



Sustainable Urban Consolidation
CentrES for construction

Scientific Advisory Board report 1

V1.0



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 633338.

Dissemination level

Confidential

Work package and task

Task 1.2 - WP coordination

Author(s)

LIST

Contributor(s)

SAB Members, All partners

Due date of deliverable

31/12/2016

*Submission date of
deliverable*

29/12/2016

Status (F: final, D: draft)

F



Document Control Sheet

Project number	633338		
Project Acronym	SUCCESS		
Work Package	WP1 – Management		
Version	1.0		
Issue	Version	Dates	Content
	0.1	09/12/16	Initial version drafted by CG
	0.2	12/12/16	Integrates comments of FF
	0.3	13/12/16	Integrates comments of CG
	0.4	13/12/16	Integrates comments of FF
	1.0	29/12/16	Finalisation

Classification of this report:

Final	X
Confidential	X

Project Coordinator:

Luxembourg Institute of Science and Technology (LIST)

5, Avenue des Hauts-Fourneaux
L-4462 Esch-sur-Alzette, LUXEMBOURG

Contact Persons:

FERRERO Francesco, +352 275 888 2227, francesco.ferrero@list.lu
GUERLAIN Cindy, +352 275 888 6746, cindy.guerlain@list.lu





Table of Contents

Table of Contents	2
Introduction	2
1 The Scientific Advisory Board	3
2 The collaboration with the SAB	4
3 Summary of the SAB's feedback and the answers provided by the consortium	5
3.1 D2.1 - Pilot sites detailed qualitative description with ref. to supply chain, the construction sites and the reverse logistics, city logistics rule	5
3.2 D2.2 - KPI's and methodologies for construction logistics	6
3.3 D2.3 - Database structure	9
3.4 D2.4 - Pilot sites quantitative as-is analysis including KPI of the as-is situation	9
3.5 D2.5 - Open Data accessibility and treatment document	10
3.6 D3.1 - List of ICT tools transferable to construction logistic management	11
3.7 D3.2 - Process mapping and management tools for construction logistic	11
3.8 D4.1 - Site specific improvements and goal	11
3.9 D6.1 - Intermediate Report on good practices in the EU and USA in construction logistics in urban area	13
3.10 General comments	13

Introduction

SUCCESS targets the construction industry as a sector with a major impact on city logistics and an unexploited potential to improve the efficiency of trips related to the delivery of goods & services in EU cities. It aims at answering the challenges pinpointed by the European Commission, in particular by improving the understanding of urban freight transportation and by introducing more resource-efficient, more environmental-friendly, safer and seamless innovations in the construction supply chain.

D1.2 - Scientific Advisory Board report 1 is part of the management work package (WP1) which coordinates, administrates and manages the activities of





the project to ensure that they are completed on time, respecting the Description of Action and the provisional budget and with high-quality results.

This deliverable sums up the feedback received from the Scientific Advisory Board (SAB) on the project's activities performed during the first period as well as on ongoing actions, on which advice was requested on how to better deliver the expected results.

This report has three chapters. The first one describes the composition of the SAB and its role. The second one lists the interactions that occurred between the consortium and the SAB. The last one summarises the comments of the members of the SAB and the actions the consortium undertook to take them into account.

1 The Scientific Advisory Board

The Scientific Advisory Board (SAB) provides external advice and a permanent evaluation of the achievements of the project. The Board brings additional expertise to the project and comments on its progress and results so as to orientate the activities towards a full achievement of the goals of SUCCEISS.

The SAB members were chosen among leading experts in the logistics, supply chain and construction sectors. Through them the project intends to benefit also from the knowledge and experience developed in extra-EU countries, especially in the United States.

