



The National Transport Master Plan of Liberia

4 Transport sector overview

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This chapter provides an overview of the institutional and legal context of the Liberian transport sector. The following sections then provide a general overview of the situation in the road, railway, maritime, aviation and public transport sector. Figure 4-1 shows an overview of the existing infrastructure in Liberia. Table 1-1 and Table 1-2 in chapter 1 offering an overview of the progress of road infrastructure within the PRS-I- (STATUS OF PRS-I DELIVERABLES: 2008 - 2011) and PRS II- (Deliverables: 2012 - 2017) program.

4.1 Institutional and legal framework

4.1.1 Roads

The Vehicle and Traffic Law, under the Liberian Codes of Laws 1956, was replaced by the Vehicle and Traffic Law 1972. Copies of these laws were deposited in the National Archives and the Motor Vehicle Bureau to be made available to public officials and members of the public. The Act prescribes the use of vehicles for the carriage of people or freight on publicly-owned highways and roads for public use that are privately owned or controlled via contractual agreements with Government. The Act specifically states that no other authority (county, township, etc.) may make any rules or regulations that duplicate or contradict the provisions of this Law.

In the Vehicle and Traffic Act 1972 - which did not content a highways legislation that classifies various standards of national, urban, or rural roads - road transportation is considered under the following headings:

Preservation of roads

The Vehicle and Traffic Law 1972, Chapter 10, sub-chapter K, concerns the preservation of roads, including such items as limitations on the kind of tyres and special permission to move certain types of vehicles (e.g. corrugated tracked vehicles).

Sub-chapter K also rules against excavations in the road without legal authorisation. Every day that this occurs shall be considered a separate offence.

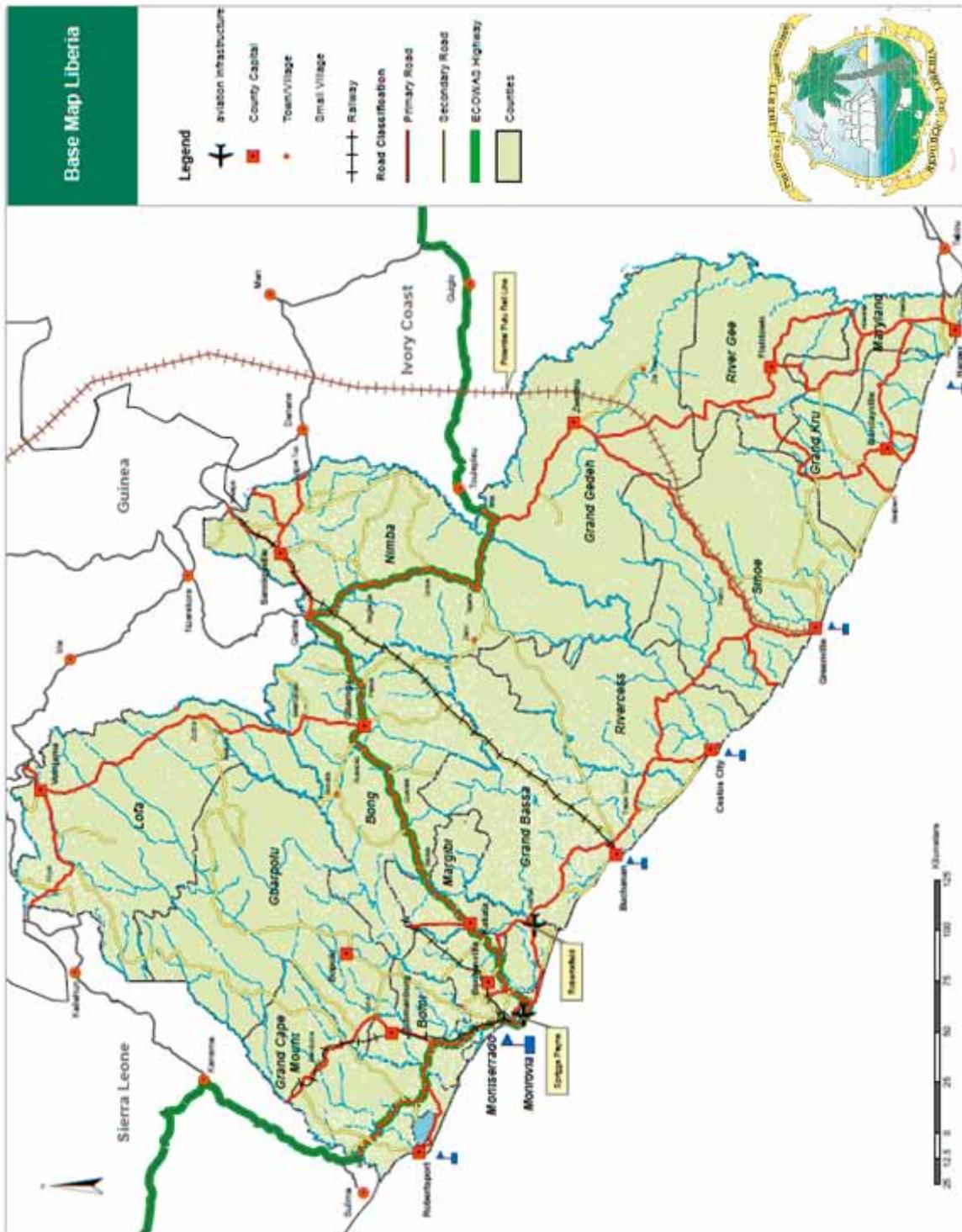
Traffic operations during road works

The Vehicle and Traffic Law 1972, Chapter 10, sub-chapter K, states that no vehicle shall pass over a road that is closed to traffic for construction or repair. A suitable sign and barricade shall be considered suitable notice that a road is closed.

Vehicle registration and inspection, fitness certification

The Vehicle and Traffic Law 1972 describes the registration and certification of all vehicles for use on publicly-open roads. Registration fees are also payable for bicycles and trailers. The Act also describes the requirements for vehicle fitness certification.

Figure 4-1: Overview - existing infrastructure



Drivers and operators of vehicles; rules of the road

The Vehicle and Traffic Law 1972 describes licensing, examining and qualification of drivers and operators of vehicles on publicly-open roads (including driving, stopping, parking, etc.). The Act also describes the rule of the road (required driver behaviour) for publicly-open roads. Additional clauses refer to school buses and riders on motorcycles.

Insurances

The Vehicle and Traffic Law 1972 outlines compulsory liability insurance, but this Act references the Insurance Law (not studied as part of this institutional review). The Act also prescribes civil liability related to negligence in the use or operation of vehicles.

Public transport

The Vehicle and Traffic Law 1972 describes annual tonnage tax and registration fees for omnibuses (vehicles for transportation of passengers for compensation having more than seven seats) and for taxis (vehicles for transportation of passengers for compensation having seven seats or less).

Commercial transport

The Vehicle and Traffic Law 1972 describes annual tonnage tax for trucks and pickups. There are no provisions in the Act regarding overloading of vehicles or axle-load restrictions.

Private transport and rented vehicles

The Vehicle and Traffic Law 1972 describes the use of private vehicles by the owner or authorised driver, and the renting of vehicles.

4.1.2 Railways

The Ministry of Transport shares the responsibility for regulating the rail sector with the Ministry of Lands & Mines; there is no particular regulatory authority. Rail infrastructure and services are traditionally closely related to the mining sector.

The Government has no plans to construct or rehabilitate railways using its own funds, and the costs of reinvestment or new investment are expected to be borne by private investors. The Government is retaining ownership but granting the right to develop, use, and operate the railways through concessionaire(s). There is no legal framework for construction and operation of railways, and “Concession Agreements” (contract law) form the only legal basis.

However the concessions do include „open access“ clauses and the National Transport Policy and Strategy 2009 (NTPS) aims at improving and expanding the rail network through integrating the railways into the overall national transport infrastructure.

The Mineral Development Agreement (MDA) with ArcelorMittal gives Government the right to use any spare capacity on the rail line for “other” traffic, providing it pays the concessionaire reasonable compensation.

The MDA with China-Union requires rehabilitation for a transportation capacity of 12 mtpa of Concessionaire ore traffic plus common carrier freight and passenger services. The Government shall authorise third parties’ use of excess capacity of the railroad, provided that the Concessionaire

confirms that excess capacity exists and third party use of such excess capacity does not unreasonably interfere with the efficient and economic conduct of the Operations. All related costs shall be borne by the third party.

