Consultancy Services for the Tbilisi Municipality City Hall
Transport Department Advisory

Final Report
Vol. 1 Report
December 2020
Draft Final Report
Vol. 1 - Report
Consultancy Services for the Tbilisi Municipality City Hall Transport Department Advisory
December 2020
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All Appendices are shown in Volume 2 of the Report
# List of Acronyms

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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>AFD</td>
<td>Agence Française de Développement</td>
</tr>
<tr>
<td>BMC</td>
<td>A Turkish bus manufacturer</td>
</tr>
<tr>
<td>BRT</td>
<td>Bus Rapid Transit</td>
</tr>
<tr>
<td>CAD</td>
<td>A software program for design</td>
</tr>
<tr>
<td>CDIA</td>
<td>Cities Development Initiative for Asia</td>
</tr>
<tr>
<td>CNG</td>
<td>Compressed Natural Gas</td>
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<tr>
<td>Covid-19</td>
<td>COVID-19 is a disease caused by a new strain of coronavirus. 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV.'</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>GIZ</td>
<td>Deutsche Gesellschaft für Internationale Zusammenarbeit</td>
</tr>
<tr>
<td>LEPL</td>
<td>Legal Entity Under Public Law</td>
</tr>
<tr>
<td>MAN</td>
<td>A German bus manufacturer</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
</tr>
<tr>
<td>STS</td>
<td>A Tbilisi Company - Smart Transportation Solutions</td>
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<tr>
<td>SUMP</td>
<td>Sustainable Urban Mobility Plan</td>
</tr>
<tr>
<td>SUTIP</td>
<td>Sustainable Urban Transport Investment Program</td>
</tr>
<tr>
<td>TA</td>
<td>LEPL - Transport Development Agency (March to July 2020)</td>
</tr>
<tr>
<td>TBT</td>
<td>Tbilisi Bus Transit</td>
</tr>
<tr>
<td>TMCH</td>
<td>Tbilisi Municipal City Hall</td>
</tr>
<tr>
<td>TMC</td>
<td>Tbilisi Minibus Company (operates all minibuses)</td>
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<tr>
<td>TOR</td>
<td>Terms of reference</td>
</tr>
<tr>
<td>TTC</td>
<td>Tbilisi Transport Company (operates metro and larger buses)</td>
</tr>
<tr>
<td>TUDA</td>
<td>LEPL - Tbilisi Transport and Urban Development Agency (from July 2020)</td>
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<td>VO</td>
<td>Variation Order</td>
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Executive Summary

Introduction

1. This project, the Consultancy Services for the Tbilisi Municipality City Hall Transport Department Advisory project, is carried out by Mott MacDonald for the Cities Development Initiative for Asia (CDIA). The proposed objective of this CDIA project is to provide advisory support to Tbilisi Municipality City Hall (TMCH) in its continued efforts to implement measures supporting the shift to sustainable urban mobility in the Tbilisi urban area. The primary project scope was to support the Tbilisi Transport and Urban Development Agency (TUDA) in the development of bus lanes along its identified strategic bus network as well as developing key elements of policy and regulation and to provide capacity building and training in selected aspects of transport planning agreed with TMCH and TUDA. On request from the CDIA, Mott MacDonald also carried out a review of the ‘New Bus Network and Integrated Tariff and Ticketing System’ report previously completed for the Yerevan City Hall and the ADB regarding a proposed new bus network for Yerevan.

Project Staffing and effects of Covid-19

2. The project was carried out by five international consultants and one national consultant who provided a total of 28 person months of consulting services as follows:

- Mark Sellin, Urban Transport Advisor/Team Leader
- Anca Palmer, Bus Priority, Cycle and Parking Specialist
- David Parkin, Traffic Signals, Junctions and LINSIG Specialist
- Michael Payne, Senior Bus Specialist
- Nana Adeishvili, Urban Management Specialist

3. The Team Leader and the Urban Management Specialist were resident in Tbilisi for most of the project with the other staff being based mainly in the United Kingdom. The project was affected by the development of the Covid-19 pandemic. This resulted in two of the international experts being repatriated to the UK in mid-March and the cessation of all international flights between 21 March until 31 July when very limited flights restarted. The project was able to continue with the Team Leader in Tbilisi working with the staff in TUDA and with support from staff in the UK. The projects began to make much use of online video conferencing for meetings and training using both MS Teams and Zoom.

Bus Priority measures

4. The key element of the project was to support staff in TUDA plan, design and implement bus lanes along the strategic bus network (TBT routes) as proposed by Systra under their EBRD project which concluded in August 2020. The project did not include detailed design but did include the development of bus lanes so that TUDA could undertake detailed design themselves. The CDIA consultants provided advisory support in order that international best practice was followed and that the solutions were pragmatic in terms of the Tbilisi context.

5. We developed a methodology that we proposed to TUDA staff for the development of the designs for bus lanes. This followed a sequence of key steps as follows:

- Development of a Project Definition Document and a Project Initiation Document to record the key parameters and constraints of the proposed project.
● Development of a scale sketch on pen and paper to ensure options are workable in the space available. This enables consideration of all options proposed and the selection of a preferred option.
● Development of the preferred option as a preliminary CAD drawing.
● Use of topographic mapping to develop a detailed design in CAD including testing using Vehicle Tracking.
● Implementation of the proposed scheme.

6 During the project term, the following bus lanes were implemented in Tbilisi:

● Pushkin Street, between Liberty Square and Baratashvili Street, bus lanes in both directions
● Baratashvili Street, bus lanes in both directions
● Melikishvili Street, with-flow bus lane
● Cholokashvili Street, southbound bus lane and part of the northbound bus lane
● Vake Park, redesign of square incorporating new bus stops and bus lanes in both directions at each
● 26 May Square, redesign of area incorporating public realm, environmental improvements, cycle lanes and pedestrian crossings as well as new bus lanes (being implemented)

7 The main benefits of such improvements can be summarised as follows:

● Buses are not caught in congested traffic allowing a more reliable and higher quality bus service.
● Buses operating smoothly in their own lane emit fewer pollutants through avoidance of stop start operation.
● Buses using their own right of way should be faster than operating within other traffic.
● Improvements to bus stop infrastructure will make boarding and alighting easier for all people.
● Projects have aimed to introduce at grade pedestrian crossings and public realm improvements, including where possible environmental improvements.

8 In addition to the implemented bus lane schemes, there have been many designs that have not as yet been implemented due to a variety of reasons, including the parliamentary elections in October and Covid-19:

● Other parts of new strategic bus route ST12 (implemented as bus route 301)
● Heroes Square
● King Tamar Avenue, including proposals for a bus station in front of the railway station
● Tamarashvili Street
● Chavchavadze Avenue, proposals for with-flow median bus lanes
● Melikishvili Street, contra-flow bus lane
● Philharmonic Square redesign including bus lanes, pedestrian crossings and environmental enhancements
● Kostava Street from Philharmonic Square to Academy of Science and Republic Square
● Rustaveli Avenue from Republic Square to Liberty Square
● Redesign of Liberty Square including bus lanes, public realm improvements and pedestrian crossings
● Kote Afkhazi Street
● Kazbegi Avenue, including with and contra flow bus lanes
● Advisory support on a number of other streets

9 In addition to these schemes for bus lanes, the TUDA had contracted the local Tbilisi company STS to undertake detailed design on three streets including bus lanes. The CDIA consultants were involved at an early stage by the TUDA which ensured that the prepared designs followed best practice. The streets were Ketevan Tsamebuli Avenue, Vasha Pshavela Avenue and Tsereteli Avenue. The designs for Tsereteli Avenue were based on a former CDIA project preliminary design for a median running busway by Mott MacDonald. All three corridors are expected to be implemented in 2021-2022.

Operational Planning

10 During the project, we gave advisory support to TUDA for a number of bus operational planning issues. Some of these related to the planning for implementation of the first strategic bus route (TBT route 12) which was introduced in October as bus route 301. These operational planning support project can be summarised as follows:

- Bus Turning Circles – support for the design of dedicated areas for buses turning at the end of bus routes, including crew facilities.
- Vehicle Tracking – an add on for CAD design which enables designers to prove their proposed designs. We prepared bus models of types in use or proposed in Tbilisi and carried out vehicle tracking on all our designs.
- Testing of larger buses on bus routes 34 and 10 – we used vehicle tracking to verify that larger buses could be used on these routes with a consequent increase in capacity.
- Testing of whether larger buses could be operated on bus routes 2, 44 and 88 – we tested the three routes to establish whether 12m or 18m buses could be operated to increase capacity and quality of service. All three routes were found to take 12m buses with at least two accepting 18m buses.
- New depot in Saburtalo – we identified a site for a new bus depot and TTC head quarters building in University Street. We created a preliminary design for the depot suitable for articulated buses.
- Local Area Plans – this was a proposal for certain areas including Kote Afkhazi Street and Ljubljana Street to ensure that TUDA properly consider the impacts of their proposed changes to traffic.

Institutional Support and Advice

11 The Team Leader was asked to make a presentation to an audience of key stakeholder to support the Mayor of Tbilisi on 17 July to promote the Sustainable Mobility for Tbilisi strategy. This enable the CDIA to shape the form of transport policy in Tbilisi.

12 At the start of the project the CDIA consultants were supporting the Transport Department of Tbilisi City Hall. In March this was changed to be a separate legal entity and became the Transport Agency. In July a further change was made when the Transport Agency merged with the Urban Planning agency to become TUDA which allowed one agency to manage both transport and land use planning. During the year we supported the management of the Transport Agency and then TUDA to develop their thinking regarding roles and responsibilities of the new agency as well as the management structure.
13 Concurrent with the CDIA project, the ADB’s Sustainable Urban Mobility project was being carried out by Ramboll for the TUDA. We held several meetings with the Ramboll staff and also with the AFD appointed consultant as required. Key topics of discussion were the development of the transport model of Tbilisi and the proposed bridge near the railway station.

14 We also have meetings with the GIZ team in Tbilisi as their project in Tbilisi started up. The GIZ project started later than envisaged in mid-October. The CDIA consultants briefed the GIZ staff as required with a number of meetings.

Training and Capacity Building

15 The project has worked alongside TUDA staff in order to demonstrate working practices and skills, has held workshops and held training events. The following major events were held:

- Workshop on the Development of the Transport Agency – 13 March
- Workshop on Project Management – 2 June
- Workshop on Programme Management – 3 June
- Workshop on the redesign of Kote Afkhazi Street – 7 August
- Training event on an overview of Transport and Land Use Planning – 8 October
- Training event on Governance and Institutional issues – 21 October
- Training event on Marketing and Passenger Information – 19 November
- Training Webinar on Transport and Tourism – 27 November
- Training Webinar on Transport and Infrastructure with Environmental Protection – 25 November

16 We held the Interim Workshop on 16 September at which the Team Leader presented to staff of TUDA in a face-to-face situation. The Final Workshop presentation took place virtually on 26 November and included Mr Andria Basilaia, Deputy Mayor of Tbilisi with responsibility for Transport.

Supporting the ADB and Yerevan Municipality

17 In March 2020, Mott MacDonald was asked to carry out a review of all aspects of the “New Bus Network and Integrated Tariff and Ticketing System Final Network Proposal” report and appendices, dated 30 January 2019, as prepared by WYG International for the Yerevan Municipality. This was carried out over March and April 2020 together with an online Presentation, A Review of the New Bus Network and Integrated Tariff and Ticketing System Reports in Yerevan, was given to the Municipality of Yerevan on 22 April 2020.


19 On the 5th and 6th March 2020, Tbilisi City Hall, the ADB and the CDIA hosted a delegation from the Yerevan Municipality in Tbilisi. They had travelled to look at the progress made in Tbilisi and to undertake a study tour of the infrastructure, buses, depots that could inform their own improvements in Yerevan.

Recommendations for Future Work

20 This project will act as a bridge to other donors’ schemes enabling them to take on individual project elements. This is huge activity with some international donors in Tbilisi, especially the ADB, AFD, EBRD and GIZ. Some of these projects have already begun (ADB,
AFD, GIZ) and some are contained in the scope of Terms of Reference currently out for tender (EBRD).

