BOUNCING FORWARD

Redefining a disaster-struck city: The case of Enschede

It's the endpoint of the train,
almost no man has to be there,
almost no dog goes that far:
Enschede.

The castles of the industry
still scattered here and there
hollow, and worn out
where only the wind reins free

Textile barons of the past,
their hunting ground no longer exists.
Where would they be,
Van Heek, Ter Kuile, Blijdenstein?

Did they produce children,
do they still have offspring here?
Or did they quickly choose for a better stead
than Enschede??

Krim, Berkenkamp, Sebastopol,
It is over. Enough is enough.
Almost nobody remembers
your resignation, your suffering.

Straight through the emaciated heart
now runs the cold Boulevard
with postal office and warehouses
O Enschede, Enschede

- Willem Wilmink – Textile City[1]

[1] Willem Wilmink, Verzamelde liedjes en gedichten (Amsterdam, Prometheus, 2017) (Translated by R.Meijer)

Figure 1 (front): Chimney-dominated skyline of the city-centre during the industrial revolution

Figure 2: Demolition textile-factory "J.F. Scholten & Zonen". (City-Archive Enschede, 1977)

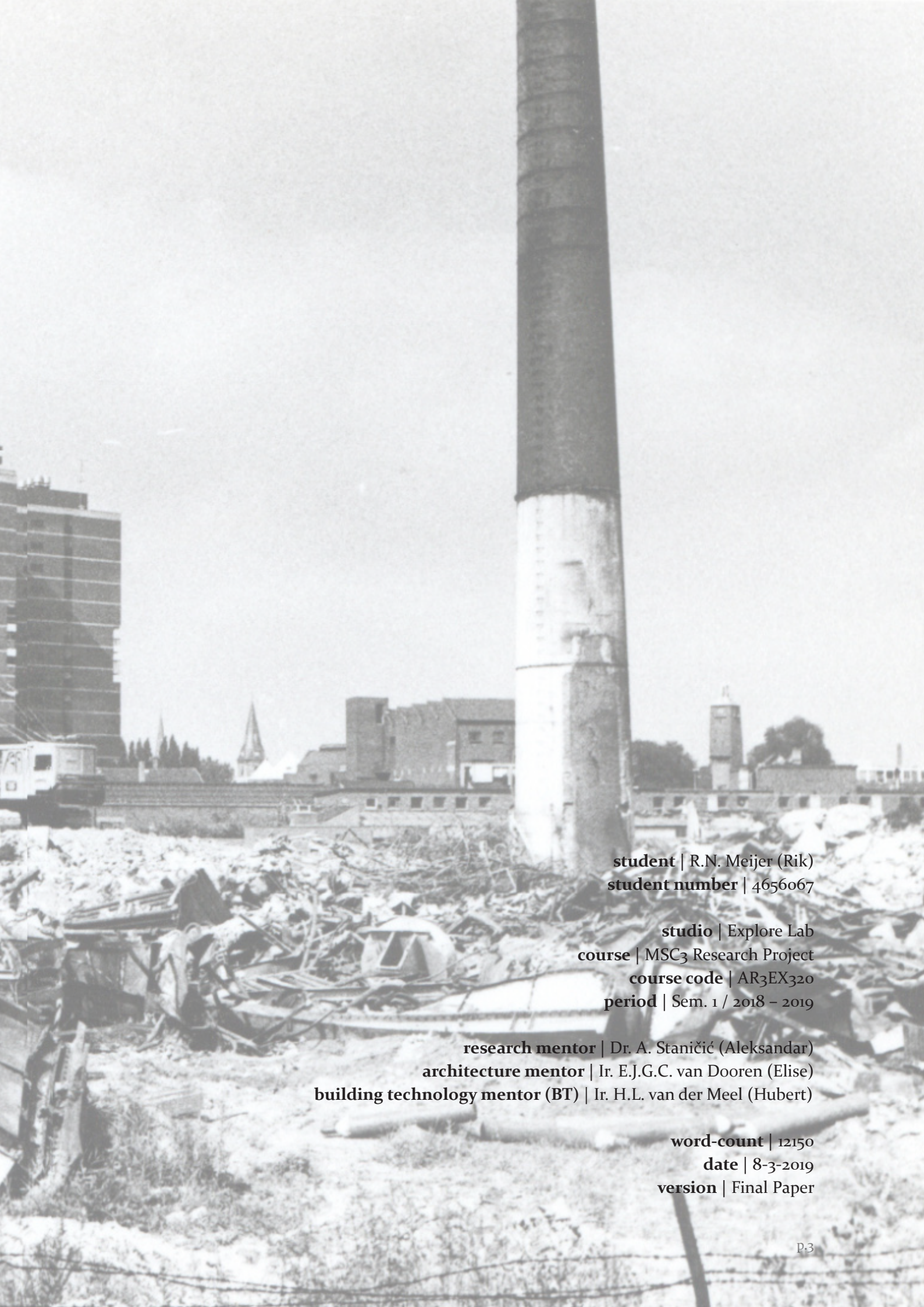

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Figure 3:
Textile-Factory "Van Heek & Co".
(City-Archive Enschede, 1970)

Abstract
The post-disaster redevelopment of a city is a complex process that requires perspectives from urban, social, economic and even ecological sciences. Resilience defines as the ability to bounce back, but the ever-changing complexity of a city requires more than a simple rebuilding to pre-disaster conditions. My research identifies different notions on urban resilience but adopts the principle of "bouncing-forward", where redevelopment aims far beyond the mere physical recovery and restoration. The "bouncing forward" notion implies the system's ability to apply a transformative, "learning-curve" attitude for long-term development. By analyzing the historical moments of destruction and reconstruction of Enschede, I define a "learning curve" that teaches us that each redevelopment offers an opportunity for a paradigm shift based on the societal requirements of time. Also, historically, each reconstruction used the specificity of place to determine the direction for urban redefinition. I use these perspectives and lessons on urban resilience to re-evaluate the Roombeek redevelopment. After the fireworks-factory disaster, a participatory mode of governance – based on consensus decision-making – was applied to restore the disrupted relationship between the public and the local government. By putting architects into a power vacuum, the Roombeek redevelopment displayed pragmatism over a "transformative" vision for urban redefinition. A 200-car parking-facility close to the disaster-site indicates favoring the wishes of a small collective over the requirements of the city. By extrapolating from the learning curve, I formulated a future urban redefinition. I argue that the city should try to establish symbiosis between the inner-city creative forces and the edge-city's innovative forces to establish itself as the cultural-technological city. By building a "sustainable, cultural breeding ground" on the location as mentioned earlier, the city could take the first step in shifting towards urban redefinition.
Key-Words: Urban Redefinition, Urban Resilience, Post-Disaster Redevelopment, Interactive Governance, Enschede, Roombeek

Introduction
Disaster-caused urban destruction sparks debate on redevelopment for the future. Urban destruction does not only damage physical property, but more importantly, the place-embedded memory, culture and spirit. However, the properties of place that are most vulnerable, also provide resources for future renewal.[2]

When the dust settles, and a period of disaster-relief and processing trauma passes, the ruins are breeding ground for ideas as opportunities for progressive reform.[3] A disaster is an ultimate opportunity to "bounce forward", it offers an incentive for the enhancement of local properties in opposite to restoring the pre-disaster conditions.[4] Destruction gives the opportunity to fast-forward the development of a city into a completely new urban paradigm.[5]

The explosion of the fireworks-factory in the city of Enschede, in the eastern part of the Netherlands, led to the loss of 23 lives and destruction of 42 hectares of urban tissue. Eighteen years

[2] L. Vale, T. Campanella, The Resilient City: How Modern Cities Recover from Disaster (Oxford: Oxford University Press, 2005) p.347
[3] Ibid
[4] B. Manyena, G. O'Brien, P. O'Keefe, J. Rose, "Disaster resilience: a bounce back or bounce forward ability?" Local Environment, 16(5) (2011) p.432
[5] L. Vale, T. Campanella, p.348

Figure 4:
Demolition textile-factory “Nico ter Kuile“
(City-Archive Enschede, 1976)

later, architects, urbanists and developers incorporated a new neighborhood into the damaged city matrix by applying a participatory and interactive model of governance for rebuilding the lost architecture of Roombeek.[6] Although most of the damaged urban tissue has been restored, it can still project a coherent vision for the future. After almost two decades of redevelopment, the time passed allows re-evaluation of the applied methods and reconstruction approaches.

Applying the participatory model of planning has enabled the return of Roombeek's citizens and linear restoration of the built environment, but the constant focusing on mundane issues has hindered the possibility to propose a bold vision for the city's future development. The applied model led to unbalanced spatial results since the most part is focused on restoration and return to pre-disaster conditions. The most striking example for this obvious lack of future vision is the vacant plot next to the explosion's epicenter. From a historical and urban perspective, it possesses the ultimate potential to display a vision of a futuristic city; instead, it has been filled with concrete slabs to facilitate parking for residents. Hence, precedence was given to a small-scale and pragmatic solution over fulfilling the landmark-potential. In a time when Enschede is need of a thorough redefinition, this location still offers the opportunity for a development whose significance would go beyond the confines of the local neighborhood.

Observing the turbulent timeline of urban development of Enschede reveals that the fireworks-factory disaster is only the last drop in a wave of urban destructions and reconstructions. The city has been subjected to a series of disasters that include a city-fire, the Second World War bombardments and a forceful destruction of its rich industrial heritage under the pretext of modernization.

One of the basic principles of urban resilience is the "bouncing-back" principle that indicates the ability of a system to regain its former physical characteristics after a disturbance.[7] However, in my research, I focus on the idea that disturbance is a necessary part of improvement to make the system stronger. This is formulated as "bouncing-forward", a principle introduced by Dr. Bernard Manyena to emphasize the necessity to improve the pre-disaster conditions.[9] I use the notions of "change" and "transformability" as criteria to re-evaluate the Roombeek redevelopment. It is my understanding that, during the reconstruction process, the municipality lacked leadership because of the extremely sensitive nature of the issue. Instead, a processual and participatory model of governance has been applied to avoid further backlash from the public.[10] As a result, the government responded to the short-sighted requirements of local residents who simply wanted to restore the pre-disaster conditions. The reconstruction process turned Roombeek into slightly enhanced representation of both the past and the disaster. The municipality used the applied model as a tool to restore the relationship between the public and the local government.[11] It is my position that the unfinished reconstruction project still carries the potential to display a redefinition for the future.

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[6] B. Denters, *The rise of interactive governance and quasi markets* (Dordrecht: Kluwer Academic Publishers, 2003) p.1

[7] S.B. Manyena, G. O'Brien, P. O'Keefe, J. Rose,) p.418

[8] L. Chelleri, "*From the Resilient City to Urban Resilience.*" Documents d'Analisi Geografica, 58(2), p.287-306

[9] S.B. Manyena, Disaster Resilience in Development and Humanitarian Interventions (Newcastle upon Tyne, University of Northumbria, 2009) p.261

[10] B. Colenbrander, "Hyper-polder model: The Rebuilding of Roombeek, Enschede"Archis, 4 (2002), p.4

[11] B. Colenbrander (2019, 7th of January) personal interview

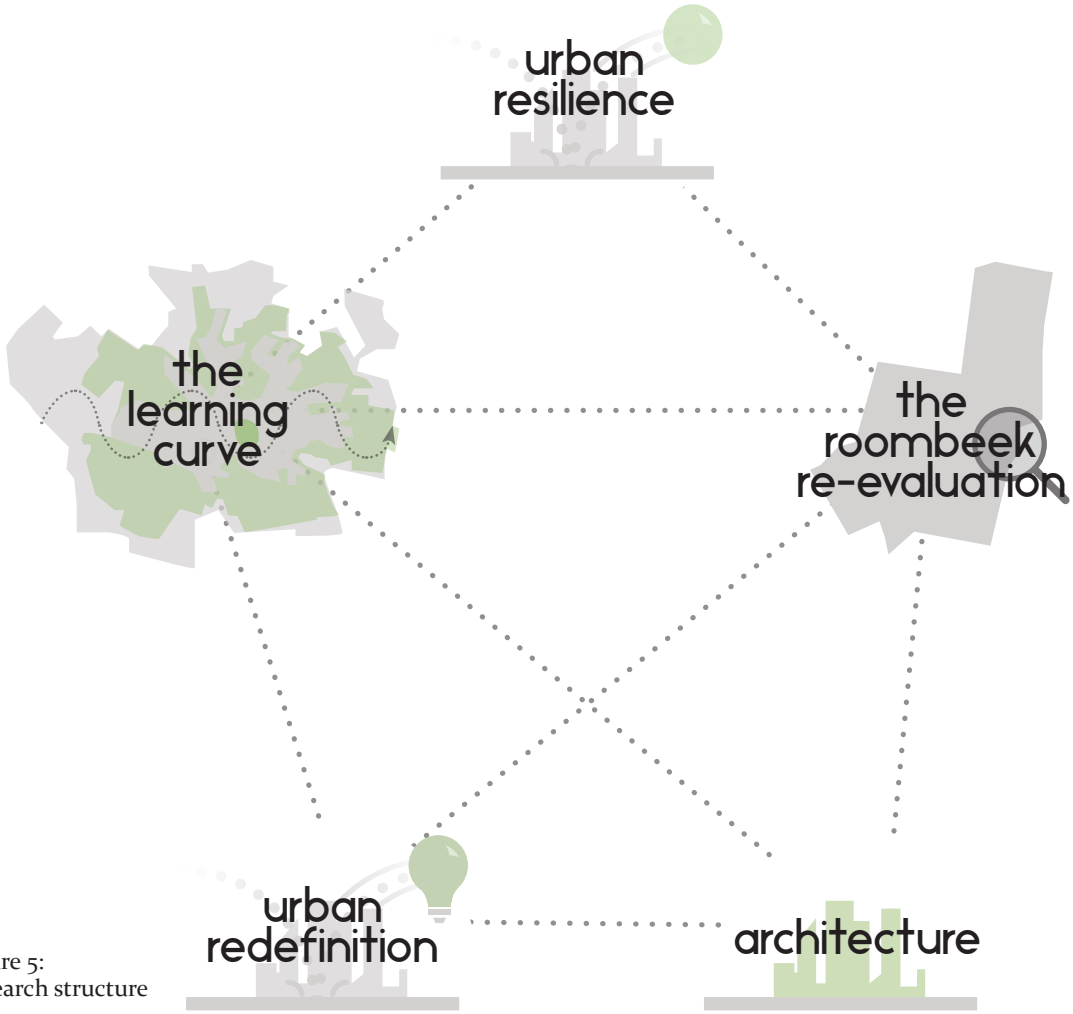

Figure 5:
Research structure

Method

My research explores how Enschede has dealt with urban resilience in the past and from that it extrapolates the direction for the future urban development of the city. This leads to the research question: *How can the city of Enschede redefine itself by learning from its own experience in urban resilience?*