Both MDAs do not specify who would be the network operator should there be third-party use of the railway. The technical terms for any third-party use are also not specified and must, therefore, be mutually agreed at some later date. The term „Excess Capacity“ is not defined. As far as railways are concerned, current MDAs are thus generally weak and leave significant space for disputes among involved parties.

As far as railways in Liberia will serve exclusively for iron ore transport in the mid-term, and the present method where contract law forms the legal basis for construction and operation of railways can be retained except for safety standards for level crossings (road safety implications).

4.1.3 Seaports and coastal shipping

The ports in Liberia are owned and managed by the National Port Authority (NPA), which was established in 1974 and mandated by the National Legislature to be responsible for all seaports, including provision and maintenance of port infrastructure, and port services. The NPA is incorporated as a state-owned enterprise; as such, it is responsible for its own revenue. It owns all facilities infrastructure and superstructure and charges for its services. An interim report by the World Bank in 2007 assessed the NPA's operations and recommended overall reorganisation and privatisation.

The NPA is responsible for regulatory issues and is the provider of port services, including traffic management in and around the port, and overseeing freight and passengers services provided by shipping lines. The MoT may wish to review these arrangements to consider whether a similar governance framework to the aviation sub-sector would be appropriate; e.g. by introducing a Maritime Authority responsible for regulatory issues (similar to LCAA), and limit the NPA's role to the management, operation and maintenance of port facilities (similar to LAA). It is suggested that Government obtains advice from experienced maritime consultants on this issue.

Inland waterways in Liberia include the rivers, lakes and near-coastline. Regular freight transport used to ply the coastline, and vessels included some provision for passengers. There have never been any formal inland waterway services other than these coastline operations. Some personal use of rivers and lakes is made but this does not constitute a formal mode of public transportation (i.e. the regulated transportation of people or goods by licensed operators for compensation).

There are no laws in Liberia pertaining to inland waterway transport infrastructure or transportation services for lakes and rivers; only the relevant maritime laws are applicable for coastline services.

4.1.4 Aviation

The Liberia Civil Aviation Authority (LCAA) is the statutory body of government, established in 2006, to be responsible for ensuring aviation safety, security and effective regulation of air transport in Liberia. The LCAA serves as a “watchdog” as well as a facilitator of the aviation sub-sector, prescribing and enforcing minimum standards for all agencies of the sub-sector. In the aviation sub-sector, the LCAA has been set-up as a self-financing, independent regulatory body, with the aim of promoting aviation safety. Similar to other autonomous aviation authorities around the world, its revenues are received from those whom it regulates (i.e. the LAA). The LAA is the provider of aviation services (except air traffic management, for which the LCAA is responsible), including the management, operation and maintenance of all airports in the country. Thus, in the aviation sub-sector, the regulatory and service provider roles are separated, which suggests good governance arrangements so long as the relative checks-and-balances are observed and professional competences meet the standards required by relevant international bodies (ICAO, etc.).

4.1.5 Public transport

An Act was passed in March 2009 for the establishment of the National Transit Authority (NTA), to which the Monrovia Transit Authority (MTA) shall become a subsidiary. The NTA will be responsible for the management and provision (along with the private sector) of passenger transport services throughout Liberia. In this case, the MoT will retain regulatory control for issues related to fee/fares and safety. In a similar manner, Government intends to develop a Road Authority (to be developed from the current Infrastructure Investment Unit, IIU, in the MoPW), to be complemented by establishment of a Road Fund to provide monies for maintenance and minor improvements, but not major development works. Regulatory controls would be retained at ministerial level in respect of road safety (MoT), technical standards (MoPW), and fees (e.g. a fuel levy regulated by the Ministry of Finance).

4.2 Road network

The roads contained in the Liberian National Road Register are classified as:

- primary;
- secondary;
- feeder roads; and
- community roads.

Primary roads are defined as links between county capitals and major international connections.

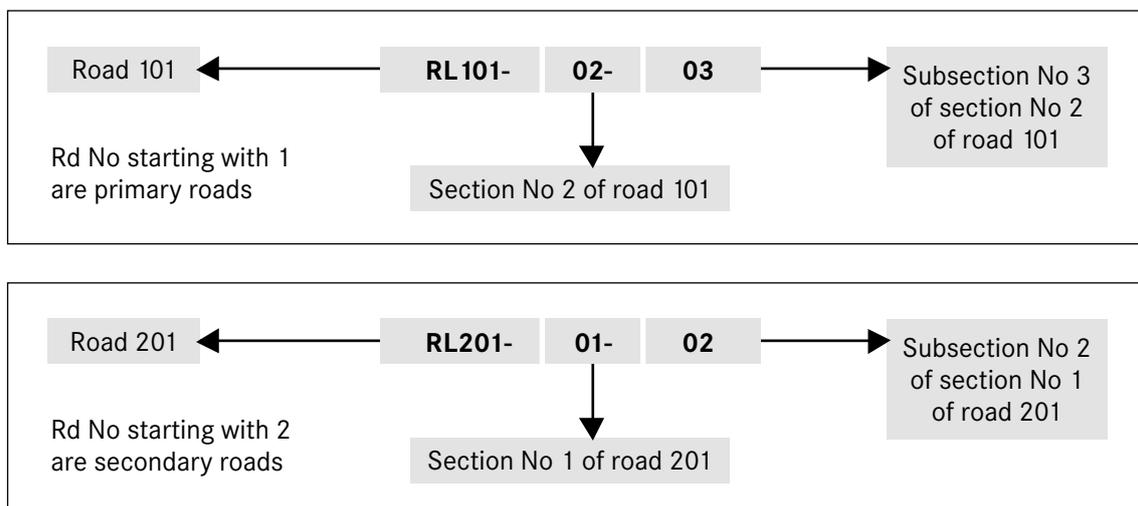
Secondary roads are defined as links between district capitals to the primary roads.

Feeder roads and community roads are not part of the priority network that will be maintained with central government resources. The ownership of these roads is to be defined in the near future so as to ensure that sufficient account is taken of them and their relevance for the community and the economy.

Many of the roads in the Liberian network are many hundreds of kilometres in length. In order to describe the network in terms that are helpful to the administration that is responsible to manage it, a system of subdivisions and naming has been developed that gives a unique reference to a link that can be used to facilitate identification of a particular road section

The referencing system breaks roads into sections and sub sections as described below:

Figure 4-2: Road referencing system



The reference system described above is a legacy of LISGIS which continues to provide satisfactory service and has been used throughout the Master Plan to describe the various elements of the road network. The full National Road Register is provided in appendix K on CD.

However, the classification of primary and secondary roads is not respected in many cases in the LISGIS register of roads. The classification system should be reviewed and rationalised to give a better set of definitions of classes that represent the function/importance of roads in the network. Roads should then either be promoted or demoted. This will require a ministerial decision to reissue the gazette of roads with the new status. The status will be a matter of great interest to many as it will affect the funds that are available for the maintenance and investment of some links.

The size of the road network is not clear. The following table shows the size as stated by three sources:

Table 4-1: Comparison of road network categories and surface types

Source	Km in class/surface type						
	Primary			Secondary		Feeder	
	Paved	Gravel	Total	Paved	Gravel	Paved	Gravel
LISGIS	579	1,884	2,463	-	2,190	-	-
GIZ/MoPW	574	1,752	2,326	-	2,636	-	-
MoPW	734	1,130	1,864	-	2,350	-	5,702

4.3 Railway system

There is no connected rail network in Liberia. Historically, three railways have been constructed for the purpose of iron-ore transport to the ports. The Nimba Railway is under rehabilitation, on the Bong Railway there are restricted operations, and renovation is proposed within five years. The Mano River Railway has been completely dismantled during the war. A fourth railway might be built to the Putu Range for which exploration is in the pre-feasibility stage.

The Putu Railway

The exploration of the Putu range (African Aura/Severstal) is in the pre-feasibility stage. The 425 km² licence is held by Severstal Group (61.5%) and Mano River Iron Ore Holdings (38.5%).

Three possible sites for a new deep water port have been identified and the new rail link would be 110 to 140 km long. No data are available to evaluate possible spare capacities. At present, there are also no data that support the idea of extending the new railway into Ivory Coast.

