



Consultancy Services for Scoping Study for Pakistan

Final Report



Mott MacDonald Ltd.

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Typical rural mountain road near Balakot in the Kaghan valley (Source: Mott MacDonald)



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RESEACH FOR COMMUNITY ACCESS PARTNERSHIP (ReCAP)
Safe and sustainable transport for rural communities

ReCAP is a research programme, funded by UK Aid, with the aim of promoting safe and sustainable transport for rural communities in Africa and Asia. ReCAP comprises the Africa Community Access Partnership (AfCAP) and the Asia Community Access Partnership (AsCAP). These partnerships support knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources. The ReCAP programme is managed by Cardno Emerging Markets (UK) Ltd.

See www.afcap.org

Acronyms, Units and Currencies

£	British Pound
AASHTO	American Association of State Highway and Transportation Officials
ADB	Asian Development Bank
ADF	Asian Development Fund
AJK	Azad Jammu and Kashmir
AfCAP	Africa Community Access Partnership
AsCAP	Asia Community Access Partnership
BRSP	Balochistan Rural Support Programme
C&W	Community & Works Department
CPI	Community Physical Infrastructure
DFID	Department of International Development
DMRB	Design Manual for Roads and Bridges
STEM	Department of Transportation Engineering and Management (UET, Lahore)
DUIE	Department of Urban and Infrastructure Engineering (NED, Karachi)
EAD	Economic Affairs Division
EOD	Environmentally Optimised Design
FCO	Foreign and Commonwealth Office (United Kingdom)
FGD	Focus Group Discussions
GDP	Gross Domestic Product
GII	Gender Inequality Index
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ITS	Intelligent Transport Systems
HDI	Human Development Index
IPSS	Infrastructure Planning Support System
JICA	Japan International Cooperation Agency
km	Kilometres
KPRRP	Khadam-e-Punjab Rural Roads Programme
LVR	Low Volume Rural Road
m	Metres
MML	Mott MacDonald Ltd.
MoC	Ministry of Communication
MoU	Memorandum of Understanding
MTDF	Medium Term Development Framework
NGO	Non Governmental Organisation
NHA	National Highway Authority
HRP	Highway Rehabilitation Project (World Bank)
KPK	Khyber Pakhtunkhwa
NRSP	National Rural Support Programme
NTRC	National Transport Research Centre
NWFP	North West Frontier Province
P&D	Planning & Development Department
PEA	Political Economy Analysis
PKR	Pakistani Rupees
PMU	Project Management Unit
PPAF	Pakistan Poverty Alleviation Fund
PPP	Public Private Partnership
R&D	Research and Development
RAMS	Road Asset Management System
RAR	Rural Access Road
RDF	Research and Development Foundation
RDPI	Rural Development and Policy Institute
RTA	Regional Transport Authority
ReCAP	Research for Community Access Partnership
SECP	Security and Exchange Commission of Pakistan
SRSP	Sarhad Rural Support Programme

UK	United Kingdom (of Great Britain and Northern Ireland)
UKAid	United Kingdom Aid (Department for International Development, UK)
US\$	United States Dollar
USPMU	Urban Strategic Policy Monitoring Unit
VDP	Village Development Plan
WLC	Whole Life Cost
TITE	Taxila Institute of Transportation Engineering
TOR	Terms of Reference
TS	Transport Services
TST	Triple Surface Treatment

Currencies Exchange Rates (May 2017)

1 US\$ = 104.84 PKR

1 UK£ = 134.28 PKR

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Executive Summary

A scoping study has been conducted to ascertain the viability of AsCAP support for Pakistan, including the optimised structure of AsCAP support, and to recommend research areas, capacity building, dissemination and embedment strategies. **It can be confirmed that AsCAP partnership with Pakistan is viable**, and if structured and organised optimally, it will have a hugely beneficial impact on the rural road sub-sector of Pakistan. Due to the 18th Amendment of the Constitution, which was passed by the National Assembly of Pakistan in 2010, there is a federal and provincial structure to governance in Pakistan and this has implications on the management and administration of roads. The rural roads sub-sector is under the jurisdiction of the Provincial Government. There is expressed interest across the political hierarchy in AsCAP support and two options for official partnership with AsCAP is analysed and presented, and summarised below.

- The Federal Option – NTRC
- The Provincial Option – P&D Department

Furthermore, if partnership with AsCAP is pursued with the provincial option, a further decision is required on the province(s) to operate (Punjab, Sindh, KPK, Balochistan or Gilgit – Baltistan). The structural option of AsCAP support as well as the provincial zone of operation requires a collaborative decision between DFID and Pakistan. In addition, DFID’s engagement with any entity in Pakistan must be negotiated through the Economic Affairs Division (EAD) of Pakistan. These issues should be resolved as a matter of urgency in order to progress AsCAP in Pakistan with a signing of a Memorandum of Understanding (MoU).

A list of (twelve, demand led) possible research topics as well as tentative costs has been presented in this Scoping Report. In addition a capacity building and dissemination strategy has been defined. However, implementing the full list of research topics and capacity building strategy will require a budget exceeding that available from AsCAP support. Below is the list of prioritised outputs that sit within the AsCAP budget support envelope. It is based on a general consensus of recommended proposals and should be subjected to further refinement.

Prioritised list of research and activities under AsCAP in Pakistan

Research Topics	Tentative Cost (UK£)
Thematic Cluster 1: Infrastructure	
Planning and Prioritisation of Rural Roads	75,000
Thematic Cluster 2: Transport Services	
Scoping Study - Community Pooled Transport Vehicle Ownership	85,000
Thematic Cluster 3: Cross-cutting Issues	
Gender Mainstreaming Strategies in Rural Transport	120,000
Capacity Building and Dissemination	220,000
TOTAL	500,000

Source: Consultants’ estimates

1 Introduction

1.1 Background

The Research for Community Access Partnership (ReCAP) is a DFID funded six – year programme of applied research and knowledge dissemination with the overall aim of promoting safe and sustainable rural access in Africa and Asia through research and knowledge sharing. Cardno Emerging Markets (UK) Ltd has been managing the programme on behalf of DFID. ReCAP is comprised of the following two components, the Africa Community Access Partnership (AfCAP) and the Asia Community Access Partnership (AsCAP). Overall, ReCAP will implement a £23.5 million programme with approximately £6.8 million dedicated to AsCAP in the years 2015 – 2020.

1.2 Pakistan Scoping Study

There is a plan to incorporate five countries within AsCAP. Nepal, Bangladesh and most recently Myanmar have been established as partner countries. Over the past year exploratory discussions have taken place to include Pakistan and Afghanistan within the AsCAP structure. This project is the initial scoping study for Pakistan. It will elaborate the feasibility for partnership, identify relevant stakeholders, suitable projects, and indicative budgets with capacity building and research embedment strategy defined. It is also important to consider that ReCAP initiatives are demand led by the partnering countries and therefore all outputs and recommendations of this scoping study will take root from local needs, demands and suggestions.

1.3 Objectives of the Scoping Study

The overall aim of this scoping study is to identify i) the viability and structure of AsCAPs support and partnership in Pakistan; ii) potential areas of rural transport infrastructure, services and associated cross-cutting research that can be supported by AsCAP; and iii) capacity building and knowledge transfer that can be supported by AsCAP.

1.3.1 Research Objectives

The research objective is to conduct stakeholder consultations to identify and compile a list of themes in rural infrastructure and transport services that can be supported by AsCAP

1.3.2 Capacity Building Objectives

The capacity building objectives is to ‘define local capacity options necessary to sustain research outcomes’ for the long run

1.3.3 Update and Embedment Objective

The uptake and embedment objective is to ‘define a framework’ in which research under AsCAP will ‘contribute to the enhancement of rural transport knowledge management, lesson learning and dissemination’

1.4 Project Tasks

This project will establish the foundations of Pakistan’s involvement with ReCAP and AsCAP. The following five tasks have been identified that will satisfy the above objectives.

- i) evaluation of the current status and governance structure of the rural transport sector in Pakistan;
- ii) consultation and identification of potential local stakeholders;
- iii) ascertain the scope of Pakistan’s partnership with AsCAP in the form of recommendations of research topics and areas; and
- iv) development of a broad strategy for capacity building, uptake and embedment.

1.4.1 Evaluation of the Current Status of the Rural Transport Sector in Pakistan

This includes a general country overview of the Pakistan rural transport sub-sector with and an evaluation of the key issues, political structure and baseline data of the sector. The evaluation includes an analysis of secondary sources to establish the current rural transport network size, the quality of the infrastructure, the population served, the overall value of funds expended in developing and maintaining the network, and the current and historic role of research into rural transportation.

1.4.2 Identification of Potential Stakeholders and Consultations

Local ownership is essential to drive AsCAP within Pakistan. Therefore, an analysis of the major stakeholders has been undertaken to identify stakeholder perspectives regarding the main problems experienced in the rural road sector, the benefits and major challenges to rural transport research and the stakeholders potential role / contribution to prospective AsCAP activities. Consultations have not been limited to local experts and practitioners - it has included civil servants, academics, non-governmental organisations (NGOs) and development partners. Stakeholder consultations were held in Islamabad and Lahore between 10th – 17th May and a list of stakeholders consulted is presented in Appendix 1 to this report.

Among an objective of this scoping study is to identify an existing local entity that has the capability to take ownership of Pakistan's partnership with AsCAP and possibly enter into a MoU. This scoping study has recommended three options with regard to AsCAP ownership.

1.4.3 Recommendation of Research Topics and Areas

This will form the focus of the Scoping Study. A long list of individual research topics consistent with the ReCAP (three) clusters and themes (infrastructure, transport services and cross-cutting issues) will be identified. Indicative budgets will be presented and a prioritisation process will be undertaken against the constraints of the overall budget for AsCAP (envisioned to be c. £0.5 million over three years for Pakistan). All projects will be consistent with and positively contribute towards the ReCAP project logframe.

1.4.4 Development of a Broad Strategy Capacity Building and Uptake Development

Finally, a broad strategy will be developed for Pakistan and AsCAP so the local capacity is empowered to both i) absorb the findings of research into current practices and norms; and to ii) indigenously develop future research so that the long term aim of self sufficiency is achieved. These two objectives should not be seen as separate, as capacity development and uptake development can be considered as inextricably linked. Therefore, a strategy must be developed that holistically enhances local capacity and disseminates knowledge.

1.5 Team Composition

This scoping study has been developed by a small team of consultants; Maysam Abedin (Team Leader) and Dr Zahra Batool (National Consultant) have been directly involved in the development of the Scoping Study Report, and Farook Chowdhury (Project Director) has provided overarching support for the study including Quality Audit of reports.

1.6 Structure of this Report

This is the Draft Final report. There are seven chapters including this introductory chapter. Chapter 2 provides an overview of the road transport sector in Pakistan and the main issues experienced by rural communities through the presentation of a case study of a village in Punjab. Chapter 3 maps the stakeholders relevant to AsCAP whilst Chapter 4 outlines the structure of Pakistan's relationship with AsCAP and the options available. Chapter 5 presents an overview of research areas and topics

as suggested by local stakeholders. Chapter 6 outlines recommended strategies for capacity building and research uptake and embedment. The final chapter will close on recommendations and conclusion.

2 Rural Transport in Pakistan

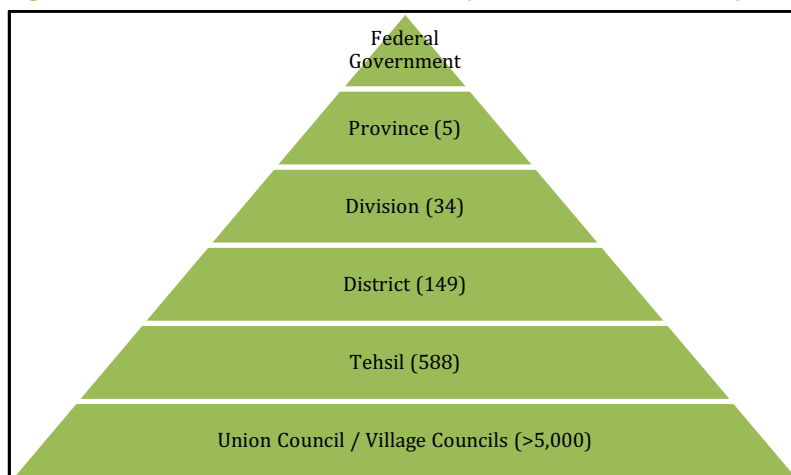
2.1 Political Structure in Pakistan and Roads

It is important to consider the political structure of Pakistan and its implication on roads – this is the basis of understanding how roads are administered and managed.

At the federal level, the Ministry of Communication and National Highways Authority (NHA) are responsible for the national highways and other strategic transport infrastructure (e.g. national railways). There are five provinces including Punjab, Sindh, Khyber Pakhtunkhwa, Balochistan and Gilgit – Baltistan. The provinces have extensive powers including tax and revenue raising powers. On a macro-level all roads with exception of national highways (therefore over 95% of the country’s road network, see below) is planned and governed at the provincial level. The provincial departments responsible for roads are Planning and Development (P&D) Department, Communication and Works (C&W) Department and Transport Department (see Chapter 3). Below the provincial tier of government sits the Divisions, of which there are 34 in Pakistan with population ranging from 500,000 to 10 million persons. The divisions are further sub-divided into 149 Districts (also known as ‘zillahs’) and further into 588 sub-districts, also known as ‘tehsils’ (or ‘telukas’ in Sindh). A typical tehsil includes the main principal town with a cluster of villages and a population between 300,000 – 350,000. The bottom tier of government in Pakistan is the Union Council (also known as a Village Council in rural areas). The councils are represented by 21 councillors and headed by a ‘nazim’.

Typically, provincial departments will set the transport strategy and policy and allocate funding to Districts based on a union council share of the provincial total – the Districts have significant autonomy on the location and type of transport infrastructure and service delivery.

Figure 1 Tiers of Government in Pakistan (and number in brackets)



2.2 Network Size and Current Status

2.2.1 Road Length

Pakistan’s road network of 264,000 km consists of approximately 80,000 km ‘low’ type road, and 185,000 km ‘high’ type roads.¹ Network expansion has been at an annual rate of (approximately)

¹ It has been difficult to establish an official definition of ‘low’ and ‘high’ type roads. Based on a consensus of information, ‘low’ type road are roads that are unpaved (and with low levels of traffic), while ‘high’ type roads are paved roads (and highly trafficked). Other labels have included ‘brown’ roads (to define ‘low’ type roads) and

2,200 kms between 1996 and 2009², however, the focus has been on consolidation of the existing network and upgrading the low-type roads to high-type roads.

The provincial split is correlated with population size and in 2015 the approximate road network sizes in the provinces was: Punjab with 110,000 km; Sindh with 80,000 km; Khyber Pakhtunkhwa with 45,000 km; Balochistan with 30,000 km; and Gilgit – Baltistan and Azad Jammu and Kashmir (AJK) with 1,500 km³. The split between ‘high’ and ‘low’ type is presented in the table below.

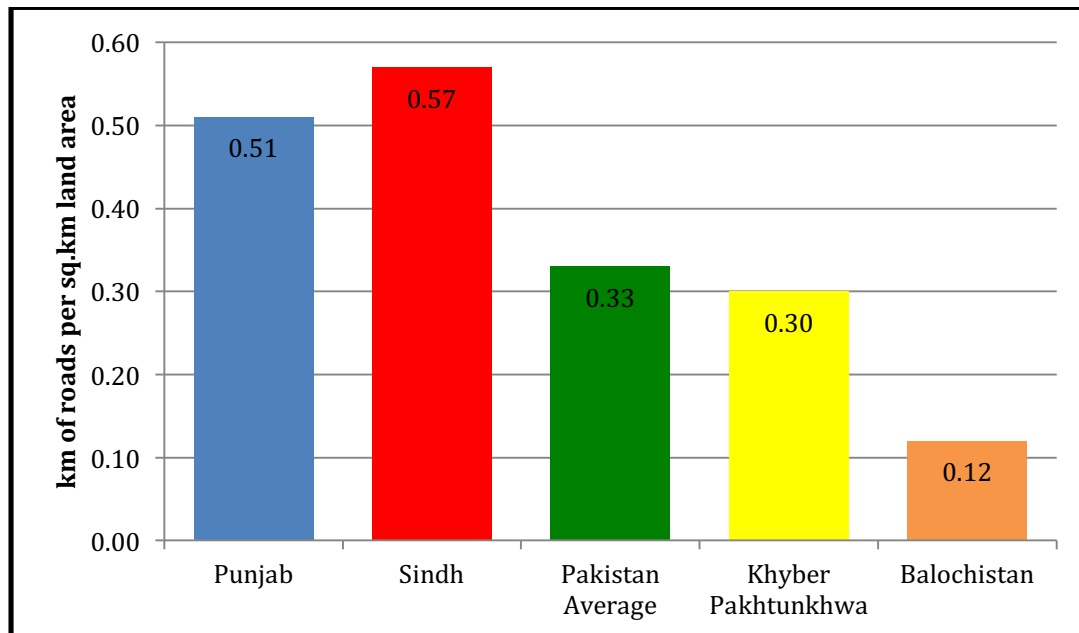
Table 1 Road Network in Pakistan (2014/15)

Province	Low Type	High Type	Total
Punjab	32,428	75,564	107,992
Sindh	24,215	57,328	81,543
Khyber Pakhtunkhwa	12,846	30,226	43,072
Balochistan	8,930	20,812	29,742
Gilgit - Baltistan and AJK	460	1,133	1,593
Total	78,879	185,063	263,942

Source: NTRC

From the perspective of road density (km of road length per sq. km of land area) the national value is 0.33 km of road length per sq.km of land area – however the provincial disparities are significant; it is relatively high in Punjab (0.51) and Sindh (0.57), but low in Balochistan (0.12) and Khyber Pakhtunkhwa (0.30)⁴. This is presented diagrammatically below.