First, the research will (1) establish a locally applicable definition of "urban resilience", understanding it as "improving the system beyond previous conditions." Secondly, the research will (2) analyze how the city of Enschede repeatedly managed to redefine itself after several moments of destruction in the past. This has produced a characteristic "learning-curve" of resilience that includes moments of destruction, immediate reconstructions and urban redefinitions that each have leaped into the future. Thirdly, it will (3) re-evaluate the most recent redevelopment of Roombeek according to the previously defined notion of resilience. This will be done through the socio-spatial analysis of the architectural and urban outcome and by conducting interviews with different stakeholders about the reconstruction process. In the fourth step, by extrapolating from the "learning curve" and using the existing theories on urban resilience, the paper will set (4) direction for future urban redefinition of the city. Lastly, the urban redefinition will serve as a guiding theme for the (5) architectural project to be designed in the aforementioned landmark-location (fig.5). I will conclude the paper by formulating the qualitative demands for the building design that I will develop further in the second phase of the project.

1. Urban resilience in the local context

This chapter analyzes different perspectives on urban resilience to extract the one that is most suitable for the local context. Even though the city of Enschede is known for its destructive past, nearly every city has experienced destruction in its lifetime. Cities are the ultimate manifestation of collective human activity and resilience; people always find a way to rebuild their cities to "reassure themselves about the future".[12] Meaningful reconstruction of a city, especially after a traumatic event, is a clear sign of progress aimed to achieve psychological recovery. Therefore, to claim the resilience of a city seems to be nothing else but appropriation of a characteristic that is already embedded in its nature.

Identifiable Models

Nevertheless, this does not mean that there are no identifiable characteristics of "resilience". As described in The Resilient City by Lawrence Vale and Thomas Campanella, the process of simple rebuilding is a necessary but by itself, insufficient reaction to the "disaster-born opportunity". The extent of displayed resilience after a disaster is questionable if it does not include the ability to "retain the economic base."[13] A similar stance taken by Mannakara and Wilkinson described as "Building Back Better" addresses the holistic approach to post-disaster reconstruction. The main objective should not just be physical recovery, but it should also answer to the economic urgencies of a place. The claim is that mere physical recovery or restoration does not fully exploit the opportunity to "address and rectify the vulnerabilities found in communities". [14]

[12] L. Vale, T. Campanella, p.344
[13] Ibid, p.344
[14] S. Mannakkara, S. Wilkinson, Re-Conceptualizing "Building Back Better" to improve Post-Disaster Recovery, International Journal of Managing Projects in Business, 7(3) (2014) p.329

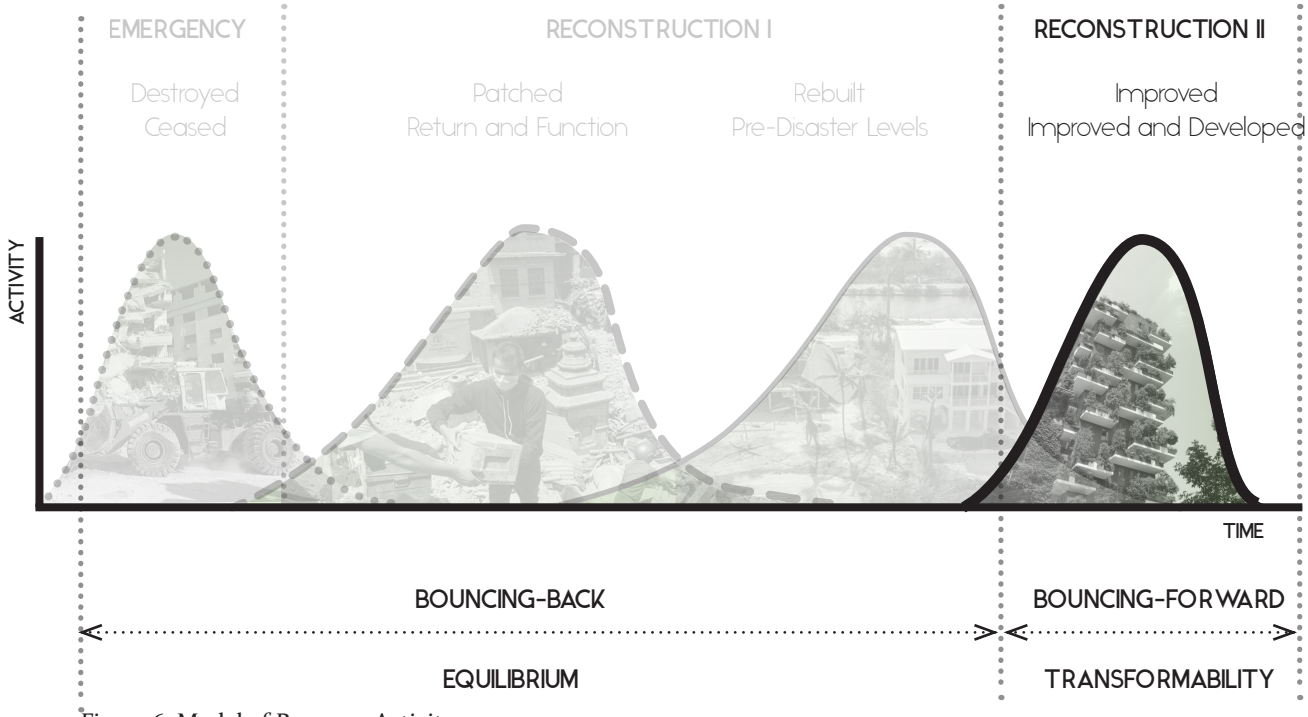

Figure 6: Model of Recovery Activity
(L. Vale, T. Campanella, p.336) (Remade by R.Meijer)

In his review of different perspectives on resilience of urban systems, Lorenzo Chelleri also emphasizes the importance of long-term system transformations. He draws his views on resilience from ecological, psychological and economic sciences. For instance, after a disturbance, the ecological system does much more than "bouncing-back" to its previous state – it manages to adapt according to the new set of conditions. This perspective leads to the understanding that the disturbance is necessary for the evolving development of the system.[15]

In Disaster resilience: a bounce back or bounce forward ability, authors point out that the "bouncing-back" is derived from the latin word, "resiliere", which means "to jump back". Dr Bernard Manyena critiques the bouncing-back principle due to its "inability to react to the changed reality".[16] Douglas Paton argues that, "bouncing-back" does not encapsulate the possibilities opened up by a disaster and that it catalyzing development should be implicit to the concept of resilience.[17] Manyena reformulated the principle by introducing the notion of "bouncing-forward". He argues that this encapsulates better the philosophical nature of urban recovery, by aiming for the deeper purpose that would go beyond the most basic phases of physical restoration.[18] Although both principles understand resilience as being progressive, "bouncing-back" seems to be short-sighted, while "bouncing-forward" aims to be visionary in its objective to predict (and adjust to) ever-changing societal and environmental circumstances (fig.6).

Model of Recovery Activity

Fragmenting the process can help determine a suitable principle for the post-disaster recovery. The "model of recovery activity" by Vale & Campanella divides the post-disaster process into four identifiable phases that range from emergency responses to reconstruction for commemoration, betterment and redevelopment.[19] According to the model, transitioning from the third into the fourth phase marks a significant moment in the process. So far, the reconstruction has re-established "prosperity and sociability", but now needs to aim for future growth.[20] The fourth phase indicates a crucial opportunity to create something that would exceed pre-disaster capacities. Instead of deriving ideas from the pre-disaster circumstances, developers now have to come up with brand-new urban concepts. Urbanist Ton Schaap underlines the importance for future renewal: "a city that shuts itself off for the future, will – to a certain extent – seize to exist".[21] He claims that the attempts to establish new concepts may be difficult, but they lead to necessary innovations that inspire future generations.

Superimposing

By overlapping the ecological principle of "adaption", as defined by Lorenzo Chelleri, with the fourth phase of the activity model ("better development"), I conclude that the long-term resilience requires radical changes of the system and making bold predictions for the future, instead of simple "linear" recovery. The understanding of post-disaster reconstruction, therefore, shifts from dealing with simple technical

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[15] L. Chelleri, p.292
[16] B. Manyena, G. O'Brien, P. O'Keefe, J. Rose, p.418
[17] D. Paton, D.M. Johnston, "Disaster Resilience: An Integrated Approach" (Springfield Charles C Thomas Pub Ltd., 2006) p.8
[18] B. Manyena, G. O'Brien, P. O'Keefe, J. Rose, p.432
[19] L. Vale, T. Campanella, p.336
[20] Ibid, p.337
[21] T. Schaap, T. Baart, "Building Site Enschede: A City Recreates Itself", (Rotterdam: NAi Publishers, 2015) p.6

Figure 7: Boulevard 1945, Enschede.
(City-Archive Enschede, 1970)

improvements of the built environment to applying vast urban redefinitions that will adapt to the new requirements of time. The fourth phase requires radically new urban direction that would go beyond the bouncing-back principle: a transformative "learning-curve" attitude for the progressive, long term development.[22]

Similarly, by combining Dr Manyana's perspectives with the model of recovery activity offered by Vale and Campanella, I conclude that the first three phases are about "bouncing-back" whereas the "bouncing-forward" principle is reserved for the fourth phase. Rebuilding to sustain life is the most critical post-disaster phase; this is where the bouncing-back principle is most prevalent. The last phase is different from the first three due to its capacity to change the urban system according to the long-term requirements that go beyond satisfying present needs. Therefore, I describe the last phase as the principle of "bouncing forward".

Ecological transformability

In his article Social and ecological resilience, William Adger addresses the importance of "change" as a defining characteristic of a resilient system.[23] Adger argues that social resilience should include the ability to transform to withstand (future) environmental change. Therefore, the community depends greatly on the transformative abilities of the ecological system.[24] Emily Boyd and Sirkku Juhola underline the importance of recognizability during social-ecological transformations: they believe that the system should be able to cross between "desired states" without changing their identity.

In the realm of the physical environment, Adger claims that "transformation" can be achieved through resource independency: the "evolutionary nature" is demonstrated by its ability to depend on the whole ecosystem.[26] Adger also states that resource independence adds to the stability of the system, which in turn, contributes to "induced innovation and technological development".[27] When projected into the urban domain, both Adger and Boyd and Juhola stress the governmental role by stating that the institutional rules of the system are fundamental in enabling social-ecological transformation.[28]

Finally, the necessity for a future vision that would go beyond the "steady state" of sustainability is addressed by Jozef Fiksel: "societal institutions need to develop adaptive policies and strategies to project a future beyond the 'steady state' model of sustainability".[29] It needs to include the ability to cope with unexpected challenges with "long-term concerns about human and ecological well-being".[30]

In my research, therefore, I focus on the "bouncing-forward"-principle. This is where, in my opinion, urban resilience is most effective: it makes urban systems adapt to disturbances, anticipate new visions for the future, and serves the ecosystem (both societal and environmental) as a whole. More importantly, it has to calculate the system's ability to evolve beyond pre-disaster conditions by following a "learning-curve" pattern. From a socio-ecological perspective, resilience implies the ability to foresee future environmental challenges and transform accordingly (without losing recognizability) and includes a

[22] L. Chelleri, p.299
[23] W.N. Adger, "Social and ecological resilience: are they related?", Progress in Human Geography, 24(3) (2000) p.347
[24] Ibid
[25] Ibid
[26] W.N. Adger, p.352
[27] Ibid, p.355
[28] W.N. Adger, p.354; E. Boyd, S. Juhola, p.1238
[29] J. Fiksel, "Sustainability and resilience: toward a systems approach", Sustainability: Science, Practice and Policy, 2(2), (2006) p.20
[30] Ibid

Figure 7: "De Oude Markt" (old market) after the city-fire (Willem Janssen, 2012)

Figure 8:
A glimpse of the devestation city through the city-gate (J.J. Meinsma, 1862)

Figure 9:
Devestation after the fire
('T Inschrien, 1982)

Figure 10:
Hotel de Graaff
(City-Archive, 1911)

resource independency to withstand future disturbances better. Applying these principles of resilience brings stability of an urban system that – subsequently – will contribute to the innovative and technological development of the urban system. The extent to which the system can apply transformability is largely dictated by the institutional rules that govern it. The next chapter analyses how the city of Enschede formed its own "learning-curve".

2. The Learning Curve

Lorenzo Chelleri's definition of a learning-loop gives us a proper analytical framework that reveals "transformative" capabilities of the post-disaster reconstruction processes. The history of Enschede has four decisive moments of destruction that incited the city to apply directions that were forced to think innovatively about the subsequent urban renewals. By elaborating on these disasters and their subsequent reconstructions, I formulate the learning-curve of Enschede.

