



Sustainable Urban Consolidation
CentrES for construction

Road Map for the uptake of the SUCCESS solution

Version 1.0



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Executive Summary

SUCCEISS chose to target the construction industry as a sector with a major impact on city logistics which has an un-exploited potential of improvement as regards the efficiency of trips associated with the delivery of goods, waste and service in EU cities. The project aims at answering the challenges pinpointed by the European Commission and in particular at improving the understanding of urban freight transport and introducing more resource-efficient, more environmentally friendly, safer and seamless supply chain innovations.

This deliverable describes a methodology to obtain a customized report that includes our solutions for a construction site aiming to improve the efficiency of its supply chain.

This document is a continuation of the framework and methodology started in deliverable D6.2, where the logistics profile of a construction project is defined based on the analysis of the area surrounding the site (urban area dimension) and of the site itself (construction site dimension).

The implementation of solutions in each construction project depends on the project's need and constraints, and also on the resources available to overcome them. Therefore, following the definition of the logistics profile, this document proposes a customized road map for the implementation of the most suitable solutions for each construction site based on specific preferences.

After the analysis of the site and its surroundings is performed, the interested entity starts a second analysis phase by selecting the inputs that it deems more relevant. Then, the interested entity selects a set of specific objectives to accomplish, the criteria that affect the implementation of the solutions and the general management categories to be upgraded.

Once the logistics profile is identified and the main objectives are selected, a customized report is sent to the interested entity with the list of the solutions to be applied classified according to the categories they fall in.

Aiming to increase the scope, visibility and replicability of the SUCCEISS solutions, an interactive web tool is being developed by the consortium to guide the users through the steps of methodology proposed in this deliverable and to identify the most suitable measures for each construction site under evaluation.





1 Introduction

Deliverable D6.3 extends the work developed in D6.2 *Intervention models and impacts report*, with the aim to facilitate the replicability of the project's solutions in any construction site based on the latter's specificities and constraints.

SUCCESS' intervention models listed a set of successful measures that can improve the logistics and the supply chain of a specific construction project under certain conditions. The approach follows a two-step methodology.

In the first step, the complexity of the urban area and of the construction site is evaluated to determine the logistics profile of the construction site (low, moderate and high priority). This step ascertains which projects should receive highest priority within the portfolio of evaluated projects.

Projects categorised as high priority should receive more attention in the second step, in which a list of relevant measures is proposed based on the overall complexity of the project.

Finally, the decision maker is guided, depending on its preferences, in the preparation of an action plan with a selection of the most appropriate measures to face the project's complexity.

The Road Map described in this deliverable extends this second step considering additional parameters to refine the selection of appropriate measures. As each construction project faces specific problems and has specific needs and constraints, the solutions to be adopted may vary depending on several factors (e.g. budget, size, type of construction project, etc.). Therefore the road map identifies the following parameters:

- Relevant criteria for the site management (e.g. cost, time, etc.).
- Specific objectives pursued.
- General management categories (such as Environmental, Health and Safety or Logistics management).

This approach allows the construction companies and other entities involved in the construction supply chain to analyse the complexity of a specific construction site, and helps the decision makers to setup a road map with the most suitable measures to face the project's complexity based on their preferences and on the existing restrictions.

Furthermore, the interactive tool that the project team is developing linking objectives, factors, and management categories with different solutions will facilitate the replicability of the solutions in new construction sites that are exposed to different problems.



2 Methodology

The methodology to implement a road map of the SUCCESS solutions in any given construction site is depicted in Figure 1. This methodology will be carried out step by step through an interactive web-based tool that will provide a report with the most suitable solutions to be implemented.

This methodology is divided into two different phases: the Project Analysis phase (carried out by the SUCCESS consortium) and the Construction Site Analysis phase, performed by the interested entity (e.g. the main contractor of a project).