Figure 2 Road Density in Pakistan (road kilometres per square kilometre of land area)



Source: Based on NTRC data

‘black’ roads to define (bituminous and ‘high’ type roads)

² Source: 11th Five Year Plan, 2013 – 2018, Planning Commission, Pakistan, 2016

³ Source: National Transport Research Centre (NTRC)

⁴ Source: 11th Five Year Plan, 2013 – 2018, Planning Commission, Pakistan, 2016

2.2.2 Road Classification and Administration

The roads are further disaggregated between the following types of roads and administrative ownership.

- National highways, motorways and strategic roads which are administered by the National Highways Authority (NHA)
- Provincial roads which are administered by the provinces with planning and management coordinated by the P&D Department and C&W Department as the executing agency. (Much of these road are considered as ‘provincial highways’)
- District Roads administered by the district governments – it is these roads that would predominantly, though not exclusively, be considered as Low Volume Rural Roads (LVRR) and most pertinent to AsCAP research
- Municipal and army roads.

The total road length disaggregated by road type is presented below (to the nearest 1,000km). The figures in the table are estimates based on NTRC figures (available for the year 2006) and uplifted to 2015 values based on the national increase in road infrastructure.

Table 2 Road Length by Classification

Classification	Length (km)
National Highway, Motorway, Strategic Roads	9,200
Provincial Roads	103,300
District Roads	96,200
Municipal and Government Army Roads	55,200
TOTAL	263,900

Source: NTRC (2006 values) updated to 2014/15 vales based on consultants’ estimates

2.2.3 Expenditures

A total of 580 billion Rupees (equivalent to approximately US\$5.5 billion) was earmarked for the Provincial Governments for the years 2013 – 18), with a further 1.2 billion Rupees (11.4 US\$ million) and 0.6 billion Rupees (5.7 US\$ million) allocated to special areas Azad Jammu and Kashmir (AJK) and Gilgit – Baltistan, respectively.⁵

With respect to maintenance expenditures it has been difficult to obtain published reports. However historically maintenance expenditure has been low and consequently the network is suffering from a maintenance backlog (often leading to road failure requiring reconstruction and rehabilitation). In 2013 the allocation for routine maintenance in Punjab Province was approximately US\$650 per km – this was above the national average but lower than what was estimated to be required (estimated at US\$ 1,000 per km)⁶.

2.3 Typical Issues in Rural Areas – Case Study

In order to comprehend the main issues pertaining to rural transport and societies a field trip to a village was undertaken on 13th April 2017. It is important to point out that Pakistan is a highly diverse country, therefore, no village can be regarded as a representation of rural Pakistan, however, an attempt has been made to identify some of the issues that would be experienced elsewhere in the province of Punjab and Pakistan in general, with particular respect to the infrastructure, governance, and social customs and norms.

⁵ Source: 11th Five Year Plan, 2013 – 2018, Planning Commission, Pakistan, 2016

⁶ Source: Performance Evaluation Report, Punjab Road Development Sector Project, ADB, December 2013

2.3.1 Case Study – Village of Mir Mohammad, Punjab

The case study relates to the village of Mir Mohammad. Mir Mohammad is relatively close to Lahore (approximately 40 km) and can therefore be characterised as relatively accessible from a national perspective.

2.3.2 Transport Infrastructure

Mir Mohhammad is connected to the main grid electricity and is predominantly served by narrow roads (average 4 metres width) of bituminous asphaltic roads, brick paving or 'kacha' (earthen) roads. With respect to the former, the surfacing is generally reasonably good, however the block paving is formed of irregular blocks resulting in an uneven and unstable surface, and the kacha roads are highly weather dependent. Examples are provided below.



Kacha (earth) road



Block paving



Paved road



Mixed areas of paved and block paving

2.3.3 Transport Services

The main modes of transportation are bicycles, 'Qingqi' (local form of auto rickshaw), motorcycles and tractor-trolley (for freight). A vehicle ownership survey was not conducted, however, we were informed that approximately 30% of households owned a motorcycle and less than five per cent of households owned a car. Those with no motorised ownership used bicycles or used the local public transport system – the 'qingqis'. Qingcis are a form of paratransit and operate under a fill up and go system. Typical fare rates are 15 PKR for a 10 km journey (equivalent to US\$ 0.01 / km). A qingqi has a capacity of 6 persons therefore can potentially levy a 90 PKR per 10 km when full. Examples of the four vehicle types are shown below.



Qingqi



Tractor Trolley



Bicycle



Motorcycle

2.3.4 Main Rural Transport Issues

Discussions with local residents reveal that the main transportation issues faced by rural residents include the following.

- **Infrastructure** – narrow roads (whereby the total width is approximately 4 m) often cause blockages when tractor-trailers are operating. Earthen roads are in poor condition. In addition, household incomes have risen to the extent that dwellings are equipped with flushing toilets and running tap facilities, however a sewerage system is non-existent (i.e. there is no facility for collection, pumping, treating, and disposing of human excreta and waste water). Waste is channelled out of houses and into the roads' open (surface) drainage system. This leaves local residents vulnerable to potential harmful contact but also compromises the roads drainage system, particularly during times of rain when the roads drainage capacity is overloaded. There remains the possibility of contaminated surface drainage water channelled into the river system – this water is often used for drinking water for humans and animals and farming irrigation water.



- **Maintenance** – After rehabilitation, the roads are often not routinely maintained. It is normal to allow a road to deteriorate without any intervention or treatment and until road failure. Therefore based on life cycle cost principles, rural roads are not efficiently managed in an economically optimised manner.
- **Overloaded freight** – Agricultural produce is usually transported by ‘tractor-trailers’ (see picture, inset) and the vehicles are often overloaded. There is a regulatory framework in place that penalises overloaded vehicles; however, enforcement is weak and the system prone to corruption. Most often the infrastructure is not in place to measure effective overloading and the relatively rare cases of enforcement mean that freight operators have internalised the cost of fines in their operating business models
- **Gender mainstreaming** – Rural societies are radically more conservative compared to the cosmopolitan residents residing in cities. This combined with the lack of private vehicle ownership, the qingqi’s fill up and go system, and the predominance of male qingqi operators, inhibits the mobility of female rural residents and their accessibility to essential services (markets, schools and hospitals).
- **Politicisation of roads** – The decision to rehabilitate a road is often based on the historic voting patterns of the road and the existing power balance of the local community at the District level of government.



3 Stakeholders

The following presents a list of stakeholders relevant to the transport sector and the rural transport sub-sector in particular. It includes organisations that the consultants undertaking this Scoping Report have made contact with and as such should not be regarded as exhaustive. The nature and scope of their involvement with AsCAP is also considered in this section.

The Eighteenth Amendment of the Constitution of Pakistan (here after referred to as the 18th Amendment), which was passed on 8th April 2010, essentially passes responsibility of provincial, district and municipal roads to the provinces, and national highways under the jurisdiction of the federal government. For this reason the following list is split between federal government, provincial government, development partners and also independent organisations (the latter includes NGOs, academic institutions, commercial companies civil society organisations and pressure groups).

3.1 Federal Government

3.1.1 Planning Commission

The Planning Commission is the key organisation with respect to the planning of the nation's economic infrastructure. Among the main tasks of the Planning Commission include developing a comprehensive National Plan for all the economic and social sectors of the economy and developing the country's Five Year National Plans. In addition, the Planning Commission has developed the country's strategic economic and social plan for the next decade in an overriding document entitled 'Vision 2025'⁷. The Planning Commission is the main government body coordinating the ADB project (including DFID funding) entitled 'Enabling Economic Corridors through Sustainable Development' which focuses on preparing and implementing a national transport policy and requires coordination and consensus building among many relevant stakeholders - a role that the Planning Commission is suitably positioned to fulfil.

Because the Planning Commission is concerned with strategic infrastructure that is spread nationally across the provinces, it often has to build a national consensus representing the Provinces through consultative processes. For this reason, many stakeholders proposed the Planning Commission as a suitable partnering entity with AsCAP, however, the consultants to this Scoping Report were not able to discuss with the Planning Commission the extent and nature of this involvement.

3.1.2 Ministry of Communication

The Ministry of Communication (MoC) is one of the oldest Ministries in Pakistan and has a wide array of functions including promoting exports, increasing accessibility of remote areas to the national economy, national roads, postal services, and research in transportation and engineering.

There are four organisations that it directly controls including; the National Highway Authority (NHA), the National Highways and Police, the Construction Machinery and Training Institute and (the most pertinent to AsCAP) the National Transport Research Centre (NTRC).

Discussions with Ministry of Communication displayed a strong interest in partnership with AsCAP through a Memorandum of Understanding (MoU) and with MoC playing a facilitating role with NTRC and the Provinces. The need for 'revitalising' the NTRC into the strong research centre was emphasised by the MoC. The MoC suggested a partnership be established between the MoC and AsCAP.

⁷ Pakistan 2025 – One Nation – One Vision, planning Commission, Ministry of Planning, Development and Reform

The MoC proposed a functioning role, leveraging synergies with the provinces through the establishment of a steering group whereby all (willing to participate) provinces are represented, as well as NGO’s, University Organisations. These were amongst the creative set ups explored in order to overcome the federal based challenges of Pakistan.

It was also expressed that the ADB project (which includes DFID funding) ‘Enabling Economic Corridors through Sustainable Development’ which includes four components, one of which is road safety, adequately covers road safety issues and therefore AsCAP in Pakistan should not prioritise resources to this component.⁸

3.1.3 National Transport Research Centre (NTRC)

The National Transport Research Centre (NTRC) was established in 1974 to provide Research and Development (R&D) support for planning and appraisal of transport sector projects. Presently it can be described as being the R&D organization of the MoC. The NTRC is the only public sector research organization carrying out research dedicated to the transport sector. Therefore, at the federal level the NTRC could be considered as the ideal institution to conduct and manage research in the area of rural infrastructure and services and therefore a potential main partner of AsCAP.



A list of all studies conducted since 1974 is presented in Appendix 2 to this report. An analysis of the list indicates that a total of 334 research projects were conducted since 1974. Approximately nine research projects per annum were conducted between 1980 and 2010 however the rate now has declined to approximately three projects per annum.

On a sub-sector basis, the main areas of research include freight transportation, urban transportation and national highways, with the latter forming the focus for research in the past decade. Between 1974 and 2000, approximately 10% of research projects had a rural transport focus, however, the last project was in March 2000 (marking 17 years since any research in rural transport has been carried out by the NTRC).

Table 3 Overview of Studies Conducted by NTRC, 1970 - 2017

NTRC studies	1970s	1980s	1990s	2000s	2010s
Number of Studies - decade	36	97	91	90	20
- per annum	6.0	9.7	9.1	9.0	3.3
Number in Rural Roads - decade	4	10	10	1	0
Percentage Rural Roads	11%	10%	11%	1%	0%

Source: Consultants’ estimates based on NTRC List of Projects

A sample list of studies with a rural transport focus is provided below.

- Farm to Market Roads Survey (NTRC – 9), October 1977
- Manual of Stage Construction of Rural Roads (NTRC-DS-2), January 1983

⁸ Discussions with ADB Deputy Team Leader responsible for the Road Safety component confirmed that the study does cover rural as well as national road safety issues.

- Manual Maintenance of Low Volume Unpaved Rural Roads (NTRC – DS – 3), January 1983
- Manual of Rural Roads Drainage (NTRC – DS – 6), May 1984
- A Review of Design Standards for Tertiary Roads (NTRC – 78), November 1984
- The Volume and Composition of Traffic on Tertiary Rural Roads (NTRC – 80), January 1985
- A Study of Design Standards for Surface Width and Design Speed on Tertiary Rural Roads (NTRC – 82), February 1985
- Survey of Agricultural Tractors (NTRC – 123), June 1989
- Role of Tractor Trolleys in Rural Transportation (NTRC – 135), May 1990
- Low Cost Roads (Demonstration Projects) (NTRC – 149), June 1991
- A Preliminary Report on User Trails of Geogrids in Road Construction in Pakistan (NTRC – 174), December 1993
- Evaluation of Low Cost Roads (NTRC – 190), August 1996
- Village Roads and Rural Development (NTRC 188), September 1996
- Non-Mechanized Road Transport and Rural Area (NTRC - 199), June 1997
- Quality Check of Asian Development Bank Funded Farm to Market Roads Phase I Project (NTRC – 235), May 1992
- Construction of Low Cost Roads (Final Evaluation Report) (NTRC – 213), March 2000

NTRC employs a select group of senior staff that is highly qualified and capable however there is a concern that the organization lacks the capacity to manage a research programme with an emphasis on rural transportation (therefore any AsCAP partnership will require significant capacity building support – see Chapter 6). The current chief of NTRC acknowledges the limitations and weaknesses of the organization and is in the process of restructuring the organization. His main concern is that the quality of research has declined, with unreliable data collected, with little analysis, lack of research uptake and an organization lacking adequate technical manpower (specifically managers, engineers and transport specialists) and specialist equipment. The staff and development budget of NTRC is presented in the table below. According to the Five-Year plan, approximately 282 million PKR (approximately US\$ 2.7 million) has been earmarked for the NRTC between 2013-18⁹ (this is approximately US\$ 540,000 per annum which is broadly consistent with the data in the table below.

Table 4 Staff and Development Budget of NTRC

Budgets, US\$	2015/16	2016/17	2017/18
Staff Budget	563,373	593,733	686,761
Development Budget	30,027	46,910	tbc

Source: NTRC

Among the priority activities for the organization include updating the NTRC web-site, developing a database with real time information sent to/from provinces, developing up to date and reliable accident data, digitalizing the NTRC back catalogue and make it more accessible to the public and further engaging in transport facilitation and conventions with other federal departments. There is a possibility of the NTRC conducting nationwide freight Origin and Destination (OD) surveys which would update previous collected data This project would have significant national importance, and although, it is not directly linked to rural transport, if implemented, will enhanced NTRC’s capacity and complementary to AsCAP support. The plans for restructuring NTRC remain in draft stage and not yet finalized by Chief NTRC.

⁹ Source: 11th Five Year Plan, 2013 – 2018, Planning Commission, Pakistan, 2016

3.1.4 National Highways Authority (NHA)

The National Highways Authority (NHA) is a statutory body of the Ministry of Communications with the function of planning, developing, operating and maintaining the federal highways and roads (including the national highways, motorways, expressways and strategic roads). This forms a combined total length of approximately 12,100 km of roads, approximately 4.5% of the national road network (but a far greater percentage of vehicle kilometres travelled).

Therefore the NHA is principally responsible for federal roads and has no mandate for rural roads. For this reason it is unlikely that the NHA will play a significant official partnership role with AsCAP.¹⁰

3.1.5 Ministry of Climate Change

The Ministry of Climate Change was upgraded to a Ministerial Department c. 2013, but has been a functioning entity since the 1990s. Partially due to public pressure as a result of the aftermath of the national floods in 2010, and in order to deal with the complex environmental challenges facing Pakistan¹¹, acknowledgement of its importance has now been accepted. With limited funds, the Ministry of Climate Change plays mainly a facilitating and coordinating role with other economic sub-sectors such as agriculture, energy, water and transportation

Discussions with Ministry of Climate Change reflected a strong interest in conducting research in rural transportation - and its linkages with climate change mitigation is acknowledged. Therefore, the Ministry of Climate Change is a possible stakeholder to prospective AsCAP partnership, however, it is unsuitable to act as the lead organisation.

The Ministry of Climate Change informed that great advances have been made at the provincial level, particularly in Khyber Pakhtunkhwa, whereby reforms have been made in the rural transport sub-sector through the use of executive orders. Examples include construction of roads along the canal banks providing protection to irrigation systems and access to farmers and residents to socio-economic services. Additionally, through executive orders, the horizontal width of rural roads has been expanded from 12 to 18 foot and mandated to include shoulders, drainage and suitable camber. These examples have direct relevance to climate change mitigation and therefore cannot be regarded as being exhaustive of reforms conducted across the rural road sub-sector. Therefore, the ability of initiating, implementing, and embedding research is regarded as highly efficient at provincial level.

3.2 Provincial Government

Stakeholder consultations were conducted in the Province of Punjab therefore the list below presents the main stakeholders particular to Punjab. However the main government bodies (Planning and Development Department, Community and Works Department and the Transport Department) will be broadly consistent across all the provinces and as such their potential role with AsCAP will be broadly relevant for Sindh, Khyber Pakhtunkhwa, Balochistan and Gilgit - Baltistan.¹² Each province however will incorporate a particular set of private companies, universities, NGOs and civic organisations – some of the organisations outside Punjab in which we communicated but did not meet face to face are presented in the list below.

¹⁰ However the NHA has relevant capacity and equipment of which has the potential to contribute to AsCAP.

¹¹ This includes changing monsoon patterns, melting glaciers, seasonal flooding, rising sea levels and desertification.

¹² Rural road programmes such as the KPRRP will be particular only to Punjab.

