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# Self-organizing in urban development: developers coordinating between construction projects

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## ABSTRACT

Sustainable urban development districts have become an answer to the challenge of increasing urbanization while decreasing human impact on the environment. Like other domains of public administration, urban development has in recent decades moved towards heterogeneous governance. Urban development becomes project ecologies, where several construction projects are carried out in parallel and in sequence. This paper sheds light on public and private developers' coordinating between their construction projects and the influence this has on the built environment of urban development districts. The space between projects in project ecologies is relevant to explore further to understand how the long-term goals of urban policy are achieved in practice. Through the theoretical lens of self-organizing, the discussion is informed by a qualitative study of two cases where developers built together in sustainable profiled urban development districts. The paper contributes to construction management research by illustrating how developers play a key role in finalizing the design and construction of new districts through self-organizing. In effect, new urban districts can only be realized through joint efforts and coordination amongst developers. The paper also provides policymakers with insights into how developers become key players in organizing new neighborhoods.

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Urban development;  
developers; project  
ecologies; self-organizing;  
heterogeneous governance



## Introduction

As a way for local and regional governments to address the challenge of increasing urbanization while decreasing human impact on the environment and climate, the formation of sustainable urban development districts has become more frequent. Similar to other domains of public administration, urban development has in recent decades moved towards a more heterogeneous form of governance, with closer collaboration between policymakers, property owners, public and private developers, spatial planners, and suppliers in order to successfully mitigate and combine different values in society (Zakhour & Metzger 2018, Candel *et al.* 2021).

Historically, urban development has been looked at as a planning or policy issue, neglecting the importance of implementation, i.e. construction and its role in realizing overarching policy goals. However, as the long-term sustainability goals associated with urban development are largely still lacking (Yigitcanlar & Teriman 2015), there have been calls for a more integrated approach to urban development that acknowledges the importance of all

stages in the development process and their impact on the overarching goals (Cole 2012, Yigitcanlar & Teriman 2015). This paper sheds light on construction projects in urban development districts. Focusing specifically on the construction sector, Hedborg and Karrbom Gustavsson (2020) report that initiatives for urban development often create a multi-project context where several projects are carried out in proximity, in parallel, and in sequence, as project ecologies (Grabher 2004). Project ecologies is a term that refers to project-intensive contexts with interdependencies and links between parallel and sequential interorganizational projects (Grabher 2004).

Through heterogeneous governance, urban development districts are created when a landowner (often a municipality or other governmental actor) divides a large piece of land into smaller plots, which are then allocated, outsourced, or licensed to private developers and public agencies (hereinafter *developers*). Developers, also referred to as *construction clients*, are defined as “those who carry out, or assign others to carry out, design, construction, demolition or ground-works for their own account” (SFS, 2010:900).

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Developers are not just main actors in construction management, but in realizing urban development through single construction projects. This study bridges the construction management literature to the related field of urban development studies, enriching the construction management field (Volker 2019) and expanding knowledge on the mutual influence between construction processes and urban development processes.

From a governmental perspective, the overarching goal with urban development is to extend or regenerate parts of a city, often with sustainability in mind (Candel *et al.* 2021). However, from a developer perspective, the focus is completing a single construction project on the allocated land, rather than fulfilling the goals of a municipal program (*ibid.*). Yet, through the spatial closeness and the municipality's overarching goals, single construction projects become interdependent. For example, one developer can build on top of another developer's construction or two buildings may share common underground constructions such as garages. To add complexity, developers procure consultants, contractors and suppliers to plan, design and construct according to their individual specifications. This mix of actors from different professions and organizations makes up a project ecology and contributes to the development of a new urban district through completion of each construction project. However, when construction projects become interdependent, coordinating practices emerge in the space between projects (Hedborg *et al.* 2020) to enable the completion of single projects and the district. How this coordination is organized and its consequences for the district is the focus of this study.

The concept of project ecologies explores the interdependencies between projects (Grabher 2002). As such, the unit of analysis is not the single construction project with a single developer, but the organizing that takes place between several parallel and sequential construction projects by different developers when jointly developing a new urban district (Grabher & Ibert 2011). The managing of the space between projects in project ecologies needs to be explored further to better understand how long-term sustainability goals influence developers' project processes and the built environment in the urban districts their projects create. Therefore, the purpose of this paper is to *gain insights on the developers' coordinating between projects and its influence on the built environment of urban development districts*. Inspired by Pryke *et al.* (2018),

the process of self-organizing (Heylighen 2013) is used to investigate the following two research questions:

- How do developers coordinate their interdependencies between construction projects in urban development districts?
- How are the overarching goals of urban development districts handled by developers?

Two case studies of interdependencies between parallel construction projects in two sustainable profiled urban development districts in the region of Stockholm shows how developers organize their interdependencies in the space between projects. It also shows how their practices correlate with municipalities' overarching goals for urban development districts.

This paper contributes to construction management research by illustrating the limits of focusing on single construction projects in construction management research. It illustrates how urban development creates project ecologies in which developers must account for interdependencies in the space between other projects when managing their single project. Bringing together the closely related fields of urban development and construction management reveals how the heterogeneous governance of urban development influences construction projects – both their processes and the resulting buildings and infrastructure. The paper also contributes to practice as it provides policymakers with insights into how urban development is carried out through project ecologies, where public and private developers become key players in planning, designing, and building new neighborhoods.

## Theoretical framework

### *Coordinating in project contexts*

In the project ecologies of urban development districts, Karrbom Gustavsson (2016) describes how project activities are characterized by constantly handling changes and crises, rather than focusing on the traditional work of project management, such as planning and structuring. Coordinating activities are central for developers, especially since most activities in the construction sector are done through interorganizational arrangements (Pemsel & Widén 2011) and construction actors must adapt to each other's practices (Bygballe *et al.* 2016). A project ecology perspective, therefore, does not imply a focus on transactional and sequential interdependencies handled through, e.g. rules and supervision. Instead, mutual decisions and adjustments

are required when actors need to temporarily combine their resources (Grandori 1997). As understood from Dubois and Gadde (2002a) seminal article, these interdependencies are loosely coupled and are adapted from a weaker or stronger permanent network.