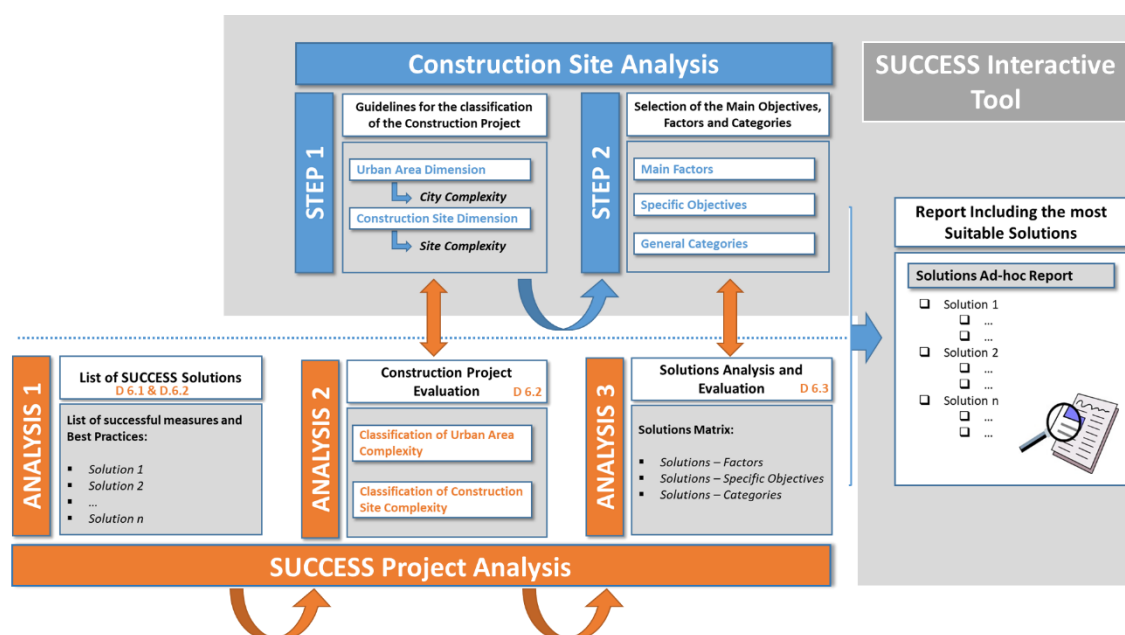


Figure 1. Road map framework.

2.1 SUCCESS Project Analysis Phase

The SUCCESS Project Analysis phase was carried out by the SUCCESS partners and includes three different analyses.

- Analysis 1: List of SUCCESS Solutions
- Analysis 2: Construction Project's Evaluation
- Analysis 3: Solutions' Analysis and Evaluation

The first analysis (i.e. the list of SUCCESS Solutions) consists in the identification of the solutions that can be implemented to increase the efficiency of the construction processes, and more specifically, those that can improve the construction supply chain. A complete description of the selected measures can be found in [D6.1 Report on good practices in the EU and USA in construction logistics in urban area](#) and in [D6.2](#). To help our readers though, the list of SUCCESS solutions is recalled in Table 6.



The second analysis (i.e. Construction Project Evaluation) covers the evaluation of the construction project, including both the urban area dimension and the construction site dimension. This analysis is fully described in D6.2 and summarized in section 3 of this deliverable. The main objective of this second analysis is to categorise the complexity of any construction project and identify different logistics profiles.

Finally, the third analysis (i.e. Solutions Analysis and Evaluation) is fully described in section 4 of this deliverable and links the identified set of solutions with the *specific objectives* pursued, the main *factors* selected and the *general management categories* to be improved. In this third analysis several matrixes (Annex 1) were developed linking the mentioned parameters.

2.2 Interested Entity Analysis Phase

The proposed methodology also covers a *construction site analysis* that is carried out by the interested entity (e.g. a construction company) that wants to improve the management of its supply chain and that will be operationally performed through the aforementioned interactive web based tool.

In this phase, the interested entity performs a specific analysis of the construction project on which to implement the solutions that will be suggested to improve the efficiency of the operations. This site evaluation is linked to the *construction project evaluation* and provides a specific logistic profile for the construction site under evaluation thanks to the analysis of the two main drivers of the project's complexity: the *urban area dimension* and the *construction site dimension*.

Once the construction project is evaluated and is assigned a specific logistics profile, the interested entity selects the main *Criteria* (C) in which it is interested, the *Specific Objectives* pursued (SO) and the *General Management Categories* (GMC) to improve. This second step allows to prepare a customized set of solutions that fit the interested entity's needs and demands.

2.3 Results

The result of the methodology proposed is an ad hoc report including the solutions that are deemed most suitable with respect to the entity's requirements and demands. This report includes for each of the solutions proposed:

- A set of solutions and their impact on the accomplishment of the specific objectives according to the logistics profile of the site under evaluation;
- A classification of the solutions proposed along the *Criteria* chosen by the interested party and;
- A complete description of each the solutions proposed.





3 Classification of the Construction Project

The complexity of the urban area and the construction site is evaluated to ascertain the logistics profile of a construction project (low, moderate and high priority). A complete description of the classification process is provided in D6.2.

3.1 Evaluation of the Logistics Profile of the Construction Project

The goal of this step is to evaluate the complexity of a construction project along two primary dimensions: the complexity of the urban area surrounding the construction site and the complexity of the site itself. A list of variables reflecting the two dimensions is rated using a common 4-point rating scale.

3.1.1 Urban Area Dimension

The *urban area* dimension refers to the complexity of a set of variables related to the accessibility of the specific urban area where the site located. The set of variables listed below are associated with their rating scale in Table 1.

- Site location
- Neighbourhood's environmental sensitivity
- Regulation
- Maturity level of local authorities
- Exposure to air pollution and traffic noise
- Congestion
- Topology
- Topography
- Construction activity

Table 1. Classification of the variables under the urban area dimension

Variable	<i>Slightly complex (1)</i>	<i>Moderately complex (2)</i>	<i>Very complex (3)</i>	<i>Extremely complex (4)</i>
Site location	in the suburbs of a small city	in the centre of a small city OR in the suburbs of a medium city	in the suburbs of a large city OR in the centre of a medium city	in the centre of a large city
Neighbourhood's environmental sensitivity	not needed	one-shot solution	one solution to apply continuously	several solutions to apply continuously
Regulation	low	moderate	high	very high
Maturity level of local authorities	extremely mature	moderately mature	slightly mature	not at all mature
Exposure to air pollution and traffic noise	low	moderate	high	very high
Congestion	low	moderate	high	very high
Topology	grid plan	Concentric zone/ring model	Irregular	Irregular and narrow streets
Topography	very flat	flat	moderate	steep
Construction activity	none	1 small	1 large OR several small	several large





3.1.2 Construction Site Dimension

The *construction site* dimension refers to the complexity of a set of variables related to the construction site itself. The set of variables listed below are associated with their rating scale in Table 2.