The Nimba Railway

The 267 km standard gauge (1435 mm) railway from the port of Buchanan to Yekepa was built by LAMCO in 1963. Because of the lack of roads, LAMCO operated staff trains and made them also available for local passengers. However, there was little public passenger traffic, and the service was abandoned in 1984. Pre-war ore traffic was between 6 and (almost) 15 mtpa. There was also some minor non-ore traffic. Timber was loaded at Tropoi exchange yard, but logging remained at approx. 60,000 tonnes p.a. – the equivalent of only 14 trains per year. Other freight was negligible. The previous regular time-table was centred on 5 pairs of ore trains. Maximum permissible speed was 70 kph for loaded and 80 kph for empty trains.

The MDA with ArcelorMittal was signed on 29.12.2006, but is not available to the public. The railway is being rehabilitated to Tokadeh (km 243) where a new terminal yard is being set up. Rehabilitation was interrupted by the financial crisis in 2009 but is expected now to be completed by July 2011.

By and large, ArcelorMittal will rehabilitate the railway to the initial design as far as required for the prevailing traffic demand. All sleepers were rotten and are being replaced; the initial idea of using concrete sleepers was dismissed and wooden sleepers imported instead. Except for some 15 km with new 136 lb (67.5 kg/m) rails, the LAMCO rails manufactured in 1984 are still in use, and points and crossings even date back to 1962. The bridges are generally in a fair condition requiring only minor repairs. The concessionaire intends to use simple radio communication in a first phase but an Incremental Train Control System (ITCS) once traffic picks up. As replacement for the Yekepa workshop that has been destroyed, a new workshop will be built in Buchanan.

Thus, the present rehabilitation must be considered a short-term reinvestment that is not likely to last for more than 12 or 15 years.

In the first phase, ore transport will be 4 mtpa. During the second phase, for which timing is not yet specified, the target is 15 mtpa.

Negotiations for a Joint Venture with BHP Billiton are in progress. If successful, ArcelorMittal and BHP would share the railway and would include rehabilitation to Yekepa and a possible further extension to a new BHP mine in Guinea.

The railway could be possibly also used by Rio Tinto for ore transport from the Simandou range in Guinea. The distance to Buchanan would be approximately 400 km compared to 700 km through Guinea. To date, however, only a desk study has been carried out, and Rio Tinto has, as yet, not approached ArcelorMittal.

The Bong Mines Railway

The 78 km standard gauge (1435 mm) railway from Monrovia to Bong Mines was built in 1964 by the Bong Mining Company. In the pre-war period, 3 train pairs for ore traffic were operated and the line capacity was approximately 3 mtpa. No data on non-ore traffic are available for this period. Maximum permissible speed is 40 kph for loaded and 45 kph for empty trains.

Through some basic maintenance, the railway could be kept operational. However, for the lack of machinery, drainages are not functional in particular on the first 10 kilometres, and the ballast is contaminated and partly missing. War damages on bridges have been repaired in a rough-and-ready way only, and the bridges are expected not to be fit for locomotives with a mass exceeding 80 tonnes.

At present, commercial freight trains are operated by the Liberian GEOSERVICES Company. They use light shunting locomotives of German Köf III type built in 1959. Previously they also provided passenger services and it is reported that there were more than 1000 passengers per day. Villagers also used the railway for transport of charcoal and other goods by makeshifts. These services had however to be abandoned because of the lack of operational locomotives. Wagons and coaches are also beyond their usual lifetime and in poor condition, in particular the brakes are not in working conditions.

An MDA with China-Union was signed on 19.01.2009. Within 5 years, the concessionaire shall complete the renovation of the existing railway and an approximately 20 km extension to the Non-Goma mines. The MDA specifies a capacity of 12 mtpa ore traffic plus common carrier freight and passenger services. No rehabilitation and operating programmes are available as yet.

The Mano River Railway

The 145 km narrow gauge (1067 mm) railway from Monrovia via Tubmanburg (Bomi Hill line) to Mano River was built in 1960 by the National Iron Ore Company. Operations ceased in 1986 when the mines were exhausted.

During the war, the track was dismantled. Today, the embankment mostly exists. Some original bridges also exist. However, the right of way has been lost for the first approx. 12 km and it is likely that it will not be possible to reinstate the railway from Monrovia port to the Saint Paul River Bridge. According to press releases, a license has been awarded to Elenilto Mining & Minerals Ltd in January 2010. No rehabilitation and operating programmes are available as yet.

4.4 Seaports and coastal shipping

The port of Monrovia currently accounts for almost all of Liberia's seaborne trade. Since the end of the war some progress has been made with rehabilitation work but much remains to be done. The port of Buchanan is being used to a very small extent for exports of logs and woodchips and imports of cement. The port of Greenville is not operational at present, whilst the port of Harper is being used on a very small scale for coastal shipments of equipment and supplies to UNMIL troops.

Monrovia

The Port of Monrovia was planned and constructed by the government of the United States, shortly after World War II, and handed over to the Liberian Government in the 1970s.

In the 1980s it contained an oil jetty for petroleum products and a dolphin berth for the import of crude oil, three iron ore jetties owned and operated by separate mining companies, and a 609m long marginal wharf for the handling of containers and general cargo. These facilities are now in varying states of disrepair.

The breakwaters are said to be in reasonable condition, but there is persistent theft of navigation aids, some of which are no longer functioning. As a result, ships cannot enter the port at night (17.00-07.00).

The approach channel between the breakwaters is approximately 1km long, and was originally dredged to between -14.0-15.0m CD to allow large iron ore carriers to access the port. Although it has been re-dredged since the end of the war, there has been some siltation, particularly around the head of the southern breakwater. Water depths are now said to be -10.0m CD at the oil jetty, and -9.0-9.5m CD elsewhere in the port, including the turning circle.

Two elderly tugs are available, and towage is compulsory even for vessels with bow thrusters. There is no proper pilot launch, with pilots boarding from a small speedboat.

The port boundaries extend from just south of the southern breakwater (Cactus Motors) to just north of the northern breakwater (Liberia Electricity Corporation) and to UN Drive in the east.

The area of land owned by NPA between the northern and southern breakwaters and the city ring road amounts to 507ha. It can be subdivided into a number of distinct areas, several of which are leased to private traders by the National Ports Authority (NPA), or have been taken away from it by Government and transferred to other users (e.g. the UNMIL land in the Freeport area and the Liberia Electricity Corporation site).

Oil jetty and tank farm. The jetty for refined oil products is connected to the south breakwater. The jetty is owned and operated by the Liberia Petroleum Refining Corporation (LPRC), which stores all imported petroleum products on behalf of the eight oil companies licensed to distribute oil products in Liberia. There are no private tank farms in the vicinity of the port.

The jetty is still operational, but one of the mooring dolphins at the jetty head is badly damaged. The jetty is reasonably well used, with significant vessel queuing. Ships are handled on a “first come, first served” basis.

In 2009 there were 40 calls by products tankers, with an average cargo size of 4,200 tons. Typical ship sizes were 15-25,000dwt, with some of the ships shared by different consignees. The petroleum products are usually supplied from Abidjan, Dakar or Mediterranean ports, and the ships also call at ports in neighbouring countries on the same voyage.

Two pipelines run from the jetty’s unloading rack via the south breakwater to the Liberia Petroleum Refining Company’s tank farm. One of the pipelines is for jet fuel, whilst the other handles other white oils.

Discharge rates are slow at 200-300cu m per hour due to the poor condition of the pipelines, which creates significant fire and safety risks.

The Emergency Action Plan for the port produced by Royal Haskoning in 2006 recommended extensive rehabilitation works for the oil jetty, but three successive tenders failed to identify a suitable contractor, partly because of the difficulty of finding spare parts for the outdated technology employed at the jetty. It has therefore been decided to build a new Fuel Unloading Facility to the east of the existing jetty.

The LPRC tank farm at the base of the southern breakwater has 28,000 cu m of tank storage for diesel, 17,000 cu m for gasoline, and 8,000 cu m for jet fuel, including 13,500 cu m of storage space leased to total for diesel and jet fuel.

The tanks are in poor condition, with evidence of serious ground contamination. Safety regulations and fire protection appear sub-standard. The storage capacity is insufficient to provide Liberia with a strategic stockpile, and may not be enough to meet future growth in demand.

Private warehousing area. Between the LPRC tank farm and the marginal wharf there is a large area of private warehousing, occupied by 20-25 importers and traders. The site is subdivided into multiple small plots leased from NPA, usually for periods of up to 15 years, and is covered with small buildings and open storage areas.