21 The following proposals for further work is suggested:

- **Informing the Passenger** - We consider that having a reformed bus network is one task but informing your customers about your product and any changes of it is equally essential. It is proposed that a network bus map is produced by TUDA together with a topological map showing metro and strategic bus routes using colour lines. Information at bus stops is proposed to be developed using recent advances in e-paper displays which are more effective and cheaper than paper displays.
- **A Forum within City Hall** to include all relevant departments and stakeholders would be a useful step so that proposed projects could be discussed together with changes to policy and implementation of projects.
- **A Public Transport Users Forum** could be started by the TUDA to allow an open flow of information, comments, complaints and suggestions between the TUDA, City Hall, transport operators and the travelling public.
- **Local Plan development** including the consideration of all local residents and businesses as well as stakeholder engagement.
- **Training in transport modelling** such as Visum, Vissim in order that the model developed under the SUMP project can be used beyond that project term and local scenarios can be modelled. Additional skills in CAD and vehicle tracking are also required.
- **Integrated Fares and Ticketing** - The TUDA are proposing to change from a nett cost contracting system to a gross cost contracting system using a public service contract model. However, this will only work with a city-wide multi-operator integrated ticketing system which needs to be managed by the TUDA (as it needs to work across all operators). The first step in this is to assess whether the existing hardware and software can be modified or whether a new system is required.
- **Accessible Minibuses** - The City Hall has recently purchased 300 new minibuses as replacements for the older Ford Transit minibuses. As these are updated Ford Transit minibuses they still do not meet universal accessibility requirements and have long dwell times at bus stops due to their door type. A revised type of vehicle is needed that is designed for bus use and which meets access for all guidelines.
- **Finessing the New Bus Network** - The TUDA will need to finesse the proposed network from Systra so that additional areas can benefit from a new bus network and that the bus network properly complements the metro system. This should include the routing of TBT buses along Kazbegi Avenue in both directions and the addition of route 14, possibly extended to Upper Ponitchala to the strategic network. This will in turn allow the correct number of articulated buses to be purchased of the roll out of the new routes.
- **Livable Cities** - As part of our project we were required to assist the TUDA to identify “priority public transport related projects” which could be financed under the ADB Livable Cities project. The projects included are those which in the CDIA consultants’ professional opinion are necessary to improve transport in Tbilisi. They include a mix of infrastructure, information, accessibility and design projects with consequently different budgets. The proposed projects are just ideas and mostly have not been formerly discussed with the City Hall. Therefore, there is no assumption that the ADB’s Livable Cities Project will adopt any or some of them. The most urgent and important projects that are not believed to be adopted by a funder, are the new western depot and the redesign for minibuses.
Appendices

22 A number of more detailed topics, including presentations and all training materials, are shown in Appendices. These may be found in Volume 2 of this report.

Technical Notes

23 During the project we have produced a total of 20 technical notes covering infrastructure, technical and operational advisory support topics. They are intended to capture the advice and work undertaken on a particular topic and act as source of reference to TUDA staff in the future. All technical notes produced may be found in Volume 3 of this report.
1 Introduction and Background

1.1 Introduction

There have been a number of previous projects that focussed on the transport sector in Tbilisi. These have been funded by donors including the Asian Development Bank (ADB), the Cities Development Initiative for Asia (CDIA) and the European Bank for Reconstruction and Development (EBRD):

- Due diligence and procurement support for new 12 metre buses (EBRD);
- Tbilisi Bus Network Improvement and Pilot Surface Transit System Pre-Feasibility Study (CDIA);
- Pre-feasibility Study for Tbilisi Metro Upgrade (CDIA);
- City Hall Transport Department – Transport Advisor (CDIA);
- Restructuring of Bus Network and Implementation of Integrated Automated Fare Collection System (EBRD).

In addition, a number of new initiatives are currently underway:

- ADB’s proposed Livable Cities Investment Program;
- TA 54128-001 REG: Implementing the Cities Development Initiative for Asia - Project Preparation Study for the Georgia Livable Cities Program (ADB) regarding metro station accessibility.
- Development of a Sustainable Urban Mobility Plan (SUMP) under ADB’s SUTIP;
- Agence Française de Développement (AFD) are providing capacity development support, specifically designed to help City Hall prepare the ADB financed SUMP;
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH have an Urban Mobility Project, which will: (i) contribute to the implementation of the SUMP outputs; and (ii) provide further capacity building support to the TUDA
- Tbilisi Bus Phase III: Technical Due Diligence and Technical Support for Procurement (EBRD)
- Tbilisi Bus Project: Support for Bus Reform (EBRD)

By way of background to this project the TMCH submitted an application to CDIA for assistance in 2019 which resulted in the appointment in Mott MacDonald as CDIA consultants for this project in Q1 2020. The main rationale for the assistance was that TCMH was developing in its institutional structure and was about to implement a new bus network and was in need of pragmatic and practical advice and had had previous good experience with CDIA. Furthermore, there were additional staff to train in both operational and infrastructure issues and October would see the parliamentary elections in Georgia. Therefore, there would a great deal to deliver associated with changes to the ways of working and management.

The proposed objective of this CDIA project is to provide advisory support to Tbilisi Municipality City Hall (TMCH) in its continued efforts to implement measures supporting the shift to sustainable urban mobility in the Tbilisi urban area. On appointment this was, as envisaged in the TOR, the TMCH’s Transport Department. On 1 March 2020 the Transport Department changed to become the LEPL - Transport Development Agency and in July 2020 this Agency and the LEPL for Urban Development (also established on 1 March 2020) merged to form the LEPL - Tbilisi Transport and Urban Development Agency (TUDA). Another role for the CDIA consultants
was to act as a bridge to enable the TUDA to receive capacity building support before other proposed initiatives start and are operational.

The Mott MacDonald team providing the consulting services comprised a team of three international consultants and one national consultant - this is better described in Chapter 2. The role of the team is to provide support to the Transport Department, later the TUDA, in their design and implementation of projects and internal reform. This has primarily taken the role of capacity building sitting alongside TUDA staff to guide them how to improve their proposals and designs.

1.2 Project Scope

While support is to be provided across a broad range of TUDA activities, the main activities were intended to focus on the following:

- Provide support to the TUDA regarding the preparation of the SUMP to be implemented under ADB funding and with AFD support;
- Advise and support the TUDA in the preparation of designs for the on-going implementation of bus priority measures, cycle lanes and parking programs;
- Assist the TUDA to identify priority public transport related projects which could be financed under the upcoming ADB Livable Cities project;
- Undertake broader capacity building and public transport knowledge development within Tbilisi City Hall with particular reference to the assisting the Tbilisi Development Fund, the Urban Planning Department and the Landscape Department to prioritize urban transport, urban upgrading and public space management projects to be financed under the proposed ADB Livable Cities Investment Program;
- Assist the TUDA during the mobilization and early stages of the GIZ funded Urban Mobility Project; and
- Provide support to the TUDA in the introduction of the proposed Transport Agency.

1.3 Priority Project Objectives

The following objectives are key outputs of the project:

- Bus Route Network – this task was intended to build on the previous task so that bus priority measures could be developed along the correct streets.
- Bus Priority Infrastructure – the support to the TUDA for the development of bus lanes along key streets with a focus on training TUDA staff to undertake this work systematically.
- TMCH Capacity Building – a key part of the project’s TOR is to develop the skills of the TUDA staff with training or on-the-job support and guidance. Primarily this comprises on the job support and guidance but also includes training events such as thematic webinars.

1.4 Other Project Objectives

The following objectives are secondary objectives or additional tasks:

- Sustainable Urban Mobility Plan (SUMP) – support to the TUDA for this project being carried out by other consultants.
- ADB financed Livable Cities Investment Program – to assist the CDIA, the ADB and the TUDA to identify suitable and practicable projects for inclusion in the ADB’s Livable Cities Investment Program.
• GIZ Urban Mobility Project - to work with the TUDA to ensure that the incoming GIZ assistance team can be rapidly informed and “brought up to speed” in all activities related to transport in Tbilisi
• Transport Authority – to support the new TUDA in institutional development and advice.
• Review of Systra’s Tbilisi Bus Transit (TBT) Network – a high level review of the strategic bus network provided by Systra and identify any gaps – this was requested by City Hall for the Inception Workshop and delivered as part of the Inception Presentation.
• The CDIA consultants supported the CDIA and ADB during a two day visit to Tbilisi by representatives from Yerevan City Hall. Their main purpose was to see what had been achieved in Tbilisi to inform them about possible interventions in Yerevan.
• On request from the CDIA, Mott MacDonald carried out a review of the ‘New Bus Network and Integrated Tariff and Ticketing System’ report previously completed for the Yerevan City Hall and the ADB regarding a proposed new bus network for Yerevan. A separate output has already been delivered for this latter item.

1.5 Structure of Report

This report takes the following structure:

• Volume 1: Main Report
  – Chapter 1 – an introduction, background and objectives of the project based on the Terms of Reference
  – Chapter 2 – a description of project staff, their time on the project and the effects of Covid-19
  – Chapter 3 – a description of Project Activities and Deliverables Part 1: Bus Priority Measures
  – Chapter 4 - a description of Project Activities and Deliverables Part 2: Part 2: Operational, Institutional and Training
  – Chapter 5 – a description of stakeholder engagement
  – Chapter 6 – a description of work topics for the future
• Volume 2: Appendices
• Volume 3: Technical Notes
2 Project Staffing

2.1 Project Staffing

The project is comprised of the following staff:

**Mark Sellin**
Urban Transport Advisor/Team Leader
Planned input at VO4 – 9.2049 PM in country
Planned input at VO4 – 1.4770 PM in the UK

**Nana Adeishvili**
Urban Management Specialist
Planned input at VO4 – 5.5 PM in country
Anca Palmer  
Bus Priority, Cycle and Parking Specialist  
Planned input at VO4 – 1.5 PM in country  
Planned input at VO4 – 5.0 PM in the UK

David Parkin  
Traffic Signals, Junctions and LINSIG Specialist  
Planned input at VO4 – 1.5 PM in country  
Planned input at VO4 – 2.5 PM in the UK

Michael Payne  
International Senior Bus Specialist  
Planned input at VO4 – 0.1818 PM in the UK
2.2 Effect of Covid-19 Pandemic

The first quarter of 2020 saw the outbreak in China of the Covid-19 pandemic. This gradually spread across the world and has affected this project in Tbilisi. The Georgia Government dealt with the situation by the following key events:

- March 2 – all schools shut
- March 17 – ban on marshrutka
- March 18 – travel ban on foreigners entering Georgia
- March 21 – all flights stopped, state of emergency declared
- March 24 – intercity transport stopped
- March 31 – municipal transport stopped
- March 31 – curfew starts 2100 – 0600
- April 4 – 1st death
- April 15 – 4 largest cities entry and exit banned
- April 17 – private cars/taxis banned until 21 April, extended to 27th
- April 17 – facemasks inside shops introduced
- May 11 – entry to Tbilisi allowed
- May 23 – state of emergency stops/curfew
- May 29 – municipal transport starts
- June 8 – intercity bus transport starts
- June 15 – domestic tourism starts and railways start
- July 20 – 16th death in Georgia
- July 31 – some flight restrictions stop
- August 1 – direct flights from France (Air France), Germany (Lufthansa) and the Baltic States (Air Baltic) start for nationals and residents from these countries only
- September sees start of second wave of Covid-19 spreading from Adjara to all large cities including Tbilisi – numbers of active cases of Covid-19 in Georgia climbs rapidly from 240 on 1 September to 3153 on 1 October, 15,262 on 1 November and 20,454 on 1 December (on 14 December stands at 27,517)
- September 15 – all foreign nationals arriving in Georgia need a PCR test
- October 31 – 22 deaths in Georgia
- November 9 – Second curfew introduced in Tbilisi between 22:00 and 05:00
- November 28 – Second suspension of TTC metro and bus network until end January 2021 (partially)
- November 31 – 1267 deaths in Georgia
- By December 14-0- total of 1839 deaths in Georgia, 49 in past 24 hours.
- February 2021 – Georgian Government plans to lift all international flight restrictions.