The Great Blaze – Industrialization

On May 7th, 1862, when the city was completely built out of wood and limited in size by the surrounding canals, a fire broke out. The fire catastrophe destroyed the entire historic town, while 80% of the inhabitants became homeless (fig. 7-9). Enschede carries the "honor" of having experienced the last city-fire in the country.[31] In the attempt to rebuild swiftly and efficiently, the ruins were cleared by shoving the debris into the gold-and silverware filled canals, cancelling them completely.[32] By doing so, the city took the opportunity to finally expand outside its historical boundaries.

Enschede already had small industrial activities, but the new circumstances significantly accelerated industrial production. The fire marks the moment when the city fast-forwarded the industrial modernization, a tipping point from a handcraft community to an economy of mass-production.[33] To accompany these industrial advancements, the city centre developed a new urban image including residential areas with villa's that predominantly belonged to the factory-owners. Improved economic circumstances led to the introduction of a brand-new architectural appearance that was previously unknown to rural settlements inside the country (fig.10).[34]

"The fire of 1862 has completely destroyed the city, but has – nevertheless – reemerged tremendously.
The millions of the region have been showcased in an amazing manner. The homes of the factory-owners are all villa's, their clubhouse is the most beautiful in the country, the Roman church is exceptionally beautiful and colossal, everything displays that the industrial business is bearing unimaginable fruits. [...] The spirit of the people is cheerful, ambitious, liberal and friendly".

- Wilhelm Loos, visiting the city couple of years after the fire.[35]

[31] Y. Suurenbroek, "Grote gebouwen, grote branden." (Enschede: Saxion, Kenniscentrum Leefomgeving, Reeks KCL Public, 2010) p.13

[32] Hoping to save at least some valuable belongings, many started throwing their most cherished possessions into the canal. To this day, some claim that the city-centre is rich in uncollected gold- and silverware.
TC Tubantia, "Verstopte dukaten in stadsgracht" (Enschede: TC Tubantia, 2012)

[33] G. Dijkstra, G. Kuitert. "De Nijvere Stad: 100 jaar bedrijvigheid in Enschede". (Enschede: Broekhuis, 1994) p. 50

[34] R. Kemper, "Publicaties over de stadsbrand." "'n Sliepsteen" 23(91), p.91 The transformation was also a technical improvement: city was completely rebuild out of brick. Also, the corners of all the buildings were radically rounded to prevent "kinked fire-hoses" during city-fires.

[35] D. Parengkuan, "Ooggetuigen van de stadsbrand in Enschede 1862" (Translated by R.Meijer)

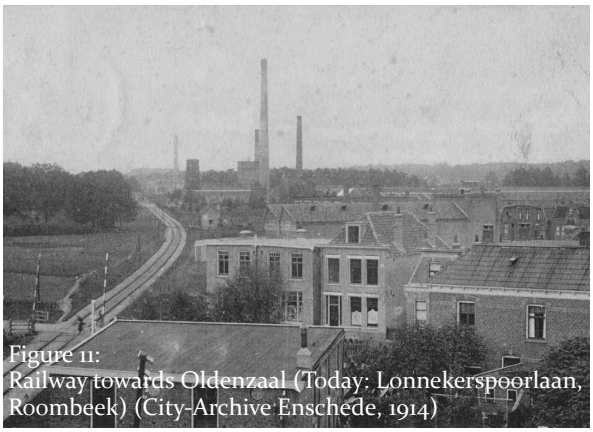

Figure 11:
Railway towards Oldenzaal (Today: Lonnekerspoorlaan, Roombeek) (City-Archive Enschede, 1914)

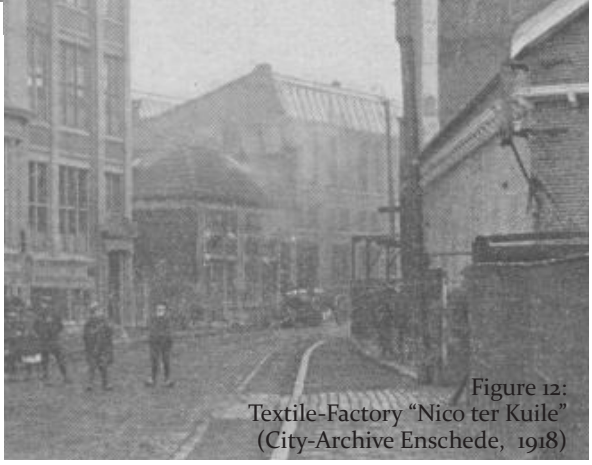

Figure 12:
Textile-Factory "Nico ter Kuile" (City-Archive Enschede, 1918)

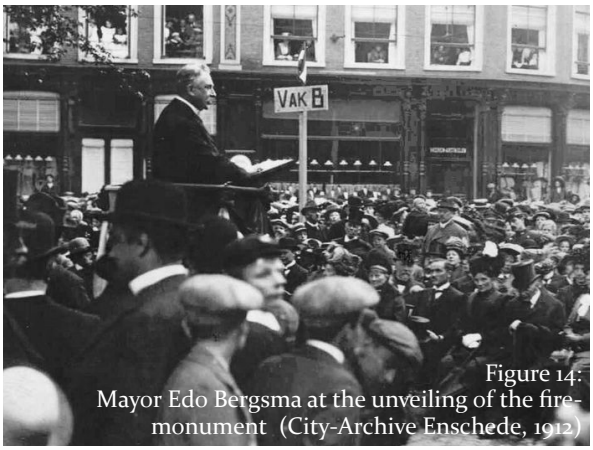

Figure 14:
Mayor Edo Bergsma at the unveiling of the fire-monument (City-Archive Enschede, 1912)

Figure 13: Chimney-dominated skyline of the city-centre (TC Tubantia, 1911)

The industrial revolution was in full effect and this influenced the post-disaster behavior heavily. The cities suddenly found themselves in an existential predicament; either join the revolution or leave it.[36] After the fire, Enschede catapulted into being the absolute epicenter of the textile industry in the country and received the name "Manchester of the East" (fig.13).[37]

The impact that the textile industry had on the city influenced a lot more than just the local economy. Factories needed space, water, energy and transport infrastructure. The new morphology of the city was resultant of decision-making dictated by the zeitgeist. One of the members of the members of Crimson Architectural Historians describes that the introduction of the railway contributed to the conditions that incited a "spectacular industrial development", resulting in an enormous industrial heritage (fig.11-12).[38] The physical shape and the aesthetic appearance of the city is more or less a derivation from the utilitarian, industrial decision-making. Essentially, the entire urban development was a result of a small collective that found the place fit for one product: textile. In a documentary about the cities thriving industry, Maarten van Rossum claims that "a handful of factory-owners completely re-shaped the city to their benefit".[39]

In effect, aftermath and recovery, the Enschede city-fire showed great resemblance to the Chicago fire of 1871. After pushing the debris into Lake Michigan, a period of "unprecedented opportunity" and "survival euphoria" began.[40] Under the supervision of Louis Sullivan, Daniel Burnham and John Root, an expanded, bettered and modernized Chicago emerged. It took decades of onward productivity before Chicagoans took the time to look back. Just as in Enschede, the urge to build back better was far greater than the urge to remember or commemorate past events. It was during the peak of Enschede's industrialization when the city took the time to reflect. At the unveiling of the fire-monument in 1926, the mayor of Enschede spoke the following words: "The city-fire was a terrible tragedy that turned out to be an absolute blessing for the city" (fig.14).[41] The rebuilding of the city after the fire enhanced the site-specific conditions and guided the city into an industrial paradigm. The reconstruction was an ultimate display of future vision guided by the requirements of the time.

Allied Bombing – Modernization

Eventually the textile-industry made the city immensely rich, but that same industry also symbolized exploitation and poverty. The textile barons enforced exploitative "survival of the fittest" mentality onto their workers, introducing the city to capitalism. South of the city-centre, the neighborhood called "De Krim" was the ultimate display of shortcomings of a capitalist-driven

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[36] The city was already familiar with the craft of textile: Peddlars who passed through Enschede on their trading route between the Netherlands and the highly industrial German hinterland. A century later, the Dutch government designated the region as a "development-area" for textile due to this strategic location and already present familiarity with the textile-craft. T. Wiegman, "Kleine historie van Enschede" (Hengelo: Broekhuis (1989) p.54

[37] G. Dijkstra, G. Kuitert. "De Nijvere Stad: 100 jaar bedrijvigheid in Enschede". (Enschede: Broekhuis, 1994) p. 50
A name that seems fit, based on the fact that at the time (1870 – 1900) the city was the second largest - industrial area in the world, in terms of textile production.
W.J. Verheul. "Het ontstaan van beeldbepalende projecten tussen betoog en beton" (Den Haag: Boom Uitgevers, 2012) p.157

[38] E. Doorman, W. Vanstiphout, C. Wilkins. "Station Enschede: Cultuurhistorische analyse en aanbevelingen" (Rotterdam: Crimson, 2011) p.14

[39] M. Van Rossum. "Hier zijn de van Rossum's: Enschede" (NTR, 2017) 5:52

[40] J. Ockman. "Out of Ground Zero: Case Studies in Urban Reinvention" (Munich: Prestel, 2002) p.51

[41] M. van Rossum. 4:34

Figure 14: German propagandaafter allied-bombardments. Figuratively stating "That's what friends are for". (TC Tubantia, 1911)

Figure 15: Devestation at Janninksweg after allied bombardments (City-Archive Enschede, 1944)

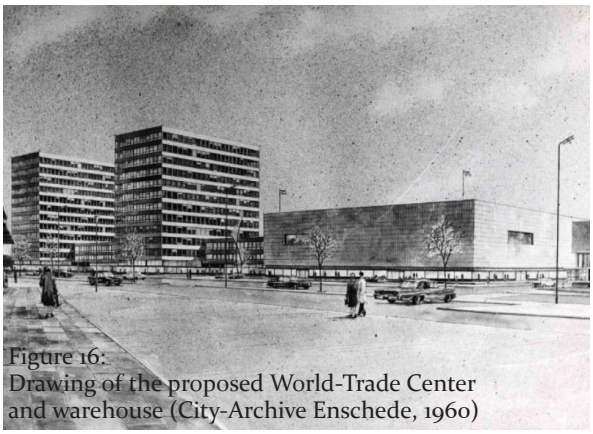

Figure 16:
Drawing of the proposed World-Trade Center and warehouse (City-Archive Enschede, 1960)

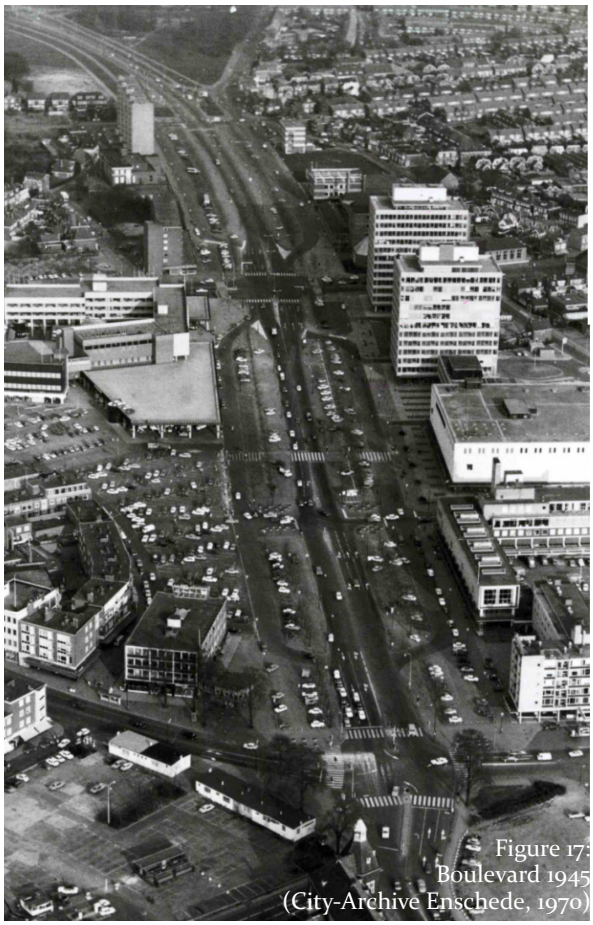

Figure 17:
Boulevard 1945
(City-Archive Enschede, 1970)

mentality of the textile barons: the place was infamous for its grimy character and impoverished conditions.

The next radical modernization and expansion of the city was executed by the virtue of the enormous damage caused by the Second World War aerial bombings. Areas south of the city centre were repeatedly hit by "erroneous bombardments" from British and Canadian forces (fig.14-15).[42] Ironically, it was the impoverished neighborhood of De Krim that was damaged the most. On the bright side, a new opportunity to redefine the city and speed-up its urban renewal appeared immediately after the end of the war. The city eagerly got rid of its "paragon for slumification" by incorporating the "Boulevard-Plan" in Haussmann-like proportions: a typical modernist reflex introduced for the sake of increased mobility in the new automobile-ruled era.[43] To address the foresighted attitude in the city's decision-making, Ton Schaap claims that these "grand metropolitan statements" were constructed in a time where only 10 cars drove through the city.[44]

The city-centre redevelopment also included new building typologies that proportionally matched the boulevard they were building.[45] The Boulevard-Plan (also, in striking coincidence, referred to as "the great leap forward") heralded the future in the typical manner of 1960's urbanism: large modern buildings along a broad thoroughfare (fig.17).[46] By adding a world trade center, public libraries, shopping malls and warehouses to the city centre, the boulevard-plan diversified a part of the city that was extremely mono-functional (fig.16). The vernacular architecture of working-class neighborhood (red-brick cottages) was replaced by buildings designed according to functionalist principles of Baron van Asbeck. For example, the world trade center consisted of two modernist high-rises built on a commercial plinth and the monumental post-office was designed in the style of "Het Nieuwe Bouwen".[47]

In terms of motivation and execution, the modernist reflex of Enschede shows resemblance to the post-war redevelopment of Rotterdam. Just like Enschede, the industrial background of Rotterdam caused its bad reputation of a city overwhelmed with poor rural inhabitants that "struggled to survive in the urban jungle".[48] Even before the war, urban developers had a dream to "clean-up" the city. The "tabula-rasa" conditions produced by heavy bombings made the city-centre a laboratory for architects and fast-forwarded the dream of fundamental modernization. By applying a new urban matrix that prioritized automobile spaces and new building typologies, post-disaster cities like Rotterdam and Enschede managed to shift into a new urban paradigm.