The Board is currently composed of the following members:

1. **Natashia BOLAND** (female), Georgia Institute of Technology, United States
2. **Luís Esteban DOMÍNGUEZ ARRIBAS** (male), FourSquare Consultoria, Spain
3. **Jeff LINDEROTH** (male), Department of Industrial and Systems Engineering, University of Wisconsin-Madison, United States
4. **Christine PASQUIRE** (female), Lean Project Management Research Group, School of Architecture Design and the Built Environment, Nottingham Trent University, United Kingdom
5. **Antonio SANZ BONDÍA** (male), Valencia City Council, Spain
6. **Martin SAVELSBERGH** (male), Georgia Institute of Technology, United States.
7. Vicente ROSELLO NAVARRO (male), initially a member of the SAB working as a logistics analyst at CEMEX Research Group, resigned in September 2016 and was replaced by Antonio SANZ BONDÍA.

The main activities of the SAB consist in providing a feedback on the SUCCEISS project's deliverables before their official submission and in providing inputs for





international benchmarking activities. Because the work of the SAB is not remunerated, the members provide feedback according to their competences, areas of interest and most of all on a best effort basis.

2 The collaboration with the SAB

To improve the collaboration, the members of the SAB have access, under a Non-Disclosure Agreement, to all the deliverables and to several other internal documents of the project including the work plan, minutes of meetings, etc.

SAB members were contacted several times since the beginning of the project. They were regularly invited to attend the project meetings. The Project Coordinator acts as the contact point between the Board and the project consortium.

The table below summarises the interactions with the Board.

Date	Channel	Topic	Annotations
30/07/15	Virtual Meeting	Agenda: <ul style="list-style-type: none"> - Project overview - Presentation of the partners and their main interest - Expectations and open discussion 	Minutes were sent to the SAB N. BOLAND, L. DOMÍNGUEZ ARRIBAS, J. LINDEROTH and M. SAVELSBERGH attended the meeting
06/08/15	E-mail	Minutes of the previous Virtual Meeting are circulated and access to project's documents is granted.	
12/08/15	E-mail	Feedback is asked on <i>Tasks 2.1 - Detailed pilot sites description</i> and <i>Task 2.2 - Identification of KPIs and methodologies to elaborate data</i>	Feedback is received via e-mail from N. BOLAND (30/07/15), M. SAVELSBERGH (27/10/15) and V. ROSELLO NAVARRO (01/11/15)
18/08/16	E-mail	SAB is informed of the change of coordinator and updated on the project's advancement. Members are invited to attend the Project Management Board	L. DOMÍNGUEZ ARRIBAS confirms his availability to attend the meeting





		and Steering Committee Meeting in Verona (October 27-28, 2016)	
27/10/16	Physical Meeting	L. DOMÍNGUEZ ARRIBAS attends the PMB & SC Meeting and gives a detailed feedback on several aspects of the project during an ad-hoc session.	
15/11/16	E-mail	Feedback is asked on amended (D2.2 and D2.3) and new (D2.4, D2.5, D4.1) deliverables posted. Feedback is asked on ICT solutions for construction logistics to improve D3.1. Feedback is asked on best practices in the EU and US to improve D6.1.	Feedback is received via e-mail from L. DOMÍNGUEZ ARRIBAS (30/11/16), A. SANZ BONDÍA (04/12/16) and M. SAVELSBERGH (05/12/16).

3 Summary of the SAB's feedback and the answers provided by the consortium

3.1 D2.1 - Pilot sites detailed qualitative description with ref. to supply chain, the construction sites and the reverse logistics, city logistics rule

Feedback provided by V. ROSELLO NAVARRO on 01/11/15

Comment 1.7.1¹: No information regarding the availability of a CCC in any of the four pilot sites. If the goal is to stand out the importance of the use of CCC's we should include them. And at the same time, perhaps, compare the performance of sites using a CCC with those that don't use it.

Answer 1.7.1: The availability of a CCC will be explored later in the project during the elaboration of the business models (WP3).