Many, but not necessarily all, of the companies occupying this site move cargo through the port. Importers are allowed to discharge their cargoes directly to their own trucks at the ship’s side and transport them directly to their warehouses, providing these are located within the port boundaries.

One of the largest tenants is the Firestone Rubber Company, whose compound includes tanks for the storage of bulk latex. This is moved by pipeline to ships berthed at the southern end of the Marginal Wharf. Firestone also exports significant quantities of crated rubber from this depot.

There is no quay wall in front of the private warehousing area, so any companies storing cargo in this area have to load and discharge it across the Marginal Wharf.

Marginal Wharf. This is the port’s main facility for the handling of containers and general cargo. It is approximately 609m long, with an apron width of 11m and a water depth of -9.0-9.5m CD.

The quay is in poor condition. The central section of the quay has collapsed, and is covered by a temporary metal bridge which can be used by vehicles of up to 19 tons gross weight. There are also holes in the deck structure which are dangerous to workers and impede cargo handling.

The piles are in very poor condition, with the state of the first two rows of piles putting the integrity of the entire wharf at risk. Shipping lines are seriously concerned about the safety of the quay. In addition, until late 2009 only three of the four berths could be used because of the existence of a wreck (Torm Alexandra). This has now been removed.

The transit sheds which run behind the apron are in poor condition and lightly used. Containers are stored mainly behind the transit sheds, on vacant land or in a series of small, unpaved storage areas. There is no continuous open space for the stacking of containers, and no proper system for the internal circulation of traffic. However some of the buildings have now been cleared, and an area of approximately 9ha is currently being paved for container storage under a contract funded by the World Bank.

The marginal wharf is to be completely rebuilt in the next three years by a private operator (APMT) under a 25 year concession agreement, selected by international competitive tendering. The requirements for the new quay are described in 4.1.3.

Administration and service area. The area between the marginal wharf and gate no. 3 is occupied by a mixture of small scale uses, including NPA offices and workshops, private warehousing, and port-related service activities. There are also substantial areas of unoccupied wasteland.

LMC Pier. The three finger piers to the north of the marginal wharf were originally constructed for the export of iron ore, but are no longer used for this purpose.

The Liberia Mining Company (LMC) pier is 270m long and 13m wide with a water depth alongside of approximately 9.0-10m. It can accommodate ships on both sides, and is currently used as an over-spill facility for the handling of containers and general cargo. The pier is in reasonable condition and - after some repairs - will be used as an alternative facility to the marginal wharf whilst the latter is being rebuilt.

NIOC Pier. The National Iron Ore Company Pier no longer has any deck, and has therefore not been used for around 15 years. It is in need of removal on safety grounds.

The area at the base of the pier may be designated as a future iron ore stockpile area for the Elenitlo Mining Company if it decides to export iron ore from the western cluster through Monrovia rather than a dedicated export terminal further north. In this case a new iron ore jetty is likely to be built on the site of, or close to, the NIOC Pier.

BMC Pier. The Bong Mining Company Pier is approximately 270m long x 12.5m wide, with 9.0-10.0m of water. Ships can berth on both sides, although the northern side is used mainly by fishing vessels.

The pier is currently used for the import of clinker and cement for the Cemenco cement mill, Clinker - and in some years gypsum and limestone - are discharged into dump trucks via hoppers using ships' gear; and taken either directly to the plant located in Somalia Drive, just east of the Port area, or to a covered storage area erected by Cemenco in the last two years just north of the BMC Pier on land leased from NPA. Bagged cement discharged at the BMC Pier is taken directly to the Cemenco plant or the warehouses of other licensed traders within the port.

The BMC railway extends almost as far as the pier, and has been used until recently for small scale, intermittent exports of iron ore and scrap metal scavenged from the mines.

The BMC Pier is to be taken over and redeveloped by China Union as part of its Mineral Development Agreement for the Bong iron ore mines. It will be allocated a substantial area of land immediately to the north of the pier for a stockpile, although the boundaries for this have still to be finalised. Negotiations for the redevelopment of BMC Pier have been undertaken by the Ministry of Lands and Mines, without the full participation of the National Ports Authority, which has very little knowledge

of China Union's intentions. However China Union's MDA obliges it to make the BMC Pier available for other dry bulk cargoes, so it is likely to continue being used for cement imports in future.

Behind the waterfront between the NIOC and BMC Piers there are two substantial areas of unused land, one leased to the Lee Group and the other occupied by crude oil tanks formerly owned by the Liberia Petroleum Refining Corporation.

Lee Group. An area of approximately 45 acres of swampy, undeveloped land in the centre of the port was leased to the Lee Group, a Chinese company, in 2004 for 15 years. Lee Group was planning to develop the site for light industry, but has not yet built anything on the land or even produced a plan. Because size and location of the site, NPA should urgently review its status, particularly in the context of renewed use of the port for iron ore and log exports, both of which will require substantial storage areas.

Crude oil facility. Just to the south of the BMC Pier is a disused – and largely destroyed – dolphin berth with a pipeline connection to two large tanks which were formerly used for the import of crude oil. These have not been used since 1984, when oil refining in Liberia ceased. The rehabilitation of these tanks for use as a heavy fuel oil storage facility is currently under discussion.

Monrovia Freeport was once NPA land, but Control of the Free Zone Area was transferred to the Free Zone Authority, another public corporation. Development was halted by the civil war, since when the area has been used as a military base by the United Nations Mission in Liberia (UNMIL). The area has been extensively developed with warehouses, offices, workshops and other logistics and military installations, but is not used for port activities.

Buchanan

The port of Buchanan, including the breakwaters, was built by the Swedish-American Minerals Company (LAMCO) in the 1960s. It is located 94 km SE of Monrovia.

The harbour is protected by two breakwaters 1,890m and 590m long. The depth in the approach channel is now –12.8m CD, but was originally –14.95m CD, with a width of 210m.

Before the war there were three main facilities: an iron ore berth, an oil berth and a commercial quay. The commercial quay on the western breakwater was subsequently transferred to NPA, and the other facilities abandoned when the Iron Mining Co of Liberia (LIMINCO) – which took over the facilities from LAMCO – ceased mining in 1990.

Iron ore berth. The iron ore berth, immediately opposite the entrance, comprises a 263m caisson structure with a –14.0m CD berthing pocket in front of it. When in use the berth was able to accommodate Panamax ships with cargoes of 60-70,000dwt by using a restricted tidal window for departure (the tidal range is approximately 1.2m). Because of the existence of rock in front of the berth no further deepening is envisaged

Project cargoes for the rehabilitation of the mines have already been discharged at the iron ore berth. They include rails, sleepers, spikes, anchors, vehicles and earth moving equipment. Most of the cargo was discharged from general cargo ships using ships' gear, except for the vehicles and earth moving equipment which were brought in on RoRo vessels.

The iron ore berth and substantial areas of land on the northern side of the harbour, including the oil berth, now form part of the Arcelor Mittal mining concession, which was awarded in December 2008. The berth requires substantial rehabilitation work. The engineering works for the reconstruction of the iron ore berth are currently at the design stage but have not yet been tendered.

In phase 1 of the mining concession – based on a throughput of up to 4m tons p.a. – there will be a stockpile capacity of 100,000 tons immediately behind the berth, with one mobile shiploader initially rated at 2,000 tons p.a. A second shiploader may be added later. Rail wagons will be loaded at the mine using front-end loaders, and discharged at the stockpile using grab cranes feeding to conveyors. For ship loading operations, front end loaders will fill dump trucks at the stockpile, and the trucks will tip ore onto mobile conveyor(s) on quay.

In phase 2 – with throughputs of up to 15m tons p.a. – the stockpile will be expanded to 600,000 tons, and the mobile shiploader(s) will be replaced by a single rail-mounted shiploader with a rated capacity of 6,000 tons per hour. Ore will be received into the stockpile using a single wagon tippler linked to conveyors, and will be transferred to the shiploader using a stacker/reclaimer system.

The maximum capacity of the existing berth is 15m tons p.a. If a proposed JV with BHP Billiton goes ahead, a new trestle berth will be constructed outside of the breakwater in –23m of water, approximately 4km offshore. This would be designed for capesize vessels (180,000+ dwt) and could have a throughput of 40-50m tons p.a. Preliminary studies indicate no breakwater protection will be required.

After reconstruction the iron ore berth will need dredging to remove at least 17 years of sediment. Water sampling and EIA studies for dredge spoil disposal have just begun, but there are not thought to be major contamination problems. Maintenance dredging is expected to be required every 15 years.