Where the influence of governance schemes through programs and other external structures is limited, as in project ecologies, coordinating and collaborating depends on social interactions emerging from interdependencies (Newell et al. 2008). Social interactions spread over organizations and professions with different social logics and cultures, which can both stimulate interaction and create tension through rivalry (Grabher 2004). The actions that actors take guide their emerging relationships (Manning 2008), where negotiation and power shifts between actors continuously happen (Newell et al. 2008).

Over time, project ecologies depend on formal mechanisms such as contracts, and informal connections such as personal relationships (Jacobsson 2011). Consequently, several ways to coordinate project actions are discussed in the project management literature, from formal tools to informal aspects such as trust (Bygballe et al. 2016). The construction management literature is still dominated by a single project paradigm, where project management tools and processes are well understood (Blismas et al. 2004). However, for developers in project ecologies, single project management is not enough, and additional management tools are needed (ibid). As Pryke et al. (2018) illustrate, construction actors who need to coordinate project activities adapt self-organizing to handle the more informal relationships that emerge between projects.

### **The perspective of self-organizing**

Project ecologies, as described above, are based on informal horizontal interdependencies. Pryke et al. (2018) use the term “informal” to describe emergent relationships that do not follow the prescribed structures of contracts. These relationships can also be described as “non-contractual”, “non-hierarchical” or “embedded”. Moreover, Pryke et al. (2018) borrow the concept of self-organizing from Heylighen (2013, p. 1), who describes it as a process that “*happens in a distributed or decentralized manner: the different members of the group all contribute to the emerging organization, and no one is in control*”. Therefore, the process of self-organizing can be seen when the actions of one actor, fully or in part, complement the actions of other actors for a common benefit. As Heylighen

(2013, p. 5) describes it: “*The one continuing the task where the other one stopped, or the one adding the necessary ingredient that the other one lacked*”.

Temporary organizing in and between projects leads to a large degree of self-organizing beyond formal contracts (Pryke et al. 2018), which is necessary to manage the relationships that arise in complex organizational structures with multiple actors, interests, objectives, cultures, etc. (Flyvbjerg 2013). Heylighen (2013) describes the background of self-organization as a “*common situation in any kind of social interaction: individuals typically come to the table with different backgrounds, habits, ideas, cultures, perspectives and even languages*” (2013, p. 1). Self-organizing in project contexts stems from the actors’ interrelations and can be difficult to manage, as control is shared between the actors (Teo & Loosemore 2017, Daniel & Daniel 2019). Even though self-organizing is a significant process in complex project contexts, there is a lack of empirical research about it (Pryke et al. 2018, Daniel & Daniel 2019).

In this paper, the theoretical concept of self-organizing is used as an explanatory concept, using Heylighen’s (2013) four mechanisms of coordinating. The emergent interaction pattern goes from alignment, through division of labor and workflow to aggregating from the patterning.

The first mechanism, *alignment*, is the process during which actors align themselves in the same direction. It is the simplest form of coordinating, where actors try different actions to identify and aim for the same target.

Secondly, the actors *divide labor* and this is where different actors take responsibility for performing certain work, focusing on what each actor does best. To move beyond the simplest form of coordinating, different actors perform different tasks that complement each other, preferably according to their abilities.

The third mechanism is *workflow*, which refers to the process of sequential work by the actors to move towards the shared goal. It should therefore be seen as a complement to the division of labor, which coordinates parallel actions.

The fourth and last mechanism is *aggregation*, which holds that the full potential of each actor’s work can only be seen when aggregated with the other participants’ work. Aggregation is about bringing together the outcome of multiple actions into a single result. It is a coordinating mechanism that develops and maintains a network, or ecology, through continuous interaction over time.

Heylighen (2013) describes the process of these four mechanisms as linear, i.e. parallel and sequential

actions going in a forward direction. However, these mechanisms should be seen as a simplified description of complex reality. The essence of the theoretical concept is to conceptualize and give words to the process in which the actions of one actor are adjusted in relation to the complex patterning emerging from joint actions of multiple actors. With that in mind, self-organizing should be seen as a useful concept to identify coordinating mechanisms between projects, as project processes cannot be fully planned ahead (Ahern *et al.* 2014). Self-organizing has typically been used to describe the organizing between public and private actors in large urban regions, and to identify how practices emerge across organizations and professions (Innes *et al.* 2010).

### **Complementing insights on coordinating**

Applying the concept of self-organizing to explore developers' actions when they become interdependent, opens for deeper insights into the space between construction projects. While coordination across organizational boundaries within interorganizational projects has been investigated (Sydow & Braun 2018), coordinating between interorganizational projects has not yet gained the same attention (Mutebi *et al.* 2020). Coordinating across projects is highly important to understand as construction projects to a large extent are performed in multi-project contexts of urban development (Candel *et al.* 2021), in this article discussed as project ecologies.

In addition to self-organizing, there are other types of organizing and governance structures that guide coordinating actions. For example, in urban development districts, there are several stakeholders such as the initiating municipalities that have their own political goals with the development (Hallin *et al.* 2021). Even though developers within urban development districts are not actively steered by governmental bodies (Zakhour & Metzger 2018), local government still governs in a more indirect way (Jacobsson *et al.* 2015); there are still formal ties, policy frameworks and land allocation agreements that guide developers' actions (cf. Candel *et al.* 2021). In this new urban governance landscape, where governmental bodies create settings and developers coordinate between project activities without explicit governance structures, many decisions are left to the developers. Here, the process of self-organizing requires exploration in order to understand the actual practices induced by these new forms of urban governance, as well as the implications for the developers building urban developments

(Barraket & Loosemore 2018, Hasanov & Zuidema 2018). These types of heterogeneous governance initiatives are not without their critics, as decisions can become non-transparent (Barrett 2004, Swyngedouw 2005).