- Turnover
- Building size
- Storage capacity
- Time pressure
- Subcontractors
- Site access
- Delivery areas
- Handling equipment
- Certification
- Logistics strategy
- Scope of the project
- Construction's intended usage
- Change in project scope

Table 2. Classification of the variables under the construction site dimension

Variable	Slightly complex (1)	Moderately complex (2)	Very complex (3)	Extremely complex (4)
Turnover	< 20 M€	between 20 and 50 M€	between 50 and 100 M€	> 100 M€
Building size	< 10.000 m ²	between 10.000 and 25.000 m ²	between 25.000 and 50.000 m ²	> 50.000 m ²
Storage capacity	< 0,3	between 0,3 and 0,7 and storage not fragmented or located on the same level	between 0,3 and 0,7 and storage fragmented or located on different levels	> 0,7
Time pressure	< 500 m ² /month	between 500 and 1.000 m ² /month	between 1.000 and 2.000 m ² /month	> 2.000 m ² /month
Subcontractors	few known subcontractors	many known subcontractors	few unknown subcontractors	many unknown subcontractors
Site access	several entrance and exit gates	1 entrance and 1 exit gate	1 entrance/exit and possibility for a U-turn on site	1 entrance/exit and no possibility for a U-turn on site
Delivery areas	several	1 fixed	1 temporary	none
Handling equipment	1 crane on site OR no crane but not needed	several cranes	mobile cranes, forklift, lift on site	only handling equipment of the suppliers (on their trucks)
Certification	none	one with certification	several without certification	several with certification
Logistics strategy	completely centralised	mostly centralised	somewhat centralised	not at all centralised
Scope of the project	construction	renovation	demolition and construction	demolition and renovation
Construction's intended usage	single-use	single-use with high level of design complexity	single-use including special techniques mixed-used including up to 3 uses	mixed-use including at least 3 uses
Change in project scope	extremely unlikely	unlikely	likely	extremely likely





3.2 Mapping the Logistics Profile of the Construction Project

The logistics profile of a construction project is identified from the combination of its urban complexity and construction complexity scores. For an easy understanding, it is graphically represented on a matrix that increases visibility and facilitates the comparison between different projects, helping to ascertain which construction project is in deeper need of an action plan.

The rating of the logistics profile of the construction site uses a 4x4 matrix (with "Slightly", "Moderately", "Very" and "Extremely" [complex] ratings for urban and site complexity) and classifies the construction sites into three different categories: "Low", "Moderate", or "High" priority (Figure 2).

- **"Low priority" category:** Construction projects which benefit from very good conditions on the construction site and on access to the site. The projects in this category do not need proactive actions since such actions would offer the least benefit. The interest to improve logistics practices is low.
- **"Moderate priority" category:** Construction projects which are somehow constrained by either the site itself or the surrounding urban area. Investments should be intermediate for projects falling in this category, since the interest to improve their logistics practices is moderate.
- **"High priority" category:** Construction projects which are highly constrained by their own nature and that are located in a constrained urban area. This category represents the highest interest to improve logistics practices. Actions should target primarily construction projects in this category since they offer the greatest benefit.