3.2.1 Planning and Development (P&D) Department

The P&D Department is the main planning body at the provincial level, coordinating and monitoring development projects and programmes. The Transport Department, the Community and Works Department and Urban Unit are all subordinate entities to the P&D, taking directives and technical support from the P&D. The P&D prepares the Medium Term Development Framework (MTDF) for the provinces and maps the economic strategies and objectives for the province. In addition, the P&D Department is the main government agency that coordinates and works with foreign donors working in the provinces.

The P&D is responsible for planning and developing in the following sectors:

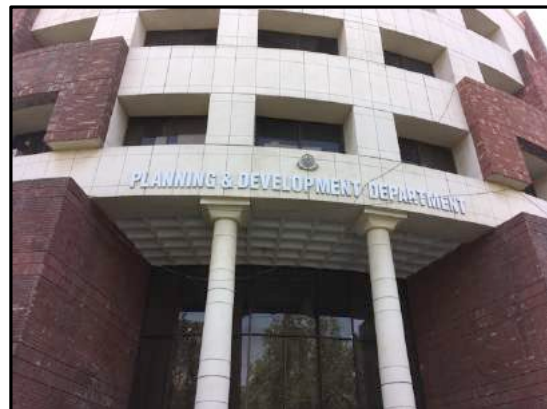
- Social (education, welfare, youth, gender)
- Services (I.T. transport, labour etc.)
- Production (agriculture, forestry, food, fisheries, mines, tourism etc.)
- Infrastructure (roads, energy, irrigation, public buildings, urban development etc.)

For Punjab province, the MTDF for period 2016 – 19 provides a significant focus on roads with a 'vision for Punjab's road sector aimed at upgrading, augmenting and maintaining a modern road network in the province under cost-effective, optimal and efficient development and management regimes'¹³. According to the MTDF the following funds have been allocated for roads development:

- 79.0 billion PKR (approximately US\$ 750 million) in 2016/17
- 86.0 billion PKR (approximately US\$ 820 million) in 2017/18
- 89.9 billion PKR (approximately US\$ 860 million) in 2018/19

The trend in allocations to roads for Punjab has increased significantly - from 2012/13 to 16/17 the allocation for roads has increased from 26.2 billion to 79.0 billion PKR, respectively, signifying a three fold increase over a four year period (or approximately 30% increase per annum). It is important to note that the above allocations are for development only (maintenance is not included) and includes provincial road (secondary roads) and urban roads, as well as rural roads. The P&D Department is the planning organisation managing the Khadam-e-Punjab Rural Roads Programme (KPRRP), with the Community & Works (C&W) Department as the executing agency. The KPRRP is the major road infrastructure programme in the province of Punjab and it has the objective of rehabilitating and constructing 20,000 km of rural roads by the year 2018 (see below).

At the provincial level the P&D Department is the appropriate body to partner with AsCAP as it is able to interact with foreign donors and agencies and implement research at the District level of government. Consultation with the P&D Department reflected a strong interest in potential partnership with AsCAP. The consultants of this report consider the P&D Department as a capable and suitable partner at the provincial level. The organisation (at least in Punjab province) include staff that are knowledgeable and exhibit strong interest in rural transportation issues. There is however no research unit embedded within the P&D Department that is rural transport focussed and therefore a significant capacity building initiative will be required to create such a research unit



¹³ Source: Medium Term Development Framework (MTDF) 2016 – 19, Planning and Development Department, Government of Punjab.

and ensure its continual survival beyond the duration of AsCAP support beyond 2020 (see Chapter 6 for further details on Capacity Building).

3.2.2 Community and Works (C&W) Department

The Community and Works (C&W) Department is the executing agency responsible for provincial roads including rural roads and bridges. The C&W Department is responsible for the design, tendering and supervision of road works whilst actual implementation is tendered to local contractors.

The C&W Department is currently the executing agency for the Khadam-e-Punjab Rural Roads Program (KPRRP) which has been the main rural road programme of the Government of Punjab since 2015. It is primarily focussed on rehabilitating extremely neglected and deteriorated roads – with 15,000 km for rehabilitation and a further 5,000 km envisioned as newly constructed roads. A Steering Committee has been constituted which will oversee and monitor the implementation of the KRPPR. There are strict criteria for selection of KRPPR roads including the following.

- No urban road under KPRRP
- Roads to be constructed to 12 foot pavement width and 24 foot formation width
- Entire road length must be taken up for construction / rehabilitation
- 30% earmarked for construction
- 70% earmarked for rehabilitation
- No rural roads less than 5 km shall be selected
- Only roads that have completed four years life cycle shall be considered for rehabilitation
- Distribution of funds for the KPRRP allocated through a formula based on Rural Union Councils

Phases I to III of the KPRRP are complete and have so far expended approximately US\$ 500 million with the entire budget coming from the Government of Punjab¹⁴ (no foreign assistance has been provided for KPRRP). Phase IV, which commenced in January 2017, is on going and set to continue upon previous commitments. The physical and financial performance of the KPRRP is presented in the table below.

Table 5 KPRRP Physical and Financial Performance

Phase No	No of Roads			Budget	
	Rehab	Construction	Length (km)	PKR (billions)	US\$ (millions)
Phase I (Apr 2015)	251	0	2,022	16.36	156.05
Phase II (Nov 2015)	118	33	1,570	16.80	160.24
Phase III (June 2016)	136	30	1,650	18.00	171.69
Phase IV (Jan 2017)	133	21	1,456	15.90	151.66

Source : Consultants estimates based on information provided by C&W.

Though significant resources have been allocated for the development (rehabilitation and construction) of rural roads – there is concern that maintenance is being neglected. It was difficult to ascertain current figures (i.e. expenditures or works conducted) for maintenance at a provincial level. However, in 2013 the allocation for routine maintenance in Punjab Province was approximately US\$650 per km¹⁵. There appears to be no effective Road Asset Management system

¹⁴ Source: Khadam-e-Punjab Rural Roads Programme, Brief, received from the Community and Works Department

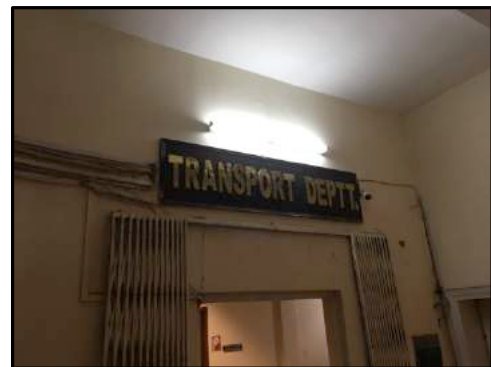
¹⁵ Source: Performance Evaluation Report, Punjab Road Development Sector Project, ADB, December 2013

(in fact this was an abandoned component of the ADB Punjab Road Development Sector Project), and there is a concern that the selection and prioritisation of roads are not being conducted on a methodology that identifies the most in-need communities. Across all stakeholders interviewed, including C&D Department, the concern that whole life cost management of rural roads as an asset is not being effectively implemented. This can provide some opportunities for focus on rural road research activities (see Chapter 5).

The C&D Department is focussed on the delivery of road works (rural and otherwise) and therefore road research is not their main concern. However, being the executing agency for road works, they would be willing to help conduct, pilot and adopt research findings emanating from AsCAP, particularly if the research is prescribed from the P&D Department.

3.2.3 Transport Department

The Transport Department is the subordinate organisation to the P&D Department and is responsible for the implementation of policies for the provision of affordable, comfortable and efficient transport services at the Provincial level, the development of transportation plans and initiatives (such as subsidies) and the fixation and regulation of public transport fares and tariffs. The Transport department directly enforces vehicle and driver registration and licencing, and the issuance of permits and payment of fees and taxes. The Transport Department is split into Regional Transport Authorities (RTA). Punjab Province contains four RTAs and there are further Unit Offices at the District Level that are directly involved in enforcement with service users.



The Transport department therefore is responsible for the smooth running of transport services at a provincial level and is keenly aware of the transport mobility, accessibility and safety issues perceived by residents. It is not however directly involved in the provision of transport services or conducting research. Therefore it could form as a stakeholder for future Pakistan and AsCAP collaboration but would not be the main responsible organisation.

3.3 Independent Organisations

Below is a summary of independent organisations that are relevant to rural transport research in Pakistan. ReCAP can only formally partner with Government department or agencies. Therefore the following institutions are more appropriate as a supporting role rather than the lead partnering entity with ReCAP.

3.3.1 The Urban Unit

The Urban Unit, formally known as Urban Sector Planning & Management Services Unit (Pvt.) Ltd., was first formed in 2006 as the Project Management Unit (PMU) of the P&D Department (Punjab). Since 2012, when it was converted into an independent company and registered with the Securities and Exchange Commission of Pakistan (SECP), it has transformed itself into a multidisciplinary organisation that promotes sustainable development of urban areas through 'shared data repository, international and local collaboration with research centres and donor agencies'¹⁶.

¹⁶ Source: Urban Unit, Holistic Solutions for Integrated Development, The Urban Unit, Urban Sector Planning & Management Services Unit (Pvt.) Ltd., September 2015

Though the name of the organisation and the glossy marketing material of the organisation imply that the focus of the unit is directed at urban areas and urbanisation, during face to face discussions we were informed that this was in name only and rural areas and economies remain within the disciplinary and functioning umbrella of the Urban Unit.

The Urban Unit currently has 360 employees, including over 300 professionals working in donor agencies, companies and departments. Some of the Urban Units' areas of expertise include:

- Urban planning and Architecture
- Urban Transportation
- Information and Communication technology
- Geographic Information System and Remote Sensing
- Environmental Management
- Institutional Development
- Monitoring and Evaluation
- Urban Economics and Municipal Finance

In terms of fiscal performance, the Urban Unit received 1,148 million Rupees (approximately US\$ 11.0 million). This combined with the over 300 highly skilled workforce of the Urban Unit places the institution in stark contrast to the NTRC.¹⁷ It is expected that the Urban Unit, with its impressively high technical capabilities and its status as an independently registered entity with the SECP, will remain interested in individual research initiatives emanating from AsCAP, either in partnership or with international companies.

3.3.2 National Rural Support Programme (NRSP)

Established in 1991, the National Rural Support Programme (NRSP) is the largest rural support programme in Pakistan in terms of outreach, staff and development activities. NRSP self describe as a 'Civil Society Organisation' with an overarching strategy to alleviate poverty by applying a positive and optimistic approach to rural issues¹⁸. The conceptual tools of the programme are 'social guidance' (recruiting local men and women who will take on a leadership role), advocacy, capacity building and awareness raising. They provide training, support, micro-credit, infrastructure development and natural resource management.

NRSP has a presence in 64 Districts in all provinces including AJK. NRSP is currently working with more than 3.1 million poor households organized into a network of approximately 200,000 Community Organizations. In the last 25 years they have implemented 35,000 Community Physical Infrastructure (CPI) projects with a cost of 7 billion PKR. They normally deliver CPIs through a process called 'Partnered Development' whereby a Village Development Plan (VDP) is developed and costs shared with the community. NRSP's budget, much of it received from the Pakistan Poverty Alleviation Fund (PPAF), is approximately 15 billion PKR per annum however most is distributed through microfinance facilities.

NRSP receive no public funds and is not government owned but according to their own words they are 'government backed' and 'bridge the gap between the government and the household'. The consultants of this Scoping Study are strongly of the opinion that the objectives and practices of the NRSP is highly correlated with AsCAP. Therefore the NRSP will likely be a major stakeholder of future

¹⁷ Source: Urban Unit, Holistic Solutions for Integrated Development, The Urban Unit, Urban Sector Planning & Management Services Unit (Pvt.) Ltd., September 2015

¹⁸ For example, during consultations with the NRSP, constraints, disadvantages and risks were repeatedly labeled as opportunities.

AsCAP involvement in Pakistan, whether as part of the Steering Committee or direct implementation of research activities.

3.3.3 Rural Development Policy Institute (RDPI)

Rural Development Policy Institute (RDPI) was established in 2003 and is a civil initiative formed of lawyers, researchers, journalists and development professionals. RDPI's objective is to stimulate public dialogue on policies and informing public action on issues pertaining to resource-poor rural communities in Pakistan. RDPI undertakes research, planning, advocacy and demonstration of pilot projects in the following key thematic areas.

- Disaster risk management
- Environment
- Adaptation to climate change
- Sustainable livelihoods
- Appropriate technologies
- Local governance
- Community media and
- Basic education

RDPI has to date conducted over 60 projects across eighteen districts and 250 villages covering all the provinces of Pakistan. RDPI will unlikely take any formal steering role with AsCAP but could decide to play a role conducting downstream research activities, particularly with respect to (Thematic Area) 3 crosscutting issues.

3.3.4 Sarhad Rural Support Programme (SRSP), Peshawar

Established in 1989 by members of the civil society, civil servants, academics, media and training institutions, the Sarhad Rural Support Programme (SRSP) is an NGO based on the Rural Support and bases its approach on community empowerment and economic and livelihood development. SRSP has been involved in implementing diverse support programmes including capacity building of community organisations leadership development across Khyber Pakhtunkhwa and FATA (with an emphasis on women's organizations), community driven housing programme after the earthquake of 2005, and community infrastructure projects such as drinking water and sanitation; irrigation; micro hydro electricity generation; link roads; housing etc. in different parts of the province.

Programmes of SRSP are mainly focused at

- Social mobilisation and local governance
- Community enabling infrastructure
- Humanitarian programmes
- Financial services
- Human resource development and vocational training
- Social sector, gender and development
- Value chain and enterprise development

With respect to AsCAP, SRSP will be a potential stakeholder and could form a member of the Steering Committee.

3.3.5 University of Engineering and Technology, Lahore

Established in 1921 as the Mughalpura Technical College, The University of Engineering and Technology acquired the status of university in 1962¹⁹. It consists of four campuses, seven faculties, twenty six teaching departments and affiliated colleges. At present the UET has approximately 11,000 enrolled students. There are two departments in the university working in field of Transportation Engineering and Planning. The Department of Transportation Engineering and Management (DTEM) currently provide courses and training in the field of Transport Engineering to approximately 320 students. The department has various dedicated laboratories²⁰. Prime areas of research include construction material, transportation engineering and planning, road safety, ITS and RAMS.

The Department of City and Regional Planning (CRP) was established in 1962 and offers degree programmes in the discipline of City & Regional Planning. Key research areas include housing, urban studies, transportation planning, environmental planning, rural and regional development, and community empowerment.

UET, Lahore, expressed keen interest to working with AsCAP and are highly suitable to conduct many of the research outputs that would emanate from AsCAP. The core areas of DTEM research and activity are highly correlated to infrastructure research (Thematic Area 1), and CRP more corresponding to transport services and cross-cutting issues (Thematic Areas 2 and 3).

3.3.6 Taxila Institute of Transportation Engineering (TITE)

The University College of Engineering Taxila was established in 1975 and achieved independent university status under the University of Engineering and Technology, Taxila in 1993. It is now referred to as the Taxila Institute of Transportation Engineering (TITE) and currently has approximately 2,000 enrolled students. TITE is a centre of excellence in the field of construction materials and highway safety. Formal partnership or Steering Committee membership is unlikely, however, TITE may have interest in downstream AsCAP research activity.

3.3.7 NED University of Engineering and Technology, Karachi

The NED University of Engineering & Technology, Karachi is the most relevant academic organisation to AsCAP in Sindh Province and is among traditional institutions in Pakistan for teaching and producing engineering graduates. The Department of Urban & Infrastructure Engineering (DUIE) is researching the emerging issues related to increased urbanisation, including urban road congestion and fatalities, urban water supply and sanitary problems, urban environment deterioration and informal settlement. The consultants of the Scoping Report did not meet the institute and the institutions involvement with AsCAP remains unclear.

3.4 Development Organisations

3.4.1 Asian Development Bank (ADB)

There have been two significant projects conducted by the Asian Development Bank (ADB) in the rural transport sector. In addition, ADB along with DFID Funding are conducting the on-going 'Enabling Economic Corridors through Sustainable Transport Development' project. These are discussed below.

¹⁹ Known then as the West Pakistan University of Engineering & Technology

²⁰ Geo-materials, Transportation Materials Improvement, Transportation Computer Aided Design, Asphalt and Concrete Mix Design, Transportation Engineering Basic, Traffic Engineering, Motor Vehicle Examination.

The North West Frontier Province (NWFP) Road Development Sector and Sub-Regional Connectivity Project included the objective increasing access of the rural population in NWFP and improving sub regional cooperation and trade with Afghanistan and Central Asian Republics. The ADB approved a loan of \$296.2 million equivalent from ordinary capital resources and US\$5 million from the ADBs Asian Development Fund (ADF). The project's objectives were to be achieved through policy reforms and institutional strengthening of the district and provincial road departments, improving approximately 700 km of rural roads, 200 km of provincial highways and approximately 300 km of national highways. The project commenced in 2005 with the executing agencies including the Works and Services Department (NWFP) for provincial and rural roads and the Ministry of Communication and NHA for the national highways. The project is now closed with approximately 77% of the works successfully completed; this includes approximately 763 km of roads (with regards to the Provincial Road Network only 456 km of roads could be rehabilitated)²¹.

