



# ROAD AND TRANSPORTATION MASTER PLAN

WEST BANK AND GAZA STRIP

TA 2012013 PS 00 F10

**Annex 13 – Logistics Facilities Layouts**

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## 1. Typologies of Production for Every Industrial Site

Two main typologies of production can be distinguished: industrial and agricultural production. Each is reviewed in details according to the best available recent data.

### Agricultural Production Typologies:

There were 111,310 agricultural holdings in the Palestinian Territory: of which 90,908 were in the West Bank (81.7%) and 20,402 in the Gaza Strip (18.3%). The largest numbers of agricultural holdings were in Hebron governorate with 19,768 holdings (17.8%) and the lowest agricultural holdings were in the Jericho and Al-Aghwar (Jordan Valley) governorate with 1,612 holdings (1.4%).

Tab 1. Number of Agricultural Holdings in West Bank and Gaza Strip by Main Purpose of Production, Type of Holding and Governorate, 2009/2010

Number of Agricultural Holdings in the Palestinian Territory by Main Purpose of Production, Type of Holding and Governorate, 2009/2010										
Governorate	Total	Main Purpose of Production and Type of Holding								
		Not Stated			For Sale			For Household Consumption		
		Mixed	Animal	Plant	Mixed	Animal	Plant	Mixed	Animal	Plant
<b>Palestinian Territory</b>	<b>111,310</b>	<b>48</b>	<b>75</b>	<b>2,271</b>	<b>7,881</b>	<b>6,838</b>	<b>15,382</b>	<b>9,964</b>	<b>7,328</b>	<b>61,523</b>
<b>West Bank</b>	<b>90,908</b>	<b>34</b>	<b>68</b>	<b>312</b>	<b>5,760</b>	<b>4,644</b>	<b>9,216</b>	<b>8,968</b>	<b>6,167</b>	<b>55,739</b>
Jenin	14,662	4	4	46	1,484	853	2,465	1,141	664	8,001
Tubas	2,834	5	2	15	450	282	613	228	153	1,086
Tulkarm	8,035	2	3	34	435	317	1,270	459	224	5,291
Nablus	13,450	11	7	34	1,013	733	662	1,398	567	9,025
Qalqiliya	4,929	1	3	33	494	251	1,056	322	157	2,612
Ramallah & Al-Bireh	10,543	1	7	13	242	255	276	827	394	8,528
Jericho & Al-Aghwar	1,612	2	4	6	163	261	447	45	539	145
Bethlehem	7,406	4	14	54	205	276	382	1,084	908	4,479
Hebron	19,768	3	1	28	1,116	910	1,720	2,876	1,915	11,199
<b>Gaza Strip</b>	<b>20,402</b>	<b>14</b>	<b>7</b>	<b>1,959</b>	<b>2,121</b>	<b>2,194</b>	<b>6,166</b>	<b>996</b>	<b>1,161</b>	<b>5,784</b>

Source: Palestinian Central Bureau of Statistics, Agricultural census 2010, Final Results- Palestinian Territories.

The table below shows the cultivated areas in Dunum (1 dunum = 1000sqm) for each site. The three main plant production typologies are Horticulture Trees, Vegetables and Field Crops, the percentage of each site area to the total Palestinian area is also calculated.



Tab 2. Cultivated Area of Horticulture Trees, Vegetables and Field Crops in West bank and Gaza Strip by Governorate, 2009/2010

Cultivated Area of Horticulture Trees, Vegetables and Field Crops in the Palestinian Territory by Governorate, 2009/2010							
Area in Dunums							
Governorate	Total	Field Crops		Vegetables		Horticulture Trees	
		#	%	#	%	#	%
Jenin	177,271.11	55,366.29	0.229	19,186.20	0.151	102,718.62	0.189
Tubas	65,087.52	34,787.53	0.144	20,319.87	0.160	9,980.12	0.018
Tulkarm	73,742.32	3,548.88	0.015	8,475.26	0.067	61,718.18	0.114
Nablus	120,920.81	27,285.78	0.113	11,353.59	0.089	82,281.44	0.152
Qalqiliya	48,234.91	7,136.01	0.029	2,954.93	0.023	38,143.97	0.070
Salfit	39,567.37	631.42	0.003	413.82	0.003	38,522.13	0.071
Ramallah & Al-Bireh	65,883.06	6,618.02	0.027	1,925.16	0.015	57,339.88	0.106
Jericho & Al- Aghwar	36,277.68	2,971.19	0.012	26,299.34	0.207	7,007.15	0.013
Bethlehem	31,870.29	4,702.78	0.019	1,583.80	0.012	25,583.71	0.047
Hebron	156,743.04	79,143.87	0.327	7,309.17	0.057	70,290.00	0.130
Gaza Strip	85,252.95	18,030.37	0.075	26,677.55	0.210	40,545.03	0.075

Source: Source: Palestinian Central Bureau of Statistics, Agricultural census 2010, Final Results- Palestinian Territories.

Tab 3. Number of Cattles, Goats and Sheep as in 01/10/2010

Number of Cattles, Goats, and sheep as in 01/10/2010			
	Cattles	Goats	Sheep
Palestinian Territory	33,925	219,364	567,236
West Bank	24,290	207,214	505,833
Jenin	4,798	17,583	58,580
Tubas	2,060	12,486	45,983
Tulkarm	906	2,969	16,946
Nablus	4,438	16,970	77,396
Qalqiliya	923	3,688	17,973
Salfit	423	3,904	8,403
Ramallah & Al-Bireh	580	21,399	34,723
Jericho & Al- Aghwar	870	26,450	32,747
Bethlehem	467	25,915	34,319
Hebron	8,446	49,436	146,220
Gaza Strip	9,635	12,150	61,403

Source: Source: Source: Palestinian Central Bureau of Statistics, Agricultural census 2010, Final Results- Palestinian Territories.



Tab 4. Number of Raised Poultry in West Bank and Gaza Strip by Type and Governorate, As in 01/10/2010

<b>Number of Raised Poultry in the Palestinian Territory by Type and Governorate, As in 01/10/2010</b>				
Governorate	Type of Poultry			
	Turkeys	Mothers of Broiler	Layers	Broilers
	<b>Palestinian Territory</b>	<b>166,869</b>	<b>399,423</b>	<b>1,545,016</b>
<b>West Bank</b>	<b>157,669</b>	<b>376,633</b>	<b>1,233,736</b>	<b>3,212,012</b>
Jenin	74,175	135,923	265,825	636,642
Tubas	12,000	-	26,310	93,125
Tulkarm	37,201	27,000	211,960	334,279
Nablus	2,753	10,000	65,995	654,149
Qalqiliya	150	-	159,531	176,240
Salfit	-	-	20,600	41,270
Ramallah & Al-Bireh	-	4,160	268,899	239,786
Jericho & Al-Aghwar	-	168,000	430	55,600
Bethlehem	-	5,300	45,600	158,534
Hebron	31,390	16,050	126,789	802,687
<b>Gaza Strip</b>	<b>9,200</b>	<b>22,790</b>	<b>311,280</b>	<b>1,494,317</b>
Source: Source: Palestinian Central Bureau of Statistics, Agricultural census 2010, Final Results- Palestinian Territories.				

