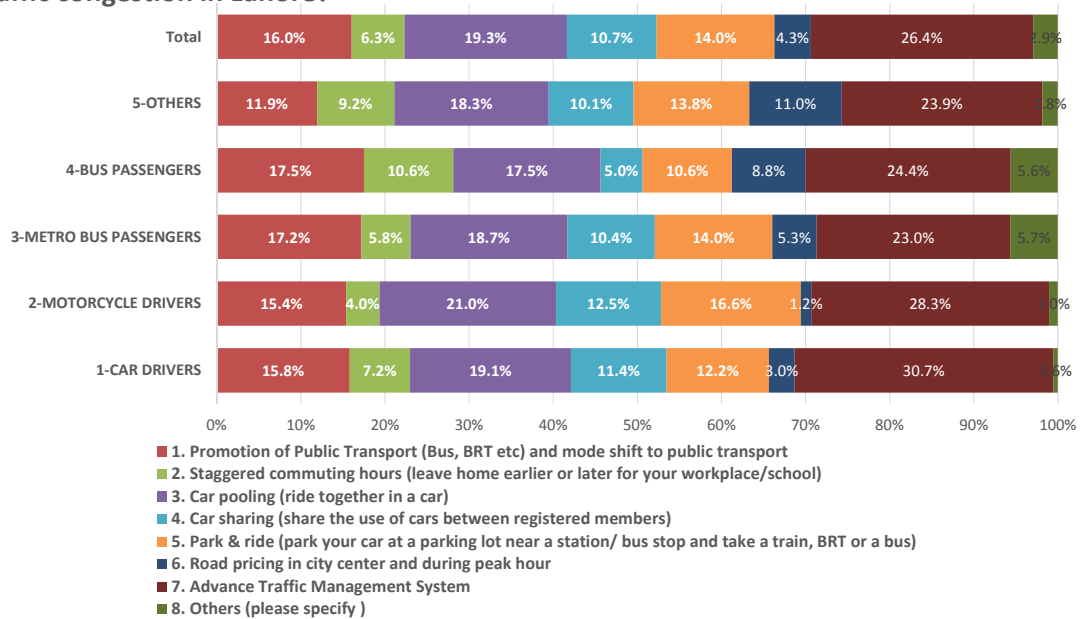


Figure 2.3.1-17 Application of TDM Method

2.3.2 Identification of Traffic Management Issues based on Traffic Data Analysis (Activity2-2)

Traffic management issues in Lahore Central Area are summarized as follows.

- Inefficient and poor conditions of existing public transport system including lack of public transport
- network and absence of accessibility by the deteriorated sidewalks, bus stops, proper bus services and shelters
- Unclear road network pattern
- Mixed traffic with high and low speed vehicles in same carriageway space
- Lack of maintenance of roads
- Insufficient traffic management such as poor junction design and traffic control, and malfunctioning and poor condition of traffic signals
- Encroachment of road space and public right of way including poor public space management

- Lack of pedestrian facilities such as occupying by illegal on-sidewalk parking and vendors
- Illegal and uncontrolled parking and lack of parking space around major commercial areas
- Road safety issues such as violation of traffic rules, lack of awareness among people about the traffic rules and no check and balance on driver licensing and training
- Lack of traffic enforcement by the traffic police officers

The issues for each intersection are shown in Table 2.3.2-1.

Table 2.3.2-1 Intersection Issues in Lahore Central Area

No.	Intersection Name	Issues
1	P.M.G	On-street parking of Aiwane Adal creates bottlenecks near intersection, Fixed signal phasing
2	Bashir Sons	Very sharp left turning from mall road to jamaludin afghani road, No channelizing for left turning
3	G.P.O	Some traffic data is missing due to orange line construction, No proper channelization of left turning from mall road. Geometry needs to be improved
4	Lahore High Court	Illegal parking and encroachment on fane Road, Very Sharp left turning from mall road to McLeod Road, No service road available adjacent to Lahore High Court
5	Regal Chowk	On-street parking and encroachment on Hall Road, Traffic from service road disturbs main-stream traffic. Traffic obstruction by strike activity
6-A	Charing Cross (a)	Frequent traffic jams and road blocks due to strikes and political activities, No channelization for separate left turning
6-B	Charing Cross (b)	Frequent traffic jams and road blocks due to strikes and political activities, No channelization for separate left turning
7	Davis Road	Fixed signal timing, no channelizing islands available for left turning on Press Club road, security barriers installed on G.O.R road
8	Mall Road & Canal	Fixed signal timing, frequent passage of VIP traffic movements
9	Qartaba Chowk	Severe traffic conflicts for straight and turning traffic before and after U-turns, weaving problem, On-street parking on Queens road
10	Lytton-Begum Road	Fixed signal timing, no separate left turning on Begum Road, on-street parking near intersection, geometry needs to be improved
11	Mazang Adda	No separate left turning, encroachment and On-street parking near intersection, fixed signal timing, electric poles present on main road.
12	Saffanwala Chowk	Encroachment and on-street parking creates traffic bottlenecks, fixed signal timing, pedestrian walkways unavailable
13	Ganga Ram	Traffic bottlenecks due to encroachment and On-street Parking of Hospital, geometry needs to be improved
14	District Court	Less number of lanes on Saggian Bypass Side. Traffic obstruction by subway construction

No.	Intersection Name	Issues
15	Shimla Hill	Geometry needs to be improved. There are many schools around the intersection, and traffic jams occur due to heavy traffic and parking.
16	Ghari Shahu	Geometry needs to be improved, less number of lanes, insufficient median width, wrong turning of motorcyclists creates traffic conflicts Traffic obstruction by subway construction
17	Aik Moria	Geometry needs to be improved, illegal Qing qi stops, luggage carrying hand driven carts create problems, On-street parking
18	Shah Alam Chowk	Traffic bottlenecks due to encroachment and On-street Parking, geometry needs serious improving near intersection.
19-A	Data Darbar (A)	Intersection narrowing due to shops and encroachment, high volume of pedestrian traffic creates bottlenecks and delays for vehicles
19-B	Data Darbar (B)	On-street parking of cinqs, placement of bus-stop and many pedestrian crossing near intersection creates severe traffic problems.
20	Shahdara	Grade separation (flyover or underpass) must be provided, geometry needs to be improved, parking and encroachment problems

2.3.3 Selection of Pilot Project as a Social Experiment and Preparation of Its Implementation Plan (Activity2-3)

(1) How to Select the Pilot Project Area

The Pilot project area shown in the Figure 2.3.3-1 is surrounded by Mall Road, Lytton Road, Queens Road and Fane Road.

Its selection is based on the following reasons:

- Based on the traffic survey analysis results and the identification of the traffic management issues, the pilot project area was selected considering the large traffic problem area.
- Priority area/corridor for the pilot project during the R/D of this project is Mall Road. However, construction by open cut system of the Orange Line underground station at Mall Road/Mcloud Road will start soon.
- Priority area/corridor for the pilot project during the R/D of this project is Mall Road. However, construction by open cut system of the Orange Line underground station at Mall Road/Mcloud Road will start soon.
- Traffic problems in the Lahore Central Area are also shown in this area. It is like a showcase of the Lahore Central Area's traffic issues.
- TEPA Office is located in the Area.

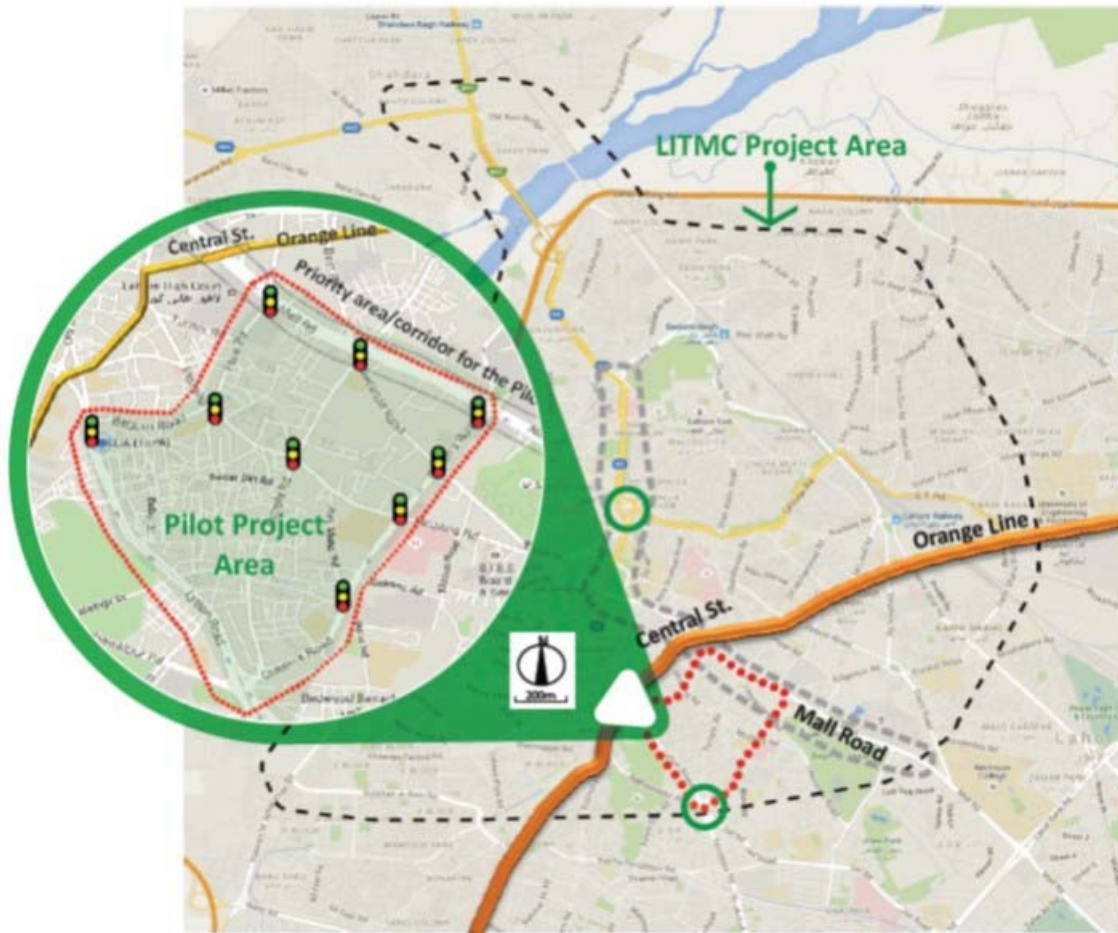


Figure 2.3.3-1 Pilot Project Area

(2) Selected Pilot Project Corridor (Queens Road)

Corridor management includes many of the traffic management measures. Therefore, corridor management is the target of the pilot project. Among six corridors in the Pilot Project Area, Queens Road is selected as the Pilot Project Corridor because of the following reasons.

- Queens Road is one of the secondary roads in the area (major roads in the area such as Mall Road and Lytton Road were selected as Model Roads by Punjab Province’s project),
- Various urban activities can be observed along the road such as schools, commercial, hospital and government offices.
- Therefore, Queens Road caters not only to through traffic but also to traffic generated along the roadside facilities.

(3) Current Situation of the Pilot Project Corridor

Based on the traffic survey and observation by TEPA C/Ps and JICA project team members along Queens Road, the following urban/traffic issues were identified:

- Signal timing at Ganga Ram intersection is not coordinated resulting in long queues especially during peak hours.
- Many sidewalk spaces are occupied by illegal parking and sidewalk vendors.
- Traffic lane sometimes is blocked by double/triple on-street parking.
- Pedestrians are sometimes forced to walk on the carriageway, which puts their lives at risk, because there are no sidewalks and if there are sidewalks, there are occupied by parked vehicles and vendors.
- Travel speed during the peak hour drops to 8km/hour due to the intersection problems and illegal double/triple on-street parking, as mentioned above.

(4) Concept of the Pilot Project and the Menu of the Pilot Project

Driving fast or creating car friendly circumstances seems the first priority of Lahore's transport planning when we observed the signal free corridor and there are also very few pedestrian crossings on the major roads. However, Punjab Government is also going to improve public transport system with such projects as BRT (Green Line) and MRT (Orange Line). This means Punjab Government may shift the transport planning priority from car friendly to car and public transport friendly. Based on these circumstances, the Pilot Project is going to consider not only cars but also public transport and pedestrians, and moreover, considering the urban activities along the road. As a result of the traffic management interview survey, "parking", "pedestrian crossing facilities", and "traffic signals" were the most frequently cited priority issues for solving traffic problems.

Therefore, the catchphrase of the Pilot Project along Queens Road is

“Safe, Smooth and Smart Urban Transport Corridor – Queens Road”.

- ◇ **Safe** means considering the safety of all road users.
- ◇ **Smooth** means smooth mobility not only for cars (but keeping speed limit) but also for pedestrians walking on continuous sidewalk space.
- ◇ **Smart** means effective use of road space by car drivers, roadside shop owners/business persons and pedestrians.

By improving QUEENS ROAD through a well-defined urban traffic management scheme, Queens Road becomes the most attractive street in Lahore.

“By improving QUEENS ROAD” means introducing six urban traffic management schemes which are simple, low-cost and maximizes the existing facilities. The schemes include the following:

- Improvement of intersections through such measures as proper installation of markings, safety poles, cats-eyes and traffic signs;
- Effective use of the cycle time and phasing pattern of traffic signals;
- Provision of on-street parking considering road and roadside conditions;
- Creation of safe and comfortable pedestrian circumstances by improving sidewalk conditions considering the networking and pedestrian safety measures;
- Conducting Mobility Management (MM) by considering a wiser use of the transport system mainly working with school students in Lahore; and
- Conducting traffic safety campaign targeting road users along Queens Road and eventually all Lahore citizens, especially young motorcycle drivers.

In order to achieve the above, it is necessary to implement not only measures but traffic control by the police. Therefore, Lahore Traffic Police worked in coordination with traffic regulation contents.

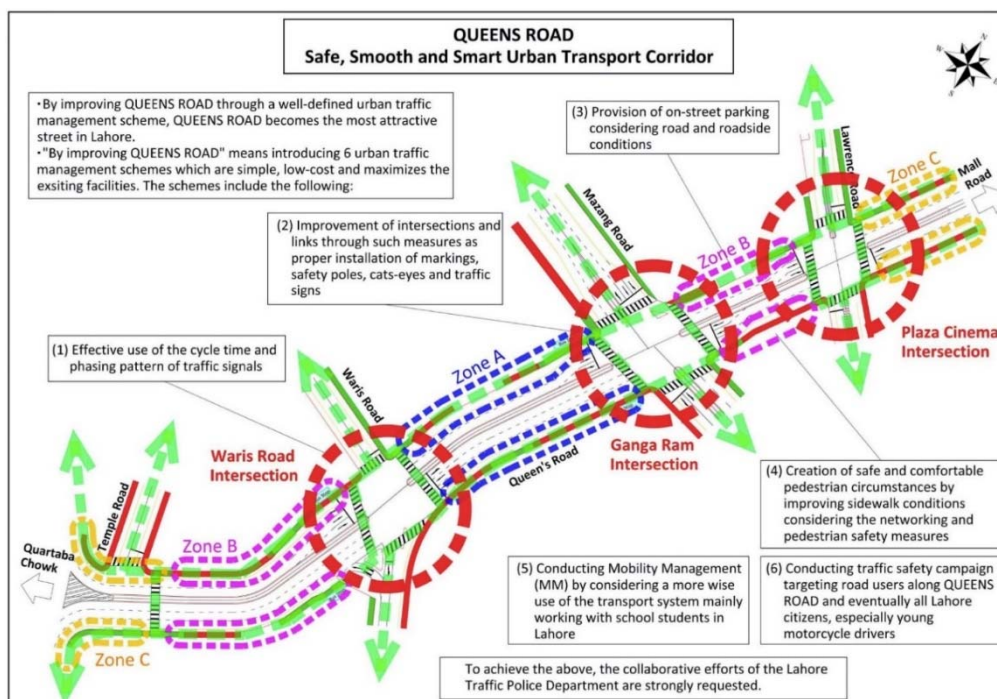


Figure 2.3.3-2 Concept of the Pilot Project along Queens Road

(5) Pilot Project Schedule

Considering approval of the Pilot Project by JCC, W/G and JICA, coordination with relevant agencies and school vacation, Pilot Project schedule is shown below.

Table 2.3.3-1 Pilot Project Schedule

Items	2017			2018											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
School Vacation									Ramadan	School Vacation					
JCC				24 Jan. ◎ 4th JCC											
W/G				19 Jan. ○ 4th WG							28 Aug. ○ 5th WG				
Seminar											5 Sep. ◇ 3rd Seminar				
Detailed Design & Cost Estimates	■														
JICA Approval & Contract with Sub-contractors	■	■													
Coordination with relevant Agencies (Road facilities etc.)	■	■	■												
Preparation, Construction and Installation			■	■	■	■	■	■	■						
Mobility management	■ Pre survey										■ Campaign	■ Post survey			
Traffic safety Campaign								■	■						
Evaluation (Pre and Post traffic survey)	■ Pre survey								■ Post survey						

2.3.4 Conduct of Pilot Project (Activity 2-4)

(1) Corridor Management

1) Outline

We set "Safe, Smooth and Smart Urban Transport Corridor" as a goal in Queens Road's corridor management, and from inexpensive and effective measures implemented in Japan, 1) widen the roadway, 2) parking space improvement on the 2 street, Improvement of sidewalks, 4. Maintenance of crosswalks, 5. Maintenance of bus stops, 6. Improvement of intersections, and 7. Planting trees to the median strip.

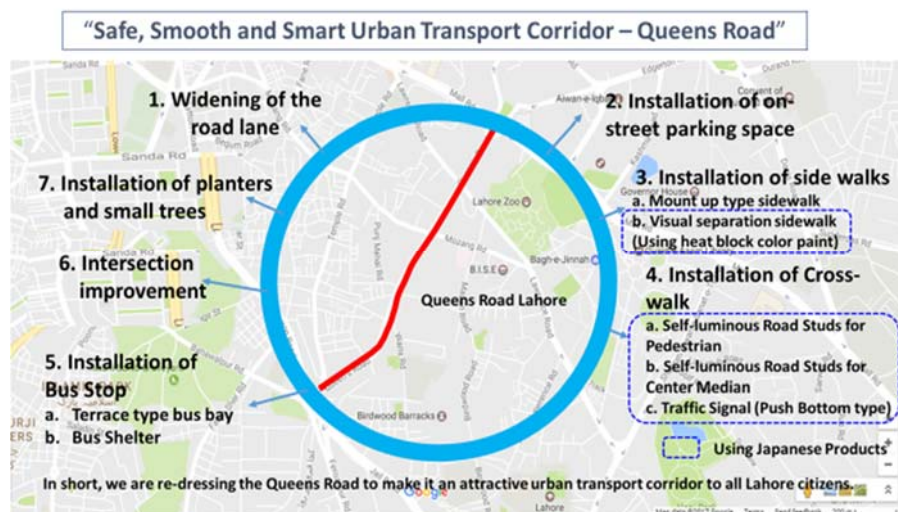


Figure 2.3.4-1 Corridor Management along Queens Road (1)

The main measures, parking countermeasure, sidewalk maintenance, bus stop maintenance, pedestrian crossing (push button signal) maintenance situation are shown below. Although we introduced Japanese products such as pushbutton signals and color sidewalk materials, we have been steadily implemented and operated as seen in the picture.



