ROAD AND TRANSPORTATION MASTER PLAN

Palestine

TA 2012013 PS 00 F10

VI Logistics, BCPs and Palestine Corridor

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1 Introduction

This chapter provides a comprehensive overview on the following aspects of the NTMP Logistics Sub Sector, considering also related security issues:

- Logistics Strategy and Network;
- Border Crossing Points that aren't at 1967 borders (herein after: BCPs (respectively), and;
- West Bank – Gaza Strip Corridor

2 Logistics and Border Crossing Network

2.1 Strategic Framework Assessment

At present, Palestinian logistics chain and sector lack an integrated strategy: existing logistics facilities provide independent services, related only to specific contexts (often industrial areas), and are neither included into a hierarchical structure nor have particular relation with the border transport infrastructure. Moreover, most of West Bank private sector foreign and domestic trade (both export and import), are controlled and logistically managed externally, by Israel.[1]Hence in the NTMP the existing situation of logistics in West Bank and Gaza Strip is analyzed and tackled from a broad perspective, where logistics is strictly intertwined with Border Crossing Points, deemed as the main gateways for export and import between Palestinian Territories and the rest of the world. *For more details, refer to: ¶AX.1 – Diagnostic Analysis of Palestinian Transport Sector.*
Logistics and Border Crossing constitute two different systems, with specific requirements and thus solutions, as reported below.

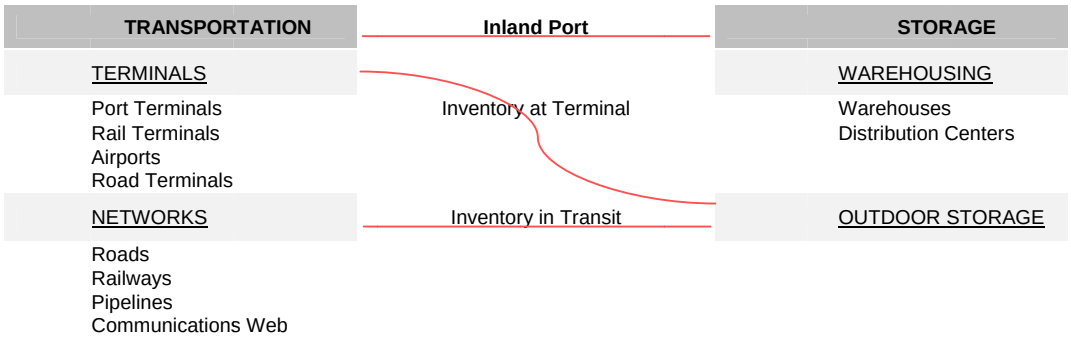
2.1.1 Logistics: Requirements and Issues

New modes of production are associated with new modes of distribution, and their main connecting feature is the logistics, the discipline of physical distribution.
Logistics coordinate complex and ever changing set of activities dedicated to the transformation and distribution of goods - from raw material sourcing to final market distribution as well as the related information flows – enabling a greater efficiency of movements with an appropriate choice of modes, terminals, routes and scheduling. The implied purpose of logistics is to make available goods, raw materials and commodities, fulfilling four major requirements related to order, delivery, quality and cost fulfillment. These are the key drivers of logistics that enable the interaction between several elements of the supply chain, thus enabling a better managerial

[1]The Agreement on Gaza Strip and the Jericho area, signed in 1994, defined the creation of Palestinian police force, to guarantee public order and internal security, while assigning Egypt, Israel and Jordan the control of external borders. With the Interim Agreement on West Bank and Gaza Strip, signed in 1995, PNA started cooperating in the management and control of some BCPs, notably, the Karama Bridge BCP and the Rafah BCP; Annex I to the 1995 Agreement focuses in particular on the settings and procedures for border control and management, structured as the EU model of one stop-shop border crossing.
Currently, Palestinian and Israeli border Authorities are located within the same facilities, sharing working spaces and technical means, as indicated in the EU concept of Integrated Border Management. The Agreement on Movement and Access (AMA, 2005) promoting peaceful economic development and the improvement of the humanitarian situation on ground, transferred some responsibilities to the Palestinian authorities, requesting the PNA to establish, without delay, a unified system for border management. Despite the signing of agreements and protocols, the regular operation of the border crossing has not started yet.

level of space-time relations. Therefore, logistics require a complex set of choices needing to consider: suppliers' locations; transport modes, and; deliveries' timing.

Figure 1. Integrated Logistics System Diagram



West Bank and Gaza Strip are expected to develop an integrated freight system, allowing the movement of goods from a Palestinian source through export chains carrying them anywhere in the world. This integrated network, working also in reverse and bringing goods from around the world into Palestinian Territories, through its several points of entry, and distributing them easily to any point within the country shall includepedestrian, vehicular, road, rail, air, seaport and communications systems. To ensure these results, the NTMP has developed the following aspects:

- Definition of a conceptual framework for an integrated national freight network and the design of a flexible network of facilities and infrastructures, able to evolve with time;
- Identification of key issues in the movement of freight (import and export), referring to current and planned economic and social situation of West Bank and Gaza Strip;
- Identification of the range of players, (public and private), necessary to achieve a coherent freight transportation network and proposal of innovative management approaches;
- Identification of legal and legislative issues and proposal of alternative models where deficiencies might exist;
- Production of schematic layouts and functional specifications for the proposed facilities.

2.1.2 Border Crossing Points: Requirements and Issues

Palestinian land BCPs to and from neighboring countries constitute crucial components of the national and regional transport network. Determining the optimal number, location, design and durable operation of these BCPs will be necessary to assure sustainable economic development. Moreover, these solutions must interact with the logistics network and evolve with it, in order to ensure a flowing and efficient delivery of freight, together with the support of tourism also an important economic source for both West Bank and Gaza Strip.
To guarantee these expected results, NTMP developed the following proposals:

- Flexible land BCP network, able to evolve during the time to adapt itself to the different phases of the Master Plan;
- Security and efficiency procedures in the operation of the BCPs, with respect to both rail and road infrastructure,for passenger and freight;
- Definition of places (bonded areas, Inland Clearance Depot etc.) located also away from BCPs, where to execute freight custom and security procedures without impeding BCPs' activities;

- Definition of typical Border Crossing Operating Plans for different traffic, based on models such as proposed in the EU and UN ECE recommendations, methodologies and conventions, taking into account all functions to be performed at each BCP, as well as the responsible agencies to be accommodated, and promoting seamless operations (risk management, single window, modern technology etc.);
- Planning of optimal BCP locations and network, its relationships with the road, rail, air and maritime infrastructures proposed by the Plan, and design of typical layout schematics, functional specifications, and typical control and communication equipment lists.

2.2 Logistics Approach: "From Push to Pull"

The NTMP proposes a Freight Logistics network, based on several key-issues, with the ability to evolve simultaneously with the different phases proposed by the Master Plan; the purpose is to provide the territory with an efficient and modern freight logistics system, to be built and composed step-by-step through the progressive evolution of its components and their adjustment to the economic situation and the changes of the mobility network.
Compared with conventional freight transport systems, the proposed network is characterized by three features:

- Integration. A fundamental restructuring of goods merchandising by establishing integrated supply chains with integrated freight transport demand. Keeping in mind that due to macro-economic changes, demand-side oriented activities are becoming and likely to remain predominant, compare to the supply-side;
- Time mitigation. Due to the requirements of modern distribution, the issue of time is becoming increasingly important in the management of commodity chains. Time is a major issue for freight shipping as it influences inventory holding strategies and tightly integrated supply chains.
- Specialization. Logistics services are becoming complex and time-sensitive to the point that many firms are now sub-contracting parts of their supply chain management to what can be called third-party logistics providers (3PL; asset based) or to the newly emerged fourth-party logistics providers (4PL; non asset based).

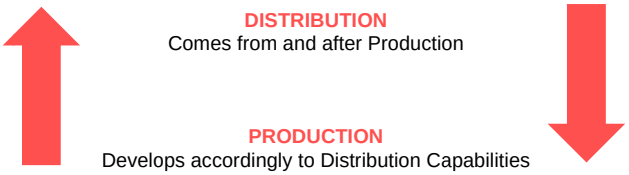
These features are expressed by a new general approach, based on the so-called "From Push to Pull Logistics".
Freight distribution is in a paradigm shift between "manufacture-to-supply" (inventory-based logistics or "push" logistics) and "manufacture-to-order" (replenishment-based logistics or "pull" logistics). This trend is strengthened by logistics, namely a better integration between transport modes and inventory control that pushed the development of major coordinators and integrators (third and fourth-party logistics providers) in order to improve segments of the supply chain.
While a push logistics system involves a limited level of integration between suppliers, manufacturers and distributors, the new pull logistics system aims at achieving a higher level of efficiency through integration[2].
This results in more frequent and time reducedfreight flow between components of the supply chain, achieved in smaller batches, subject to tight or just in time constraints and facilitated by modern communication and transport systems. Optimization and coordination of data *e.g. point-of-sale data) make possible a better interaction between supply and demand, while the so-called "reverse logistics" drives the involvement of improved customer services and the promotion of environmental strategies.
NTMP Proposal for logistics in West Bank and Gaza Strip consists of an evolving system, starting with a basic "push" approach (step 1), but able to evolve quickly and efficiently in a "Pull-oriented" system.

[2]Source: https://people.hofstra.edu/geotrans/eng/ch5en/conc5en/pushpulllogistics.html

2.2.1 Logistics Physical Distribution

The range of activities involved in the movement of goods from points of production to final points of sale and consumption is called physical distribution. It includes all the functions of movement and handling of goods, particularly transportation services (trucking, freight rail, air freight, inland waterways, marine shipping, and pipelines), transshipment and warehousing services (e.g. consignment, storage, inventory management), trade, wholesale and, in principle, retail[3]. The close integration of physical distribution and materials management through logistics is blurring the reciprocal relationship between the derived transport demand function of physical distribution and the induced demand function of materials management. This implies that distribution, as always, is derived from materials management activities (namely production), but also, that these activities are coordinated within distribution capabilities.

Figure 2. Relationship Between Distribution and Production



The functions of production, distribution and consumption are difficult to consider separately, thus recognizing the integrated transport demand role of logistics. This is the reason why the proposed Freight Logistics Network is developed strictly in relationship with:

- The existing and planned industrial areas, taking into account the features of their production, their enlargement opportunities, their existing and future connections with mobility system and BCP network;
- The existing and future transport modalities and nodes, according to the system proposed by the Master Plan;
- The ongoing transformation and innovations inside Logistics field.

2.2.2 Freight Typologies

Freight management requires specific loading and unloading equipment. In addition to the facilities required to accommodate ships, trucks and trains (berths, loading bays and freight yards respectively) a very wide range of handling gear is required that is determined by the kinds of cargoes handled. Freight transport terminals have a set of characteristics linked with core (terminal operations) and ancillary activities (added value such as distribution). The result is that terminals are differentiated functionally both by the mode involved and the commodities transferred. A basic distinction is that occurring between bulk, general cargo and containers:

- Bulk refers to goods that are handled in large quantities that are unpackaged and are available in uniform dimensions. Goods could be differentiated between liquid bulk (crude oil and refined products) that need limited handling equipment but significant storage facilities, and dry bulk (ores, coal, cereals…) that need more handling equipment[4].