The Destruction of Industrial Heritage – The Knowledge Economy

While the city-fire and the allied bombings led to direct physical destruction, the next historical moment was a social-economic crisis that led to a large physical destruction secondarily. After the Second World War, Enschede enjoyed only a few decades of industrial prosperity: between 1967 and 1977 all textile-factories closed their doors in an "unprecedented cascade of bankruptcies."[49]

[42] H. Brusse. "Enschede: van bevrijding tot Boulevard" (Enschede: Broekhuis, 1992) p.120; Allied forces supposedly mistook Enschede for the German industrial city of Münster. During the course of the Second World War, 40.000 bombs were dropped on the city, killing 356 people G. Dijkstra, G. Kuitert. p. 50

[43] Ibid; The Boulevard had a width of 70 meter, just as wide as Hausmann's Champs-Elysees.

[44] T. Schaap (2019, 6th of February) personal interview

[45] H. Brusse. p.120

[46] E. Doorman, W. Vanstiphout, C. Wilkins. p.16

[47] E. Buursink, "Groeten uit Enschede", ArchiNed (2010); "Het Nieuwe Bouwen", a post-war architectural style aimed to facilitate economic and demographic growth.

[48] J. Ockman. p.89

Figure 18: The void left behind by the demolition of the "Ter Kuile"-factory (City-Archive Enschede, 1977)

Figure 19:
Demolition textile-factory "Van Heek"
City-Archive Enschede, 1977)

Figure 20:
Demolition textile-factory "Nico ter Kuile"
(City-Archive Enschede, 1976)

Figure 21:
New hospital on former industrial grounds
(City-Archive Enschede, 1980)

In 1968, the city lost its most prominent industrial heavyweight, Van Heek, who laid off all 3700 employees after once being the biggest industrial entrepreneur of the country (fig.19). Economically speaking, the city entered the worst period in its dynamic modern history and turned into an "unemployed ghost town with abandoned buildings" (fig. 20).[50] In a wave of misplaced governmental ambitions, a lot of the industrial buildings were demolished to be replaced with new companies that would – supposedly – propel economic development.[51] New companies never came, but the heart of the city was left with areas of immense emptiness (fig.18). In effect, the urban crisis compares to the decline of Detroit after the downfall of the automobile industry.[52] Some of the demolished factory-buildings were replaced by architecture that was typical for the 1970s and 1980s: high-rise apartment blocks and office buildings on "closed plinths". The scale of the replacement buildings was inconsistent to that of the historical centre which added to the fragmented urban structure (fig. 21).[53]

"Who examines the history of the city Enschede must conclude that someone cast a spell on the city. Since the end of the Middle Ages, disasters have periodically taken place in the city, disasters that have left definite urban traces ... And finally, the industrial collapse in 1967, for decades the industrial cork on which Enschede floated. This plague has caused enormous cavities that gave the city its current deplorable face."

- T. Boersma, "The Grim Emptiness of Enschede"[54]

Everything that was reminiscent of the industrial era became susceptible for demolition. The local Foundation for Cultural Heritage recalls that even the rich residential areas built by the factory-owners were victimized by the governmental "demolition-rage". Enschede citizens started to revolt against the city's administration and by doing so, raised awareness about the city's rich cultural heritage: in the 1990s, it finally seized it's destructive-attitude and started transforming industrial buildings for adaptive re-use.[55] Paradoxically, in the decades after that, many prestigious architectural projects have been built so that they stylistically refer to the industrial past by being wrapped in traditional red masonry.

After losing its entire industry, the city desperately tried to attract new sources of capital (fig. 21). Surprisingly, it managed to lure in the third largest technical university in the country: The University of Twente. State advisors initially thought that Enschede was far less fit for the job than other candidates due to its peripheral location. But by offering one of its finest pieces of rural estate, the city earned the privilege.[56] Architects Sjoerd van Emden and Wim van Tijen found their architectural inspiration in the Corbusian principles of modernism. According to University staff member Peter Timmerman, the tabula-rasa conditions of the rural estate were fundamental in the development of "one of the few actually realized CIAM-cities in the world" (fig. 23).[57]
Ton Schaap also acknowledges that the

[49] E. Doorman, W. Vanstiphout, C. Wilkins. "Station Enschede: Cultuurhistorische analyse en aanbevelingen" (Rotterdam: Crimson, 2011) p.14
[50] G. Dijkstra, G. Kuitert. p. 96
[51] E. Doorman, W. Vanstiphout, C. Wilkins. p.26
[52] Ibid p.24
[53] Ibid
[54] T. Boersma "Gaten en nog eens gaten. De barre leegte van Enschede", Wonen-TA/BK, (9) (1976) p.9-16 (Translated by R. Meijer)
[55] Ibid
[56] a 'bocage'-landscape which is typical for the region, characterized by its theatre-esque display of rolling hills and rows of trees.
[57] P. Timmerman, P. Benneworth. "Architectuur in Twente: Een nieuw kennispark", Kunst en Wetenschap (2006) p.11

Figure 21:
Attempts to attact "higher education" to the city.
(City-Archive, Enschede, 1960)

Figure 22:
Surrounded by the rural landscape: "De Hogekamp",
the former faculty for Electrical Engineering.
(City-Archive Enschede, 1969)

Figure 23:
Birds-eye view of the University of Twente, onder
construction (Enschedeinansichten)

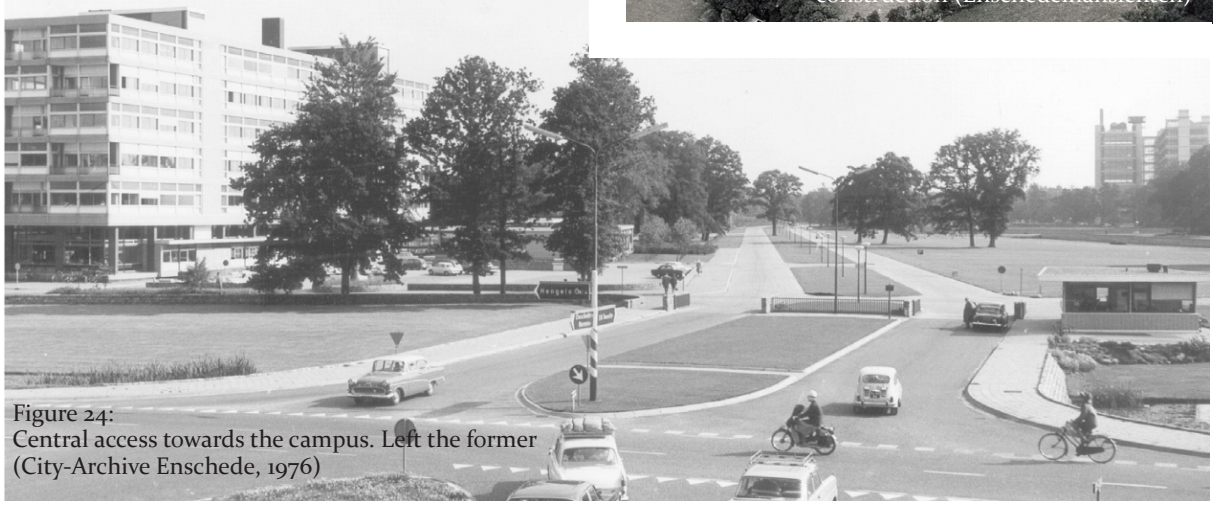

Figure 24:
Central access towards the campus. Left the former
(City-Archive Enschede, 1976)

properties of the landscape were beneficial in establishing a place for innovation and technology. He states that – from a social-geographical perspective – the estates provide the perfect conditions for studying exact sciences.[58] The architects devised a functionalist urban plan with strict division of dwelling, studying and recreation and in, what can be described as, the campus of towers-dominated green landscape (fig. 22-24).[59] Timmerman claims that the campus became a breeding place for innovative architecture that attracted professionals from all over the world. Aside from the architectural attraction, the university also started gaining economic success. In its surrounding neighborhood, a "Silicon-Valley"' type campus was developed to facilitate the countless "spin-off" companies that the university produced. In fact, the University of Twente became the most entrepreneurial university in the Netherlands with a thousand "spin-offs" since its inception.[60]

From this learning curve, I draw lessons on two different scales: a paradigm scale and a local scale. Each historical moment of destruction was followed-up by a reconstruction that paved the way for the city to go into a completely new urban paradigm; the city-fire led to an age of industrialization; the post-war redevelopment led to an era of modernity, and the industrial crisis led to a knowledge economy. Each destruction took the opportunity to apply an urban redefinition tuned to the societal requirements of the time. To say that the disasters where the cause for urban redefinition would be wrong - they simply expedited a paradigm shift that was already destined to happen. The allied bombings, for example, preluded the shift towards modernity in a time where the local industry already started to fragilize. Sooner than expected, the city was given a chance to achieve urban redefinition. Also, this opportunity was used to address the vulnerabilities of the place: the shift from the textile-industry to modernity was also a shift from a capitalistic, mono-economy to a more social and diversified economy.[61]

On a local scale, I conclude that the directions for urban redevelopment relate to the genius loci. For example, the textile-industry was an acceleration of the already present knowledge and the city's strategic geographic location; the rural properties on the edge of the city were purposely selected to develop a technological university. The learning curve teaches us that: redevelopment preludes a paradigm shift; is an opportunity to predict future societal requirements; and reacts to the vulnerabilities and specificities of the place.[62]

3. The Roombeek Re-evaluation

In this chapter, the redevelopment process that followed the fireworks-factory disaster of Roombeek will be re-evaluated using the established principles of resilience from the previous chapter. The processual redevelopment will be analyzed to see to what extent did they satisfy the four phases of the "model of recovery activity".[63]
It will be my conclusion that the fourth phase, better development, never came to be, and this is exactly what I propose to do in my project.

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[58] T. Schaap (2019, 6th of February) personal interview
[59] T. De Vries "Campus Universiteit ligt onder vuur", ArchiNed (2005)
[60] T. Schaap (2019, 6th of February) personal interview
[61] S. Mannakkara, S. Wilkinson, p.329
[62] Ibid
[63] L. Vale, T. Campanella, p.335

Figure 25:
"Why is this happening?"
(City Archive Enschede, 2000)

Figure 26:
The moment of the second explosion.
(A. Groothuis, 2000)

Figure 27:
Aerial photo of the post-disaster neighborhood.
(KLM Aerocarto, 2000)

Figure 28:
Local resident being carried away by riot police.
(R. Hoeltink)

Public Outrage (Emergency Phase)
On the 13th of May 2000, a fireworks-storage exploded in the middle of a lower-class, industrial neighborhood, killing 23 and destroying 42 acres of urban tissue (fig.26). The scale of the devastation brought back the images of war. In fact, the country had not experienced violent destruction at such an extent since the Allied air bombardments (fig. 27).[64]
The emergency phase was a heroic and international effort of medical staff and firefighters to save lives and limit the catastrophe. This phase is also characterized by the outrage of the public. The local government received huge backlash for their negligence in enforcing fireworks-storage regulations: they refrained from taking actions against illegal storage and also allowed the company to expand its inventory without the environmental permit.[65] The municipality failed to protect its citizens from harm, hence producing a nation-wide outcry as to how such an event could take place in the middle of an urban area (fig.25). The spiteful sentiments towards the government were also fueled for prohibiting entrance to the disaster-site for its residents for weeks on end.[66]

"What are you concealing from us?!"

– Local resident, after ploughing his car through the disaster-site perimeter (fig.28).[67]

The architect of the masterplan, Pi de Bruijn, described the post-disaster situation of "immeasurable human suffering and the trust in government pulverized in a single moment".[68] The fireworks-factory explosion simultaneously destroyed a neighborhood as well as relations between the public and the government. As noted by Vale and Campanella, disasters reflect poorly on the government in power; the destruction of a densely populated inhabited place is "the greatest possible challenge to its competence and authority".[69] The events basically led to the creation of two opposing teams: the public versus the government. In retrospect, this conflict that became the basis for the selected model of redevelopment.

Retaining Recognizability (Restoration Phase)
After the emergency phase, the municipality still showed – instead of strong leadership – a notably passive attitude, enhanced by the prevailing sentiment of guilt.[70] Due to the persistent overall confusion and lack of leadership, the restoration phase received little public attention. Most of the ruined buildings were in an irreparable shape, the disaster had struck both the residential and the industrial fabric of the city, and most of the buildings were in an irreparable shape. The biggest and one of the oldest textile factories in the city, De Bamshoeve, was completely bulldozed (fig.31-32) . Because of this secondary destruction of buildings that were in a state beyond repair, the disaster area grew twice the size.