Oil berth. The existing oil berth (no longer used) is located on the eastern breakwater. It has a water depth of –10.0m CD, and also requires extensive rehabilitation work. The tanks are located approx 1km away, to the east of the railway, and require refurbishment.

Arcelor Mittal may outsource its own fuel supply operations to a third party, which would be allowed to bring in and store oil for other companies in the area.

Commercial quay. The commercial quay as common user port facility is located on the western breakwater, and comprise a 330m quay with –10.0m CD water depth. There is a shed of approx 80m length at the landward end of the quay; this is in reasonable condition and used by Cemenco for cement imports. There is a smaller shed, also in reasonable condition, at the entrance to the quay. The port offices are at one end of the Cemenco shed. There is one portal crane in poor condition, so ships discharge using ships' gear

The area at the seaward end of the quay is open storage and has been used recently for loading woodchips. The main storage area for woodchips (quite large) is approx 1km from the quay on the port approach road.

There have also been some trial shipments of logs recently using ships of around 15,000dwt with a water depth requirement of –10.5m. Log exports are handled in different ways depending on whether the logs are floaters (20%) or sinkers (80%). Floaters are rolled into the water from a ramp, bound together in bundles, towed out to ships anchored in the middle of the harbour by a small workboat, and then loaded by ships' gear. Sinkers, in contrast, are loaded by ships' gear from the quay. There has also been a trial shipment of logs in containers.

Customs inspection is carried out on quay using local Customs staff.

The breakwater is believed to be in reasonable condition, but the navigation aids need to be reinstated. Tug assistance will be needed for Panamax and Handymax size vessels, and will probably be outsourced by Arcelor Mittal. Ships using the commercial quay do not require tugs.

Pilots come from Monrovia as and when needed, and will continue to be provided by NPA, even though LAMACO had its own pilots.

Greenville

Greenville is 241 km SE from Monrovia. Its harbour is protected by a 400m breakwater with two quays on the inner side, or 70m and 180m respectively. The harbour was rehabilitated in the 1980s with funds from the German Development Bank, and is used for logs and timber.

The quay is approximately 150m long with a design depth of 8.1m CD. The quay wall is located along the landward side of a spit of land which forms a natural breakwater.

The structure appears from photographs to be in reasonably good condition, but is very narrow (approximately 15m) which impedes cargo handling. There are two small fuel tanks located at the end of the berth.

The port's location at the mouth of a river causes siltation, and results in a significant maintenance dredging need. Water depths have recently been surveyed by the Dutch Navy. The figures have still to be converted into dredging volumes, but preliminary indications are that 800,000 cu m will have to be removed at USD 8.00 per cu m in order to match the -8.1m design depth of the quay.

At present Greenville cannot be used because of a wreck alongside the berth. It also needs a tug and a pilot launch.

Harper

Harper is 476km SE from Monrovia. It was built in 1959 on the rocky Russwurn Island, which is connected to the mainland by a causeway, and is protected by a 150m breakwater. The 100m reinforced concrete pier has a water depth of 5.5m. The port serves the timber industry, and also has the potential to handle palm oil.

Harper is the smallest of Liberia's four ports, but is of strategic importance because of the difficulty of accessing Maryland County by road. It is used primarily by coastal shipping, and for log exports.

Harper requires relatively little maintenance dredging, as the design depth of the quay is only -5.5m and the present water depth is -5.0m. There is very little siltation.

It does not require a tug, as the channel is too small to accommodate a ship and a tug at the same time; vessels berth using their own power.

Coastal Shipping

At present there is only limited competition from sea transport. Although there are some short-distance movements of passengers and freight by sea, usually in open boats with outboard motors, there are no regular commercial shipping services.

Around 12,000 tons p.a. of military and aid cargo is currently being carried by sea between Monrovia and Harper, mainly on the UNMIL ship (the MV Caterina). This is a multipurpose vessel of 1,888dwt with a stern ramp for loading/discharging vehicles, a single large hold, a crane and deck space for containers. It has been used in the past for carrying troops, but does not have suitable accommodation for commercial passengers.

The vessel is 70m long with a laden draft of approximately 4.5m and a speed of 10-12 knots. Because of the configuration of its internal spaces, it has a cargo carrying capacity of approximately 1,000 tons.

In 2009 the port of Harper received 49 vessel calls, of which 30-35 are believed to have been by the MV Caterina. This accounted for the majority of the cargo handled at Harper.

Table 4-2: Cargo loaded and discharged at Harper (tons)

	2008	2009
Discharged	7,038	3,549
Loaded	5,578	4,108
Total	12,617	7,657

Source: NPA Annual Report on Activities of the Port of Harper 1 Jan - 31 Dec 2009

In 2008 an estimated 8,000 tons of cargo was moved to/from Harper for the UNMIL forces using the M/V Caterina, whilst around 4,500 tons of cargo was moved for the civilian population (including some cargo carried on the MV Caterina for NGOs and Government contracts).

The drop in traffic between 2008 and 2009 is said to have been due to accidents at sea, which caused the loss of some small vessels and/or their cargo. The loss of several coastal vessels in recent years - of which the most recent was the sinking of the MV Havia in June 2010 - means that the MV Caterina now provides the sole remaining shipping service to Harper in the formal sector.

The port of Greenville is still effectively closed to commercial shipping because of siltation and a wreck adjacent to the berth. In 2009 it received two calls by small feeder ships of less than 500dwt; one bringing in cement for an NGO and the other taking out rubber scraps for a company based in Monrovia.

The port of Buchanan, which imports cement and exports logs and woodchip exports, does not handle significant amounts of coastal traffic because of its proximity to Monrovia.

Some passengers are carried by coastal shipping, but the numbers are small at present - probably no more than 1-2,000 passengers p.a. - because of the absence of regular scheduled services.

4.5 Domestic and international aviation

Historical air traffic data in Liberia is generally lacking. Whatever data that is available relates mainly to ROB. In addition, data integrity is difficult to verify when inconsistencies appear between various sources of data. For this reason, and for consistency throughout this study, the following assumptions are applied:

- Traffic data (for ROB only) are extracted from Liberia's Vision for Accelerating Economic Growth - A Development Corridor Study (MoPEA and USAID) Republic of Liberia, and National Transport Policy and Strategy (November 2009).
- Traffic forecast for DOM is extrapolated from 1980 data contained in "Republic of Liberia Planning and Development Atlas, MoPEA and GIZ" (1983).
- Traffic at DOM is assumed to be unchanged since 1980 - 2009 due to the effects of the civil war (1989 - 1996 and 1993 - 2003).
- Traffic growth based on GDP growth rates between 2009 and 2030 are sourced from:
 - 2009 actual data;
 - projections to 2014 from IMF; and
 - extrapolation between 2015-2030 from consultants' estimate based on advice from IMF.
- Exceptional surge in air traffic in 2007 is attributed to influx of foreign advisors and facilitators during the period of the Liberian national elections.

- Subsequent PHP (Peak-hour Passenger) figures are extracted from forecast traffic, calculated on 30th busiest hour principles that include weighting from average aircraft seat load factors.
- Data for air freight is unavailable. Most airfreight transacted at Liberian airports (ROB in particular) are “belly cargo” on passenger aircraft. Full freighter commercial flights tend to be exceptional events and are statistically immaterial in the present context of study.

Monrovia Roberts International Airport (ROB)

As a nucleus of civil aviation in Liberia, ROB is a Code 4E airport with a 3300m instrument runway. It is the only airport in Liberia capable of offering Cat II instrument landing system (ILS) based approaches. ROB also has a sufficiency of apron space totalling c.85,000m². Altogether, ROB faces no operational constraints with respect to runway and apron capacities. In addition, ROB has the luxury of having a substantial land bank of c.2084ha.

The combined physical attributes ensures ROB’s fundamental capacity to be an operationally sustainable airport facility in the years up to and beyond 2030. This also confirms ROB as a prime national asset worthy of attention, warranting the necessary investments in the years ahead.

An 8-month Emergency Works study by the World Bank (WB) was conducted between April and December 2005. The report provided a comprehensive array of recommendations; although 5-years on and with a WB/USAID grant of approx. USD 500,000, there appears insufficient evidence of substantive progress. Buildings, facilities, installations, equipment and processes remain in disarray and in gross state of disrepair. Earlier in the year, Lockheed Martin (LM) was assigned to manage and operate ROB, excluding ATC services, pax and baggage screening and refuelling. Since then, safety and security issues are understood to have attained ICAO Annex 17²¹ compliance. Proceedings are already underway to achieve aerodrome facility compliance in accordance with ICAO Annex 14²².