The Punjab Road Development Sector Project was approved in 2002 with the aim of improving rural access through improved road network and increasing accessibility to markets and social services for rural populations, improving provincial highways to facilitate trade and support organisation reforms and institutional strengthening of the Punjab Communication and Works (C&W) Department, preserve the asset and infrastructure and improve road maintenance through a provincial road maintenance funding apparatus and increase private sector participation in the road sector. The project outputs were to include the rehabilitation of approximately 300 km of provincial highways and 1,100 km of rehabilitated and improved rural access roads. The total project cost was US\$ 261.6 million and was closed in 2009. With respect to performance, of the provincial highways, approximately 91% of the original plan (300 km) was completed, however, only 320 km of rural access roads (only 29% of the original target of 1,100 km) was complete. With respect to capacity building, important initiatives such as PPP initiatives, development of an asset management systems, road safety and axle load control and training were not initiated²².

3.4.2 Japan International Cooperation Agency (JICA)

There have been two significant rural transport projects conducted by JICA recently. These are summarised below.

The Sindh Rural Road Construction Phase II which commenced in 2008 was a 9.126 billion Japanese Yen project (equivalent to approximately US\$ 80 million in today's exchange rate) to reconstruct and/or rehabilitate rural road infrastructure in eight districts within Sindh (Dadu, Hyderabad, Jacobabad, Khairpur, Larkana, Shikarpur, Sukkur, Thatta) with Triple Surface Treatment (TST), which is a form of double surface treatment with a sand seal on to fill voids and applicable to high stress areas. The executing agency was the Works and Services Department, Government of Sindh and was completed in 2015. Evaluation of the project is to be conducted by external evaluation.

The Khyber Pakhtunkhwa Emergency Rural Roads Rehabilitation Project, agreed in 2011, aims to rehabilitate roads and bridges damaged by the floods in 2010. With total loan value of approximately 14.700 billion Yen²³ (equivalent to approximately US\$ 128 million in today's exchange rate) the project aims to rehabilitate three provincial roads with combined length of 163 km, 392 km of district roads and ten bridges. Works commenced in 2012 and the physical works of the project is almost complete (some bridges and shoulders of roads remain outstanding). The Communication

²¹ Source: Pakistan – Northwest Frontier Province Road Development Sector and Subregional Connectivity Project, ADB, Completion Report, November 2012

²² Source: Performance Evaluation Report, Punjab Road Development Sector Project, ADB, December 2013

²³ With a loan interest rate of 0.1 %, 30 year repayment period including ten year grace

and Works (C&W) Department, Government of Khyber Pakhtunkhwa, were the executing agency and local engineering contractors were awarded for contracts averaging five km in length.

3.4.3 World Bank

The World Bank has traditionally been supporting highway rehabilitation for example the Highways Rehabilitation Project (HRP). The World Bank through its multi-donor trust fund (including DFID as a donor) conducted some work for rural roads construction in Khyber Pakhtunkhwa, the Federally Administered Tribal Areas (FATA) and Balochistan. This work is mainly for emergency road rehabilitation and has been limited in support. With respect to community initiatives, the World Bank has been providing support (until 2015) to the Pakistan Poverty Alleviation Fund (PPAF) which was established by the government as a private entity and conducts poverty alleviation initiatives across the whole of Pakistan on the principles of Public-Private Partnerships (PPP). PPAF has provided resources for institutions such as the NRSP (see above).

3.4.4 Department for International Development (DFID)

DFID has been active in the rural transport sector, however, usually in collaboration with other development partners. As stated above, DFID has been involved with the World Bank through its multi-donor trust fund with emergency road works in Khyber Pakhtunkhwa, Federally Administered Tribal Areas (FATA) and Balochistan. Currently ADB with assistance from DFID funding is conducting the 'Enabling Economic Corridors through Sustainable Transport Development' project. The project is on-going and has four main components, including the following.

- National Transport Policy in line with Pakistan's Vision 2025 document
- National Transport Master Plan, which will be consistent and complementary to the National Transport Policy. The Master Plan will recommend both hard (road, rail, aviation, ports and shipping, urban transport, inland transport and pipeline) and soft infrastructure (e.g. legislation, capacity building etc.)
- Road Safety, this component will include both urban, national and rural road safety (this component is the only component that has any rural dimension)
- Road Asset Management of both the national and provincial highways

Therefore DFID involvement in rural transportation has been limited and AsCAP would raise DFID's profile in the sub-sector. In addition it is recommended that AsCAP partnership in Pakistan does not overwhelmingly focus on road safety research as this component is being covered in the Enabling Corridors project, however, the road safety component of the ADB/DFID funded project should be coordinated with AsCAP and disseminated appropriately.

3.4.5 USAID

In 2005 US AID provided support for the Pakistan Earthquake Reconstruction Programme, a US\$ 120 million reconstruction initiative aimed at rebuilding damaged health centres and schools over a period of five years. In 2011, this was extended with a further US\$17 million funding for building schools. The focus of the Pakistan Earthquake Reconstruction Programme was not the rehabilitation of rural roads, however.

USAID indirectly supports rural road development research by providing grants to universities. For example US AID provided US\$ 2 million support for the Asphalt and Concrete Mixed Laboratory at the UET Lahore. This funding allows the institution to procure specialist equipment such as the Single Wheel Tracker and projects to improve pavement life such as the 'Implementation of Superpave Binder and Asphalt Mix Specification to Improve Pavement Performance in Pakistan'. Though the main objective of such initiatives is the improvement of strategic highways, the knowledge is transferable to rural roads development. The support from USAID (US\$2 million) is

proportionate to the support on offer from AsCAP and is wholly targeted at innovate methods of sealed road construction and improving pavement performance. For this reason it is recommended that AsCAP support for Pakistan should focus on other areas of research in infrastructure and services. Nevertheless, the findings and recommendations of such projects should be coordinated with AsCAP and disseminated as appropriate.



Asphalt and Concrete Mixed Design Lab, UET



Single Wheel Tracker

3.4.6 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has historically been providing support for the Balochistan Rural Support Programme (BRSP), an autonomous non-profit organisation that was set up as far back as 1984. The BRSP continues as an organisation, however, GIZ (then know GTZ) withdrew its support in 2001. The scope of support from BRSP is multi-sectoral and covers rural infrastructure (including roads) but also social services, helping marginalised and people with disabilities, providing microfinance and microfinance advice, IT and communication and gender mainstreaming initiatives.

4 Pakistan's Partnership with ReCAP and AsCAP

4.1 Viability

There is no doubt that a partnership between Pakistan and ReCAP and AsCAP is viable and extremely beneficial. There have been significant research activities that have been conducted in Pakistan independent of AsCAP. These have included research being conducted by academic institutions such as the University of Engineering and Technology in Lahore, Karachi and Taxila, the NRSP and the RDPI as well the NTRC and the P&D Department (In Punjab). Apart from the Road Surfacing design laboratories that are existent in university institutions such as Lahore and Taxila, research in rural transport infrastructure and services has not benefited from any sustained support. It is recommended that a partnership between AsCAP and Pakistan be established as soon as practicable. The sensitive issue is the structure of the relationship, and specifically, the main organisation responsible for overseeing AsCAP research.

4.1 Partnering Entity

Since the passing of the 18th Amendment of the Constitution, powers with respect to the planning, management, construction, operation and maintenance of roads falls under the jurisdiction of the Provincial Governments. In addition, the provinces have further powers with respect to local roads; they have revenue-raising powers and are able to levy tolls on road users and even levy and collect taxes on exportation.

For this reason, there are two options for AsCAP partnership; the federal option and the provincial option. Both options - their advantages and disadvantages are discussed below.

4.1.1 The Federal Option – NTRC

The NTRC is the most pertinent transport research organisation operating at the federal governmental level and therefore their role as the lead authority responsible for AsCAP research is among the main options. Partnership could be established between AsCAP and the NTRC, or alternatively, considering the Ministry of Communication (MoC) is the parent organisation of the NTRC, it is possible to structure the official partnership entity with the MoC with the beneficiary remaining the NTRC.

As stated in the previous chapter, the organisation has, in the past, been at the forefront of transportation research since the 1970's. However their rural road research activities have declined particularly since the passing of the 18th Amendment in 2010. This has been reflected in the decline in the number of research publications with respect to rural roads.

On the other hand the NTRC is in the process of an ambitious business plan that has the potential to revive the institution. In addition, the senior management of the NTRC are highly qualified, motivated and are pursuing the challenges facing the NTRC in a practical manner. Despite this however, there does remain a concern that the focus of the NTRC remain fixed on macro level planning and research. In addition, their provincial reach in terms of influence, understanding and the practicalities of operation in the district communities is restricted.

In order to mitigate these two issues, it has been suggested that a steering group be formed which would comprise each of the five provinces, perhaps the P&D Department of each province (and perhaps implementation of specific projects conducted by the provincial governments). Though this set-up would provide a voice in the form of representation, the strength of influence the provincial steering group members would be able to wield remains uncertain.

From another perspective, the fate of NTRC should be considered in the absence of partnership with AsCAP. Stakeholders have informed that it is unlikely the NTRC would collapse, and it would at minimum continue on the current trajectory and maintain its macro planning orientation.

4.1.2 The Provincial Option – P&D Department

The second option is to establish a partnership at a provincial level. Upon discussing with stakeholders in the province of Punjab, it was concluded that the P&D Department would be the most appropriate institution. The P&D Department is the parent organisation of the C&W Department (which is the executing agency of road work related development and maintenance) and the Transport Department. The P&D Departments have a first hand understanding of the issues facing rural communities with respect to transport infrastructure and services. They will be able to reach into the rural communities through the District Governments and into the Union Councils, and would be able to conduct research from a practical perspective with the assistance of the C&W and Transport Department.

The downsides of partnership with the P&D Department is that research will unlikely represent all of Pakistan and instead focus on one of the five provinces. However it is normal practice for Development Partners, such as the ADB and JICA, to sign with provincial departments (for example with P&D or C&W through the EAD, see below) on initiatives relating to rural access roads. Therefore this approach would not be regarded as an irregularity or inconsistent with current practices. In addition, Pakistan is a large country with a population of approximately 188 million (World Bank, 2015) – making it more populous than any other ReCAP country. Punjab alone has a population of almost 100 million and only Nigeria and Bangladesh are more populated. Therefore the issue of representation is perhaps not an overwhelmingly strong argument.

If partnership is established at the provincial level, the key question is which of the five provinces presents the most appropriate set of opportunities and the least set of risks? In order to consider this question a brief analysis based on basic indicators has been conducted. The indicators that are considered are listed below.

- Road coverage - the number of persons per kilometre of road length (including all provincial roads such as provincial highways, district roads and municipal roads).
- Poverty Levels – based on the Human Development Index (HDI) which forms a combined score based on life expectancy, literacy and school enrolment and provincial product (analogous to GDP for sovereign nations) has been applied (the higher the HDI the lower the level of poverty).
- Security Risk – based on the United Kingdom Foreign and Commonwealth Office (FCO) warning for Pakistan. The warnings are broadly based on ‘advice against all travel’ and ‘advice against all but essential travel’. If any locality in a province has a warning against it, the entire province is labelled accordingly.
- Development Assistance - the level of development assistance in the rural roads sub-sector since 2010

Table 6 Analysis of Provinces (Road Coverage, Poverty levels, Security Risk, Development Assistance)

Province	Persons per kilometre of road	Poverty (HDI)	Security Risk	Development Assistance (since 2010)
Balochistan	443	0.46	Against all travel	World Bank (minor)
Gilgit - Baltistan	905	unknown	Against all travel	N/A
Khyber Pakhtunkhwa	624	0.51	Against all travel	JICA
Punjab	846	0.54	No warning	N/A
Sindh	678	0.57	All but essential travel	JICA, ADB

Source: Population (Wikipedia, https://en.wikipedia.org/wiki/Administrative_units_of_Pakistan), Network Size (NTRC, 2014/15), Poverty (Institute for Policy Reform, 2015), Security Risk (UK Government, <https://www.gov.uk/foreign-travel-advice/pakistan>), Donor Assistance (consultants understanding based on stakeholder consultation)

Based on the above information, the below appraisal analysis has been conducted. Population, network size and poverty represent the opportunities for AsCAP partnership. The higher the population and the lower the road network size and Human development Index (HDI) the greater the need for rural road research (and the higher the potential benefits). The level of security risk represents the constraints of operating inside the country. In addition donor involvement is an issue of fairness and equity. A score of '3' (green coloured in table below) is allocated for a positive contribution to / from the provinces' partnership with AsCAP, and a score of '2' for moderate (yellow coloured in table below) and '1' for poor, (red coloured in table below) respectively.

Table 7 Appraisal of Province and Suitability to AsCAP (high score and green represent highest score)

Province	Persons per kilometre of road	Poverty (HDI)	Security Risk	Development Assistance (since 2010)
Balochistan	1	3	1	2
Gilgit - Baltistan	3	2	1	3
Khyber Pakhtunkhwa	2	2	1	1
Punjab	3	2	3	3
Sindh	2	2	2	1

Source: Consultants' analysis

Based on the analysis the Province of Punjab scores most favourably. This corroborates with discussions with stakeholders, whereby most recommended Punjab. Other provinces that were recommended, though with fewer nominations included Khyber Pakhtunkhwa and Balochistan. However, the analysis conducted above should only be considered as a guide. Although Balochistan

scores poorly with respect to the Road Coverage indicator, if measured in terms of Road Density (kilometres of road length per square kilometre of land area), it would score highly with respect to opportunities for AsCAP support. The Poverty Level indicator does not consider rural poverty specifically and does not take into account inequalities of human development. The Security Risk indicator is a coarse indicator in the sense that there are islands of stability (or instability) in a province. The Development Assistance indicator does not consider the measured impact of previous donor involvement.

4.2 Steering Committee

It is recommended that ASCAP in Pakistan form a national Steering Committee (SC). The role of the SC is critical for the continued viability of the AsCAP programme and among the tasks required include; periodic meetings to provide advice, settle disputes, make management decisions, monitor the quality of the project, provide support, guidance and oversight, and nominate members to attend regional Steering Group meetings in Asia. The SC will also be fundamental during the final periods of AsCAP involvement in Pakistan when the focus will turn to succession planning.

The structure of the Steering Committee (SC) is presented below and dependent upon the Partnering Entity Option (see above).

Table 8 Steering Group Options

Option	Federal	Provincial
Chair	NTRC	P&D Dept. (of Province)
Members	<ul style="list-style-type: none"> • Ministry of Communication • NHA • Planning Commission • P&D Govt. of Punjab • P&D Govt. of Sindh • P&D Govt. of KPK • P&D Govt. of Balochistan • P&D Govt. of Gilgit-Baltistan • P&D FATA • NRSP 	<ul style="list-style-type: none"> • C&W Dept. (of province) • Transport Dept. (of province) • Civil Organisations and NGO's (e.g. NRSP, RDPI, SRSP etc.) • Public Sector Companies (e.g. Urban Unit) • Universities (e.g. UET Lahore, TITE, NED Karachi etc.)

Before members official join the national SC it is important to define their role and responsibilities, and also in the case of the non-governmental entities (such as the universities, civil society groups and companies), the consequences and restrictions of conducting downstream research outputs should be clearly communicated. Some organisations may consider that they are more appropriate to conduct AsCAP research rather than manage, monitor or steer AsCAP's direction in Pakistan.

4.3 Economic Affairs Division (EAD)

Another important issue is that any partnership with an external (to Pakistan) Development Bank must be structured through the Economic Affairs Division (EAD). Discussion with stakeholders have informed that all the above institutions, the NTRC, the P&D Departments and the Planning Commission have the constitutional permissions of forming an agreement with the EAD through external funding. However, DFIDs past relationship and historic transactions with the EAD has hitherto not been explored.

5 Research Areas and Topics

Recommendations for research areas and topics were solicited during consultation with local stakeholders. Below is a summary of research topics and outline of objectives proposed by national stakeholders. Because all the research topics emanate from local stakeholders the initiatives can be regarded as demand led. A tentative cost has been estimated for each output and because the combined cost of all research outputs exceeds the c £0.5 million available for AsCAP support in Pakistan, a prioritisation has been conducted. However, as the option and structure of AsCAP – Pakistan partnership remains unresolved (see Chapter 4), the list may require amendments and the prioritisation reconfigured in order to reflect the requirements of the partnering and lead organisation. Capacity building and dissemination options and strategies are presented in Chapter 6.

5.1 Thematic Cluster 1: Infrastructure

5.1.1 Standardised Specifications for Rural Road Development and Maintenance

There are currently no standardised specifications for the development of rural roads and bridges and practitioners are referring to the American Association of State Highway and Transportation (AASHTO) and Design Manual for Roads and Bridges (DMRB) guidelines. The problem is that AASHTO and DMRB are international guidelines for high volume roads such as highways and include recommendations that are high cost and unsuitable for rural roads. Therefore stakeholders have advocated that AsCAP assist in the development of Standardised Specifications for Rural Road Development and Maintenance. The research should consider some of the following issues to road design and maintenance.

- Classification of roads and geometric designs
- Environmentally Optimised Design (EOD) including pavement options (e.g. unsealed, bituminous or concrete pavements) and technical specifications taking into account traffic and local environment (climate, topography, materials, local labour etc.)
- Road and shoulder widths
- Design of roads that protect and mitigate against impacts of current and future climate
- Structural strength recommendations
- Maintenance (routine and periodic) treatments and intervals
- Pavement design life, Whole Life Costs (WLC) and estimated residual asset valuations for the various designs
- Development of a Traffic Management Plan during road construction
- Guidelines on Environmental and Social Management Plans

It is estimated that the cost of the research will be £130,000 (no data collection costs are anticipated).