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[64] B. Colenbrander, "Nieuw Roombeek: Enschede na de vuurwerkramp". (Rotterdam: Uitgeverij 010, 2003) p.1
M. Oosting, "De vuurwerkramp: Eindrapport".
[65] (Enschede: Commissie Onderzoek Vuurwerkramp, 2001) p.251
[66] R. Brouwers, "Pi de Bruijn Engagement + Stedenbouw". (Delft: Prototype Editions, 2008) p.205
[67] R. Hoetink, "Wat wordt hier verzwegen!" (Youtube, 2012) 1:52 (Translated by R.Meijer) These infamous words were shouted by former Roombeek resident Frits Pril. The moment was symbolic for the disrupted relationship between the public and the local government. To this day the words are still part of local vocabulary to jokingly describe suspicious situations.https://www.youtube.com/watch?v=3iR9Oxj9N7k&t=130s
[68] R. Brouwers, p.19
[69] L. Vale, T. Campanella, p.339
[70] W.J. Verheul. p.188

Figure 29:
Children playing in the explosion-crater.
(City Archive Enschede, 2000)

Figure 30:
Aerial image Roombeek, 2002.
(algemene-ontwikkeling.nl)

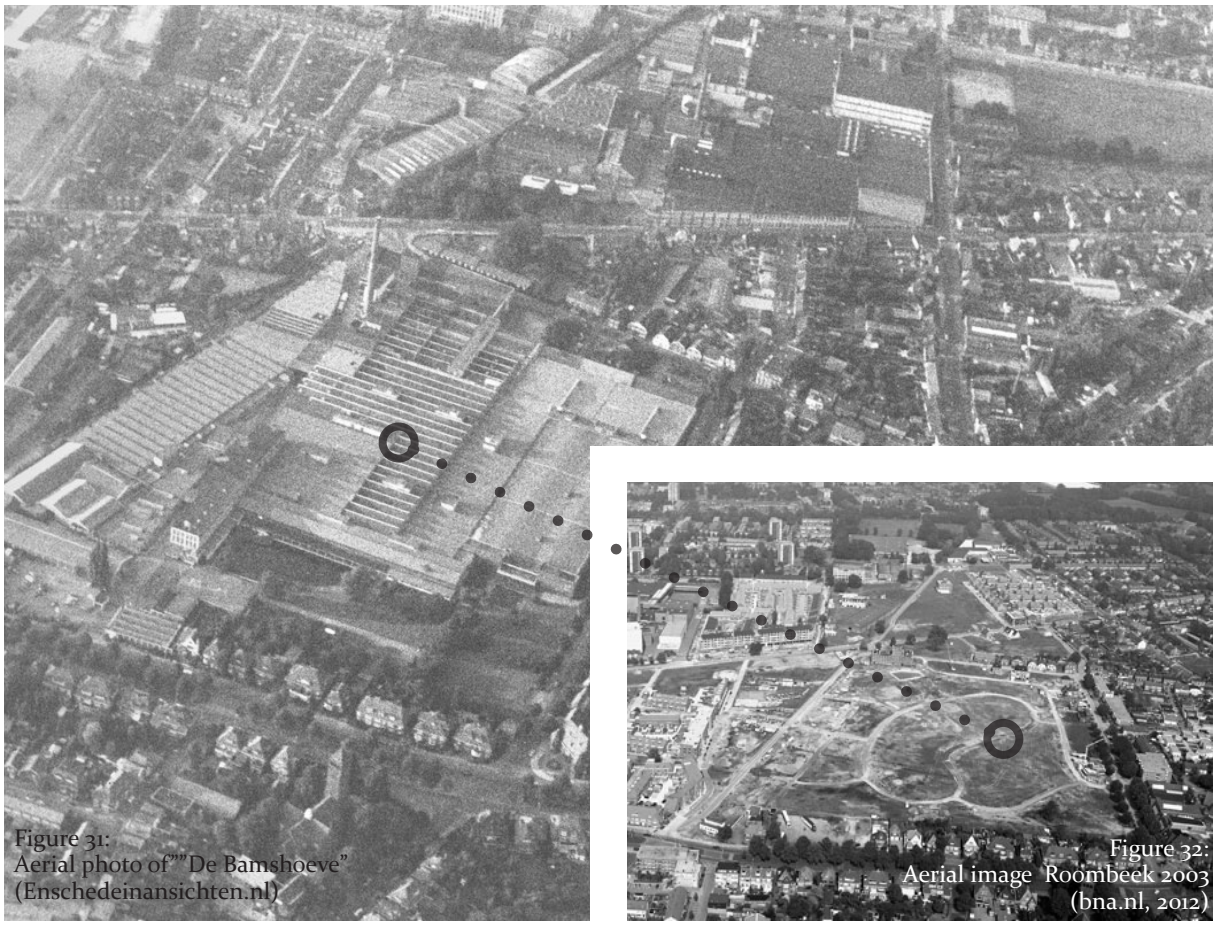


Figure 31:
Aerial photo of""De Bamshoeve"
(Enschedeinansichten.nl)

Figure 32:
Aerial image Roombeek 2003
(bna.nl, 2012)

While the area was still prohibited from entrance, the local government slowly started formulating plans and appointing specialists. One of the first decisions was to rebuild the former infrastructural matrix to retain recognizability and orientation.[71] Furthermore, restoring the former street-plan, areas that commemorated the former textile-factories buildings – either destroyed after the industrial exodus or by forces of the explosion – were also reserved. The very first redevelopment actions were based on historic sentiments, in order to maintain and, where necessary, recreate the industrial identity of the neighborhood (fig. 29-30).[72]

The Hyper-Polder Model (Reconstruction Phase I & II)

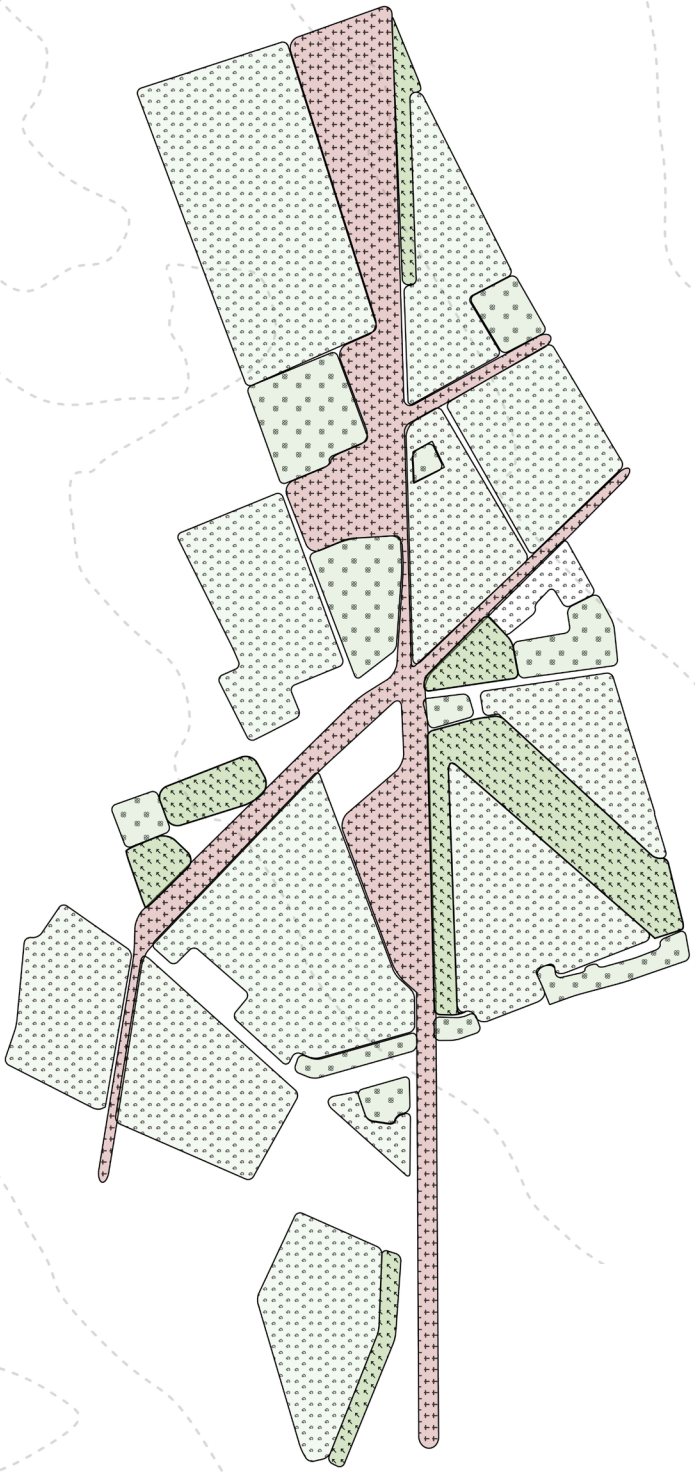
After the restoration phase, the first plans for reconstruction started to crystalize. In an interview I recently conducted with professor in Urbanism, Bernard Colenbrander , he described that the "extreme social sensitivity", caused the government to step away from any form of responsibility completely. They displayed the attitude of "if we are to blame for the problem, we don't want to be blamed for the solution".[73] The first formulated criteria for redevelopment was to enable the return of original Roombeek residents. Also, an undisputed consensus was reached that the disaster victims should be allowed "maximum feasible participation" in the planning process. Pi de Bruijn formulated that the "repatriation agreement" strongly influenced the direction of the redevelopment and made immediately clear that the architects will have never worked with a blank sheet.[74]

Huge efforts were made to facilitate the participatory design process, from all-inclusive collective consultations to joint design-evaluations and brainstorm-sessions.[75] The Roombeek redevelopment plan is the ultimate display of the Dutch "polder-model", a type of governance based on consensus decision making. Reflecting on the process, Colenbrander used the superlative "hyper-polder-model" to describe the extent of participation and complete focus on public interests. An intensified version of the polder-model was the only possible approach to control the problems that were present in that neighborhood: "absolutely everybody had to participate".[77] He describes that over the years the storm blew over and that the tension reduced to "the incidental abusive language" from Roombeek residents.[78]

Therapeutic Town-Planning

The applied model of governance, hence, dictated the urban and architectural infill of the site. Giving precedence to public opinion, however, meant that simple restoration of the built environment to pre-disaster conditions was inevitable. For a great part, the reconstructed Roombeek is a typological replica to the pre-disaster neighborhood and stylistic continuation of the traditional building-type characteristic for (old) Enschede. This seems a bit misplaced since Roombeek sits right on top of a "typological split" in the city: the city centre follows an organic structure while, on the outskirts, the post-war redevelopment was based on CIAM-principles and designed with the rigidity and ordnance typical for modernity.

[71] R. Brouwers, p.103
[72] Ibid, p.344
[73] B. Colenbrander (2019, 7th of January) personal interview
[74] M. V. Rooij, "Tien jaar Roombeek: vuurwerkramp redt Nederlandse stedenbouw.", Ons Erfdeel, (3) (2010), p.4
[75] B. Denters. "Rebuilding Roombeek: Patterns of Citizen Participation in Urban Governance." Urban Affairs, 45(5) (2010), p.583
[76] B. Colenbrander, "Hyper-polder model: The Rebuilding of Roombeek, Enschede"Archis, 4 (2002), p.5
[77] B. Colenbrander (2019, 7th of January) personal interview
[78] Ibid



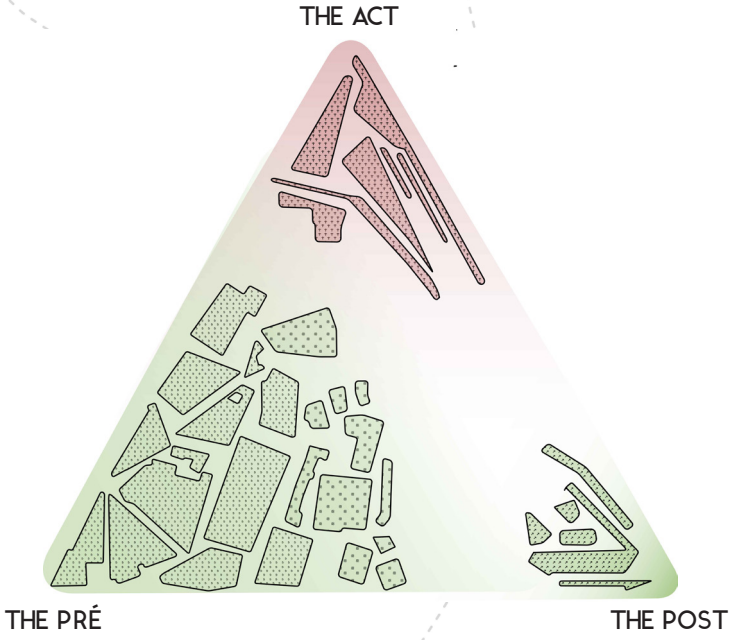


Figure 33:
Urban analysis: Redevelopment emphasized pre-disaster conditions.
(R. Meijer, 2018)

The result is that the new Roombeek is characterized by the same architectural mishmash that Enschede developed during its first industrial wave. It has both the fine urban grain and the absence of rhythm and consistency. It is impossible to observe individual pieces of architecture separate from a bigger picture.[79] Colenbrander describes that redevelopment scheme of Roombeek could be called as "town planning without qualities" and as "fairly chaotic" since it answers to hundreds of different requirements.[80]

Reading through transcripts of the participatory design-meetings reveals how these different opinions manifested. The interaction between the architects and the residents does not seem to acknowledge the pertinent role of the architect. Instead of formulating a future vision on a scale that fits the magnitude of the disaster, the discussions addressed pragmatic yet short-sighted and even frivolous problems.[81] By acknowledging the opinions of not only former residents but also of people with no obvious affiliation to the project, any potential to address a broad architectural vision was diminished for the sake of participation.