[3] Source: https://people.hofstra.edu/geotrans/eng/ch5en/conc5en/pushpulllogistics.html
[4] Source: The Geography of Transport Systems, Jean-Paul Rodrigue, Claude Comtois, Brian Slack, Routledge, 2013

- General cargo refers to goods that are of many shapes, dimensions and weights such as machinery, processed materials and parts. It requires a lot of labor due to the complexity of its handling.
- Containers are standard units that have had a substantial impact on terminal operations. Container terminals have minimal labor requirements and perform a wide variety of intermodal functions. They however require a significant amount of storage spaces which are simple paved areas where containers can be stacked and retrieved with intermodal equipment (cranes, straddlers and holsters). **Intermodality** is in fact the necessary element to better valorize the potentiality of containers system, and it requires specialized cranes, such as portainers, accordingly with the features of the inter-port. Intermodal terminals and their related activities can constitute an added value within supply chains.

A feature of most freight activity is the need for storage; and for the most economical limited time. Assembling the individual bundles of goods may be time-consuming and thus some storage may be required. This produces the need for terminals to be equipped with specialized infrastructures such as grain silos, storage tanks, and refrigerated warehouses, or simply space to stockpile, such as for containers. Containerization, because of its large volumes, has forced a significant modal and temporal separation at terminals and thus the need of a buffer in the form of storage areas. In addition, a variety of transloading activities can take place in the vicinity of terminals, particularly if long distance inland transportation is involved. Transloading, when suitable, enables to reduce transportation and inventory costs.
The proposed solutions start with an initial phase, where freight is mainly general cargo and, in some cases, bulk, with different packaging and transport solutions and needs, proposing therefore simple logistics facilities able to manage all those different possibilities. The progressive standardization and upgrading is then expected, to specialize and make more cost and time efficient transport and stock activities and facilities.

2.2.3 Logistics Management: 3PL

While many manufacturing corporations may have own account transportation, increasingly the complex needs of the supply chain are being contracted out to third parties. A third-party logistics provider (3PL) is an asset based company that offers logistics and supply chain management services to its customers. It commonly owns and manages distribution centers and transport modes. The main factors behind the proposal of a 3PL solution to eventually manage Freight Logistics in West Bank and Gaza Strip are the following:

- Global network of manufacturing and consuming, imply that producers and consumers tend to have an acute geographical separation requiring complex transportation services;
- Increasing focus of manufacturers and retailers on their core business (core competencies) sub-contracting activities such as logistics where they have less expertise.
- Better utilization of transportation assets and resulting economies of scale. 3PLs can make better use of transportation assets by balancing the needs of multiple client shippers across transportation and distribution functions, locations, etc. (e.g. developing networks to maximize backhaul);
- Productivity gains in supply chain management in terms of costs and reliability that can be derived from the managerial and information technology expertise provided by 3/4PL;
- Offshoring and outsourcing resulted in longer and more complex supply chains in which several segments of the transport chain are taking place in environments unfamiliar to the outsourcing company;
- 3PLs are more prone to implement novel supply chain management practices requiring a higher expertise on material flows such as transloading, crossdocking and shipment tracking;

- A general trend towards deregulation permitting a higher level of interaction between transportation modes. These interactions rely on complex transport services[5].

Although 3PLs can deal with a vast array of services, their core competencies in which they add value to supply chain management dominantly concern the product and the transport.
Product. Involves sourcing strategies where the 3PL assist in finding suppliers offering the best value proposition in terms of cost, quality and reliability. The location and the usage of warehousing facilities is also an important component over which 3PL may influence the distribution strategies of a product, including value added activities (labeling, packaging, returns, etc.).
Transport. A 3PL can actively influence the shipping of a good by establishing contracts with transport providers and organizing load units in accordance to distribution requirements (costs, lead time). A 3PL also advises on the routing conditions within supply chains, namely frequency and scheduling and the sequence of ports and distribution centers used.
NTMP proposes 3PL approach from the first steps of its process.

2.2.4 Tracking

Logistics service providers (LSPs) play a challenging role in today's complex global supply chains. Many different players are taking part in the transport of products between suppliers and their customers. Consumers are using technologies - online, mobile apps, social media - to discover, evaluate, purchase and interact with products across physical and digital channels. Retailers are quickly transitioning to omni-channel commerce to keep pace with consumers and their demand for a seamless experience - with products delivered when they want them and where they want them.
While retailers are exploring new ways to connect with consumers, they recognize there's a significant opportunity to leverage LSPs for successfully executing omni-channel strategies in their supply chains. In fact, LSPs may be considered by many consumers to be the actual retailers themselves, representing their retailers' brands when delivering products to consumers.
Yet, LSPs may be the weakest links in the chain, adhering to proprietary systems they believe give them a competitive advantage. In truth, by using proprietary systems, LSPs believe that this will "lock-in" their customers, but this could in fact be the reason they get "locked out" of the global trend toward interoperability[6].
To navigate today's logistics landscape, LSPs must transition from proprietary systems to open standards. To optimize the management of shipments, LSPs, their partners and customers need to know exactly where shipments are, at any moment.
For this reason, NTMP proposes for West Bank and Gaza Strip LSPs, the adoption of the international "GS1 System", beginning with the creation of the Palestinian GS1 Association.
GS1 is the international body that coordinates the diffusion and correct implementation of GS1 standards, that is the most common and representative system used for the development of technical tools to support world trade.
Every country can have a national GS1 association, that becomes the only body that is part of the global system GS1, authorized to issue GS1 company prefix, from which to build the barcodes GS1 to identify products.
GS1 standards provide common ways to uniquely identify things like pallets in the supply chain so that LSPs can track them as they move from manufacturing sites, travelling from port to port, onto trucks, into distribution centers, and to retail sites or consumers' homes.
Without standard identifiers, each time a pallet passes from an LSP to one of its logistics partners, the pallet tends to get re-labelled with identifiers that are used only within each partner's system.

[5]Source: https://people.hofstra.edu/geotrans/eng/ch5en/conc5en/3pl4pl.html
[6]Source: www.gs1.org

With GS1 standards, the LSP and all partners avoid this wasteful re-labelling activity by using common identifiers like the GS1 Serial Shipping Container Code (SSCC). The SSCC enables companies to track each pallet for efficient order and transport management and automated delivery and receipt. EPCIS - another GS1 standard - allows partners to know exactly where things are at any point in time, where they have been before, and why. LSPs can conduct business with partners and customers across organizational boundaries by using GS1 standards to easily collaborate and exchange information.
What's more is that LSPs can include the same SSCC-provided information in their invoices for faster payments and cash flow.

2.3 Logistics Network Proposal by Phase

The planning and implementation of "logistics paths" made by transport axes, logistics centers, interchange points, multi-modal and intermodal services, are required. This is the reason why Logistics Network and proposed road, rail, air and maritime network, interact with transport network supporting logistics with respect to the territorial development.
The backbone of logistics network in the West Bank is composed of roads n°60 and n°90, along the N-S directions, and roads n°55, n°1 and n°35 along the W-E direction. A fundamental role is also expected to be played by the West Bank - Gaza StripCorridor, to allow the export of Palestinian products abroad through seaports as well as the distribution of Gaza Strip products inside West Bank and, from here, to Jordan and foreign countries. Moreover, the planned expressway in Gaza Strip will represent the basic element of the logistics distribution within Gaza Strip, together with the branches connecting this corridor with the rail, port and the airport. Finally, seaport, airports and rail transport, with the relevant logistic areas are also part of the logistics backbone.
On this frame,Master Plan builds a system of logistics facilities organized on 2 different levels, distinguished as follows:

- District level Facilities: Jenin, Tulkarm, Jericho, Bethlehem, Hebron and Gaza City.
  6 logistics areas are located near the main industrial and production districts in the afore said cities. Some of them already exist but need to be improved while, others are proposed. They are expected to be developed according to the changes of the supply chain, starting as simple warehouses in Phase 1 to become innovative distribution centers in Phase 4;
- National level Facilities:Damyeh Bridge BCP and Gaza Commercial Port.
  NTMP identifies two main logistics areas, representing the core-facilities for import-export process. They start as simple peripheral warehouses in the Phase 1 to become intermodal freight villages in Phase 4.

The above-defined logistics network develops according to the already introduced phases, that are combined in 3 different evolution's steps, as introduced in the following table.
The Master Plan aims to reach a well-structured, contemporary logistics system, whose facilities are planned and designed to be flexible and adaptable to the territory's evolution.
For more details, refer to: ¶III – Road and Transportation Master Plan Overview.

Tab 1. 2-Level Logistics Network Development by Step and Phase

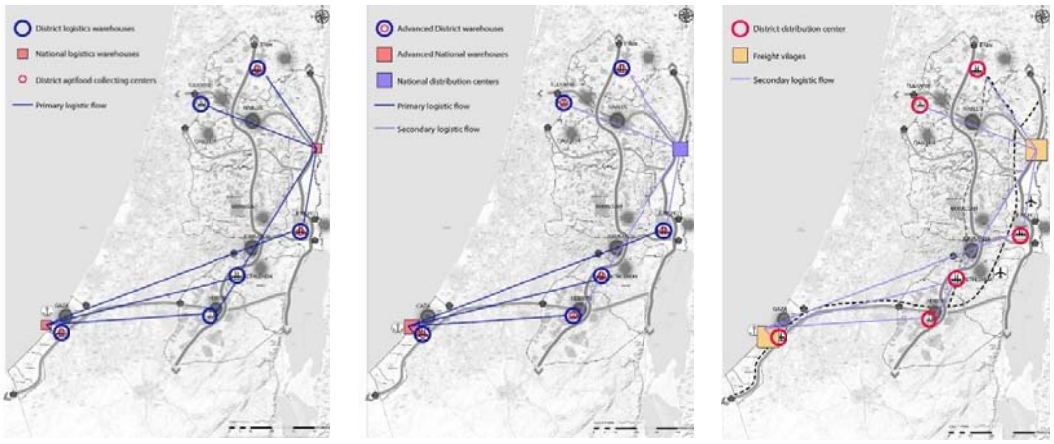
	STEP A (Phase 1)	STEP B (Phases 2 and 3)	STEP C (Phase 4)
District level	District warehouse	Advanced district warehouse	District distribution center
National level	National warehouse	Advanced distribution center Inland Clearance Depot	Freight village

To better explain the proposed evolution of the entire system, in the following table are summarized the changes of every logistic area during the different evolution's steps planned for the proposed network.

Tab 1. Logistics Network Facilities Development by Step and Phase

	STEP A 2016-2024 (phase 1)	**STEP B 2025-2037 (phases 2-3)**	**STEP C 2038-2045 (phase 4)**
Jenin District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Tulkarm District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Jericho District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Bethlehem District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Hebron District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Gaza City District Logistics Area	District warehouse	Advanced District warehouse	District Distribution Center
Damyeh National Logistics Area	National warehouse	Advanced Distribution Center/Inland Clearance Depot	Freight Village
Gaza Commercial Port National Logistics Area	National warehouse	Advanced Distribution Center/Inland Clearance Depot	Freight Village

Figure 3. Logistics Network Development Map by Step and Phase



STEP A *STEP B* *STEP C*

Moreover, it's important to underline that there is a strong division between import-export flows and internal commercial flows. The proposed network is focused on international trade, but the local facilities could, in some cases, be used also for national and local trade, but always following specific different procedures and involving different subjects.