Comment 1.7.2: Although it maybe yet too soon to mention the waste generated in any of the four pilot sites, the experience of building teams can

¹ The comments are identified by a X.Y.Z index where X identifies the order of the item on which the comment is expressed, Y identifies the SAB member and Z identifies the comments in progressive order. Comment 1.7.1 will thus identify the 1st comment expressed by the 7th SAB member (i.e. V. ROSELLO NAVARRO) on the 1st item under exam in this report (i.e. D2.1), while comment 1.7.2 will identify the 2nd comment expressed by the same SAB member on the same item.





tell us the nature, type of waste, and an approximation of the quantity generated. That will help us foresee possible backhauls, and the diminution of truck trips.

Answer 1.7.2: Data on waste will be collected in WP2.

Comment 1.7.3: In Table 1 - Population and geographic statistics on page 26, some of the figures may be wrong.

Answer 1.7.3: Figures have been double-checked and are correct.

Comment 1.7.4: On page 32 where the different phases of work on a site are mentioned, prior to the "Structural Phase" a preparatory phase (preparation work, excavation, etc.) should perhaps be included.

Answer 1.7.4: The preparatory phase is already included in the structural work phase.

Comment 1.7.5: On page 41, dealing with truck issues, information regarding routes, distance, lead times, timetables, frequency, truck type, etc. should be included at least in draft.

Answer 1.7.5: These elements will be analysed during the data collection.

Comment 1.7.6: On page 45, once the number of "several times moving" is identified, we can perhaps obtain information on which potential operations could be performed in a CCC. At the same time, it may help to outline the importance of direct deliveries to this type of work sites.

Answer 1.7.6: Noted.

Comment 1.7.7: As the Paris work site is the only one that has an on-site and dedicated logistics team, it may be helpful to compare performances between the two types, and to measure the importance of this team.

Answer 1.7.7: These elements will be analysed during the data collection.

3.2 D2.2 - KPI's and methodologies for construction logistics

Feedback provided by N. BOLAND on 30/07/15

Comment 2.1.1: From that experience, I feel it is very important to collect as much information as possible about: the types of vehicles that are used, individually or in combination, to deliver building construction materials and their capabilities, in terms of capacity, handling equipment needed for loading/unloading, etc.; any coordinating vehicle types and rules for site compatibility.

Answer 2.1.1: We planned to collect the Gross Vehicle Weight, the net weight, the type of truck (chassis-cab, semi-trailer, etc.) as well as the handling equipment used to unload depending of the type of material packaging. For the pilot sites observed no coordinating vehicles are needed. Regarding rules





for site compatibility, they were not yet collected but it is the kind of data we can obtain *a posteriori* by interviewing the construction workforce. We of course agree that this kind of information is important to develop a coherent CCC but the amount of data to be collected is very important and we had to set priorities to ensure data quality. We can already say that rules for site compatibility can be very specific depending of the site environment. However some classical rules can also be generic, as for example the truck characteristic that make the unloading activities with the crane easier.

Comment 2.1.2: Understanding what kinds of time windows might apply to deliveries, and what the motivating reason for the time windows are, could also be critical. Since distributors usually service multiple customers at multiple sites, it is important to understand the interactions to be able to know how efficiency can be improved in the distribution of materials.

Answer 2.1.2: As for some other information, it is the kind of data we can obtain *a posteriori* interviewing the suppliers. We have partial information on the motivating reasons for time windows from the construction site point of view. For example during the phase of structural works, the crane is often used in the afternoon for productions so unloading activities using the crane are planned in the morning. Distributors have adapted their construction delivery schedule to this kind of constraints.

Comment 2.1.3: Rules for what materials can be loaded, how they can be loaded (as in sequenced/packed within the vehicle space) would be important to understand, as well as how many workers of what types need to either accompany certain loads, or be present for loading/unloading.

Answer 2.1.3: The number of workers required to unload materials was collected but what we emphasise until now is that some factors are not only based on materials or packaging characteristics but also on the experience of human resources. Moreover, on one pilot site a dedicated professional logistic team favours efficient unloading activities. However, the firsts results show that the main potential savings are not really on unloading activities but more on trucks and workforce waiting times due to lack of planning robustness.