Figure 2.3.4-2 Corridor Management along Queens Road (2)

2) Details of each measure

The details of each measure are described below.

a) Widening of the lane

To ensure safe and smooth traffic for large vehicles such as bus and large truck, the lane width was changed from 2.75m to 3.0m



Before



After

b) Installation of On-Street Parking

To prevent lane blockage due to illegal parking, On-Street Parking Space was installed on shoulder for cars and motorcycles.



Before



After

c) Installation of sidewalk

i. Mount-Up Type Sidewalk

- Mount-Up Type Sidewalk was installed to allow pedestrians to walk safely.
- In the section where the vehicle enters the private property on the roadside continuously, the height gap between the Carriageway and the sidewalk was set as 5cm.
- The width of sidewalk was ensured that pedestrians can pass each other (more than 1.5m).



Before



After

ii. Visual Separation Sidewalk

- The visual separation sidewalk was installed in the section where the Mount-up Type sidewalk cannot be installed due to safety reasons such as the UK Visa center and gas stations.
- To improve pedestrian safety at night, Self-luminous Road Studs was installed at the boundary of the carriageway and the sidewalk.



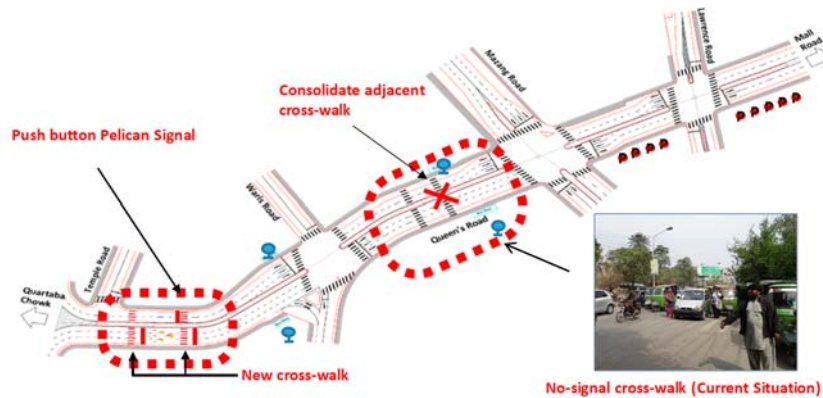
Before



After

d) Installation of Crosswalk

To make an environment where pedestrians can cross the roads safely, Crosswalk facilities were installed at regular intervals (Every 200 m).



i. Signalized Crosswalk

- To make conditions where pedestrians can cross the roads safely, Push Button Pelican Signal was installed in front of Jinnah Degree collage for Women.
- To allow pedestrians to cross the road safely and comfortably, Center median (part of the pedestrian crossing) was removed.
- To reduce the vehicle speed at the signal section, road studs were set in front of the cross-walk marking.



Before



After

ii. Non-Signalized Crosswalk

- To make an environment where pedestrian can cross the roads safely, proper crosswalks with Self-luminous Sign board and Road studs were installed in front of Medical University and Shezan Bakers.
- To allow pedestrian to cross the road safely and comfortably, Center median (part of the pedestrian crossing) was removed.

Medical University



Before



After

Shezan Bakers



Before



After

e) Installation of Bus Stop Facilities

- To stop the bus near the sidewalk, marking was installed to clearly show the stop position.
- To improve comfort of bus users, the bus shelter was rehabilitated.



Before



After

f) Intersection Improvement

To prevent reverse lane running of the vehicle at the intersection, extension of the center median and installation of the sign board were conducted.



Before



After

- To prevent vehicle collision to the center median at night time, Self-luminous Road Studs were installed on the edge of the center median at the Gangaram Intersection.
- To prompt speed reduction of vehicles that enter the non-signalized intersection (Waris Chowk intersection) Self-luminous Road Studs were installed at the boundary of each lane.



Self-luminous Road Studs for Center median



Self-luminous Road Studs for Lane classification

g) Installation of Planters and Small Trees

To prevent pedestrian jaywalking, planters and trees were installed in the Center Median.



Before

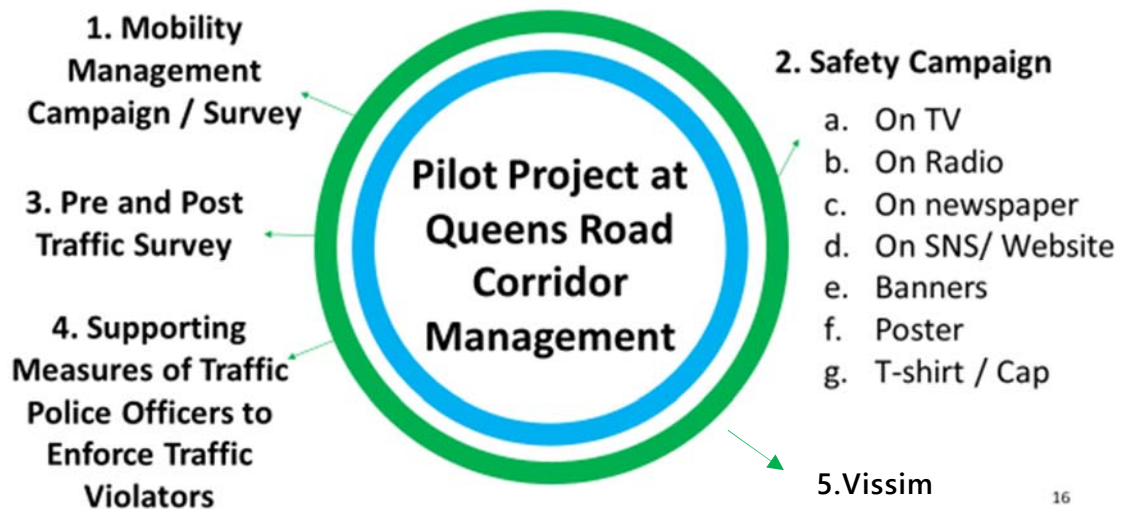


After

(2) Non-Structural Measures

1) Outline

The TEPA / JICA project team implemented Non-structural management measures parallel to the structural measures of corridor management 1. Mobility management, 2. Traffic safety campaign, 3. Pre-and post-traffic survey, and 4. Traffic police enforcement. In particular, this mobility management was the first attempt in Pakistan, greatly contributing to the capacity building of TEPA.



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Figure 2.3.4-3 Mobility Management, Traffic Safety Campaign, etc.

2) Mobility Management

a) Defining Mobility Management

Mobility Management is defined as a concept which promotes the use of sustainable transport (like walking for short trips, use of public transport) by changing travelers' attitudes and behavior. The ultimate goal is to create a new mobility culture.

Schools are good target for Mobility Management (MM) Campaign since school children need to be aware of traffic safety and they are influencer within their family hence the multiplication of the MM Campaign is achieved.

b) Objectives of Mobility Management

The objectives are as follows:

- To promote among the students' use of public transport and other environmentally friendly modes of transport (e.g. walking for short trips).
- To promote effective use of Queen's road once the corridor is improved as safe, smooth and smart corridor.
- To raise awareness among the students of their role to contribute in improving transportation condition of Lahore.

c) Target Schools and Students for Mobility Management

The target schools are: (i) Fatima Jinnah Medical University, (ii) Government Jinnah Degree College for Women, and (iii) Adabistan-e-Soophia School. These three

schools were selected after careful study of all schools along the Queen’s Road. High number of students was one of the criteria. Likewise, the three schools were selected as representative of primary, secondary and university students. Location of the said schools are shown in Figure 2.3.4-4. The targeted students are as follows:

- Fatima Jinnah Medical University– post graduate students (20 yrs old and above)
- Government Jinnah Degree College for Women – secondary students (16-20 yrs old)
- Adabistan-e-Soophia School – primary students (10-12 yrs. Old)

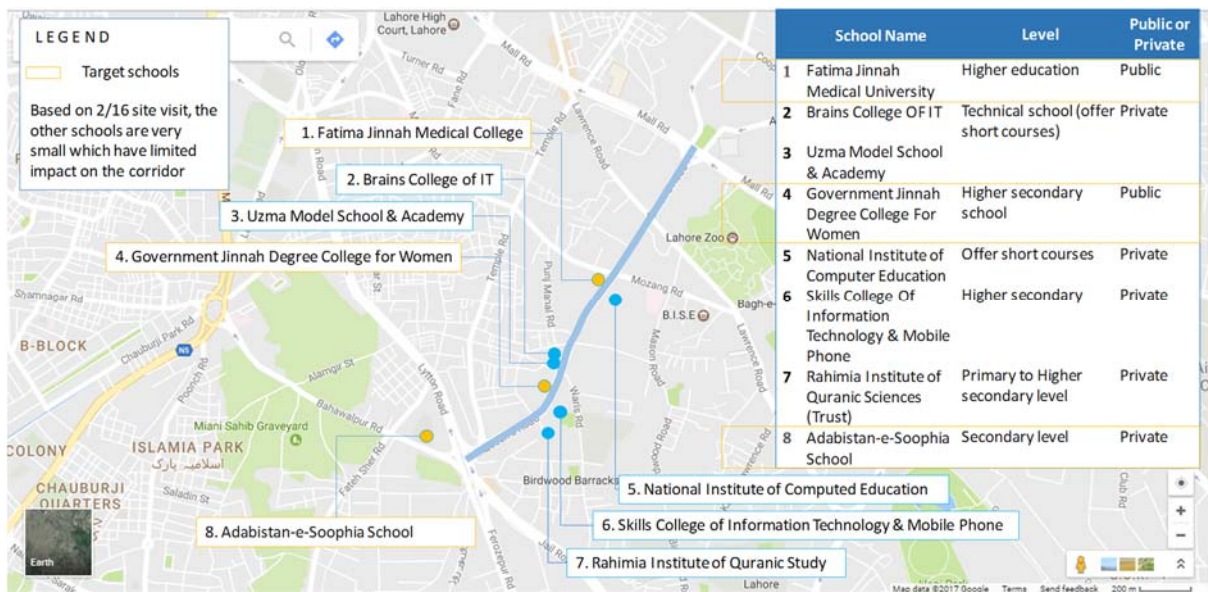


Figure 2.3.4-4 Location of Target Schools

d) Methodology

The method used to carry out MM campaign were as follows:

- Introduction of the project and MM campaign by power point presentation. In the presentation, transport problems in Lahore and how the students can contribute in improving the transportation system was shown. Similarly, MM campaign example in in other countries were introduced.
- Face to face interview using the prepared survey form to know the students travel behaviour. This was done twice, (i) before the improvement of Queen’s Road and (ii) after the improvement of Queen’s Road.
- Conduct of seminars and workshop to disseminate to wider audience the results of the Mobility Management.

e) Timeline and Schedule of Mobility Management

The MM campaign has started in April 2017 and completed in February 2019. During this almost two years period, a series of activities were undertaken as illustrated in the Figure 2.3.4-5.

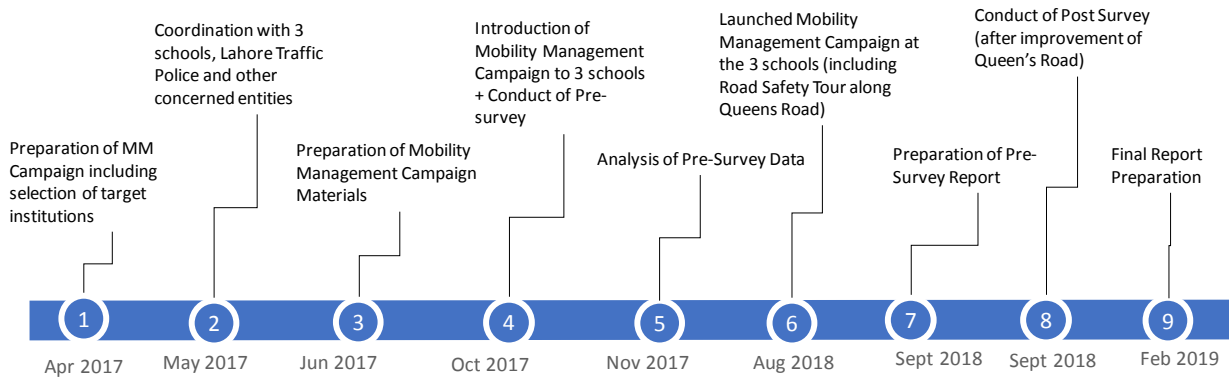


Figure 2.3.4-5 Timeline of the Mobility Campaign

f) Results of the Mobility Management Campaign

i. Impact of the MM Campaign in the Choice of Mode of Transport of the Students

Adabistan-e-Soophia

Although limited in numbers, there are observed changes on the behavior of the students in selecting transport mode to school as well as on their way back home. For instance, before the campaign, only 1 student walk to school but this number increased to 3 after the campaign. This shows that the students are sincere in their effort to indeed contribute in making the transportation of Lahore better which was the one of the campaign themes.

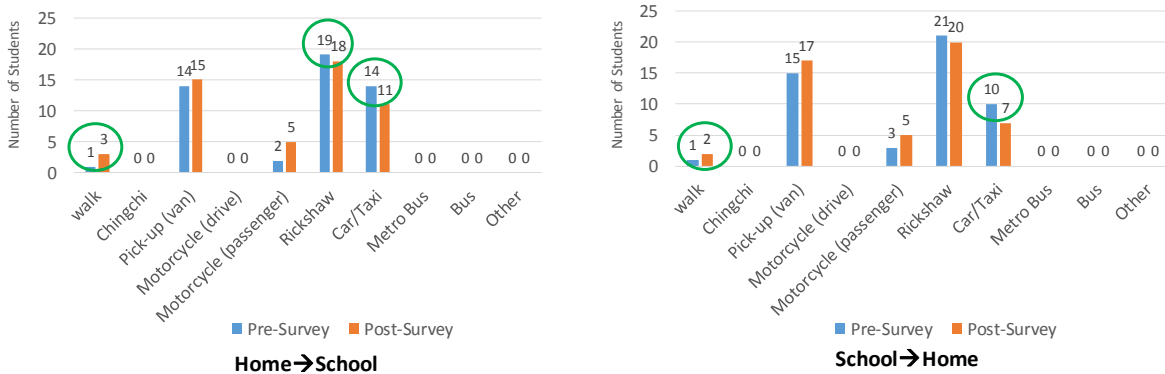


Figure 2.3.4-6 Students of Adabistan’s Choice of Transport Mode

Government Jinnah Degree College

For the students of Government Jinnah, no significant changes on their travel behavior. There was even observed reduction of number of students who walked to school and to home.

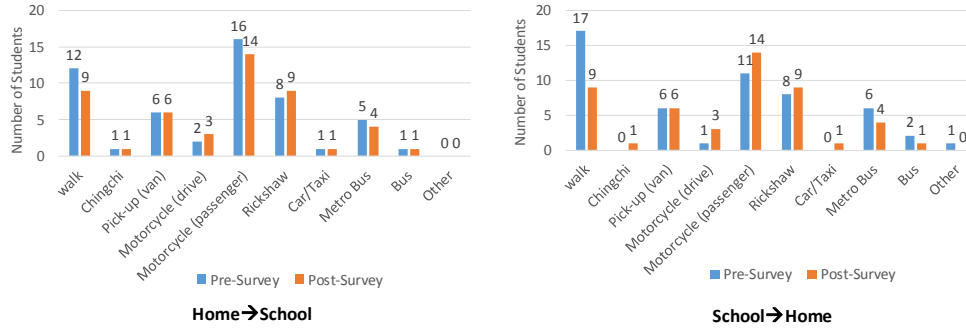


Figure 2.3.4-7 Students of Government Jinnah’s Choice of Transport Mode

Fatima Jinnah Medical University

Students walking to school increases by 1 and students walking from school to home increases by 3 after the MM campaign. Similarly, shifting from rickshaw to other transport of mode increases (at least 1 or 2 students shift from rickshaw to walk).

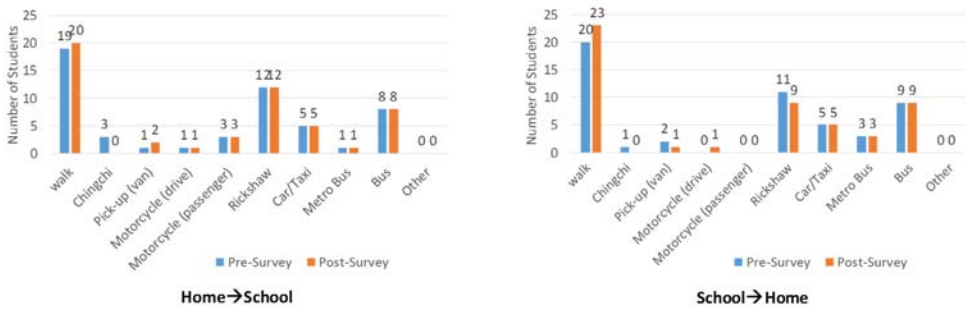
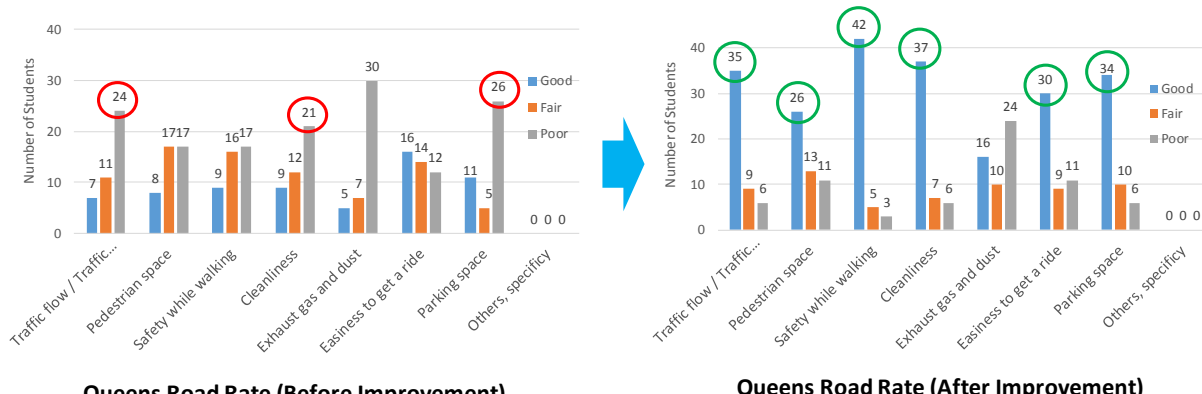


Figure 2.3.4-8 Students of Fatima Jinnah’s Choice of Transport Mode

ii. Impact of Queens Road Improvement from the Eyes of the Students

Adabistan-e-Soophia

Before the improvement of the Queen’s Road, in general, the students perception of the corridor is negative or mostly “poor” as indicated by the red circle. After the improvement however, opinion of the students on the Queens Road became positive. For instance, 42 students said that they feel safe now while walking at Queens Road. Before the improvement, only 6 students said so and most of them (17 students) have negative opinion.