2.3.1 Logistics Network Proposal in StepA (Phase 1: 2016 – 2024)

In Step A, that covers the period 2019-2024, freight transport is mainly based on road transport. The following six industrial areas are identified as source of the freight to manage:

- Jenin;
- Tulkarm;
- Jericho;
- Bethlehem;
- Hebron, and;
- Gaza City.

Each of the six industrial areas listed above develops a logistics facilities area, where basic logistics activities are performed: storage and packaging processes, together with primary processing (e.g. components assembly for just in time delivery). One single area for every industrial or production district is prosed; this area shall become a multi-products and multi-clients' logistics platform focusing mainly on import-export trade, with the possibility to reserve a specific sector for local trade.
The primary flow of goods starts from these logistic areas to reach other 2 logistics areas, that operate at national level, in Jericho and Gaza City, that work as peripheral warehouses, where goods are stored and/or partially worked (postponement activities), before they leave for their final destination through the so-called "*picking process*". The features of the areas depend on the typologies of freight, produced and/or distributed in that territorial context.

The BCP activities are still to be improved and logistics system needs additional supporting facilities (equipped truck parking areas, equipped bonded areas…) to be located at the junction or inside BCP areas.
This phase offers a basic but effective structure, able to support the economic development also at international level.

2.3.2 Logistics Network Proposal in Step B (Phases 2 and 3: 2025 – 2037)

In Phase 2, freight transport relies mainly on road transport but logistics network can use also the rehabilitated Y. Arafat Airport and the new Gaza Commercial Port. Trade and security procedures by land are well structured and logistics flows are more efficient.
The six district logistics areas evolve into storage areas as well as distribution centers, serving at the same time the local and the international market. They offer also additional services, like showrooms and commercial services. The standardization of freight packaging is ongoing, therefore logistics platforms adapt themselves to the new needs.
The two national logistics areas evolve in distribution centers and transit points, reducing the storage activity and implementing distribution, along with other additional services. The area in Damyeh Bridge starts cooperating with the close BCP, carrying out also clearance procedures, while the area in Gaza Strip starts working jointly with the Port Authority.
At the end of Phase 3, Logistics network is still incomplete, yet it is characterized by a high level of service, capable of ensuring international basic standards.

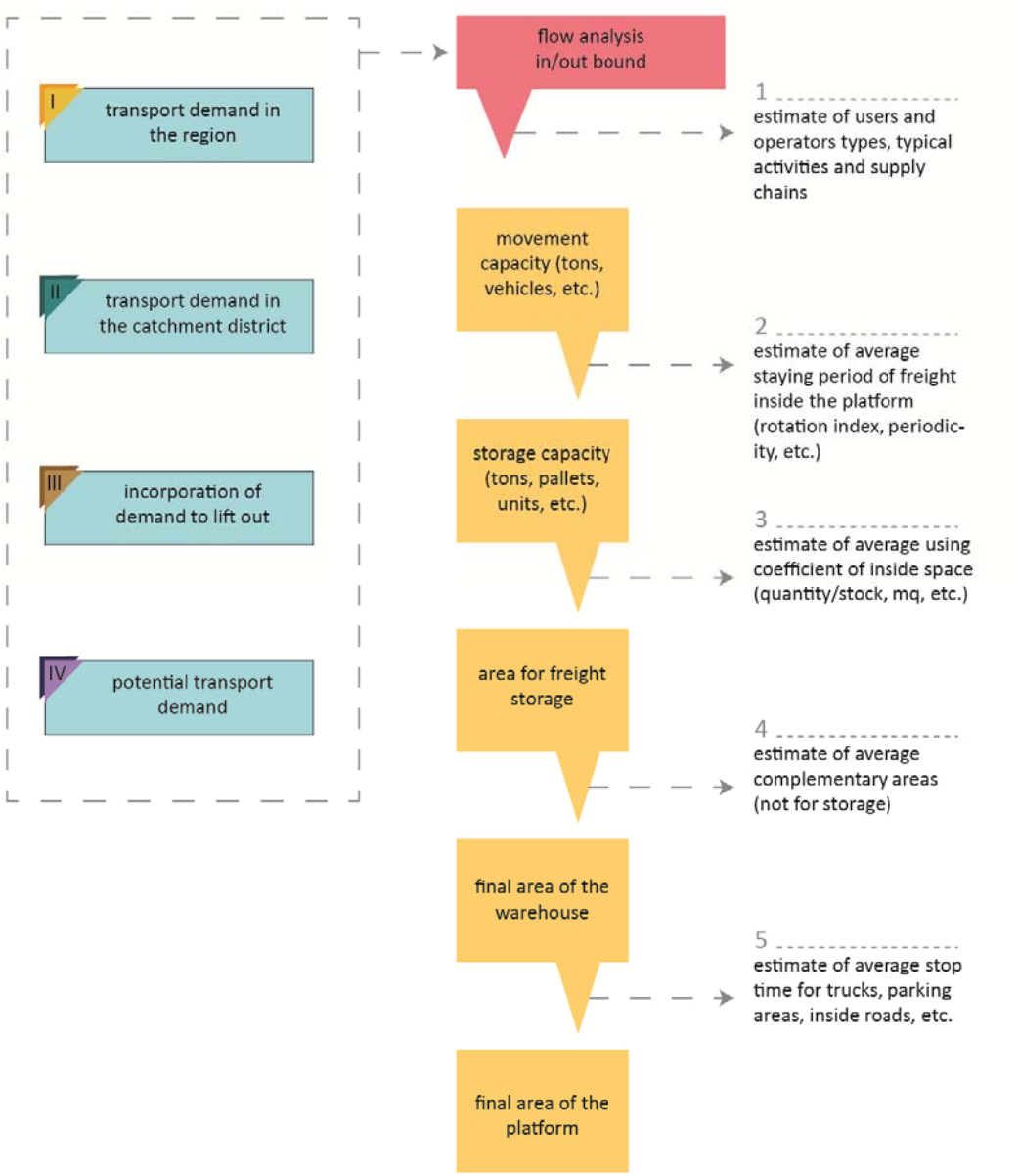
2.3.3 Logistics Network Proposal in Step C (Phase 4: 2038 – 2045)

New road and rail networks, with air and maritime transport facilities are operational, therefore logistics can rely on an advanced multi-modal network; at the same time, custom activities are better defined and clearance and procedure control facilities can be created outside bonded areas at BCPs. Moreover, the standardization of freight transport's mode is ongoing and the use of containers catches on.
The six district logistic areas store and re-work goods efficiently to send them to the newly evolved freight villages in Damyeh and Gaza City. Freight Villages are the final evolutionary stage of previous national platforms. Freight villages integrate multi-modal facilities and infrastructures, clearance and custom activities, as well as storage and logistics additional services.

2.3.4 Proposed Logistics Facilities: Size, Layouts and Services

To evaluate the dimensions of the proposed logistics areas, both at district and national level, their catchment area feature, along with respective logistics flows, need to be assessed. NTMP underlines the opportunity of specific feasibility studies related to every logistics area, and at this stage, to indicates a generic methodology to determine the size of a logistics area.

Figure 4. How to Size Logistics Areas



A wide array of names can be used to refer to different versions of logistics centers: distribution center, dry port, inland clearance depot, load center, logistics node, gateway, freight village and several others. NTMP proposes an integrated logistics system for West Bank and Gaza Strip, hinged on several poles, with different level of services and different roles, providing the following facilities:[7]

Figure 5. Freight, Corporate and Personal Services

[7] In-depth description of main logistics facilities proposed by NTMP is provided in ¶*AX.13 – Logistics Facilities Layouts*.

Services to freight, corporations and people are fundamental elements of a value proposition of a logistic zone. The above diagram provides an extensive list of services that can be found in a logistic zone. The more complex and extensive the logistic zone, particularly if co-located with a port, rail or a barge terminal, the more extensive the services that can be found.

2.4 Border Crossing Points (BCPs) Network Proposal

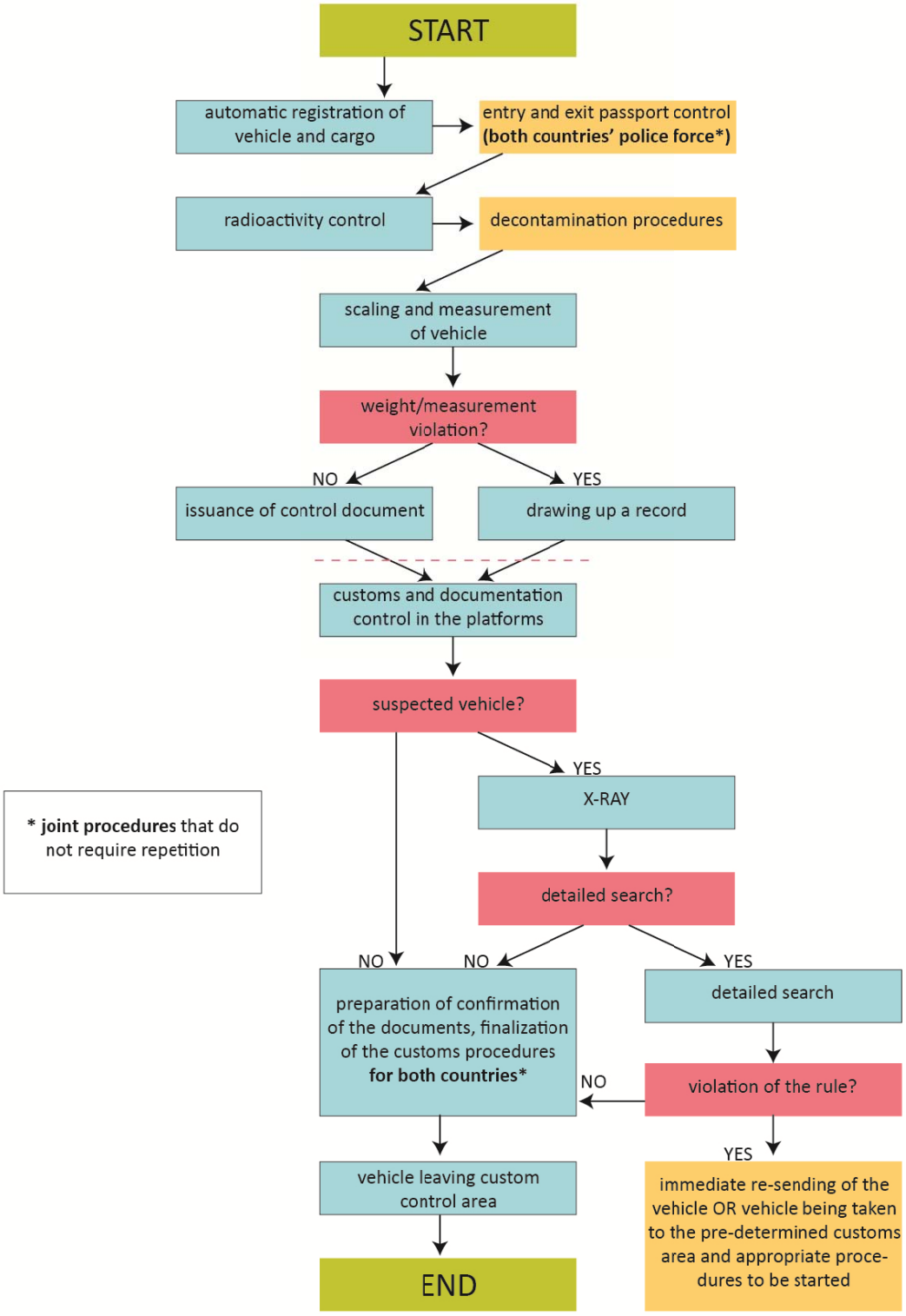
The proposal included in the NTMP for BCPs network in West Bank and Gaza Strip is based on a set of recommendations providing common standards adopted by the European Union and other international best practices related to border management, to assist the PNA in planning and establishing a modern border control[8].