Tab 5. Number of Beehives in West Bank and Gaza Strip by Type and Governorate, As in 01/10/2010

<b>Number of Beehives in the Palestinian Territory by Type and Governorate, As in 01/10/2010</b>			
Governorate	Total	Type of Beehives	
		Modern Beehives	Traditional Beehives
<b>Palestinian Territory</b>	<b>38,216</b>	<b>35,494</b>	<b>2,722</b>
<b>West Bank</b>	<b>29,040</b>	<b>27,451</b>	<b>1,589</b>
Jenin	3,540	3,111	429
Tubas	2,941	2,916	25
Tulkarm	3,383	3,323	60
Nablus	3,778	3,558	220
Qalqiliya	3,403	3,319	84
Salfit	1,818	1,776	42
Ramallah & Al-Bireh	2,699	2,453	246
Jericho & Al-Aghwar	2,975	2,910	65
Jerusalem	418	378	40
Bethlehem	1,011	839	172
Hebron	3,074	2,868	206
<b>Gaza Strip</b>	<b>9,176</b>	<b>8,043</b>	<b>1,133</b>
Source: Source: Palestinian Central Bureau of Statistics, Agricultural census 2010, Final Results- Palestinian Territories.			

Tab 6. *Main Economic Indicators for Olive Presses Activity in West Bank and Gaza Strip by Governorate and Automation Level, 2015*

<b>Main Economic Indicators for Olive Presses Activity in Palestine by Governorate and Automation Level, 2015</b>				
<small>(Quantity in Metric Ton and Value in USD 1000)</small>				
<b>Governorate</b>	<b>Olive Presses Output Value</b>	<b>Extracted Oil Quantity</b>	<b>Pressed Olive Quantity</b>	<b>No. of Operating Presses</b>
<b>Palestine</b>	<b>10,282.0</b>	<b>21,084.4</b>	<b>95,142.0</b>	<b>272</b>
<b>West Bank</b>	<b>9,392.2</b>	<b>19,530.3</b>	<b>85,478.9</b>	<b>248</b>
Jenin and Tubas*	2,145.9	5,522.7	24,092.9	61
Tulkarm	719.3	1,730.3	6,949.1	37
Nablus	1,637.7	3,664.7	15,643.2	42
Qalqiliya	649.9	1,642.6	6,943.6	15
Salfit	809.3	1,892.7	7,727.1	25
Ramallah and Al-Bireh	2,048.4	2,765.9	12,759.9	32
Bethlehem	509.9	647.9	3,831.9	8
Hebron	650.2	1,320.0	6,159.1	25
<b>Gaza Strip</b>	<b>889.8</b>	<b>1,554.2</b>	<b>9,663.1</b>	<b>24</b>
<b>Traditional &amp; Half Automatic Presses</b>	<b>657.3</b>	<b>1,477.5</b>	<b>5,711.3</b>	<b>25</b>
<b>Full Automatic Presses</b>	<b>9,624.7</b>	<b>19,607.0</b>	<b>89,430.7</b>	<b>247</b>
<small>* The Data of some Governorates were merged to maintain data confidentiality as stated in the General Statistics Law 2000.</small>				

## Industrial Production Typologies

For West Bank, manufacturing of food products represents the most important activity. It represents 21.6% of total industrial products, then the manufacture of other non-metallic mineral products with 21.3% and after that the manufacture of fabricated metal products, except machinery and equipment with 11.4%.

For Gaza Strip, manufacturing of food products represents the most important activity, with 32.1% of total production, then the manufacture of other non-metallic mineral products with 18.6% and after that the manufacture of furniture with 12.4%.

The table below shows the details of each activity value and percentage for West Bank and Gaza Strip.



Tab 7. Industrial Production in West Bank and Gaza Strip by Economic Activity, 2014

Industrial Production in West Bank and Gaza Strip by Economic Activity, 2014				
(Value in USD 1000)				
Economic Activities	West Bank		Gaza Strip	
	Value	Percentage	Value	Percentage
Other mining and quarrying	59,018.60	0.024	15,249.30	0.029
Manufacture of food products	530,637.60	0.216	167,402.20	0.321
Manufacture of beverages	143,616.30	0.058	13,670.80	0.026
Manufacture of tobacco products	123,026.80	0.050		0.000
Manufacture of textiles	22,551.50	0.009	11,922.50	0.023
Manufacture of wearing apparel	28,317.50	0.012	9,500.30	0.018
Manufacture of leather and related products	48,886.50	0.020	609.6	0.001
Manufacture of wood and products of wood and cork, except furniture; Manufacture of articles of straw and plaiting materials	35,428.60	0.014	12,516.40	0.024
Manufacture of paper and paper products	81,872.10	0.033	15,063.20	0.029
Printing and reproduction of recorded media	37,846.60	0.015	10,742.20	0.021
Manufacture of coke and refined petroleum products	36,630.30	0.015		0.000
Manufacture of chemicals and chemical products		0.000	22,604.20	0.043
Manufacture of basic pharmaceutical products and pharmaceutical preparations	82,600.20	0.034		0.000
Manufacture of rubber and plastics products	139,566.90	0.057	19,227.50	0.037
Manufacture of other non-metallic mineral products	524,848.80	0.213	96,934.00	0.186
Manufacture of basic metals	7,608.70	0.003		0.000
Manufacture of fabricated metal products, except machinery and equipment	280,645.30	0.114	49,043.20	0.094
Manufacture of motor vehicles, trailers	14,898.70	0.006		0.000
Manufacture of electrical equipment	4,117.70	0.002	5,992.60	0.011
Manufacture of machinery and equipment n.e.c.	7,831.70	0.003	2,462.90	0.006
Manufacture of other transport equipment		0.000		0.000
Manufacture of furniture	241,523.40	0.098	64,782.60	0.124
Other manufacturing	9,253.40	0.004	4,231.20	0.008
<b>Total</b>	<b>2,460,727.20</b>	<b>100%</b>	<b>521,953.70</b>	<b>1.000</b>

Source: collected and prepared from: Palestinian Central Bureau of Statistics, 2015. Economic Surveys Series 2015: Main Results.

## Foreign Trade

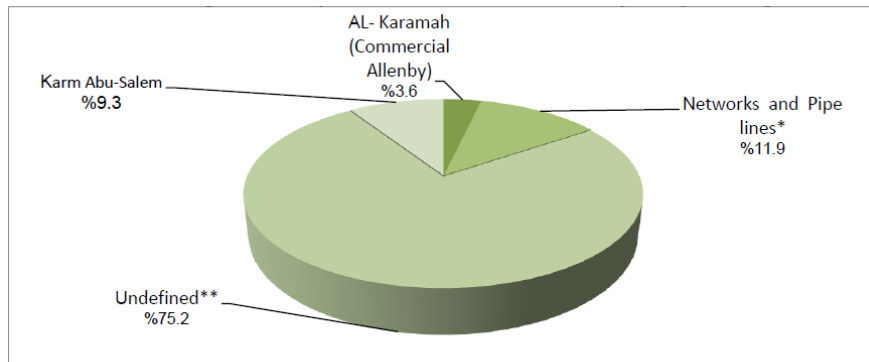
### 1- Registered foreign trade in 2014 in West Bank and Gaza Strip was as follows:

- Registered Imports: The total value of imports of goods in 2014 was USD 5,683.2 million.
- Registered Exports: Exports of goods totaled USD 943.7 million

### 2- Registered Imports of Goods by Entry Passage in 2014:

Imports into West Bank and Gaza Strip entering from Israel or other countries via different passages represented 75.2% of total imports in 2014. Around 9.3% of goods entered into the Gaza Strip via Karm Abu-Salem, while 11.9% and 3.6% of goods entered via networks and pipelines and Al-Karama passage respectively.