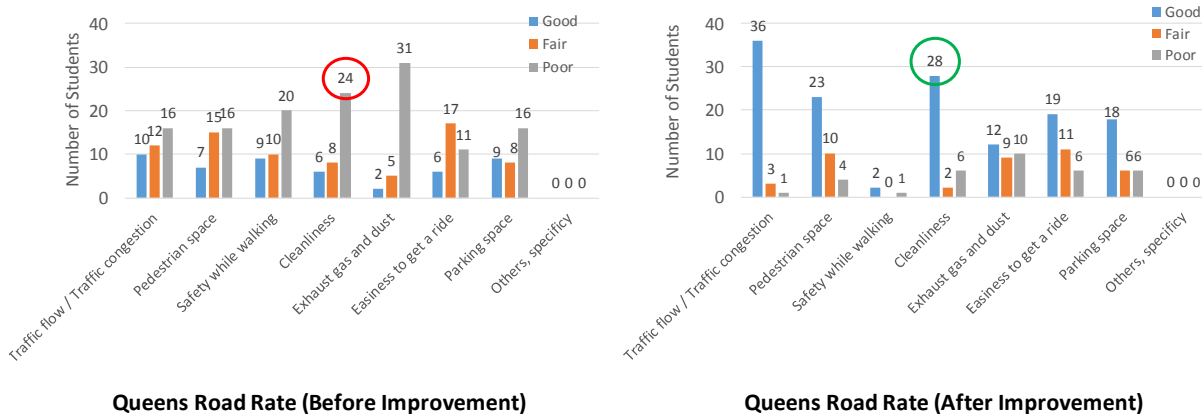
Queens Road Rate (Before Improvement)

Queens Road Rate (After Improvement)

Figure 2.3.4-9 Impression of the Adabistan’s Students on the Queens Road

Government Jinnah Degree College

Before the improvement of Queens Road, students’ opinion on the road were negative. After the improvement of the Queens Road, most of the students had a positive opinion. For instance, in terms of cleanliness, 28 students’ rate “Good” compared to 10 before the improvement.



Queens Road Rate (Before Improvement)

Queens Road Rate (After Improvement)

Figure 2.3.4-10 Impression of the Government Jinnah’s Students on the Queens Road

Fatima Jinnah Medical University

As seen in the red circles, most of the students said that the Queen’s Road is in poor state in terms of cleanliness, easiness of get a parking space, unhampered pedestrian space, safety among others. However, this negative opinion is completely reversed after the improvement of Queens road as indicated in the green circles. This implies that the improvement made has significant impact on the way the students view the corridor hence similar efforts should be made to other corridors.



Figure 2.3.4-11 Impression of the Fatima’s Students on the Queens Road

iii. Feedbacks from the Students and Teachers on the Mobility Management Campaign

The Mobility Management Campaign conducted among the three schools can be considered a success basing on the (i) level of interest/participation of stakeholders (students, teachers, traffic police) and their positive feedbacks that the activity is very useful to improve their safety, (ii) request by some school teachers and students for the activity to become a regular part of their school activities, (iii) request by some teachers and students for expansion to cover all schools in Lahore, and (iv) further request by some teachers for the activity to be become part of school curriculum of the education system of Pakistan.



Figure 2.3.4-12 Route of the Students during the Road Safety Tour



- Explain to them the meaning of road markings and traffic signs
- Identify safe route while walking (e.g. by observing the pedestrian lane and designated zebra crossing with push button)
- Teach them how to behave in the public space (e.g. raise your hand when crossing to increase your visibility to the driver or walking and crossing as a group will increase their visibility)
- Tell them to influence their family members who drive to follow traffic rules

Figure 2.3.4-13 Members of Lahore Traffic Police Explaining to the Students the Meaning of Different Road Markings and Traffic Signs

Selected Feedbacks from the Students



- Yeah, it is a very useful campaign and this should be continued to make Pakistan more safer.
- Yes, but not all people are aware of this so it should be continued further to all area of Lahore
- Yes, this seminar is very useful and about safety for our children and families and this safety is most important for the students. Students were given information for this. Thank you so much for this information.
- Yes, this seminar and safety campaign is very useful. This seminar gave us a lot of information about traffic laws. Please continue seminars like this, all over Pakistan.

Figure 2.3.4-14 Feedback from the Students

Selected Feedbacks from the Teachers



- Its a very good effort and it should be continued. Our students learn inside class room especially about traffic signs and safety but this activity brings them on road and show them practically so they learn how to follow these things in their daily life. Kids are happy to participate and they learned a lot.
- This seminar is very useful since what children learned at early age will stay with them forever
- This should become part of our regular school activities in Pakistan.
- Parents should be also involved since they make decision for their kids.
- This seminar/program should be part of our educational system.
- Please extend this program to all boys schools since they are the motorcycle users and major source of accidents

Figure 2.3.4-15 Feedback from the Teachers

3) Traffic Safety Campaign

a) Target for Traffic Safety Campaign

Traffic safety campaign is to be carried out for the whole of Lahore and Queens Road users. Basic catchphrase (Whole Lahore): “Safe and Smooth City” Queens Road catchphrase: “Queens Road- Safe, Smooth and Smart Urban Transport Corridor”. Target of campaign is as follows.

- To Young M/C Rider: Wearing Helmet,
- To Pedestrian: To cross the crosswalk, Follow the pedestrian signal,
- To Car Driver: Follow the traffic signal and road marking, Not illegal parking, Fasten seat belts

b) Safety Campaign Tools

The effective media was selected considering the budget and schedule. The logo design and basic design were unified in the campaign. The tools used are as follows.

Table 2.3.4-1 Safety Campaign Tools

1	TV Spot	Time length: Broadcasting Days: Broadcasting Station: Times: Weekend: 6:00Pm, 8:00PM Times: Weekday:11:55, 12:45, 18:55, 20:45	30 seconds Commercial 14 Days Local*1 channel (City 42) 4 Days, 8 times 10Days, 40 times	23 April to 8th May
2	Radio	Time length: Broadcasting Days: Broadcasting Station: Times:Weekend:8:30, 11:30, 12:30,17:30, 18:30, 19:30, 22:30 Times:Weekdays:8:30, 11:30, 12:30,17:30, 18:30, 19:30, 22:30	30 seconds Commercial 14 Days FM103 LHR 4 Days, 28 times 10 Days, 70 times	23 April to 8th May
3	Newspaper	Size: Posting: Newspaper company:	Half Page Color(Ordinary) 4 days,Every Friday Daily Dawn Daily Naway Waqat	23,27 April and 02 May
4	SNS/Web	Website page Facebook page	83 people like page 79 Follow page different post have different number of people reach but 1,333 people reach our single post which is the highest number.	How many views we have? 23 April to 8th May (only 15 days campaign)
5	Streamers	Number of Streamers: Size: Posting:	80 5*2	23 April to 8th May
6	Poster	Location: Size: Number of Sheets: Posting:	Schools, Shops along Queens Road A1 200	23 April to 8th May
7	T-Shirt & Caps	Number of T-Shirt: Number of Caps: Distribution destination:	170 170 Roadside, Residents, TEPA/JICA Team, Surveyor	



TV Commercial



Newspaper



Social Media (Facebook)



Streamer

Figure 2.3.4-16 Campaign Tools

(3) Cooperation of Relevant Organizations

And the collaboration between related agencies as shown below was the key of success of the pilot project.

A pilot project beyond the framework of the WG and JCC and implemented with involving schools and police has increased opportunities for TEPA to cooperate with related organizations.

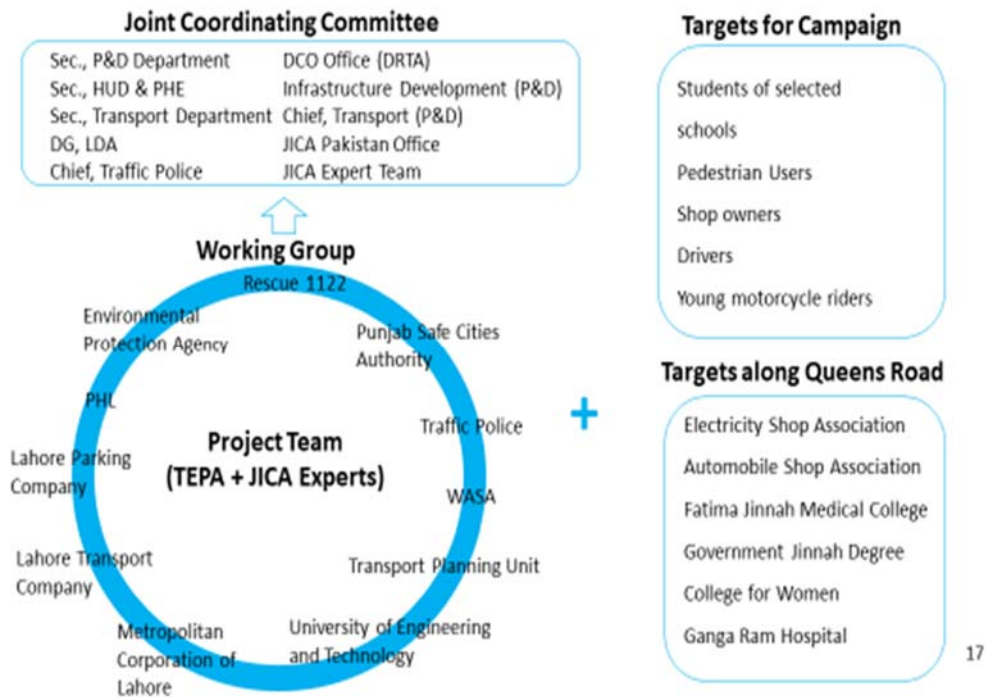


Figure 2.3.4-17 Collaboration with Related Agencies

Table 2.3.4-2 Role of Each Organization in the Pilot Project

No.	Organization	Role in the Pilot Project
1	Rescue 1122	<ul style="list-style-type: none"> Provision of accident data
2	Panjab Safe Cities Authority	<ul style="list-style-type: none"> Discussion on planning and design of pelican signal Maintenance and management of pelican signal after the end of our project
3	Lahore Traffic Police	<ul style="list-style-type: none"> Enforcement of illegal parking Traffic control in the traffic safety campaign Lecture on traffic rules for drivers and students for target school of mobility management
4	WASA	<ul style="list-style-type: none"> Cleaning of drainage facilities
5	Transport planning unit (TPU)	<ul style="list-style-type: none"> Discussion of implement measures of pilot project
6	University of Engineering and Technology (UET)	<ul style="list-style-type: none"> Discussion on planning of mobility management Implementation of Mobility management base on the above plan Implementation of pre and post traffic survey

No.	Organization	Role in the Pilot Project
7	Metropolitan Corporation Lahore (MCL)	<ul style="list-style-type: none"> • Removal of illegal Encroachment • Cleaning of road facilities • Permit of operation, maintenance of on-street parking
8	Lahore Transport Company (LTC)	<ul style="list-style-type: none"> • Discussion on planning and design of bus stop facilities • Maintenance and management of bus stop facilities after the end of our project
9	Lahore Parking Company (LePark)	<ul style="list-style-type: none"> • Discussion on planning and design of on street parking • Maintenance and management of on street parking after the end of our project
10	Parks and Horticulture Authority (PHA)	<ul style="list-style-type: none"> • Permit of removal unwanted trees • Construction permit streamers for traffic safety campaign
11	Environmental Protection Agency	<ul style="list-style-type: none"> • Screening of corridor improvement along Queens road (Judgement of category)

2.3.5 Conduct of Traffic Surveys to Assess the Pilot Project (Activity 2-5)

(1) Outline

Traffic surveys were conducted before and after the Pilot Project to assess the traffic conditions and image of road users of the Pilot Project. The section targeted for evaluation is Temple Road to Plaza cinema. The types and the location of the survey are as follows:

- Intersection Traffic Flow Survey
- Congestion Queue Length Survey
- Pedestrian Traffic Survey
- Parking Survey
- Interview Survey

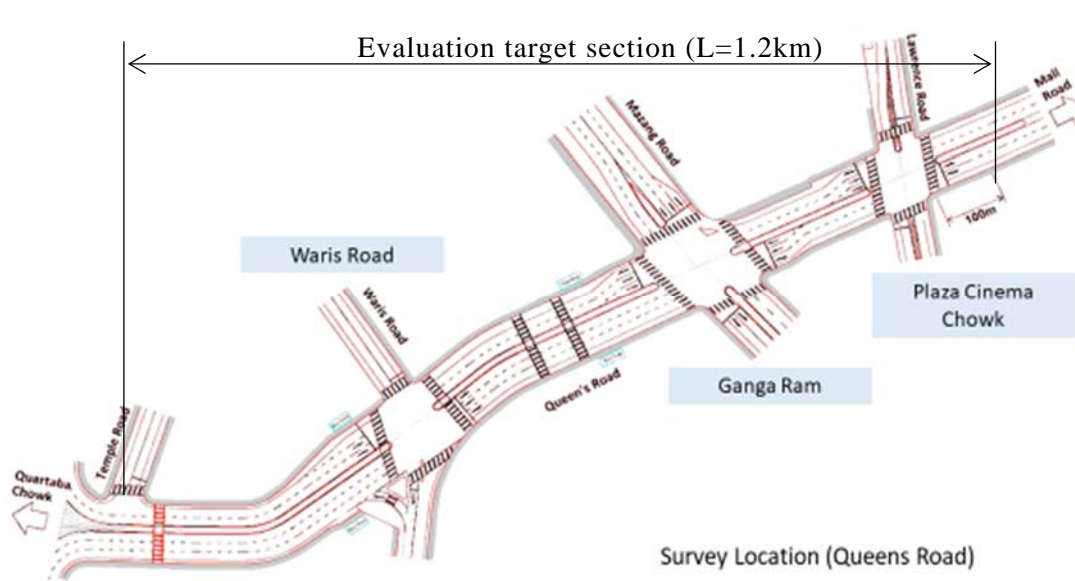


Figure 2.3.5-1 Survey Location (Queens Road)

Several survey results were explained below.

(2) On-Street Parking

As a result of improving the parking space on the street during the Pilot Project and conducting enforcement of the traffic police, the number of parked cars has decreased. It is expected to develop parking countermeasures by considering the balance of the number of parked vehicles between on the road and off the road, especially introducing parking index standards for off road parking.

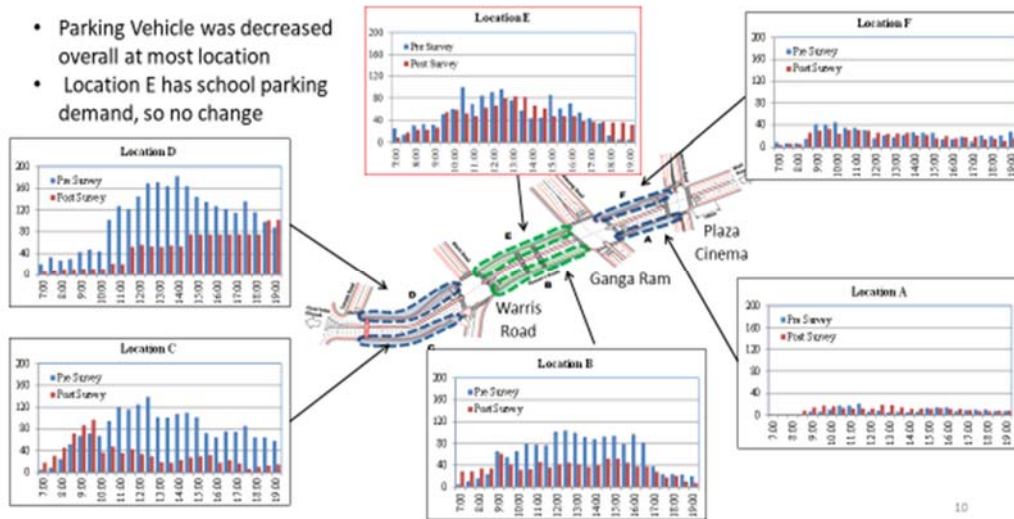


Figure 2.3.5-2 On-Street Parking (Time Distribution by Location)

(3) Pedestrian Traffic on the Sidewalk

Especially front of the big hospital (points E, F, G), before the road pedestrian vehicles and vendors occupied the sidewalks and could not walk on the sidewalk, but sidewalks were improved in this pilot project. The number of people increased dramatically.

- Rate of within sidewalk increase at Location E, F, G, K, good impact of improvement work for sidewalk.

Maintenance rate of sidewalk

Sidewalk	West side	East side	Total
Existing sidewalk	562m	797m	1,359m (56%)
New mount-up sidewalk	498m	309m	807m (34%)
New visual separation sidewalk	140m	94m	234m (10%)
Total	1200m	1,200m	2,400m

Rate of walking on the sidewalk

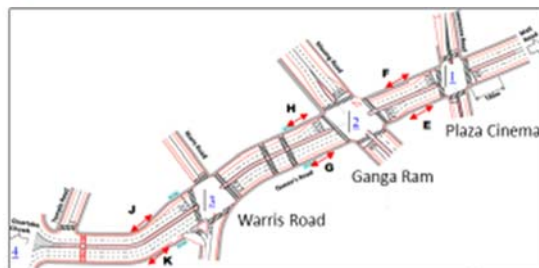
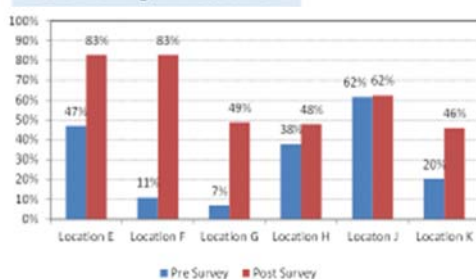


Figure 2.3.5-3 Pedestrian Traffic on Sidewalk

(4) Pedestrian Traffic on a Pedestrian Crossing

In most places the proportion of walking inside the sidewalks has increased, while Ganga Rams is decreasing, but it holds a high percentage at 73%. This can be said to be the impact of pilot projects and traffic safety campaigns.