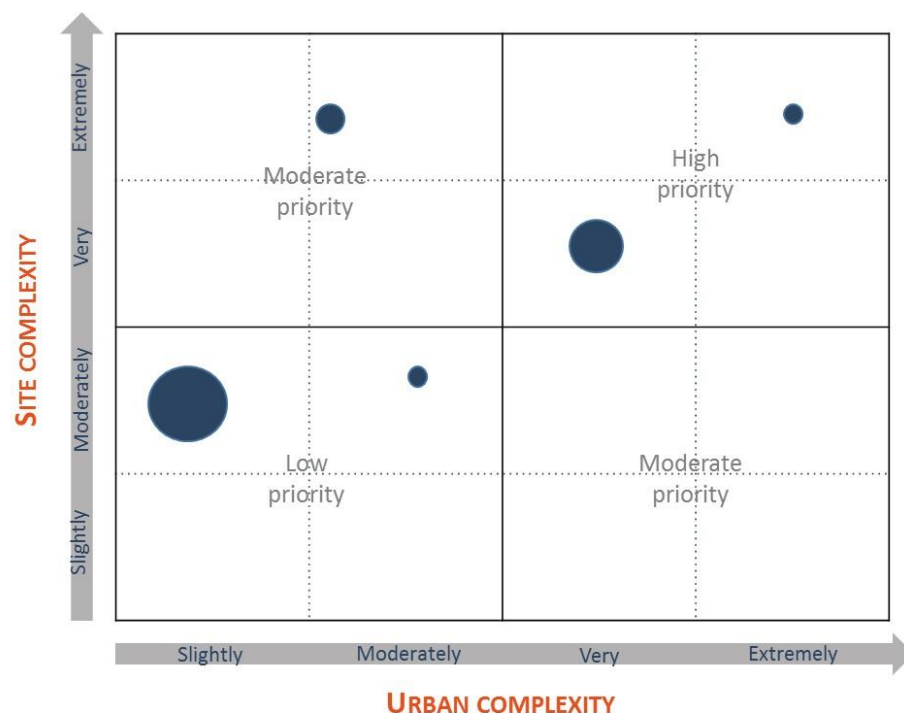


Figure 2 Logistics profile matrix





4 Road Map for the Uptake of SUCCESS Solutions

After the analysis of the site and of the surrounding area and the classification of the project's logistics profiles, a road map including the solutions for the improvement of the project's supply chain is provided to the entity using the methodology described in this deliverable.

Following the proposed methodology, the interested entity selects the main Criteria (C) in which it is interested, the Specific Objectives (SO) it pursues and the General Management Categories (GMC) it wants to improve. Thanks to this customized approach, the interested entity obtains an ad hoc report including the most suitable solutions to upgrade the logistics supply chain of the project(s) under evaluation.

In this second stage of the methodology, a group of experts inside the SUCCESS project's consortium carried out the identification and mapping of Solutions (S), Specific Objectives (SO), Criteria (C) and General Management Categories (GMC). The next sub-sections provide the complete description of each of them.

4.1 List of Specific Objectives (SO) Pursued

One of the main purpose of the SUCCESS project is to increase the efficiency of the supply chain management of the construction industry, a sector normally reluctant to change in which there is significant room for improvement. Keeping this into account, a group of experts belonging to the SUCCESS project's consortium have proposed a set of specific objectives that can increase the efficiency of the construction logistics. The complete list of these Specific Objectives (SO) is described in Table 3. A total of twenty-four specific objectives were identified.





Table 3. List of SUCCESS Specific Objectives

Number	Name
SO1	Increase safety of the logistics operations at the construction site
SO2	Increase security of the construction site
SO3	Increase the reliability of the deliveries (Quality and Quantity)
SO4	Increase the level of control and reliability of the deliveries schedule
SO5	Increase the performance of the labour force at the construction site
SO6	Increase the performance of the machinery and handling equipment
SO7	Increase the performance of the construction tasks
SO8	Increase the interoperability between suppliers and contractors
SO9	Increase the interoperability between stakeholders
SO10	Reduce delivery processes time
SO11	Reduce the congestion at the construction site
SO12	Reduce the congestion surrounding the construction site
SO13	Reduce the number of deliveries on the construction site
SO14	Reduce the number of materials stored on the construction site
SO15	Reduce the wasting time due to material location and management
SO16	Reduce the wasted material on the construction site
SO17	Reduce the stolen material on the construction site
SO18	Reduce dust pollution in the construction site
SO19	Reduce the carbon footprint of the construction site
SO20	Reduce the loss of material on the construction site
SO21	Improve the management of the administrative tasks at the construction site
SO22	Improve communication protocols and activities at the construction site
SO23	Improve the data collection and reporting for decision making
SO24	Improve the delivery planning

The solutions (S) proposed in the analysis were classified according to the impact that they have on the Specific Objectives (SO) targeted. The “Solutions - Specific Objectives” matrix (Annex 1) classifies the set of Solutions (S) and the impact that they have on each Specific Objective (SO) following these criteria:

- Direct Impact: the solution has a direct impact on the compliance with the selected objective;
- Indirect Impact: the solution helps to accomplish the selected objective indirectly;
- No Impact: the solution does not have impact on the selected objective.

Figure 3 shows an example of the “Solutions - Specific Objectives” matrix that links the two categories according to the criteria previously mentioned.



	Matrix Solutions - Objectives	SO1	SO2	SO3	SO4	SO5	SO6
		Increase safety of the logistics operations at the construction site	Increase security of the construction site	Increase the reliability of the deliveries (Quality and Quantity)	Increase the level of control and reliability of the deliveries schedule	Increase the performance of the labor force at the construction site	Increase the performance of the machinery and handling equipment
	S1	Access Control					
	S2	Accidents Reporting					
	S3	Alternative Material Handling - Lift					
	S4	Approved Routes Plan					
	S5	Authorisation to use Public Space					
	S6	BIM					
	S7	Blind Mirrors at the access and exits					
	S8	Blind Spot Minimization					

Figure 3. Example of the matrix linking SUCCESS solutions and Specific Objectives



4.2 List of Criteria

Following the same approach they used to define the Specific Objectives pursued to increase the efficiency of the construction supply chain, the group of experts of the SUCCEISS project have proposed a set of Criteria that affect the implementation of measures in the construction industry. These Criteria (C) are listed in Table 4.