The heterogeneity of programme and architecture had a "therapeutic" purpose, aimed to satisfy all groups involved in the process.[82] Hoping it would resolve the post-disaster trauma, the redevelopment plan had an obvious and strong preference for restoring to pre-disaster-conditions (fig. 28). In describing the downside of the applied model, professor in Public Governance Bas Denters claims that the variety of opinions that came from the participatory meetings were so diverse that it could have led to the conception of "any neighborhood possible".[83] The charged sentiments of the neighborhood had a far-reaching impact on the redevelopment decision-making: it placed the architects in a "power vacuum", caused by the wish to restore trust in the government and secure return of displaced residents.[84]

Pragmatics over Vision

The power vacuum finds its ultimate manifestation in a current state of the most central part of the disaster site.[85] This plot contains the highest urban potential of the masterplan due to is proximity to the explosion epicenter and its high visibility when approaching alongside the main urban axes (fig.35). The most significant piece of vacant land within this cluster was once reserved for a 8000 m² cultural building that should have been the central piece of the redevelopment.[86]

In 2002, two years after the fireworks-factory disaster, the local government placed a parking lot in this location that has a 5000m² surface area and facilitates a maximum of 200 cars. Seventeen years later, the parking lot is still there, and over time it has significantly downplayed the importance of the site. Even the minimal act of removing the parking lot would undoubtedly suddenly release its enormous architectural potential.

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[79] B. Colenbrander (2002), p.1
[80] Ibid
[81] Timmerman, P., Philippi, G., & Vries, T. D., "Wederopbouw Roombeek" (2004) p.14
Report of the activities that the Architecture Centre Twente organized between April 2001 and February 2004 for the redevelopment of Roombeek, Enschede
[82] B. Colenbrander, "Hyper-polder model: The Rebuilding of Roombeek, Enschede"Archis, 4 (2002), p.4
[83] B. Denters, O.V. Heffen, J. Huisman & P-J Klok, "The Rise of Interactive Governance and Quasi-Markets". (Dordrecht: Kluwer Academic Publishers, 2003) p.91
[84] Ibid
[85] The cluster is called "the Roombeek Knot", symbolizing a place where the infrastructural, economic and cultural axes connect.
[86] Gemeente Enschede, "Roombeek Voltooid!? Afrondingsplan voor een bijzondere wijk" (2004) p.9

Figure 34:
Aerial photo of the parking lot.
(R. Meijer, 2018)

Figure 36:
Aerial photo of "the Knot"
(R. Meijer, 2018)

When asked to comment on the aerial images of the parking lot,

Bernard Colenbrander describes the situation as "a damned pragmatic solution".[87] On the other hand, the architect of the masterplan, Pi de Bruijn, describes that the choice for a parking-lot is acceptable, as long as its answers to the urban requirements that fit this "prominent location".[88] This is where, in my opinion, the ultimate paradox is revealed: it is highly questionable if a parking lot can ever meet the requirements of a location that is the centre-piece of one of the biggest events in the city's history. Even in terms of spatial composition, the rectangular concrete slab is a geometrical mismatch with the triangular plot (fig. 34). The concrete slabs, the trees and the parked cars are placed within a rigid orthogonal grid and therefore aesthetically inconsistent to that of the memorial landscape and the surrounding architectural ensemble. When passing through the economic axis, the opportunity to observe the memorial ground or the architecture that surrounds it is blurred by an array of parked cars (fig. 36)

In 2017, the municipality attempted to redesign the parking lot to establish a connection between the memorial ground and the culture cluster. This plan was quickly cancelled due to the resistance of a pressure-committee founded by residents that feared the loss of the parking space.[89] In my opinion, the local government made a crucial mistake in solving a local problem with a temporal – but eventually irreversible - solution. The parking lot is the ultimate manifestation of pragmatic decision-making that favored wishes of a small collective over responding to large-scale requirements. It answers to the daily needs of the few instead of closing off a redevelopment that emotionally belongs to the entire city.

Loss of Energy

In a news article from 2009, de Bruijn emphasized the importance of a centre-piece development: he states that the "very last piece has to be handled with extreme care" since it is the last opportunity to do something special. The article is concluded with the remark that De Bruijn and the project bureau believe that these "special grounds" deserve an infill of exceptional quality and are therefore do not want to make rushed decisions.[91]
Elaborating these qualities, Pi de Bruijn recalls that the initial plan for the parks was to develop several "solitaires": by de Bruijn explained as autonomous objects with a visual attraction.[92] De Bruin envisioned two "sculptural volumes with an infill that would fit the idea of the culture cluster". The plan also contained an underground parking facility that would resolve the neighborhoods supposed parking problems.[93] For the aspired programme, de Bruijn emphasizes that he would never allow commercial development to take place as it would be inconsistent with the location's apparent emotional dynamics. Meanwhile the municipality built a temporal version of the parking facility, for which both parties believed would eventually become a part of a bigger project.[94]

[87] B. Colenbrander (2019, 7th of January) personal interview
[88] P. de Bruijn (2018, 13th of September) personal interview
[89] TC Tubantia, "Plan herinrichting parkeerplaats Enschedese wijk Roombeek in ijskast" (2017, 1st of June)
[90] TC Tubantia, "Pi de Bruijn: bijzonder slotakkoord Roombeek" (2009, 3rd of December)
[91] Ibid
[92] P. de Bruijn (2018, 13th of September) personal interview
Along the infrastructural axis, the urban masterplan includes three triangular parks that refer to the former "bleaching-fields" of the textile-factories. The fields were used to spread out the cloths to purify or whiten the fabric.
[93] Ibid
[94] Gemeente Enschede, "Roombeek Voltooid!? Afrondingsplan voor een bijzondere wijk" (2004) p.9

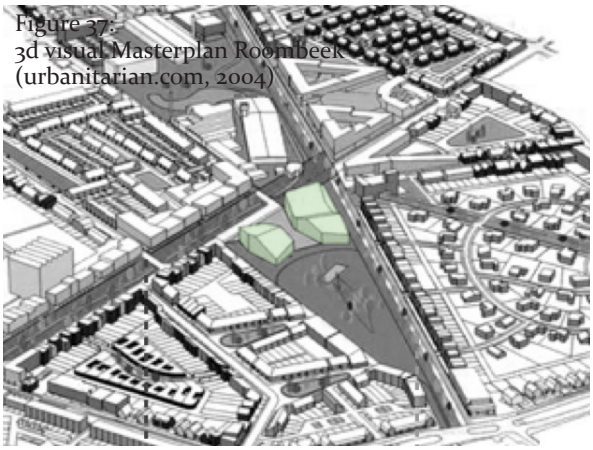

Figure 37:
3d visual Masterplan Roombeek
(urbanitarian.com, 2004)

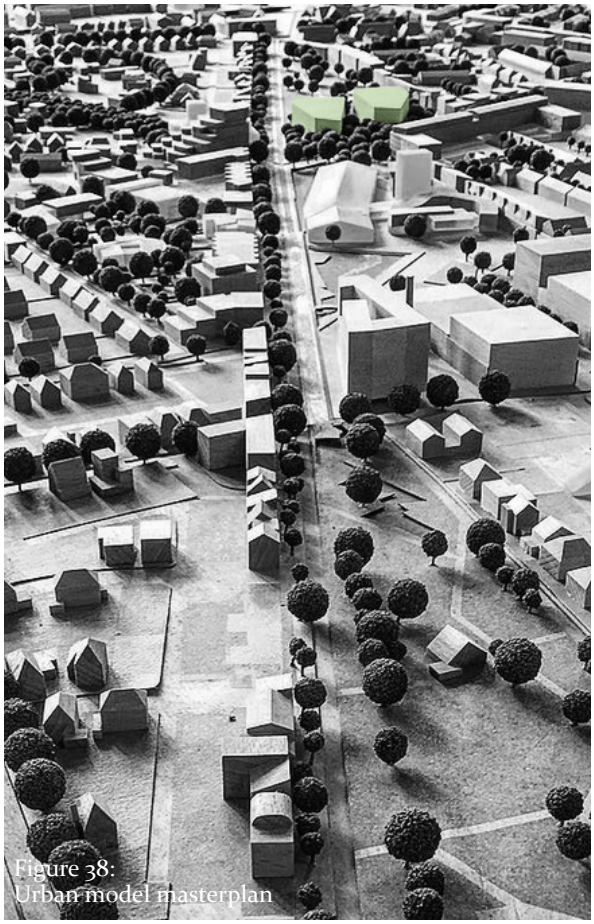

Figure 38:
Urban model masterplan

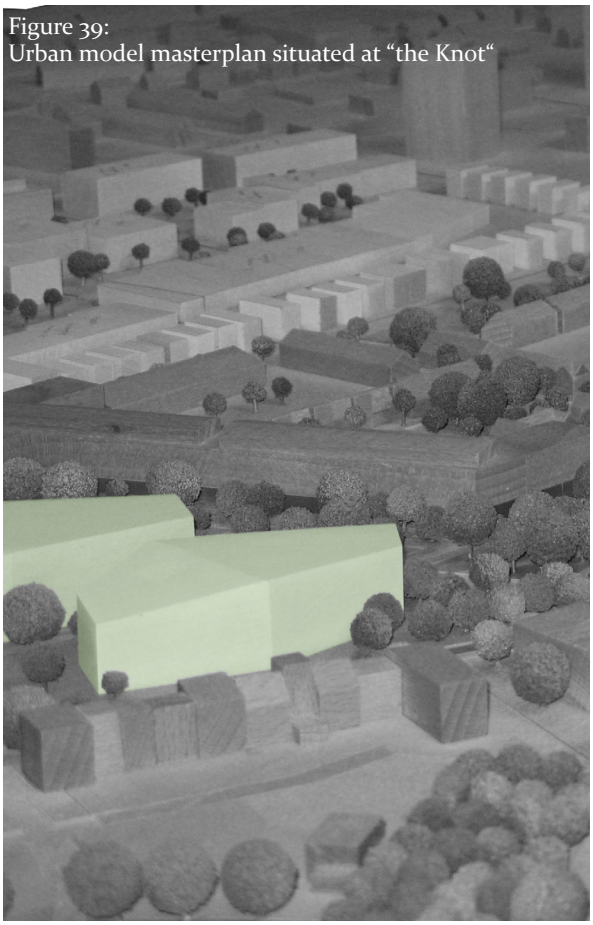

Figure 39:
Urban model masterplan situated at "the Knot"

Figure 40:
"The Roombeek Knot"
(R. Meijer, 2018)

De Bruijn describes the first compositional studies for the locations as "two volumes of substantial size, with an elevation increase towards the 'The Knot'" (fig.37-40). Simultanously, Rob Dieleman, CEO of a local media company proposed to develop a A Media Art Centre. This proposal was quickly embraced by both Pi de Bruijn and Peter Kuenzli (head of organization redevelopment) and – according to Dieleman – quickly outgrew the scale of the initial vision and the financial capabilities of the company.[95] In the meantime, discussions about the building at the participatory town meetings revealed the lack of public support: One participant in the discussion stated that: "The Media Art Centre will be disrespectfully close to the scene of the explosion".[96] Eventually, the company decided to shift its focus and developed their concept on a vacant industrial plot elsewhere in Roombeek. Dieleman concludes the articles by stating that he still believes in the feasibility of a large scale development on the location due to the "pull-factors" of Roombeek.

Ton Schaap claims that any other "centre-piece" development never came to life due to a "loss of energy" at the final phase of the project. As soon as architect Pi de Bruijn and Peter Kuenzli withdrew themselves from the redevelopment project, people felt Roombeek was finished and nobody bothered to reinvigorate the energy needed for this conclusive step.[97] Pi de Bruijn claims that, in retrospect, the idea to develop another cultural facility was "overambitious" in an already saturated market for cultural institutions.[98] De Bruijn's remark of being in no rush to develop the final project was meant to emphasize the significance of the location but – paradoxically - prevented the project from ever happening.

Brain-Drain

To this day it remains a recurring problem that Enschede is unable to apply growth.[99] This is manifested most strikingly in its inability to keep hold of the young, educated people. The university always tried to act as a bridge between science and business but failed to maintain this connection. Ironically, an elevated viaduct on the edge of the campus both physically and symbolically disconnects the university area from the rest of the city.

Gert-Jan Hospers points out that, a century ago, Enschede was the second "textile" agglomeration in the world and that, after its industrial exodus, it shifted its focus to being the centre for innovative education.[100] In "Citymarketing in Perspective" he states that Enschede is the richest ground for technological starters and networks but the city struggles with keeping this creative class within city-boundaries. He advises that investments in the creative class to improve the transition from education to job-market and eventually prevent the ongoing "brain-drain".[101] Enschede, a city with 159.000 inhabitants and 26.000 students, is dealing with a "negative student input-output balance".[102] About half of the students attending the University of Twente are from the local region, from which two-thirds relocate to different parts of the country after graduating.

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[95] TC Tubantia, "Alternatief Media Art Centre in pand Tetem" (2004, 19th of April)
[96] The speaker claims to be no representative of the Roombeek residents. P. Timmerman, P. Benneworth. "Architectuur in Twente: Een nieuw kennispark", Kunst en Wetenschap (2006) p.11
[97] T. Schaap (2019, 6th of February) personal interview
[98] P. de Bruijn (2018, 13th of September) personal interview

[99] TC Tubantia, "Zorgen over geringe groei van bevolking Enschede" (2019, 8th of January)
[100] G.J. Hospers, "Citymarketing in perspectief." (Lelystad: IVIO/Wereldschool, 2010) p.34
[101] Ibid, p.33
[102] F. Coenen, D.J. Fikkers, "Human Capital in European Peripheral Regions: Brain Drain and Brain Gain", (Berlin: Erisch Schmidt Verlag, 2010) p.121

Figure 40:
"De Eekenhof", appartment-building designed by Felix Claus. (R. Meijer, 2018)

''The city is the sum of its citizenry": the extent to which resilience is successful depends on the collective effort of the people involved.[103] The fact that the Roombeek citizens prioritize a parking lot over a far-reaching solution to the problem indicates that the collective concern on the scale of the city is neglected. In part, the Roombeek redevelopment provided solutions for mundane individual solutions but forgot to address the bigger questions that concern the rest of Enschede.