2.4.1 Integrated Border Management (IBM) National Strategy

Generally, a BCP should provide efficient processing of lawful traffic, include facilities to detect violations, and offer a good image of the country it represents. From an economic/trade perspective, an essential feature of a well-functioning BCP is fluid traffic flows. In case of congestion, priority is given to traffic flows' expedition; other controls can be established downstream, for example, at inland clearing depots.
Traffic at BCPs has increased significantly in recent decades and infrastructure is often not optimal for the large number of tasks - also related to security and trade facilitation - border authorities must carry out.
In order to determine the objectives of a BCP, a PNA national strategy concerning national borders (IBM National Strategy) is to be developed. This Strategy must include design criteria based on categorization of BCPs and must identify the risks and threats that are present at particular borders, in order to develop appropriate counter measures. Security and safety at BCPs should be balanced with the need for trade facilitation measures, such as reducing export and import time delays (opened but controlled border – IBM EU concept). BCPs' design should therefore consider the image as much as the functions, as well as safety and the environment, and finally security and the economy.

[8]Recommendations and best practices are found in the European Union Schengen Catalogues and Acquis, and in line with the EU concept of IBM, and particularly in the 'Handbook of Best Practices at Border Crossings – A Trade and Transport Facilitation Perspective' developed by the OSCE and the UNECE

Figure 6. IBM National Strategy: Flow Chart



When designing a BCP, the objective is to establish its needs, functions and operations. It shall reflect the normal division of tasks and the flow of activities aa well as the organization of the work within the facilities. The design could also include typical generic models for elements that are common to all BCPs; bearing in mind that though certain features can be mutual, there is no universal design solution, because the overall structure depends on many variables, such as: type of traffic, volume of traffic, origin and destination of traffic, etc. (elements to be assessed during the development of the national strategy on IBM and in particular during the process of categorization of the BCPs). An important recommendation is to plan and build BCPs in partnership with neighboring countries counterparts. The latter is important as different agencies can structure their own facilities, mirroring procedures and improving performances.

2.4.2 BCPs Categorization and Phasing

Criteria for categorization and standardization of BCPs are to be developed taking into consideration the evaluation of internal and external factors under interstate agreements. This categorization is developed based on the current situation, future forecasts and fulfillment of international standards, such as:

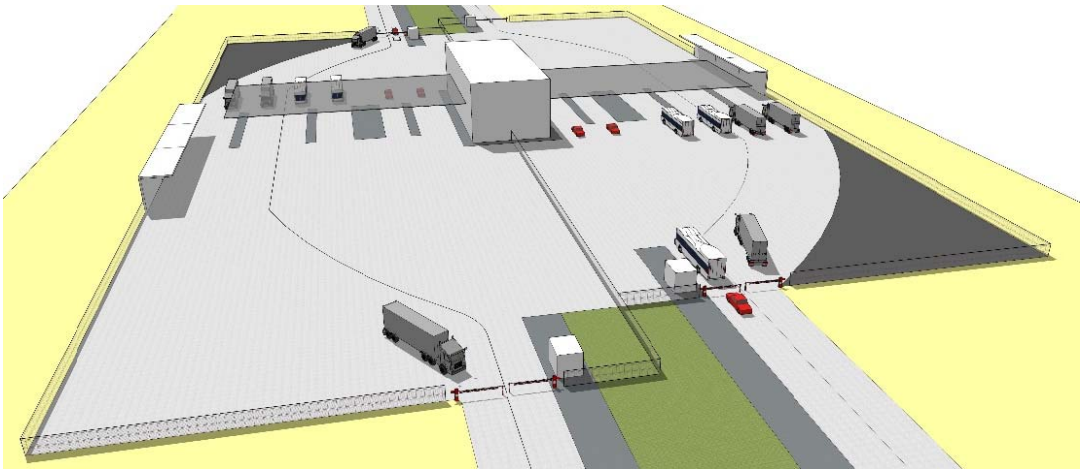
- Movement of people and goods
- Cross – border crime
- Migration and asylum
- Presence of agencies authorized for the integrated management and state border control
- Number of personnel

Determination of BCP categories is to be completed by Governmental decision and based on the recommendations drawn by the IBM Executive Board and in accordance with bilateral agreements with neighboring countries. Besides, changes could be initiated regarding future categorization of BCPs.
On this concern, NTMP suggests a possible categorization of BCPs, based on the proposed Transport network, the presented logistics strategy and infrastructures, and the different development phases defined by the Master Plan itself. Moreover, NTMP proposes an evolution of the current situation, taking into account existing BCPs and their features, without proposing new BCPs, with the only exception of East Jerusalem area.
According to this approach, the proposed Land BCPs, as per the importance and type of activities, could be categorized as follows:

<u>Category A:</u>

BCP – Category A represent the basic level of proposed BCPs facilities, open for limited time intervals. All the proposed BCPs can be designed, built and managed following the indications proposed for these structures.Some BCPs evolve to Category B or C, by simply adding areas, functions and equipment, according to the evolution of international agreements and national economic and social situation, or remain as temporary facilitates. On the contrary, some other BCPs cankeep this original configuration, serving only for circulation of persons and being opened in accordance to bilateral agreements with neighboring countries. Finally, Beitunia BCP can also be refurbished in a first moment, to support the evolution of the system until a final layout of Bayt Jala, between East Jerusalem and Bethlehem, is achieved. The basic features of these BCP could represent the reference for a first-step development of all existing BCPoints. The not mentioned in the strategical vision explained before could then remain as “temporary” BC points.

Figure 7. BCP Category A: 3D Layout

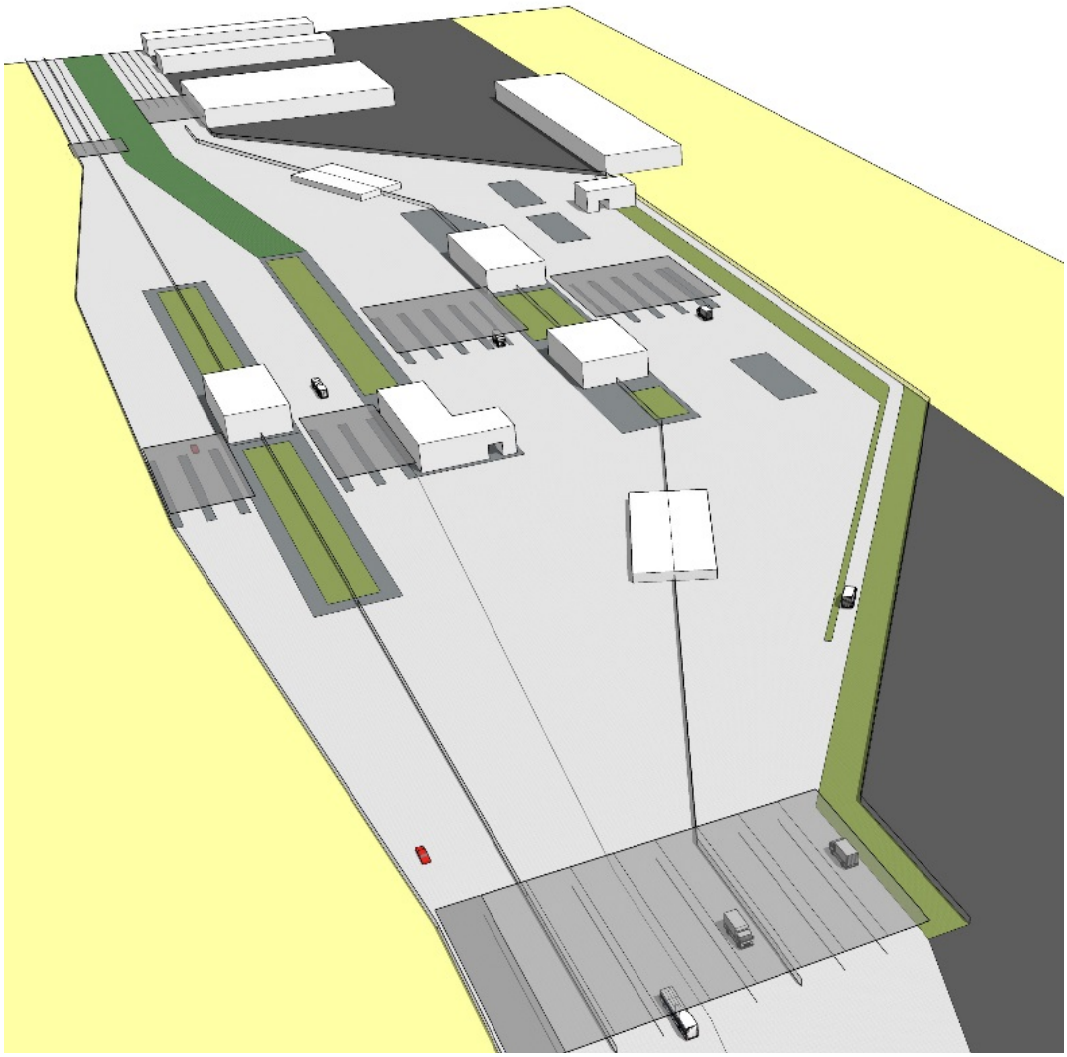


Category B:

BCPs are open 24 hours and host the movement of people, vehicles and goods. In these BCPs, Police, Customs, and a Food and Veterinary Agency are constantly present.
The proposed BCPs inside this category are:

- Al Jalameh BCP: located in the North, where the road n°60 goes to Israel and close to the planned international railways; it is a very important BCP for import-export activities;
- Tell Al Bayda BCP: similar to the previous one, located in the North, where the road n°90 goes outside West Bank and close to the planned international railways, it is a very important BCP for import-export activities;
- Tulkarm / Faroun BCP: near the industrial area of Tulkarm and along the road n° 57, this BCP represents the main point for import-export activities in connection with the ports of Haifa and Ashdod;
- Damyeh Bridge BCP: on the border with Jordan, this BCP represents the commercial reference for import-export of West Bank, also for the proximity to the planned intermodal logistics platform. The location in a non-built area and at the crossing point of many transport infrastructures is an opportunity to support the development of a well-structured and strategic BCP;
- Karama Bridge BCP: the reference point for the import-export of Jordan valley products, this BCP plays a strategic role in the economic development of the agricultural sector of West Bank;
- Tarqumiya BCP: this BCP represents the door to and from Gaza Strip, a strategic node in the commercial network;
- Bayt Hanoun BCP: recently re-opened also for commercial traffic, this BCP is the other door to and from Gaza Strip in relationship with Israel;
- Karem Abu Salem BCP: strategic for the commercial traffic with Egypt, this BCP works in synergy with the one of Rafah. The location offers the opportunity of enlargement.

Figure 8. BCP Category B: 3D Layout



For these BCPs, NTMP suggests the following actions:

- Feasibility study for development according to the proposed typological layout and the estimated freight flows;
- Insertion inside the Spatial Planning Tools of the required area and infrastructures, to assure the possibility of a step-by-step development in the future.