Table 9 Tentative Cost for Standardised Specifications for Rural Road Development and Maintenance

Component	Cost (UK£)
Standardised Specifications for Rural Road Development and Maintenance	130,000
Total	130,000

Source: Consultants' estimates

5.1.2 Rural Road and Bridge Inventory

The provinces lack a systemised, updated, complete and mapped road inventory of the rural road network. Such an inventory would be of great benefit to optimised network management with

expressed interest from (provincial government) P&D Department, C&W Department, and (federal government) NTRC.

Based on a fixed cost of database development and simple equipment, and variable cost of data collection and GIS mapping roughly proportionate to the size of the rural network, a proportionate cost for the development can be estimated. Considering the large network in Pakistan (the national road network is over 260,000 km including 90,000 km of district roads) a road inventory of the entire country's rural road network would likely consume the majority of the ReCAP budget and would require extremely good cooperation between the provinces at a district level.

At a provincial level a basic geographic road inventory system developed by remote sensing analysis could be feasible in Punjab and Sindh for approximately £350,000 and £300,000, respectively, meanwhile for KPK and Balochistan it would be possible to develop a basic system for approximately £200,000. The specifications of the inventory would include GIS with basic information of the road (name, surface type, previous treatment / interventions) recorded. To successfully conclude such a project, significant assistance from local district engineers with intimate knowledge of the roads under their jurisdiction would be required.

Table 10 Tentative Cost for Rural Road Bridge Inventory

Province	Cost (UK£)
Punjab	350,000
Sindh	300,000
KPK	220,000
Balochistan	190,000
GB and AJK	130,000
Pakistan	1,190,000

Source: Consultants' estimates

It is important to note that under the ADB (including DFID funding support) 'Enabling Economic Corridors through Sustainable Transport Development' project a Road Asset Management System (RAMS) is being developed that will incorporate the national highways and strategic provincial roads. Though the specification of the aforementioned project will be more sophisticated for a shorter infrastructure length (though more expensive on a per km basis), such an initiative would include mutual synergies.

5.1.3 Planning and Prioritisation of Rural Roads

There is a concern that rural roads are developed and maintained in a non-equitable and non-participatory manner. One stakeholder succinctly commented "in Pakistan roads are built over the heads of people and not on the ground". Though large rural road programmes such as the KPRRP in Punjab is based on a District share of Union Councils, many stakeholders and beneficiaries informed that the decision for intervention is highly politicised. There is therefore significant room for improvement in rural road project inception and preparation.

Therefore to provide fairness, impartiality and maximise economic and poverty reduction benefits of road development, a systematic road planning and prioritisation methodology be developed. Such a concept is already being considered in P&D Department of Punjab through the concept of 'Infrastructure Score cards', which has been conceptualised by the Punjab Economic Research Institute. This concept can be evaluated and taken forward if appropriate. In addition the updated planning and prioritisation method should ensure complementarity with the rural road and bridge inventory (see above). The research activities / objectives should:

- identify the current processes of road prioritisation and its strength and weaknesses;
- propose a list of indices based on socio-economic and technical data that can be used for appraisal;
- develop an appropriate economic and road prioritisation methodology for rural roads;
- design and develop appraisal and prioritisation tools;
- development of a manual for rural road planning and appraisal and prioritisation; and
- provide training for practitioners in the use of the updated planning and prioritisation tools and manuals

It is estimated that the cost of the output would be approximately £75,000. This includes a budget of £5,000 for the development of planning and appraisal tools.

Table 11 Tentative Cost for Planning and Prioritisation of Rural Roads

Component	Cost (UK£)
Planning and Prioritisation of Rural Roads	70,000
Planning and Appraisal Tools	5,000
Total	75,000

Source: Consultants' estimates

5.1.4 Axle Load Enforcement Regime for Rural Roads

According to recent reports, freight vehicle overloading is leading to roads deterioration resulting in an annual economic loss of 240 billion PKR (approximately US\$ 2.3 billion) and equivalent to 6.8% of GDP²⁴. Evidence of vehicle overloading is further evidenced by the findings of an axle load study conducted in 1995 that estimated an 88% of trucks are loaded above the designed limits of 8.2 tons and 43% above the axle load limits of 12 tons²⁵. This is further reinforced with stakeholder discussions transport officers operating at the District level of government who inform that though regulations are in place for issuance of permits and limits of loading and fines known as 'challans', it is extremely difficult to enforce and most often the infrastructure is not in place to measure effective overloading and the relatively rare cases of enforcement mean that freight operators have internalised the cost of fines in their operating business models.

Therefore, there has been a fast growing concern for finding out the root causes of pavement failure and introducing the effective and innovative measures in prevalent specifications and the design practices. It is therefore recommended to conduct research on axle load enforcement regime for rural roads in Pakistan. The research should aim to cover following tasks.

- Research to quantify damaging effects of overloaded heavy vehicles on rural roads
- Research into international best practices on sound and sustainable control regimes
- Development of an updated over updated axle load regime in Pakistan including vehicle types and limits, recommended instruments for measurements
- Exploration of impact on import and export vehicles and customs regulations
- Viability of introducing private operation of weighbridges and/or community regulation
- Development of awareness raising campaigns for local communities to educate about damaging effects overloading and the impact premature roads failure

²⁴ Source: Abduhu, S. 2016. Trucks overloading: road sector inefficiency causing 240b loss. The Nation. <http://nation.com.pk/business/28-Feb-2016/trucks-overloading-road-sector-inefficiency-causing-rs240b-loss>.

²⁵ Source: National Transport research Centre (NTRC), 1995

- Development of heavy vehicle management guidance and standards (especially focusing on locally manufactured and customised freight vehicles)
- Development of national standards and specifications for freight vehicles including permissible weight limits
- Development of strategies and frameworks to initiate and enforce axle load control on rural roads
- Economic and financial appraisal of the benefits and costs
- Investigation of the legal framework regarding overloading, penalties, permit issuance and inspection and exploration of amending laws so that local officers are empowered to enforce an updated overload control regime

It is estimated that the cost of an initial overview research programme will be £80,000 (no data collection costs are anticipated).

Table 12 Tentative Cost for Axle Load Enforcement Regime for Rural Roads

Component	Cost (UK£)
Axle Load Enforcement Regime for Rural Roads	80,000
Total	80,000

Source: Consultants' estimates

5.1.5 Participatory Approach to Rural Road Planning and Development

Devolution and decentralisation in Pakistan is confirmed in the country's constitution and engrained in the political cultural of the nation. This allows District Government significant autonomy in executing road works. However, there remains a perception of disempowerment with respect to the planning and implementation of rural road infrastructure and services. The standard practice is that roads are planned, prioritised, built, managed and (when) maintained without any participation from local beneficiaries.

Development of participatory approaches in the rural road sub-sector has been recommended as a research area by stakeholders in Pakistan. Exploratory experimentation using participatory approaches has been conducted by the NRSP through a process called 'Partnered Development'. Partnered Development develops infrastructure in the community through Village Development Plans (VDP). The VDP defines a list of infrastructure needs for the village, budgets and agreements for cost sharing (normally villages contribute 20% of the costs, either through cash or labour), with basic monitoring and evaluation activities integrated to ensure that the project objectives are positively realised. In VDPs 3-5% of the project cost is held back for operation and maintenance. In addition to the VDP approach, the University of Engineering and Technology, UET, Lahore, has conducted research into the viability of Citizen Community Boards, whereby projects are identified by the local community and funding is shared between public sector funds and the community (also on an 80:20 ratio basis).

Considering the previous initiatives in Participatory approaches in Pakistan, the objective of the AsCAP research should focus on evaluating the recent experiences, highlighting success and failures, incorporating international best practices and developing an action plan for institutionalising participatory approaches in Pakistan. The research should combine the skills of local and international experts and is estimated to require a budget of £60,000. No data collection or equipment or software costs are anticipated.

Table 13 Tentative Cost of Participatory Approach to Rural Road Planning and Development

Component	Cost (UK£)
Participatory Approach to Rural Road Planning and Development	60,000
Total	60,000

Source: Consultants' estimates

5.2 Thematic Cluster 2: Transport Services

5.2.1 Scoping Study for Community Pooled Transport Vehicles

Transport ownership in rural areas is extremely low – even in relatively affluent villages like Mir Mohammad (see Chapter 2), private car ownership is less than 5% and motorcycle ownership approximately 30%. That leaves the majority of residents reliant on expensive (on a distance basis) Qingcis. Stakeholders have proposed an initial scoping study on the potential for community pooled transport vehicle ownership - a concept commonly known as ‘car-sharing’²⁶ in the industrialised world. Community pooled transportation allows a group (e.g. village, a cluster of villages, or members) to pool resources for the purchase or lease of a vehicle (e.g. car, or a form of intermediate transport vehicle), insurance, tax and maintenance. The study should investigate the following issues.

- Outline necessary requirements to establish a successful community pooled infrastructure scheme.
- The characteristics of a village most (and least) likely to successfully implement community pooled transportation.
- The members or residents that would benefit most (and least) from such an initiative.
- The vehicles best suited to community sharing.
- Outline possible business models for community sharing.
- Possible management options (of the asset), including conflict and dispute resolution. Rules on time of day use, duration of use, distance from village.
- The potential for increasing female participation (directly through ownership and indirectly as users).
- Vehicle storage and parking.
- Overall assessment of viability and recommendations on the design of a pilot scheme / further research.

The cost of conducting the scoping study is estimated to require a budget of approximately £85,000.

Table 14 Tentative Cost for Scoping Study - Community Pooled Transport Vehicle Ownership

Component	Cost (UK£)
Scoping Study – Community Pooled Transport Vehicle Ownership	80,000
Scheme pilot and data collection	5,000
Total	85,000

Source: Consultants' estimate

5.2.2 Potential for Rural Demand Responsive Transport (DRT)

The mobility of rural residents is constrained because of the limited supply of public transport services. As a result residents do not have access to transport at a convenient location, time, mode

²⁶ Although car-sharing in developed countries has a wide array of applications.

and price combination. Demand Responsive Transport (DRT) can be defined as a “form of transport where day-to-day service provision is influenced by the demand of the users” (Commission for Integrated Transport, UK, 2008). In this respect a form of transport service that can be tailored to individual needs of the rural populace can be of great benefit and (DRT) has hitherto not been tested at the rural level.

Research into the viability and design of DRT tailored to local Pakistan rural communities has been nominated by stakeholders as a potential research output of AsCAP. The research can investigate the nature of the accessibility constraints including the uncertainty, long waits, high financial costs, personal safety issues and social exclusion (especially for the disabled and females) as a result of the market inefficiencies in mainstream transport provision. An analysis into the types of vehicles most appropriate for DRT (private cars, QingQi, bicycles, motorcycles etc.) and technology platforms for allocating a customer to operator – with respect to the latter, horizon scanning of the emerging future technologies (smartphone application based versus traditional methods). Recommendations of the level of flexibility of the DRT scheme (fully flexible, i.e. door to door, to less flexible, i.e. semi schedule routes and feeder services) can be further investigated. The research could investigate the financial costs and identify the likely subsidy required, as well as the economic benefits of a scheme. Development of monitoring and evaluation indicators for measuring prospective schemes should be recommended. It is recommended that the research be piloted in one location over a twelve month period (duration optional). It is estimated that the research output will cost approximately £170,000.

Table 15 Tentative Cost for potential of Rural Demand Responsive Transport

Component	Cost (UK£)
Potential for Rural Demand Responsive Transport (DRT)	140,000
Scheme pilot and data collection	30,000
Total	170,000

Source: Consultants’ estimate

5.2.3 Farm to Export Transport Strategy Through Networked Small Scale Cool Rooms

The Enabling Economic Corridors through Sustainable Transport Development project (funded by ADB and DFID) is developing a National Transport Policy and National Master Plan, which is consistent with the Vision 2025, and Pakistan’s aim of harnessing the natural resources of the country and establish Pakistan as the breadbasket of Central Asia. There is an objective of increasing the value of exports to US\$150 billion by 2025²⁷. Much of this is export growth is expected to derive from agricultural produce. However this remains a challenge considering the accessibility problems of transporting produce through the ‘first mile’ and into mainstream distribution channels.



Some of the issues include extremely poor road infrastructure linking the farm to the village and the village to the town, no warehousing facility at an intermediate level for small scale farmers to store

²⁷ Pakistan 2025 – One Nation – One Vision, planning Commission, Ministry of Planning, Development and Reform

their produce, poor availability of inputs and spoiling of perishable harvested produce due to a lack of cool space storage facilities. These problems are not unique to Pakistan, according to the UN's Food and Agricultural Organisation, up to 40% of the world's farm produce is wasted before it reaches the market or consumed. This problem is more acute in the case of a large number of fragmented small-scale farmers that lack finance and technology to overcome such challenges.

Therefore research that analyses the current issues facing small and intermediate size farmers as well as developing a farm to storage to export strategy should be the main objective of this research. The activities of the research should include the following²⁸.

- Analysis of famers profile with respect to the size and type of goods produced, transport means, equipment, resources and finance available
- Analysis of the proportion and quantum of agricultural produce for home consumption, domestic consumption, export as well as the proportion of food spoilage due to lack of storage facility
- Analysis of vehicles used in the transportation and distribution of agricultural produce
- Viability of a networked cool room facilities for optimised logistical distribution of perishable farm produce
- Development of a financial model and pricing structure for the cool room facilities
- An economic and financial appraisal taking into consideration the benefits and costs to the farmer and the transport operator
- Estimation of possible subsidies and investigation into credit facilities

It is estimated that the research output will be approximately £85,000 and this includes approximately £15,000 allocated for agricultural surveys.

Table 16 Tentative Cost for Farm to Export Transport Strategy Through Networked Small Scale Cool Rooms

Component	Cost (UK£)
Farm to Export Transport Strategy Through Networked Small Scale Cool Rooms	70,000
Data Collection (Agricultural Survey)	15,000
Total	85,000

Source: Consultants' estimate

5.3 Thematic Cluster 3: Cross-Cutting Issues

5.3.1 Gender Mainstreaming Strategies in Rural Transport

Pakistan ranks 130th out of 188 countries in the Gender Inequality Index (GII)²⁹. This general macro level imparity is manifest in the lack of opportunities and evident in the barriers for female participation in the provision of transport infrastructure and services. For example female involvement in the transport construction sector is minimal and though basic transport services exist in rural areas, there is anecdotal evidence that the opportunities to benefit from such options differ between males and females. Therefore research in gender mainstreaming will provide an opportunity in improving the lives of female rural citizenry.

²⁸ The output could also include the design of cool room facilities (temperature, size, power source etc.) to cater for the volume of goods per farmer / village, types of goods distributed and the types of vehicles transported to and from the facilities. However this would be regarded as outside the scope of ReCAP and therefore support would be required trough partnership with alternative sources of funds.

²⁹ Source: Human Development Report 2015, The United Nations Development Programme, 2015

It is recommended that the research investigate the role of women in the transport value chain – including the planning and design of road infrastructure and services, the construction sector, the transport operator sector and the final link in the chain – female users of transport infrastructure and services. The research should highlight opportunities for greater female engagement – either in presenting initiatives that have the capacity to transform institutions that deliver or support transport infrastructure and services or providing women to fully capitalise upon existing opportunities. The project should also take into account the practical and cultural constraints of gender mainstreaming strategies in Pakistan.

It is recommended that the research conduct the following tasks:

- Data collection of female involvement in the transport sector
- Focus Group Discussion (FGD) of female villagers
- Semi-structured interviews of stakeholders (transport executing agencies, transport construction companies, consultancy companies, transport operators)
- Highlight potential change in female participation and the transformative effect through engagement
- Design of a public transport service (e.g. QingQi) that is particularly targeted to the female section of the rural population (this includes strategies for recruiting female drivers, financial and economic implications, costing and subsidy strategies, communication strategies)
- Potentially piloting the transport operator scheme and monitoring and evaluating the results and impacts. Highlighting lessons learnt and an outline scale up strategies

It is estimated that the cost of research is approximately £120,000, including £10,000 for data collection and £10,000 for scheme pilot.

Table 17 Tentative Cost for Gender Mainstreaming Strategies in Rural Transportation

Component	Cost (UK£)
Gender Mainstreaming Strategies in Rural Transport	100,000
Data Collection	10,000
Pilot of Public Transport Scheme	10,000
Total	120,000

Source: Consultants' estimate

5.3.2 Socio-economic Impact Evaluation of Rural Roads Projects

Although this research is selected with the example of the KPRRP (Punjab province) in mind –a socio-economic evaluation could be conducted in any province where there are on-going rural road construction / rehabilitation.

Considering the ambitious KPRRP programme in Punjab in which over 20,000 km of roads will be rehabilitated and built there is a need for systematically measuring the impact of the projects on local rural residents. Stakeholders have informed that no comprehensive socio-economic impact evaluation of the KPRRP has taken place. The benefits of rural transportation in relieving poverty are well documented³⁰. The potential benefits of schemes such as the KPRRP on raising rural household

³⁰ Source: Hine J, Abedin M, Stevens RJ, Airey T, Anderson T (2016) Does the extension of the rural road network have a positive impact on poverty reduction and resilience for the rural areas served? If so how, and if not why not? A systematic review. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London.

incomes, increasing accessibility to all sections of society, increasing the diversity and quantum of agricultural products, increasing the employment rates in both agricultural and manufacturing sectors should be assessed. Favourable outcomes should be disseminated in order to raise the profile of the rural road sub-sector and in turn attract greater political focus. Disappointing outcomes should also be disseminated so that planners and road designers can learn from mistakes.