The construction sector can be described as a loosely coupled system in which actors come and go in different projects (Dubois & Gadde 2002a). This temporality of actor constellations is possible since there are institutionalized roles and processes that make each "new" project similar to previous ones (Kadefors 1995, Miterev *et al.* 2017). As Eriksson and Kadefors (2017) show, actors come into construction projects with their own experiences and routines. Similarly, Söderlund *et al.* (2008) illustrate how routines in construction projects are essential mechanisms to develop interorganizational relationships between buyers and suppliers in single projects. In effect, developers acting in a project ecology of urban development are not acting in isolation, but are guided by a combination of top-down management from government, institutionalized and habitual routines and roles, and temporary self-organizing (Silva & Farrall 2016).

In conclusion, there are many factors that guide actors' actions in complex project ecologies. Similar to Windeler and Sydow (2001) findings from studying the TV and film sector in Germany, it is likely that different developers and their representatives in urban development districts will take on different roles, depending on their personal experience, the developer's legitimacy with the other actors, and the internal goals of the project.

With the above discussions in mind, the concept of project ecologies will be used to describe the complex multi-project context of urban development, where numerous developers perform construction projects in parallel and sequence to each other. From this perspective of organizational complexity, developers and local governments' management are seen as catalysts for self-organizing processes (Silva & Farrall 2016). Therefore, self-organizing, as defined above, will serve as an analytical framework to open up the organizing that emerges from the need for interorganizational coordination in the space between projects.

## **Method**

### **Research approach and case selection**

A qualitative study building on two cases was conducted to achieve increased and context-dependent understanding of the phenomenon being investigated (Flyvbjerg 2006). In this study, the phenomenon under



**Table 1.** Comparative description of the setting of cases 1 and 2.

	Barkarby City (Case 1 setting)	Stockholm Royal Seaport (Case 2 setting)
Developers	1 state developer, 2 regional developers, 1 municipality, 2 private developers	11 private housing developers, 1 municipality
Districts constituents	Regional and metro railway, train stations, bus terminal, pedestrian bridge, commercial buildings, residential buildings	Residential buildings, shared garages, public spaces, infrastructure
Studied phases	From initial design to construction stage	Planning and design
Purposes	Local and regional development	Local development
Agreements	- State directive for transport system - Agreements between regional and municipal developers - Different private contracts	- Land allocation - Garage agreement - Different private agreements

investigation is how developers coordinate between projects in two urban development districts, namely Barkarby City and Stockholm Royal Seaport. These districts were chosen because of the large number of developers carrying out single projects within a specified area without formal management steering their interdependencies, i.e. they perfectly exemplified project ecologies (Grabher 2004). Moreover, development in both districts was ongoing during the collection of the empirical material, they were being carried out in the same region, and both were applying a heterogeneous form of governance. These two urban development districts can be seen as “extreme”, due to their large number of actors and projects, their complex combination of buildings and infrastructure, and their ambitious sustainability goals. Flyvbjerg (2006) suggests that such extreme case studies can bring a lot of information about the phenomenon being studied, through the multiple actors and mechanisms they activate.

The collection of empirical material was mainly done through observing meetings. Interviews were also conducted with the participants in those meetings, i.e. developers and municipal representatives. During the interviews, the participants were asked to openly reflect on the coordination practices being used in their projects.

The study was explorative, and the initial observations helped the authors to understand the context of each district (Gehman *et al.* 2018), i.e. how the developers interrelated and their projects’ practices and purposes. During the meeting observations, the developers’ coordination practices between their single projects emerged as a research focus. A significant example of this was selected within each district, where the developers had to construct joint structures together. These examples, the cases, were chosen because they shed light on the interdependencies between the developers and thus provided insight into how the organizing between projects in urban development districts was managed in practice. The

two cases are: *the transportation hub* (Case 1) from Barkarby City, and the *shared garages* (Case 2) from Stockholm Royal Seaport. Both are described in detail below.

### Case descriptions

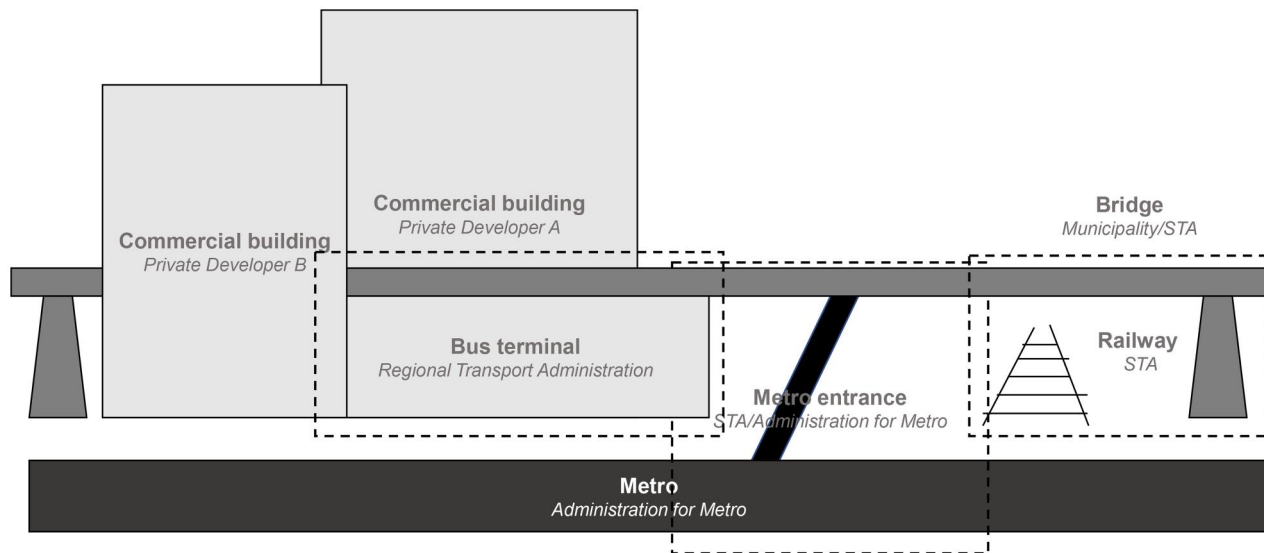
In this section, the two cases and the empirical material are presented. An overview of each case can be found in Table 1.