Feedback provided by M. SAVELSBERGH on 27/10/15

Comment 2.6.1: Even though "trip" is used in the document it is not clearly defined. Is a trip equivalent to a delivery? Is every trip always from a single origin to the construction site? Are there multi-stop trip? For example, does it ever happen that items are picked up at multiple locations before delivering at the construction site? Multi-stop trips may improve efficiency, so if they are happening, or if we anticipate that they may happen in the future, it would be good to have an appropriate indicator.





Answer 2.6.1: This kind of information is not directly included in the formalized indicators. However, it makes part of the information gathered in the “Delivery Tracking Board” tool used to collect data on deliveries and pick-ups. There are currently some partial answers to these questions:

- *Does every trip always come from a single origin to the construction site?* With the information gathered we can answer yes so far.
- *Are there multi-stop trips?* Yes, although not for picking-up materials but for delivering to several construction sites in the same trip. It is what we call “round trips”.
- *Does it ever happen that items are picked up at multiple locations before delivering at the construction site?* No, we have no information in this direction so far.

Comment 2.6.2: Load factor is an important indicator, but the current one may not capture all the information of interest. It is often the case that vehicle capacity is measured by both volume and weight. As such, it is important to measure both. Furthermore, the “lost volume per item” is an interesting one, but there may also be “lost volume because of non-optimal loading/packing”. Vehicle load optimization may be another opportunity for efficiency improvement.

Answer 2.6.2: We planned to collect not only the data to calculate the load factor but also the load rate in terms of volume. However, the number of data collected is really important and some information on the way of loading/packing material on the trucks is too much detailed to be able to collect it with enough quality and to make relevant use of it.

Comment 2.6.3: Related to load factor is the equipment used. Are large trucks used? Are small trucks used? Efficiency improvements may result from using different equipment.

Answer 2.6.3: We collected data related to the trucks used (size, capacity) and to the unloading equipment used. So we will be able to perform some analysis on these issues for the four pilot sites considered.

Comment 2.6.4: Punctuality of deliveries is important, but it may not be sufficient to only count on-time deliveries. It may be equally important to capture how late or how early deliveries are that are not on-time.

Answer 2.6.4: We adjusted the punctuality indicator in this way.

Comment 2.6.5: Is there a need to capture driver utilization? That is hours worked as a percentage of hours available?

Answer 2.6.5: In our context getting information on driver utilization should be really relevant to better assess the impact of a CCC on the haulier’s journey time and confirm the potential savings identified. However, this information is difficult to obtain from drivers themselves.





Comment 2.6.6: An indicator related to reducing congestion is the "number of vehicles on the site". If this refers to vehicle making deliveries and pickups, it is probably also important to capture timing information. Five vehicles visiting the site on one day may not be a problem, but five vehicles visiting the site all at once may be an issue.

Answer 2.6.6: We planned to collect all the data to perform these kind of analysis.

Feedback provided by A. SANZ BONDÍA on 04/12/16

Comment 2.5.1: Definitions of concepts are appropriate.

3.3 D2.3 - Database structure

Feedback provided by A. SANZ BONDÍA on 04/12/16

Comment 3.5.1: Nothing else to add.

3.4 D2.4 - Pilot sites quantitative as-is analysis including KPI of the as-is situation

Feedback provided by L. DOMÍNGUEZ ARRIBAS on 27/10/16

Comment 4.2.1: The data collection is a critical and fundamental part for the accuracy and application of the project's results. Define and apply a quality control process for the data. There was a big improvement between July and October. I am still concerned about some issues. It must be clear who is in chair in each site for collecting data, how the quality is controlled in the sites and along the supply and subcontractor chain. Additional information on the period time in which we are collecting the information. Is 2-3 weeks enough to sample a 2-3 years construction work? Is it measured or estimated?