ROB’s traffic loading in terms of passenger throughput is estimated at 121,000 passengers per annum (2009); a 4.6% increase from 2008 actuals of 116,000 pax per annum. With respect to aircraft movements, no significant increases were observed between 2008 and 2009 with 3,830 aircraft movements being recorded between the two intervening years.

At present, ROB’s main international air conduit is through ACC with minor traffic volumes through Casablanca (CMN). Connections to its immediate neighbours to the west remain poor despite reports of there being sufficient demand to support small scale commuter-type aircraft traffic to cities such as Freetown (FNA), Conakry (CKY) or Banjul (BJL).

²¹ ICAO reference guide to Security – Safeguarding International Civil Aviation against Acts of Unlawful Interference.

²² ICAO reference guide to Aerodrome Design and Operations.

Figure 4-3: Accra (ACC) is ROB's main international conduit

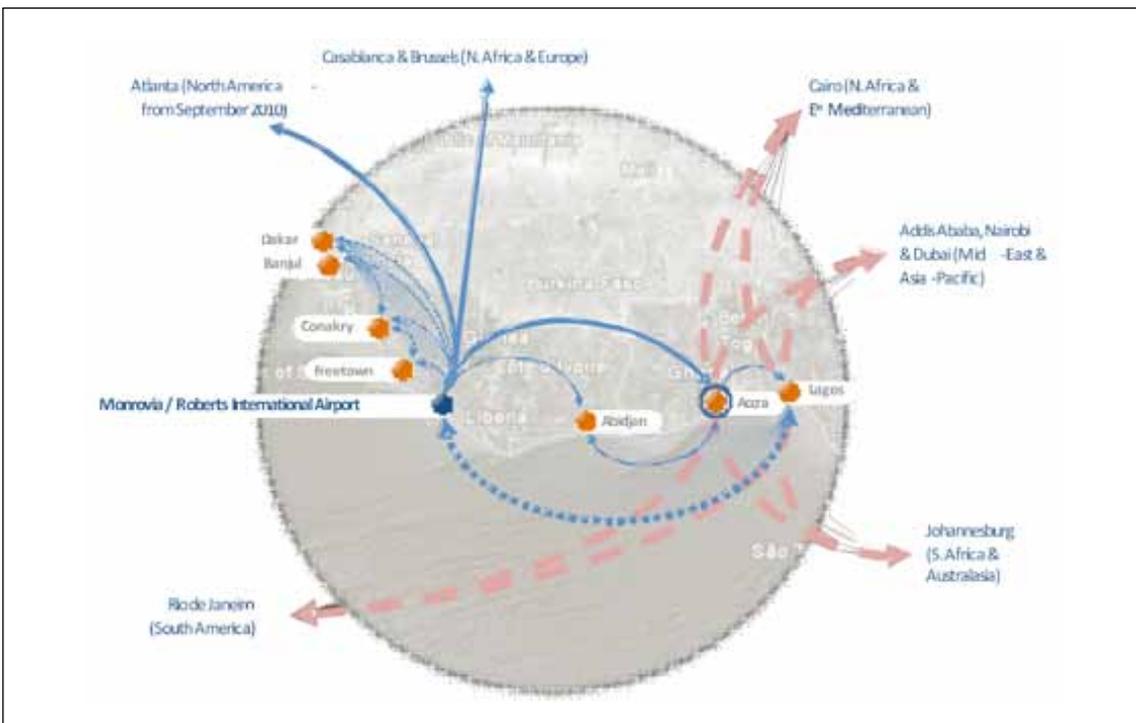
Destination	Benin	Bukina Faso	Cape Verde	Côte D'Ivoire	Gambia	Ghana	Guinea	Guinea-Bissau	Liberia	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo
Benin		5		10	5					1	1	4	3		4
Bukina Faso	4			8	3					9	1		6		4
Cape Verde					1								1		
Côte D'Ivoire	10	11				22	9		3	8	4	8	14	1	14
Gambia							4		4			2	12	4	
Ghana	1	3	1	23					13			41		9	8
Guinea				8	4				2	1		2	7		
Guinea-Bissau			1										9		
Liberia				3	5	9	2					3	3		
Mali	1	7		4							3		18		
Niger	1	1		4						4			2		
Nigeria	3			8	2	46	2		2				5	4	
Senegal	3	6	7	14	11		7	9	1	16	2	5		4	2
Sierra Leone				1	5	7			6			3	4		
Togo	5	4		15	4							1	2		

All Flights from One Week in November 2007 for ECOWAS
 Extract from ECOWAS' Infrastructure: A Regional Perspective (Draft)
 Source: Bofinger (2009)

Ghana (ACC) provides Liberia (ROB) with the highest connectivity, and through this, to other international destinations

In the short-term, flight capacities need to be established between these centres using small feeder aircraft initially such as the Beechcraft King Air C90GTx Turboprop (c.7/8 pax) or similar. This small measure can immediately reduce the cost of air travel and enhance Monrovia's connectivity with its immediate western neighbours. Similar aircraft can operate from existing small rough STOL air-fields in Liberia's hinterland to connect them with Monrovia and further afield. Elysian Airlines have confirmed this route potential, subject to conditions being viable and encumbrances mitigated.

Figure 4-4: ROB's regional & international connectivity is via ACC, CMN & LOS



With increases in passenger throughput, air traffic movement is expected to correspondingly increase through increases in aircraft deployment and flight frequencies. This is the likely scenario rather than through the deployment of larger aircraft in the shorter-term. In the case of ROB, increases in aircraft movements are not runway and/or apron limited; ROB has the capacity to absorb the increases with minor maintenance works to its pavement surfaces.

The operational constraint for ROB lies in the processing capacity of the PTB (Passenger Terminal Building). This constraint is an operational stress point and is particularly acute.

The most critical and immediate requirement for ROB is to conduct an independent and comprehensive Airport Master Plan study. The Airport Master Plan (AMP) will provide the basis to describe future operational expectations of the airport, and the logical path it needs to take to fulfil them. Stipulations contained therein will help reinstate necessary safeguards to ensure its operational sustainability. The AMP will ensure ROB's continued future as an operational airport facility in years ahead.

More importantly, the Master Plan shall form an informed basis from which the Government of Liberia may define frameworks for possible concessions, to solicit private investment interest and to leverage available PPP instruments to finance ROB's future development. Aligning ROB's development towards a PPP approach is especially important in the context of Liberia; there is simply insufficient funding available against more acute and socially demanding needs such as health or water projects.

Monrovia, James Spriggs Payne Airport (MLW)

Monrovia's James Spriggs Payne Airport (MLW) on the other hand faces a different prospect. MLW presently functions as the primary operational base for UNMIL's domestic flight operations based on a fleet of De Havilland Dash 7's and MIL Mi-8 helicopters. By default, UNMIL is also the airport's operator, responsible for maintaining the entire airport facility within its own "military based standards" of operation. They do not necessarily coincide in its entirety with ICAO standards. In addition, all operational personnel and equipment necessary for flight operations at MLW belong to, and are maintained by UNMIL. They include the temporary ATC tower facility, temporarily erected NDB beacon, mobile standby generator, the provision of Rescue and Fire Fighting (R&FF) services, and so on. The nature of installations and fixtures, and standards of maintenance all suggest the minimal and temporary nature of MLW operations - to be dismantled when UNMIL and its operations ceases at MLW.

In addition to UNMIL, MLW is the home base for Elysian Airlines. Until recently, Elysian Airlines operated a single 19-seater Beechcraft 1900, wet leased from South Africa. They provided both scheduled and charter services to other local destinations in Liberia and Conakry (CKY), Banjul (BJL), Harper (CPA) and Freetown (FNA). New operators are using the airport now (since Jan 2011) giving rise to an increase in traffic.

When UNMIL ceases operations in Monrovia, traffic volumes at MLW are expected to fall substantially.

Being some 45 air-km apart from ROB, MLW is far too close to ROB to offer substantial advantages as an airport, either as an operational stand-alone facility or as a complementary [feeder] airport to ROB. MLW's main advantage is its airstrip that is in close proximity to Monrovia city centre. Whilst this convenience factor is desirable, it is beneficial only to a meagre number of users, comprising airport staff and some passengers. Traffic is presently²³ understood as being c.6 aircraft movements/c.20 pax per day.