- The rate of walking inside side walk are increased at most locations, Ganga Ram is decreased but keep high rate with 75 %
- This is the results of impact of pilot project and traffic safety campaign

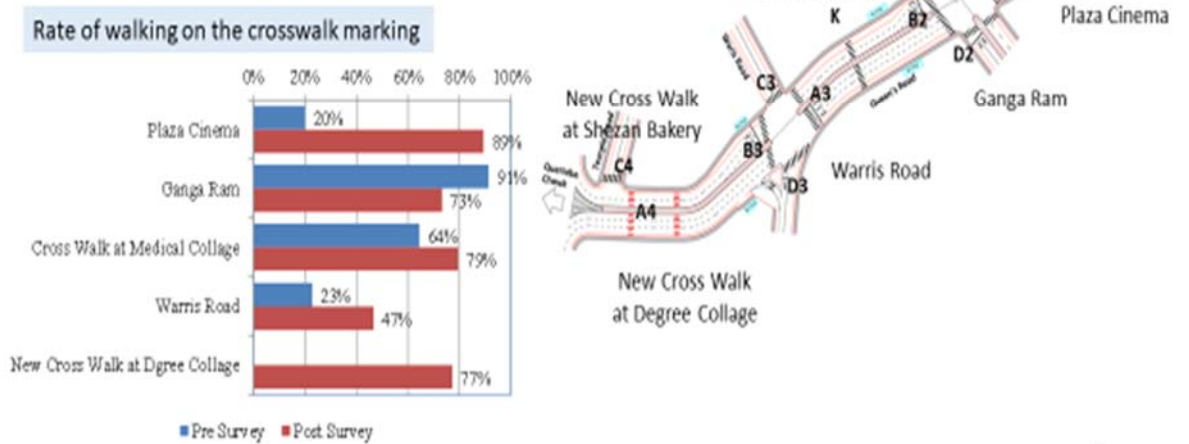


Figure 2.3.5-4 Pedestrian Traffic at Crosswalk

(5) Interview Survey

In the interview survey, road users (pedestrians, residents, cars, motorcycles, users of public transport, 300 people in total) evaluated traffic conditions before and after the pilot project from the following six points of view.

Evaluation contents: "(Question) Please assess the traffic conditions from the following aspects (five steps of evaluation)"

1. Traffic signal, 2. Structure of intersection, signpost, road marking
3. Supply of parking lot 4. Sidewalk environment, 5. Crosswalk, 6. Driver's action

According to the interview survey, the evaluation on the pilot project was traffic signal / road marking, crosswalk and sidewalk. It was greatly accepted by the citizens of Lahore.

- All items are improved.
- High evaluation are traffic signal/road marking with 47points increase, pedestrian crossing with 45 points and sidewalk with 42 points.
- Above-mentioned Points are percentage of good and very good.

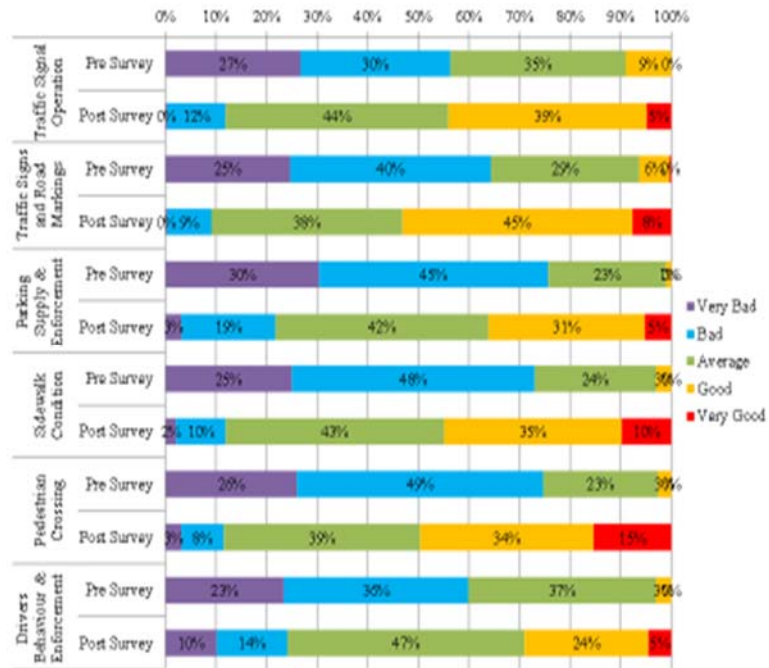


Figure 2.3.5-5 Interview Survey: Overall Assessments for Traffic Situation

2.3.6 Evaluate the Effectiveness of Pilot Project by Using Micro- Simulation "VISSIM" (Activity2-6)

In this simulation case, TEPA/JICA Study Team tried to modify the signal pattern of Ganga Ram and Plaza Cinema.

Impact of the proposed New Traffic Signal Pattern is evaluated using VISSIM Simulation

Vehicle Flows of the two intersections (Capacity of Intersection) increase by about 142 % in average and Average queue length per leg is short to 20 – 33 m (55 %) from 50 m.

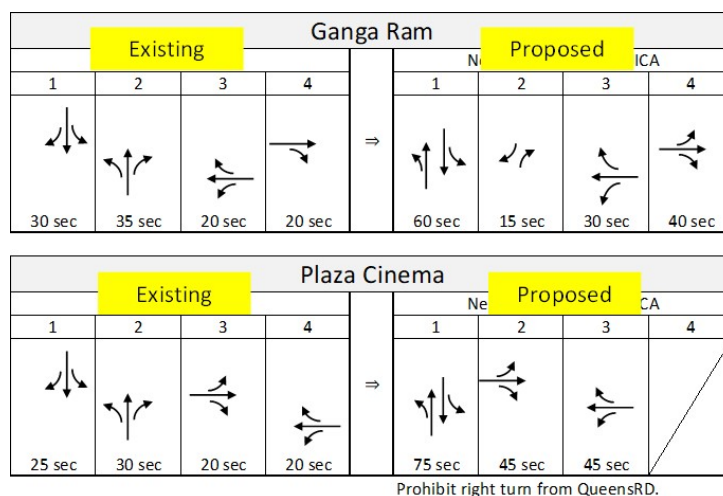


Figure 2.3.6-1 Improvement Signal Pattern Proposed by JICA

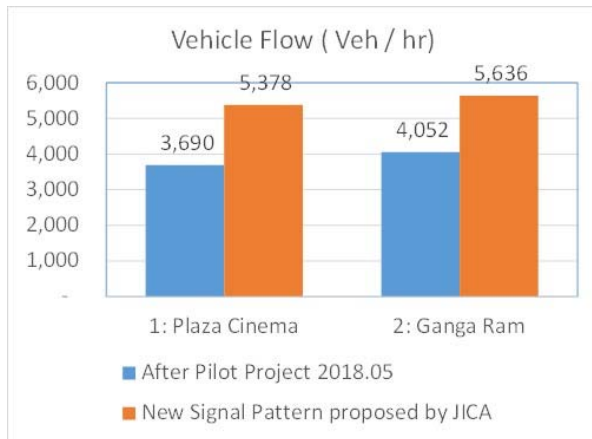
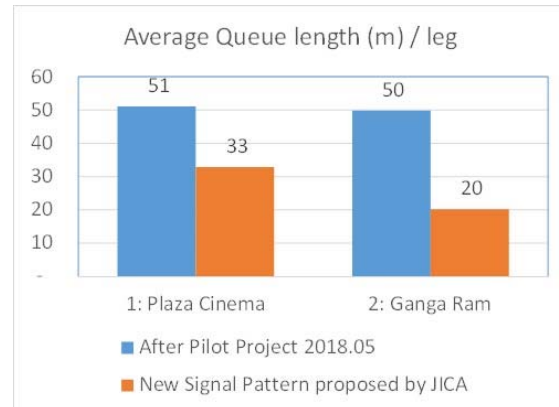


Figure 2.3.6-2 Vehicle Flow



Queue defines as the vehicle speed is below 5 km/h.

Figure 2.3.6-3 Average Queue Length



Figure 2.3.6-4 Simulation Using VISSIM

2.3.7 Investigate the Current State of Organizational Frameworks of TEPA (Activity 2-7)

(1) Approach

In studying the current condition of TEPA as an institution tasked to address the growing transportation problems of Lahore, the approach adopted was by (i) reviewing existing relevant documents such as laws, budgets, etc, and (ii) by interviewing relevant officers of TEPA thru the C/Ps. Likewise, the policy adopted was that the TEPA C/Ps and the JICA Project Team worked as one team to ensure that everybody have the same understanding of the issue at hand before moving to the next. The end goal was to make the C/Ps better engineer that are capable of assessing institutional issues by walking them through the process.

(2) Assessment of TEPA

Together with the C/P, the following topics were studied: (a) Part 1: Legal mandate, Vision, Mission, Functions of TEPA, (b) Part 2: Human Resources of TEPA, (c) Part 3: Planning Tools (Equipment) and other useful equipment of TEPA, (d) Part 4: Budgetary Framework and Project Implementation System of TEPA and (e) Part 5: Organizational cooperation in implementing traffic management plan. In essence, the following were major findings:

- Mandate of TEPA - TEPA has a solid mandate to carry out transportation works from planning stage to operation and maintenance within Metropolitan Area of Lahore through the LDA Act of 1975.
- Review of Transportation Functions and Administration in Lahore - Of the 25 major functions granted to TEPA, only four (4) are regularly undertaken and others are taken over by other government agencies. These four (4) are: (i) construction of pedestrian facilities, (ii) planning and maintenance of traffic signals, (iii) traffic impact assessment, (iv) road development (planning to construction).
- TEPA's Human Resources - Of the 130 staff of the agency, engineers have a share of 26.9% (35 personnel), technicians have a share of 27.7% (36 personnel), and non-technicians have a share of 45.4% (59 personnel).
- TEPA's Budget and Project Identification - The proposal by TEPA to the LDA is composed of projects identified based on "as-needed basis" (ad hoc basis) and mostly road constructions. The lack of transport plan in Lahore is the major reason of the occurrence of the "as-needed basis" concept of picking up projects. There's a need therefore to capacitate TEPA (enhancing capacity of its human resources and equipping them with suitable planning tools) in a way it could prepare a transport plan for Lahore. The plan would be composed of traffic management measures, road development plan, pedestrian plan improvement, parking policy and plan, traffic safety/campaign plan among others. To arrive in that position, a systematized collection of transportation data is in order. Thus, it is proposed that data collection will be part of the "list of activities" submitted yearly by TEPA to the LDA. The aim is to have a regular programme for transportation data collection as part of regular activities of TEPA. See Figure 2.3.7-1 and Figure 2.3.7-2.

(3) Proposed Institutional Improvement Plan

1) Preparation of Annual Development Plan

Based on the institutional analysis undertaken by the C/Ps and JICA Project Team, the first step needed is to address the mismatch between the legal mandate of TEPA and actual work being undertaken. As such, there is a need to expand the function of TEPA to cover most of its legal mandate. As shown in Figure 2.3.7-1, the regular functions of TEPA which involves construction of interchanges, junction improvement, road development and conduct of feasibility study have to be expanded to cover item 5, 6, 7, 8, 9, 10 in the said Figure 2.3.7-2. This means that item 1 to 10 have to be submitted by TEPA to LDA as part of their annual plan. Although not all of the list might be granted by LDA due to budget constrain, it is a good start to assert TEPA's legal mandate.

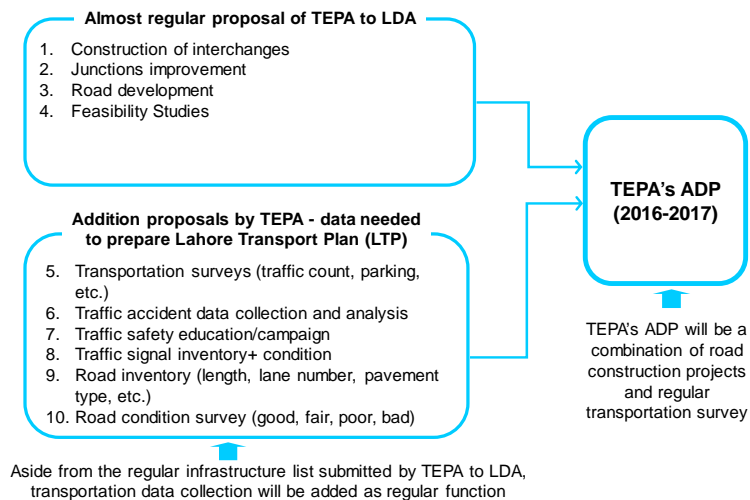


Figure 2.3.7-1 Proposed Preparation of Annual Development Plan (ADP) of TEPA

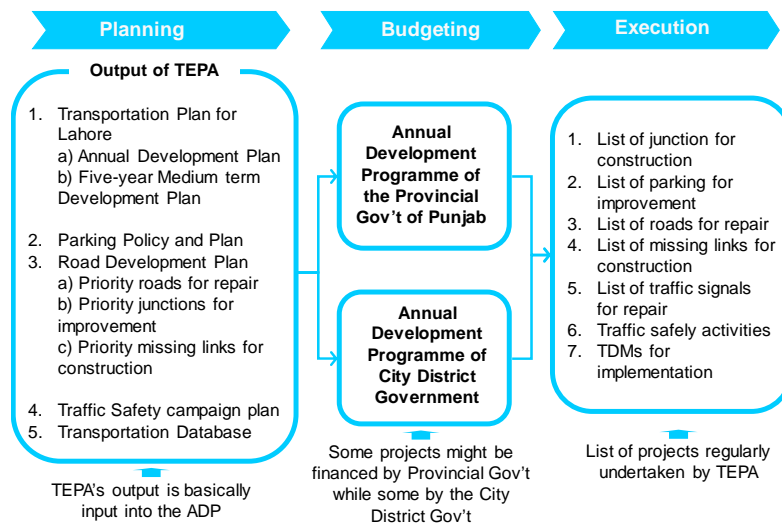


Figure 2.3.7-2 Expected Type of Projects in the ADP of TEPA based on the Proposed ADP

If the proposed ADP is realized, this will allow TEPA to prepare (i) Transport Plan for Lahore, (ii) Parking Policy and Plan, (iii) Road Development Plan, (iv) Traffic Safety Campaign, and (v) build Transportation Database.

2) Challenges in Executing Institutional Improvement Plan including Annual Development Plan

Clarifying the demarcation of tasks among government agencies (to avoid duplication of work hence saving resources), training of TEPA personnel (to make them more effective staff), increasing of budget (to executive large number of projects addressing transportation problems of Lahore), procurement of needed planning tools (to execute tasks efficiently), preparing correct ADP will all contribute to institutional strengthening of TEPA. However, the C/Ps are aware of the difficulties in realizing all of the above and put forward the following opinions:

- On the overlapping of functions among different government agencies (since some agencies took over some functions of TEPA), this needs to be discussed by higher level of each organization such as LDA, TEPA, Punjab Safe City Authority, Lahore Parking Company, City District among others. However, this identification of institutional issue (overlapping of functions) is a good start and should be pursued.
- On the human resources of TEPA and Planning Tools – the C/Ps made the comment that if all the functions of TEPA under its legal mandate will be recovered, there is indeed a need to expand the human resources of TEPA. However, since TEPA is only performing just some of its legal functions, the current size might be just right. Providing training of existing personnel (like this JICA Project) is very important to capacitate the human resources of TEPA.
- On the available planning tools – the C/Ps expressed their frustration for lack of enough tools to execute their mandate. For example, there is not even enough personal computer (only 36 computers are available for the 130 staff) which is a very basic equipment for an employee to perform his/her tasks. Some of the needs equipment/planning tools they mentioned include: computers, GPS, scanners, photocopy machine, softwares (e.g. MS Office suit, virus scanners, HRM software, payroll system, computerized attendance system, accounting softwares, SAP software, traffic simulations) among others.
- On TEPA's budget and Annual Development Plan– since TEPA is generating its own resources to finance its operation which is taken from the payment of tasks given by

the Provincial Government of Punjab and City District Government, it is difficult to increase its budget to cover the “soft component projects”. According to the C/Ps, there is a need for all the agencies involved in managing and developing the transportation of Lahore to meet and discuss how to demarcate tasks and how to systematize project identification which is supposed to be a product of solid data.

2.3.8 Preparation of TEPA Institutional Improvement Plan for Traffic Management (Activity 2-8)

(1) Introduction

As seen in Section 2.3.7, the C/Ps acknowledged that executing an Institutional Improvement Plan in large scale is beyond their mandate since they are just low and mi-level ranking staff of TEPA. For instance, clarifying the demarcation of functions among government agencies has to be addressed through discussion among the heads of agencies. Similarly, strengthening of human resources, procurement of planning tools and increasing budget are decision that have to be made by the head of TEPA. The C/Ps however indicated their willingness to share with other TEPA personnel including to their head what they have learned as institutional issues affecting the efficiency of the organization.

In view of the above, an alternative plan which was to prepare a small-scale Institutional Improvement Plan (i.e. implementable within the level of the C/Ps) based on the Queen’s Road Pilot Project was made. The idea here was to allow the C/Ps execute a project in correct manner (i.e. it involves correct planning, coordination with relevant entities both public and private, effect indicators are assessed) while the JICA Project Team serving as advisor/guardian/monitoring.

(2) Support Programme for Institutional Improvement Plan

The practical plan as shown Figure 2.3.8-1 is prepared which can be a guide of TEPA in strengthening their institution to fulfill successfully their task. This institutional plan can be modified by changing both milestones and indicators.

Support Programme for TEPA Institutional Improvement Plan through the Pilot Project

Milestone	2016					2017												2018					2019			Required Output											
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
Building of TEPA Institutional Improvement Plan for Traffic Management																																					
A Fundamental Tasks																																					
1. TEPA identified fundamental issues of the Pilot Project area	■																																				Fundamental issues identified
2. TEPA prepared overall goal (vision to achieve for) for the Pilot Project			■																																	Establishment of Vision	
3. TEPA prepared objectives for the Pilot Project				■																																Establishment of Objectives	
4. TEPA prepared strategies to achieve Pilot Project objectives					■																															Establishment of Strategies	
5. TEPA clarified division of duties of each agency involved in the Pilot Project Organization							■																													Demarcation of tasks by different agencies is cleared	
6. TEPA allocated appropriate human resources for smooth operation of the Pilot Project Organization												■	■																							Number of people to be involved and their qualification is established	
B Quantifiable Milestone																																					
Monitoring																																					
1. No. of meetings related to traffic management chaired by TEPA													■																							Minutes of meeting	
2. No. of identified issues during project implementation																																				Minutes of meeting	
3. No. of resolved issues during project implementation																																				Minutes of meeting	
4. No. of TEPA staff involved in the project	■																																	Minutes of meeting			
5. No. of public campaign related to traffic management (tv, radio, visit to schools, etc)																																				Minutes of meeting / campaign programs and photos	
6. No. of times cooperation of public/citizen (e.g. cleaning roads with school children)																																				Minutes of meeting	
7. No. of times participation of private sector																																				Minutes of meeting	

Figure 2.3.8-1 Institutional Improvement Plan for TEPA

2.3.9 Monitor the Implementation of the Institutional Improvement (Activity 2-9)

(1) Outline

TEPA's C/P, when carrying out the Pilot Project, clearly worked the fundamental tasks of the organization improvement plan such as problem identification of the pilot project area, goal setting, formulation of the strategy, and assigning the TEPA C/P and staff to each task of the Pilot Project.