Figure 1. Distribution of Registered Imports of Goods in West Bank and Gaza Strip by Entry Passage in 2014



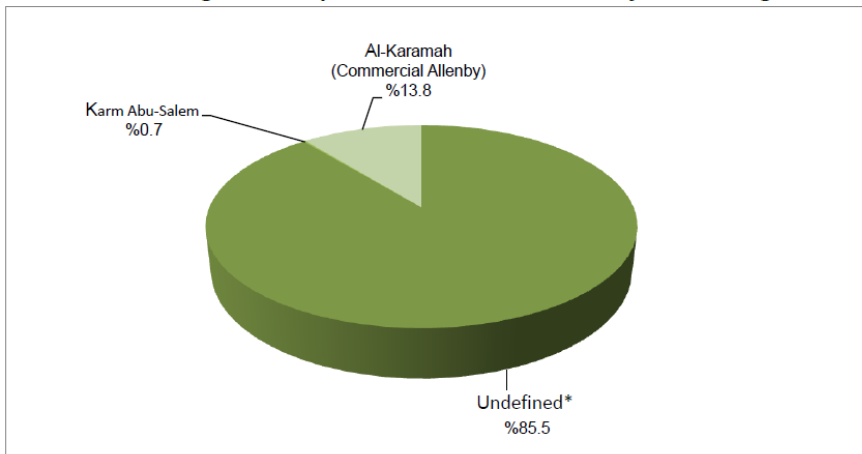
\* Including water and electricity entering Palestine, and petroleum products to Gaza Strip only.  
\*\* Including trade transactions between the West Bank and Israel.

### 3- Registered Exports of Goods by Exit Passage in 2014:

Registered exports of goods via different passages to Israel represented 85.5% of total exports in 2014. Other commodities were exported to other countries via the Al-Karama (West Bank) 13.8% and Karm Abu-Salem (Gaza Strip) 0.7% passages respectively of total exports in 2014.

Figure 2. Distribution of Registered exports of Goods in West Bank and Gaza Strip by Entry Passage in 2014

#### Distribution of Registered Exports in Goods in Palestine by Exit Passage in 2014



\* Including trade transactions between the West Bank and Israel.



Tab 8. Total Value of Imports in Goods in West Bank and Gaza Strip by Entry and Exit Passages 2013-2014

Value in Thousand USD				
Entry/ Exit passage	Total Value of Exports		Total Value of Imports	
	2014	2013	2014	2013
AL- Karamah ( Commercial Allenby)	130,286	98,007	206,706	150,948
Networks and Pipelines**	–	–	676,704	552,738
Undefined***	807,066	801,064	4,272,862	4,044,374
Karm Abu-Salem	6,365	1,547	526,927	415,838
<b>Total</b>	<b>943,717</b>	<b>900,618</b>	<b>5,683,199</b>	<b>5,163,897</b>

(\*) The data excludes that part of Jerusalem which was annexed forcefully by Israel following its occupation of the West Bank in 1967.  
(\*\*): Including Water and Electricity to Palestine, and Petroleum Products to Gaza Strip only.  
(\*\*\*) Include Trade Transaction between the West Bank and Israel.

## 2. Proposed District Logistics Areas

The district logistics areas are, at a first stage, logistics surfaces and buildings equipped to store primary logistic flow of multi-products nature. Therefore, they require the following features:

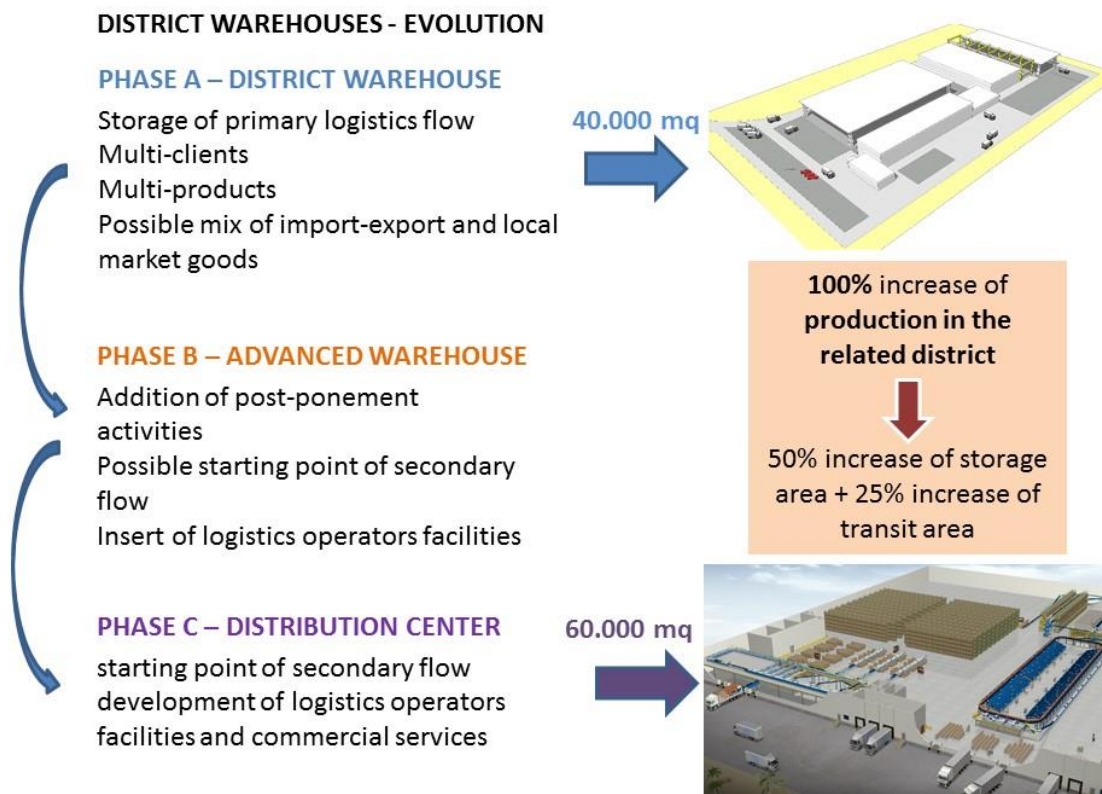
- Surface wide enough to serve the production district in the most evolved configuration;
- Internal layout able to store a wide range of products of different dimensions and packaging characteristics;
- Basic logistics facilities, like security, people facilities, parking and movement areas.

According to the current and planned dimension of the 6 industrial areas of West Bank and Gaza Strip and the specific features of their district, the NTMP proposes a starting surface of 40,000sqm, equipped with bulk storage, block storage, general cargo warehouse and automated warehouse, and open-space storage place for a total amount of about 15,000sqm of storage area.

In Jenin, Jericho and Gaza City, where the agri-food production plays a strong role, the district logistics area should be divided into 2 different parts, one (20,000sqm) reserved for agri-food chain and the other for mixed non-food products. The general principle to follow in the layout design of these logistic areas is: **1 platform = 1 logistic chain.**

Agri-food requires specific layout configuration and services, such as cold-storage facilities, postponement or washing treatments etc., which should not be in contact with other production chains. This specific agri-food area could be the same for internal and export trade in stage A, to optimize the investment and space.