Answer 4.2.1: To ensure that the evaluation was significant:

1. Whenever possible, we tried to use the same materials on several pilot sites in order to be able to compare the results. By analysing the differences in between the sites we were able to ask some explanations to the pilot coordinator and analyse deeply the representativeness of the collected data.
2. We discussed with the construction companies to ensure that the data were significant with regard to the analyses performed. These frequent discussions were mainly based on presentations of the analysis results by highlighting data which appear unusual and collecting the workers' feedback.
3. We chose a representative list of materials (enough quantity installed, included in each phase of the construction project, installed by several sub-contractors)





To follow the specific progress of each pilot these specific actions were implemented:

1. Regular virtual meetings between each pilot coordinator and VCF were organised every two weeks. The main issues discussed were:
 - a. How to ensure the same translation for each site
 - b. How to adapt the data collection to the changes in the planning of the construction project
 - c. Clarifications on the KPI calculation to be sure that the data collected are the good ones
 - d. Questions on some unusual data and requests to understand the causes
 - e. Exchanges on the potential conclusions
 - f. Regular deliveries of the collected data by the pilots to feed the data quality checks.

For the evaluation of the reliability of collected data several measures were taken:

1. A test of all tools was done on Luxembourg City's site to ensure the reliability of the collected data. Some adjustments were performed to simplify the data entry
2. A face to face meeting between LIST and each construction company in order to explain in detail all the tools and the data to collect and consequently ensure that all pilots' partners had understood how to fulfil the expected files
3. Automatic data quality checks on data completeness, consistency and accuracy were put in place and performed systematically on deliveries and pickups data (see Section 3.4 of *D2.5 - Open Data accessibility and treatment document*).
4. Comparisons among the data of all sites were performed and requests for explanation were sent to each pilot coordinator when significant differences emerged.

Feedback provided by A. SANZ BONDÍA on 04/12/16

Comment 4.5.1: A good description of the different times of the logistics chain and productivity has been made. In the case of Valencia, the main effects on traffic have been the construction of pipelines of service networks and the improvement of an adjoining intersection in the main road network of the city. These actions have been carried out in the accesses to the works area. Therefore, such parallel activities should be taken into account in a theoretical framework.

3.5 D2.5 - Open Data accessibility and treatment document

Feedback provided by A. SANZ BONDÍA on 04/12/16





Comment 5.5.1: Nothing to comment.

3.6 D3.1 - List of ICT tools transferable to construction logistic management

Feedback provided by L. DOMÍNGUEZ ARRIBAS on 27/10/16

Comment 6.2.1: It is obvious that the information gathered from the pilot is not representative of the sector, there are many other companies trying ICT tools around. You should use FEVEC and the other associations to make a survey on that to enlarge the sample. I don't see BIM for instance.

Answer 6.2.1: Accepted. We are currently investigating other channels to collect information on the sector: a survey via FEVEC, feedback asked to the SAB and deeper market research. However, BIM was already investigated in the report; it is in fact one of the main categories of ICT tools.

3.7 D3.2 - Process mapping and management tools for construction logistic

No feedback provided so far.

3.8 D4.1 - Site specific improvements and goal

We report below all the comments received on D4.1. The answers to those comments will be provided in a future revision of the deliverable.

Feedback provided by L. DOMÍNGUEZ ARRIBAS on 30/11/16

Comment 8.2.1: Quite focused document. It's a pity that some of the KPIs gathered can't be integrated in the model, especially those that could have a high impact on the economic savings and therefore, in the model's viability analysis. My concern is if the model's results will be enough for demonstrating the viability of the alternatives. The weakest part of the document is that it highly lays on the LCCC experience, which seems to be a fundamental one, but it may be difficult to support decisions based in a single case. In the meeting in Verona I understood that Vinci has some experience in the subject, it may be useful for getting more consistency to get information from them. On the other hand, such an insistence seems to centre the analysis in CCCs outcomes, giving aside with other alternatives.