After the end of the summer holiday period in late August, the number of Covid-19 active cases increased from the beginning of September, particularly after an outbreak in Batumi. The number of active cases and the rate of new cases continued to climb faster during October until a peak on 27 October. Following this date the rate of increase slowed somewhat until a second, higher, peak on 12 December after which a small decline has been noted.
This resulted in the evacuation of Anca Palmer and David Parkin on Tuesday 17 March just days before this was no longer possible. Their re-entry to Georgia was not possible and remote working from the UK has been used. Latterly the effects of Covid-19 had three main effects on the project:

- The planned training event in Borjomi for 4 September had to be postponed the week before due to the risk of having many people in a small space.
- The worsening conditions during October and the continuing uncertainty around international flight availability led to Mark Sellin departing Tbilisi for the UK on 25 October and has since worked from his home base.
- The Covid-19 conditions in Tbilisi also began to affect TUDA and its staff. Many if not most of the staff began to work from their homes and all communication used MS Teams, Zoom and Whatsapp.

The effect on the project has seen the way the project is conducted shift to more virtual working at home using Zoom or MS Teams for meetings. Mark Sellin and Nana Adeishvili remained in Tbilisi and have visited City Hall for specific meetings or attended site meetings for bus lane projects. Anca Palmer and David Parkin have continued to support the Team Leader from the UK as required by the demands of City Hall. This has primarily been the development of bus lane ideas for the design team in TUDA. The effect of Covid-19 has been to restrict the number of people meeting together for site visits and limiting the on street discussions and work.

The main effect has been in arranging training events with staff in workshop environment. Although the cases of Covid-19 decreased to a point so that training event was being planned to take place in Borjomi, the cases then increased to a level that the risk was too great to undertake this training in that manner. This has resulted in the training sessions changed to be done using virtual classroom instead. All these training presentations have been delivered using MS Teams but the discussion and group work has not been possible.

The TCMH budgets that were initially earmarked for infrastructure improvements and associated bus lanes were diverted in part to help with the Covid-19 crisis. This resulted in bus lanes still being implemented but without major infrastructure changes and using painted lines instead of infrastructure. During the period of low or no traffic, this enabled the TCMH to focus staff on infrastructure improvements in Vake Park and Chavchavadze Avenue area faster than would have been the case otherwise. This being said, the implementation of new bus lanes has continued with more being implemented during September and October.

### 2.3 Missions to Tbilisi

This chapter summarises the staff who have worked on the project in Tbilisi and time spent on the project. A schedule summarising the staff inputs over the life of this project is shown in Figure 2.1 included at the end of this chapter.

#### 2.3.1 Mark Sellin

Up until the end of November, Mark Sellin has been in country since 15 January 2020 and has worked 207 days in country (Mondays to Fridays) and 33 days in the UK. His planned return to the UK on 6 June was not possible due to the ban on international travel. During the field time, four public holidays and 4 days leave were taken as leave. He returned to the UK on 25 October and has worked in the UK since then.

**Table 2.1: Missions by Mark Sellin**

<table>
<thead>
<tr>
<th>Mission</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission 1</td>
<td>Wednesday 15 January 2020</td>
<td>25 October 2020</td>
</tr>
</tbody>
</table>
2.3.2 Anca Palmer

Up until the end of November, Anca Palmer has worked a total of 115.25 days, including 32 days in country and 83.25 days in the UK. The following two missions have been conducted by Anca Palmer, the second of which was cut short by the need to evacuate out of Georgia due to Covid-19.

Table 2.2: Missions by Anca Palmer

<table>
<thead>
<tr>
<th>Mission</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission 1</td>
<td>Monday 20 January 2020</td>
<td>Friday 14 February 2020</td>
</tr>
<tr>
<td>Mission 2</td>
<td>Monday 2 March 2020</td>
<td>Tuesday 17 March 2020</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

2.3.3 David Parkin

Up until the end of November, David Parkin has worked a total of 32.87 days, including 32 days in country and 0.87 days in the UK. The following two missions were conducted by David Parkin, the second of which was cut short by the need to evacuate out of Georgia due to Covid-19.

Table 2.3: Missions by David Parkin

<table>
<thead>
<tr>
<th>Mission</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission 1</td>
<td>Monday 20 January 2020</td>
<td>Friday 14 February 2020</td>
</tr>
<tr>
<td>Mission 2</td>
<td>Monday 2 March 2020</td>
<td>Tuesday 17 March 2020</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

2.3.4 Mike Payne

Mike Payne was brought in at Variation Order 1 stage to contribute a total of four days to the project bringing specialist support for the Yerevan bus network review. These four days was carried out over a period of time between 27 March and 15 May 2020.

2.3.5 Nana Adeishvili

Nana Adeishvili was present in Tbilisi as a National Specialist on an intermittent basis throughout the project to support the Mott MacDonald team. Up until the end of November she has worked for a total of 116.2 days.
## Figure 2.1: Staffing Schedule, as at end November 2020

<table>
<thead>
<tr>
<th>Staff</th>
<th>Jan-20</th>
<th>February 2020</th>
<th>March 2020</th>
<th>April 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week starting</td>
<td>6  13</td>
<td>20  27</td>
<td>3  10  17</td>
<td>2  9  16  23 30</td>
</tr>
<tr>
<td>Mark Sellin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anca Palmer</td>
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<td></td>
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</tr>
<tr>
<td>David Parkin</td>
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</tr>
<tr>
<td>Michael Payne</td>
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</tr>
<tr>
<td>Nana Adelshvili</td>
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<tr>
<td>Air Travel Ban</td>
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</tr>
<tr>
<td></td>
<td>4  11</td>
<td>18  25</td>
<td>1  8  15  22</td>
<td>29</td>
</tr>
<tr>
<td>Week starting</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Mark Sellin</td>
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<tr>
<td>Anca Palmer</td>
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<tr>
<td>David Parkin</td>
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<td>Michael Payne</td>
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<td>Nana Adelshvili</td>
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<td>Air Travel Ban</td>
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<tr>
<td></td>
<td>7  14</td>
<td>21  28</td>
<td>5  12  19  26</td>
<td>2  9  16  23 30</td>
</tr>
<tr>
<td>Week starting</td>
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<td></td>
</tr>
<tr>
<td>Mark Sellin</td>
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<tr>
<td>Anca Palmer</td>
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<tr>
<td>David Parkin</td>
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<tr>
<td>Air Travel Ban</td>
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</tr>
</tbody>
</table>

Key:
- Time in Country (actual)
- Time at home/intermittent (Tbilisi based)
- Time at home/intermittent (UK based)
- Staff Leave
- International flights ban
- Restricted international flights
3 Project Activities and Deliverables
Part 1: Bus Priority Measures

3.1 Introduction

22 We have been working with staff from the TUDA throughout the project and supported them to show the right way of planning, designing and implementing a scheme and to develop a process for the design of bus lane infrastructure. The pandemic has slowed implementation but from July until the start of the parliamentary election process in approx. Early September several bus lanes were implemented fully or were under construction. This process is expected to continue after the parliamentary elections on 31 October 2020 subject to Covid-19 and other constraints.

23 This was a technical assistance project and did not include detailed design (the detailed design was undertaken by the TUDA or its contractors in Tbilisi such as STS). We have demonstrated the need to plan projects carefully and to use different techniques at different stages. We have shown the importance of testing proposals in CAD using vehicle tracking and using more detailed topographical maps. The infrastructure improvements (bus lanes) permit the operational changes (bus network) to function well.

24 The support was focussed on the proposed strategic bus network that was recommended by the Systra consultants, as shown in Appendix B1. The objective of TUDA was to provide bus lanes on one key corridor at first (ST12) and then roll them out to other corridors to enable strategic bus routes to begin operations in a phased manner and for that reason bus lanes were prioritised on certain streets to enable this to happen – a process that has been ongoing throughout the project term. With the run up to the election, the order of priorities was amended to focus on quick wins until after the election (for example on wider streets with no parking problems).

Please see Appendix B2 for maps showing the implementation of bus lanes throughout Tbilisi.

3.2 Methodology

3.2.1 Checking Constraints on Mapping Base Layers Provided by City Hall

25 We used a combination of different resources to achieve our designs and to support the TUDA achieve their designs. Many of the layers are available online at the following site (also available in English): http://maps.tbilisi.gov.ge

- Road polygons – to show the edges of the road and thus the available space
- Building polygons – to show the edges of the buildings
- Cadastral mapping – to show land ownership boundaries and ownership details as held by the official land registry
- Aerial photography – to act as a supplementary check
- Site visit and project photographs – to reconfirm proposed hypotheses
- Topographical mapping – used to achieve detail for detailed CAD drawings (commissioned by the TUDA).
3.2.2 Programme and Project Management

26 The CDIA consultants demonstrated how a project could be initiated by developing two templates used to scope and define the proposed project as shown in Technical Note 35 (see Volume 3). This comprised the following two documents:

- A Project Definition Document - intended to identify the objectives, scope, risks, stakeholders, budget, timescale, outcomes and responsible team for a project
- A Project Initiation Document - this specifies any constraints for the project and records decisions taken about them to help the design team - issues such as removal of parking and installation of cycle lanes are parameters that would be included and would affect the design.

The training given to the staff in TUDA regarding project management and programme management was an introduction designed to address a clear gap in knowledge. It was intended that the principles could be used in bus lane projects such as the design of bus lanes on route ST12. However, in practice it is suggested that more work in this area is needed including changes to management understanding and practices.

27 We have carried out capacity building in two ways, more information is shown in Section 4.3 Training:

- A workshop on the programme management for developing a project such as a new bus lane showing the steps to be followed and in which order. This is shown in Technical Note 35 in Volume 3 of this report.
- A training workshop of the basics of project management. The transcripts are included in Appendix I6 in Volume 2 of this report.

We found that the TUDA staff were generally unused to considering schemes in this way and that management usually gave them too short a time to properly think through a scheme so that implementation was less successful. We still found that the TUDA staff preferred to go straight to CAD skipping this step.

28 Therefore, this needs change in two ways – for management to understand that planning a successful scheme takes time to get it right and for TUDA design staff to develop a scheme using a logical process that prevents rework and wasted time. Additionally, there is no public stakeholder process in these schemes and public views are not considered until after implementation. The assessment of capacity gaps is shown in Chapter 6 of this report.

29 The process is planned to continue following the agreement from management of a preferred option which would then be designed in more detail in CAD. At this stage, the TUDA have been commissioning a topographical survey to obtain more detailed mapping of the location of a given scheme, which is to be supported.

3.2.3 Developing a Scale Sketch

30 The first stage includes the development of an idea, the discussions of how this could be developed and finally the production of scale sketches in pencil and paper to illustrate how the solutions could look. The intention of this stage was to allow management to decide which solution to proceed with based on some practical drawings.
3.2.4 Drawing a Preliminary CAD design

The second stage is to convert the scale sketch to a preliminary CAD drawing.

Figure 3.1: Scale Ketch (Vake Square)

Figure 3.2: Preliminary Design in CAD (Vake Square)
3.2.5 Drawing a Final CAD design

The third stage is to incorporate any topographic mapping if available and for the design to be drawn in detail in CAD. This stage would always be undertaken by the TUDA.

![Figure 3.3: Detailed Design in CAD (26 May Square)](image)

3.2.6 Implementation of Schemes

With regard to the implementation of schemes, all stakeholders, including any municipal entity (including Infrastructure and Environmental Protection) and utility companies (such as water and electricity) must seek the agreement of the TUDA before starting any work.

Within the TUDA, this coordination is undertaken by the Deputy responsible for Road Infrastructure and Traffic Management (Mamuka Mumladze) whereas the design of the schemes within the TUDA is the responsibility of a different Deputy responsible for Traffic Planning and Design (Nino Bagashvili).