²³ Data collected in Aug 2010. Traffic has increased since then by a further four flights per week.

The aviation facilities at Spriggs Payne are unsatisfactory so they should be either upgraded or relocated. A thorough feasibility study of the costs and benefits of upgrading compared to those of relocating the aviation services to Roberts should be undertaken. The study should also consider the strategic and security benefits from each option. Consideration should be given to the value from leasing the airport property. Instead of being an operational and cost liability to the GoL, the real estate designated to MLW may be productively utilised for commercial urban development. Expectant income accrued from the management of such real estate can be ploughed back to finance various development demands within the sector.

Following the study recommended above it will be possible to determine where to focus the investment of scarce resources - either towards getting ROB operating to acceptable minimal standards or towards the preservation and upgrading of MLW.

Other domestic/rural airports in Liberia (DOM)

There are about 30 other domestic or rural airports (DOM) throughout Liberia. All are understood to have unpaved runways ranging between c.900m to c.1800m in length and cleared for VFR (Visual Flight Rules) only flight operations. For the present moment, they are principally understood to have sufficient runway and apron capacities to accommodate expectant low average traffic volumes of c.2-3 aircraft movements per day, and passenger throughput of c.47 per day. A recent report on Liberian Airstrips issued by the LCAA (May 2008) suggests that many have poor runway conditions and/or non-existent passenger handling facilities that are in various states of disrepair. Even in their basic configuration, and given the prevailing adverse economic situation, it seems inconceivable that GoL can justifiably manage and support all 30 airports. Airport closures appear inevitable, and choices and priorities over such decisions need to be made. The usual mechanism for resolving such issues may be via an Airport Consultative Committee (ACC) or through an independent cost-benefit analysis, or both. This may be the next step for resolving DOM issues.

4.6 Public transport

The main issues and problems regarding public transport services in Liberia are considered under the following headings:

- access to services;
- affordability;
- service capacity;
- vehicles;
- infrastructure;
- safety; and
- service quality.

The following sections will follow this sequence.

Access to services

The basic public transport route network in Monrovia comprises eleven routes operating along main roads; most routes are served by conventional buses (albeit at very low frequencies), minibuses and taxis. Taxis will deviate from the main routes to serve places off these routes, but charge extra for the service, and expensive motorcycle taxis are available on roads where other vehicles will not operate. Public transport operators are reluctant to serve some relatively densely populated areas

of the city where road conditions are poor, and tend to charge higher fares on routes to these areas. Therefore virtually all areas of the city have access to some form of public transport, but away from the main routes and on poor roads this is relatively expensive.

Accessibility cannot therefore be considered to be satisfactory for a large proportion of the city's residents. In particular, poor people living in informal settlements are poorly served and cannot afford the public transport fares. Without some form of intervention to ensure improved accessibility to areas where demand is low or where road conditions are poor, this situation is likely to deteriorate further.

There appear to be adequate public transport services between Monrovia and most towns and cities throughout Liberia. Most services are provided by taxis, minibuses and pickups, operating at relatively high frequencies throughout the day. Fares appear to be competitive and reasonable for the distances travelled.

People living in rural areas require transport to and from market areas, both to sell their produce and to purchase provisions. Children must travel to school and a small number of adults travel to and from their work, but many people live within walking distance of their workplaces. Those living nearer to the towns may travel more frequently, for employment and education.

Some informal transport, both motorised and non-motorised, is available in rural areas. This includes agricultural transport such as farm carts, tractors and trailers. More formal public transport is also available, particularly nearer to the towns. Taxis, pickups and motorcycle taxis serve many villages throughout the country and provide links to nearby towns. As the economy recovers, the number of such vehicles is increasing.

Accessibility for rural dwellers is therefore reasonably good, and is improving. However, fares tend to be much higher, in terms of cost per passenger-kilometre, on rural routes than on inter-urban and city services. This effectively restricts availability to those who can afford to pay the fares, and since incomes are generally low in rural areas, this is likely to remain a problem for some time to come.

Affordability

A typical commuter in Monrovia earns approximately L\$3,500-4,200 per month, and works approximately 22 days per month. There are wide variations in the fares charged by the different public transport modes in the city. MTA bus fares are cheapest, at L\$15 per single journey, irrespective of distance travelled. A person making 22 round trips per month using MTA buses would therefore spend L\$660, or approximately 16-19% of income. However, only a very small proportion of travellers are able to use MTA buses since there are very few of them, and the majority have no choice other than to use the much more expensive taxis.

Typical fares paid by taxi users range from L\$10 to L\$45. Those travelling short distances and paying fares as low as L\$10 will therefore spend between 10% and 13% of their incomes on transport but those travelling long distances from points such as Redlight into Central Monrovia will be spending between 47% and 57%. Passengers who travel only short distances, but who must use taxis operating on long routes, will also have to spend a large part of their incomes on transport. If there are also children travelling to and from school there will be an additional burden. Where minibuses are available, the percentages will be approximately half those for taxis but there are far fewer minibuses: in 2009 they were used for approximately 10% of trips, compared with 71% by taxi. Regular use of public transport services is therefore clearly unaffordable to many people on low incomes.

MTA bus fares are subsidised, but the level of service is too low to benefit many people. If they were not subsidised, the fares would be higher, but if buses were operated efficiently, on routes where they are most suited, fares would still be lower than those charged for minibuses or taxis for a similar quality of service.

Passengers using long-distance public transport services tend to travel less frequently than those using urban and rural services for shorter journeys, and therefore affordability is less of an issue. In any case, long-distance fares in terms of the rate per passenger-kilometre tend to be low compared with urban fares, due partly to the increased productivity possible on long-distance services.

Fares for public transport in rural areas are high compared to those charged on urban and inter-urban routes. For example, taxis charge L\$100 per person and motorcycles charge L\$75 for the 9-kilometre one-way journey between Belleh village and Gbarnga. Schoolchildren travelling into Gbarnga daily, travelling in both directions, therefore incur substantial costs. Many people walk because they cannot afford the fares.

To cater for all income levels and requirements, a wider range of service standards and fares would be appropriate. At the lower end, cheap subsidised public transport services for the lowest income groups may be desirable: subsidies might be funded by government, or through cross-subsidy from other, profitable, services. This is a matter of government policy but is not addressed in the government's NTPS document. At the next level, there could be basic bus services, providing minimal acceptable standards of comfort, operating at fares which are adequate to fully cover all operating costs; above this level there could be premium-quality buses, minibuses and taxis operating where required, also at fares which would cover all costs.

Service capacity

There is shortage of public transport capacity on urban services in Monrovia at peak times but this is due partly to inefficient operating practices, which in turn are a result of the unregulated manner in which the services are provided. More efficient operating practices would increase the capacity of the service with the existing resources.

Many taxis and minibuses do not leave terminal points until they are full. This applies particularly at off-peak times, when drivers are reluctant to depart with empty seats in case there are no passengers to be picked up along the route, even if this is rarely the case. As a result, passengers waiting at the roadside may have to wait for a considerable time before being able to board a taxi or minibus. This practice results in a shortage of service capacity even if there is excess capacity within the system: the excess capacity is manifested in the queue of vehicles at the terminals waiting to gather full loads before departing.

Demand for bus services provided by MTA is high, due largely to the relatively low fares charged for longer distance journeys. However, there are very few buses available: typically only 15 or 16 buses are operating on any day, when in a city of the size of Monrovia the number of buses required to provide a full service, in the absence of taxis or minibuses, would be of the order of 500-1,000.

In almost any city, public transport services are overcrowded at peak times, and it would be uneconomic to increase capacity to eliminate overcrowding altogether. In the case of Monrovia, the main problem is not so much one of inadequate capacity, but the manner in which existing capacity is deployed.

As in the case of urban transport services, the large numbers of taxis, pickups and minibuses observed waiting for passengers at terminal points suggests that capacity on inter-urban services is adequate. However, if vehicles leave the terminals only when they are full, this again will result in a shortage of capacity along the route.

The adequacy of capacity of rural transport services is difficult to assess. From observation, there appears to be generally reasonable transport to most areas, but demand is limited by the level of affordability. It is probably true to say that capacity is adequate at prevailing levels of fares, but that an increased level of service, at more affordable fares, would be highly beneficial to residents in rural areas. This cannot be achieved without some form of government intervention.