Feedback provided by A. SANZ BONDÍA on 04/12/16

Comment 8.5.1: As a continuation of what has been said on D2.4, an adequate analysis of the overall improvements in travel times, obstructing vehicles and pollutant emissions is observed. It is important to highlight the impact of technology and the age of work vehicles on air pollution and noise pollution.

Feedback provided by M. SAVELSBERGH on 05/12/16





Comment 8.6.1: I feel that a short discussion on the fact that a CCC introduces additional costs is needed also in the executive summary. An additional stakeholder is introduced, a facility has to be purchased/build, city delivery vehicles will have to be purchased/leased, handling increases, additional communication and planning is introduced ... There are not only benefits, but also costs and complexities.

Comment 8.6.2: Figure 1 - *Vehicle Journey Time Components* suggests that the journey is one-way. It may be good to have a figure that clearly distinguishes (or at least indicates) that there is an inbound as well as outbound part.

Comment 8.6.3: How can the figure on pickups for Valencia be so different from the others?

Comment 8.6.4: The conclusion on page 12 is too simple. It ignores the location of the CCC. For some suppliers the CCC may be in a good location, for others the CCC may not be in such a good location.

Comment 8.6.5: On page 17, the conclusion for travel time seems to implicitly assume that all freights enters the city from the same direction. However, this appears to depend on the location of the supplier.

Comment 8.6.6: On page 32, a first step, especially in the presence of a CCC, is to share the production schedule (and if possible updates to the production schedule). That helps in planning deliveries.

Comment 8.6.7: On page 56, the observation on the location of the construction site is important. Little attention has been paid to the specific location of the construction site and the (potential) location of the CCC. Both locations will have a significant impact on the benefits.

Comment 8.6.8: Targeting improvements on page 58 are based on a very dangerous assessment. The traffic conditions (congestion) in London may be quite different from those in Verona.

Comment 8.6.9: That the target related to the costs of unsorted bins on page 61 "seems to be achievable" is a weak statement. Why? What studies have been done to warrant this statement?

Comment 8.6.10: Limiting the number of deliveries is not always a good thing. Sometimes many smaller deliveries may be beneficial. Smaller vehicles may be less prone to congestion, will be unloaded more quickly, and the unloaded materials take up less space.)

Comment 8.6.11: A cautionary note is warranted in the conclusion on page 77. The existing CCCs may be in environments that are quite different from the environments of interest in this study.





3.9 D6.1 - Intermediate Report on good practices in the EU and USA in construction logistics in urban area

Feedback provided by L. DOMÍNGUEZ ARRIBAS on 30/11/16

Comment 9.2.1: It would be great to include also information about city councils' policies related with the subject. Mainly restraints and taxes than could help to develop or implement new business models related with logistic in construction, as CCCs. In my opinion those information will be interesting for next project steps.

Answer 9.2.1: No practice on city councils' policies related with construction logistics has been found so far, they usually exclude it from policies. Feedback from SAB and further investigation should help to find such practices.

Comment 9.2.2: In addition, it would be appreciated that the document gives to readers a correlation between the best practices, taking into account their complexity or implementation cost and the degree they reach the main objectives.

Answer 9.2.2: Accepted. Information on the level of difficulty to implement the best practice will be added.

3.10 General comments

Feedback provided by L. DOMÍNGUEZ ARRIBAS on 27/10/16

Comment 10.2.1: It is absolutely necessary to identify and agree on the objectives and the outcome of the project, to be focused on the real life, and give it a chance in the real life. Who can exploit the focus? The project can be focussed on a company, who wants to create a new business model and exploit it. Or it could be targeted at giving information that the sector could need to implement new solutions in every place. One or the other must be accomplished with a good quality level.

Answer 10.2.1: This concern is shared by the Project coordinator and the entire consortium. The main purpose of this meeting (the PMB & SC Meeting in Verona) is exactly to make a substantial advancement on this aspect. The consortium agrees that some preliminary outcomes that need to be tested are that i) a construction company or ii) a city or iii) a service provider company create a Decision Support Systems (i.e. a software tool) to allow for an optimization of one or more construction projects.