It is recommended that a quasi-experimental (also known as double – difference) methodology to the socio-economic evaluation be conducted. Given that prospective AsCAP involvement in Pakistan covers a period of three years, it is recommended that this research be among the first to be initiated, starting with a series of baseline of socio-economic conditions before a KPRRP selected roads are improved in 2017 / 18 (including control roads, i.e. roads not improved), and an impact evaluation survey of the same roads conducted three years later to allow for outcomes and impacts to realise within the community.

It is estimated that the cost of implementing a socio-economic evaluation of a rural roads project in Pakistan will require a budget of £210,000. This will include £40,000 for data collection costs (traffic counts, road side interviews and household surveys).

Table 18 Tentative Cost for Socio-economic Impact Evaluation of Rural Roads Projects

Component	Cost (UK£)
Researcher fees for Socio-economic evaluation	170,000
Data Collection	40,000
Total	210,000

Source: Consultants' estimates

5.3.3 Political Economy Analysis of the Rural Roads Sub-Sector

Stakeholders unanimously account that 'roads are complicated'. There are many competing vested interest groups and the voices of beneficiaries are often crowded out. This is perhaps more of an issue with respect to rural roads whereby the road infrastructure is often the major form of investment and the collective power of residents weak.

A Political Economy Analysis (PEA) specific to the rural road sector will present an overview of how interests and incentives of the main protagonists with respect to rural infrastructure affect policy outcomes, and prioritisation procedures for roads and the opportunities and constraints they present to development.

The PEA for the rural road sub-sector in Pakistan should cover the following important issues.

- Exploration of the role of formal stakeholders (from federal to union council) and informal actors. Their competing interactions and the impact upon rural road infrastructure and services. Mutually beneficial and creative solutions should be identified to advance development in the rural road sub-sector.
- Examination of the cultural, religious and kinship values that form policies and define outcomes in the rural road sub-sector.
- Investigate how policies and actions can be better designed that complement progressive and productive elements.

- Form a comprehensive understanding of the legal framework with respect to rural road infrastructure and services and define strategies, processes and guides to enact and enshrine innovative research into law.
- Identify ingrained, inflexible and obdurate conditions in the bureaucracy of civil service and other sectors (value chains) of the rural road sub-sector as well as the social and economic patterns of transaction.
- Define opportunities to allow for the embedment of innovative research findings.

It is recommended that the PEA be among the first research activities in order to allow for research findings to be incorporated and embedded into laws (if necessary) and practice. A PEA is best conducted by national consultants that have a deep understanding of the Pakistan bureaucracy, commercial sector and rural political economy. The cost of the PEA is estimated to be approximately £35,000.

Table 19 Tentative Cost for Political Economy Analysis (PEA) of the Rural Roads Sub-Sector

Component	Cost (UK£)
Political Economy Analysis of the Rural Roads Sub-Sector	35,000
Total	35,000

Source: Consultants' estimates

5.3.4 Improving Climate and Disaster Resilience of Transport Infrastructure and Services in Rural Communities

Pakistan is frequently exposed to natural hazards like floods, droughts and cyclones. The 2010 floods have been regarded as a major threat to national security. In addition, rural transport infrastructure is among the main economic assets at the front line in the events of climate change related shocks. This is further exacerbated, as in the case of rural transport infrastructure, when it is poorly constructed or inadequately maintained. The impact of climate related hazards is more pronounced for rural and agrarian communities as the agriculture sector ensures national food security and employs about half the workforce and contributes 22% to the GDP. The supply chain of a significant industrial segment engaged in processing raw material also comes from agriculture³¹. Therefore, separate stakeholders often recommended AsCAP research targeted at Improving Climate and Disaster Resilience of Transport Infrastructure and Services in Rural Communities. The research output can consider the following issues.

- Identification and development of pro-active adaptation measures
- Quantification of the impacts of climate on road infrastructure and potential economic savings
- Investigation of the use of software tools³² in the development and management of rural transportation infrastructure
- Development of strategies and guidelines to access remote villages as an immediate emergency response following a natural disaster
- Integrated planning and design of farm to market roads network with identification of alternative temporary routes ensuring connectivity to the poorest, most remote, and agrarian communities

³¹ Source: Mustafa, Z. 2012. Climate Change And Its Impact With Special Focus In Pakistan. Symposium on "Changing Environmental Pattern and its impact with Special Focus on Pakistan.

³² Such as the Infrastructure Planning Support System (IPSS) developed by the Institute of Climate and Civil Systems

- Development of capacity-building training programs for locals to effectively implement identified pro-active measures

It is important to stress that pioneering work in this field has been conducted and implemented in Pakistan including an initiative in Khyber Pakhtunkhwa whereby construction of roads along the canal banks have provided protection to irrigation systems and access to farmers and residents to socio-economic services. Therefore it is important that this research output reinforces and complements existing developments in the country.

It is estimated that the cost of an initial study to be approximately £80,000. No data collection costs are anticipated.

Table 20 Tentative Cost for Improving Climate and Disaster Resilience of Transport Infrastructure and Services in Rural Communities

Component	Cost (UK£)
Improving Climate and Disaster Resilience of Transport Infrastructure and Services in Rural Communities	80,000
Total	80,000

Source: Consultants' estimates

5.4 Summary of Research Projects and Prioritisation

5.4.1 Summary of Research Projects

Below is a summary of research projects with tentative cost / budget and the contribution to each of the outcome indicators as per the Project LogFrame for ReCAP. The three outcome indicators are summarised below.³³

- Generation, validation and updating of evidence for effective policies and practices to achieve safe, all season, climate resilient, equitable and affordable Low Volume Rural Road (LVRR) and Transport Services in African and Asian countries (Output Indicator 1 - Research).
- The building of sustainable capacity to carry out research on LVRR and rural transport services in African and Asian countries (Output indicator 2 - Sustainability).
- Generated evidence base of LVRR and Transport Services, knowledge is widely disseminated and easy accessible by Policy Makers and practitioners (Output Indicator 3 – Knowledge).

As can be seen, all research topics under the three Thematic Clusters contribute to Output Indicator 1 – research, however some contribute to Output Indicators 2 and 3, sustainability and knowledge, respectively. However, the capacity building and dissemination support (see Chapter 6) is designed specifically to contribute to Outcome Indicators 2 and 3 (sustainability and knowledge, respectively)

³³ Source: Inception Report, Africa Community Access Partnership (AfCAP) and Asia Community Access partnership (AsCAP), Cardno Emerging Markets, Prepared for DFID, March 2015

Table 21 Summary of research topics and Contribution to ReCAP Project LogFrame

Research Topics	Tentative Cost (UK£)	Output Indicator 1 - Research	Output Indicator 2 - Sustainability	Output Indicator 3 - Knowledge
Thematic Cluster 1: Infrastructure				
Standardised Specifications for Rural Road Development and Maintenance	130,000	✓		✘
Rural Road and Bridge Inventory	350,000	✓	✓	✘
Planning and Prioritisation of Rural Roads	75,000	✘	✓	✘
Axle Load Enforcement Regime	80,000	✓		
Participatory Approach to Rural Road Planning and Development	60,000	✓		
Thematic Cluster 2: Transport Services				
Scoping Study of Community Pooled Transport Vehicle Ownership	85,000	✓		
Potential for Rural Demand Responsive Transport (DRT)	170,000	✓		
Farm to Export Transport Strategy Through Networked Small Scale Cool Rooms	85,000	✓		
Thematic Cluster 3: Cross-cutting Issues				
Gender Mainstreaming Strategies in Rural Transport	120,000	✓		✘
Socio-economic Evaluation of Rural Roads	210,000	✓		✓
Political Economy Analysis of the Rural Roads Sub-Sector	35,000	✓		✘
Emergency Crisis Response Interventions for Communities Vulnerable to Climate Change	80,000	✓		
Capacity Building and Dissemination	220,000		✓	✓
TOTAL COST SHORT-LISTED RESEARCH	1,700,000			

Source: Consultants' estimates and analysis

5.4.2 Prioritisation of Research Topics and AsCAP Support

The total envelope for all research topics and capacity building support exceeds the budget available for AsCAP support, and therefore a prioritisation of the short-listed research topics is required. The original proposed budget cooperation with Pakistan was UK£1.3 million. As part of a 2017-2020 Way Forward strategy this has been revised to an initial figure of UK£500k. Below is a prioritized list of projects that fit within this initial budget. It is based on a general consensus of recommended proposals (via separate discussions with the [disparate] stakeholders). It is not a final recommendation and should be subjected to further discussion and deliberations between AsCAP and the partnering local agency / authority responsible for AsCAP research in Pakistan.

Table 22 Recommended Initial Priorities for AsCAP in Pakistan

Research Topics	Tentative Cost (UK£)
Thematic Cluster 1: Infrastructure	
Planning and Prioritisation of Rural Roads	75,000
Thematic Cluster 2: Transport Services	
Potential for Community Pooled Transport Vehicle Ownership	85,000
Thematic Cluster 3: Cross-cutting Issues	
Gender Mainstreaming Strategies in Rural Transport	120,000
Capacity Building and Dissemination	220,000
TOTAL	500,000

Source: Consultants' estimates

6 Capacity Building, Research Uptake and Embedment

A broad strategy is required so local capacity is empowered to both absorb the findings of research into current practices and norms and indigenously develop future research so that the long-term aim of self-sufficiency is achieved. These two objectives should not be seen as separate, as capacity development and uptake development and embedment can be considered as inextricably linked. Therefore, a strategy must be developed that holistically enhances local capacity and disseminates knowledge.

6.1 Capacity Building

6.1.1 Current Status of Capacity in Rural Transportation

It is evident that local research capacity in Pakistan is of a high standard. There are many institutions that are conducting pioneering activities in rural transport from university institutions (e.g. UET, Taxila), independent corporate entities (e.g. The Urban Unit), Civil Society Organisations (NRSP, RDPI). Capacity and management skills within public bodies are high (NTRC and P&D Department). The aforementioned institutions include staff from an impressive variety of backgrounds including engineers, social scientists, planning specialists, lawyers, academics and journalists.

However a focal point for research in rural transportation in the country is absent. The NTRC is the surviving national centre for transport research in Pakistan, however, as explained in Chapter 3, it has long lost its focus on rural transportation. Though it is clear that staff within provincial departments (e.g. P&D Department in Punjab) are highly skilled and knowledgeable regarding issues across all three thematic structures (infrastructure, services, cross cutting issues) there is however, no research unit in the provincial departments focussed on rural transport research.

Therefore, though capacity is strong in the rural road research sub-sector, the networks are disparate and there is no established home whereby research is inspired, developed, shared and embedded. Because of this there is a real risk that after AsCAP support the capacity of rural transport research regresses back to the currently existing position.

For this reason it is recommended that capacity building support is provided. Chapter 4 discusses the options for Pakistan and AsCAP partnership, essentially whereby the partnering entity is either the i) Federal Option - NTRC, or the ii) the Provincial Option - P&D Department. The strategy for capacity development will depend upon which option is pursued. These are discussed below.

6.1.2 Capacity Building Strategies

Federal Option (NTRC) - According to the archive list of projects received from the NTRC, the last project conducted in the rural road transport sub-sector was March 2000. Therefore, if NTRC is the partnering entity with AsCAP it is essential that there is a re-emergent focus on rural transportation. To achieve this, the NTRC would need to raise its human capital in personnel that are enthusiastic and committed to rural issues. To this end, it is recommended that NTRC recruit a small number of experts (perhaps three personnel) on long term permanent contracts – it is recommended that this should be funded outside of AsCAP support so that there is some guarantee of long term engagement in rural transport research. To reinforce this commitment, it is recommended that AsCAP support structured mentoring with international Technical Assistance on an intermittent basis over the three-year period to assist the newly recruited staff. Training budget should be provided for the three staff, including access to internationally recognised training courses³⁴. Other support from

³⁴ Internationally there are many suitable courses, however, the Senior Roads Executive Course provided by the University of Birmingham is an example of the category of course that would be suitable with respect to the

AsCAP can include mentoring on the upgrade of the NTRC website; the knowledge portal and advising on the NTRC website and improving the knowledge portal and digitising and uploading the back catalogue of archive research conducted by the NTRC³⁵. The local beneficiary should provide office space.

Figure 3 NTRC Archive Room and Back Catalogue of Research Literature



Provincial Option (P&D Department) - There is no rural transport research unit within the P&D Department, therefore it is recommended that a small unit be established to manage and champion the AsCAP research over the three-year period and beyond. Like the NTRC option (see above) it is recommended that this include staff recruited on long term permanent contracts funded by provincial funds, with a commitment from AsCAP to provide long term intermittent TA and training budget (similar to the NTRC option). The local beneficiary should provide office space.

6.2 Research Embedment and Dissemination

In order to ensure that research is institutionalised, a framework must be defined in which Pakistan and AsCAP partnership can contribute to the enhancement of rural transport knowledge management, lesson learning, dissemination and practices.

This scoping study has presented a framework for Pakistan – AsCAP partnership that is demand led. The multifarious local stakeholders have proposed (all) the research topics presented in Chapter 5.

content of the course, reputation of the institution and experience of training providers. Tentative costs have been estimated based on courses of this category standard.

³⁵ This will be a relatively straightforward and inexpensive task if the catalogue is restricted only to previous rural transport research outputs conducted by the NTRC

The research topics and capacity building support above should be continued to be defined and refined by local stakeholders and should evolve with local circumstances and needs. In addition the capacity building support establishes a home for research that can serve as a focal point for knowledge management and transfer.

Additionally it is important that local champions who can most likely ensure that research findings are integrated into laws, practices and professional and academic discourse promote research. For this reason it is recommended that local permanent staff enthusiastic about rural transport issues be recruited by the partner organisation on a permanent basis within the integrated research unit.

In addition funding and support is required for research dissemination. The capacity support above provides support and knowledge transfer. However, dissemination will require additional (and more active) modes of dissemination including forums, webinars, emails, printed materials, interactions with research institutions, decision makers, local communities, politicians, stakeholders, think tanks, pressure groups and the general public. Therefore a nominal budget for dissemination should be included. It is important for AsCAP countries to work in regional partnership – coordination between the AsCAP member states should be promoted to act as ‘force multiplier’ for research dissemination and uptake. As such a budget for local staff engaged in AsCAP to attend regional conferences should be included.

Research embedment cannot be achieved through dissemination alone, it is important to find ways legal or unofficial to have research implemented in practice. For this reason the Political Economy Analysis research topic is included as among the research activities (see Chapter 5).

Finally and perhaps most importantly, the role of the P&D and C&W departments in research uptake and embedment is essential. This scoping study has defined multiple options for AsCAP support in Pakistan, however, it is important to integrate the aforementioned departments in the AsCAP project as much as possible and project ideas should take root and be implemented at the provincial departmental level.

6.3 Exit Strategy

This scoping report has presented a structure for DFID support for rural transport research that is within the confines of the support available. It is important that rural transport research continues beyond the support from AsCAP – therefore local support in the form of long-term permanent staff (dedicated specifically for the research programme) must be provided. A commitment is required in which the newly created research unit (or in the case of NTRC, strengthened) receives continued support from public sector funds beyond the life of AsCAP (beyond 2020).

6.4 Budget for Capacity Building and Dissemination

The budget for the above framework for capacity support and dissemination is presented in the table below. The tentative cost for AsCAP capacity development and dissemination is estimated at £230,000. This is predominantly made up of TA international support (estimated at 180 days over three years, £150,000), website development (£15,000), equipment (£10,000), budget for local staff training over three years (£22,500), budget for local staff to attend local and regional (AsCAP) meetings, conferences and steering committees (£20,000) and budget for dissemination (£12,500). Local support to AsCAP should provide permanent staff (three) and associated expenses estimated at approximately £90,000 over three years.

Table 23 Tentative Cost for AsCAP Capacity Development and Dissemination Support

Component	Cost (UK£)
Mentoring of local staff	150,000
Support to Knowledge Transfer	15,000
Budget for Local Staff Training	22,500
Budget for Regional and Local Conferences	20,000
Budget for dissemination	12,500
Total AsCAP Support	220,000
Recruitment of (3) staff on Permanent Contract	90,000
Total Local Contribution	90,000

Source: Consultants' estimates

7 Recommendations and Conclusions

7.1 The Scoping Study

A scoping study has been conducted to ascertain the viability of AsCAP support for Pakistan, the optimised structure of the support and to recommend research areas, capacity building, dissemination and embedment strategies.

7.2 AsCAP Viability

Firstly, it can be confirmed that AsCAP partnership with Pakistan is viable, and if structured and organised optimally, it will have a hugely beneficial impact on the rural road sub-sector.

However, due to the 18th Amendment of the Constitution, which was passed by the National Assembly of Pakistan in 2010, there is a federal and provincial structure to government in Pakistan and this has implications on the management and administration of roads. The rural roads sub-sector is under the jurisdiction of the Provincial Government. Despite this, there is expressed interest across the political hierarchy in AsCAP. Therefore, the dilemma is the options available, rather than, the limitations to partnership.