This leaves key questions:

- Within the TUDA is there a weekly management meeting where schemes from different stakeholders are discussed so that conflict can be identified?
- Are external or internal stakeholders outside of TUDA being asked to formerly register proposed schemes early enough so that any all bus lane impacts can be addressed well before detailed design stage and before contractors are engaged.
● What formal mechanism is there in place between the two Deputies in the TUDA to ensure both are fully appraised of all schemes and their consequences.

36 This is an area of work that falls to a Transport Authority and which requires more work.

37 There is not a history of stakeholder engagement both inside City Hall and with external stakeholders. It is understood that some dialogue is undertaken but we have found instances where the Infrastructure Department have started construction without final designs being completed by TUDA or that contractors have been awarded a fixed price contract for a scheme although the final design has not been approved and they were unable to price the job accurately leading to issues downstream.

38 We led a workshop between the TUDA, the Infrastructure Department and the Environmental Protection Team (see details in section 4.3 Training and in Appendix I). Although this started to develop a dialogue between the parties, work remains to be done, particularly with respect to overlapping roles and responsibilities.

3.3 Implemented Schemes

39 Following this process, we have supported the TUDA which has now implemented the following schemes:

3.3.1 Pushkin Street

40 The street between Liberty Square and Baratashvili Square is a key link in the network and comprises two lanes in each direction. During August one of these lanes in each direction was converted to a bus lane.

Figure 3.4: Bus Lane on Pushkin Street heading to Liberty Square
3.3.2 Baratashvili Street

Sketches for this area were prepared, the TUDA drew this in CAD with improvements and it was implemented in late August incorporating new cycle lanes and pedestrian crossings. This design incorporates two bus stopping areas each side and a bypass lane for buses.
Figure 3.6: Bus Lanes in Baratashvili Street

Figure 3.7: Baratashvili Street – New Bus Lanes and Cycle Lanes
3.3.3 Melikishvili Street (with Flow)

Although the original project concept was to introduce a contraflow bus lane between Chavchavadze Ave and Philharmonic Square, the implemented design to date has introduced a with flow bus lane with amended parking layouts and a short bus lane by Philharmonic to allow left turning buses to better access the bus lane in Kostava Street. Please see Technical Note 16 for more details shown in Volume 3 of this Report.

Figure 3.8: New With Flow Bus Lane in Melikishvili Street
3.3.4 Cholokashvili Avenue

The southbound bus lane from Vake Cemetery to Vake Park was already installed and this has been retained under the new designs for the area. The northbound bus lane was again already in place between Vake Park and Tsereteli Street and this has been retained. The proposed section between Tsereteli Street and Vake Cemetery is being deferred until after the new road bridge between Bagebi and University is built, although this project has been delayed due to the Covid-19 crisis. The main design change is that both bus lanes from Vake Park as far as Tsereteli Street are now situated together on the north side of the street – this is designed to work with the new arrangements at Vake Park.
3.3.5 Vake Park

The westernmost bus stops of the Chavchavadze project at Vake Park were redesigned with with-flow bus lanes and bus stops together with pedestrian crossings by the TUDA following proposals from the CDIA consultants who were supporting design staff at the TUDA. This included a cross over to contraflow operation to the east of Vake Park. Following the opening of this installation buses have been operating successfully at this location.
Figure 3.12: Vake Park Bus Stop and Bus Lane

Figure 3.13: Vake Park Bus Lanes with Lane Change Design
3.3.6 26 May Square

We were asked our advice for the area south of the Holiday Inn and east of “Wendy’s”. This area has a large privately owned land parcel just south of the Holiday Inn and the remaining area is marked out for general traffic by plastic bollards. Our proposals to the TUDA included several options that incorporated bus lanes, cycle lanes, public realm space and pedestrian crossings by Wendy’s which is currently not available (the area is surrounded by large residential and university buildings). Following final detailed design by the TUDA, and adoption of most of the CDIA consultants’ recommendations, this scheme has now been implemented in the last week of September and the first weeks of October. Please see Technical Note 22 for more details shown in Volume 3 of this Report.

Figure 3.14: New Bus Stop and Cycle Path
3.3.7 Scheme Benefits

The implemented schemes show a number of benefits:

- Buses are not snagged in traffic, particularly at busy times, and they can offer a more reliable and higher quality bus service. It is important that this key benefit is not diluted by allowing taxis or cycles in bus lanes.
- The strategy has been to avoid adjusting traffic junction signal settings, instead using bus lanes to bring buses up to the stop line – this achieves most benefits without disrupting other traffic.
- Buses operating smoothly in their own lane emit fewer pollutants – although the removal of minibuses along strategic streets will help the reliability of larger buses.
- Buses using their own right of way should be faster than operating within other traffic and therefore it is possible to optimise the schedule and save a bus in the cycle thereby reducing costs – or alternatively using this vehicle to enhance the service frequency. It is essential to optimise all bus routes using modern software designed for this purpose.
- Improvements to bus stop infrastructure will make boarding and alighting easier for all people – although measures to improve the close docking of buses at kerbs and the use of accessibility kerbs will further improve this.
- We have introduced at grade pedestrian crossings and public realm improvements, including where possible environmental improvements. These will help the accessibility of all citizens but especially those who are more infirm and will provide a green lung in key squares – for example at 26 May Square. Crossings have been provided at locations where there have been only pedestrian subways or where no crossing was previously available.
3.4 Proposed Schemes

This section considers those schemes that are under the planning phase and have not yet been implemented.

3.4.1 Heroes Square

We were asked our advice regarding Heroes Square and how it could be improved. Without data collection and extensive traffic modelling it is impossible to undertake this task and we do not have these skills within our team. Therefore, we have limited our advice to proposing bus lanes that could be implemented with the current highway design. Please see Technical Note 21 for more details shown in Volume 3 of this Report.

Figure 3.16: Proposed Bus Lanes on Heroes Square

3.4.2 King Tamar Avenue

The team has also supported city hall in the development of drawings of King Tamar Avenue between the railway station and the Circus near to Heroes Square. Staff from City Hall have largely completed the CAD design of King Tamar Avenue. The CDIA team has additionally provided advice with a view to remodelling the bus station in front of the railway station to a modern bus interchange incorporating future articulated buses and also the regional buses and potentially the bus to Kutaisi airport, currently blocking the bus stop on Pushkin Square.
Figure 3.17: Preliminary Ideas for a New Bus Station

Figure 3.18: CAD Design of part of King Tamar Avenue

3.4.3 Tamarashvili Street

The main corridor from Delisi metro station to Vake Park along Tamarashvili Street was always planned for rapid transit with a tramway reservation already built. We have developed proposals for bus lanes along the entire street to connect Delisi with Vake, part of the strategic
route ST12. The section of Tamarashvili Street between Tsereteli Street and Vake Park was implemented as part of the Vake scheme.

3.4.4 Chavchavadze Avenue

51 The bus lanes along Chavchavadze Avenue, from Mishveladze Street to Varaziskhevi Street was initially designed by external consultants and then the design was taken over by City Hall. It is along this section that buses now operate in contraflow. The CDIA input along this section comprised supporting the TUDA in the design of the bus switchovers at each end of the section to allow buses to regain with-flow operation.

52 The CDIA team developed an alternative proposal for bus lanes on Chavchavadze Avenue during January which retained the median design and used the same space requirement within the street but changed the operation to with-flow for buses. The City Hall decided in February to retain their original contraflow design apart from at Vake Park.

Figure 3.19: Mott MacDonald Proposed Design of Chavchavadze Avenue (not implemented)

3.4.5 Melikishvili Street (Contraflow)

53 Following the implementation of the with flow bus lane in Melikishvili Street, we were asked to support the TUDA to prepare designs for the implementation of a contra flow bus lane along this street. This was completed and now awaits implementation. Please see Technical Note 33 for more details shown in Volume 3 of this Report.
3.4.6 Philharmonic Square

In order for the contra flow bus lane in Melikishvili Street to work, bus operations have to be amended in Philharmonic Square. We have produced a design for this that allows an at grade pedestrian crossing between Vere park and the Public School and also to the Philharmonic Hall. The design also allows environmental improvements to be made in a similar way to 26 May Square. Please see Technical Note 33 for more details shown in Volume 3 of this Report.
3.4.7 Kostava Street/Academy of Science

The section from Philharmonic Square to the Academy of Science features a narrow section of road that will not permit one bus lane and two general traffic lanes in each direction. We developed a design that saw median bus lanes in each direction (this is possible as there are no bus stops) and one wide lane on each side of the street. In practice this is wide enough for two cars but not for a larger vehicle so maximises the capacity of the street taking into consideration the available space and the local driving habits.

On reaching the junction with Javakhishvili Street, we have developed a traffic signalled junction that means that buses can move from centre running bus lanes to side running bus lanes easily but that traffic travelling up Javakhishvili Street can turn in both directions. This means that no traffic is required to use Republic Square by Andropov’s Ears and this space can be pedestrianised – there is enough space at the Academy of Science for one bus lane and two general traffic lanes in each direction, although these would be narrow.

At the east side of the Republic of Science we have redesigned the Republic Square by the Olive Tree and simplified the junction with fewer conflicting movements now that traffic is not
moving by Andropov’s Ears. There is an opportunity to introduce environmental improvements and to enhance the public realm in this area. Please see Technical Note 33 for more details shown in Volume 3 of this Report.

Figure 3.22: Proposed Design Signalled Junction near Rustaveli Metro Station
3.4.8 Republic Square/Rustaveli Avenue

58 We have supported the TUDA by developing a proposed design from Republic Square to Liberty Square. Although originally it was intended to include cycle lanes, the TUDA later required two general traffic lanes in each direction as well as bus lanes. Therefore, for now, the design just features simple side running bus lanes using the existing bus stops. In the future the rebuilding of this street with median bus lanes and general traffic calming will greatly improve this area. It will be necessary to identify marked space for cycles and e-scooters on the pavements as they cannot use the bus lanes. Please see Technical Note 33 for more details shown in Volume 3 of this Report.
3.4.9 Liberty Square

As part of the designs prepared for Rustaveli Avenue and Kote Aflkazi Street, we ensured that buses could move to and from these streets. This resulted in a sketch for a radical reappraisal of the Liberty Square space reducing the amount of space given over to traffic and increasing public realm. This is an option and remains a suggestion for the City Hall. Please see Technical Note 33 for more details shown in Volume 3 of this Report.
3.4.10  Kote Afkhazi Street

We have advised the TUDA regarding their proposed changes to Kote Afkhazi Street. They are proposing to route their first strategic bus route, ST12, along this road and are therefore proposing to close it to all traffic except buses. We ensured that the TUDA design team walked the street looking at all the issues namely side road access, access to hotels and businesses, access to residential addresses, emergency vehicle and refuse access, impacts to the local area if the road is closed. Please see Appendix H for more details of the presentation.
In August a meeting was held with the Kazbegi Avenue

Latterly a query has been asked by the TUDA regarding Vasha Pshavela Avenue, which with Kazbegi Avenue operate with one way traffic, whether these could be changed to operate with two way traffic. We research whether this proposal could work using a number of options:

- Retain the same as now (one way traffic and one way buses)
- Two way traffic and two way buses on both streets
- One way traffic and two way buses on each street.

We found that if all parking was abolished on Kazbegi Avenue there would be sufficient space for two traffic lanes in each direction. However, the TUDA preferred to retain parking on one side of Kazbegi Avenue so that the option of one way traffic and two way buses was recommended to provide enough general traffic capacity. To make this flow better we proposed the stopping up of minor streets and developing a hierarchical street system. Please see Technical Note 30 for more details shown in Volume 3 of this Report.
3.5 A Summary of Bus Lanes Implemented and Planned

Further details of the Strategic Bus Network and of implemented bus routes can be found in Appendix B1 and maps of the bus lanes implemented and planned may be found in Appendix B2.

3.5.1 Bus Lanes Implemented with CDIA Assistance

These are shown in red and blue on the maps.