#### Description of case 1

As a result of major infrastructure investments in the region of Stockholm, several urban development districts have been initiated in areas surrounding the new metro stations. In one of those districts, Barkarby City, a new metro line and commuter train station has spurred a large development district with 10,000 new apartments, as well as commercial buildings.

Apart from the municipality’s infrastructure work, projects are being performed by four public agencies acting as developers, namely the Swedish Transport Administration (STA), two developers from the region of Stockholm (Regional Transport Administration and Administration for Metro), and a municipality, as well as two private housing developers (Private Developer A and Private Developer B). The municipality (Järfälla Kommun 2016) states in its development program that the urban development district aims to inspire sustainable investment and joint development of the Stockholm region in a sustainable manner.

In the neighborhood around the new stations (regional train, metro, and buses), the public developers and the two private developers will build a “transport hub” (serving as Case 1) which, in addition to the station buildings and a bridge, includes both commercial and residential buildings. The developers oversee at least one project that jointly creates the transportation hub. The different construction projects are in various phases, ranging from planning and design to construction, and there is no overarching



**Figure 1.** Illustration of how the developers in case 1 are structurally connected in the transportation hub (overlapping infrastructures are indicated by dashed line).

**Table 2.** Empirical material collected in Case 1.

Type	Actors	Empirical material
Meeting observations	1 state developer, 2 regional developers, 1 municipality, 1 private developer 1 state developer, 2 regional developers, 1 municipality, 2 private developers	10 collaboration meetings 4 collaboration workshops 12 coordination meetings
Interviews	meeting participants from all developers	7 interviews with: 2 Municipal Coordinators, Private Developer 1, Private Developer 2, Regional Developer 1, Regional Developer 2, State Developer 1

program steering the completion of the transportation hub. In other words, no one has overall responsibility for the end product of the transportation hub, it needs to be organized between the developers.

The need for coordination stems from shared structures. For example, the commercial building developed by Private Developer A is built on top of the bus terminal's roof. Furthermore, the developers will oversee construction in the same limited area. These construction activities need to be coordinated, for example, because the new metro line is built beneath the construction of a new railroad track. Figure 1 shows an illustration of the transportation hub, where structures are shared between developers, and where the need to coordinate design and construction activities is especially high.

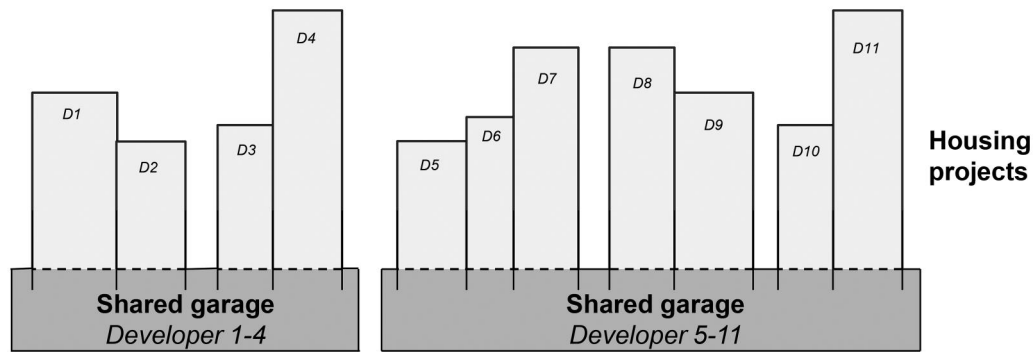
The study, conducted between 2018 and 2021, consists of meeting observations (in total, 31 hours), semi-structured interviews, and document analysis for background understanding of the case setting (see Table 2 for a summary of the empirical material). Parallel meetings were held every six weeks and these were observed by one of the authors. In line with the explorative approach of the study, the authors' initial

research interest was to investigate the collaboration model of the STA. However, as more meetings were observed, the research interest switched to the interdependencies between all the developers of the transportation hub as their need to coordinate grew. The interviews complemented the findings from the meeting observations and enabled triangulation.

### Description of case 2

Case 2 relates to the urban development district called Stockholm Royal Seaport, which is planned to be completed in various stages between 2010 and 2030. The main stakeholders in the district are the City of Stockholm municipality (the initiating actor), the developers, their suppliers, and citizens living and working in the completed district. The construction of the district is divided into several sequential stages, where each stage includes the municipality's infrastructure work and around ten housing, office, or commercial construction projects. The projects are carried out by different developers, who are appointed and allocated land by the municipality. According to the municipality's policy documents, the decision to divide the urban development district into smaller plots for





**Figure 2.** illustration of how the developers in case 2 are structurally connected through the shared garages.

different developers was taken to create a vivid district with varied architecture, housing, and commercial spaces. Furthermore, sustainability and new solutions to achieve sustainability goals are top priorities for the district (Stockholms Stad 2016).