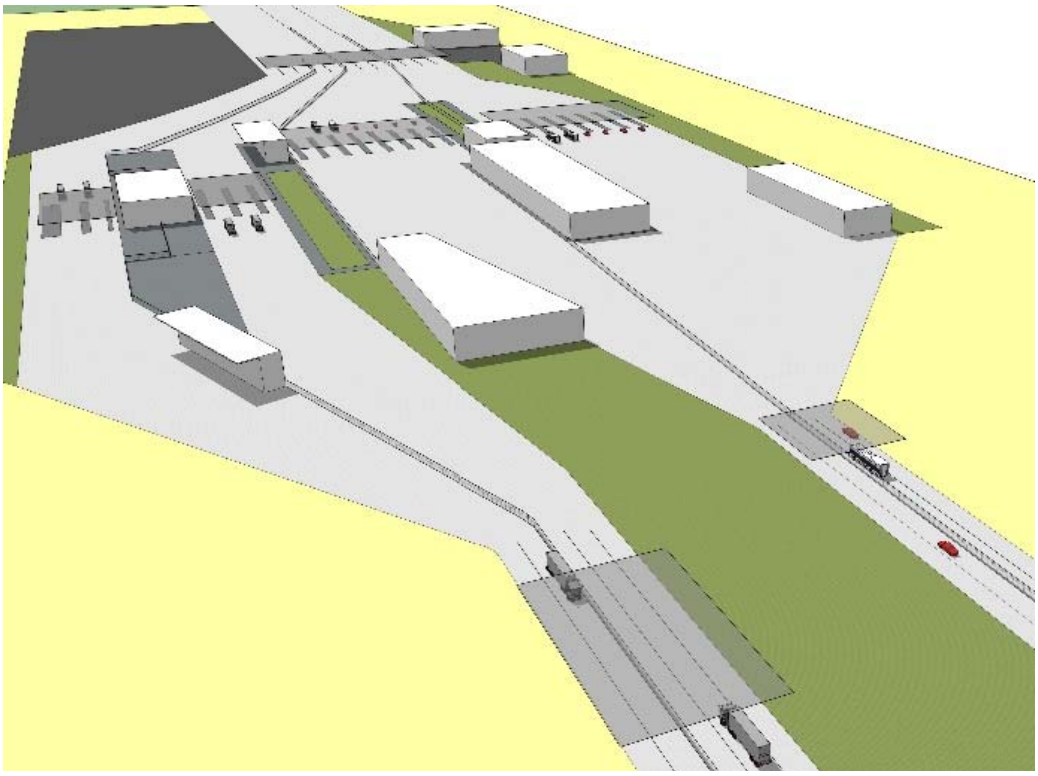
In general, this category of BCPs, according to the international best practices, requires a maximum surface of 170,000m^2, able to support a flow of 480,000 trucks/year and 2,500,000 passengers/year. *For more details, refer to ¶AX.14 – Border Crossing Layouts.*

Category C:

BCPs are open 24 hours and work with movement of people, vehicles and non-commercial goods. In these BCPs, Police is present 24 hours, while Customs and FVA are present during time intervals determined under bilateral agreements with neighboring countries.
The proposed BCPs inside this category are:

- King Abdallah BCP:This BCP is located on the border with Jordan. It works in a complementary fashion with Karama Br. BCP, representing the reference point for people flows to West, especially to Jordan and attractive touristic places close to the Dead Sea.
- Rafah BCP: working in synergy with the other BCP in the South of Gaza Strip, it shall offer facilities for people going/coming to/from Egypt, reinforcing the touristic potentiality of Gaza Strip;
- Bayt Jala (East Jerusalem) BCP: this BCP plays a strategical role, being located inone of the most attractive place of global tourism.

Figure 9. BCP Category C: 3D Layout



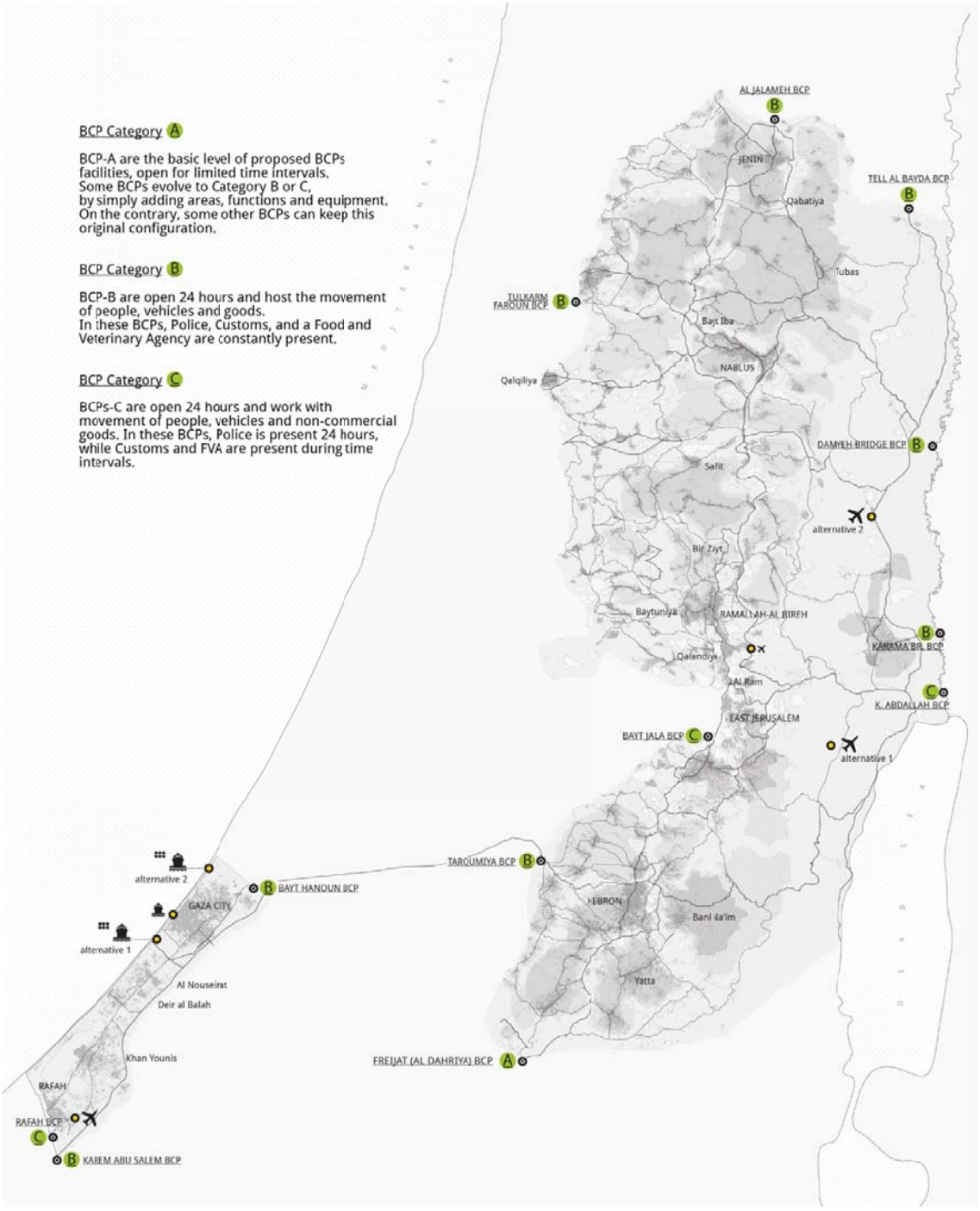
For these BCPs the NTMP suggests the following actions:

- Feasibility study for development, according to the proposed typological layout and the estimated people flows;
- Insertion inside the Territorial Planning Tools of the required area and infrastructures, to assure the possibility of a step-by-step development in the future.

In general, this category of BCPs, according to the international best practices, requires a maximum surface of 120,000m^2, able to support a flow of 800,000 vehicles/year and 3,000,000 passengers/year. *For more details, refer to ¶AX.14 – Border Crossing Layouts.*

The overall network of categorized BCPs is shown in the following figure:

Figure 10.BCPs Network, with Categories (2045)



The following table shows the proposed intervention for selected existing BCPs, organized by phase:

Tab 2. BCPs Proposed Interventions by Phase

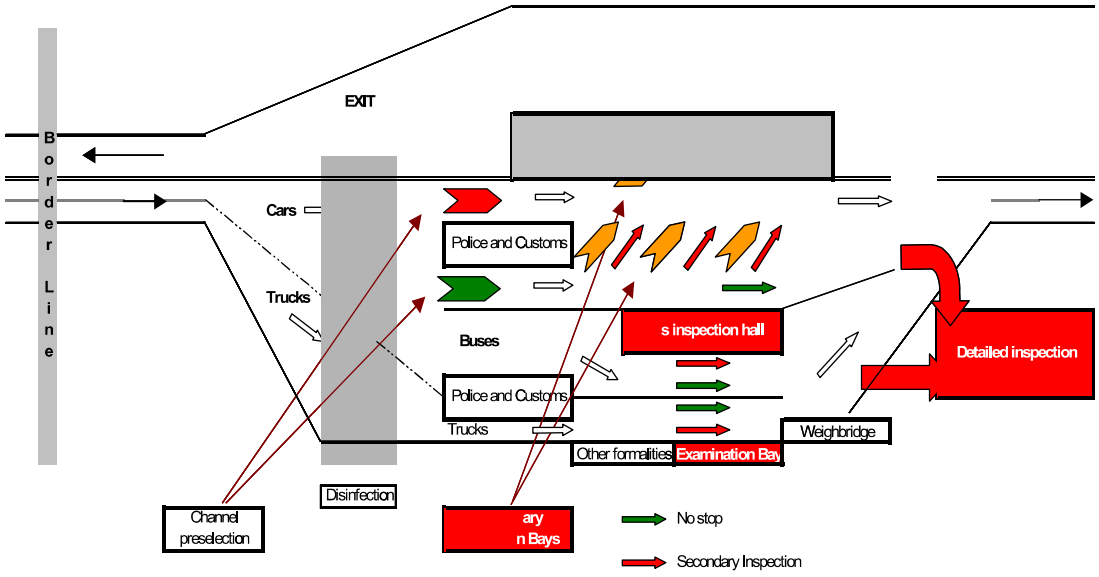
	Phase 1A (2-Year Investment Plan)	Phase 1	Phase 2
Al Jalameh BCP	-	A Rehabilitation, enlargement and new buildings	B Enlargement and new buildings
Tell Al Bayda BCP	-	A Rehabilitation	B Enlargement and new buildings
Tulkarm / Faroun BCP	A Rehabilitation	A	B Rehabilitation and new buildings
Damyeh Bridge BCP	A New acquisition of 50.000 m^2 and construction	B Enlargement and new buildings	B
Karama Bridge BCP	A Rehabilitation	B Rehabilitation and new buildings	B
Tarqumiya BCP	A Rehabilitation	A	B Rehabilitation and new buildings
Beitunia BCP	A Temporary Rehabilitation	No more used	No more used
Bayt Hanoun BCP	-	A Rehabilitation	B Rehabilitation
Karem Abu Salem BCP	-	B Rehabilitation and new buildings	B
Bayt Jala BCP (East. Jerusalem)	-	A Land acquisition and building	C Enlargement and building
King Abdallah BCP	-	A Land acquisition and building	C Enlargement and building
Freijat (Al Dahriya) BCP		A Rehabilitation	A
Rafah BCP	A Rehabilitation	A	C Enlargement and new building

2.4.3 BCPs Layout and Operation

Generally, BCPs layouts should consider the segregation of vehicle and pedestrian traffic. For safety and security reasons, people crossing the borders on foot should be kept separated from vehicles. The design and facilities should allow state border agencies to perform primary and secondary vehicles and cargo inspection, without being distracted by the flow of pedestrian crossing the border. Consequently, pedestrian traffic must have its own access and control lane with a border guard and/or police checkpoint.
In the small BCPs layouts, border authorities are located in the central shared building and booths are placed along each lane, for the control of vehicles and trucks. In some cases, when commercial traffic is small, truck drivers park their vehicles and proceed to the central building to carry the customs formalities. Moreover, at BCPs with low traffic levels, it might be useful to train multi-skilling Customs officers.