Figure 3. As Shown In the Picture, A District Warehouse Could Evolve During the Time

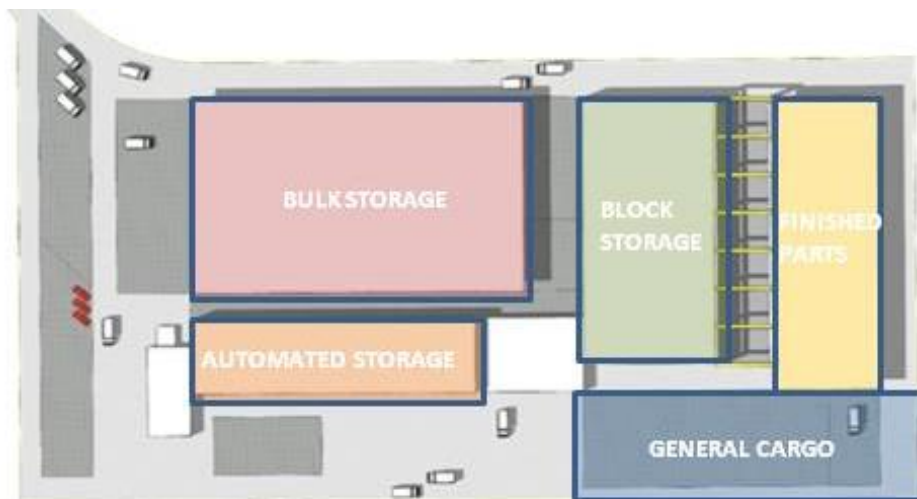


## Stage A: District Warehouses

Warehousing refers to the activities involving storage of goods on a large-scale in a systematic and orderly manner and making them available conveniently when needed<sup>1</sup>. That is, holding or preserving goods in huge quantities from the time of their purchase or production until their actual use or sale. This is the reason why warehousing is one of the most important auxiliaries to trade, creating time utility by bridging the time gap between production and consumption of goods. Therefore, it is an essential element of activity in the distribution of goods, from raw materials and work in progress to the finished goods, and represents a basic element to develop in a systemic way when it has decided to create a well-structured, national logistics system, like in the case of NTMP.

Warehousing system should work in a synchronized way with the whole supply chain, of which it is an integral part. It is not a 'Stand-alone' element of activity and it must not be a weak link in the whole supply chain network. Recently, the supply chain is being asked to offer increasing customer service levels, inventory optimization, time compression and cost minimization and this fact brings changes within the supply chain itself, with effects also on location and working of warehouses. In this sense, the old concept of warehouses as to store goods has been outdated. Warehouses perhaps are evolved to distribution centers; their first goal is therefore primarily to facilitate the movement of materials to the end customer. However, the concept of throughput rather than storage, and the pressure to optimize inventory with improved customer service level have also seen the development of distribution centers that do not hold stock-the 'stockless depot' – such as trans-shipment depots - with more cross-docking operations<sup>2</sup>. Another important element of the evolution process is the technological degree of warehousing process: from conventional warehousing – racking and shelving with fork-lift or even manual operations, that have changed to fully automated systems with conveyors and automated guided vehicles (AGVs) and from carousels to robotic applications. The NTMP foresees that this evolution could take place in STAGE B of the logistics system development: the choice of a particular technology level requires a mature logistics system, ranging according to financial, marketing and other factors.

Figure 4. Schematic functions distribution in a district warehouse at Stage A

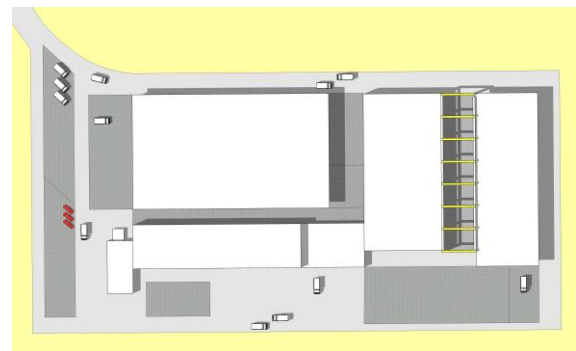
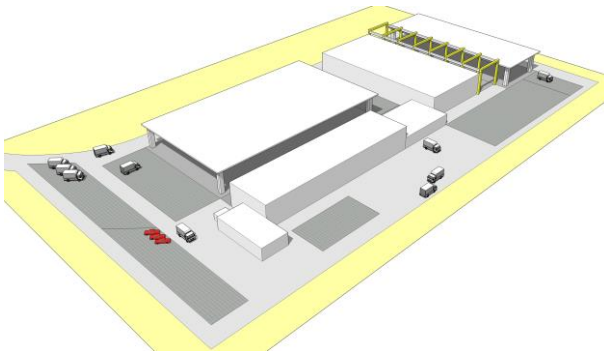
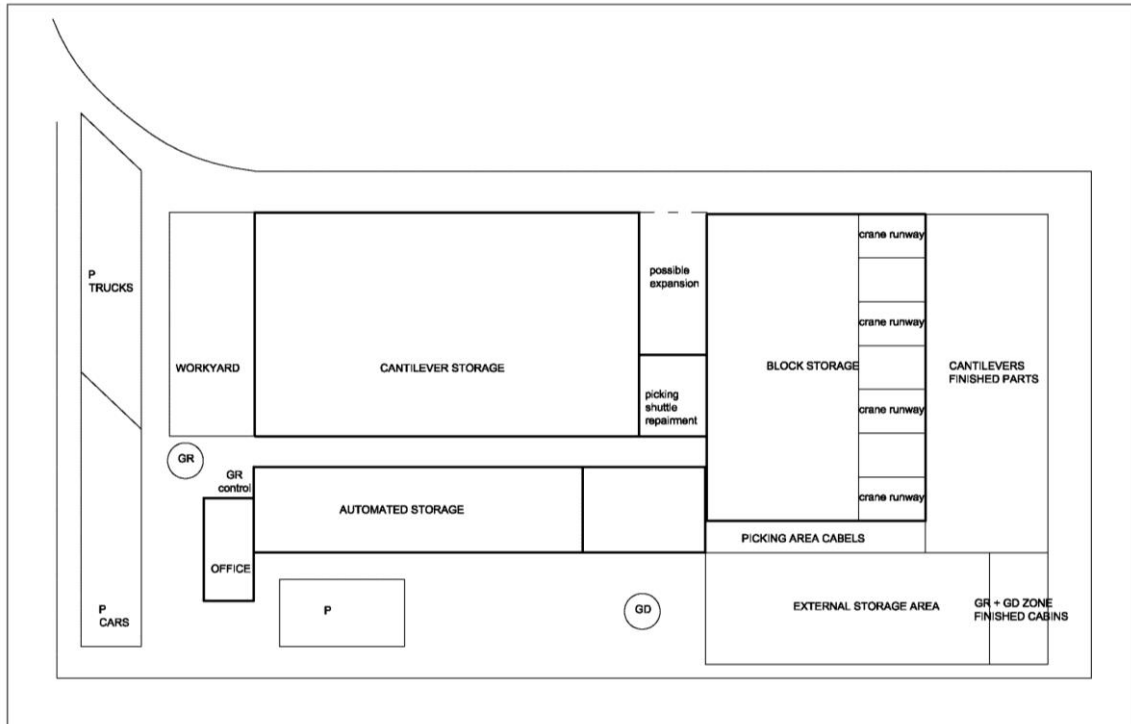


<sup>1</sup> The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns), NPCB Board of Consultants & Engineers - Niir Project Consultancy Services, 08 lug 2015

<sup>2</sup> ibidem

## Schematic layout of a district area at Stage A

Figure 5. Simulations of possible solutions for district logistics areas





## Stage B: District Distribution Centers

In stage B and C of the planned development of logistics network, the district warehouses should evolve to distribution centers, reducing storage activities and offering postponement and picking, transit point services, additional facilities for logistic operators and clients.

A distribution center is a facility or a group of facilities that perform consolidation, warehousing, packaging, decomposition and other functions linked with handling freight<sup>3</sup>. Their main purpose is to provide added-value services to freight, which is stored for relatively short periods of time (days or weeks). For their correct working process, distribution Centers should be located in proximity to major transport routes or terminals. They have storage function, and at the same time can perform light manufacturing activities such as assembly and labeling (the so-called postponement activities).