This study follows one stage of the development, in which apartment buildings for around 700 people will be built, with commercial spaces on the ground floors. The municipality's land allocation led to developers sharing space for their construction projects. Two or three developers work simultaneously to construct buildings in the same block, and one or two blocks share garages. These garages were chosen by the authors to serve as Case 2, as they show how the developers do not just have their own projects to think about, but must also take the other projects in the same stage into consideration. Figure 2 illustrates how the developers need to build shared garages together, before constructing their own buildings on top. The shared garages must not only be designed and constructed together, but also managed long-term by the future residents.

The shared garages have been a focus for the developers since the planning phase, as they affect both their single project processes, as well as their own, or their end-customers' long-term facility management. The municipality decided, when initiating the stage, that only two large garages covering several blocks should be built, instead of the more common solution of building smaller garages under each building. The municipality's reason for this decision was to reduce traffic between blocks by having only one entrance and exit per garage. This requirement was included in the land allocation agreements, but the details of how the garages would be designed and function was left up to the developers, e.g. how the parking spaces should be allocated, the level of security, and the connections through staircases and elevators with the buildings above.

The study took an exploratory approach. The empirical material was collected between 2018 and 2019 during the developers' planning phase and was comprised of meeting observations, informal discussions with project actors, and semi-structured interviews (see Table 3 for an overview of the empirical material). To begin, four meetings between the municipality and the 11 developers were observed, and individual interviews were later conducted with all participants in those meetings. These methods were chosen in order to study the interdependencies between projects, focusing on the developers' project managers and their actions. Zooming out from the single projects, the developers' shared space and the requirement for them to design and construct shared garages triggered coordination between the different organizations and projects.

### Analysis of material

The empirical material was analyzed in iterations (Dubois & Gadde 2014); first, each case separately, and then in combination to aggregate the findings.

In a *first* step, the cases were identified as examples of each urban development district, where the developers coordinated based on mutual interest, i.e. the transportation hub and the shared garages. The initial material collection was done separately by the two authors in one case each. The authors then discussed the coordination practices of each case, which narrowed down the focus of further material collection to: (a) coordination tools, (b) actors involved in the organizing, (c) the level of formalized coordinating activities, and (d) different roles of the developers. This was done to ensure the empirical material for the two cases was comparable.

*Secondly*, through a literature overview, self-organizing was found to be fruitful in describing how developers managed interdependencies in a multi-project context without formal management. Notes

**Table 3.** Empirical material collected in Case 2.

Type	Actor	Empirical material
Meeting observations	Developers, consultants, municipality	4 planning meetings
Interviews	Developers (D1–C11)	11 interviews with project manager
	Consultant	1 interview with coordination manager
	Municipality	6 interviews with managers and support functions

**Table 4.** Summary of self-organizing in cases 1 and 2.

Coordinating mechanisms in self-organizing	Transportation hub	Shared garages
Alignment	Recognize common issues Initial meetings Involving all affected parties (invite private developers)	Initial meetings with municipality Identifying common issues Reflecting on trust
Division of labor	Regular collaboration meetings hosted by different developers	Different developers explore different solutions Follow informal leaders Hire consultants
Workflow	New forums arise from identified needs, coordination meetings, and collaboration workshops.	Formalize different levels of meeting forums
Aggregation	The coordination is deepened when coordinating model is applied and developed and after the formal agreements.	Trust was developed over time. Created coordinating solutions together, informally through the meeting forums, which developed into formal contracts over legal issues.

from the meeting observations and interview transcriptions were put into NVivo, which was used as a tool to categorize the empirical material. Each case was analyzed separately through the theoretical lens of self-organizing, using Heylighen's (2013) understanding of self-organizing as a process of coordinating mechanisms, with actions being performed by different actors. The coordinating mechanisms of self-organizing (i.e. alignment, division of labor, workflow, and aggregation) were used in this first categorization to understand how the developers organized themselves in each case (see the summary of analysis in Table 4).

In the *third* step of the analysis process, the findings presented in the four categories were combined to find similarities and differences in how the developers coordinated as a result of their interdependencies (RQ1) in the two cases. This was done in an iterative manner by both authors going back and forth between the empirics and the literature (Dubois & Gadde 2002b).

*Lastly*, to understand how the developers handled their overarching goals (RQ2), the aggregated findings were related to the literature on project ecologies and public governance. The term “*between*” was identified as a good way to describe the space where self-organizing was a prominent feature of managing the actions of several developers (private and public) in these evolving project ecologies. How this “*between*” was managed was essential for the developers’ ability to complete single construction projects and government actors’ goal of reaching sustainable urban development.

## Findings

This section describes how the developers coordinated their interdependencies in the two cases, using examples of how the developers *aligned*, *divided* and *worked*, and the *aggregation* of their self-organizing. Using keywords, Table 4 presents an overview of the findings of the two cases, which are then combined in an aggregated discussion in the next section.

### Case 1: The transportation hub

#### Alignment

The alignment between the construction projects in Case 1 was due to the efficiency of each developer and their construction project, and their common interest in creating a transport hub that would be attractive for future residents, commuters, and visitors. There was no contract or agreement binding all parties together, but there were several independent agreements and financial commitments between the developers. Due to the interdependencies created by the transportation hub, the developers aligned themselves in several ways to reach their common goal, i.e. “*an attractive transportation hub*”.

In autumn 2018, one of the STA’s project managers initiated a meeting with the region and the municipality, when he saw the increasing need for coordination regarding the transportation hub. The manager took this initiative because of his previous experience: “*I thought, ‘well, it’s better if we sit together from the start in this type of situation’. We had some things we needed to sort out amongst us*”. This initiative later developed

into a series of meetings named “the collaboration forum”.