Vehicles undergoing secondary document verification, must park in a dedicated “herringbone” (angled) manner so that they do not block the movement of other vehicles. These parking areas must have enough space to accommodate a mobile truck X-ray scanning machine, so that Customs authorities are able to carry out random vehicle scanning. If Customs or other border agencies decide to conduct a more extensive physical inspection of goods and/or a vehicle, ideally, there should be a secure inspection area to which the vehicle can move to.

Figure 11. Border Crossing Point Flows and Layout



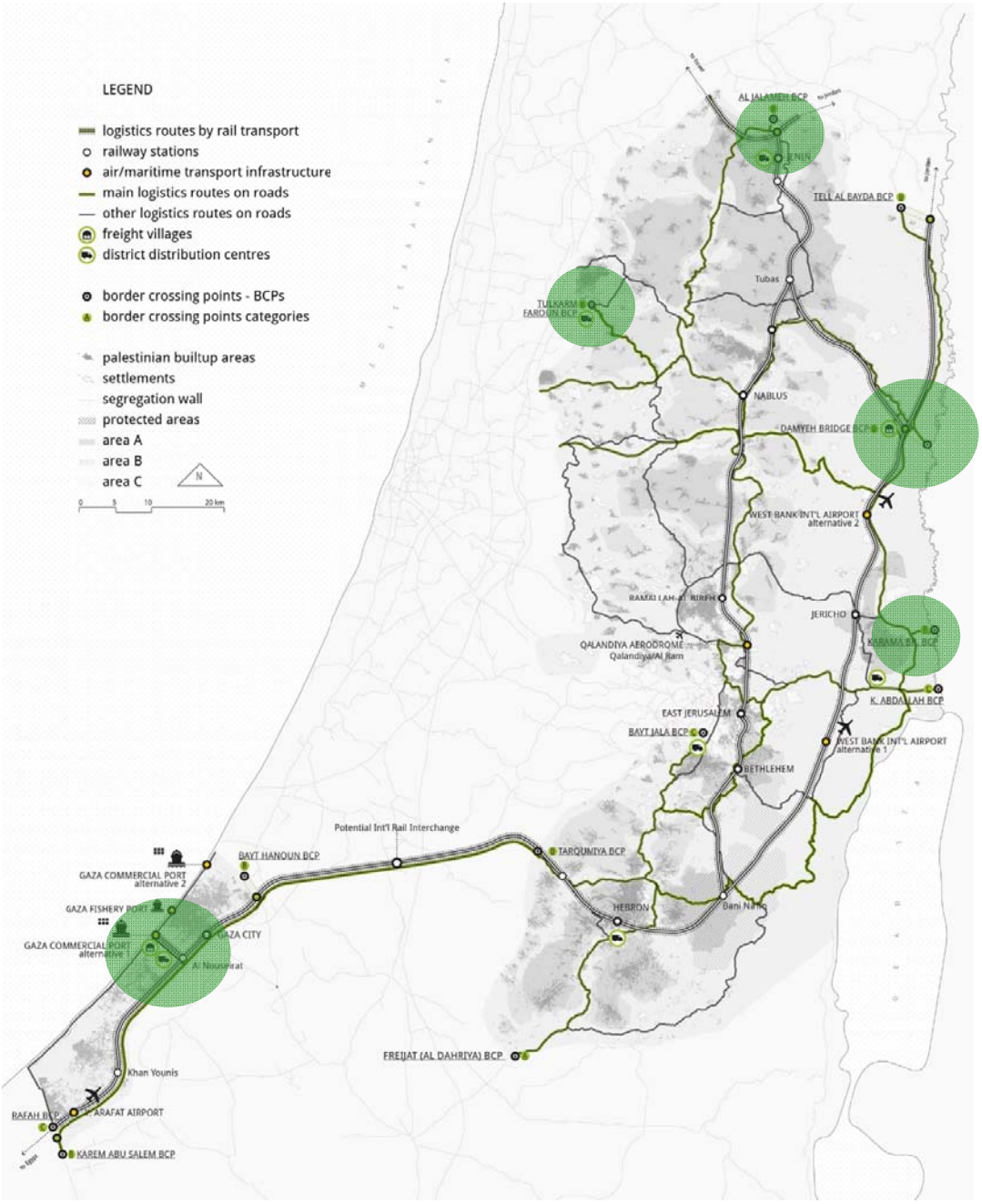
The types of buildings, areas and facilities needed, are determined according to the categorization attributed to the BCP and by the tasks undertaken in each one.

3 Security Issues

Inland BCPs are proposed for both passengers and freight transport, providing efficient traffic processing systems and guaranteeing fluid flow at all times. Consequently, security measures are crucial componentsstrictly intertwined to BCPs' layout design. For this reason, recommendations on general standards at BCPs, document verification procedures, traffic flow management, and building and infrastructure are further explained in¶*AX.7 – Security Issues.*

The following map shows the final situation of both BCP and Logistics network (2045): the components work together with a complex but efficient synergy. It's possible to identify **5 main poles** related to freight logistics, where BCP and logistics facilities constitute a whole integrated area.

Figure 12.5 Main Poles for Logistics and BCPs Network (2045)



4 West Bank – Gaza Strip Corridor

Considering the fact that physical isolation of Gaza Strip from West Bank is a significant constraint for the economic development of the country, the following chapter is aimed to briefly address possible link solutions between the West Bank and Gaza Strip.
The link will consist of a multi modal transport corridor (herein after: WB-GS Corridor) with roads and railways to move both people and freight, as well as utility connections to transport gas, liquid, semi-liquid material as well as information cables and others.

4.1 Existing Studies on West Bank – Gaza Strip Corridor

4.1.1 First Agreements: Oslo Accords

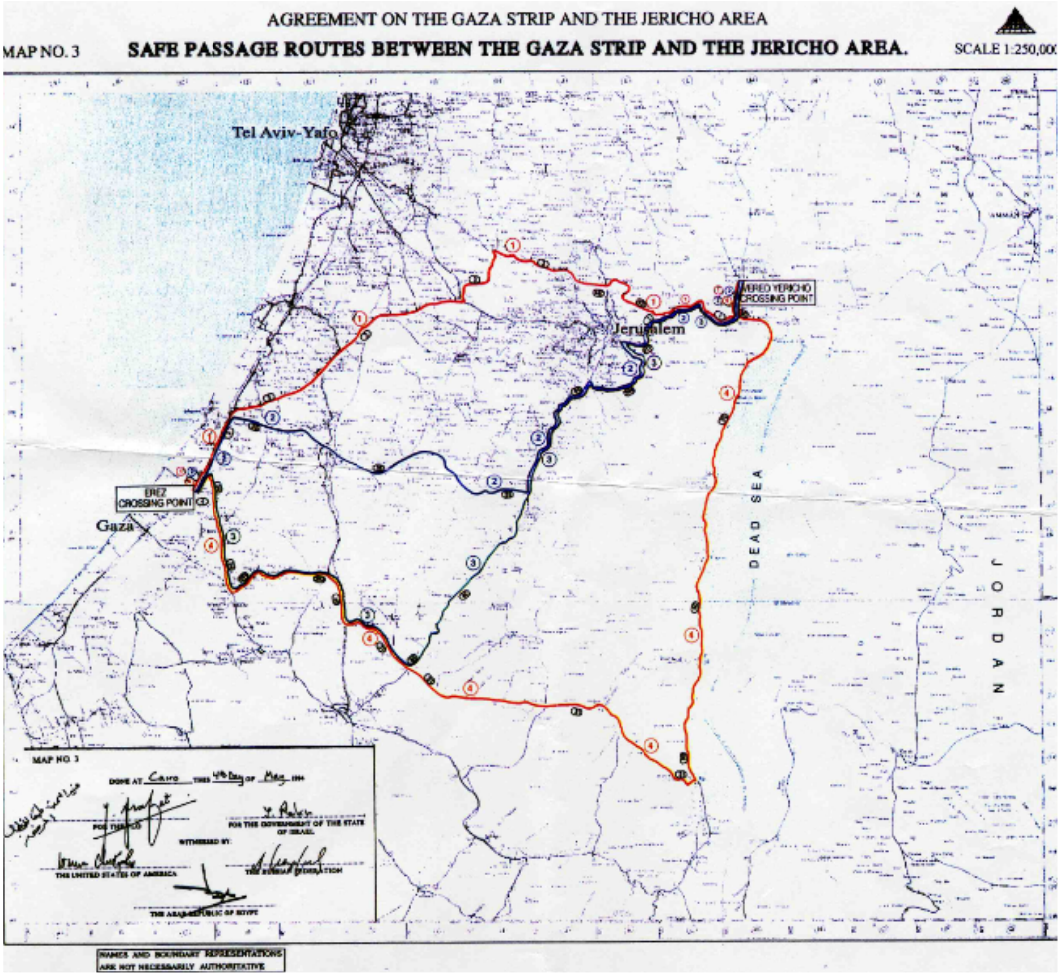
The first agreements on the possible linkage between the West Bank and Gaza Strip was the result of “Oslo I Accord” and through “Agreement for the Safe Passage Routes between the Gaza Strip and the Jericho Area”, signed in Cairo, by Mr. Y. Arafat and Mr. Y. Rabin, on the 4th of May, 1994.
On Annex I, Article IX, of this agreement it is mentioned that there would be safe passage between the Gaza Strip and Jericho area for the residents of these areas as well as the visitors.Based on the mentioned document, the safe passage was supposed to connect the two crossing points of:[9]

- Erez (Bayt Hanoun) crossing point; and
- Vered Yericho crossing point.

Although there is no clear definition of the safe passage in the agreement or any details of how it would be in terms of transport mode, Map No.3 shows the proposed “Safe Passage Routes between the Gaza Strip and the Jericho Area”.

[9] Crossing Points are indicated with the names used in the official documents of the Agreements; additional names between brackets are added, when available, in line with the definitions used by the NTMP.