Table 4. List of SUCCEISS main Criteria

Number	Name
C1	Continuous Control Required
C2	Continuous Management Required
C3	Cost
C4	Difficulty to implement
C5	Prerequisites needed
C6	Resources needed
C7	Time to implement

Following the methodology explained in section 2 and depicted in Figure 1, the list of 68 solutions identified in the SUCCEISS project (Table 6) for the improvement of the construction efficiency was analysed and categorized with the expertise and support of the SUCCEISS construction companies. The range used to express the degree of relation between the solutions and the criteria is:

- Low
- Medium
- High

The impact of every criterion on each of the proposed solutions was classified according to the previously mentioned rating. Besides, an additional column evaluating the global impact of the solution proposed was added to the analysis (Figure 4). The main objective of this additional column is to facilitate the understanding of the scope of the possible outcomes and benefits of each of the solutions proposed.



Matrix Solutions - Factors	Range			Difficult to implement	Prerequisites needed	Resources needed	Time to implement	Global Impact
	Low	Medium	High					
Access Control	Red	Red	Yellow	Green	Green	Green	Green	Yellow
Accidents Reporting	Yellow	Yellow	Green	Green	Green	Green	Green	Green
Alternative Material Handling - Lift	Yellow	Yellow	Red	Yellow	Green	Red	Green	Yellow
Approved Routes Plan	Red	Red	Green	Green	Red	Yellow	Green	Yellow
Authorisation to use Public Space	Green	Green	Yellow	Yellow	Red	Green	Green	Green
BIM	Yellow	Yellow	Red	Red	Red	Yellow	Red	Red

Figure 4. Example of the matrix linking SUCCESS Solutions and Criteria



4.3 List of General Management Categories

Finally, a list of the General Management Categories (GMC) identified for improving the management of the construction supply chain is presented in Table 5.

Table 5. List of SUCCESS General Management Categories

Number	Name
GMC1	Administrative efficiency - Administrative management
GMC2	Environmental sustainability - Environmental management
GMC3	Health and safety - Health and safety management
GMC4	Logistic efficiency - Logistic management
GMC5	Production efficiency - Production management
GMC6	Quality management
GMC7	Security - Security management
GMC8	Waste Management

The complete set of sixty-eight solutions identified in the SUCCESS project for the improvement of the efficiency of the construction processes was classified on the basis of the general management categories listed in Table 5. Figure 5 shows how all the solutions were grouped according to the general management categories they fall into. It can be seen from the figure that some of the solutions are listed in two different categories, as some of them affect more than one construction process.





GMC1 Administrative efficiency - Administrative management	GMC2 Environmental Sustainability - Environmental Management	GMC3 Health and Safety - Health and Safety Management	GMC4 Logistic Efficiency - Logistic Management	GMC5 Production efficiency - Production management	GMC6 Quality Management	GMC7 Security Management	GMC8 Waste Management
BIM	Building Canvas	Blind Mirrors at the entry/exit gates	Approved Routes Plan	BIM	Defects Management Software	Closed Room	Centralize waste collection
Framework Agreement	Centralize waste collection	Blind Spot Minimization	Authorisation to use Public Space for Storage	Centralised Waste Collection		Construction Consolidation Centre	Use of demolition waste
RFID	Coating	CLOCS - Construction Logistics and communication	Centralised Waste Collection	Construction Consolidation Centre		Entry / Exit Gate	Waste Management Team
Sourcing Software	Compression	Coating	Consolidation	Construction Logistics Plan		Entry Barrier	
	Consolidation	Compression	Construction Consolidation Centre	Dedicated Logistic Team		Exit Barrier	
	Construction / Deconstruction Site tarpaulin	Construction Consolidation Centre	Construction Logistic Plan	Last Planner System		Road Cleaning	
	Construction Consolidation Centre	Construction Material Canvas	Dedicated Logistic Team	Lift		Secure Area	
	Construction Material Canvas	Dust Control Plan	Defects Management Software	Mobile Crane		Site Demarcation	
	Decorated Fence	Emission Mitigation Plan	Delivery Area Booking System	Pre-fabrication		Site Guarding	
	Dust Control Plan	Entry / Exit Gate	Delivery Schedule	Scaffolding Tower		Storage in Containers	
	Emission Mitigation Plan	Entry Barrier	Delivery Windows	Site Logistics Plan		Street furniture and vegetals protections	
	FORS - Fleet operator label	Exit Barrier	Dynamique Site Logistic Plan	Waste Management Team		Construction Material Canvas	
	PEIK Labelling	Housekeeping Plan	FORS - Fleet Operator Label				
	Physical containment of fugitive dust	Lift	Housekeeping Plan				
	Road Cleaning	Manoeuvring Guide	Just In Time Deliveries				
	Road/Paths Sealing	Physical containment of fugitive dust	Last Planner System				
	Routes Plan	Recordkeeping and reporting damages, injuries	Lift				
	Spraying of a dust suppressing agent	Road Cleaning	Logistics Team				
	Street furniture and vegetals protections	Roads / Paths Sealing	Manoeuvring Guide				
	Tarpaulin	Side Under-run Protection	Mobile Crane				
	Truck Tarpaulin	Speed Limit Inside	Off Peak Time for Deliveries				
	Use of demolition waste	Speed Limit Outside	Pre-fabrication				
	Water Pool/Pit	Tarpaulin	RFID				
	Wheel cleaning zone	Traffic Lights to make insertion in traffic safety	Routes Plan				
	Wheel washing of all construction non-road and motor vehicles leaving the site	Truck Tarpaulin	Scaffolding Tower				
		Use of demolition waste	Shared Handling Equipment				
		Vehicle Manoeuvring Warnings	Site Logistic Plan				
		Warning Signage	Waste Management Team				
		Water Pool/Pit					
		Wheel cleaning zone					
		Wheel washing of all construction non-road and motor vehicles leaving the site					