One example of how developers aligned with each other and used each other’s competence was their decision to establish an internet “sharing point” for information exchange and communication. It was made so all developers could be aware of other’s decisions and avoid work conflicts because of a lack of information. An example of the need to share such information was during discussions on a joint storm-water basin, which the STA had planned in connection with the bus terminal. One of the private developers of an apartment house was to build on top of the bus terminal and their project manager asked to see their design solution. This led to a general discussion on shared design solutions and data from previous technical enquiries, such as flooding analysis and transport analysis. The STA project manager simply stated: *“I think it would be beneficial if we had everything in one place, so I don’t need to sit and email things back and forth”*. As a result, the Administration for Metro set up a sharing point in their IT-system, so that information could be shared between all the developers in a more convenient and inclusive way.

### Division of labor

In the first collaboration meeting, a decision was made to create a coordination forum where more practical and technical issues could be discussed. The municipality would call these meetings and provide the agenda because it participated in many of the arrangements and was seen as a main actor because it had long-term responsibility for the district: *“It is in the municipality’s interest that [the transportation hub] works. We have a natural interest since we are responsible for the detailed planning. I don’t have an important role; it is the forum that is important, where people can talk to each other”* (municipality coordinator).

Private Developer B, having least to do with the transportation hub, was invited to the coordination forum but not the collaboration forum. One of the participants explained why all parties, including Private Developer B, were invited to the coordination forum: *“It is good to have a meeting with everyone, otherwise you always assume that the ones not present can adapt”*. The decision to include all developers in one forum was supported by all of the public developers, even though there was some hesitation from one of the larger public developers, with one project manager stating: *“They do not think like us”*. One of the private developers explained their view: *“The public developers have set up the conditions of*

*the collaboration and whose voice should be heard the most (...) it is sometimes hard to adapt to their processes”*.

Another example of how the developers divided work between them related to a shared wall in the main station building. The wall was adjacent to three of the developers’ projects (the STA, the Administration for Metro and Private Developer A). The STA had the main responsibility for the wall and its construction, and it had designed the wall to fit its internal regulations. However, when the developers conducted a fire safety investigation of the transportation hub and it became clear that the design of the wall was sub-optimal, the STA was reluctant to change its design.

The STA then questioned the wisdom of allocating resources for changing the design. However, after much discussion, the STA agreed to investigate the possibility of changing the design to comply with fire safety requirements. This resulted in many consulting hours, but in the end Private Developer A did not want to make any sacrifices on its building to adjust for a changed design of the wall. This experience generated a discussion in the collaboration forum on decision-making processes within the developer group. The following short dialogue between the municipality’s meeting coordinator and a representative of the Administration for Metro illustrates the issue:

Municipality: *“Everything here is based on voluntary agreements, so if someone refuses to change, it can have a great impact. Often, it is about big decisions so it will quickly become large sums of money we are talking about. That is why we need a process.”*

Administration for Metro: *“Yes, we have already experienced that it can cost more than it tastes... take the wall as an example”*.

In the end, this experience resulted in a joint decision-making process for matters affecting both individual developers and the final product of the transportation hub.

### Workflow

Issues that surfaced in the coordination forum that could not be resolved were escalated to the collaboration forum. In contrast to the coordination forum, the developers took turns to host the collaboration forum. In spring 2019, a decision was made to design a formal collaboration agreement to facilitate future coordination issues – especially those connected to the construction phase. The STA suggested using its model for collaborations with suppliers as a tool to move from informal to partly formal coordinating.

The other developers accepted the suggestion. A first collaboration workshop began in late spring 2019, using an internal coordinator from the STA. During these workshops, the group formulated the common goal of producing “an attractive transportation hub”. Furthermore, it formalized meeting forums and set up joint working groups on various matters such as “safety on-site”.

One difficulty of this new emphasis on long-term organizing for future coordination was that all projects had already started their planning, which meant that participants often started to discuss current issues, rather than identifying common interests and principles. Due to the number of developers and their differing project goals, it was difficult to find joint *measurable* goals, but they could agree upon joint *generic* goals, e.g. safety and security, reliable traffic, smooth transition between different modes of transport, and good service. As some of the projects progressed from planning to the construction phase, the voluntary joint workgroups became more important and, during late 2019, started to focused more on principles for joint processes that would benefit the developers.

### Aggregation

Aggregation from self-organizing is to receive a completed product, i.e. a functioning and attractive transportation hub. But aggregation must also be seen as the aggregated processes of the developers’ actions. When the projects progressed, individual relationships emerged between the developers. In parallel, new issues were identified and new joint workgroups were suggested, and the collaboration and coordination forums were redefined in late 2019 and early 2020.

An example of this is how the municipal coordinator talked about the coordination meeting in late 2019: *“As the organizations settle and projects move forward, specific questions can be handled separately between individual developers. As a consequence, we have less to evaluate here”*. With time, the developers found ways to coordinate that suited their interdependencies in the transportation hub and started to focus on solving actual issues.

## Case 2: The shared garages

### Alignment

To be allocated land in the emerging urban district, the developers had to enter a competition. When accepting an offer of a plot (a building site), they did not know what other developers would be building

together with them in the same stage. In other words, they knew they would need to share garages with other developers and have to coordinate and collaborate over the processes and end product, but they did not know who their neighbors would be. Thus, at project initiation, the developers did not have any formal agreements between them on how to construct the shared garages.

The findings show that the developers aligned themselves in several ways: they all attended meetings initiated by the municipality, they formed meeting forums within the developer group, and they created contracts and hired consultants together to design and construct the garages. Due to the shared garages, the municipality anticipated the developers’ need to align their parallel projects, so from the planning phase it organized regular information meetings and competence development seminars. Despite its effort to get the developers together, the municipality took a conscious decision that it should not lead the developers’ coordination. One project manager at a developer summarized it thus: *“There are uncertainties, where the municipality has left the responsibility to us to coordinate among ourselves”* (PM, Developer D2).