- Vake Cemetery – Vake Park
- Tsereteli Street – Vake Park
- Melikishvili Street, with-flow
- Robakidze Avenue (last CDIA project)
- Kostava Street South, with-flow
- Pekini Street
- Baratashvili Avenue
- Kostava Street North (last CDIA project)
- Pekini Avenue, with flow (last CDIA project)
- Ana Kalandadze Street, with flow (last CDIA project)
- Shartava Street (last CDIA project)

3.5.2 Bus Lanes Planned with CDIA Assistance

These are shown in green on the maps.

- Ana Politkovskaia Street
- Sandro Euli Street
- Tamarashvili Street
Kazbegi Avenue
- Pekini Avenue (North and South)
- Kostava Street North
- 26 May Square
- Heroes Square
- King Tamar Avenue
- Rustaveli Avenue
- Embankment Right Bank (Baratashvili Street to Gorgasali Street)
- Gorgasali Street
- Gulia Street and Bridge (Ortachala)
- Bogdan Khmelnitski Street (to Aviation Factory)
- Kerchi Street
- David Sarajishvili Street
- David Guramishvili Avenue (as far south as Eristavi Street)
- Tengiz Sheshelidze Street and Mindeli Bridge
- George Balanchini Street
- Mirian Mepe Street
- Akaki Beliashvili Street
- Sandro Akhmeteli Street

3.5.3 An Estimate of Kilometres Implemented and Planned

An approximation of the kilometres of bus lanes implemented and planned is shown in the table below.

<table>
<thead>
<tr>
<th>Type of Scheme</th>
<th>Metres</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus lanes implemented, two directions</td>
<td>3,606</td>
<td>3.4</td>
</tr>
<tr>
<td>Bus lanes implemented, one direction</td>
<td>7,151</td>
<td>6.8</td>
</tr>
<tr>
<td>Bus lanes planned with CDIA assistance, not yet implemented</td>
<td>38,598</td>
<td>36.9</td>
</tr>
<tr>
<td>Planned but without CDIA assistance</td>
<td>18,425</td>
<td>17.6</td>
</tr>
<tr>
<td>Other Strategic Bus Routes</td>
<td>30,313</td>
<td>29.0</td>
</tr>
<tr>
<td>Total</td>
<td>104,635</td>
<td>100.0</td>
</tr>
</tbody>
</table>

3.5.4 An Estimate of Passengers Benefitting

The estimate of passengers shows the annual passengers carried by affected TTC bus routes using 2018 data which is the latest available. This estimate is carried out for the bus lanes implemented to date surrounding the Vake Park area.

<table>
<thead>
<tr>
<th>Bus Route</th>
<th>Annual Passengers 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>225,994</td>
</tr>
<tr>
<td>Bus Route</td>
<td>Annual Passengers 2018</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>9</td>
<td>1,533,489</td>
</tr>
<tr>
<td>34</td>
<td>2,078,484</td>
</tr>
<tr>
<td>51</td>
<td>5,229,894</td>
</tr>
<tr>
<td>58</td>
<td>188,751</td>
</tr>
<tr>
<td>59</td>
<td>958,026</td>
</tr>
<tr>
<td>61</td>
<td>3,587,707</td>
</tr>
<tr>
<td>82</td>
<td>175,590</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,977,935</strong></td>
</tr>
<tr>
<td><strong>Total TTC Bus Network 2018</strong></td>
<td><strong>131,916,178.00</strong></td>
</tr>
<tr>
<td>%</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

### 3.6 Contracted Scheme Support

The TUDA has contracted with STS, a local design company, to undertake façade to façade designs for three streets including the provision of cycle lanes and bus lanes. We have supported the TUDA and STS staff from an early stage to ensure that the bus lanes are depicted correctly to ensure the optimum operation of the bus routes. This was achieved successfully with the final proposals achieving a good design. The streets are:

#### 3.6.1 Tsereteli Avenue

The section of road between Didube and the main football stadium is undergoing detailed design by STS as part of a plan to implement bus lanes along this street. The company have based their designs on the previous CDIA study in which a preliminary design for a BRT route was developed for this road by Mott MacDonald. As detailed design has progressed, some details have changed but essentially retains a median busway for much of its length. It is expected that this will be implemented in 2021/22.

*Figure 3.27: Median Busway Design for Tseteli Avenue*
3.6.2 Vazha Pshavela Avenue

The section of this street between State University metro and Peking Avenue is undergoing detailed design by STS which incorporates bus lanes and cycle lanes. It is expected that this will be implemented in 2021/22.

Figure 3.28: STS Design of Vasha Pshavela Avenue
3.6.3 Ketevan Tsamebuli Avenue

The section of this road from the bottom of Baratashvili Rise to Avlabari and then to Bochorma Street. The detailed design of this street has been completed by STS and awaits implementation.

3.7 Other Design Support

We have also provided support and capacity building to the TUDA to enable them to design bus priority for the following locations:

a) Vekua Street/Vasadze Street, Gldani – we held a site meeting with staff from the TUDA and discussed several options for this road. It was later decided by TUDA to adopt contraflow operation on this road.
b) Kerchi Street, Gldani – we also looked at this street on the same site visit so that bus lanes could connect as far as Sarajishvili metro station. TUDA agreed to use side running bus lanes, but this project has not yet progressed beyond a first stage design.

c) Balanchini Street - we provided suggestions of how to connect the bus lanes shown above at Sarajishvili metro station with Didi Digomi past the US Embassy. As yet this proposal has not been progressed.

d) Guramishvili Street – plans were prepared with staff from the TUDA to link bus lanes at Sarajishvili metro station with Erstavii Street using side running layouts. The CAD designers at the TUDA have developed designs and have continued along Dadiani Street towards the railway station. The current status of this project is not known.

e) Kakheti Highway – we were asked our opinion on bus lanes along the Kakheti Highway as far east as Varketeli. On further consideration we suggested that bus lanes either are unnecessary on this faster road or that buses should be routed instead along Dedofali and Moscow Avenues which better serve the communities.

f) Ljubljana Street – we have been asked about how buses and traffic can co-exist in this area which has many large hospitals and media centres. This area sees considerable traffic and realising bus priority is not easy.

g) Marjanishvili Roundabout – the TUDA requested our support for the redesign of the junction to the east of Galaktion Tabidze Bridge. We supported them in their designs for cycle lanes and the better design for a roundabout using best practice.

h) Pekini Avenue North and Zurab Zhvania Square – we supported the TUDA in the redesign of the section of Peking Avenue north of Vasha Pshavela Avenue as well as the square. This was based on the premise that the median strip of Peking Avenue was being freed from trees and could be used for bus lanes. This was later changed, and the existing streets had to accommodate the bus lanes instead. It was decided not to proceed with this part of the project at this time. The support for the remodelling of Zhvania Square with bus lanes and more public realm and greening were accepted although work has not yet started.

i) Advice on Y Junctions – we received a request from the TUDA about the best practice relating to the design of a Y junction in suburban Tbilisi. We provided a number of sketches illustrating options available for their consideration.
4 Project Activities and Deliverables
Part 2: Operational, Institutional and Training

4.1 Operational Planning

75 The team assisted the TUDA with the planning of the bus priority for the first of the proposed strategic bus routes, an end to end distance of 21.5 km one way. This was coded as route ST12 and was a joining of existing bus routes 55 and 140, with a revised section to serve the State University metro station. From implementation on 24 October, this route is currently numbered 301. A Map of the entire strategic (TBT) bus network is shown in Appendix B1 with route 301 picked out in red.

4.1.1 Bus Turning Circles

76 As part of the planning for the ST12 bus route, we provided support to lay out and plan for bus turning circles at route termini or along a route. We used the example of the western end of the ST12 route at Ana Politkovskaia Street. Please see Technical Note 15 for more details shown in Volume 3 of this Report.

Figure 4.1: Bus Turning Circle Proposals

4.1.2 Vehicle tracking

77 We received a query as to whether larger buses could be used on two key rural bus routes which currently use 8 metre buses. Team Members created vehicle tracking models for all types of bus in the Tbilisi bus fleet for use in CAD. We used CAD and its vehicle tracking add-on
software to test both routes using CAD models of the MAN 10.5 metre bus and both 12 metre bus models (MAN and BMC) in use in Tbilisi. We found that the 10.5 metre bus could be used on both routes, although a 9.5 metre bus may be more appropriate on route 10, but that the 12 metre bus types would not be suitable. We also discovered that the swept path of the MAN 12 metre bus fits better than the BMC bus so the latter needs to be used with care. We also used vehicle tracking along the route of ST12.

This exercise was undertaken by the CDIA consultants because the TUDA do not have the correct legal copies of Autodesk AutoCAD software and the Vehicle Tracking add-on is only available to be bought with CAD software. It is understood that GIZ are considering purchasing CAD software for TUDA and it is hoped that this omission will be corrected then. Bus models for vehicle Tracking can then be supplied to TUDA. Please see Technical Note 24 for more details shown in Volume 3 of this Report.

**Figure 4.2: Vehicle Tracking on Bus Route 10**

**Route 10 - screen 1 /Tracking of 10.5m MAN A47 BUS**

### 4.1.3 New depot at Saburtalo

We identified a site for a new bus depot at University Street in Saburtalo. This has sufficient space for a turning circle for local bus routes, a reasonably large depot and a new headquarters building for the TTC to replace the old facility at Station Square.

The location of the bus depot would replace the need for buses to travel from the existing bus depot #2 at Didi Digomi, a distance of 14 km, and thus reduce dead kilometres and thus costs.

It is proposed to include the bus depot project in the ADB’s Livable Cities project options (see Appendix D). It is very important for the TUDA to reserve this site now.
Please see Technical Note 19 for more details shown in Volume 3 of this Report.

**Figure 4.3: Location of Proposed Bus Depot**

![Figure 4.3: Location of Proposed Bus Depot](image)

**Legend**
- Yellow: Bus Route Extension
- Blue: Future Strategic Bus Routes
- Black: University Turning Circle
- Red: Proposed Depot Saburtalo

**Figure 4.4: Detail of Bus Depot Design**

![Figure 4.4: Detail of Bus Depot Design](image)

Legend:
- **Bus Depot General Arrangement**
- **Bus Parking Bays**
- **Bus Wash Bays**
- **Bus Engine Bays**
- **Bus Driver Cab Bays**

Rev A
Scale 1:2000@A4
4.1.4 Route ST12 corridor planning

82 We were asked to support the bus lane design team of the TUDA who were given a very short time of three weeks to design a 21.5km bus route and its bus lanes. This route effectively joined the existing 55 and 140 bus routes together with minor routing changes. We provided design support and accompanied TUDA on site to look at local issues as required. Comments were provided that the route should be operated by one bus type (each existing routes use a different type) and that the new BMC buses are higher than the MAN buses (bridges need checking and their swept path is different to the MAN 12m). All 12m buses run on CNG – this is only available at depot 2 – hence the proposed new depot site in Saburtalo. It is evident that some changes will be required on other bus and minibus routes and that effective marketing and information in relation to the changes will be necessary. Support to the design of bus lanes and subsequent changes in parking and other road features has been provided for many parts of this route. Please see Technical Notes 12 and 13 for more details shown in Volume 3 of this Report.

4.1.5 Articulated Bus Route Testing

83 During the end of January, the City and the TTC had a demonstrator articulated bus on loan from Otokar in Turkey. This was used to test all the proposed strategic bus routes in Tbilisi at night. Mark Sellin joined one of these trips with other staff from the TUDA, TTC and Otokar.

**Figure 4.5: Demonstrator Articulated Bus at Station Square**

4.1.6 Testing New Larger Buses

84 In September and October we joined site visits held in a number of locations. These had the aim of seeing whether larger bus types were able to operate on selected routes and
consequently whether these routes could be converted to newer 12 metre buses with a larger capacity.

- **Route 2** – we considered whether 12 metre buses could replace the old 10 metre Bogdan buses at three key locations: at the existing terminal at Kiziki Street, at a proposed new terminal at Africa and along a narrow road with a tight corner in Africa beset with parked cars. Following a site visit and testing of sections of the route using vehicle tracking in CAD we verified that both 12 metre and 18 metre buses could use all locations. In addition, we were able to suggest the options to improve the operational experience. Please see Technical Note 29 for more details shown in Volume 3 of this Report at the locations.