Figure 5. Complete list of the SUCCEED Solutions in each of the General Management Categories

4.4 List of Solutions

Table 6 lists the solutions selected by the SUCCESS team to improve the management of the construction supply chain and the logistics operations inside a construction site. In total, a set of sixty-eight different solutions have been identified to increase the efficiency of the construction processes not only of the construction companies, but also including other stakeholders such as material suppliers and trade contractors.

Table 6. List of SUCCESS solutions

Number	Name	Number	Name
S1	Approved Routes Plan	S36	Mobile Crane
S2	Authorisation to use Public Space for Storage/Delivery	S37	Off-Peak Time for Deliveries
S3	BIM	S38	Physical containment of fugitive dust
S4	Blind Mirrors at the entry/exit gate	S39	PIEK Labelling
S5	Blind Spot Minimization	S40	Pre-fabrication
S6	Building Canvas	S41	Recordkeeping and reporting damages, injuries and illnesses
S7	Centralize waste collection	S42	RFID
S8	"CLOCS - Construction Logistics and community safety"	S43	Road Cleaning
S9	Closed Room	S44	Roads / Paths Sealing
S10	Coating	S45	Routes Plan
S11	Compression	S46	Scaffolding Tower
S12	Consolidation	S47	Secure Area
S13	Construction / Deconstruction Site tarpaulin	S48	Shared Handling Equipment
S14	Construction Consolidation Centre	S49	Side Under-run Protection
S15	Construction Logistics Plan	S50	Site Demarcation
S16	Construction Material Canvas	S51	Site Guarding
S17	Decorated Fence	S52	Site Logistic Plan
S18	Defects Management Software	S53	Sourcing Software
S19	Delivery Area Booking System	S54	Speed Limits inside
S20	Delivery Schedule	S55	Speed Limits outside
S21	Delivery Windows	S56	Spraying of a dust-suppressing agent
S22	Dust Control Plan	S57	Storage in Containers
S23	Dynamic Site Logistic Plan	S58	Street furniture and vegetal protections
S24	Emission Mitigation Plan	S59	Tarpaulin
S25	Entry / Exit Gate	S60	Traffic Lights to make insertion in traffic safety
S26	Entry Barrier	S61	Truck Tarpaulin
S27	Exit Barrier	S62	Use of demolition waste
S28	FORS - Fleet operator label	S63	Vehicle Manoeuvring Warnings
S29	Framework Agreement	S64	Warning Signage
S30	Housekeeping Plan	S65	Waste Management Team
S31	Just In Time Deliveries	S66	Water Pool/Pit
S32	Last Planner System	S67	Wheel cleaning zone
S33	Lift	S68	Wheel washing of all construction non-road and motor vehicles leaving the site
S34	Logistic Team		
S35	Manoeuvring Guide		



Conclusion

This deliverable explains the framework for the implementation of the SUCCESS solutions following a two-step methodology where the interested entity obtains a customized road map for improving the management of its construction supply chain.

The SUCCESS consortium has analysed the two dimensions that affect the complexity of a construction project (urban dimension and construction site dimension), providing a methodology to be followed by any interested entity willing to increase the efficiency of its portfolio of construction projects.

The proposed methodology dictates the priority of the construction projects in which solutions must be implemented to upgrade their efficiency, but it also proposes a set of solutions to be implemented for the maximum compliance with the selected objectives and criteria.

In order to increase the scope, visibility and replicability of the SUCCESS solutions, an interactive web tool is being developed by the SUCCESS consortium to guide the interested parties through the steps of the methodology proposed in this deliverable and to obtain a customized report including the solutions proposed by the SUCCESS team for any construction project under evaluation.





Annexes

Annex 1

- *List of Specific Objectives, Criteria, Solutions and General Management Categories*
- *Matrix Specific Objectives - Solutions*
- *Matrix Criteria - Solutions*
- *General Management Categories and Solutions*



List of Specific Objectives, Criteria, Solutions and General Management Categories

SPECIFIC OBJECTIVES	
#	Description
SO1	Increase safety of the logistics operations at the construction site
SO2	Increase security of the construction site
SO3	Increase the reliability of the deliveries (Quality and Quantity)
SO4	Increase the level of control and reliability of the deliveries schedule
SO5	Increase the performance of the labour force at the construction site
SO6	Increase the performance of the machinery and handling equipment
SO7	Increase the performance of the construction tasks
SO8	Increase the interoperability between suppliers and contractors
SO9	Increase the interoperability between stakeholders
SO10	Reduce delivery processes time
SO11	Reduce the congestion at the construction site
SO12	Reduce the congestion surrounding the construction site
SO13	Reduce the number of deliveries on the construction site
SO14	Reduce the number of materials stored on the construction site
SO15	Reduce the wasting time due to material location and management
SO16	Reduce the wasted material on the construction site
SO17	Reduce the stolen material on the construction site
SO18	Reduce dust pollution in the construction site
SO19	Reduce the carbon footprint of the construction site
SO20	Reduce the loss of material on the construction site
SO21	Improve the management of the administrative tasks at the construction site
SO22	Improve communication protocols and activities at the construction site
SO23	Improve the data collection and reporting for decision making
SO24	Improve the delivery planning