The evaluation of this Pilot Project-based organizational improvement plan was made based on how many times C/P chaired the meetings, how many problems/issues were identified, how many engineers other than TEPA's C/P were involved, how many meetings were held with the residents along the corridor, etc. The details are as shown below, and it can be said that the results are satisfactory.

(2) Monitoring Result of the TEPA Institutional Plan

1) Fundamental Tasks

a) TEPA Identified Fundamental Issues of the Pilot Project Area.

- Lack of coordination between infrastructure implementing related agencies
- Lack of knowledge of traffic rules by most of road users especially drivers
- Inconvenience of bus transport system inhibits ridership
- Lack of traffic safety education especially children's, who will be car/motorcycle drivers in the near future

b) TEPA Prepared the Overall Goal (Vision to Achieve) for the Pilot Project

- To build a Safe, Smooth and Smart urban transportation environment along Queens Road by mitigating traffic congestion through implementing the Pilot Project consisting of Corridor Management, Mobility Management and Traffic Safety Campaign

c) TEPA Drew up the Objectives for the Pilot Project

- To educate all road users on the proper use of Queens Road
- To enable safe sidewalk use
- To allow smooth navigation, not too fast and not too slow
- To encourage children, children and aged persons to use public buses
- To vitalize roadside business

d) TEPA Prepared Strategies to Achieve the Pilot Project objectives

- To hold discussions with stakeholders so that they will better understand the Pilot Project; a face-to-face meeting, not phone calls nor email. This is the key to the success of the Pilot Project.
- To develop the appropriate design standard for corridor management
- To develop the appropriate tools for Mobility Management Activities and Traffic Safety Campaign
- To regularly check with the contractor. This is important because the construction scale is not big; therefore, small firms may join the Pilot Project work. Small firms tend to neglect traffic safety because their equipment and financial resources are limited

e) **TEPA Clarified Division of Duties of Each Agency Involved in the Pilot Project Organization**



- The Pilot Project needed collaboration between a large number of agencies (as shown in next slide) for a smooth implementation of the project.
- Therefore, TEPA C/Ps discussed among the members and developed and clarified the division of responsibilities of each agency involved in the Pilot Project Organization.

Table 2.3.9-1 Responsibility Assignment Matrix

Counterpart	Mission	Management of Pilot Project	Meeting/ Seminar Arrangement	Corridor Management	Mobility Management	Traffic Safety Campaign
Waqar		✓	✓			
Abbas			✓	✓		
Zaigham			✓			✓
Usman			✓			✓
Khurram			✓	✓		
Hammad				✓		
Mubeen					✓	
Nauman					✓	
Sajida					✓	
Khaled				✓		

2) **Quantifiable Milestone**

a) **Meetings Related to Traffic Management Chaired by TEPA C/Ps**

 TEPA Traffic Engineering & Transport Planning Agency Government of Punjab	Project for Improvement of Traffic Management Capacity in Lahore	 JICA NIES Research & Planning, INC. CTE Engineering International Co. Ltd. Tokyo, Japan
AGENDA Counterpart Meeting		
Date: 30 May 2016		Time: 1030 Hrs
Agenda		
1.	8 th Weekly Information Update to JICA Project Team	TEPA (Mr. Usman)
2.	Traffic Flow Survey Analysis Intersection #11 and #12	Mr. Syed Zaigham Ms. Sajida
3.	Pilot Project (I)	Mr. Koto
4.	Others	

C/P meeting agenda



Auto Mobile & Electric Shops association



Jinnah Degree college for women

b) Identified Issues during Project Implementation

- Contractor had no protective structure in place for the safety of workers during the construction.
- Contractor started digging in the area of the damaged WASA drainage without any permission.

c) Resolved Issues during Project Implementation

- TEPA C/Ps advise the Contractor to maintain the safety measures such as wearing helmets and wearing safety shoes during the work.
- TEPA and WASA discussed how to safely and smoothly work towards repairing WASA's drainage system along Queens Road.

d) Number of TEPA Staff Involved in the Project

- C/P: 10 engineers
- TEPA Design Department: 2 engineers
- TEPA Administration Department: 2 directors and staff

e) Number of Public Campaigns Related to Traffic Management (TV, Radio, Visit to Schools, etc.)

- TV Broadcasting: Channel City 42, 14 days
- Radio Broadcasting: FM103LHR, 14 days, 9 times a day
- Newspaper Ad: Daily Nawa-E-WAQT and Daily Dawn, Color, half page, 4 days
- Streamer: Install Center Median along Queens Road, Size: 5*2, 36 locations
- Poster: Schools, shops along Queens Road, Size: A1, 500 copies
- Campaign Logo, T-shirts and Caps: distributed to stakeholders, 200 shirts and caps
- Website/SNS: Home page, Facebook, Tweeter, You tube
- Meeting/training at schools for Mobility Management: 9 days

f) Number of Times Effort was Made to Show the Importance of Public/Citizen Cooperation (e.g., Cleaning Roads with School Children)

- Road safety tour: 3 times for 3 schools
- Seminars and trainings: 6 times for 3 schools
- Traffic safety guidance by traffic police officers: 3 time for 3 schools

g) Number of Times Activities Focused on Private Sector Participation

- Meeting with stakeholders: 13 times (3 schools, 1 Electric Shops Association and 1 Car Dealers Association)
- Traffic surveys: 6 times
- Mobility Management surveys: 9 times (pre, during and post survey for 3 schools)
- Pilot Project construction: About 50 times (by type of work)
- Seminars: 4 times

2.3.10 Develop traffic management plan (Activity 2-10)

Refer to 2.4.1.

2.4 Activity for Output 3

2.4.1 Review the Existing “Handbooks” and “Manuals” for Traffic Management (Activity 3-1)

Review of existing “Manuals” and “Handbooks” was conducted in January 2016. Based on this review, revision of existing “Manuals” and “Handbooks” was carried out (Activity 3-2).

2.4.2 Preparation of Handbook that Contains Know-how for Traffic Management Project (Activity 3-2)

(1) Pilot Project Handbook

1) Background, Purpose and Process of Creating Handbook

Traffic congestion in the city center in developing countries like Pakistan is one of the most serious urban issues. Lahore, the capital city of the Pakistani province of Punjab, is facing this problem due to the population concentration and increase of vehicle registration such that urban air pollution, or smog, is observed during winter season. The urban transport problems give rise to issues related not only to the transport sector but also to the environment sector. To cope with these issues in the dense city center, there are many transport countermeasures which can be applied. However, new infrastructure development is very difficult in the dense city center in terms of high-cost, environmental impact, etc. Therefore, this handbook covers the traffic management measures which are simple and low-cost, maximizing the use of the existing facilities.

This handbook is a compilation of the process of the pilot project implementation with main focus on the traffic management scheme. Since this handbook discusses the process of the implementation, the approach is more practical.

TEPA engineers should find this handbook helpful as a reference when implementing the traffic management measures to the other areas in Lahore Central Area. Transport-related agencies such as DCGL, Lahore Transport Company and other cities across Pakistan, particularly in Punjab, should also find this handbook useful.

2) Structure of Handbook

This handbook has consisted of the following three parts:

Part1: Introduction

- Chapter 1 to 3 is the introductory part of the Pilot Project and includes the background, objectives, transport circumstances in Lahore Central Area, and selection of the Pilot Project Area/Corridor.

Part2: Summary

- Chapter 4 to 6 is the main part of the handbook and gives a summary from the planning to implementation of the traffic management measures by Pilot Project menu, namely, Corridor Management, Mobility Management and Traffic Safety Campaign.

Part3: Way Forward

- Chapter 7 provides detailed analysis results of the evaluation of the Pilot Project. And Chapter 8 is Way Forward.

See Book2 Pilot Project Handbook for details.

(2) Intersection Design Manual

This is the Intersection Design Manual. It contains a summary of the design standards used for intersection improvement of the Queens Road corridor management, which is the largest among the LITMC actives carried out by TEPA C/Ps and JICA project team. The manual is based primarily on the design standards of Punjab Province and added Japanese standards as needed in the actual intersection improvement design and construction in the Pilot Project.

The manual clearly describes the series of procedures necessary for intersection improvement using examples and charts.

This manual clearly describes the flow of procedures (1. Survey (traffic volume survey and topography survey) → 2. Plan → 3. Design → 4. Construction (described in the pilot handbook) → 5. verification of the improvement effect using the micro simulation "VISSIM") necessary for improving intersections using examples and charts.

For details of the methods of Intersection design, see attached document Book 1: Intersection design manual.

2.4.3 Distribute “Handbook” and “Manual” to Traffic Management Related Organizations (Activity 3-3)

Three books (Book1: Intersection Design Manual, Book2: Pilot Project Handbook and Book3: Traffic Management Plan.) were created 100 each. It was sent to TEPA. Distributed by TEPA to transportation related organizations.

2.4.4 Hold Workshops/ Seminars to Transfer Engineering Knowhow to Staff of Related Organizations (Activity 3-4)

Refer to 2.1.5.

2.5 Activity for Output 4

2.5.1 Preparation of Traffic Management Plan of Lahore Central Area (Activity 4-1)

Generally, the traffic management implementation plan is designed in the short-term plan (mainly within 5 years) in urban transport planning.

However, this Project’s main theme is the Traffic Management Plan (TMP). Therefore, TMP’s period, area, etc. are subdivided as follows:

- Action Period: Action 1 (within 1 year), Action 2 (3 years) and Action 3 (5 years)
- Target Area by Action: Action 1 (Pilot Project Corridor - Queens Road), Action 2 (Pilot Project Area) and Action 3 (Lahore Central Area).
- Planning Concepts of each Action are as follows:

Action 1: How to sustain implemented measures of Queens Road Corridor
Management

Action 2: How to improve the Pilot Project Area

Action 3: How to ensure safe and smooth traffic of both vehicular and pedestrians in the Lahore Central Area

- Components are classified by 3 types as follows:
 - (1) Traffic Management Plan: Mainly discusses the measures of vehicular traffic
 - (2) Traffic Improvement Plan for Pedestrians: Mainly for pedestrian facilities
 - (3) Traffic Demand Management (TDM) Plan: General discussion of the TDM Plan and proposed measures for Mobility Management (MM)

Table 2.5.1-1 Planning Directions of the Traffic Management Plans

	Action 1 (Within 1 year)	Action 2 (3 years)	Action 3 (5 years)
	Mainly along Pilot Project Corridor	Mainly in Pilot Project Area	Lahore Central Area
	How to Sustain the Pilot Project	How to Improve the Congested Intersections and Pedestrian Facilities	How to Secure the Safe and Smooth Traffic Both Vehicular and Pedestrian
	Traffic Management Plan Improvement measures for the Pilot Project Implementation	• Improvement of Congested Intersections • Improvement of Traffic Signal Phasing	• Improvement of Qaraba Chowk • Coordinated Traffic Signal System along Mall Road
Traffic Improvement Plan for Pedestrian Safety measures for marking sidewalk and pedestrian signal in front of Women's University	Traffic Improvement for Pedestrians in the Pilot Project Area	Proposed Pedestrian Network in the Lahore Central Area	
Traffic Demand Management Plan How to Sustain the Mobility Management (MM) activity at 3 schools	How to Expand the MM Activity to the Whole Pakistan		

Note Including Quantitative Analysis (Traffic Simulation)

Participation in C/P's traffic management plan was to discuss improvement measures after corridor management in the short-term plan, intersection improvement at 6 intersections of the pilot project area in the mid-term plan (CAD drawings and calculation of the saturation factor during the revision of signal phasing). C/P also joined the field survey to develop the Lahore Central Area pedestrian network proposed in the long-term plan, which was also the important for the Punjab government transport policy (public transport oriented urban transport system).

For details of the traffic management plan formulation, see attached document Book 3: Traffic Management Plan.

3 Activity Achievement of Project

3.1 JICA Expert Dispatch Record

Dispatch results of JICA experts are as follows.

Table 3.1-1 JICA Expert Dispatch Record (Assignment in Pakistan)

Plan (PDM Ver.0)		Dispatch period	Actual
<u>MASATO KOTO [METS]</u> Chief consultant / Traffic Management (1)	8.50MM	2016/2/15-2016/3/30 2016/5/14-2016/6/9 2016/7/21-2016/8/19 2016/11/9-2016/11/29 2017/2/6-2017/3/17 2017/5/22-2017/6/5 2017/7/20-2017/8/13 2017/10/25-2017/11/16 2018/1/11-2018/1/28 2018/6/24-2018/6/30 2019/1/21-2019/3/6	9.63MM
<u>RYUICHI UENO [CTII]</u> Deputy chief consultant / Traffic Management (2)	4.00MM	2016/3/14-2016/4/8 2016/7/10-2016/7/19 2016/9/19-2016/10/18 2017/7/3-2017/7/27 2017/10/6-2017/10/20 2018/8/26-2018/9/8	4.00MM
<u>MASAZUMI ONO [METS]</u> Road facilities design	10.00MM	2016/2/25-2016/3/25 2016/5/11-2016/6/10 2016/7/29-2016/9/6 2016/10/17-2016/11/25 2017/4/27-2017/5/26 2017/9/3-2017/9/26 2017/11/27-2017/12/17 2018/3/10-2018/4/28 2018/7/31-2018/9/11	10.00MM
<u>AKIHIRO SAMPEI [METS]</u> Traffic signal design and operation	6.50MM	2016/2/22-2016/3/23 2016/6/6-2016/7/19 2016/8/23-2016/9/30 2016/10/31-2016/11/29 2017/2/27-2017/3/3 2017/12/13-2017/12/31	5.60MM
<u>OSAMU SHIRAI [METS]</u> Pilot project implementation and management	4.00MM	2017/12/27-2018/3/14	2.60MM
<u>YUSUKE TERAOKA [CTII]</u> Traffic survey / analysis(Predecessor)	8.50MM	2016/3/14-2016/4/27 2016/6/15-2016/7/23 2016/9/15-2016/10/11	3.70MM

Plan (PDM Ver.0)		Dispatch period	Actual
<u>TAKAHIRO MIYAZAKI</u> [CTII] Traffic survey / analysis (successor) / project evaluation	3.50MM	2016/7/21-2016/8/19 2017/2/27-2017/3/28 2017/5/22-2017/6/9 2017/7/3-2017/8/13 2017/8/28-2017/9/23 2017/10/25-2017/11/22 2018/1/14-2018/2/22 2018/3/19-2018/4/1 2018/6/24-2018/6/30 2018/8/26-2018/9/11	9.40MM
<u>NASHREEN・G・SHINARIMBO</u> [CTII] Capacity development planning / organization improvement	5.50MM	2016/4/1-2016/5/15 2016/6/15-2016/7/5 2016/11/9-2016/11/29 2017/2/12-2017/3/13 2017/10/16-2017/10/30 2018/5/10-2018/6/8 2018/8/6-2018/9/6 2019/2/3-2019/2/10	6.73MM
<u>CHIKAHIKO MACHIDA</u> [METS] Training plan / Seminar	7.50MM	2016/2/15-2016/3/30 2016/5/11-2016/6/9 2016/9/1-2016/9/30 2017/2/6-2017/3/7 2017/5/7-2017/5/26 2017/7/20-2017/8/13 2018/2/11-2018/3/12	7.17MM
<u>MASAZUMI ONO</u> [METS] Traffic simulation (1)	-MM	2019/1/4-2019/2/6	1.77MM
<u>CHIKAHIKO MACHIDA</u> [METS] Traffic simulation (2)	-MM	2019/1/4-2019/1/31	0.77MM
<u>TAKAHIRO MIYAZAKI</u> [CTII] Traffic simulation (3)	-MM	2019/1/21-2019/3/6	0.47MM
Total	58.00MM		61.84MM

Table 3.1-2 JICA Expert Dispatch Record (Assignment in Japan)

Plan (PDM Ver.0)		Dispatch period	Actual
<u>MASATO KOTO</u> [METS] Chief consultant / Traffic Management (1)	0.30MM	2015/2/11-2015/2/13 2019/1/16-2019/1/18	0.30MM
<u>RYUICHI UENO</u> [CTII] Deputy chief consultant / Traffic Management (2)	0.30MM	2015/2/11-2015/2/13 2019/1/16-2019/1/18	0.30MM
<u>MASAZUMI ONO</u> [METS] Road facilities design	0.15MM	2015/2/11-2015/2/13	0.15MM
<u>AKIHIRO SAMPEI</u> [METS] Traffic signal design and operation	-MM	2019/1/11-2019/1/18	0.30MM
Total	0.75MM		1.05MM
Grand total	58.75MM		62.89MM

3.2 Supplied Equipment in the Pilot Project

Table 3.2-1 Main Supplied Equipment in the Pilot Project

No.	Equipment	Location	Purpose	Remarks
1	Push bottom pelican signal ×1 location	Crosswalk	To improve the safety of crossing pedestrians	Transfer to PSCA
2	Self-luminous signboard×4 plates	Non-signalized crosswalk	To improve the visibility of the signboard at night	Transfer to TEPA
3	Self-luminous road studs for crosswalk×24 pieces	"	To improve the safety of pedestrian at night	"
4	heat-blocking color paint×3 locations (16L×56 cans)	Visual separation sidewalk	To give road users recognize that paint area is sidewalk	"
5	Self-luminous road studs for crosswalk×80 pieces	"	To improve the visibility of the signboard at night time	"
6	Bus shelter×3 locations (Two bus stops renovated existing bus shelters)	Bus stop	To improve the satisfaction of the comfort of the bus user	Transfer to LTC
7	Road post×12 poles	Terrace type bus stop	To prevent collision of the vehicle to the terrace type bus stop	Transfer to TEPA
8	Self-luminous road studs for Center median×4 pieces	Center median	For alerting attention to right turn or distracted driving vehicles	"
9	Road sticker×28 sheets	-Visual separation sidewalk -Crosswalk - Bus stop etc.	To give road users recognize facilities (pedestrian crossing and visual separation sidewalk)	"
10	Road / Traffic signboard×51poles (No parking, Parking, Crosswalk etc.)	Shoulder or Sidewalk	To give road users recognize traffic rules and facilities such as crosswalk, parking etc.	Transfer to LePark (Parking Signboard) Transfer to TEPA (Except the above signboard)

4 Change History of PDM

4.1 Change History of PDM

The change history of PDM shall be described below.