**Figure 4.6: Bogdan Buses at Route 2 Terminus**

![Route 2 Africa Option 2 - Tracking of OTOKAR 18.75m BUS](image-url)
- Route 44 – Upper Ponitchala we assisted the TUDA by establishing whether 12 metre buses could replace the existing 8 metre buses which would increase capacity on the 44 and potentially the 19 routes tremendously. We held a site visit first to view the issues and barriers followed up with a trial with a 12 metre bus together with representatives from TTC. We proposed to the TUDA that due to narrow roads that operating the route using a one-way terminal loop would prevent meeting buses in the other direction and this could be adopted for all bus routes. We proposed an operational plan and tested it with a bus. We identified that one tight corner needed to have a pothole filled in and a garage removed. Following our intervention, the pot hole has been filled in, the garage removed and new bus routes 344 and 319 operated with new 12 metre buses have started operation. Please see Technical Note 28 for more details shown in Volume 3 of this Report.

Figure 4.7: Testing the 12m Bus in Upper Ponitchala

- Route 88 – We were asked by the TUDA to establish whether the bus route in Nutsubidze Plato could be operated by articulated buses – route 88 is already operated by 12 metre buses. Their view and that of Systra was that it could not and therefore the strategic bus route had been terminated at Delisi metro. We therefore tested the existing route using vehicle tracking in CAD using a model of both an 12 metre and an 18 metre bus. We found that the route was viable with an articulated bus but that segregation from other traffic was not possible. Please see Technical Note 27 for more details shown in Volume 3 of this Report.
4.1.7 Local Area Plans

We worked with the TUDA to establish the best way forward for Kote Afkhazi Street in the old town. This included a walking site visit with TUDA staff so we could establish possible issues and opportunities. The traffic in the street currently operates in one direction only towards Liberty Square. The official viewpoint was that all general traffic would be removed from the street with buses operating in both directions. The purpose of the walking visit, general discussions and a presentation to the Head of the TUDA was to ensure that they were considering the results of their proposals on other traffic users, local businesses and householders in nearby streets. We demonstrated that by establishing a southbound (away from Liberty Square) bus lane together with the northbound lane remaining open to all traffic this would achieve all the TUDA objectives yet remove any issues relating to stakeholder objections. We therefore proposed that a Local Plan be written in similar areas to enable City Hall to adequately consider all the issues. Other areas this could apply to may include Ljubljana Street and the adjacent hospital district.

4.2 Institutional Support and Advice

4.2.1 Support to the Mayor presenting the Transport Strategy

On 17 July 2020 the Mayor of Tbilisi, Kakha Kaladze, presented his transport strategy to Senior Management, members of the City Assembly, members of Parliament, diplomats, NGOs and City Hall staff. The presentation was televised live and featured on media and Facebook. Supplementary presentations were given by CDIA consultant Mark Sellin and SUMP consultant Jean-Marc Mirailles. A copy of the presentation is shown in Appendix B. This enabled CDIA to influence the shape of the future transport policy of the city. Following this, the Deputy Mayor, Maia Bitadze, stated that both she and the Mayor had been pleased with the CDIA presentation.
4.2.2 The Transport Agency

The Transport Department changed its legal status on 1 March 2020 to a separate legal entity (LEPL) and at the same date the Urban Planning Department also became a LEPL. Following changes in leadership and structure in July it was decided to join the LEPL’s to make a unified Agency dealing with Transport and Land Use Planning which happened by regulation on July 16 2020. We have supported the development of the structure of the TUDA particularly in its early months after its creation and have made suggestions as to its functions. As it stands now, the Agency replicates the roles and functions of the previous departments but over time it will need to develop into a full Transport Authority. This will be particularly important when passenger fares come to the Agency rather than operators and Public Service Contracts are introduced. This major change will require a banking and financing unit to be introduced in the next two years.

The CDIA consultants supported and provided advice to the management of the TUDA in the development of the TUDA and later in the run up to their merger with the Urban Development LEPL. We proposed that the key functions of transport policy and planning policy (land use master plan) should belong under the same deputy head so that the benefits of transport and land use planning can be considered together. This proposal was adopted into the final structure and is managed by Davit Jaiani.

We provided a presentation to the management of the Transport Agency on 13 March 2020 describing the following:

- Objectives for a transport authority
- Structure of a typical transport authority (taken from best international practice)
- Main functions of a typical transport authority
- The role and composition of a Board of Directors
• Descriptions of the responsibilities of the director level posts
• An organisational chart for a proposed transport authority

90 Later in the year, on 18 June, we sent the Transport Agency advice on how the structure of the new Agency could look following its merger with the Urban Development LEPL.

91 Following the establishment of TUDA during the year and their staff’s adjustment to their new role there is a need for management to fully understand the difference between being a department in a local authority and being a transport authority. The roadmap from one point to the other is not achieved overnight but there seems to be a lack of an understanding on what a transport authority (such as Transport for London or STIF in Paris) does and how it is fundamentally different. On one hand it is an understanding that its role is more than just public transport but include parking management (taken from TTC), taxi regulation and infrastructure changes on key streets.

92 Moreover, it has identified it wants to move from nett cost bus contracts to gross cost bus contracts, which is correct, but needs more technical assistance in reaching to this end result. This is because the existing TUDA has no established funding and Banking agency which is needed to handle all passenger fares when gross cost contracting starts. There also needs to be more understanding whether network franchise style contracts such as used in France or route contracts as used in the UK or another model is the way forward. The presentations and advice are attached in Appendix C.

4.2.3 SUMP

93 As part of our project we were required to advise the TUDA with regard to the overall management of SUMP activities. The SUMP project is being carried out by Ramboll and is funded by the ADB. We held several meetings with Jean-Marc Mirailles and the SUMP team from Ramboll during our project term. We also met with Vidhi Mohan who was appointed by AFD, also providing direct support to the TA for the SUMP. Therefore, we have provided advice and support as relevant and have brought others up to speed.

94 We aimed to understand how the transport model being developed by Ramboll was proceeding. This is a model built using Visum software and includes both highways and public transport. As a strategic city model it will be useful in the future in testing proposed scenarios for change in the city, for example introducing bus lanes along Rustaveli Avenue with a consequent reduction in capacity on this street – where will the existing traffic be reassigned to and will this cause gridlock in other streets? It appeared that this model is running late and was not available during the time of the CDIA project.

95 At the beginning of the project we met with Jean-Marc Mirailles and other Ramboll consultants and discussed key topics such as the location of a bridge over the railway next to the central railway station (a topic since taken up by the ADB’s Livable Cities Project). Following March, although Jean-Marc remained in Tbilisi, there was less interaction as consultants were home working.

4.2.4 GIZ Urban Mobility Project

96 We were required as part of our project “to work with Transport Department to ensure that the incoming GIZ assistance team can be rapidly informed and “brought up to speed”. Consequently, we have met with the GIZ team comprising Martina Kolb, Jan Rickmeyer and Otar Nemsadze as required and requested. The GIZ project started later than envisaged (from 16 October) and together with Covid-19 issues was just starting when we left Tbilisi.
4.3 Training Activities

Training comprises several activities including teaching by working alongside staff as well as formal events. Most of the work up to September comprised working alongside staff teaching best practice so they could improve the way they undertook their day to day tasks. This provides a legacy after the end of the project for many staff. Examples of the type of activities include:

- Guidance on the presentation of CAD drawings including the use of a border frame, name of the drawing, scale and legend. We also gave them instruction on the use of versioning so that each drawing could be identified in the sequence of production. This gives a more professional product that can be presented to senior management during decision making processes.
- The development of a process for identifying, developing a project scope, developing preliminary sketches or the proposed project, designing an approved sketch in CAD and the final approval followed by implementation was described to staff undertaking the development of new bus lanes.
- Demonstrating to TUDA staff the benefits of using Vehicle Tracking and how this works. To develop the full use of this software is dependant on TUDA owning the right software but knowledge and skills were transferred during the project so that CAD operators can make use of the functionality and their managers can see schemes tested operationally.

These new concepts have now been used successfully by TUDA staff and we can see that the planning and design of bus lanes continue to improve, and the staff have more confidence in their own skills.

4.3.1 Workshop on the Development of the Transport Agency

A workshop regarding the CDIA consultants’ proposals for the development of the structure and functions of the developing Transport Agency was held on 13 March 2020. This is reflected in the presentations shown in Appendix D (which also shows the before and after Agency structures). The attendees were:

- Victor Tsiilosani: Head of the Transport and Urban Development Agency
- David Jaiani
- Merab Mamulashvili
- Nino Baghashvili

4.3.2 Workshops on Project Management

A workshop was held on 2 June 2020 to describe to TUDA staff the essential principles of project management. We discussed the general principles of project management and why this was important for TUDA. We showed the attendees a video (https://www.youtube.com/watch?v=OD9vx81kPA4) which is an Introduction to Project Management course. The transcripts are shown in Appendix I6. The attendees were:

- Consultants: Mark Sellin, Nana Adeishvili
- Eliko Vardzelashvili
- Nino Shanidze
- Iva Vasadze
- Levan Kavtaradze
- Levan Doborjginidze
- Levan Pantsulaia
4.3.3 Workshop on Programme Management

A workshop was held on 3 June 2020 on the subject of the project definition and project initiation stages in the development of a bus lane project. The outcomes from this workshop have now been shown in Technical Note 35 which is available in Volume 3 of this Report. The attendees were:

- Consultants: Mark Sellin, Nana Adeishvili
- Nino Baghashvili
- Eliko Vardzelashvili
- Nino Shanidze
- Levan Kavtaradze
- Levan Pantsulaia

4.3.4 A Workshop on the redesign of Kote Afkhazi Street

A workshop was held on 7 August 2020 regarding the issues to be faced if Kote Afkhazi Street were to be closed to all traffic except buses. The attendees were:

- Consultants: Mark Sellin, Nana Adeishvili
- Victor Tsilosani
- David Jaiani
- Nino Baghashvili
- Mzevar Gogilava
- Levan Kavtaradze
- Eliko Vardzelashvili

4.3.5 Training Event at Borjomi

Although other training events had been planned during the project before September the interruption that Covid-19 brought to the project meant that this was not done. Consequently, when it was considered less risky to staff to undergo training, the TUDA requested an event to be held in a location remote from Tbilisi.

This training event was to be held in Borjomi over a weekend in conjunction with GIZ at Borjomi for 60 staff of the TUDA on 4th to 6th September 2020. Unfortunately, due to an outbreak of Covid-19 in Adjara in early September, it was decided to defer the training in the week before. The training would have covered four key topics in Transport Planning that is relevant to the TUDA. The table below shows the previously planned timetable.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday 4 September 2020</td>
<td>1 – Trainers travel from Tbilisi by car</td>
</tr>
<tr>
<td></td>
<td>2 – Trainees travel from Tbilisi by bus (arrival by 19:00)</td>
</tr>
<tr>
<td></td>
<td>3 – Hotel registration and room allocation (issue of name badges with 6 colour groups)</td>
</tr>
<tr>
<td>Date</td>
<td>Session 1</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Saturday 5</td>
<td>1 – Breakfast 08:00 to 09:30</td>
</tr>
<tr>
<td>September 2020</td>
<td>2 - Training Registration 09:30 – 10:00</td>
</tr>
<tr>
<td></td>
<td>3 – Training starts 10:00 sharp</td>
</tr>
<tr>
<td></td>
<td><strong>Session 1 – 10:00 – 11:30: Introductory Session (CDIA/GIZ)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Session 2 – 12:00 – 13:30: An overview of Transport and Land Use Planning in 10 Steps (CDIA/GIZ)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Session 3 – 15:00 – 16:30: Demand, Networks and Integration (GIZ)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Session 4 – 17:00 – 18:30: Governance and Institutional Issues including finance and contracting issues (CDIA)</strong></td>
</tr>
<tr>
<td>Sunday 6</td>
<td>1 – Breakfast 08:00 to 09:30</td>
</tr>
<tr>
<td>September 2020</td>
<td>2 – Training Conclusion Session 11:30 – 12:00</td>
</tr>
<tr>
<td></td>
<td>Session 5 – 10:00 – 11:30: Walking, Cycling, Road Safety and TOD (GIZ)</td>
</tr>
</tbody>
</table>

### 4.3.6 Training Event 1

A workshop was held online on 8 October 2020 which presented an overview of Transport and Land Use Planning in 10 Steps (session 2 from Borjomi). This covered the following topics:

- 10 key Transport Planning principles,
- To understand why building more roads is the wrong strategy for a city,
- To understand the concept of Shift, Avoid, Improve
- To understand the importance of the relationship between transport and land use planning

Full details of attendees and the presentation are shown in Appendix I1.