Figure 13.Safe Passage Routes Between the Gaza Strip and the Jericho Area[10]



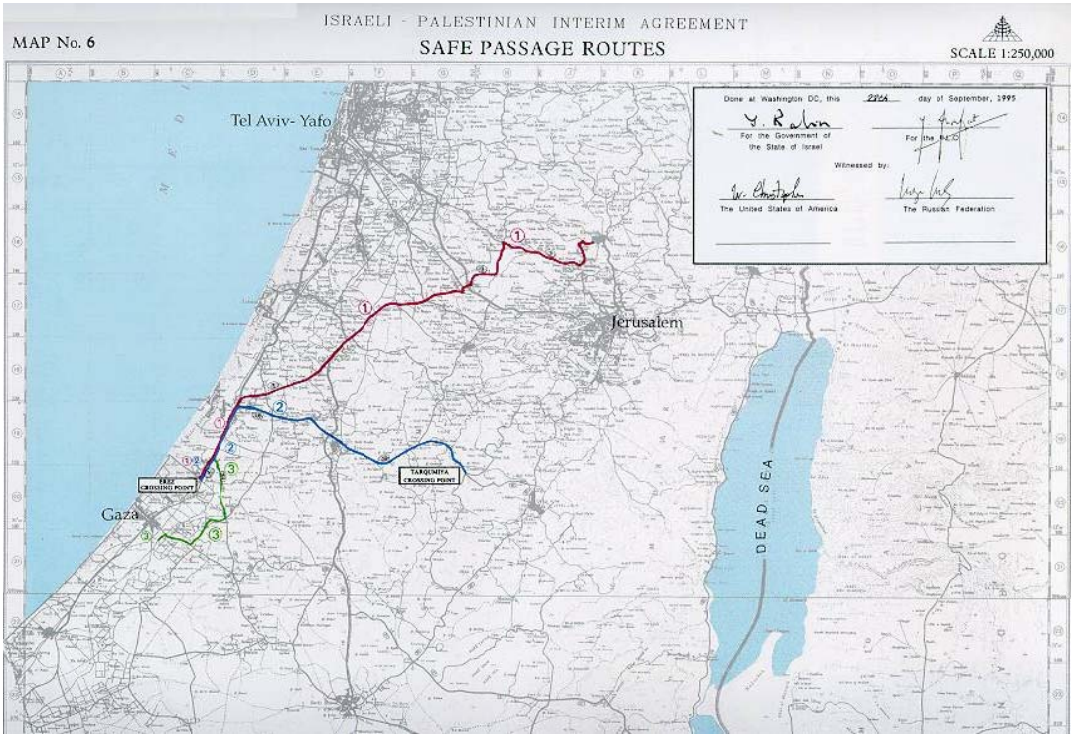
Safe Passage is next mentioned in the "Interim Agreement on the West Bank and the Gaza Strip"known as "Oslo II Accord", which was officially signed on September 28, 1995.
On Annex I, Article X, the "Arrangements for safe passage of persons and transportation between the West Bank and the Gaza Strip" are set out. Annex I, Article X, states that there shall be safe passage connecting the West Bank with the Gaza Strip for the movement of persons, vehicles and goods. Israel will ensure such passage during daylight hours.
According to what is declared in Annex I, this passage was to be implemented via four crossing points: the Erez (Bayt Hanoun)[11] crossing point (for persons and cars), the Karni crossing point

[10]Source: MoT

[11]Crossing Points are indicated with the names used in the official documents of the Agreements; additional names between brackets are added, when available, in line with the definitions used by the NTMP.

(for goods), the Tarqumiya crossing point, and an additional crossing point around Mevo Horon.[12]

Figure 14.Olso II – MAP No.6: Safe Passage Routes



4.1.2 Feasibility Studies after Oslo Accords

The most comprehensive study on the subject after the "Oslo Accords" is the "Transportation Feasibility for Linking the West Bank and Gaza Strip "[13] prepared by The Louis Berger Group, Inc. for USAID (United States Agency for International Development), in 2006.
The study includes 11 transport alignments connecting West Bank to the Gaza Strip using the following modal combinations of:

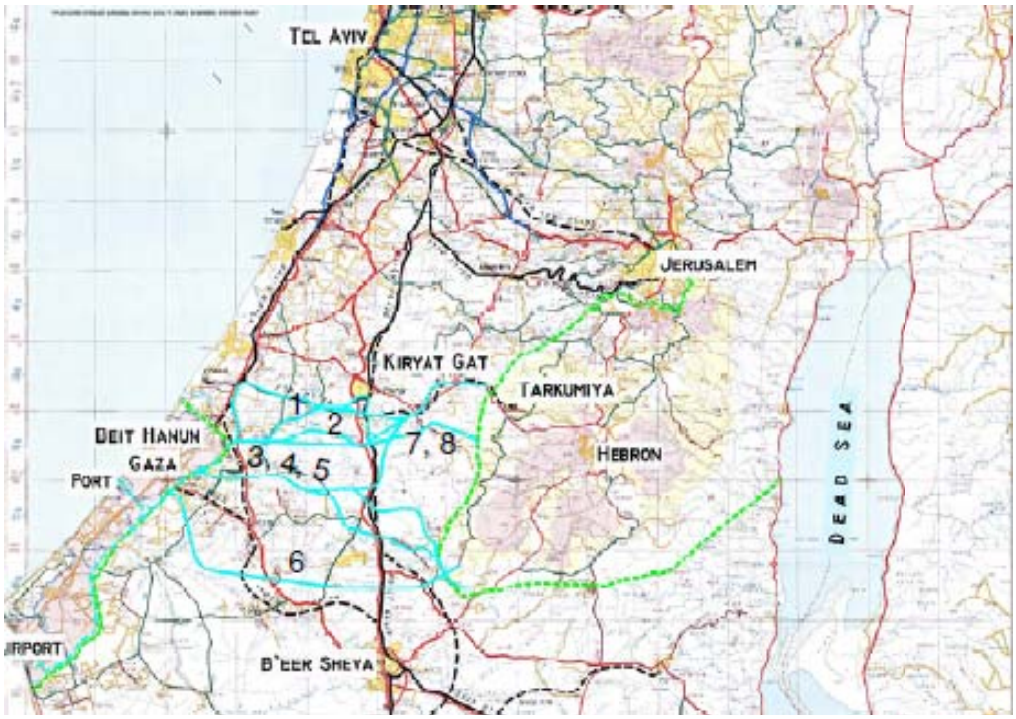
- road only;
- rail only, and;
- road and rail within the same corridor considering different cross-sectional configurations of: 1) at grade, 2) sunken cross section for a road, and tunnel alternatives for rail.

The following "Potential Connectors Map" is excerpted from the referred Study:

[12] Annex I, Article X, part 3, indicates that passage between the Gaza Strip and Israel will be via one or more of the following crossing points:Erez crossing point (for people and cars);Nahal Oz crossing point; Sufa crossing point, and; Karni crossing point (for goods only).

[13]The full version of the document is available here: http://pdf.usaid.gov/pdf_docs/Pdaci212.pdf

Figure 15.General Location Map Showing Potential Connectors[14]



The USAID Study provides detailed information about: Corridor Alignments; Design Standards; Utility Transmission Requirements; Cost and Operational Requirements, and; Environmental Conditions and Impact.

4.2 NTMP Proposal for a Multi-Modal WB-GS Corridor

4.2.1 WB-GS Corridor General Description

For NTMP purpose, the USAID Study's assumptions and proposals, made in 2006, are partially confirmed and duly updated and partially reviewed in light of socio-economic developments and projects phasing considerations.
The following base considerations apply:

- The Master Plan, to be developed in highly unpredictable scenarios and over the next 30 years, demands coherent and coordinated actions to timely and economically connect the various Transportation Sub Sectors;
- Time expected and eventually taken, for the furthering and finalizing of the original Agreement, between PNA and Israel, on the Safe Passage or Connecting Corridor, plays critically for some Potential Connectors, while being of a lesser criticality in others;
- Some connecting options have been already ruled out, as technically feasible but financially or logistically nonviable, by the Study itself;

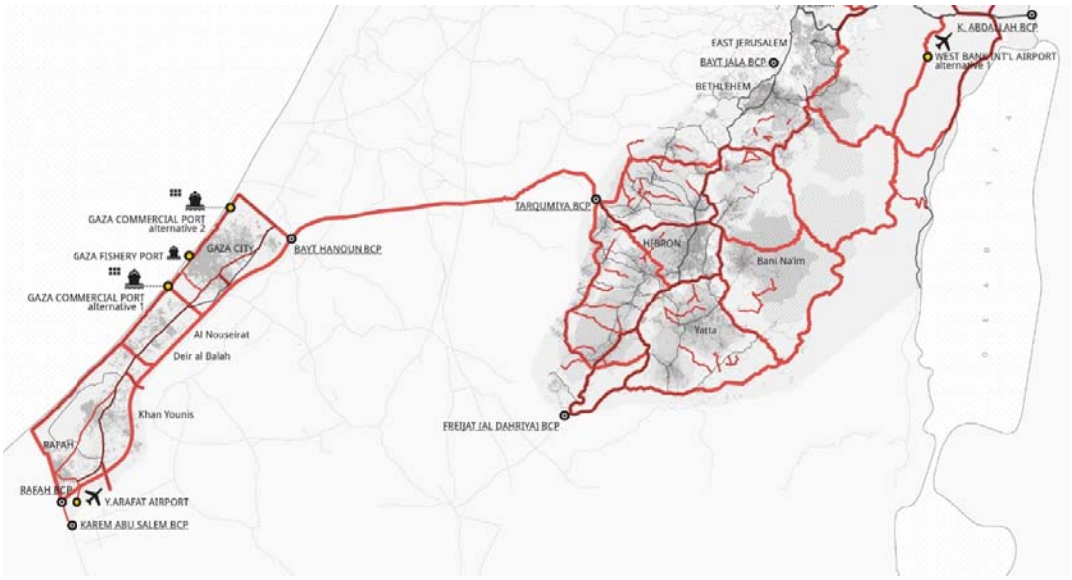
[14] Source: Louis Berger Group Inc.

- Some preferences for proposed alignments have been recently adopted by EuroMed, at a meeting, held in Brussels on the 24th of May, 2016, following provisions, by National Transport Coordinators, of programmed International alignments.

NTMP proposal for multi-modal Corridor between West Bank and Gaza Strip is basically coherent with Alignments 2, in the above presented "Agreement for the Safe Passage Routes between the Gaza Strip and the Jericho Area" (1994)[15], and considers Bayt Hanoun BCP, in Gaza Strip, and Tarqumiya BCP, in West Bank, as the two terminus.
The above Agreements and Resolutions standing in place, the NTMP proposal for multi-modal Corridor between West Bank and Gaza could reasonably become operational in Phase 2 for road transport and Phase 3 for rail, after due negotiations, design and construction.
This preferred alignment offers the shortest link option, with a length of approximately 40 km: all on ground, as base hypotheses, with limited under/overpassing stretches as deemed necessary.
As far as the Utilities are concerned, the West Bank - Gaza Strip Corridorwould provide the opportunity to include, within the right of way:

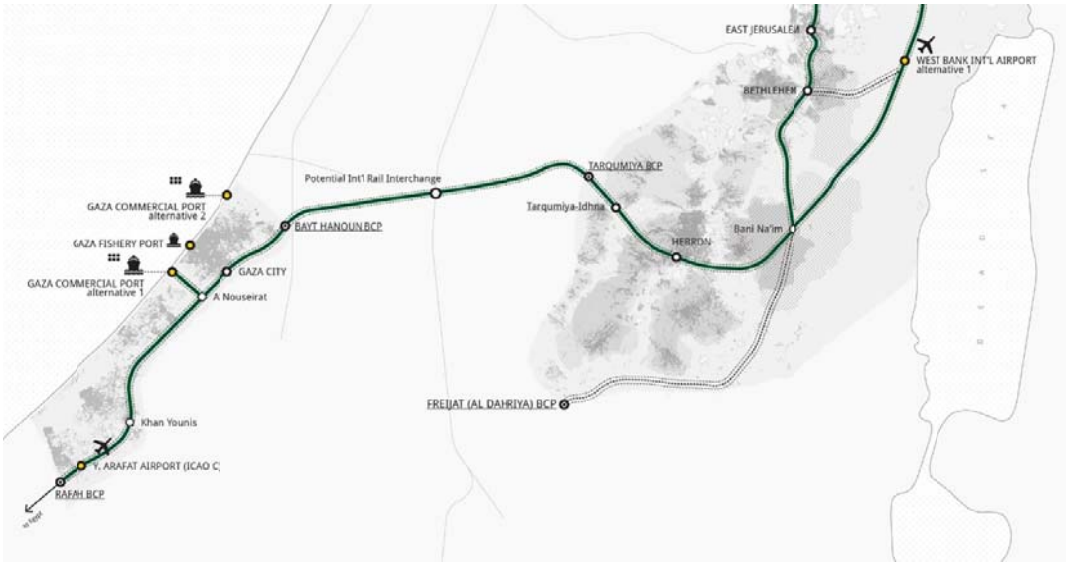
- Power Lines,
- Water Ducts,
- Gas Ducts, and;
- Telecommunications.