Table 4.1-1 Change History of PDM

Version	Date	Revision detail
Version 0		Original (Described in R/D)
Version 1	2016 / 3	<p>[Added of Output and Activity] The contents of activity and output were added based on the special specification.</p> <p><u>Output</u> 4. Traffic Management Improvement Plan in Lahore is developed.</p> <p><u>Activity</u> 1-4 To conduct post-evaluation test on trainees after training course and recommend future Capacity Development. 3-3 To make manual for Intersection geometric design. 3-4 To make "handbook" for pedestrian safety facilities. 4-1 To develop the traffic management plan in the Lahore central area. 4-2 To develop the pedestrian traffic improvement plan 4-3 To develop the traffic demand management plan.</p>
Version 2	2016 / 9	<p>[Added of activities] The contents of activity were added as a result of discussion with C/P organization. Activity number was changed in chronological order.</p> <p><u>Activity</u> 1-6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations. 2-6 To evaluate the effectiveness of Pilot Project(s) using micro-simulation "VISSIM" 2-7 To investigate the current state of organizational frameworks of TEPA. (legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)" 3-1 To review the existing "handbooks" and "manuals" for traffic management. 3-4 To distribute "handbook" and "manual" to traffic management to related organizations.</p> <p>[Modified of activities] The contents of activity were modified as a result of discussion with C/P organization. The activities were subdivided as necessary and activity number was changed in chronological order.</p> <p><u>Activity</u> (Before) 1-1 To assess capacity of trainees to participate in the course of traffic management. (After) 1-1 To conduct pre-evaluation on trainees who will participate in the traffic management training.</p>

Version	Date	Revision detail
		<p>(Before) 1-2 To develop training plan and materials.</p> <p>(After) 1-2 To develop training plan. 1-3 To develop training materials.</p> <p>(Before) 2-2 To analyze traffic data, identify traffic management issues and develop traffic management plan, which includes countermeasures.</p> <p>(After) 2-2 To identify traffic management issues. 2-3 To plan Pilot Project(s). 2-10 To develop traffic management plan including countermeasures.</p> <p>(Before) 2-5 To conduct traffic surveys to evaluate effectiveness of the countermeasures.</p> <p>(After) 2-5 To conduct traffic surveys to effectiveness of the pilot project (s).</p> <p>(Before) 2-6 To support TEPA to prepare its institutional improvement plan for traffic management and to monitor its implementation</p> <p>(After) 2-8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA. 2-9 To monitor the implementation of the institutional improvement plan.</p> <p>[Combined of Activities (Output-3)] Three activities of Output 3 were combined into one. <u>Activity</u> (Before) 3-1 To make and disseminate “handbook” that contains process of data collection, analysis, development of countermeasures and implementation of traffic management. 3-3 To make manual for Intersection geometric design. 3-4 To make "handbook" for pedestrian safety facilities. (After) 3-2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Project(s). (data collection, analysis, development and implementation of countermeasure, geometric design of the intersection and pedestrian facilities)</p> <p>[Combined of Activities (Output-4)] Three activities of Output 4 were combined into one. <u>Activity</u> (Before) 4-1 To develop the traffic management plan in the Lahore central area. 4-2 To develop the pedestrian traffic improvement plan 4-3 To develop the traffic demand management plan. (After) 4-1 To develop the traffic management plan in the Lahore Central Area (Including Traffic Improvement Plan for Pedestrian, Traffic Demand Management Plan).</p> <p>[Reason] Since the three items are related to each other, it is better to consider better planning by thinking together than activities separately.</p>

Version	Date	Revision detail
		<p>[Placement of experts] Takahiro Miyazaki was placed as a project evaluation expert.</p>
Version 3	2017 / 3	<p>[Placement of experts] Osamu Shirai was placed as a Pilot Project Implementation and Management expert.</p> <p>[Modified of assigned area (1)] The responsibility of Dr. Sinarimbo has been expanded as follows: SINARIMBO : (O) Capacity Development Planning, Organization Improvement (N) Capacity Development Planning, Organization Improvement / Pilot Project Implementation and Management (2)</p> <p>[Reason] Because added a mobility management campaign as one of the pilot project items.</p> <p>[Modified of assigned area (2)] The responsibility of Mr. Miyazaki has been expanded as follows: MIYAZAKI : (O) Project Evaluation (N) Project Evaluation, Traffic Survey Analysis (2)</p> <p>[Reason] Mr. Miyazaki took over his work (traffic survey and analysis) because of Mr. Teraoka's retirement.</p>
Version 4	2018 / 9	<p>[Modified of assigned area] The responsibility of Mr. Ono, Mr. Machida and Mr. Miyazaki have been expanded as follows: ONO : (O) Road Facility Design (N) Road Facility Design, Traffic Simulation (1) MACHIDA : (O) Training Plan / Seminar (N) Training Plan / Seminar, Traffic Simulation (2) MIYAZAKI : (O) Project Evaluation, Traffic Survey Analysis (2) (N) Project Evaluation, Traffic Survey Analysis (2), Traffic Simulation (3)</p> <p>[Reason] To support implementation of Action 2-6 added in Version 2.</p>

4.2 PDM

PDM for each version is as shown below.

(1) Version 0 (PDM described in R/D)

Overall Goal		Traffic management in Lahore will be planned and implemented in an appropriate, reasonable and scientific manner.
Project purpose		1) TEPA will be able to formulate and implement countermeasures for traffic management. 2) Knowledge of related organizations on traffic management will be enhanced.
Outputs		1. Capacity Development for traffic management of TEPA and related organizations is conducted through training. 2. Institutional and personal capacity for traffic management of TEPA is enhanced mainly through implementation of Pilot Project(s). 3. Pilot Project(s) are summarized into “handbook” to be shared among TEPA and related organizations as reference for other areas’ improvement.
Outline of Activities	Activity 1	1-1 To assess capacity of trainees to participate in the course of traffic management. 1-2 To develop training plan and materials. 1-3 To conduct training courses. 1-4 To evaluate achievement of trainees and recommend future Capacity Development.
	Activity 2	2-1 To conduct traffic condition surveys in Lahore central area. 2-2 To analyze traffic data, identify traffic management issues and develop traffic management plan, which includes countermeasures. 2-3 To select Pilot Project(s) as a social experiment. 2-4 To plan and implement Pilot Project(s). 2-5 To conduct traffic surveys to evaluate effectiveness of the countermeasures. 2-6 To support TEPA to prepare its institutional improvement plan for traffic management and to monitor its implementation
	Activity 3	3-1 To make and disseminate “handbook” that contains process of data collection, analysis, development of countermeasures and implementation of traffic management. 3-2 To conduct workshops / seminars to transfer knowledge to staff of related organizations.

(2) Version 1 (Revised at the 1st JCC meeting)

Overall Goal	Traffic management in Lahore will be planned and implemented in an appropriate, reasonable and scientific manner.	
Project purpose	1) TEPA will be able to formulate and implement countermeasures for traffic management. 2) Knowledge of related organizations on traffic management will be enhanced.	
Outputs	1. Capacity Development for traffic management of TEPA and related organizations is conducted through training. 2. Institutional and personal capacity for traffic management of TEPA is enhanced mainly through implementation of Pilot Project(s). 3. Pilot Project(s) are summarized into “handbook” to be shared among TEPA and related organizations as reference for other areas’ improvement. 4. Traffic Management Improvement Plan in Lahore is developed.	
Outline of Activities	Activity 1	1-1 To assess capacity of trainees to participate in the course of traffic management. 1-2 To develop training plan and materials. 1-3 To conduct training courses. 1-4 To conduct post-evaluation test on trainees after training course and recommend future Capacity Development.
	Activity 2	2-1 To conduct traffic condition surveys in Lahore central area. 2-2 To analyze traffic data, identify traffic management issues and develop traffic management plan, which includes countermeasures. 2-3 To select Pilot Project(s) as a social experiment. 2-4 To implement Pilot Project(s). 2-5 To conduct traffic surveys to evaluate effectiveness of the countermeasures. 2-6 To support TEPA to prepare its institutional improvement plan for traffic management and to monitor its implementation
	Activity 3	3-1 To make and disseminate “handbook” that contains process of data collection, analysis, development of countermeasures and implementation of traffic management. 3-2 To conduct workshops / seminars to transfer engineering knowhow to staff of related organizations. 3-3 To make manual for Intersection geometric design. 3-4 To make "handbook" for pedestrian safety facilities.
	Activity 4	4-1 To develop the traffic management plan in the Lahore central area. 4-2 To develop the pedestrian traffic improvement plan 4-3 To develop the traffic demand management plan.

[Legend]

Red letter: Addition of activities based on the special specification

(3) Version Version 2 (Revised at the 2nd JCC meeting)

Overall Goal	Traffic management in Lahore will be planned and implemented in an appropriate, reasonable and scientific manner.	
Project purpose	1) TEPA will be able to formulate and implement countermeasures for traffic management. 2) Knowledge of related organizations on traffic management will be enhanced.	
Outputs	1. Capacity Development for traffic management of TEPA and related organizations is conducted through training. 2. Institutional and personal capacity for traffic management of TEPA is enhanced mainly through implementation of Pilot Project(s). 3. Pilot Project(s) are summarized into "handbook" to be shared among TEPA and related organizations as reference for other areas' improvement. 4. Traffic Management Improvement Plan in Lahore is developed.	
Outline of Activities	Activity 1	1-1 To conduct pre-evaluation on trainees who will participate in the traffic management training. 1-2 To develop training plan. 1-3 To develop training materials. 1-4 To conduct training courses. 1-5 To conduct post-evaluation test on trainees after training course 1-6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations.
	Activity 2	2-1 To conduct traffic condition surveys in Lahore central area. 2-2 To identify traffic management issues. 2-3 To plan Pilot Project(s). 2-4 To implement Pilot Project(s). 2-5 To conduct traffic surveys to effectiveness of pilot project (s). 2-6 To evaluate the effectiveness of Pilot Project(s) using micro-simulation "VISSIM" 2-7 To investigate the current state of organizational frameworks of TEPA. (legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)" 2-8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA. 2-9 To monitor the implementation of the institutional improvement plan. 2-10 To develop traffic management plan including countermeasures.
	Activity 3	3-1 To review the existing "handbooks" and "manuals" for traffic management. 3-2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Project(s). (data collection, analysis, development and implementation of countermeasure, geometric design of the intersection and pedestrian facilities) 3-3 To hold workshops / seminars to transfer engineering knowhow to staff of related organizations. 3-4 To distribute "handbook" and "manual" to traffic management to related organizations.
	Activity 4	4-1 To develop the traffic management plan in the Lahore Central Area (Including Traffic Improvement Plan for Pedestrian and Traffic Demand Management Plan)

[Legend]

Red letter: Added of activities as a result of discussion with C/P organization.

Blue letter: modified of activities as a result of discussion with C/P organization.

5 Working Group and Joint Coordinating Committee

5.1 Structure of WG and JCC

The structure of WG and JCC is shown in Figure 5.1.1.1. JCC Chairs P & D Secretary, WG Chairs TEPA Chief Engineer, it is the composition of the following related organizations.

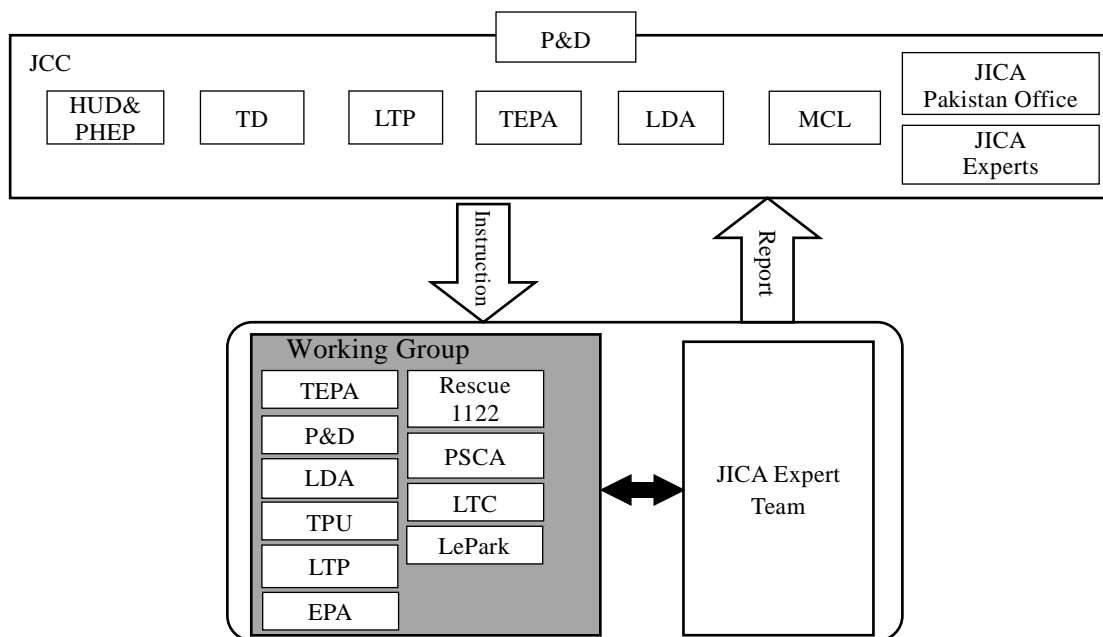


Figure 5.1.1-1 Structure of WG and JCC

5.1.1 Joint Coordinating Committee (JCC)

The JCC was established to approve the implementation plan, check the overall progress, and exchange views on issues encountered during the project implementation. The members of JCC are shown below.

Table 5.1.2-1 Member of JCC

	Designation	Position & Department
1	Chair person	Secretary, Planning and Development Department (P&D)
2	Member from Pakistan Side	Member, Planning and Development Department (P&D)
3	Member from Pakistan Side	Secretary, Housing, Urban Development and Public Health Engineering Department (HUD&PHED)
4	Member from Pakistan Side	Secretary, Transport Department (TD)
5	Member from Pakistan Side	Chief, Lahore Traffic Police (LTP)
6	Member from Pakistan Side	Chief Engineer, Transport Engineering and Planning Agency (TEPA)
7	Member from Pakistan Side	Director General, Lahore Development Authority (LDA)
8	Member from Pakistan Side	Mayer, Metropolitan corporation Lahore (MCL)
9	Member from Japanese Side	Representative of JICA Pakistan Office
10	Member from Japanese Side	Japanese experts

11	Member from Japanese Side	Personnel concerned to be decided by the Japanese side
12	Others	Persons who are invited by the Chairperson may attend the JCC meeting.

5.1.2 Working Group (WG)

The WG is a working group to formulate implementation plans and implement project activities. The WG members are shown below.

Table 5.1.3-1 Member of Working Group

	Designation	Position & Department
1	Chair person	MD/Chief Engineer, Traffic Engineering & Transport Planning Agency (TEPA)
2	Member	Designated Team Leader, Traffic Engineering & Transport Planning Agency (TEPA)
3	Member	Representative of Planning and Development Department (P&D)
4	Member	Chief Metropolitan Planner, Lahore Development Authority (LDA)
5	Member	Project Director, Transport Planning Unit (TPU)
6	Member	SP, Lahore Traffic Police (LTP)
7	Member	DG-Environmental Protection Agency (EPA)
8	Member	Representative of Rescue 1122
9	Member	Representative of Punjab safe cities Authority (PSCA)
10	Member	Representative of Lahore Transport Company (LTC)
11	Member	Representative of Lahore Parking Company (LePark)
12	Others	Persons who are invited by the Chairperson may attend the WG meeting.

5.2 Outline of WG and JCC

The outline of the working group and Joint Coordinating Committee is as follows. For details, see attached document.

Table 5.2-1 Outline of Joint Coordinating Committee (JCC)

	Date	Attendees	Agenda	Summary of consultation
1 st JCC	24-Mar-2016	16	<ol style="list-style-type: none"> 1. Description of the Inception Report [Report] 2. Discussion on Inception Report [Approve] 	1) Discuss the Inception Report and unanimously approve
2 nd JCC	18-Aug-2016	21	<ol style="list-style-type: none"> 1. Traffic surveys/ identified Issues [Approve] 2. Pilot project area selection, Candidate Menu of the pilot project [Approve] 	<ol style="list-style-type: none"> 1) Approve pilot project work plan 2) Unanimously approving the pilot project area selection and measures menu 3) It is agreed that JICA experts /Lahore City /Lahore Traffic Police will work in close collaboration to solve major traffic management problems.