In the middle of the relationship between producers and retailers, distribution centers essentially act as a buffer where products are assembled, sometimes from other distribution centers, and then shipped in batches. They play also the role of dealing-elements with different forms of a synchronism in freight distribution as well as with different paces of production and consumption, like the situation that the NTMP foresees for first stages of the logistics network development. Distribution centers commonly have a market area in which they offer a service window, defined by delivery frequency and response time to order.

Moreover, at international level distribution centers tend to evolve towards a distribution cluster, which could represent the goal for the proposed Stage C of district warehouses. The distribution centers handling the requirements of modern distribution serve different purposes, combining fabrication, storage, and distribution functions, while their location, design and operation are strictly related to the technological level. Modern distribution centers occupy more space, both in the site of their location and the building area. The location of distribution centers mainly based on trucking, implying a preference for suburban locations with good road accessibility supporting a constant traffic<sup>4</sup>. Consequently, the NTMP suggests at first to define inside the Planning Tools an appropriated area, inside the industrial zones, to let the district logistics facilities evolve through time.

The innovative distribution centers are therefore one-floor facilities, designed more for throughput than for warehousing, with specialized loading and unloading bays and sorting equipment. Cross-docking distribution centers represent one of the foremost expressions of a facility that handles freight in a time sensitive manner, often with a high level of automation, that pushes forward the productivity level of distribution centers. The NTMP foresees a possible fully automation of sorting, storing and palletizing processes in a distribution center only at Stage C. Another important element is that the setting of freight distribution clusters has to take place where distribution activities agglomerate, to create synergy between shared infrastructures and accessibility and expand the added-value performed by logistics.

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<sup>3</sup> The Geography of Transport Systems, Jean-Paul Rodrigue, Claude Comtois, Brian Slack, Routledge

<sup>4</sup> ibidem

## District Level Best Practice: Fercamterry Logistic Center

Figure 6. Fercamterry Logistic center



Country	Italy
City	Ottobiano (Milan)
function	logistics platform
dimension	65.000 m <sup>q</sup>

Notes:

- project: 2009
- euro 18.000.000





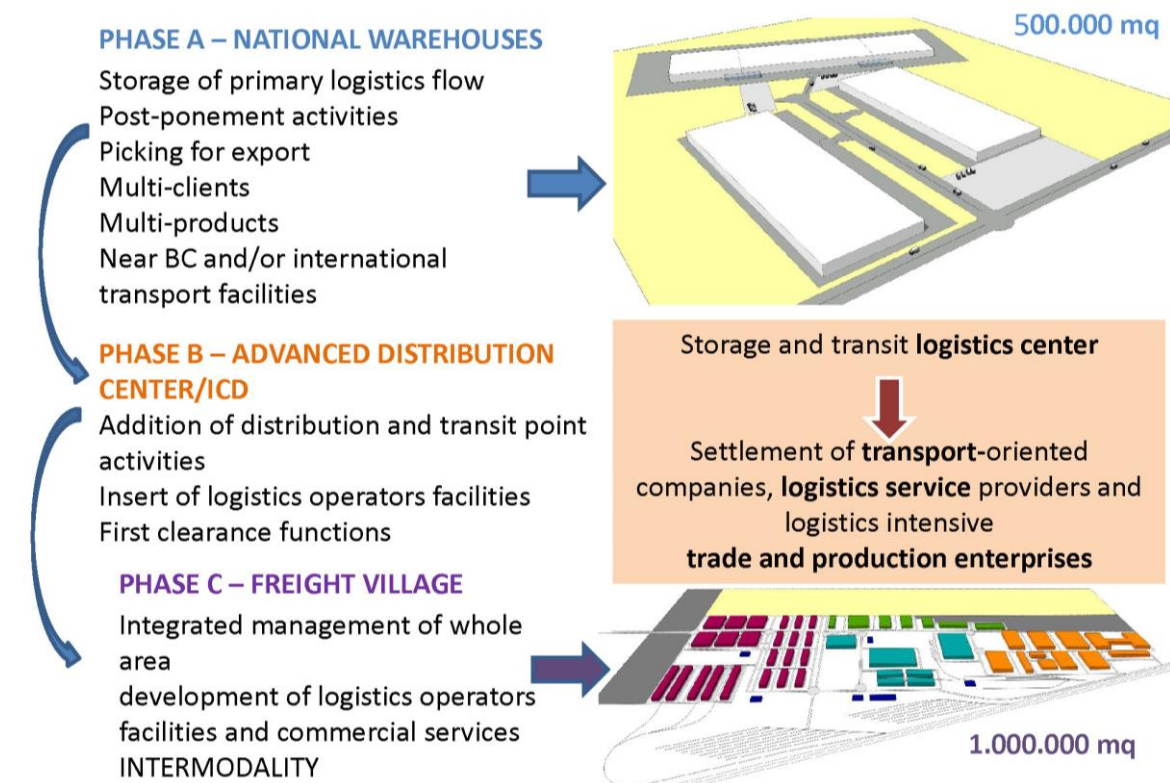
### 3. Proposed National Logistics Areas

The national warehouses are, at a first stage, logistic areas focused on import-export trade and equipped to store logistic flows of multi-products nature and in relationship with many clients, from West Bank, Gaza Strip and abroad. Consequently, they require the following features:

- Surface wide enough to collect and store different products from the production districts;
- Internal layout able to store a wide range of products of different dimensions and packaging characteristics, according to the seasonal demand and the requirements of import-export trade;
- Basic logistics facilities, like security, people facilities, parking and movement areas;
- Location close to the BCPs and to the planes intermodal nodes.

According to the planned freight flows of West Bank and Gaza Strip and the specific features of the import-export goods, the NTMP proposes for these areas a maximum surface at Stage A of 500,000 sqm, structured in 3 specific sections: storage, re-work and postponement activities, and transit point. Each of these sections, has to be divided in modules to be dedicated to specific logistics chains/clients/operators. As of Stage A, these logistic areas should host a transit-point facility, especially focused on import-products to be redistributed inside West Bank and Gaza Strip.

Figure 7. Illustration of Stage A, B and C

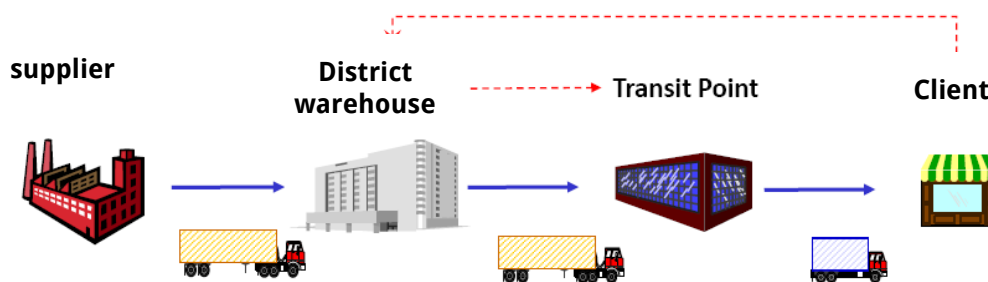


## Stage A: National Level – Transit Points Specifications

As it was mentioned before, the specificity of these national warehouses are, in comparison to the district warehouses, the faster evolution to **Transit Point/ Cross Docking Distribution facilities**.

**Transit point** enables only the rationalization of incoming-transport from production companies or district warehouses. They host only transit stockpiles. Inside transit points the sorting process of freight takes place, already prepared by district warehouses according to orders from final clients.