CRITERIA	
#	Description
C1	Continuous Control Required
C2	Continuous Management Required
C3	Cost
C4	Difficulty to implement
C5	Prerequisites needed
C6	Resources needed
C7	Time to implement

SOLUTIONS	
#	Description
S1	Approved Routes Plan
S2	Authorisation to use Public Space for Storage/Delivery
S3	BIM
S4	Blind Mirrors at the entry/exit gate
S5	Blind Spot Minimization
S6	Building Canvas
S7	Centralize waste collection
S8	CLOCS - Construction Logistics and community safety
S9	Closed Room
S10	Coating
S11	Compression
S12	Consolidation
S13	Construction / Deconstruction Site tarpaulin
S14	Construction Consolidation Centre
S15	Construction Logistics Plan
S16	Construction Material Canvas
S17	Decorated Fence
S18	Defects Management Software
S19	Delivery Area Booking System
S20	Delivery Schedule
S21	Delivery Windows
S22	Dust Control Plan
S23	Dynamique Site Logistic Plan
S24	Emission Mitigation Plan
S25	Entry / Exit Gate
S26	Entry Barrier
S27	Exit Barrier
S28	FORS - Fleet operator label
S29	Framework Agreement
S30	Housekeeping Plan
S31	Just In Time Deliveries
S32	Last Planner System
S33	Lift
S34	Logistic Team
S35	Manouvering Guide
S36	Mobile Crane
S37	Off Peak Time for Deliveries
S38	Physical containment of fugitive dust
S39	PIEK Labelling
S40	Pre-fabrication
S41	Recordkeeping and reporting damages, injuries and illnesses
S42	RFID
S43	Road Cleaning
S44	Roads / Paths Sealing
S45	Routes Plan
S46	Scaffolding Tower
S47	Secure Area
S48	Shared Handling Equipment
S49	Side Under-run Protection
S50	Site Demarcation
S51	Site Guarding
S52	Site Logistic Plan
S53	Sourcing Software
S54	Speed Limits inside
S55	Speed Limits outside
S56	Spraying of a dust suppressing agent
S57	Storage in Containers
S58	Street furniture and vegetal protections
S59	Tarpaulin
S60	Traffic Lights to make insertion in traffic safety
S61	Truck Tarpaulin
S62	Use of demolition waste
S63	Vehicle Manouvering Warnings
S64	Warning Signage
S65	Waste Management Team
S66	Water Pool/Pit
S67	Wheel cleaning zone
S68	Wheel washing of all construction non-road and motor vehicles leaving the site

GENERAL MANAGEMENT CATEGORIES	
#	Description
GMC1	Administrative efficiency - Administrative management
GMC2	Environmental sustainability - Environmental management
GMC3	Health and safety - Health and safety management
GMC4	Logistic efficiency - Logistic management
GMC5	Production efficiency - Production management
GMC6	Quality management
GMC7	Security - Security management
GMC8	Waste Management

Matrix Specific Objectives - Solutions

[illegible]

Matrix Criteria - Solutions

		Range							
		Low	Medium	High					
		C1	C2	C3	C4	C5	C6	C7	
Matrix Solutions - Criteria		Continous Control Required	Continous Management Required	Cost	Difficulty to implement	Prerequisites needed	Resources needed	Time to implement	Global Impact
S1	Approved Routes Plan								
S2	Authorisation to use Public Space for Storage/Delivery								
S3	BIM								
S4	Blind Mirrors at the entry/exit gates								
S5	Blind Spot Minimization								
S6	Building Canvas								
S7	Centralize waste collection								
S8	CLOCS - Construction Logistics and Community Safety								
S9	Closed Room								
S10	Coating								
S11	Compression								
S12	Consolidation								
S13	Construction / Deconstruction Site Tarpaulin								
S14	Construction Consolidation Centre								
S15	Construction Logistics Plan								
S16	Construction Material Canvas								
S17	Decorated Fence								
S18	Defects Management Software								
S19	Delivery Area Booking System								
S20	Delivery Schedule								
S21	Delivery Windows								
S22	Dust Control Plan								
S23	Dynamique Site Logistic Plan								
S24	Emission Mitigation Plan								
S25	Entry/Exit Gate								
S26	Entry Barrier								
S27	Exit Barrier								
S28	FORS - Fleet operator label								
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S32	Last Planner System								
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S52	Site Logistic Plan								
S53	Sourcing Software								
S54	Speed Limits Inside								
S55	Speed Limits Outside								
S56	Spraying of a dust suppressing agent								
S57	Storage in Containers								
S58	Street furniture and vegetals protections								
S59	Tarpaulin								
S60	Traffic Lights to make insertion in traffic safety								
S61	Truck Tarpaulin								
S62	Use of demolition waste								
S63	Vehicle Manouvering Warnings								
S64	Warning Signage								
S65	Waste Management Team								
S66	Water Pool/Pit								
S67	Wheel cleaning zone								
S68	Wheel washing of all construction non-road and motor vehicles leaving the site								