	Date	Attendees	Agenda	Summary of consultation
3 rd JCC	16-Mar-2017	20	<ol style="list-style-type: none"> 1. Selected Pilot Project Corridor (Queens Road) [Approve] 2. Current Situation along the Pilot Project Corridor including the PSCA Project [Discussions] 3. Concept of the Pilot Project for Queens Road [Discussions] 4. Implementing Menus of the Pilot Project [Approve] 5. Schedule of the Pilot Project Implementation [Approve] 	<ol style="list-style-type: none"> 1) Unanimously approved the pilot project to improve traffic management skills in Queens Road 2) Punjab Provincial Government requests the development of pilot projects to other roads / intersections / areas in Lahore in the future
4 th JCC	25-Jan-2018	18	<ol style="list-style-type: none"> 1. Implementation Plan of the Pilot Project (Intersection and Traffic signal improvement, On-street parking measures and Pedestrian facility improvement) [Approve] 2. Progress of pilot project construction [Report] 3. Result of Pre-Traffic Survey [Report] 4. Outline of Traffic Safety Campaign [Approve] 5. Result of Pre-Mobility Management Survey [Report] 6. Schedule of the Pilot Project [Approve] 	<ol style="list-style-type: none"> 1) General agreement on pilot project implementation plan (details) with the start of traffic safety campaign. 2) The following four items were pointed out when finalizing the plan. 3) Signal indication adjustment for VVIP 4) Integrate two pedestrian crossings in front of nearby Ganga Ram Hospital and in front of Women Medical College. 5) Install a barrier in the median as a deterrent to pedestrians crossing 6) Implementation of on-street parking measures based on consultation between relevant organizations, especially MCL and LPC
5 th & 6 th JCC	26-Feb-2019	16	<ol style="list-style-type: none"> 1. Corridor Management [Report] 2. Mobility Management & Traffic Safety Campaign [Report] 3. Traffic Simulation using VISSM [Report] 4. Pilot Project Handbook, Intersection Design Manual and Traffic Management Plan [Approve] 5. Way Forward [Discussions] 	<ol style="list-style-type: none"> 1) Project completion report 2) Approve the contents of handbook, manual and traffic management plan 3) Recommend establishment of coordination meeting among government agencies 4) Express the importance of sustainability of this project

Table5.2-2 Outline of Working Group (WG)

	Date	Attendees	Agenda	Summary of consultation
1 st WG	02-Aug-2016	18	<ol style="list-style-type: none"> 1. Objective & approach to the pilot project [Discussions] 2. Traffic surveys/ identified Issues [Discussions] 3. Pilot project area selection, Candidate Menu of the pilot project [Discussions] 	<ol style="list-style-type: none"> 1) Discuss and agree on the pilot project work plan (draft) submitted by TEPA / JICA experts 2) Discuss the selection of pilot project area and measures (draft) and agree on the pilot project area and measures (draft)
2 nd WG	28-Feb-2017	16	<ol style="list-style-type: none"> 1. Selected Pilot Project Corridor (Queens Road) [Discussions] 2. Current Situation along the Pilot Project Corridor including the PSCA Project [Discussions] 3. Concept of the Pilot Project for Queens Road [Discussions] 4. Implementing Menus of the Pilot Project [Discussions] 5. Schedule of the Pilot Project Implementation [Discussions] 	<ol style="list-style-type: none"> 1) Agree to conduct Corridor Management in the pilot project at Queens Road 2) Implementation menu based on the current situation including the PSCA project Agree on Corridor Management, Mobility Management, and Traffic Safety Campaign
3 rd WG	08-Aug-2017	22	<ol style="list-style-type: none"> 1. Implementation Plan of the Pilot Project (Intersection and Traffic signal improvement, On-street parking measures and Pedestrian facility improvement) [Discussions] 2. Scope of Mobility Management [Discussions] 3. Scope of Traffic Safety Campaign [Discussions] 4. Schedule of the Pilot Project Implementation [Discussions] 	<ol style="list-style-type: none"> 1) Discuss the pilot project implementation plan (details) and agree on the countermeasure menu of corridor management 2) Agreement on mobility management survey content, content of traffic safety campaign, tools and schedule
4 th WG	19-Jan-2018	17	<ol style="list-style-type: none"> 1. Implementation plan of the pilot project [Discussions] 2. Progress of Pilot Project [Report] 3. Pre-Traffic Survey Results [Report] 4. Traffic safety campaign summary [report] 5. Pre-Mobility Management Survey Results [Report] 	<ol style="list-style-type: none"> 1) Progress report of the pilot project 2) Report of preliminary survey results 3) Sharing the contents of coordination with related organizations

	Date	Attendees	Agenda	Summary of consultation
5 th WG	28-Aug-2018	26	<ol style="list-style-type: none"> 1. Outline of Project [Report] 2. Project Schedule [Discussions] 3. Objective of Pilot Project [Report] 4. Corridor Management [Report] 5. Evaluation of Pilot Project (Pre and Post Traffic Survey Result) [Report] 6. Traffic Safety Campaign [Report] 7. Mobility Management [Report] 8. Lesson from Pilot Project [Report] 9. Forward to next JCC. [Discussions] 	<p>1) As a result of the pilot project implementation, evaluations and lessons were shared. The decrease in on-street parking and the pedestrian use rate for pedestrians improved. Pelican signals and visual sidewalk separation were not recognized and not used properly</p>
6 th WG	07-Feb-2019	20	<ol style="list-style-type: none"> 1. Evaluation of the TEPA's Capacity Development [Report] 2. Mobility Management [Report] 3. Traffic Simulation using VISSM [Report] 4. Pilot Project Handbook [Discussions] 5. Brief of the Intersection Design Manual and Traffic Management Plan [Discussions] 6. Way Forward [Discussions] 	<ol style="list-style-type: none"> 1) Share that TEPA's ability has improved 2) Report that mobility management and simulation study were effective 3) Discuss the contents of the handbook, manual, traffic management plan and agree on the contents of the proposal



Figure 5.2-1 Photo of Working Group (6th WG meeting)

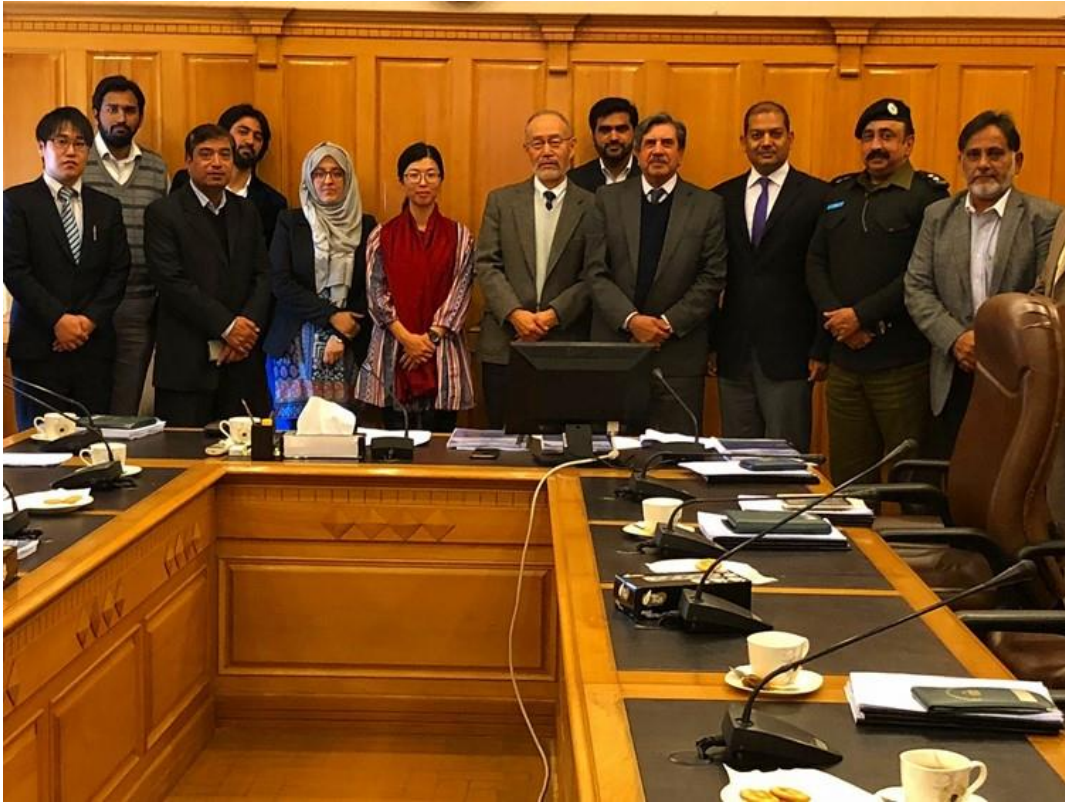


Figure 5.2-2 Photo of Joint Coordinating Committee (5th & 6th JCC meeting)

6 Issues, Ingenuities, Lessons Learned in the Project Implementation

6.1 Current Conditions and Problems of the Counterpart Agency

The counterpart agency of this project is the Traffic Engineering and Planning Agency (TEPA), which is one of the agencies under Lahore Development Authority (LDA) LDA in turn in under the umbrella of Department of the Housing, Urban Development and Public Health Administration (HUD & PHED), which is one of the departments of the government of Punjab Province. LDA is responsible for urban development, building standards and development of poor areas in Lahore City. TEPA is engaged mainly in traffic management, transportation design, construction (mainly electric and machine related), traffic safety facilities and parking planning in Lahore.

TEPA has a staff of 130: 71 (55%) are technical staff and 59 (45%) are administrative staff and those involved in field work (many are non-technical staff). Despite TEPA's diverse responsibilities, there is not enough budget allocated by the Punjab government; and the work environment, such as the necessary number of personal computers, is also an issue. The Pakistan government's non-official staff rate is very high because financial constraints. Thus 7 out of 10 Counterpart members of the project were non-official employees as well; they were also relatively young. Since Pakistani regulations do not allow non-regular staff to receive overseas training, the Japanese training planned in this project could not be implemented. Also, it can be said due to organizational constraints in Punjab province (relatively low among the organization hierarchy of Punjab), the coordination capability with related departments was low until the project started.

As the focus of this project, the traffic management measures required high-level coordination of the wide range of related agencies in order to obtain an understanding and agreement on what is being proposed and implemented.

6.2 Current Conditions and Issues of the Traffic Management Related Agencies

The following are the related agencies of Punjab Province and Lahore City, which are directly and indirectly related to this project. Among these; (1) to (3) are agencies that did not participate directly in the Pilot Project although they gave great impact to the whole project; (4) to (10) are agencies that are directly related to the traffic management measures mainly the hardware measures; and (11) to (13) are agencies directly related to software measures such as Mobility Management and traffic safety campaign. With the exception of (6) and (7) (semi-public, same as the public corporation in Japan) all are Punjab or Lahore government agencies.

- (1) The Planning and Development Department (P&D) is the organization responsible for the planning function of the Punjab State, coordinating and monitoring the development program prepared by the other agencies concerned in the development of Punjab Province, analyzing the state's economic statistics and developing medium and long-term plans. P&D is the most powerful department in the Punjab Province. TEPA was the counterpart agency of this project; but the project was executed and completed while coordinating with many relevant agencies and the efforts of each department concerned. The fact that the Project's JCC chairman was the P&D Director also greatly affected the project.
- (2) LDA is the upper agency of TEPA, and not only TEPA's traffic management measures but also many plan/design instructions are issued from LDA. Its direct involvement in the project was small, although the C/P project manager of this project concurrently served as Chief Engineer of LDA and TEPA.
- (3) Transport Planning Unit (TPU) is an agency under the Transport Department (TD) which was established through the 2012 Urban Transportation Master Plan by JICA and is mainly responsible for Lahore's transportation plan. At the start of this project, it was greatly expected to lead the urban transport planning. However, TPU's consciousness of participation in this project was low because this is a relatively small-scale project included in short-term measures in traffic management.
- (4) Metropolitan Cooperation Lahore (MCL) is the Lahore City government and it is responsible for the implementation and maintenance of roads in Lahore City. In this project, MCL's governor approved the management and maintenance of Queens Road after the pilot project, and the operation and the maintenance plan and implementation of the on-street parking facility by LePark. In addition, MCL is a supervisory agency of LePark and LTC of the semi-public with high publicity. Thus, MCL will make up for the deficit of these companies.
- (5) Parks and Horticulture Authority (PHA) is the Urban Beautification Agency of Punjab Province. In this project, it produced one of the traffic safety campaign tools, street banner which have a relatively good image of the campaign to the road users.
- (6) Lahore Parking Company (LePark) is mainly responsible for maintenance, operation and management of on-street parking facilities. The pilot project cooperated with the planning and

installation of the on-road parking facilities. After the completion of the pilot project, the handover of the on-street parking facilities was carried out, and the operation and maintenance of the on-street parking facilities was to be continued even after the completion of the project.

- (7) Lahore Transport Company (LTC) is a Lahore Bus Company; it is responsible for the operation and maintenance of public bus transportation in the city. In this project, the TEPA/JICA Project Team cooperated in actually improving the bus stops along Queens Road. After the completion of the pilot project, handover of the bus stops to LTC was carried out and maintenance and management to be continued even after the project. According to the CEO of LTC, the current bus route system was based on the analysis of the public transport survey conducted by University of Engineering & Technology Lahore (UET) in 2006. But the data is old and the current coverage of the bus route network is no longer able to cope with the demand.
- (8) Punjab Safe Cities Authority (PSCA) has taken over the responsibility for the traffic signal installation and maintenance from TEPA. In this project, discussions were made on measures to improve signalized intersections. In addition, after the completion of the pilot project, Pelican signal was handover to PSCA for their continued maintenance even after the project. Initially, the traffic signals in the city were said to be centrally controlled by the PSCA traffic control center, but this has not been realized as of February 2019.
- (9) Water and Sanitation Agency (WASA) is a sewerage treatment agency under LDA and shares with other agencies the under road space of Lahore City. There is a frequent problem of leaving a road unrepaired after it has been dug up because of the lack of coordination among agencies sharing the same space. A similar problem also occurred at the initial stage of construction of this project.
- (10) Environment Protection Agency (EPA) of Punjab Province checked whether this pilot project conflicts with environmental regulations in Punjab. It confirmed that the project is an activity within the present road right-of-way and there is no problem.
- (11) Rescue 1122 is an emergency medical team in Punjab Province; it also conducts aggregate analyses of traffic accident data. Rescue 1122 data was based on the traffic safety campaign plan of the Pilot Project
- (12) In this project, Lahore Traffic Police (LTP) gave a lecture on traffic control and guidance to

drivers through Mobility Management activities and road safety seminars on traffic safety campaigns. From the interview with the Lahore traffic police chief, it was gathered that the number of traffic police officers is insufficient at the city scale and that enforcement can not be carried out sufficiently.

- (13) Education Department (ED) is the Education Department of Punjab Province is the supervisory authority of 3 Mobility Management implementation schools. The project was granted permission to implement the Mobility Management activities with adjustment being made.

6.3 Issues, Ingenuities, Lessons Learned in the Project Implementation

The ingenuities implemented to overcome the “issues of project implementation” described in 6.1 to 6.2 and their effects on the five (5) project evaluation items are shown in Table 6.3-1.

Table 6.3-1 Issues, Ingenuities, Lessons Learned in the Project Implementation

Project Issues	Ingenuities	Project Evaluation of 5 Evaluation Criteria					Output/Lessons Learned
		Relevance	Effective-ness	Efficiency	Impact	Sustain-ability	
<ul style="list-style-type: none"> ● Young and inexperienced TEPA C/P 	<ul style="list-style-type: none"> ○ Conducted many C/P meetings (125 times), seminars (4 times) and traffic simulation to increase the traffic management capability 		✓	✓			<ul style="list-style-type: none"> ○ Increase of the traffic management capacity of TEPA C/Ps ○ Traffic management planning/implementation is possible by C/Ps themselves.
<ul style="list-style-type: none"> ● Low-level position of TEPA in the Punjab government 	<ul style="list-style-type: none"> ○ In addition to the WG and JCC meetings, the C/P led many meetings with high ranking officers as well as those in charge of related organizations. 					✓	<ul style="list-style-type: none"> ○ Increase of coordination capacity of TEPA C/P ○ Contributing to the recognition of the importance of traffic management measures to the high ranking officers of the related organizations ○ Contributing to sustainability of Pilot Project Implementation ○ Improving traffic management capacity of young engineers in related organizations as well as TEPA ○ Transfer of various hard facilities implemented in the p pilot project to Lahore will be realized
<ul style="list-style-type: none"> ● Many related agencies and lack of coordination between them 						✓	
<ul style="list-style-type: none"> ● Decision of adopting/ implementing traffic management measures by top down approach 					✓		
<ul style="list-style-type: none"> ● Lack of awareness of the importance of traffic management measures on the Pakistani side 		✓					

<ul style="list-style-type: none"> ● Limited time and budget of the Pilot Project ● Public transport system in Lahore is not well developed 	<ul style="list-style-type: none"> ○ Due to limited budget and not well developed public transport, Mobility Management is selected from among TDMs as soft measure for Pilot Project 				✓		<ul style="list-style-type: none"> ○ While teachers are given an opportunity to think about the urban environment among students, they come to recognize that MM is a measure that greatly affects urban traffic within a limited budget and time
<ul style="list-style-type: none"> ● There are few menus of traffic management measures on Pakistan side 	<ul style="list-style-type: none"> ○ Japanese equipment was introduced and implemented as a new measure such as pelican signal in the pilot project menu 				✓		<ul style="list-style-type: none"> ○ Although many measures were effective, some measures, such as pelican signals, left some lessons that more information on proper use is necessary
<ul style="list-style-type: none"> ● Little importance attached to of maintenance of infrastructure measures 	<ul style="list-style-type: none"> ○ In addition to the pilot project construction, after the evaluation of pre and post survey, the C/Ps and JICA experts proposed some improvement plans and implemented some improvement measures 					✓	<ul style="list-style-type: none"> ○ The transfer of various hard facilities implemented in the Pilot Project to Lahore City was realized, and an environment that attaches importance on maintenance and management could be implemented.

6.4 Project Evaluation of 5 Evaluation Criteria

6.4.1 Relevance

(1) Consistency with Pakistan's National Development Policy

"Modernizing Transportation Infrastructure and Greater Regional Connectivity" is the seventh major development field of Vision 2025 (August 2014), Pakistan's long-term national development policy.

According to Vision 2025, development of modern transportation infrastructure plays a pivotal role in economic development and attracting investments. Pakistan Vision 2025 seeks to establish an efficient and integrated transportation system that will facilitate the development of a competitive economy. Key related targets are to ensure reduction in transportation costs, safety in mobility, effective connectivity between rural areas and markets /urban centers, inter-provincial high-speed connectivity, integrated road/rail networks between economic hubs and also high capacity transportation corridors connecting major regional trading partners.

Promotion of public transportation such as Orange Line, rail transit, in Lahore, the capital of Punjab Province, embodies the modernization of the traffic infrastructure of Vision 2025 above. And

the traffic management measures, which are the main theme of this project, are small but important measures supporting the public transport improvement in line with Pakistan's national development policy.

(2) Consistency with Japan's ODA Policy

According to Japan's Ministry of Foreign Affairs' Country Development Cooperation Policy for Pakistan (February 2019), in the "Improvement of Economic Infrastructure", it says: "Vast country land and densely populated urban areas and geopolitical importance, Japan will support the improvement of transportation, improvement of investment environment, correction of disparity between urban and rural areas, and improvement of transportation infrastructure leading to strengthening of connectivity in the regions". Therefore, it can be said that promotion of traffic management measures in Lahore is an indispensable factor in improving the distribution and transportation of urban areas which is in the country cooperation policy. So it is highly consistent with Japan's ODA policy.

(3) Conformity of the Project

Lahore, the capital city of Punjab Province and the central city, has become increasingly concerned with traffic problems due to population concentration in recent years and its accompanying increasing traffic volume. To cope with these circumstances, Lahore is actively pursuing infrastructure development, particularly rail transit system construction. In this way Punjab Province is trying to shift from private to public transportation oriented in Lahore. Implementation of the traffic management measures in this Project for the safe and comfortable pedestrian space and development for stations and bus stops that are indispensable for promoting the use of public transportation such as buses is the best timing to proceed with the urban transport policy of Punjab Province.

6.4.2 Effectiveness

(1) Achievement Status of Outputs

In this section, the achievement status of each Output set in PDM was evaluated. And based on this, the achievement degree of Project Goal (results of 4 Outputs) was also evaluated for checking the effectiveness of the Project.

(2) Output 1: Achievement level of improvement of organizational capacity of TEPA and traffic management related agencies through training

The activities related to Output 1 in this project are as shown in 2.1. With regard to TEPA's capacity development, the capacity was strengthened through training in more than 120 counterpart meetings. In addition to TEPA, a seminar in which various organizations related to traffic

management attended was held four times, and capacity building was strengthened.

When formulating an institutional improvement plan, C/P and the JICA expert conducted an organization analysis, clarified problems in the organization, and prepared the formulation of an institutional improvement plan. C/P and the JICA expert tried to formulate an institutional improvement plan, but there were problems such as TEPA's lack of authority. Thus, C/P and the JICA expert tried to strengthen the C/P's institutional capabilities, not the entire organization.

(3) Output 2: Achievement level through the implementation of the pilot project, streamlining the organizational structure of TEPA and enhancing the traffic management capability of the staff

At the preparation stage of the pilot project, under the leadership of the counterpart supervising the whole activities, the organization system was improved by assigning the tasks to each counterpart, and the project was implemented. In addition, individual capacity of the staff was also strengthened by hands-on experience of the various implementation menus ranging from hard measures of corridor management to soft measures such as mobility management and traffic safety campaign.