### 4.3.7 Training Event 2

A workshop was held online on 21 October 2020 which presented the Governance and Institutional Issues including finance and contracting issues (session 4 from Borjomi). This covered the following topics:

- To understand the need for a clear written transport strategy with individual policies,
● To understand how a Transport Authority or Association functions,
● To understand the relationships in a Transport Authority regarding contracts and finance

Full details of attendees and the presentation are shown in Appendix I2.

4.3.8 Training Event 3 – Marketing and Passenger Information

A workshop was held online on 19 November 2020 which covered marketing and passenger information including inputs from Pindar Creative and had a duration of 1 hour 55 minutes. This covered the topics of understanding communications and understanding passenger information.

Full details of attendees and the presentation are shown in Appendix I3.

4.3.9 Training Event 4 – Transport and Tourism

A workshop was held online on 27 November 2020 which covered transport and tourism and had a duration of 1 hour 20 minutes. This covered the following topics:

● To encourage the TUDA and the Tourism Department to jointly consider how transport facilities are suitable for visitor requirements
● Different types of visitor (domestic and international)
● Fares and ticketing – issues for visitors
● Passenger information – aimed at visitors
● To demonstrate some best practice that could be used in Tbilisi
● To consider how, jointly, the two departments could produce information to meet the needs of visitors

Full details of attendees and the presentation are shown in Appendix I4.

4.3.10 Training Event 5 – Transport and Greening/Infrastructure

A workshop was held online on 25 November 2020 which presented issues relevant to TUDA, the Infrastructure Department and the Environmental Protection Service to consider in the preparation of schemes and had a duration of 1 hour. This covered the following topics:

● To encourage the TUDA, the Infrastructure and the Environmental Protection Service to jointly consider how new transport schemes can add to public realm
● To ensure that the implemented scheme meets the project objectives
● The meaning of greening for transport projects
● The commissioning and procuring of work
● The needs of the internal client
● Demonstrated good examples of 26 May Square and Chavchavadze Avenue
● Opportunities for collaboration in Philharmonic Square, Republic Square and Liberty Square

Full details of attendees and the presentation are shown in Appendix I5.

4.4 Interim Workshop

The CDIA consultants held an Interim Workshop on Wednesday 16 September 2020. The workshop took the form of a face-to-face PowerPoint presentation to the attendees and the workshop was also distributed live using Teams. There were few comments following the
workshop but Davit Jaiani was complementary about the work undertaken and there were technical questions which were answered. A copy of the Presentation can be found in Appendix E. The attendees were:

1 – CDIA and Mott MacDonald

- Mark Sellin – presenting
- Nana Adeishvili
- Fabienne Perucca
- Neil Chadder

2 – Transport & Urban Development Agency

- David Jaiani, Deputy, International Relations
- Nino Bagashvili, Deputy, Traffic Management
- Vasil Abuladze, Deputy, Legal and Monitoring
- Mamuka Mumladze, Deputy, Road Infrastructure
- Oto Chitidze, Deputy, Detailed Development Planning
- Alexander Targamadze, International Relations Department
- Irakli Mtshvethelidze, International Relations Department
- Zaal Sherozia, Public Transport Planning Department
- Salome Sharashenidze, Public Transport Planning Department
- Eliko Vardzelashvili, Team Leader, Traffic Management Planning
- Levan Kavtaradze, Traffic Management Planning
- Levan Pantsulaia, Traffic Management Planning
- Mzevar Gogilava, Team Leader, ITS
- Levan Doboriginidze, ITS

4.5 Final Workshop

The CDIA consultants held a Final Workshop on Thursday 26 November 2020. The workshop took the form of a virtual PowerPoint presentation to the attendees and the workshop was also distributed live using Teams. The Deputy Mayor of Tbilisi and Deputy Head of the TUDA spoke of the work undertaken by the project and the team. A copy of the Presentation can be found in Appendix F. The attendees were:

1 - CDIA and Mott MacDonald

- Fabienne Perucca, CDIA
- Neil Chadder, CDIA
- Kathleen Jovellanos, CDIA
- Rudini Nick Baoy, CDIA
- Analyn Rubeneceia, CDIA
- Cathlyn Rose Terio, CDIA
- Mark Sellin, Mott MacDonald, Presenting
- Nana Adeishvili, Mott MacDonald
- Anca Palmer, Mott MacDonald
- David Parkin, Mott MacDonald
● Geert van Boekel, Mott MacDonald (Project Director)

2 – Tbilisi City Hall and Transport & Urban Development Agency

● Andria Basilaia, Deputy Mayor of Tbilisi
● Davit Jaiani, Deputy Head, TUDA
● Aleksandre Targamadze, TUDA

3 – International Donors

● Kamel Bouhmad, ADB
● Bertrand Gcoalou, ADB
● Tea Papuashvili, ADB
● Stanislas de La Rivière, AFD
● Vidhi Mohan, AFD
● Jan Rickmeyer, GIZ
● Otar Nemsadze, GIZ

Two interpreters were also in attendance.

4.6 Support to Yerevan Municipality

112 In March 2020, Mott MacDonald was asked to carry out a review of all aspects of the “New Bus Network and Integrated Tariff and Ticketing System Final Network Proposal” report and appendices, dated 30 January 2019, as prepared by WYG International for the Yerevan Municipality. This was carried out over March and April 2020 concluding with an online presentation of the results and recommendations.

113 On the 5th and 6th March 2020, Tbilisi City Hall, the ADB and the CDIA hosted a delegation from the Yerevan Municipality in Tbilisi. They had travelled to look at the progress made in Tbilisi and to undertake a study tour of the infrastructure, buses, depots that could inform their own improvements in Yerevan.

114 An online Presentation, A Review of the New Bus Network and Integrated Tariff and Ticketing System Reports in Yerevan, was given to the Municipality of Yerevan on 22 April 2020.


116 These outputs are not included with this Final Report as they are related to a different city.
4.7 Deliverables

117 The deliverables on this project comprise two types please see Appendix A for an Outgoing Documents Register:
● Routine Reports which comprise the following:
  – The Inception, Interim and Final Reports
  – Monthly Reports to CDIA
● Technical Deliverables which comprise a series of Technical Notes on specific subjects including, as shown in Volume 3 of this Report, in three categories:

  1 - Infrastructure
  – 1.1 Technical Note 12: Ana Politkovskaia Street to Delisi Metro
  – 1.2 Technical Note 13: Liberty Square – Ortachela – Gardabani Highway
  – 1.3 Technical Note 15: Turning Circle Design for TBT12
  – 1.4 Technical Note 16: Melikishvili Street
  – 1.5 Technical Note 19: New Bus Depot Saburtalo
  – 1.6 Technical Note 21: Heroes Square
  – 1.7 Technical Note 22: 26 May Square
  – 1.8 Technical Note 30: Kazbegi Avenue
  – 1.9 Technical Note 33: Bus Lanes Melikishvili and Kostava Streets

  2 - Technical
  – 2.1 Technical Note 09: Category M & N Vehicles
  – 2.2 Technical Note 10: Category L & R Vehicles
  – 2.3 Technical Note 11: Bus Lane Design for Narrow Streets
  – 2.4 Technical Note 17: Yellow Box Junctions
  – 2.5 Technical Note 32: Speed Cushions for Buses
  – 2.6 Technical Note 35: Programme and Project Planning

  3 - Operational
  – 3.1 Technical Note 20: Tourist Buses
  – 3.2 Technical Note 24: Bus sizing on routes 10 and 34
  – 3.3 Technical Note 27: Bus route 88 operational testing
  – 3.4 Technical Note 28: Bus services in Upper Ponitchala
  – 3.5 Technical Note 29: Bus route 2 operational testing

● Presentations to support Workshops, Training Events and Other Issues
  – Presentations to support the Workshops at the Interim, Inception and Final stages of the project
  – Presentations supporting the training events and webinars
  – Technical Presentations (e.g. for Kote Afkhazi Street)
  – Supporting presentations (e.g. to support the Mayor with Transport Strategy)
5 Summary of Key Counterpart Staff and Partners

5.1 CDIA Consultant Role and Advisory Services

118 The CDIA consultants provide different types of advisory services. These include strategic advice dealing with high level queries regarding the TUDA, some relate to institutional advice, such as the development of the structure and roles of the new TUDA, many are technical, including advice on public transport routes and operations, infrastructure based regarding development of bus lanes and how other traffic needs to be considered and also how staff in the TUDA do their own role in terms of guiding, mentoring and providing “soft” capacity building. We have undertaken numerous site visits on street and have considered issues on the ground with TUDA staff. This type of advice is particularly important so they can visualise issues and benefits whilst on site.

119 We have seen effects of our daily work at several levels – our capacity building has made a clear and extremely positive impact on Maia Bitadze, Deputy Mayor for Transport – this includes support to the Mayor in providing a clear transport policy which is generally being adopted across the city. At the TUDA level, we have seen that our approaches have adopted on key issues such as the way that bus lanes are planned, designed and implemented. We are also seeing that advice on the revision of bus routes is being listened to and that suggestions on the extension or curtailment of routes is being considered together with the use of different sizes of buses. At individual levels our work has been shown to have a positive effect on many staff – this is sometimes difficult to assess but they have picked up key concepts introduced in discussions and training workshops.

120 We have been involved with approximately 21 staff from the TUDA although other departments such as legal have been involved as well, particularly in relation to new regulations and the development of the Public Service Contract. In addition, we have had interaction with the Mayor of Tbilisi, two of his deputies and staff from other departments such as Infrastructure, the tourism part of Economic Development and Environmental Protection (greening) during the rolling out of the thematic webinars.

121 We have developed links with external agencies and particularly with GIZ whose project is likely to carry on from this CDIA project. We have also developed links with AFD, EBRD and ADB staff in the work of this project. The concurrent projects at City Hall, in particular the SUMP project has led to cooperation with the Ramboll consultants who are undertaking this.

122 Within City Hall, we have enabled staff at the TUDA to broaden their knowledge of transport issues, and particularly public transport though a mixture of on the job capacity building (for example taking a staff member to a local bus stop to measure the bus stop platform height and the relationship to modern buses) and training events. We have worked with TUDA staff to improve their understanding, skills and appreciation of public transport and bus priority (include CAD). With regard to other parts of City Hall and Agencies we have engaged with the following organisations to discuss transport issues more widely:

- Tbilisi Development Fund (they stated that their remit is only the buildings)
- The Urban Planning Department (later absorbed into the TUDA)
- The Landscape Department (greening)
5.2 Collaboration with Stakeholders

We took part in an international donors meeting on 26 February at the ADB offices and on 29 June online. We have maintained an ongoing dialogue with international donors during the project – especially ADB, AFD, CDIA, EBRD, GIZ. This dialogue between City Hall, the TUDA and international donors has been important in two ways – firstly the TUDA have been, through capacity building from this project, able to arrange a donors’ meeting themselves and secondly the meetings enable different donors to avoid duplication in effort.