In reflection to Mannakkara and Wilkinson's perspective that resilience should address and rectify the vulnerabilities, Roombeek redevelopment seems to have failed. The scale to which it tried to resolve vulnerabilities caused by destruction was limited to the linear restoration of the neighborhood and all the attention was directed to the individuals who required simple retribution. Also, the governmental role and absence of proper institutional rules – as stressed by Boyd and Juhola – prevented required social-ecological transformation. In formulating Enschede's future direction, Nienke van Boom and Hans Mommaas state that the challenge for future urban development is to be independent from the processes that built Roombeek.[104] This acknowledges the fact that the applied participatory process was neither able to offer solutions to a community larger than Roombeek nor capable of predicting long-term development of the city.

Peter Kuenzli, made the comparison between Enschede and Rotterdam, both working-class and economically deprived cities. In those moments of despair, both were given the opportunity to improve the city in totality, "the fireworks-factory disaster is a real chance for a new start".[105] Colenbrander firmly disputes this comparison by stating that the post-war process of Rotterdam was the very opposite of the state of affairs in Enschede. He claims that Rotterdam had the complete freedom to pursue modernization and that Roombeek pursued a modernization that was dictated by "its own restricted terms".[106]

This notion of "total improvement" resembles the bouncing-forward principle by Bernard Manyena. In contrast, the history- and emotion-driven process prevented the visionary redevelopment of Roombeek that would serve as a total improvement of the city. In reflection to Lorenzo Chelleri's perspective on resilience, reconstruction Roombeek did not follow a "transformative, learning-curve" pattern. From this perspective, it teaches us that the redevelopment after the fireworks-factory disaster did not direct the city into a new urban redefinition. As of yet, the learning curve does not display a paradigm shift, in contrary to the earlier moments of reconstruction.
This place still requires the direction that answers to the long-term problems on the scale of the entire city. I see the center piece location as an opportunity to design a building that offers a glimpse into the future: a small example on how the city can react to the requirements of time and eventually apply urban redefinition.

4. Directions for urban redefinition

The analysis of the learning curve has produced lessons on how the city has recovered from each moment of destruction in the past. By extrapolating from the learning curve and using its lessons, I formulate directions for future urban redefinition on a paradigm scale and the local scale.

[103] L. Vale, T. Campanella, p.341
[104] N. van Boom, H. Mommaas, p.74
[105] W.J. Verheul. p.195
[106] B. Colenbrander, "Hyper-polder model: The Rebuilding of Roombeek, Enschede" Archis, 4 (2002), p.3

Figure 41:
Busstop at the infrastructural axis. The city's coat of arms symbolizes a fence, indicating the last city before the country's border.
(R. Meijer, 2018)

Paradigm Shift

Nienke van Boom and Hans Mommaas believe that cities should no longer apply a "laissez-faire" policy but aim for a sustainable strategy that reacts to the changing conditions of the time. The changing conditions of our current timeframe are: galloping urbanization and climate change. Therefore, if the learning curve of Enschede's development is to be completed, a new paradigm would have to deal with the city's ability to adapt to future environmental circumstances. By currently focusing on a strategy to increase environmental resilience, the city will be able to "fix the future before its lost".[107] In The future of sustainable urbanism: a redefinition, Professor of Sustainable Urban Environments Rob Roggema argues that the notion of "anti-fragility" connects to a type of resilience that bounces-forward. According to this principle, urban resilience is achieved by not only preparing the city for environmental change but also making sure it can benefit from it.[108] Roggema states that buildings have to be designed so that their form can adjust at any moment in time and anticipate unexpected change and thus becoming more resilient. This perspective also strongly relates to the adopted notion of "transformability", as described in the first chapter.

Another challenge for the future city and its buildings is to become resource independent. Making sure the urban system is able to create and consume from its own ecosystem decreases its vulnerability and thus contributes to its resilience. William Adger's perspective that resource independency contributes to an innovative and technological environment, connects seamlessly to the formulated future profile of the city.[109] Therefore, independent cities of the future should aim for building self-sufficient, "closed-loop" environments.

Strategic Location

Without the former industry, Enschede still has the "fortunate" that is sits on the edge of the country. According to van Rossum, having an eccentric position in the Netherlands, often causes having an inferiority complex.[110] Nevertheless, these "edge-city" conditions should be part of the city's development strategy. When discussing the city's future economy, Bernard Colenbrander believes that the city should seize its endless efforts to draw attention from "The Randstad" and aim for the densely populated German hinterland.[111] He believes that internationalization is the key to future development for the city and that is should manifest itself through cultural and innovative exchange between both countries.[112]

In addition, Peter Hall argues that the post-industrial cities have an advantage as opposed to the thriving capital-cities. He claims that, because of their marginalized position, they possess a certain accessibility, involvement and horizontality, hence these elements can be successfully appropriated for establishing places of cultural and technological renewal.[114] These cities do not entail the "hyper-hectics" and "hard competition" that the big cities have and should try to amplify their place-embedded profile as a strategy for post-industrial renewal. Urban planner Kevin Lynch goes as far as to link resilience to the interconnectedness of a place by stating

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"Anti-Fragility" is first introduced by Nessim Talib".
R. Roggema "The future of sustainable urbanism: a redefinition" City, Territory, Architecture, 3(22) (2016) p.8
Ibid
W.N. Adger, p.355
M. van Rossum, 2:45
B. Colenbrander (2019, 7th of January) personal interview
Ibid
P.G. Hall, p.29
1N. van Boom, H. Mommaas, p.41

Figure 42:
Birds-Eye view of the University of Twente

Figure 43:
AK1 (College of Arts) situated in Roombeek

that "the city is hard to kill, because of its strategic geographic location". [115]

New Connections

In Cities in Civilization, Peter Hall describes that the innovative milieu has always linked to capitalist development but that its nature has changed over time. Innovation transitioned from the era of industrial production to the era of general scientific advance. Enschede has experienced the disadvantages of a one-sided economy in the past, the problems of the textile-industry reflected to the entire city. [116] Hall argues that the expiration date of mono-cultural industries is caused by their short-sighted vision. Cities like Manchester and Glasgow, who failed to innovate, were eventually overtaken by new competitors, making these "edge-cities" dwell in industrial nostalgia. A description that just as easily fits the circumstances of Enschede.[117] Nevertheless, Peter Hall explains that if the creative forces behind the once thriving industry interacted differently, they would contribute to an innovative urban milieu.[118]

He exemplifies this transition in interaction as going from "Detroit to Palo Alto", Enschede aspiring to be a sister-city of the latter. Hall distinguishes four types of "creative" cities, from which, Enschede connects to the "cultural-technological city".[119] Also because it's two identified directions for urban renewal are: "knowledge-economy" and "cultural-touristic".[120] Hall defines the cultural-technological city as a city that aims for a symbiosis of technology and culture. Although the city no longer depends on the production of one singular element and has established different economies, it failed in establishing an oscillation between them. Physically and symbolically, these two sources are miles apart. By situating the technological campus outside of the city, the communication with the inner-city's cultural activities is non-existent (. Roombeek redevelopment architect Pi de Bruijn emphasized a mutual lack of interest within both the city and the university, whose geographical distance produced an inability for meaningful collaboration.[121] The traction between the university and the city has been detrimental for both parties. The city has attempted to retain physical connection by investing €15 million for reconstructing an elevated highway along the edge of the campus, now calling it the "lane of innovation". If the city establishes an interaction between its creative and intellectual strongholds (beyond the visual), the sum can become bigger than its parts.

In The Economy of Cities, Jane Jacobs propagates the idea of diversity, claiming that diversity is the "fertile soil for the creativity of cities".[122] An acknowledged theory on establishing a connection between different creative disciplines is Jacobs' "knowledge spillover" theory. It contains the idea that a diversity of local economies from different lines of work can heighten creative output when placed in close vicinity. Jacobs describes the city as a source for innovative economic change and argues that it is the diversity that facilitates true interaction. By finding strength in diversity, different bases of knowledge could clash to achieve more innovation and economic performance.[123]

[115] K. Lynch, "Wasting Away", (San Franciso: Sierra Club, 1990) p.109
[116] N. van Boom, H. Mommaas, p.95
[117] P.G. Hall, "Cities in Civilization", (New York: Pantheon Books, 1998) p.309
[118] Ibid, p.500
[119] Ibid, p.291
[120] N. van Boom, H. Mommaas, p.12

[121] P de Bruijn (2018, 13th of September) personal interview
[122] J. Jacobs, The Economy of Cities, (New York: Vintage Books, 1969)
[123] G.J. Hospers, P. Desrochers, "Cities and the economic development of nations: an essay on Jane Jacobs' contribution to economic theory", "The Canadian journal of regional science, 30 (2007) p.120"

Figure 44:
Infrastructural axis Roombeek (Lonnekerspoorlaan)
(R. Meijer, 2018)

Gert-Jan Hospers explains that the diversity has to not only be pursued through knowledge and activities but also by applying a diversity of the built environment: "there is always something happening, day and night, and the chance of accidental encounters and 'new combinations' is greater." [124]

The Identity of Place

The importance of discovering a strategy of development strategy that tailors to the specificity of a place is addressed in Comeback Cities.[125] Mommaas and van Boom argue that the elements that were decisive in the evolutionary development of the city, should also be the foundation for setting out a course for the future.[126]
Some decisions from the past still determine the route of development of the city; the technology- and trade-driven mentality from the past is still part of its DNA.
Author and urban planner Charles Landry also describes the necessity to use local intellectual resources in The Creative City. According to him, it is an essential precondition to recognize and utilize local identity to achieve economic and spatial regeneration. He also underlines the necessity of change: "local culture is dynamic, and therefore change and development are an essential partner to protection and conservation".[127] Gert-Jan Hospers confirms the importance of place-specific determination by stating that a city like Eindhoven, Delft and Enschede should distinguish themselves by emphasizing their uniqueness instead of just qualifying themselves as cities with a technological university.[128]
It is my position that Enschede should strive to revive its forgotten identity of the technological and innovative city, while introducing a new profile based on culture and creativity. Local artists confirm the necessity for the city to invest in places of culture and creativity. A "breeding-place" is an expression used by Sipke Huisman to describe the pre-disaster atmosphere Roombeek.[129] Huisman believes that the city should do everything in its power to recreate the breeding-place that was once lost. "Relatively speaking, the city has a large population of artists and they have to be taken into account".[130] Similarly, in an interview conducted by local newspaper Tubantia, cultural entrepreneur Arris Roordink states that the presence of culture is a fundamental factor in deciding to settle in a city; "culture is an essential part and the city cannot live without it".[131] Roordink pleads that the city should invest in a "cultural breeding ground" that will eventually be a bustling place that will help prevent young, educated talents from leaving the city.[132]

Extrapolating from the learning curve prescribes shifting towards new urban paradigms, which essentially means preparing the city for a future environmental change. By making sure buildings are adaptable to change and resource-independent, the city will become resilient.
In conclusion, Enschede has to benefit from its edge-city conditions by exchanging knowledge and innovation with the German hinterland. The city has to establish itself as

[124] G.J. Hospers, "Creative Cities in Europe: Urban Competitiveness in the Knowledge Economy." Intereconomics 38(5), (2003) p.264
[125] N. Van Boom, H. Mommaas, p.46
[126] Ibid p.95
[127] C. Landry, "The Creative City: A Toolkit for Urban Innovators", (London: Comedia, 2008) p.87
[128] G.J. Hospers, p.265
[129] B. Colenbrander, "Enschede na de vuurwerkramp: Het spel en de spelers", (Rotterdam: Uitgeverij 010, 2004) p.31
[130] Ibid
[131] TC Tubantia, "Gezocht: broedplaats voor creatievelingen in Enschede" (Enschede: TC Tubantia, 2012)
[132] Ibid

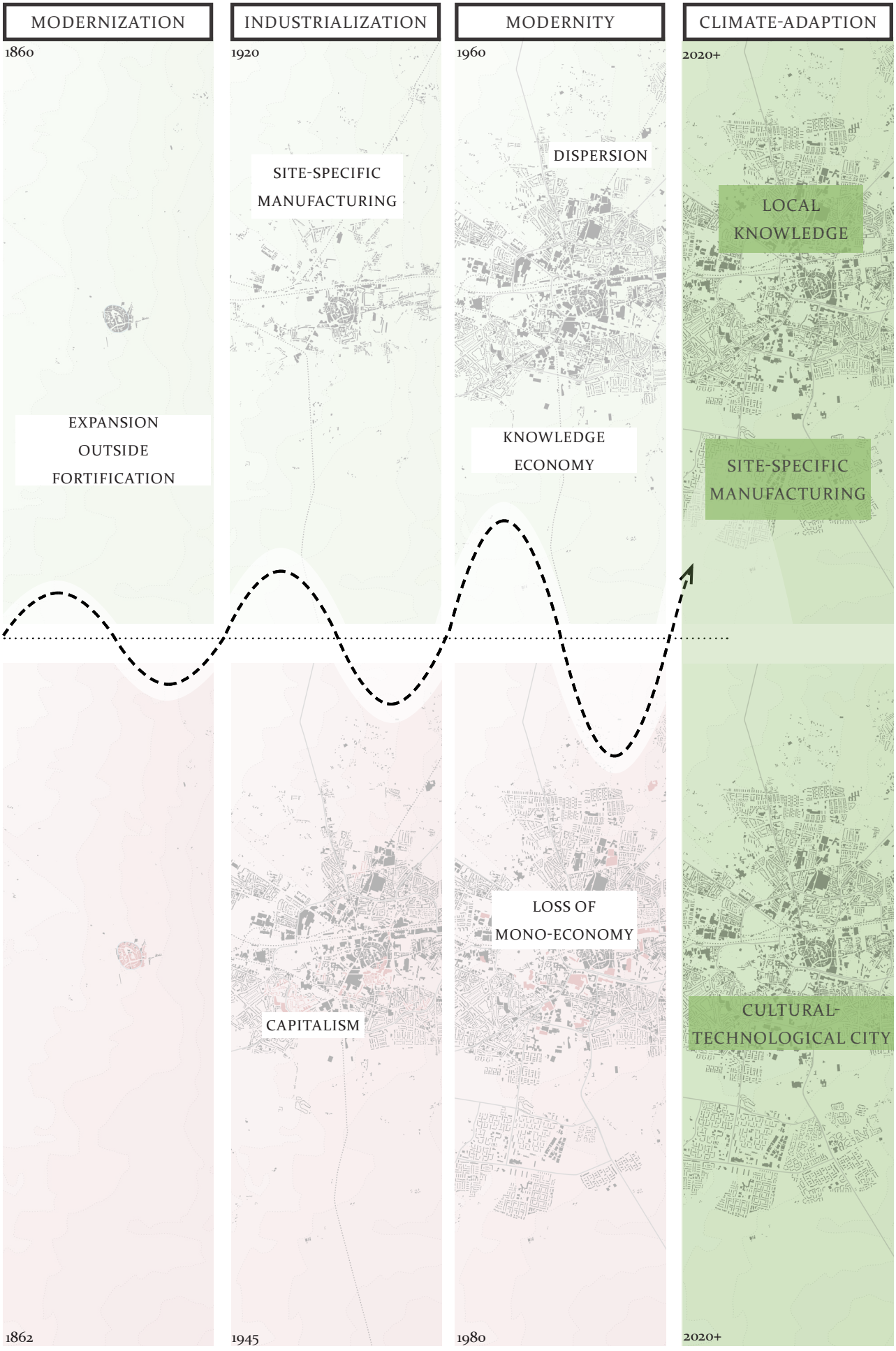

Figure 45:
Overview of the "learning-curve" with a formulated future vision on a paradigm scale and local scale