General Management Categories and Solutions

Solutions		GMC1	GMC2	GMC3	GMC4	GMC5	GMC6	GMC7	GMC8
		Administrative efficiency - Administrative management	Environmental Sustainability - Environmental Management	Health and Safety - Health and Safety Management	Logistic Efficiency - Logistic Management	Production efficiency - Production management	Quality Management	Security Management	Waste Management
S1	Approved Routes Plan	BIM	Building Canvas	Blind Mirrors at the entry/exit gates	Approved Routes Plan	BIM	Defects Management Software	Closed Room	Centralize waste collection
S2	Authorisation to use Public Space for Storage/Delivery	Framework Agreement	Centralize waste collection	Blind Spot Minimization	Authorisation to use Public Space for Storage	Centralised Waste Collection		Construction Consolidation Centre	Use of demolition waste
S3	BIM	RFID	Coating	CLOCS - ConstructionLogistics and community	Centralised Waste Collection	Construction Consolidation Centre		Entry / Exit Gate	Waste Management Team
S4	Blind Mirrors at the entry/exit gate	Sourcing Software	Compression	Coating	Consolidation	Construction Logistics Plan		Entry Barrier	
S5	Blind Spot Minimization		Consolidation	Compression	Construction Consolidation Centre	Dedicated Logistic Team		Exit Barrier	
S6	Building Canvas		Construction / Deconstruction Site tarpaulin	Construction Consolidation Centre	Construction Logistic Plan	Last Planner System		Road Cleaning	
S7	Centralize waste collection		Construction Consolidation Centre	Construction Material Canvas	Dedicated Logistic Team	Lift		Secure Area	
S8	CLOCS - ConstructionLogistics and community safety		Construction Material Canvas	Dust Control Plan	Defects Management Software	Mobile Crane		Site Demarcation	
S9	Closed Room		Decorated Fence	Emission Mitigation Plan	Delivery Area Booking System	Pre-fabrication		Site Guarding	
S10	Coating		Dust Control Plan	Entry / Exit Gate	Delivery Schedule	Scaffolding Tower		Storage in Containers	
S11	Compression		Emission Mitigation Plan	Entry Barrier	Delivery Windows	Site Logistics Plan		Street furniture and vegetals protections	
S12	Consolidation		FORS - Fleet operator label	Exit Barrier	Dynamique Site Logistic Plan	Waste Management Team		Construction Material Canvas	
S13	Construction / Deconstruction Site tarpaulin		PEIK Labelling	Housekeeping Plan	FORS - Fleet Operator Label				
S14	Construction Consolidation Centre		Physical containment of fugitive dust	Lift	Housekeeping Plan				
S15	Construction Logistics Plan		Road Cleaning	Manouvering Guide	Just In Time Deliveries				
S16	Construction Material Canvas		Road/Paths Sealing	Physical containment of fugitive dust	Last Planner System				
S17	Decorated Fence		Routes Plan	Recordkeeping and reporting damages, injuries	Lift				
S18	Defects Management Software		Spraying of a dust suppressing agent	Road Cleaning	Logistics Team				
S19	Delivery Area Booking System		Street furniture and vegetals protections	Roads / Paths Sealing	Manouvering Guide				
S20	Delivery Schedule		Tarpaulin	Side Under-run Protection	Mobile Crane				
S21	Delivery Windows		Truck Tarpaulin	Speed Limit Inside	Off Peak Time for Deliveries				
S22	Dust Control Plan		Use of demolition waste	Speed Limit Outside	Pre-fabrication				
S23	Dynamique Site Logistic Plan		Water Pool/Pit	Tarpaulin	RFID				
S24	Emission Mitigation Plan		Wheel cleaning zone	Traffic Lights to make insertion in traffic	Routes Plan				
S25	Entry / Exit Gate		Wheel washing of all construction non-road and	safety	Scaffolding Tower				
S26	Entry Barrier		motor vehicles leaving the site	Truck Tarpaulin	Shared Handling Equipment				
S27	Exit Barrier			Use of demolition waste	Site Logistic Plan				
S28	FORS - Fleet operator label			Vehicle Manouvering Warnings	Waste Management Team				
S29	Framework Agreement			Warning Signage					
S30	Housekeeping Plan			Water Pool/Pit					
S31	Just In Time Deliveries			Wheel cleaning zone					
S32	Last Planner System			Wheel washing of all construction non-road					
S33	Lift			and motor vehicles leaving the site					
S34	Logistic Team								
S35	Manouvering Guide								
S36	Mobile Crane								
S37	Off Peak Time for Deliveries								
S38	Physical containment of fugitive dust								
S39	PIEK Labelling								
S40	Pre-fabrication								
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