(4) Output 3: The achievement level of the experience relating to the implementation of the pilot project is compiled in the handbook, and the improvement plan related to traffic management in Lahore Central Area is formulated and distributed to the TEPA and traffic management related organizations

The pilot project was summarized in "Pilot Project Handbook" together with "Intersection Design Manual" and distributed to TEPA and organizations involved in traffic management and shared that it will be a guide to development projects in regions other than the pilot project area.

(5) Output 4: The achievement level of the Traffic Management Plan including the Traffic Improvement Plan for Pedestrian and Traffic Demand Management Plan in Lahore is developed

The Traffic Management Plan including the Traffic Improvement Plan for Pedestrian and Traffic Demand Management Plan are developed and distributed to the TEPA and traffic management related agencies for improvement of urban transport environment in Lahore Central Area.

Participation in C/P's traffic management plan was to discuss improvement measures after corridor management in the short-term plan, intersection improvement at 6 intersections of the pilot project area in the mid-term plan (CAD drawings and calculation of the saturation factor during the revision of signal phasing). C/P also joined the field survey to develop the Lahore Central Area pedestrian network proposed in the long-term plan, which was also the important for the Punjab government transport policy (public transport oriented urban transport system).

(6) Achievement Level to Project Purpose

The project purposes, namely, "1. The Lahore Transportation Technology Planning Department (TEPA) will be able to plan and implement traffic management projects" and "2. Technical knowledge in the traffic management related organizations will be improved" can be said to have been achieved considering the achievement level.

In addition to "Intersection Design Manual" and "Pilot Project Handbook", "Traffic Management Plan" including the traffic improvement plan for pedestrian and traffic demand management plan are formulated based on the pilot project implementation. The above 3 books were distributed not only to TEPA but also to the traffic management related agencies to serve as a guide for project planning and implementation.

6.4.3 Efficiency

The planned experts' input to this project increased by 7.0% (62.89 MM against the planned 58.75 MM). Factors for the increase in experts' input are mainly dispatch of traffic simulation experts to validate the effect of the comprehensive improvement plan on a large intersection (Qartaba Chowk) and coordinated traffic signal system along Mall Road which is reduce the traffic problems in the pilot project area and Lahore central area.

The experts' input not only validated the effect of the improvement plan with the counterpart but also transferred the simulation method at the C/P meeting. After the training on the traffic simulation, C/P can develop the improvement plan at problematic intersections at other areas by himself /herself.

6.4.4 Impact

(1) To TEPA (Counterpart agency)

The counterpart agency of this project is TEPA. The number of staff is 130 of which 71 are engineers and technicians. Fifteen (15) of the engineers were involved in this project. Their assigned tasks were as follows:

- 1) Ten (10) counterparts,
- 2) Two (2) from design department including the director who participated in the discussion on design criteria in Punjab Province during the corridor management design of Queens Road and on the intersection design manual,
- 3) An engineer from supervising department who participated in the discussion about quality control at the time of repair work of Queens Road and attended many local meetings to answer questions from the roadside residents, and

- 4) Two (2) from the finance department including the director who were consulted about the import and customs procedures when the project needed to import many traffic management related materials such as paint for marking sidewalks from Japan.

While this project was ongoing, it had the largest mobilizations of engineers (more than 20% of total engineers) in TEPA.

(2) To JCC members

Initially in Lahore, Orange Line, which is a new rail transit, has become a major topic of urban transportation. And planning and implementation of traffic management measures is an important theme. But among traffic policy decision makers, it can be said that awareness was low. TEPA's administrative position was a sub-organization, under the LDA, HUD & PHEP. However, through JCC meetings, the importance of traffic management measures was recognized by the transport policymakers in Punjab and Lahore. The high level officials in the agencies tend to look more at large-scale infrastructure developments because of their large impact to the urban area. But this project proved that even small-scale infrastructure with soft component at low cost also has a large impact.

(3) To School Teachers (Trainers to new drivers in the near future)

Solution to traffic problems are not only the hard infrastructure but also the soft measures such as traffic enforcement and traffic education through seminars and pilot project activities to the traffic management related organizations and the student groups, as young age group will be drivers in near future. With regard to traffic education, not only traffic safety campaigns, the kinds that are usually carried out in many countries, are conducted. There are also the activities of mobility management and its collaboration with schools to advance the action of selecting more environmentally friendly transportation through their own activities. This was the first attempt in Lahore as well as in Pakistan and attracted the sympathy of many students and teachers who participated in Mobility Management. In particular, the teachers received many comments that "this should be included in the school curriculum throughout Pakistan."

6.4.5 Sustainability

(1) Policy Aspects

Looking at Vision 2025 and the Foreign Ministry's assistance policies for Pakistan, the vitality of urban areas and poverty reduction in rural areas are the major themes for the development of Pakistan. To improve the traffic problems which are impediment to urban development, the key to a successful shift from private to public transport policy in Lahore is how to safely, comfortably and punctually

move public transport users from origin to destination. To achieve this, it is necessary not only to introduce a new public transport system but also to develop mode interchange areas (transfer points such as stations and bus stops) and pedestrian spaces from home/office to the station. The traffic management measures implemented in this project include the securing of pedestrian space that has not been regarded as important until now. But it has been recognized by many JCC members as important to traffic management. This will be a tailwind to TEPA and related institutions to implement the traffic management measures.

(2) Institutional, Technical and Financial Aspects

All of the pilot project's hard infrastructure have been transferred to their respective regulatory agencies as shown in Table **. Therefore, in the future, main activity along Queens Road is the operation and maintenance and there will be no major financial burden. If Lahore is to implement corridor management on the other areas, it is desirable to restructure the C/P organization due to TEPA's limited coordination ability with many related organizations and financial issues. With P&D or MCL as the lead C/P, TEPA plays a part in the C/P team using the experience of the pilot project. In terms of engineering, TEPA has sufficient accumulation of pilot projects and can cope with the given issues without any problems. In terms of soft measures, it is important to continue to strengthen traffic enforcement and to expand to other schools MM measures. The responsible agencies such as TPO and ED have positive attitudes but continuity is not sufficiently secured.

In this regard, the chief representative of the JICA Pakistan office commented that he would like to support seminars and campaigns that can be easily implemented because they are about important activities in Pakistan.

Table 6.4-1 Types of Hard Facilities/Soft Measures in Pilot Project to be Transferred

Type	Types of facilities / activity transferred	Transfer destination	Remarks
Hard facility	Road including traffic sign	TEPA	Transferred
	Pelican signal	PSCA	Transferred
	On-street parking	LePark	Transferred
	Bus stop	LTC	Transferred
Soft measure	Enforcement of encroachment violation such as street vendors	MCL	Transferred
	Traffic enforcement and Traffic safety campaign	Lahore Traffic Police	Approved by Police Chief at the meeting
	Mobility management	ED, Target schools of Pilot Project	Positive attitude of the Director at the meeting

6.5 Recommendations for Improving the Sustainability of the Project

In the future, if Pakistan side implements its own pilot project to the other areas, it is desirable to restructure the C/P organization from the TEPA's limited coordination ability with many related organizations and financial issues because the Pakistani organizational hierarchy is top-down. If the lower organization is a C/P organization, coordination with related organizations would be difficult. With P&D or MCL as the lead C/P, TEPA plays a part in the C/P team using the experience of the pilot project.

In addition, it is considered that the creation of a coordination meeting proposed by the chairperson at the 5th and 6th JCC meeting is also essential for the sustainability of the project. At the time of the pilot project implementation, coordination was very difficult because the areas of responsibility of each organization were unclear or duplicated. Based on this experience, a liaison coordination meeting will be created, where it will be possible for all relevant parties to discuss the selection of a project to be implemented, the assignment of project roles, and the examination of solutions to project issues being implemented. The members of the coordination meeting should not be fixed, i.e., it should be flexible to cope with any problems/issues.

6.6 Lessons Learned, Recommendations, etc. in Future Cooperation Implementation

6.6.1 Not Only Official Meetings But More Importantly Constant and Face-to-Face Communication

The importance of WG meetings and JCC meetings in the implementation and completion of the project is not denied. But in order to ensure the sustainability of the project, especially in the case of this project, it is very important to personally meet and discuss directly with the supervisory authority of each facility to be transferred because communication is very important. Corridor management on Queen's Road has been completely transferred to the supervisory authorities, and project sustainability has been secured. The a key persons who support this are the mayor of MCL (LePark continues to approve the operation and maintenance of the on-street parking facilities on Queens Road), the chief executive officer of LTC (approval of bus stop transfer), the chief operating officer of PSCA (transfer of pelican signal), and the chief operating officer of LePark (continuation of operation and maintenance of on-street parking facilities).

6.6.2 Not Always Good But Challenging

Many of the traffic management measures which were tackled in the pilot project including the improvements of road design criteria that do not satisfy the conditions, had been suggested in discussions with counterparts and stakeholders, and measures with certain effects experienced in Japan were implemented.

Among them, (1) improvement of intersections, (2) widening of carriageway width from 2.75m to 3.00m, (3) improvement of sidewalks and crosswalks, (4) improvement of bus stops including terrace type, and (4) cats eyes were highly evaluated by the roadside users, counterparts and stakeholders.

On the other hand, (1) marking sidewalk, (2) Pelican signal at crosswalk, (3) on-street parking facility for private cars and motorcycles were facilities that the user did not use as intended by the pilot project designers such as TEPA counterparts and the JICA Project Team members.

Regarding the traffic management measures that had a low evaluation by the road users, several guidance signs to show the intention and usage of the facility were added and the traffic police officers were requested to give proper guidance of its usage.

However, with regard to the Pelican signal, there was no recognition of the traffic signal for pedestrians to the driver. This means that it did not work in the pilot project. It is a difficult attempt to improve the daily behavior patterns of citizens, and the authorities realized that it would take time for the road users to understand and use them correctly.

On the other hand, the main roads of Lahore are signal-free corridors; basically, the pedestrian crossings are limited pedestrian bridges or underground walks. Lahore City is aiming to promote the use of public transport in the future. It is very important to allow pedestrians to comfortably cross the road introducing Pelican signals. In that sense, the introduction of the Pelican signal was an important pioneering attempt.

6.6.3 Widespread Positive Effect of the Pilot Project

A young LePark engineer (in charge of transferring the on-street parking space on Queens Road) gave a PowerPoint presentation at the project office after the JCC on "Direction of Future Parking Facilities Improvement of Lahore". This is a proposal for the future desirable parking measures based on the traffic problems in Lahore. As such, the pilot project affected not only C/Ps from TEPA but also young engineers of other traffic management related organizations. Thus, it can be said that there is widespread strengthening of capacity for traffic management measures.

Appendix

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Appendix-1
PDM



Project Monitoring Sheet I (Revision of Project Design Matrix)

Project Title: The Project on Improvement of Traffic Management Capacity in Lahore Central Area in Islamic republic of Pakistan

Implementing Agency : Traffic Engineering & Transport Planning Agency (TEPA)

Target Group: Traffic Engineering & Transport Planning Agency (TEPA), Lahore Development Authority (LDA) • Punjab Province Traffic Office (Transport Planning Unit (TPU), Transport Department (TD))

Period of Project : Mar 2019.

Project Site : Lahore Central area

Model Site : Queens Road

Version 4

Dated , 7 / 9 / 2018

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
<p>Overall Goal</p> <p>Traffic management in Lahore will be planned and implemented in an appropriate, reasonable and scientific manner.</p>	<p>1. Traffic condition in Lahore is maintained.</p> <p>2. User's satisfaction is improved.</p>	<p>Government reports</p>	<p>Urban transport Policy of Government of Punjab and CDGL does not charge drastically.</p>	<p>(Future activity)</p>	
<p>Project Purpose</p> <p>1. TEPA will be able to formulate and implement countermeasures for traffic management.</p> <p>2. Knowledge of related organizations on traffic management will be enhanced.</p>	<p>1. Technical documents for design and implementation are developed.</p> <p>2. Traffic management is properly planned in a coordinative manner.</p>	<p>1. Developed technical documents</p> <p>2. Documents of related organizations</p>	<p>Government funding for traffic managements is ensured.</p>	<p>In addition to "Intersection Design Manual" and "Pilot Project Handbook", "Traffic Management Plan" were formulated based on the pilot project implementation. The above 3 books were distributed to TEPA to serve as a guide for project planning and implementation.</p> <p>In order to enhance the knowledge of traffic management, meeting was conducted twice a week (Total 125 times) for CP members and seminars were conducted 4 times for related organizations to share knowledge.</p>	
<p>Outputs</p> <p>1. Capacity Development for traffic management of TEPA and related organizations is conducted through training.</p>	<p>1-1. Training materials are developed</p> <p>1-2. Training courses are held on twice a week.</p> <p>1-3. Results of assessment test after the training show improvement of knowledge of the trainees (Score of assessment test is more than 80% by June 2017)</p> <p>1-4. Workshop / seminar was held on four times during the project and concerned traffic management organizations attend.</p>	<p>1. Training materials</p> <p>2. Project Progress Report (the number of execution times, participants etc.)</p> <p>3. Results of assessment test</p> <p>4. Workshop implementation report</p>	<p>Continuous involvement of TEPA and related organizations is secured.</p>	<p>- Training course was held twice per week. (125 times as of end of February, 2018)</p> <p>- Capacity assessment survey was conducted three times (Baseline, Intermediate and Terminal) in total undertaken three (3) times</p> <p>The results of this evaluation are as follows:</p> <p>(1) Technical Capacity 1.77 (Baseline) □ 3.43 (Interim(2))</p> <p>(2) Core Capacity 3.12 (Baseline) □ 3.63 (Interim(2))</p> <p>(3) Enabling Environment 2.05 (Baseline) □ 2.79 (Interim(2))</p> <p>the CP member's evaluation value of all items was improved (especially Technical capacity was improved by 93%) from the baseline survey</p>	
<p>2. Institutional and personal capacity for traffic management of TEPA is enhanced mainly through implementation of Pilot Project(s).</p>	<p>2-1. Pilot Project(s) is implemented.</p> <p>2-2. Pilot Project(s) is evaluated.</p> <p>2-3. The personnel Structure (particularly, number of engineer) of TEPA is improved.</p> <p>2-4. Project management capacity of TEPA is improved until the end of the project.</p> <p>2-5. Financial disbursement of TEPA for projects becomes more balance between hard and soft projects.</p>	<p>1. Implementation Plan</p> <p>2. Results of evaluation</p> <p>3. Project progress report (monitoring results)</p> <p>4. TEPA's report</p>		<p>- A draft Support Program for TEPA's Institutional Improvement Plan through the Pilot Project was prepared in July 2016.</p> <p>The monitoring result was prepared in February 2019 and shared among TEPA and related organizations in 4th seminar.</p> <p>- Consultations with related organizations on pilot projects were conducted mainly on counterparts.</p>	
<p>3. Pilot Project(s) are summarized into "handbook" to be shared among TEPA and related organizations as reference for other areas' improvement.</p>	<p>3-1. Manual and Handbook for Traffic Management is published by the end of this project.</p> <p>3-2. Workshop / seminar regarding Manual and Handbook is held by the end of the project and concerned traffic management organizations attend at least once.</p>	<p>1. Traffic Management Handbook</p> <p>2. Intersection Design Manual</p> <p>3. Pedestrian Safety Handbook</p> <p>4. Workshop implementation report</p>		<p>- Pilot Project(s) was summarized into "handbook" as reference for other areas improvement by the end of February 2019.</p> <p>- These will be distributed to relevant organizations until the end of March 2019.</p>	
<p>4. Traffic Management Improvement Plan in Lahore is developed.</p>	<p>4. Traffic management improvement plan is developed by the end of this project. (Including Traffic Improvement Plan for Pedestrian, Traffic Demand Management Plan)</p>	<p>1. Traffic management improvement plan</p>		<p>- Traffic Management Improvement Plan including "Traffic Improvement Plan for Pedestrian" and "Traffic Demand Management Plan" was summarized into "Traffic management plan" by the end of February 2019.</p> <p>- These will be distributed to relevant organizations until the end of March 2019.</p>	

Activities	Inputs		Important Assumption		
	The Japanese Side	The Pakistan Side			
1-1 To conduct pre-evaluation on trainees who will participate in the traffic management training.	Japanese side: 1. Dispatch of Japanese experts: 1) Chief consultant / traffic management 2) Deputy Chief consultant / traffic management 3) Road facilities design / Traffic simulation (1) 4) Traffic signal design and operation 5) Pilot project implementation and management 6) Traffic survey / analysis 7) Capacity development planning / organization improvement/ Pilot project implementation and management (2) 8) Training plan / Seminar / Traffic simulation (2) 9) Project evaluation/ Traffic survey / analysis (2) / Traffic simulation (3)	Pakistan side: 1. Provision of office and necessary facilities. 2. Appointment of counterpart personnel from available TEPA/TPU staff 3. Counterpart budget: administrative cost including staff salary, transportation and utilities. 4. Security arrangement for JICA experts.	Trainees stay and continue to work for the organization.		
1-2 To develop training plan.					
1-3 To develop training materials.					
1-4 To conduct training courses.					
1-5 To conduct post-evaluation test on trainees after training course.					
1-6 To conduct workshops/seminars to transfer engineering knowhow to staff of related organizations.					
2-1 To conduct traffic condition surveys in Lahore central area.			2. Training of counterpart personnel in Pakistan 3. Necessary equipment 4. Handbook printing 5. Workshop / Seminar		Pre-Conditions
2-2 To identify traffic management issues.					
2-3 To plan Pilot Project(s).					
2-4 To implement Pilot Project(s).					
2-5 To conduct traffic surveys to effectiveness of the pilot project (s).					
2-6 To evaluate the effectiveness of the Pilot Project(s) by using micro-simulation "VISSIM"					
2-7 To investigate the current state of organizational frameworks of TEPA. (legal mandate, transport administration in Lahore, human resources, budget, preparation of development plan, etc.)					
2-8 To prepare institutional improvement plan taking into account the "Pilot Project" as case study by TEPA.					
2-9 To monitor the implementation of the institutional improvement plan.					
2-10 To develop traffic management plan including countermeasures.					
3-1 To review the existing "handbooks" and "manuals" for traffic management.			↓ <Issues and countermeasures>		
3-2 To make "handbook" and "manual" for traffic management taking account of the experience of Pilot Project(s). (data collection, analysis, development and implementation of countermeasure, geometric design of the intersection and pedestrian facilities)					
3-3 To hold workshops / seminars to transfer engineering knowhow to staff of related organizations.					
3-4 To distribute "handbook" and "manual" to traffic management to related organizations.					
4-1 To develop the traffic management plan in the Lahore Central Area.(Including Traffic Improvement Plan for Pedestrian and Traffic Demand Management Plan)					

Appendix-2
Project Flowchart

Appendix-3
Assignment Schedule