*Figure 8. Schematic Diagram of Proposed Logistics System, with National Warehouses Playing the Role of Transit Point. This Solution is Possible Mainly at Stage B of the Foreseen Development*



**Cross-docking** favors the timely distribution of freight, a better synchronization with the demand and a more efficient use of transportation assets<sup>5</sup>. Its advantages involve a minimization of warehousing and economies of scale in outbound flows (from the distribution center to the customers). Cross-docking procedure offers also the possibility to minimize the costly inventory function, while still maintaining the added-value functions of consolidation and shipping. With a cross-docking operation, inbound flows (from suppliers) are directly transferred into outbound flows (to customers) with short term, reducing warehousing activities to a minimum level (typically less than 24 hours). This fact comes from the issue that in a conventional distribution system, goods are stored in a distribution center (or kept in inventory at the supplier) and wait to be ordered by a customer. Under such a setting it is difficult to have shipments that are not less than truckload (LTL). With cross-docking, goods are already assigned to a customer. The process is:

- 1) Distribution center receives goods from suppliers,
- 2) Sorts them directly to be shipped to a consolidated batch (often including other orders from other suppliers) to customers.

**Since there is less shipments for each supplier, most of them are full truckload (FTL).**

Cross-docking can be applied to a number of situations. For manufacturing, cross-docking can be used to consolidate inbound supplies, which can be prepared to support just-in-time assembly (parts for different stages of an assembly line). For distribution, cross-docking can be used to consolidate inbound products from different suppliers which can be delivered when the last inbound shipment is received. For transportation, cross-docking involves the consolidation of shipments from several suppliers (often in LTL batches) in order to achieve economies of scale with FTL<sup>6</sup>.

<sup>5</sup> The Geography of Transport Systems, Jean-Paul Rodrigue, Claude Comtois, Brian Slack, Routledge

<sup>6</sup> ibidem

Figure 9. Schematic Procedures Inside A Distribution Center, With and Without Cross Docking Approach.<sup>7</sup>

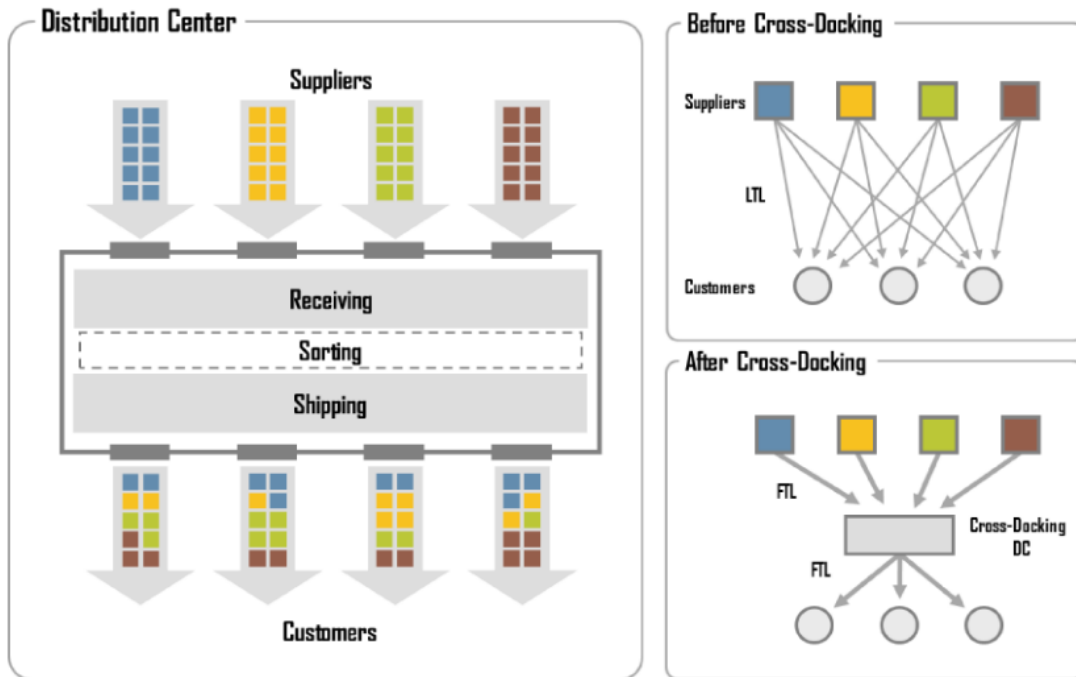
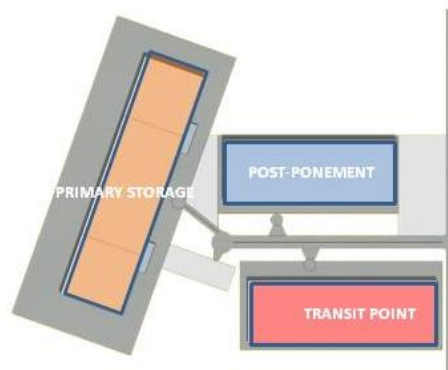


Figure 10. Schematic Functions Distribution in a National Warehouse at Stage A



<sup>7</sup> source: <https://people.hofstra.edu/geotrans/eng/ch5en/conc5en/crossdocking.html>

Figure 11. A Possible Layout of a National Logistics Area. 3 Different Buildings with 3 Different Functions, Each Divided into Subfunctions

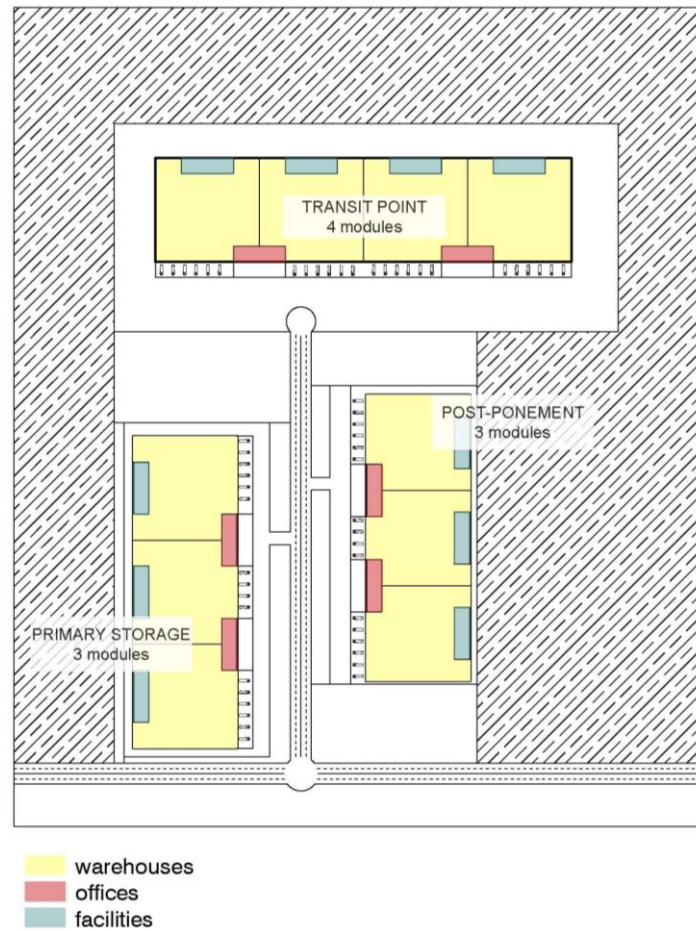
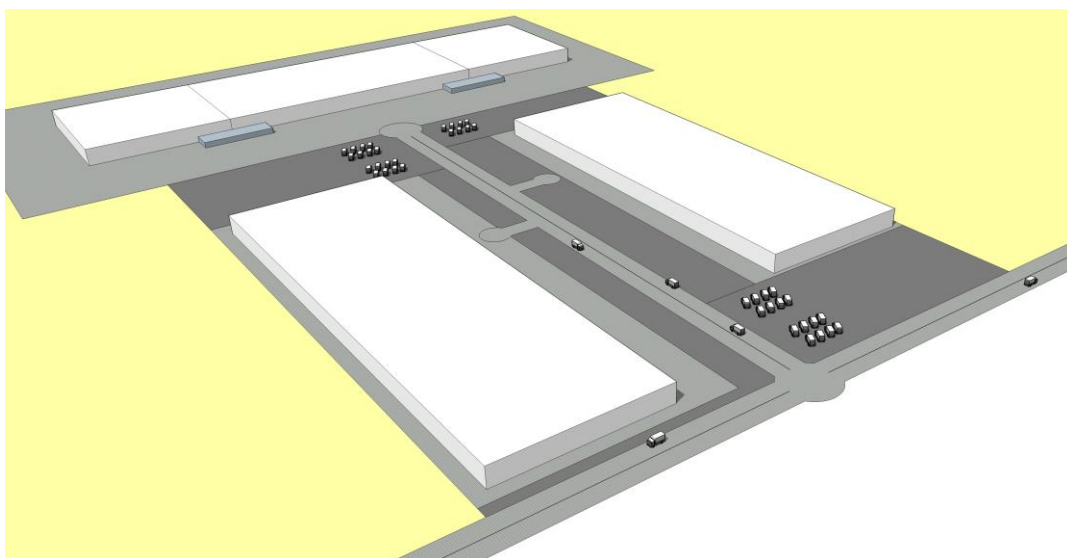
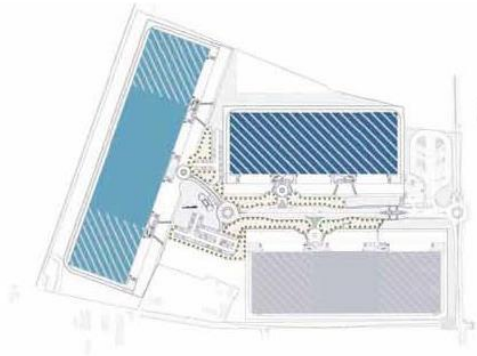