7.3 AsCAP Structural Options

There are essentially two options for official partnership with AsCAP and these are summarised below:

- The Federal Option – NTRC
- The Provincial Option – P&D Department

The advantages and disadvantages of each option are presented in Chapter 4. So far this Scoping Study has left the issue of AsCAP's partnering to be decided in on-going discussions. However the current view is that given the nature of ReCAPs aim to strengthen sustainable research capacity the option to partner with NTRC would be the favourite, although this does not preclude undertaking individual projects with Punjab P&D Department.

If partnership with AsCAP is pursued with the provincial option, a further decision is required on the province(s) to operate. Chapter 4 presents an appraisal of the opportunities and constraints of operating in Punjab, Sindh, Khyber Pakhtunkhwa, Balochistan and Gilgit-Baltistan. The multi-criteria appraisal is a applies a 'light-touch' analysis and therefore has its limitations, however on balance Punjab is assessed as the 'most appropriate' province based on the road coverage, incidence of poverty, security risks and previous development assistance indicators.

7.4 Research Areas

A list of possible research topics as well as tentative costs has been presented in Chapter 5 to this report. The list includes the following.

Thematic Cluster 1: Infrastructure

- Standardised Specifications for Rural Road Development and Maintenance (£130,000)
- Rural Road and Bridge Inventory (£350,000 for Punjab province, lower for other provinces)
- Planning and Prioritisation of Rural Roads (£75,000)
- Axle Load Enforcement Regime (£80,000)
- Participatory Approach to Rural Road Planning and Development (£60,000)

Thematic Cluster 2: Transport Services

- Scoping Study - Community Pooled Transport Vehicle Ownership (£85,000)

- Potential for Rural Demand Responsive Transport (DRT) (£170,000)
- Farm to Export Transport Strategy Through Networked Small Scale Cool Rooms (£85,000)

Thematic Cluster 3: Cross-cutting Issues

- Gender Mainstreaming Strategies in Rural Transport (£120,000)
- Socio-economic Evaluation of Rural Roads (£210,000)
- Political Economy Analysis of the Rural Roads Sub-sector (£35,000)
- Emergency Crisis Response Interventions for Communities Vulnerable to Climate Change (80,000)

7.5 Capacity Building and Dissemination

Depending on the structural options of partnership the exact configuration of capacity building and dissemination strategy will vary in its detail. However, there is a broad conceptual framework that is summarised below.

A research unit needs to be created or strengthened (depending on the structuring option). The partnering entity (NTRC, P&D Department or Planning Commission) should recruit (three) staff on permanent long term-contracts to house the new or strengthened research unit. The new staff should be new recruits and not transfers from other departments of the same organisation. In addition, office space and all associated overheads and expenses of the staff, must be provided for by the partnering entity. This will ensure that rural road research has firm foundations to continue beyond the life of AsCAP (2017 – 2020). In return, it is recommended that AsCAP provide a structured capacity building programme including the following.

- International Technical Assistance (TA) to provide structured mentoring intermittently over the three year AsCAP period (£150,000)
- Support to knowledge transfer (£15,000)
- Budget for local staff training (£22,500)
- Budget to attend regional and local conferences and regional steering group meetings (£20,000)
- Budget for dissemination of research material and outputs (£12,500)

The total estimated cost for capacity building and dissemination is estimated at £220,000.

7.6 Prioritisation

The tentative total cost of the twelve research topics and the capacity building and dissemination strategy is estimated at £1.7 million. This is significantly greater than the available budget from AsCAP support. Therefore a prioritisation of the projects is required.

Below is the list of prioritised outputs that sit within the AsCAP budget support. It is based on a general consensus of recommended proposals (via separate discussions with the [disparate] stakeholders). It is not a final recommendation and should be subjected to further discussion and deliberations between AsCAP and the partnering local agency / authority responsible for AsCAP research in Pakistan.

Table 24 Prioritised list of research and activities under AsCAP in Pakistan

Research Topics	Tentative Cost (UK£)
Thematic Cluster 1: Infrastructure	
Planning and Prioritisation of Rural Roads	75,000
Thematic Cluster 2: Transport Services	
Scoping Study - Community Pooled Transport Vehicle Ownership	85,000
Thematic Cluster 3: Cross-cutting Issues	
Gender Mainstreaming Strategies in Rural Transport	120,000
Capacity Building and Dissemination	220,000
TOTAL	500,000

Source: Consultants' estimates

7.7 Recommended Next Steps

It is recommended that DFID and local partners conclude on the optimal structure of AsCaP support for Pakistan. It is recommended that this be concluded by October 2017 so that a Memorandum of Understanding is signed between ReCAP and the partnering entity in Pakistan.

Appendix 1: List of Stakeholders Consulted

Monday 10th April (Islamabad):

- Hameed Akhtar, Director Roads, Ministry of Communications, GoP
- Engr Sajjad Afzal Afridi, PSP, Chief National Transport Research Centre, Ministry of Communication, GoP
- Muhammad Sayyar, Assistant Chief (Technical), National Transport Research Centre (NTRC), Ministry of Communication, GOP
- Zia – ul Islam, Research Officer, National Transport Research Centre (NTRC), Ministry of Communication, GoP

Tuesday 11th April (Islamabad):

- Muhammad Farooq, Joint Secretary, Ministry of Climate Change, GoP
- Muhammad Ali Shahzada, Additional Secretary, Ministry of Communication, GoP
- Altaf Asghar, Joint Secretary, Ministry of Communication, GoP
- Khushal Khan, Deputy Team Leader – Road Safety Policy Specialist, ADB Project TA 8990-PAK, NTU

Wednesday 12th April (Lahore):

- Dr. Syed Murtaza Asghar Bukhari, Director, Transport Planning Unit, Transport Department, Government of Punjab
- Muhammad Abid Bodla, Ph. D, Member Infrastructure Development, Planning and Development (P&D) Board, Government of Punjab
- Aamir Mustafa, Deputy Secretary, Communication and Works (C&W) Department, Government of Punjab
- Dr. Nasir Javed, Chief Executive Officer, Urban Sector Planning and Management Services (PVT.) Ltd. – also known as the Urban Unit

Thursday 13th April (Lahore and the Village of Mir Muhamad):

- Mr. Waqas Yunis, Lecturer, Faculty of Civil Engineering, University of Engineering and Technology, Lahore and resident of Mir Muhammad Village
- Ms. Faryal, District Regional Transport Authority (Mandi Bahuddin) and Secretary

Friday 14th April (Lahore):

- Prof. Dr Ghulam Abbas Anjum, Dean, Faculty of Architecture and Planning, University of Engineering and Technology, Lahore
- Prof. Dr. Fazal Ahmad Khalid, SI, Vice-Chancellor, University of Engineering and Technology, Lahore
- Mujasim Ali Rizvi, Ass. Professor, Director, Asphalt & Concrete Mix Design Lab, Faculty of Civil Engineering, University of Engineering and Technology, Lahore

Saturday 15th April (Islamabad):

- Mr Peter Turner, Team Leader, Enabling Economic Corridors through Sustainable Development, Asian Development Bank

Monday 17th April (Islamabad):

- Muhammad Irteza Haider, Programme Manager, Physical Infrastructure and Technology Development (PITD), National Rural Support Programme (NRSP)
- Saad Iqbal, Senior Programme Officer, Monitoring and Evaluation and Research, National Rural Support programme (NRSP)
- Naila Almas, Senior Program Officer, Japan International Cooperation Agency (JICA)

- Kamran Khan Durrani, Deputy Executive Officer, Rural Development Policy Institute (RDPI)
- Amjad Bhatti, Technical advisor to Board of Trustees, Rural Development Policy Institute (RDPI)
- Dr. M. A. Kamal, Professor of Transportation Engineering, Dean, Faculty of Civil & Environmental Engineering, University of Engineering and Technology, Taxila

Wednesday 26th April (Telephone Call):

- Shamas Bajwa, Infrastructure Advisor, DFID Pakistan, British High Commission, Islamabad

Appendix 1: List of NTRC Research Studies / Reports

NATIONAL TRANSPORT RESEARCH CENTRE (NTRC)

SL. NO	TITLE	DATE OF COMPLETION
1.	Economic of Electrification – Khanewal –Samasatta Section of Pakistan Railways (NTRC-1).	February, 1975
2.	Inland Water Route-Port Qasim – Sukkur (NTRC-2).	May, 1975
3.	Highway Improvement Priority Criteria (NTRC-3).	January 1976
4.	Cargo Port Traffic Forecast For Pakistan (1974-75 to 1989-90) (NTRC-6)	February, 1976
5.	Inland Traffic Forecast 1980-81(NTRC-5).	February, 1976
6.	Organization of NTRC-Interim Report (NTRC-7).	April, 1976
7.	Effects of Highway Design Elements on the Capacity of Two-Lane Roads (NTRC-8).	August, 1976
8.	Farm-To-Market Roads Survey (NTRC-9).	October, 1977
9.	Pakistan Maritime Transport Study (NTRC-10).	November, 1976
10.	Lowari Ropeway Study (NTRC-11).	January, 1977,
11.	A Note on Petrol Versus Diesel Transport (NTRC-12).	February, 1977
12.	Re-Organization of Administrative Control of Transport (NTRC13).	August, 1977
13.	Change of Passenger Class Structure of Pakistan Railways-Effect on Revenues (NTRC-14).	October, 1977
14.	Transport Requirements-Shortage of Buses (NTRC-15).	November, 1977
15.	Economics of Pipeline Versus Rail (NTRC-16).	December, 1977
16.	Pakistan Highway Code (NTRC-17).	December, 1977
17.	Re-Organization of Traffic Police (NTRC-18).	January, 1978
18.	Draft Motor Vehicle Ordinance 1978 (NTRC-19).	January, 1978
19.	Containerization in Pakistan-Final Report (NTRC-28).	January, 1978
20.	Traffic Survey of Islamabad Highway (Dual Carriageway) (NTRC-20).	June, 1978
21.	Organization of NTRC-Final Report (NTRC-21).	July, 1978
22.	Effect of Increase in Bus Fares on Common Man's Budget (NTRC-22).	July, 1978
23.	Highway Operating Speeds of Govt. & Private Bus Drivers (NTRC-23).	August, 1978
24.	Modern Transportation (NTRC-25).	December, 1978
25.	Survey of Bus Services for Islamabad Secretariat (NTRC-26).	December, 1978
26.	Accident Study for Punjab (NTRC-27).	December, 1978
27.	Feasibility Study for the Operation of Passenger/Ro-Ro Ferry Service to the Gulf by P.N.S.C (NTRC-29).	March, 1979
28.	Transport Data Collection, Storage and Retrieval System (NTRC-30).	April, 1979
29.	Highway Transportation Studies and Surveys (NTRC-31).	April, 1979
30.	National Port Policy (NTRC-32).	May, 1979
31.	Bus Passenger Loads and Mileage-A Survey of Intercity Bus Operations (NTRC-33).	May, 1979
32.	Motor Vehicle Ordinance-Working Paper (NTRC-34).	June, 1979
33.	Canal Roads for Public Use (Feasibility Study) (NTRC-35).	July, 1979
34.	Choice of Mode for Journey to Work (For Government Employees) (NTRC-36).	August, 1979
35.	Traffic Enforcement/Plan for Rawalpindi (NTRC-44).	November, 1979
36.	4 th Course on Transportation Project Planning (NTRC-56).	November, 1979
37.	Psychological attitudes towards Highway Safety (NTRC-37).	January, 1980
38.	Energy Use in Transport (NTRC-49).	February, 1980
39.	Bus Make Study (NTRC-38).	March, 1980
40.	Abstract of Research/Desk Studies of National Transport Research Centre (NTRC-39).	March, 1980
41.	Computerized Reservation of PIAC-A Re-Appraisal of the Project (NTRC-53).	June, 1980

42.	Establishment of NTRC Phase-I (Revised) (NTRC-40).	July, 1980
43.	Role of Transportation In Development (NTRC-42).	July, 1980
44.	Investment Programme and Development Project of PIAC (NTRC-50)	July, 1980
45.	Real Problem of Highway Safety in Pakistan (NTRC-43)	July, 1980
46.	Review of Port Traffic Forecasts with Particular Reference to Fertilizer Imports (NTRC-45)	August, 1980
47.	Effectiveness of Traffic Police Training (NTRC-46)	September, 1980
48.	Road Safety Ordinance (NTRC-47)	October, 1980
49.	Transport Bulletin (NTRC-48)	November, 1980
50.	Highway Speed Survey (NTRC-51)	November, 1980
51.	Utilization of Technical Manpower in PWDs (NTRC-58)	February, 1981
52.	Effect of Enforcement on Road User's Behavior (NTRC-59)	March, 1981
53.	Fuel Consumption Study (NTRC-54)	July, 1981
54.	Inland Water Transport in Pakistan (NTRC-60)	September, 1981
55.	Transport Research and Development in Pakistan (NTRC-61)	October, 1981
56.	A Review of Vehicle Operating Equipment & Inventory in Pakistan (NTRC-66)	November, 1981
57.	Transport Bulletin (Summary No.1) (NTRC-74)	November, 1981
58.	Bus Driver Training Pilot Study (NTRC-62)	December, 1981
59.	Traffic Factors For Pakistan-I (NTRC-55)	March, 1981
60.	Multi Axle Vehicle Survey (NTRC-63)	October, 1982
61.	Axle Load Survey (NTRC-65)	October, 1982
62.	Road Accidents in Pakistan (NTRC-64)	January, 1982
63.	Manual of Stage construction of Rural Road (NTRC-DS-2)	January, 1983
64.	Manual of Maintenance of Low Volume Unpaved Rural Roads (NTRC-DS-3)	January, 1983
65.	Manual of Road Construction Engineering (NTRC-DS-1)	January, 1983
66.	Proposal for Establishment of NTRC Phase-II (NTRC-41)	March, 1983
67.	Economic Implications of Vehicle Overloading (NTRC-71)	April, 1983
68.	Road Development Plan for Azad Jammu and Kashmir (1983-88) (NTRC-73)	April, 1983
69.	National Transport Plan Study (NTRC-57)	May, 1983
70.	Five Years Plan For F.W.O (NTRC-75)	June, 1983
71.	Road Traffic Origin-Destination Survey (1979-80) (NTRC-67)	June, 1983
72.	Transport Alternatives for Sixth Five-Year Plan (NTRC-68)	August, 1983
73.	Survey of Skidding Resistance Value on Main Roads in Pakistan (NTRC-69)	December, 1983
74.	5 th Planning Commission Course on Transportation Projects Planning (NTRC-70)	December, 1983
75.	Manual of Vibratory Compaction (NTRC-DS-4)	March, 1984
76.	Bahawalpur Traffic Accidents (NTRC-DS-5)	March, 1984
77.	Proposal for Road Research Division in NTRC (NTRC-72)	May, 1984
78.	Manual of Rural Roads Drainage (NTRC-DS-6)	May, 1984
79.	Abstract of Research Studies of National Transport Research Centre (NTRC-76)	May, 1984
80.	A Review of Design Standards for Tertiary Rural Roads (NTRC-78)	November, 1984
81.	Inter Modal Choice Motivation (NTRC-84)	December, 1984
82.	6 th Planning Commission Course on Transportation Projects Planning (NTRC-88)	December, 1984
83.	Road Vehicle Operating Costs Study-I (NTRC-79)	January, 1985
84.	The Volume and Composition of Traffic on Tertiary Rural Roads (NTRC-80)	January, 1985
85.	A Study of Design Standards for Surface Width and Design Speed on Tertiary Rural (NTRC-82)	February, 1985
86.	Public Service Vehicle Survey (NTRC-81)	February, 1985
87.	Transport Statistic-1984 Vol. I & II (NTRC-83)	April, 1985
88.	Road Accident Counter Measures in Pakistan (NTRC-85)	June, 1985
89.	Motor Vehicle Utilization Survey (NTRC-77)	June, 1985
90.	Transport Demand for Major Commodities (NTRC-86)	June, 1985