We have, as a team, collaborated with the following stakeholders:

5.2.1 Tbilisi City Hall

- Kakha Kaladze – Mayor of Tbilisi
- Maia Bitadze – Deputy Mayor with portfolio responsibility for Transport
- Irakli Bendeliani – Deputy Mayor with portfolio responsibility for Infrastructure
- Giorgi Abutidze - Deputy Head (now Head) of the Office of Infrastructure Development - (former TTC).
- Nino Machrhadze - Deputy Head of the Office of Economic Development (Tourism)
- Nanuka Aghmelashvili - the head of Maya Bitadze’s Office
- Saba Pipia - Deputy Head of the Office of Environmental Protection (Greening)
- Tamar Zedelashvili - Office of Environmental Protection (Greening)

5.2.2 Transport and Urban Development Agency

- Viktor Tsilosani, Head of Agency
- David Jaiani, Deputy International Relations, Bus Planning and Strategic Planning
- Nino Bagashvili, Deputy Transport and Urban Planning
- Vasil Abuladze, Deputy Legal and Monitoring
- Mamuka Mumladze, Deputy Road Infrastructure
- Oto Chitidze, Deputy Detailed Development Planning
- Alexander Targamadze, Project Manager, International Relations
- Eliko Vardzelashvili, Senior Traffic Planning Specialist
- Irakli Mazanashvili, Researcher
- Irakli Mtshkhetadze, International Relations
- Irakli Zhozhuaashvili, Public Transport Planner
- Iva Vasadze, Project Manager, International Relations
- Levan Doborigindiz, ITS and Traffic Signals
- Levani Kavtaradze, CAD Designer
- Levan Pantsulaia, CAD Designer
- Merab Mamulashvili, Public Transport Planning
- Mzevar Gogilava, ITS and Traffic Signals
- Nino Soselia, Project Manager, International Relations
- Nino Shanidze, Analytics and Urban Planning Unit

- Tourism
- Infrastructure Department
5.2.3 External Stakeholders

- Salome Sharashenidze, Head of Traffic Planning Unit
- Zaal Sherozia, Public Transport Planning

- Neil Chadder, Programme Manager, CDIA
- Fabienne Perucca, Urban Development Specialist, CDIA
- Kamel Bouhmad, Portfolio Management Specialist, ADB
- Tea Papuashvili, ADB GRM
- Avtandil Tskhvitava, Senior Project Officer, ADB
- Arnaud Desmarchelier, Senior Transport Engineer, AFD
- Stanislas De La Riviere, Project Officer, AFD
- Vidhi Mohan, Urban Transport Advisor, AFD
- Martina Kolb, Programme Director, GIZ
- Jan Rickmeyer, Leading Technical Advisor, GIZ
- Otar Nemsadze, Technical Advisor, GIZ
- Robert Roth, Urban Mobility Project Manager, KfW
- Tamar Kvatlaniani, Project Coordinator, KfW
- Jean-Marc Mirailles, Team Leader, Ramboll
- Amali Rajapaksa, Transport Specialist, World Bank
- Ian Jennings, EBRD
- Tea Melikadze, EBRD
- Elene Khundadze
- Aleksandrs Znovs – Public Transport Cartographer in Tbilisi
- Arad Benkoe – former Ambassador of Austria in Tbilisi
- Emre Sarp, Otokar Buses
- Nick Tabatadze - Commercial and Economic Officer, British Embassy
- Giorgi Sharkov, Director General, TTC
- Tamar Machavariani, TTC
- Gela Kvashilava - Member of Advisory Board and Consultant at Eastern Alliance for Safe and Sustainable Transport
- Eka Laliashvili – Road Safety NGO
- Hrachya Sargsyan, First Deputy Mayor of Yerevan, Armenia
- Vazgen Harutyunyan, Director of the City Parking Services
- Seyran Mejlumyan, Assistant to the First Deputy Mayor of Yerevan
- Nonna Babayan, Deputy Prime Minister Tigran Avinyan’s office specialist
- Maria Pia Ancora, ADB Yerevan, Armenia
- Vardan Karapetyan, ADB Yerevan, Armenia
6 Continuation of Collective Efforts and Recommendations for Future Work

6.1 CDIA Bridges to Other Donors’ Projects

125 This project will act as a bridge to other donors’ schemes enabling them to take on individual project elements. This is huge activity with some international donors in Tbilisi, especially the ADB, AFD, EBRD and GIZ, as shown below. Some of these projects have already begun (ADB, AFD, GIZ) and some are contained in the scope of Terms of Reference currently out for tender (EBRD).

- Livable Cities project with focus on metro accessibility and Dadiani Bridge
- Completion of the SUMP project
- Support to TUDA re SUMP
- Passenger information
- Model bus stop designs
- Development of contracting (PSC)
- Development of gross cost contracting
- Due diligence and procurement for 200 articulated buses
- Further support to the TUDA
- Transport modelling and CAD training

6.2 Informing the Traveller

126 We consider that having a reformed bus network is one task but informing your customers about your product and any changes of it is equally essential. The culture in Tbilisi has not currently shown the promotion of passenger information to be a strength of the TUDA to date. This must change quickly in order to inform passengers of the changes to their bus network that is likely to happen in forthcoming months. We propose to work with the policy team in the TUDA so that a bus map can be produced (using an existing bus map current to June 2020) for online publication and possible display on bus shelters. Furthermore, discussions are taking place with the Tourism Department to see if the bus map can be published on the reverse of their tourist map of Tbilisi. Going forward, it is proposed to develop the map using colour lines for strategic routes and to produce a separate strategic routes map incorporating the metro. Further discussions regarding the use of modern technology including e-paper for bus stop displays took place during a Thematic Training Webinar. This topic will be proposed under the ADB’s Livable Cities project options.
Figure 6.1: The Existing Bus Map for Tbilisi (Excerpt)

Figure 6.2: Example of Using Colour Lines for Strategic Routes

127 Further investigation into e-paper displays at bus stops and larger digital displays at metro stations to properly inform passengers should be undertaken. This technology is distrusted by international companies, but the identification of a Georgian local agent would be a useful step. In addition, demonstrations in Tbilisi that showcase the capabilities of the technology should be undertaken, perhaps funded by an international body.

128 The TUDA must recognise that its different stakeholders are comprised of many people with different needs and abilities and that this needs to be reflected in how it informs its passengers. Up to now it is maintaining that its Facebook page is sufficient but social media does not suit all members of society and instead a package of different media is required. To start with a web site for the TUDA is urgently required to act as a one stop shop for all transport issues in Tbilisi and to replace the outdated and often incorrect websites offered by TTC and TMC.
6.3 Stakeholder Engagement

A Forum within City Hall to include all relevant departments and stakeholders would be a useful step so that proposed projects could be discussed together with changes to policy and implementation of projects.

A Public Transport Users Forum could be started by the TUDA to allow an open flow of information, comments, complaints and suggestions between the TUDA, City Hall, transport
operators and the travelling public. This could be similar to the consultative committees in the UK now known as Transport Focus.

6.4 Capacity Building in the TUDA

Figure 6.5: Example of a Local Plan Diagram from the UK

131 It is evident that the TUDA staff need to consider the wider effects of closing major roads to general traffic. We have found that when planning for major bus infrastructure that would either severely restrict the capacity for other traffic on key roads or close them altogether apart from buses, that a holistic view of the local area has not been considered. This has already been seen around Chavchavadze Avenue and is now being seen in the areas surrounding Kote Afkhazi Street and Ljubljana Street. In order to better appreciate and model the effects caused by a scenario we are suggesting the use of Local Plans to consider the effects of transport and planning changes on local residents and businesses. These would include the option of changing the route of strategic buses as well as closing main streets.

132 Most transport modelling undertaken by the TUDA in undertaking in Vissim which does not capture the effects of a scheme on a wider area and any traffic reassignment. Currently the SUMP project is developing a strategic transport model in Visum which would be able to be used for this work. However, this model is not yet available and the staff in the TUDA will need extensive training in the software.

133 The skills used by TUDA staff in drawing schemes by CAD have improved over this project, but additional training would be beneficial including using vehicle tracking. As already discussed by GIZ with the TUDA, the supply of appropriate laptops and CAD software licenses will help in this objective tremendously.
6.5 Integrated Fares System

134 The TUDA are proposing to change from a nett cost contracting system to a gross cost contracting system using a public service contract model. However, this will only work with a city-wide multi-operator integrated ticketing system which needs to be managed by the TUDA (as it needs to work across all operators). The TUDA will need a banking sub-agency set up to handle bank card transactions and revenue handling, however, no provision has been made for this by any donor project even though gross cost contracts are planned.

135 It is suggested that the way forward is to engage with an experienced international consultant to firstly assess the existing system to see how much of it can be reused and to consider any issues re contracts, regulations etc. These will have major impacts on the next stages. The consultant should work with key stakeholders to decide what is important for each party and what is needed at first and what can be introduced in a later phase. This will lead to a written report/ strategy/ action plan to further inform both the City Hall and international donors.
6.6 Finessing the New Bus Network

Figure 6.6: Example of an Accessible Minibus

136 The project “Restructuring of Bus Network and Implementation of Integrated Automated Fare Collection System” which was being undertaken by Systra and funded by the EBRD completed in about August 2020. The main scope of this project was:

- Stage 1: Define Requirements for New Bus Route and AFC System and Establish Initial Business Case: this stage required the design of a city wide integrated hierarchical bus network which was designed to replace the current TTC and TMC bus networks.
- Stage 2: Route tendering plan, AFC specifications and model operating contract for bus operations.

137 Now that the TUDA has finished the Systra contract, the TUDA is open to suggestions in order to make improvements to the network. The strategic bus network should be further assessed with the TUDA to make any necessary revisions or additions, together with an assessment of route frequencies. This should include the routing of TBT buses along Kazbegi Avenue in both directions and the addition of route 14, possibly extended to Upper Ponitchala to the strategic network. This will in turn allow the correct number of articulated buses to be purchased of the roll out of the new routes.

138 Following this it would ideally be useful to finesse the proposed City and Local bus route bus network to improve the proposed network to avoid duplication and to integrate better with the metro.

139 The City Hall has recently purchase 300 new minibuses as replacements for the older Ford Transit minibuses. As these are updated Ford Transit minibuses they still do not meet universal accessibility requirements and have long dwell times at bus stops due to their door type. A revised type of vehicle is needed that is designed for bus use and which meets access for all guidelines.

6.7 Livable Cities

140 As part of our project we were required to assist the TUDA to identify “priority public transport related projects” which could be financed under the ADB Livable Cities project. This
project is designed to make a city more amenable to its citizens and visitors to promote climate change and to grow the local economy. The projects included are those which in the CDIA consultants' professional opinion are necessary to improve transport in Tbilisi. They include a mix of infrastructure, information, accessibility and design projects with consequently different budgets. At the time of developing the ideas, international donors had not proposed to cover these in their projects but latterly, some of the projects are now included under ADB or EBRD projects, in whole or in part.

141 We have developed a number of possible projects as follows, as shown in Appendix D:

1. A bridge over the railway linking King Tamar Avenue and Dadiani Street, as proposed by Systra and Ramboll to the TUDA and which is being further assessed by consultants for the ADB.

2. The roll out of e-paper bus information screens and new solar powered bus stop poles/flags on all strategic bus routes, as proposed by this project to TUDA staff. Some parts of this have now been covered by the scope of a new EBRD project.

3. A new western bus depot & TTC HQ, as proposed to the TUDA and shown in Technical Note 19 which was shared with the TUDA. It is very important that the necessary land is reserved by TUDA.

4. Implementation of major bus lane infrastructure not discussed with TUDA but proposed as a mechanism to allow the more infrastructure heavy designs to be implemented following a year which may have seen funds diverted to Covid-19 responses.

5. Junction improvement with environmental improvements

6. Improved design & specification for minibuses

7. Improved transport interchange and physical accessibility. Interchanges at metro stations are due to be covered by an upcoming CDIA project in 2021.

8. Improvements for pedestrians

9. A new TUDA website. Some parts of this have now been covered by the scope of a new EBRD project.

142 The proposed projects are just ideas and mostly have not been formerly discussed with the City Hall. Therefore, there is no assumption that the ADB’s Livable Cities Project will adopt any or some of them. Indeed, other international donors have sown interest in some of the identified projects.

143 Given this, the most urgent and important projects that are not believed to be adopted by a funder, are the new western depot and the redesign for minibuses. Also important but covering a far wider area are improvements for pedestrians in the city which also including improvements for the disabled due to the incorporation of dropped kerbs and other accessibility improvements.