Figure 12. Simulation of a Possible National Logistics Area



## National Level Best Practice: Logicor Center

Figure 13. Logicor center



Country Italy  
City Alessandria  
Function logistics platform  
Dimension 100.000 m<sup>2</sup>

### Notes

- located between the A7, A26 and A21 motorways
- directly connected with the port of Genoa
- consists of 3 divisible warehouses, with an internal height of 10 meters
- equipped with 140 loading bays



## Stage C: Freight Villages

The so-called "freight village" represents the expected evolution of the 2 national logistic areas, that, at Stage C, have to become integrated and multimodal logistic parks, able to combine storage, re-work, commercial services, intermodal transport activities, custom and clearance services. A freight village is an area of land that is devoted to a number of transport and logistics facilities, activities and services, which are not just co-located but also coordinated to encourage maximum



synergy and efficiency<sup>8</sup>. Central to a freight village is an **intermodal terminal that is connected to major freight corridors and a nearby seaport**<sup>9</sup>. Therefore, NTMP proposes these structures for Stage C, when the transport network is fully developed.

The inter-modality is essential to assure flexible, quick movement of containerized and de-containerized cargo between wharf, warehouse and ultimate destination by both road and rail. The integrated work of the intermodal terminal, facilities such as container storage (full and empty) and handling areas, warehouses linked to rail, allow the significant **reduction in cargo handling costs and time, as well as reduction in the use of roads for container transportation.**

But a Freight Village is something different from a traditional Inter-port, because it offers **shared access to other facilities**, equipment and services, like customs and quarantine services, a truck cleaning area, post office and conference and training rooms, managed by only one subject and used on a common access basis by all companies involved in the activities. Moreover, some freight villages offer specific services for their workers, like bus services, parking facilities, amenities such as cafes and canteens, up to recreation and childcare facilities. Obviously, facilities such as these could be provided when the freight village attracts enough operators to warrant their use and could represent a reference point at national level.

As it was mentioned before, the distinguishing feature of a freight village is the centralized management and ownership structure<sup>10</sup>.

Centralized management, in most cases private or public-private, has to plan the long-term investment and growth of the village as well as the short-term maintenance of the village infrastructure. The management structure is responsible for establishing corporate governance and administrative arrangements for the village in relationship with quality control, safety, risk and environmental management. As part of the strategic oversight of the village, the manager would lead village members in designing and implementing ways of attracting business to the village.

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<sup>8</sup> Review of Developments in Transport in Asia and the Pacific 2007: Data and Trends, United Nations Publications

<sup>9</sup> By 2005, there were 40 of these complexes in Europe, and since then there has been an emerging trend for their establishment in the US and in Australia

<sup>10</sup> This is similar to the strategic management role of a port authority/corporation.

Figure 14. Schematic Possible Layouts of Freight Village With Different Functional Zones

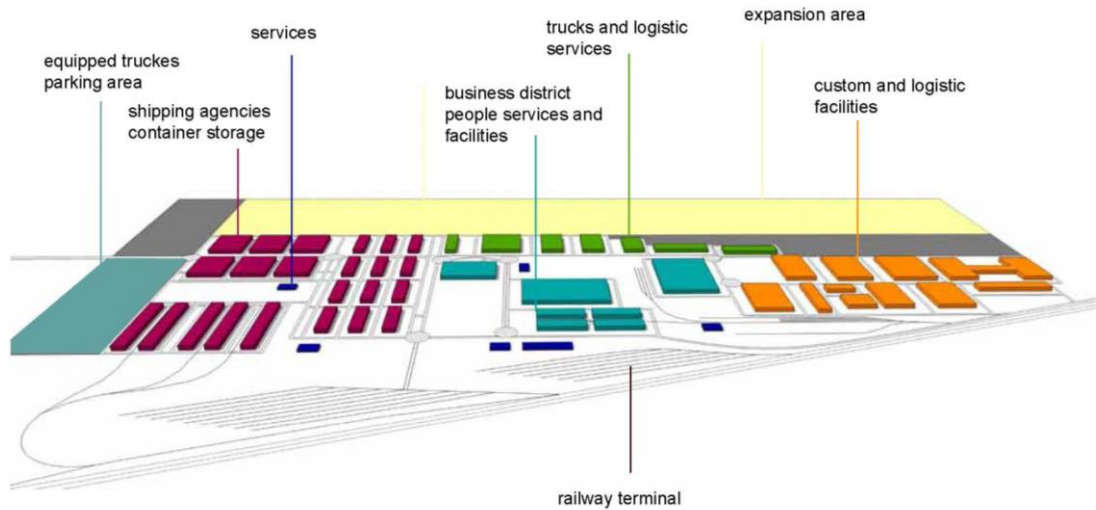
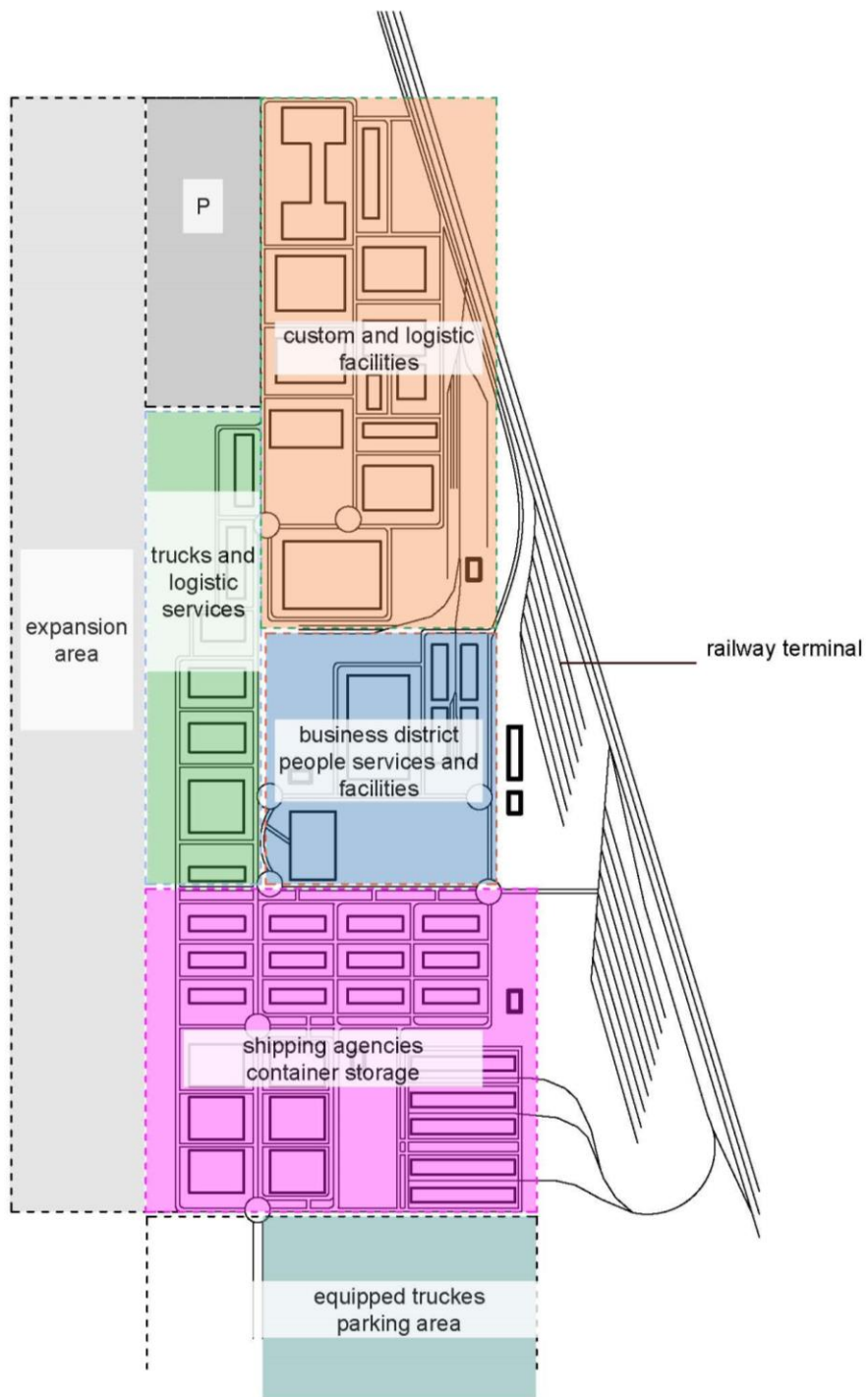