The municipality thought the developers should align themselves so as not to interfere with their business plans. A lawyer at the municipality believed that *“the municipality’s role is just to make sure that the district will be completed. If it is sufficient that individual developers make agreements, the municipality should not be involved”* (M-Lawyer). One project manager at a developer reflected over their situation, saying that *“it is all about time and trusting that we show each other our playing cards”* (PM, Developer D9).

### Division of labor

The developers reacted differently to their task of building and sharing garages, but all developers were a bit unsure about the level of coordination needed. One project manager summarized the early discussions: *“To have seven developers collaborating over one garage will not work”* (PM, Developer D4). Some smaller developers took a passive role and let the larger, more experienced developers lead the way. One larger developer was very proactive in the discussions and took the lead role in investigating other options. Its project manager thought the large garages would be *“very expensive, very complex, both during planning, construction and to facilitate, just because the municipality forces us into this to create a car-free district”* (PM, Developer D9).



This developer investigated the possibility of building a garage in existing caverns close by, and its project manager continued to explain: *"We picked up the baton, because we thought it was worth exploring, and we pitched it to all developers"*. However, some other developers were skeptical about this idea, and one project manager raised an issue during a meeting: *"There will be problems for women in a large garage at night, but no one cares about safety and security problems"* (PM, Developer D6). A project manager at another developer rejected both suggested options: *"Our dream scenario is to have our own garage... it might be expensive, but it is possibly what the end customer also wants. Sometimes, you forget to think about the end customers"* (PM, Developer D5).

Due to the different opinions within the developer group, the developers did not try to convince the municipality to reconsider the garage solution. Instead, two developers sharing one block jointly hired a land lawyer to investigate how contracts should be set up between the developers to build and manage the two shared garages. All the other developers liked the idea of having a joint attorney, so the attorney was engaged by all 11 developers. One project manager summarized it thus: *"It is important to have consensus on how to use the facilities within the blocks; you have to have discussions all the time"* (PM, Developer D5).

Another example of how the developers divided their work is when they hired a project manager consultant for each garage to lead the design and construction process, and to care for each building constructed on top of the garages. One consultant described his work in this way: *"Making the best for all developers. Trying to see what is positive for one, should also be positive for the other. Or, if there is something negative, one might unconsciously take that into account – to make it as good as possible for all"* (PM, consultant). In other words, the developers hired a neutral party to lead the coordinating work in order to minimize conflict. From the informal relationships at the beginning of the process, they *"will have a good deal of commonality agreements"* (PM, Developer D2).

### Workflow

During the early phases of the planning, the developers thought the municipality would guide them in how to build the garages, but the municipality made it clear from the start that the developers had to organize between themselves. As soon as the developers understood what issues they had to coordinate

and collaborate over, they aligned themselves in different meeting forums: *"I believe it was one of us developers who called for a meeting regarding one or two issues. Then it moved on to additional questions. It has not been super formalized"* (PM, Developer D2). Those who shared a block had the closest collaboration, meeting each other regularly and discussing their shared structures and regulatory issues.

Apart from the close collaboration between the developers who shared blocks, the most regular meeting forum was with the developers who shared garages. Here, the discussions revolved around who should build what part of the garage and how the facility management should look. An additional meeting forum was for the whole stage, i.e. all 11 developers. This forum was mainly used to discuss common issues they had with the municipality and to share ideas with the two garage forums on how the two groups planned to coordinate.

### Aggregation

From a rather chaotic start with many different opinions, through an iterative process, the developers tried to find a solution that worked for all projects. One project manager summarized this process, saying that it had *"become a close and natural coordination, which continuously becomes clearer"* (PM, Developer D9). The process had a positive purpose to create a common end product (the garages) and had developed from the initial organizing in meeting forums. To reduce conflict and ensure that all voices were heard, the developers hired joint project management consultants to oversee the design and construction of the garages, in addition to the lawyers that created communality agreements between the developers.

### Discussion

#### Self-organizing in urban development districts

Large urban development districts are often described and researched through the lens of megaprojects (Flyvbjerg 2014) or large-scale complex projects (Miller & Hobbs 2005). In this paper, however, urban development districts are seen through the lens of project ecologies (Grabher 2004). The end products, buildings and infrastructure, were all initiated by local government (municipalities), yet they were delivered and constructed through multiple single projects by public or private developers, a rather new way of delivering public services of urban development (Osborne 2009, Howlett 2019). Project ecologies create space between projects filled with informal, horizontal

interdependencies that, over time, become more or less formalized. The findings of this paper show this “between” projects to be a main complexity for developers to manage, as coordinating activities between different projects is essential to finalizing the end product.

Having interdependencies between projects affects single construction projects in several ways. Karrbom Gustavsson (2016) describes the constant management of change and crises when performing projects in a project ecology, which is here seen as happening not just in single projects but *between* projects. The messy reality of projects has been described before (e.g. Engwall 2003), but in project ecologies it is not project complexity, but *between*-project complexity. Adding to this, the findings of this paper show that the management of the between takes up time and resources from the developers’ project managers, which is needed to coordinate time plans and shared spaces across projects. This is in stark contrast to programs that have a separate program manager to manage the interdependencies between projects.

To explain the social and relational interdependencies between construction projects, self-organizing as understood by Heylighen (2013) was fruitful. It was helpful to be able to zoom in on a micro level from the project ecologies and explore the developers and their project managers as facilitators of organizing beyond top-down management from the government (Pryke *et al.* 2018). However, while Heylighen (2013) describes self-organizing as a linear process moving through the four coordinating mechanisms, the cases in this paper describe an iterative process. The developers aligned themselves in different ways depending on how they experienced their coordinating processes when dividing the work between themselves and working through their issues. An example of this iterative process can be seen in the trial-and-error approach. In a first process, the developers set up different meeting forums; if that was not enough, they hired consultants or lawyers to draw up collaboration agreements.