Comment 10.2.2: The Climate KIC is an initiative that the consortium needs to consider in order to look for interesting business plans. The continuation of the project could be pursued by some partners through them.





Answer 10.2.2: Contacts exist between some partners and the Climate KIC. Once more results will be available the KIC will be contacted to see whether they are interested in discussing some joint exploitation strategy.

Comment 10.2.3: It is very important to have a clear idea of the perimeter in which a specific solution can be applied. I understand that your focus is mainly on CCCs and limited reference to other optimization strategies. But a CCC is depending on many conditions. The location of the site within a city changes the framework a lot. The surface of the project, the size of the city, the structure of the city (EU and US cities are very different for instance), restrictions imposed by the city councils, etc.

Answer 10.2.3: The idea is to simulate the different scenarios in generic cities, not just in the four pilot cities of the project. We aim to design an open toolkit so that actors from outside the project can reuse them and get their own results. By tools we mean algorithms and methods. The project will not just focus on the CCC. In the framework of WP3 and WP4 the impact of many other potential optimisation strategies will be assessed.

Comment 10.2.4: The involvement of cities, especially representatives of the city councils, is paramount. In construction, we are still doing things in the same way they were done a long time ago. The drivers for change can be money or social advantages. The second is imposed by city authorities. The city councils could be willing to make some restrictions to the truck traffic if there is a solution, or to create a specific tax. It is important to have cities in the project ASAP.

Answer 10.2.4: At least one city (Valencia) is directly involved in the project through INNDEA, and the other pilot cities are in contact with the local partners and are stakeholders of the project. A specific agenda for involving other cities (at least 12) is covered by WP6, and has not yet started.

Comment 10.2.5: It is very difficult to involve 12 cities in the project in a year's time. Define a realistic set of outcomes that you are willing to achieve from these cities.

Answer 10.2.5: Accepted. The consortium is now working on defining the Unique Selling Propositions of the SUCCEISS projects for the cities to involve and a list of contributions that we expect from them.

Comment 10.2.6: Provide all the information about the savings for each actor of the chain, provide costs and revenues for the new actor (the CCC) and try to elaborate a business model for that. This will be a good way to move from research to reality. If you want to involve a new actor in the construction chain you need very good knowledge of the financial implications. City Councils are fundamental.





Answer 10.2.6: The consortium is aware of this need and is designing business model canvasses for several possible scenarios in each of the pilot cities. They should cover a number of potential other realities. The simulations run in WP4 will allow to at least partially monetize the gains and losses for each actor of this m-sided market.

Comment 10.2.7: There are already locations to stock some material (storehouses) around the city of Valencia. Normally the owner of the storehouse buys the goods from a factory and resells them to construction companies. There is a relation between this reality and the CCC because they will be in competition.

Answer 10.2.7: These realities will be taken into account in defining the scenarios mentioned in the previous answer.

Comment 10.2.8: You could think about providing a service for the city council to analyse the impact of construction works. Developing a software for one or more construction companies is another good option. In the first case, you need to simulate what the impact would be on the entire city, because a city council would not be interested in a single construction site but in the totality of them. You could candidate yourself to sell them consultancy service.

Answer 10.2.8: We are currently analysing both potential exploitation strategies. Optimizing one big construction project at a time is probably much easier than optimizing the totality of construction projects in a city. From the first exchanges that we had on the matter with the pilot cities it appears that most cities do not even have a clear vision of the totality of construction works that will happen over their territory even in the short term. Already finding a way to aggregate this information and make it available to all the actors concerned could be an interesting service to offer.

Comment 10.2.9: You should also try and develop a standard for data exchange in the construction sector at European level.

Answer 10.2.9: We had not seen the opportunity to contribute to developing such a standard, but if it will appear necessary for our exploitation strategy the consortium is well positioned to promote this approach.