Figure 15.A Detailed Layout of a Typical Freight Village





## National Level Best Practice: Interporto Di Padova

Figure 16. Interporto di Padova



Country Italy  
City Padova  
Function freight village  
Dimension 1.100.000 m<sup>2</sup>

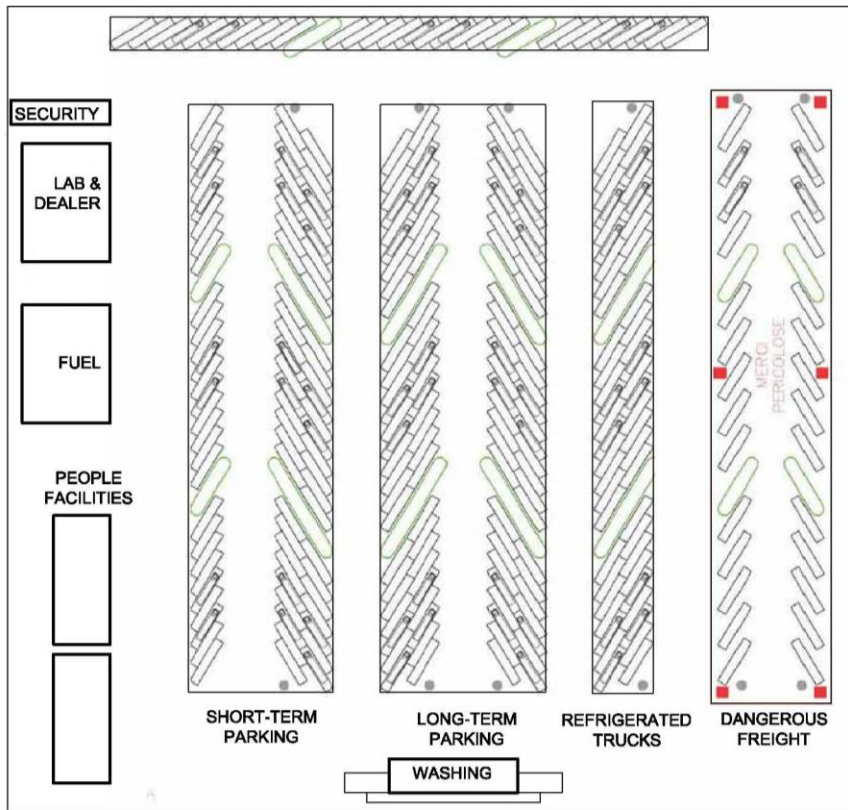
Notes:

- Warehouses: 270.000 m<sup>2</sup>
- Terminal: 300.000 m<sup>2</sup>
- 275.000 TEU
- 5.500 trains/year



## Additional Facilities: Equipped Trucks Parking Areas

Figure 17. Schematic Layout of a Possible Trucks Parking Area, with the Required Functions and Facilities



-100.000 mq of total area for 350 parking slots

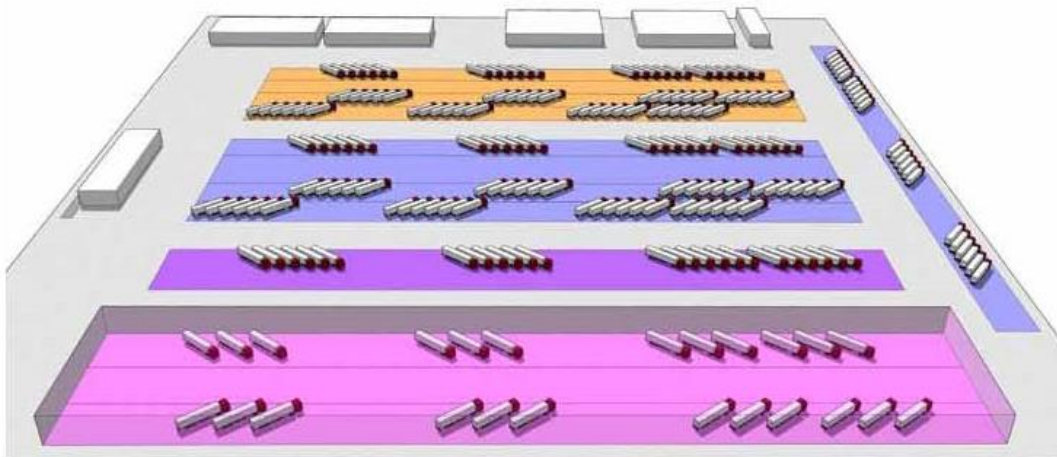
-services and commercial buildings for operators

-equipped cold-parkings area

-Security infrastructures

-Different parking duration opportunities

**COST: 12.000.000 euros**



## Parking Areas Best Practice: Campogalliano Ovest

Figure 18.Campogalliano-ovest



Country Italy  
City Campogalliano (Modena)  
Function equipped parking area  
Dimension 20.000 m<sup>2</sup>

Notes:  
trucks parking lot: 79