### **Coordinating between projects**

Bygballe *et al.* (2016) find that coordinating is central in multi-project contexts. While Jacobsson (2011) asserts that a combination of formal and informal relationships is needed to coordinate multi-project contexts, from the two cases of this paper it is clear that informal relationships led the coordinating between the projects. Albeit with some differences,

the developers’ coordinating in Case 1 was a bottom-up initiative, where they, from the start, focused on formalizing their relationships. While in Case 2, the self-organizing came after a top-down decision by the municipality to make the developers share garages. Here, the developers instead focused on establishing trust between themselves, which is in line with Newell *et al.* (2008) findings that trust takes time in project ecologies. These differences can also be related to the different kinds of developers, large government entities versus small private housing developers, and their experience of working in project ecologies.

Strong actors form self-organizing communities (Pryke *et al.* 2018) and the findings show that the between is filled not only with issues of common interest but with developers of different size and influence. For instance, in Case 1, the large state developer took the role of initiator and provided a model for formalized collaboration, and in Case 2 a large private developer took the role of informal leader on certain matters. While single projects might benefit from this in terms of convenience, it is evident that this type of self-organizing creates possibilities for informal power relationships to thrive (Swyngedouw 2005).

In addition, the ways of organizing and routinizing the coordination, especially in Case 1, were adapted from the developers’ experiences in past projects. Previous research shows these types of decisions may lead to forms of organizing that are sub-optimal (Eriksson and Kadefors 2017). In both cases, examples were found where one or more developers took the lead in a matter that was important for them, and they were able to prioritize their own goals. This revealed a context where public and private interests were managed and negotiated through individual project managers. Single projects and their management, however, may have other agendas than those posed by the government for urban development districts (Candel *et al.* 2021), instead focusing on finishing their construction projects on time and within budget. For instance, in Case 2, when one large developer tried to influence the developer group to place the garages in a cavern to simplify the design and construction process, while a smaller developer objected in the interests of their future residents’ security.

### **The developers’ influence on urban development districts**

Following public governance schemes and new public management logics, projects of societal significance



are more frequently done in the public sector – often with collaboration between public and private actors (Fred 2015, Lundin *et al.* 2015). The findings of this paper illustrate how interdependencies between projects lead to complex project ecologies, where no actor is in full control. This offers a perspective on the implications of the “projectification” of both the built environment and society at large (Lundin *et al.* 2015).

Construction projects and developers can be enablers of integrating urban development because their project results (buildings and infrastructure) form a large part of completed districts (Candel *et al.* 2021). Through self-organizing processes, project ecologies emerge and constantly develop, which can aid in reaching goals beyond completed construction projects, such as the grand challenges of urbanization and sustainable districts or cities (Hallin *et al.* 2021). However, the findings show that this is dependent on developers’ participation and their organizing between projects.

Both cases illustrate that the developers were not focused on the policy goals of the municipalities for the two urban development districts. They were more focused on their own projects, organizing between projects only when it affected their project processes or outcomes. The incentive for the developers to align themselves was to provide an end product that was attractive to sell or rent to end users. For example, in the urban development districts of Case 2, sustainability was stated to be the most important factor for both the development process and the profile of the new district. However, in the case of the shared garages, sustainability was not on the agenda. Instead, when the developers self-organized to coordinate the construction of the shared garages, the focus was finding a solution that was buildable and manageable within the developers’ budgets. This offers some perspective on the division of a district into small, autonomous projects. When the developers are left to self-organize, the focus tends towards short-term goals, often missing the bigger picture (Fred 2015).

## Conclusions

The purpose of this paper is to provide insight into the practices of coordination between public and private developers in urban development districts, and the influence they have on the built environment in new districts. Based on the findings from two case studies, several coordinating mechanisms have been revealed, described through the self-organizing that the developers used to handle their between-project

interdependencies. These coordinating practices consisted of, for example, establishing a series of meetings, hiring consultants together, defining common goals, and creating shared IT solutions.

The study contributes to the emerging field of construction management, looking particularly at project ecologies and the practices associated with such environments. It illustrates how developers play a large role in finalizing the design and construction of new districts through their self-organizing. In effect, new urban districts can only be reached through joint efforts and coordination amongst developers. The study also sheds light on the differences between developers (small or large, level of experience, new entrants, public or private, etc.) and how the potential for skewed power dynamics between these actors needs to be addressed.

In line with the aim of heterogeneous urban development, urban development districts grant the opportunity for many developers to participate, even if they are small or inexperienced. However, such diverse participation is also associated with the risk that the overarching goals of urban development districts, such as sustainability, may be missed. When the work to carry out urban development is divided between different developers, the ability to include overarching goals is largely given to the project ecology. The findings show that, with no one in charge, the developers focused on fulfilling their own project goals according to their business plans, and that during planning and design, time management and cost efficiency were their focus. Even though the developers were building in sustainability profiled districts, the messy reality between the projects, created through heterogeneous governance, risked missing the sustainability goals. Future studies should investigate how sustainability goals can be reached in project ecologies.

The practices to coordinate between developers vary widely between contexts and are influenced by the actors’ experiences. This study contributes at the policy level, as the findings may spur a discussion on the benefits and drawbacks of the current form of carrying out urban development (many developers operating on small neighboring plots). Future research should also focus specifically on how overarching sustainability goals are translated by different processes into an end product.

This study is limited due to its regional focus in Stockholm and future studies in other regions could provide greater nuance to the findings. An international comparison could also broaden the understanding of how different national cultures and norms

influence how developers work together, such as the influence of the Nordic consensus culture on project ecologies (cf Klakegg & Holst Volden 2016). The study could also be extended to focus on different heuristics as coordinating mechanisms for developers to organize between projects, with the understanding that practices within construction projects are based on previous experiences and industry know-how.

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