Vehicles

A wide range of vehicle types is used for public transport services in Liberia. These include motorcycles operating as taxis carrying individual passengers, in urban and rural areas; saloon cars operating as taxis for individual passengers in Monrovia but much more commonly as taxis operating on designated routes on urban, inter-urban and rural services; minibuses operating on fixed urban and inter-urban routes; four-wheel drive vehicles (referred to as “jeeps”), mainly on inter-urban services; pickups and light trucks carrying passengers and their accompanied luggage and freight on inter-urban and rural services; and medium-sized and full-sized conventional buses on urban and inter-urban services.

Motorcycles are suitable for carrying individual passengers for short distances but they are unsatisfactory in bad weather, and tend to be dangerous, particularly if good driving standards are not enforced. They provide valuable services where demand is low or road conditions are unsuitable for larger vehicles. However, demand for such services is probably relatively high due to deficiencies in the services provided by more conventional public transport vehicles. In the long-term, it is desirable for safety and environmental reasons that the number of motorcycle taxis should be controlled.

The majority of vehicles used for taxi services are medium-sized saloon or estate cars, with engines of around 1600cc capacity, mostly of Japanese manufacture. Most are designed to carry five people, including the driver, but when used as taxis they normally carry five passengers, with four sitting on the rear seat. This is not only uncomfortable but dangerous.

The minibuses used in Liberia are similar to those used in most African countries: the typical vehicle is a Toyota Hiace carrying 15 passengers. They are not ideal vehicles for busy services with high passenger turnover, but are suitable for carrying capacity loads between two points, particularly on routes with low traffic volumes. They are also ideal on narrow roads where large buses would not be able to operate safely, and where demand is low.

The buses used in Monrovia by MTA are typical European city buses. Although they were built to standards which were applicable in Europe up to twenty years ago, they are generally suitable for the poor road conditions in Monrovia; however, as road conditions improve, buses to more modern standards, offering improved access and better facilities for disabled passengers, will become more appropriate although such vehicles do incur a cost penalty.

Some private sector operators on urban routes in Monrovia run full-sized buses which were formerly school buses operated in North America. Such buses were constructed relatively cheaply since they were designed for low levels of use: typically, a school bus will operate one journey in the morning and one in the afternoon, with occasional use during the day in connection with school activities. They are not designed for intensive urban public transport use with high passenger turnover, and those in use in Monrovia are unreliable and costly to operate.

NTA operates three full-sized buses on long-distance services. These are to European standards of comfort for medium-distance services but are nearly twenty years old.

The different types of public transport vehicles are not always used for the purposes for which they are most suited. In general, large buses are more efficient on routes with high traffic volumes; smaller buses are best for services on narrow roads or routes where demand is low; and taxis are best at catering for the requirements of individuals or small groups of people travelling together between the same two points.

The predominance of saloon cars used as taxis on services where larger vehicles would be more appropriate is inefficient in terms of operating cost per passenger, and, for urban services, also in terms of use of road space. Already, the taxis contribute substantially to traffic congestion in Monrovia, and any increase in their number will make matters worse. The predominance of small vehicles also results in higher levels of exhaust emissions per passenger, which is compounded by the poor condition of the majority of vehicles.

Apart from the motorcycle taxis, almost all vehicles used for public transport services were imported second-hand; many had already reached the ends of their economic lives before they were purchased. Maintenance standards are generally poor, so that many of the vehicles operating are in very poor and often dangerous condition, breaking down frequently and emitting high levels of pollutants and noise.

Infrastructure

Poor road conditions make some roads unsafe or inaccessible for types of public transport vehicle which would otherwise be most suitable for the routes concerned, and increase operating costs for all vehicle types. It is recognised that improved road conditions are necessary for all transport, not only public transport, and this issue is being addressed as the Liberian economy recovers.

Similarly, the configuration of the roads and management of road traffic is equally important for all transport, particularly in Monrovia. Traffic congestion resulting from poor road design, inadequate capacity and poor traffic management increases the cost of (public) transport by reducing operating speeds and thus increasing fuel consumption and general wear and tear, and by reducing the productivity of the vehicles, so that a greater number is required to provide a given level of service. This in turn increases the fares which passengers must pay. Problems of traffic congestion are becoming serious in Monrovia, and must be addressed as a matter of urgency.

Infrastructure specific to public transport includes bus stops and terminals, and maintenance facilities.

Most public transport vehicles stop anywhere along the road to pick up and set down passengers. This obstructs other traffic including other public transport vehicles. MTA buses stop at designated stopping places: all of these were formerly marked by signs but many of these have been removed. Passenger shelters are provided at some bus stops but there are very few of these.

On some roads, such as Somalia Drive in Monrovia, vehicles can pull off the road and stop on the shoulder, although many stop in the roadway; on most roads this is not even an option. There are virtually no lay-bys at bus stops where buses can stop out of the traffic stream. Where high-frequency public transport services are provided, vehicles stopping at any point in the roadway can cause severe delays to other traffic, and can be a danger to all road users.

There are no formal terminal facilities for public transport vehicles anywhere in Liberia although some have been proposed for Monrovia. At present, vehicles wait and load on the road or on open spaces beside the road. No facilities are provided for passengers except by informal traders. Several of these terminals, or parking stations, share the land with markets, and traders' stalls are intermingled with waiting and loading vehicles. This is both inefficient and dangerous, and poses problems of security.

These terminals also create serious problems of traffic congestion. At Duala and Redlight in Monrovia, traders' stalls and waiting taxis and minibuses encroach on the roadway, obstructing the movement of through traffic. It often takes more than an hour for traffic to pass these points.

There is an urgent requirement for properly designed, formal terminal facilities in appropriate locations. This is particularly urgent in Monrovia, but will become an issue in other towns in Liberia before long.

There is also a requirement for maintenance facilities. At present, apart from the MTA bus depot in Monrovia, there are virtually no formal facilities for the maintenance of public transport vehicles. The majority of vehicles are maintained in informal roadside workshops with limited equipment and poor working conditions. Inevitably, this adversely affects maintenance standards which in turn affect costs and safety. The lack of proper maintenance facilities reflects the poor enforcement of vehicle standards: if enforcement were improved, vehicle owners would be forced to have their vehicles maintained at facilities with the appropriate equipment and resources, and such facilities would begin to be more commercially attractive.

Safety

Statistics showing accident records for public transport vehicles were not available but from observation of vehicle condition and driving standards it is apparent that safety standards generally in Liberia are low. According to the Traffic Police, between 25% and 40% of drivers (including taxi, bus and truck drivers) do not have the requisite licences.

A licence database covering vehicles and drivers is currently being set up, but in the meantime a lack of information makes enforcement of standards difficult. This is compounded by inadequate penalties for traffic offences: the courts frequently levy fines well below the maximum because the offenders are unable to afford to pay the maximum. The Traffic Police and the Federation of Road Transport Union hold training workshops for taxi, truck and bus drivers, but without the database it is not possible to ensure that all attend.

All vehicles are required by law to be inspected annually at test stations operated by the police. There are also random roadside inspections with penalties for using defective vehicles. However, limited resources make enforcement of vehicle standards difficult.

Service quality

Overall, the quality of public transport services in Liberia is low. While standards are consistent with those in many other developing countries, significant improvements could be achieved at little or no cost.

Comfort standards are low. Taxis and minibuses are normally overloaded so that passengers travel in cramped conditions. Vehicles are often dirty with damaged seats and interior fittings, soiling and damaging passengers' clothing and sometimes also threatening their safety. MTA city buses are designed for greater passenger comfort but since there are insufficient to meet requirements these are regularly over-crowded also.

The use of small vehicles such as taxis and minibuses results in high service frequencies but the convenience of the service is impaired by the practice of leaving terminals when full, resulting in long waiting times for passengers joining along the route. The taxis will divert from their routes to some extent: this is convenient for passengers already on board, but passengers wishing to join a taxi at a point off the main route must either wait for an indeterminate time, or walk to a point where a taxi is more likely to appear.

Reliability appears to be poor. Broken-down taxis and minibuses are frequently seen at the roadside, often with passengers still on board. If the driver is not prepared to refund their fares, passengers must either pay again to use another vehicle, or wait for the one they are travelling in to be repaired. If the vehicle breaks down near their destination, passengers often walk for the remaining distance unless they have large quantities of luggage.

The adverse environmental impact of old and poorly maintained vehicles is also significant, compounded by the excessive numbers resulting from the use of small vehicles. In particular, noise and exhaust emissions from poorly maintained engines affects not only public transport users but all residents of urban areas in particular.



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