Figure 16.NTMP Proposal for WB-GS Corridor – Road Transport



[15] The preferred Alignment 2 basically corresponds to Option 8 in the USAID Study.

Figure 17.NTMP Proposal for WB-GS Corridor – Rail Transport

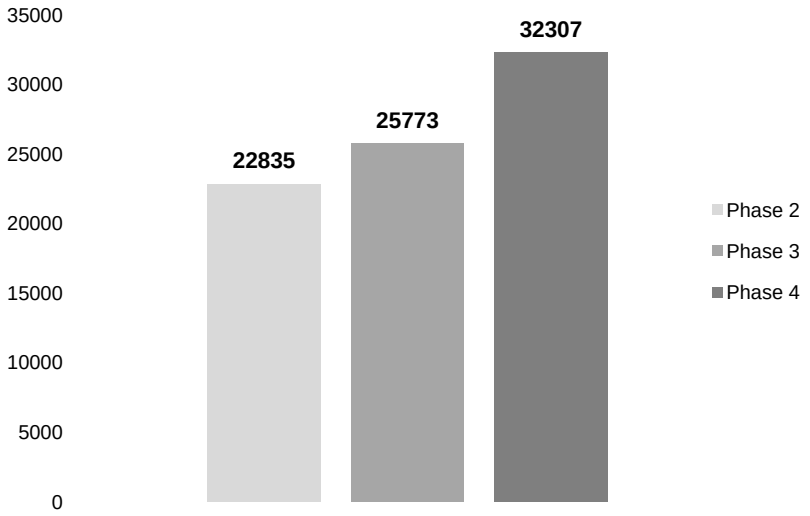


4.2.2 WB-GS Corridor Traffic Forecasts

Traffic forecasts, based on transport model the WB-GS Corridor are briefly reported here; for a more comprehensive understanding of traffic forecasts along WB-GS Corridor, refer to: ¶*VII – Transport Model Outputs,* and¶*AX.16– Transport Model Features and Calibration*.

The table below illustrates the forecasts for road-based traffic along WB-GS Corridor by Phase. All values reported in the following tables express the quantity of vehicles expected during a day.

Figure 18.Traffic Forecasts for WB-GS Corridor (daily vehicles)



Detailed breakdowns of road-based traffic forecasts along WB-GS Corridor by Phase and by type of vehicles are presented in the following tables.

Figure 19.WB-GS Corridor – Road-based Traffic Forecast in Phase 2 (vehicles)

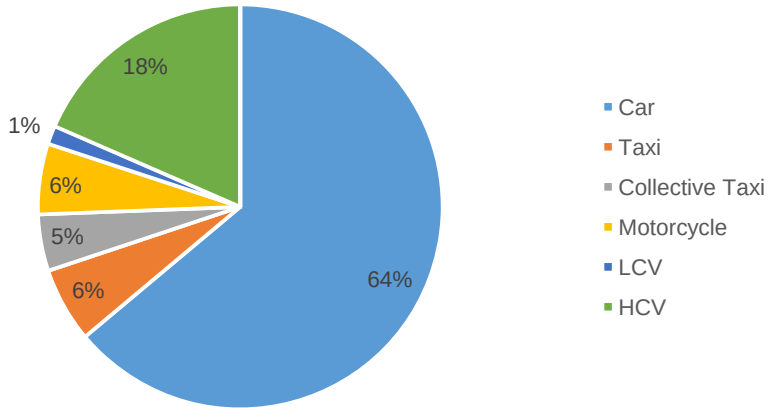


Figure 20.WB-GS Corridor – Road-based Traffic Forecast in Phase 3 (vehicles)

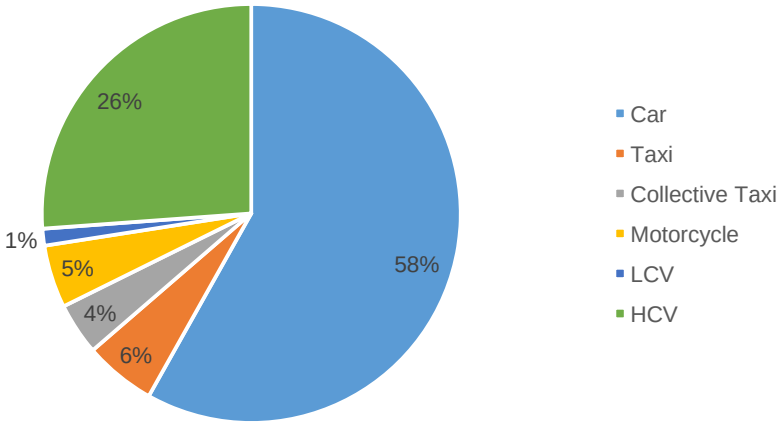
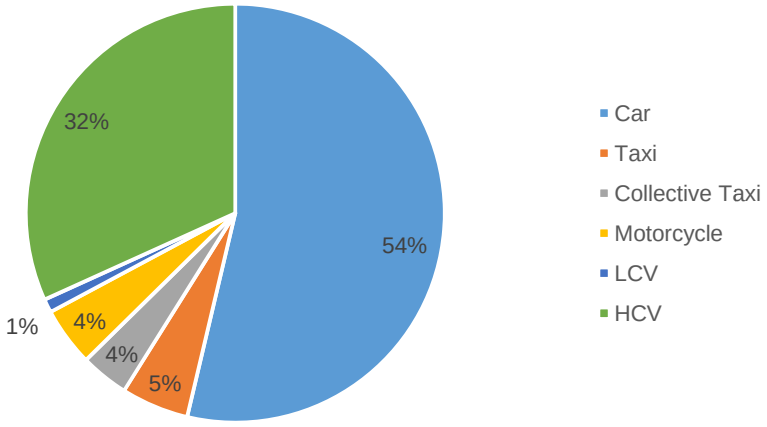


Figure 21.WB-GS Corridor – Road-based Traffic Forecast in Phase 4 (vehicles)



The c above show that the biggest part of expected road-based traffic along WB-GS Corridor will be composed of cars and HCV (Heavy Commercial Vehicles). On this concern, two main facts can be deduced from what is presented in the figures:

- Decrease of cars (-10%), from Phase 2 to Phase 4, due to the rail-based services that start operating from Phase 3, providing both international and domestic lines, and;
- Increase of HCV (Heavy Commercial Vehicles) (+14%), underlining the vital importance of the WB-GS Corridor for freight transport.

4.2.3 WB-GS Corridor Typical Cross Section and Major Design Standards

In compliance with what is described in the USAID Study (2006) as “Alternative C”,[16] the typical cross section of at-surface CombinedRoad+Rail Corridorcould develop in stages as follows:

- Initial Stage: Construction of a 2 x 2-lane road, with a 2-track diesel railway located either in the central median of the road or on one side of the road, as it will be determined by the preliminary design of the Corridor System. During this stage the 2 inner road lanes each side of the railway would be built;
- Following Stage: Expansion is represented by electrification of the railway (if and when considered viable) and the addition of an outer road lane to each of the 2 carriageways.[17]

Utilities canbe located within the right-of-way of the Alignment corridor. Water, gas and telecommunications can be placed together in acommon, 8-metre wide utility corridor located on one side of the transport infrastructure.Power transmission lines (161 to 400kV), however, require a separate corridor located on one side of the transport infrastructure (on the opposite side to that utilized by water, gas andtelecommunications).
Power transmission can be effected by overhead lines or be buried. An overhead high voltage transmission line would require up to a 30-metre wide corridor. Alternatively, a buried power transmission line would require only a 5-metre wide corridor.

[16]Volume 3 of USAID Study (2006) shows drawings of typical cross sections. “Alternative C: Combined Road/Rail Alignments” is the one embedded by NTMP proposal.
[17]USAID (Louis Berger Inc.)Transportation Feasibility for Linking the West Bank and Gaza Strip, 2006.

Finally, an access road would be required on both side of transport infrastructure corridor.[18]

As it concerns the major design standards and parameters, the NTMP proposalfor multi-modal Corridor between West Bank and Gaza Strip is fully coherent with what expressed in the USAID Study (2006) in Volume 2.
Geometric standards for multi-lane dual carriageway road section are proposed for flat and rolling/mountain terrain. The following tables summaries all the useful data.

Tab 3. Geometric Standards for WB-GS Corridor Road Section on Flat Terrain[19]

Designation	Flat Terrain	Rolling/Mountain Terrain
Design Speed (km/h)	120	100
Minimum Horizontal Radius (m)	870/2000	530/1000
Maximum Superelevation (%)	6.0	7.0
Min. Vert. Curve Radii: Crest (m)	22,600	10,000
Min. Vert. Curve Radii: Sag (m)	7,700	4,900
Maximum Gradient (%)	1.3/3.0	2.5/5.0
Min. Stopping Sight Distance (m)	300[1]	200[1]
Lane Width (m)	3.75	3.75
Median Width (m)	6.8/8.0	6.8/8.0
Cross-Fall (%)	1.5/2.0/2.5[2]	1.5/2.0/2.5[2]
Outside Shoulder Paved Width (m)	3.0/4.0[3]	3.0/4.0[3]
Inside Shoulder Paved Width (m)	3.0[4]	3.0[4]
Shoulder Cross-fall: Sealed (%)	2.0/4.0[5]	2.0/4.0[5]

1 *vertical slope less than 4.0%*
2 *1.5- concrete, 2.0 asphalt, 2.5 asphalt with vertical slope less than 1.0%*
3 *including safety barrier*
4 *three lanes*
5 *4.0%- gravel shoulder*

As it concerns the major design standards and parameters for railway along NTMP proposedfor multi-modal Corridor, refer to: ¶ *3.3 Functional and Technical Specifications.*

[18] Ibidem
[19] USAID (Louis Berger Inc.)Transportation Feasibility for Linking the West Bank and Gaza Strip, 2006 – VOLUME 2/ APPENDIX 3-1: ROAD DESIGN STANDARDS