91.	O-D Survey for Rail (NTRC-87)	June, 1985
92.	Survival Rate of Motor Vehicles in Pakistan (NTRC-90)	December, 1985
93.	7 th Course on Transportation Projects Planning (NTRC-91)	December, 1985
94.	Origin Destination Survey for the Proposed Link Road Between Super Highway and National Highway (NTRC-89)	March, 1986
95.	Abstract of Research Studies (3 rd Issue) (NTRC-93)	June, 1986
96.	The Effect of Road Work Signs on Driver Behavior (NTRC-92)	October, 1986
97.	The Effect of Road Marking on Driver Behavior (NTRC-94)	December, 1986
98.	Road Construction Machinery Survey (NTRC-99)	January, 1987
99.	Taxi Surveys (Rawalpindi-Islamabad) Vol. I & II (NTRC-96)	February, 1987
100.	Economics of Taxi Operation (NTRC-95)	March, 1987
101.	Effectives of Bus Drivers Training (NTRC-100)	June, 1987
102.	Battery Powered Electric Vehicle (NTRC-103)	October, 1987
103.	Analytical Review of Road and Road Transport Statistics (1947-86) (NTRC-101)	December, 1987
104.	9 th Course on Transportation Projects Planning (NTRC-102)	December, 1987
105.	Pilot Urban Bus Project (Preliminary Evaluation) (NTRC-104)	December, 1987
106.	Transport Bulletin (NTRC-107)	January, 1988
107.	Road Freight Industry Survey (Role of Freight Agents) (NTRC-105)	February, 1988
108.	Road Freight Transport Survey (NTRC-106)	February, 1988
109.	International Seminar on Highway Safety (NTRC-116)	March, 1988
110.	Proposal for NTRC PC-II, Phase-III (Approved) (NTRC-108)	May, 1988
111.	Taxi Survey (Peshawar) (NTRC-109)	June, 1988
112.	Proposal for Road Research Wing In NTRC (NTRC-122)	June, 1988
113.	Un-Remunerative Rail Lines (Mandra – Bhaun Section) (NTRC-128)	June, 1988
114.	Unit Cost of Road Construction (NTRC-110)	July, 1988
115.	Inland Water Transport (Review) (NTRC-114)	August, 1988
116.	Urban Transport Dilemma in Pakistan (NTRC-143)	October, 1988
117.	Abbottabad – Murree Road Traffic Count Study (NTRC-111)	October, 1988
118.	Taxi Survey (Lahore) (NTRC-112)	November, 1988
119.	Indus River Expedition (1987-88) (NTRC-113)	November, 1988
120.	Abstract of Research Studies (4 th Issue) (NTRC-115)	December, 1988
121.	Inland Water Transport (Canal Re-Connaissance) (NTRC-117)	April, 1989
122.	Traffic Signs N-5 Lahore-Gujranwala Section (NTRC-118)	April, 1989
123.	Taxi Survey (Queeta) (NTRC-119)	May, 1989
124.	Taxi Survey (Karachi) (NTRC-120)	May, 1989
125.	Peshawar Ring Road (Alignment) (NTRC-121)	May, 1989
126.	Survey of Agricultural Tractors (NTRC-123)	June, 1989
127.	Transport Bulletin (NTRC-124)	June, 1989
128.	Financing Pakistan's Trucking Industry (NTRC-125)	June, 1989
129.	Manual of Signs Signals & Road Marking (NTRC-52)	July, 1989
130.	Road Freight Transport-Utilization (NTRC-126)	July, 1989
131.	Road Freight Industry-Tariffs (NTRC-127)	July, 1989
132.	Road Freight Industry (An Overview) (NTRC-129)	July, 1989
133.	Islamabad Road Accident Analysis (NTRC-130)	January, 1990
134.	Proposal for Railway Research Wing in NTRC (NTRC-131)	January, 1990
135.	Lahore Dry Port Improvement (NTRC-134)	April, 1990
136.	Role of Tractor Trolleys in Rural Transportation (NTRC-135)	May 1990
137.	Freight Rates (Karachi-Peshawar) (NTRC-136)	May 1990
138.	Road Accident Analysis (NTRC-137)	May 1990
139.	Link-Node Directory (Rawalpindi) (NTRC-132)	June, 1990
140.	Quality Control in Road Construction (Phase-I) (NTRC-133)	June, 1990

141.	Planning Machinery For 8 th Plan (NTRC-139)	September, 1990
142.	Road Safety Education Campaign (NTRC-140)	October, 1990
143.	Traffic Regulation at Schools (NTRC-141)	October, 1990
144.	Proposal for Multi Modal Transportation Program, UNCTAD (NTRC-142)	November, 1990
145.	Planning Machinery For 8 th Plan (NTRC-139)	December, 1990
146.	Road Safety Education Campaign (NTRC-140)	February, 1991
147.	Traffic Regulation at Schools (NTRC-141)	March, 1991
148.	Proposal for Review and Update of National Transport Plan Study (NTRC-147)	June, 1991
149.	Quality Control in Road Construction (Phase-II) (NTRC-148)	June, 1991
150.	Low Cost Roads (Demonstration Projects) (NTRC-149)	June, 1991
151.	Proposal for Training Wing in NTRC (NTRC-146)	July, 1991
152.	Vehicle Operating Cost-II (NTRC-150)	August, 1991
153.	Chemical Stabilization of Land Slide Kohala – Muzaffarabad Road (A Preliminary Report) (NTRC-152)	November, 1991
154.	Traffic Improvement at Urban Intersection (NTRC-153)	December, 1991
155.	Location for Intercity Bus Stand (NTRC-154)	February, 1992
156.	Rutting of Kashmir Highway, Islamabad (NTRC-162)	February, 1992
157.	Road Traffic Origin Destination Survey (NTRC-155)	March, 1992
158.	Traffic Factors for Pakistan-III (NTRC-151)	April, 1992
159.	NTRC Bus Train (NTRC-156)	May, 1992
160.	Transport Bulletin (Road Transport) (1982-1991) (NTRC-170)	July, 1992
161.	Transport Bulletin (Road) (1982-1991) Summary Tables (NTRC-171)	July, 1992
162.	Transport Bulletin (Road) (1982-1991) (NTRC-169)	July, 1992
163.	Planning Standards for Roads in Pakistan (NTRC-157)	August, 1992
164.	Evaluation of Telecommunications and Related Signaling Project of Pakistan Railways (NTRC-158)	August, 1992
165.	International Comparison of Pakistan National Shipping Corporation (NTRC-159)	November, 1992
166.	Benefits from Transport Infrastructure Improvement (NTRC-160)	December, 1992
167.	Transport Bulletin (1982-1991) (Summary Tables) (NTRC-172)	December, 1992
168.	Impact of Road on Socio-Economics Development (NTRC-161)	December, 1992
169.	Zoning for Comprehensive Urban Transportation (Islamabad / Rawalpindi) (NTRC-167)	May, 1993
170.	Effect of Cellulose Fiber and Pulverized Rubber on Asphaltic Concrete Properties (NTRC-166)	June, 1993
171.	International Comparison of Pakistan Railways (NTRC-173)	July, 1993
172.	Mitigation of Congestion at an Urban Bus Stop (Faizabad) (NTRC-168)	August, 1993
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174.	Transport Sector in Pakistan (An evaluation of Domestic Traffic) (NTRC-164)	September, 1993
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176.	A Preliminary Report on User Trails of Geogrids in Road Construction in Pakistan. (NTRC-174)	December. 1993
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179.	A analytical Review of Railway Statistic (NTRC-178)	July, 1994
180.	Inventory of Air Transport Facilities in Pakistan (NTRC-175)	August, 1994
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182.	Road Accident Investigation (NTRC179)	October, 1994
183.	Indus River Survey Comprehensive Report With Reference to Previous Work in Inland Water Transport in Pakistan (NTRC-180)	January, 1995
184.	The Study on National Transport Plan in the Islamic Republic of Pakistan	February, 1995
185.	Accident Black Spots Study on National Highway (N-5) Hassan Abdal Attock (NTRC-185)	April, 1995

186.	A Guide for Project Appraisal Monitoring and Evaluation (With special Reference to Transport Sector) (NTRC-182)	August, 1995
187.	Greater Islamabad / Rawalpindi Area Transportation Study (GIRATS) (NTRC-211)	September, 1995
188.	A Guide to Transport Economics (NTRC-184)	November, 1995
189.	Reduction in Delays to the Vehicular Traffic at an Urban Road (NTRC-183)	December, 1995
190.	Pilot Origin and Destination Survey (NTRC-4)	January, 1996
191.	Reducing Smoke Nuisance Effects from a Diesel Bus (NTRC-193-A)	January, 1996
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199.	Use of Asphaltic Mixers on Road in Pakistan (NTRC-192)	October, 1996
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219.	Motor Vehicle on Roads (1991-1997) (NTRC-210)	July, 1998
220.	Quality Control of NWFP - Bituminous Roads (NTRC-236)	April, 1991
221.	Quality Check of Asian Development Bank Funded Farm-to-Market Roads, Phase-I Project (NTRC-235)	May, 1992
222.	Inspection and detail investigation of rehabilitation work of N-5 between Lahore - Gujranwala (NTRC-237)	February, 1993
223.	Report on National Transport Research Centre (Restructuring of the Communications Division, its Attached Departments, Subordinate Offices, Autonomous Bodies and Corporations (NTRC-214)	December, 1998
224.	Construction of Low Cost Roads (Final Evaluation Report) (NTRC-213)	March, 2000
225.	Distress Analysis of Kashmir Highway (NTRC-215)	April, 2000
226.	Report on Concrete Core Extracted from Box Culvert Provincial Highways Project Contract Package No. 5 (NTRC-216)	May, 2000
227.	A Study on Truck Body Sizes in Pakistan (NTRC-220)	May, 2000

228.	Fundamental Tests on Sub-grade Material of Highways in Islamabad (NTRC-217)	June, 2000
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230.	Faisal Avenue – Jinnah Avenue Intersection Manual Versus Signal Operation (NTRC-219)	June, 2000
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234.	A Comparison of Pakistan Road & Road Transport Statistics (NTRC-225)	September, 2000
235.	Defective Construction of Murree Dual Carriage (NTRC-224)	September, 2000
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238.	Quality Checking of Section-I of M-I (NTRC-229)	November, 2000
239.	Condition Survey of Islamabad Runway Pavement (NTRC-230)	December, 2000
240.	Impact of Motorway (M-2) on the Socio-Economic Development of the Area (NTRC-231)	January, 2001
241.	Pavement Failure Study Phase-II (NTRC-238)	February, 2001
242.	Quality Checking of Contract 10-A, IHP (NTRC-232)	March, 2001
243.	National Transport Policy (Draft) (NTRC-233)	March, 2001
244.	Monitoring of H-8, H-9 Service Road - Islamabad(NTRC-228)	March, 2001
245.	Report of the Quality Checking Contract-10 (13 KM Defective Portion – Indus Highway Project (NTRC-234)	March, 2001
246.	Training of Motorway Policy (NTRC-239)	November, 2001
247.	Pedestrian Bridge Facility (Preliminary Evaluation) (NTRC-240)	July, 2001
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252.	Country Report Pakistan, Seminar on Practical Application of Construction Technology (NTRC-244)	May, 2002
253.	Draft National Transport Policy (NTRC-245)	June, 2002
254.	Country Report of Islamic Republic of Pakistan – Asian Highways – ESCAP (NTRC-246)	August, 2002
255.	Transport Bulletin Roads (1991-2000) (NTRC-247)	September, 2002
256.	Motor Vehicles on Roads (1991-2000) (NTRC-248)	October, 2002
257.	Lecture on Rail / Road Bridge. (NTRC-252)	March, 2002
258.	Overhead Bridge-Railway Crossing at Taxila on Sarai Kala & Haripur Road. (NTRC-251)	May, 2003
259.	SAARC Transport Project Planning Course Held at Islamabad from 31 st March 2003 to 6 th April, 2003 (NTRC-249)	June, 2003
260.	SAARC Transport Project Planning Course Held at Islamabad from 31 st March 2003 to 6 th April, 2003 (Course Lectures, Country Paper & Presentation) (NTRC-250)	June, 2003
261.	Accident Statistics (1991-2001) (NTRC-253)	June, 2003
262.	Travel Time Survey of Commercial Vehicles on N-5 (NTRC-254)	September, 2003
263.	The Urban Public Transport Policy-Some underlying Concepts (NTRC-255)	September, 2004
264.	National Transport Policy (Assessment of Critical Current Transport Sectors Needs) – Asian Development Bank – Stage I Report (NTRC-256)	December,2003
265.	Accidents in Pakistan – A Review (NTRC-257)	December,2003

266.	Report of the Technical Committee on “The Existing Public Transport System” – Draft (NTRC-258)	January, 2005
267.	Flood Damages on Makran Coastal Highway (NTRC-259)	February, 2005
268.	Recommendations of the Technical Committee constituted by the Senate Standing Communications on “The Existing Public Transport System” - Draft (NTRC-260)	May, 2005
269.	Pakistan Transport Plan Study (PTPS) – Inception Report (NTRC-261)	June, 2005
270.	Vehicle Operating Coasts Using HDM – VOC Version 4.0 (NTRC-262)	September, 2005
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272.	Key Issues of Pakistan Transport Plan Study Master Plan (NTRC-264)	December, 2005
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277.	Pakistan Transport Plan Study (PTPS) – Draft Final Report (NTRC-269)	February, 2006
278.	Pakistan Transport Plan Study (PTPS) – Final Report (NTRC-270)	March, 2006
279.	The Existing Public Transport System – 3 rd Party Insurance (Supplementary Report) (NTRC-271)	April, 2006
280.	Failure Causes of Nowshera – Peshawar Sections on N-5 (NTRC-272)	July, 2006
281.	Travel Time Survey of Commercial Vehicles on N-5 (NTRC-273)	August, 2006
282.	Pre-Requisites for a Dedicated Mass Transit System in Islamabad / Rawalpindi (A Preliminary Assessment) (NTRC-274)	October, 2006
283.	Revamping of the Existing 3 rd Party Insurance for Motor Vehicles on a No-Fault Basis - Recommendations of the Senate Standing Committee on Communications (NTRC-275)	November, 2006
284.	Essentials for Modernizing the Trucking Sector of Pakistan (An Outline) (NTRC-276)	February, 2007
285.	Traffic Count Survey at Super Highway (M-9) (NTRC-277)	November, 2007
286.	NTRC Bus Train Passenger Opinion Survey (NTRC-278)	December, 2007
287.	Traffic Count on M-1, M-2, M-3 and National Highways N-52 (NTRC-279)	August, 2008
288.	Causes of Pre-Mature Failure of Sections of N-20 (Chowk Mari to Mureed Shakh) (NTRC-280)	February, 2009
289.	Report of the Inquiry Committee on Sibbi – Dhadhar Section of N-65 (NTRC-281)	July, 2009
290.	Priority Ranking of An Electric Cable Driven Bus in the Urban Public Transport System (NTRC-282)	March, 2009
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292.	Cross Border traffic Movement at Torkham and Wahga Border (NTRC-292)	October. 2011
293.	Availably of Public Transport (A Case Study of Pak. Sectt. To Faizabad) (NTRC-293)	November, 2011
294.	Road and Road Transport Statistics (NTRC-294)	November, 2011
295.	Traffic Counts on M-9 and national Highway N-5. (NTRC-295)	July, 2012
296.	NTRC Operational Research Program. (NTRC-296)	December, 2012
297.	NTRC Past, Present & Future (NTRC-325)	January, 2013
298.	Prevention of Road Traffic Accidents (A Case of Study of Islamabad). (NTRC-326)	March, 2013
299.	NTRC Road Research Program (NTRC-297)	March, 2013
300.	NTRC Axle Load Study (NTRC-298)	March, 2013
301.	NTRC Permanent Traffic Count Program (PTCP) (NTRC-299)	March, 2013
302.	NTRC Buildings Special Maintenance / Renovation (NTRC-300)	March, 2013
303.	Travel Time Survey on N-5 (NTRC-301)	June, 2013

304.	Diligence Checks of NHA Toll Plazas M-9 (Preliminary Evaluation)(NTRC-302)	September, 2013
305.	Concept Paper for Korean Soft Grant for the year 2015 (NTRC-303)	September, 2013
306.	Intra-City Public Transport Fare Fixation (Preliminary Evaluation) (NTRC-304)	October, 2013
307.	PC-I “NTRC Road Safety Research Program (NTRC-305)	December, 2013
308.	PC-I “NTRC International Training Program (NTRC-306)	January, 2014
<u>Pakistan Transport Plan Study (PTPS)</u>		
<u>Phase-I</u>		
309.	Inception Report (NTRC-259)	June, 2005
310.	Presentation on Data Collection, Methodology and Its Analysis for PTPS Study. (NTRC-60)	August, 2005
311.	Progress Report (NTRC-261)	September, 2005
312.	<u>Traffic Counts / O-D Surveys</u> (NTRC-283) i) Manual Classified Traffic Count, Summary of All Stations. ii) Present O-D Matrices, Summary. iii) 16 hours and 24 hours Classified Traffic Count of all Stations. iv) PTPS Traffic Survey Containing the interview survey forms and results of traffic survey and roadside O-D survey. v) PTPS Database Manual.	September, 2005
313.	Discussion Material for 3 rd Steering Committee Meeting (NTRC-284)	December, 2005
314.	Draft Final Report on PTPS (NTRC-267)	February, 2006
315.	Seminar (Report) on PTPS (NTRC-266)	February, 2006
316.	Final Report on PTPS (NTRC-268)	March, 2006
<u>Feasibility Study for Construction of 2nd Kohat Tunnel & Access Road</u>		
<u>Phase-II</u>		
318.	Inception Report (NTRC-285)	April, 2006
319.	Presentation Material for 2 nd Kohat Tunnel (NTRC-286)	May, 2007
320.	Technical Presentation I on 2 nd Kohat Tunnel (NTRC-287)	May, 2006
321.	Technical Presentation II on 2 nd Kohat Tunnel (NTRC-288)	July, 2006
322.	Technical Presentation III on 2 nd Kohat Tunnel (NTRC-289)	September, 2006
323.	Seminar on 2 nd Kohat Tunnel (NTRC-290)	September, 2006
<u>National Transport Plan Study (NTPS)</u>		
324.	Transport Policy Support – Draft Final Report	May, 2007
325.	Comprehensive Review of Draft Final Report by NTRC	September, 2007
326.	National Transport Policy (NTP Draft – I)	November, 2007
327.	National Transport Policy (NTP Draft – II)	December, 2007
328.	A Brief Introduction to National Transport Policy	December, 2007
329.	National Transport Policy (NTP Draft – III)	April, 2008
330.	National Transport Policy (NTP Draft – IV)	May, 2008
331.	National Transport Policy (NTP Draft – V)	July, 2008
332.	National Transport Policy (NTP Draft – VI)	August, 2009
333.	National Transport Policy (NTP Draft – VII)	May, 2010
334.	National Transport Policy (NTP Draft – VIII)	April, 2011

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