the cultural-technological breeding-ground by facilitating symbiosis between both forces of knowledge through diversification and knowledge-spillovers. Conceptually, what the city needs is a cultural breeding ground, a place where different creative forces can thrive in symbiosis and prevent talents from leaving the city.

Architectural Design
The preliminary design will be further elaborated during the next semester. The qualitative demands are already formulated: the building needs to be a cultural breeding ground that facilitates symbiosis between different modes of creativity; the building needs to serve an exemplary role in climate adaptively. In appearance, the building will not draw from its architectural surroundings but will introduce a typology that is new to the city. In doing so, the building departs from an era of historically-reminiscent architecture but showcases a –much needed- future vision.

5. Conclusion
The purpose of this research was to find a direction for future urban redefinition for the city of Enschede by learning from its historical moments of destruction and reconstruction. By first identifying different perspectives on urban resilience, I adopted a notion that summarizes as the principle of "bouncing-forward".[133] Bouncing-forward is a type of resilience that: includes the system's ability to predict future circumstances; can apply transformability and serves the whole ecosystem. Also, the system has to apply learning-loop attitude where it uses lessons from the past to better withstand future disturbances. By analyzing each moment of destruction and subsequent reconstruction, a learning-curve is produced (fig.45). Each destruction has enabled the city of Enschede to apply an urban redefinition that was dictated by the zeitgeist and, by doing that, meets the requirement of applying a predictive transformability. By applying a rapid modernization after the city-fire, it was able to introduce a new architectural allure to the city but above all, guide it into the industrial revolution. The bombing during the Second World-War was used as an opportunity to guide the city into modernity by making grand metropolitan gestures, heralding the oncoming automobile-ruled era. After the loss of its mono-economy and destruction of its industrial heritage, the city successfully shifted towards a knowledge-economy: establishing CIAM-inspired breeding ground for innovation and technology. The fireworks-factory disaster in 2000 is the last in a series of destructions that the city has been subjected to. After eighteen years of continuous effort to redevelop Roombeek, time allowed re-evaluation of the process. Using the model of recovery activity to dissect the Roombeek redevelopment process has revealed that –as of yet – the project has not been able to apply transformability. In order to restore the trust between the public and the local government, architects were placed in a power vacuum which prevented them from projecting a future vision based on actual requirements of the city. Architectural and urban decisions were made that refabricated large parts of the old neighborhood and did not introduce new conceptual typologies. By applying the "hyper-polder model", an enhanced version of governance based on consensus decision making, the redevelopment provided solutions for individual questions instead of bigger concerns for the city.

[133] S.B. Manyena, p.261

Currently, the city is dealing with a "brain drain": many of the talents that the university produces relocate themselves after graduating. The university and the city produce two different creative forces that do not interact due to a physical and psychological distance between them. The ultimate manifestation of this problem is found on a central location: a 200-car parking facility is built within proximity to the epicenter of the fireworks-factory disaster. The location currently occupied by the parking lot has great architectural potential and therefore indicates that the development can still apply a vision for the future.

The main conclusion of this paper is that the strategies for urban redefinition should be formulated on a paradigm scale and a local scale. The paradigm scale prescribes that the city should actively pursue a strategy that reacts to the changing environmental conditions. Also; the city needs to increase its social resilience by aiming for resource independency. On a local scale, the city should better establish itself as the cultural-technological city by facilitating symbiosis between its two different forces of creation. Drawing direction for urban redefinition from local properties enables transformation while maintaining the recognizability as described by Sirkku and Juhola.[134] Therefore, a sustainable landmark for the cultural-technological city will bring to meaningful conclusion Roombeek's redevelopment, and also will mark the beginning of Enschede's urban redefinition.

[134] E. Boyd, S. Juhola, p.1238

References

Adger, W. N. (2000). Social and ecological resilience: are they related? Progress in Human Geography 24(3), 347-364.

Boersma, T. (1976). Gaten en nog eens gaten. De barre leegte van Enschede. Wonen-TA/BK (9), 9-16.

Boom, N. v., & Mommaas, H. (2009). Comeback Cities: Transformation Strategies for Former Industrial Cities. Rotterdam, The Netherlands: NAi Publishers.

Brouwers, R., Bruijn, P. d., Buursink, E., & Kuenzli, P. (2008). Pi de Bruijn: Engagement + Stedenbouw. Delft, The Netherlands: Prototype Editions.

Bruijn, P. d. (2018, September 13). Interview. (R. Meijer, Interviewer)

Brusse, H. (1992). Enschede: van bevrijding tot Boulevard. Enschede, The Netherlands: Broekhuis.

Brusse, H. (1994). Enschede: van echec tot elan. Enschede, The Netherlands: Broekhuis.

Buursink, E. (2010). Groeten uit Enschede. ArchiNed.

Chelleri, L. (2012). From the Resilient City to Urban Resilience. Documents d'Analisi Geografica, 58(2), 287-306.

Colenbrander, B. (2002). Hyper-polder model: The Rebuilding of Roombeek, Enschede. Archis, 4.

Colenbrander, B. (2003). Nieuw Roombeek: Enschede na de vuurwerkramp. Rotterdam: Uitgeverij 010.

Colenbrander, B. (2004). Het spel en de spelers: Enschede na de vuurwerkramp. Rotterdam, The Netherlands: Uitgeverij 010.

Colenbrander, B. (2019, Januari 7). Interview. (R. Meijer, Interviewer)

Colenbrander, B., & Lengkeek, A. (2008). Op locatie: Enschede na de vuurwerkramp. Rotterdam: 010.

Denters, B. (2010). Rebuilding Roombeek: Patterns of Citizen Participation in Urban Governance. Urban Affairs 45(5), 583-607.

Denters, B., Heffen, O. V., Huisman, J., & Klok, P.-J. (2003). The Rise of Interactive Governance and Quasi-Markets. Dordrecht, The Netherlands: Kluwer Academic Publishers.

Dijkstra, G., & Kuitert, G. (1994). De Nijvere Stad: 100 jaar bedrijvigheid in Enschede. Enschede, The Netherlands: Broekhuis.

Dorman, E., Vanstiphout, W., & Wilkins, C. (2011). Station Enschede. Cultuurhistorische analyse en aanbevelingen. Rotterdam, The Netherlands: Crimson. Retrieved from Crimson Architectural Historians.

F.Coenen, & Fikkers, D. (2010). Human Capital in European Peripheral Regions: Brain Drain and Brain Gain. Lebensqualität und Standortattraktivität Kultur, Mobilität und Regionale Marken als Erfolgfaktoren., 117-132.

Fiksel, J. (2006). Sustainability and resilience: toward a systems approach. Practice and Policy 2(2), 14-21.

Gemeente Enschede. (2016, September 24). Roombeek Voltooid!? Retrieved from Gemeente Enschede: http://enschede.ris.muze.nl/stukken/7621/1/

Graham, S. (2004). Cities, War and Terrorism: Towards Urban Geopolitics. Oxford, Australia: Blackwell Publishing.

Hall, P. G. (1998). Cities in Civilization. New York, United States: Pantheon Books.
Hoetink, R. (2012, Maart 12). Wat wordt hier verzwegen! Retrieved from Youtube: https://www.youtube.com/watch?v=3iR9Oxj9N7k

Hospers, G. J. (2010). Citymarketing in perspectief. Lelystad, the Netherlands: IVIO/Wereldschool.

Hospers, G. J., & Desrochers, P. (2007). Cities and the economic development of nations: an essay on Jane Jacobs' contriution to economic theory. The Canadian journal of regional science, 30, 119-134.

Hospers, G.-J. (2003). Creative cities in Europe: Urban competitiveness in the knowledge economy. Intereconomics 38(5), 260-269.

Hospers, G.-J. (2005). De creatieve stad: concurreren in de kenniseconomie. Tijdschrift voor Economie en Management 50(4), 389-418.

Jacobs, J. (1970). The Economy of Cities. New York, United States: Vintage Books.
Juhola, E. B. (2014). Adaptive climate change governance for urban resilience . Urban Studies 52(7), 1234-1264.

Kemper, R. (2007). Publicaties over de stadsbrand. 'n Sliepsteen, 23(91), pp. 16-20.
Kok, M. (2018, November 28). Gezocht: broedplaats voor creatievelingen in Enschede. TC Tubantia.

Landry, C. (2008). The Creative City: A Toolkit for Urban Innovators. London, United Kingdom: Comedia.

Lynch, K. (1990). Wasting Away. San Francisco: Sierra Club.
Mannakkara, S., & Wilkinson, S. (2014).

Re-Conceptualising "Building Back Better" to improve Post-Disaster Recovery. International Journal of Managing Projects in Business 7(3).

Manyena, S. (2009). Disaster Resilience in Development and Humanitarian Interventions. Newcastle upon Tyne: Northumbria University.

Manyena, S., O'Brien, G., O'Keefe, P., & Rose, J. (2011). Disaster resilience: a bounce back or bounce forward theory ability? Local Environment, 16(5), 417-424.

Newsroom Enschede. (2017, June 1). Plan herinrichting parkeerplaats Enschedese wijk Roombeek in ijskast. TC Tubantia.

Nijhuis, J. (2013). Een beschouwing over opmerkelijke monumenten in Enschede. Enschede: Stichting Cultureel Erfgoed.

NTR (Director). (2017). Hier zijn de van Rossums: Enschede [Motion Picture].
Ockman, J. (2002). Out of Ground Zero: Case Studies in Urban Reinvention. Munich, Germany: Prestel.

Oosting, M. (2001). De vuurwerkramp: Eindrapport. Enschede: Commissie Onderzoek Vuurwerkramp.

Parengkuan, D. (2015, May 13th). Ooggetuigen van de stadsbrand in Enschede (1862). Retrieved from Historien.nl: http://www.historien.nl/ooggetuigen-van-de-stadsbrand-in-enschede-1862/

Patton, D., & Johnston, D. (2006). Disaster Resilience: An Integrated Approach. Springfield, United States: Charles C Thomas Pub Ltd.

Roggema, R. (2016). The future of sustainable urbanism: a redefinition. City, Territory and Architecture 3(22), 1-12.

Rooij, M. v. (2010). Tien jaar Roombeek: vuurwerkramp redt Nederlandse stedenbouw. Ons Erfdeel, 3, pp. 38-47.

Schaap, T. (2019, Februari 6). Interview. (R. Meijer, Interviewer)

Schaap, T., & Baart, T. (2015). Building Site Enschede: A City Recreates Itself. Rotterdam: NAi Publishers.

Staal, T. (2019, January 8). Zorgen over geringe groei van bevolking Enschede. TC Tubantia.
Suurenbroek, Y. (2010). Grote gebouwen, grote branden. Enschede: Saxion, Kenniscentrum Leefomgeving.

TC Tubantia. (2009, December 3). Pi de Bruijn: bijzonder slotakkoord Roombeek. TC Tubantia.

TC Tubantia. (2012, August 12). Verstopte dukaten in stadsgracht. TC Tubantia.

Timmerman, P., & Benneworth, P. (2006). Architectuur in Twente: Een nieuw Kennispark. Kunst en Wetenschap, 11-12.

Timmerman, P., Philippi, G., & Vries, T. d. (2004). Wederopbouw Roombeek Enschede: Architectuurcentrum Twente. Retrieved from http://www.architectuurcentrumtwente.nl/agenda/eindverslag-wederopbouw-roombeek/eindverslagwederopbouwroombeek.pdf

Vale, L., & Campanella, T. (2005). The Resilient City: How Modern Cities Recover from Disaster. Oxford, United Kingdom: Oxford University Press.

Verheul, W. J. (2012). Stedelijke iconen: Het ontstaan van beeldbepalende projecten tussen betoog en beton. Den Haag: Boom Uitgevers.

Voorburg, A. (2018, May 18). Arie Voorburg: Cities on the move. Retrieved from Arie Voorburg: http://www.arievoorburg.com/index.php/rethinking-the-fundamental-objective-of-our-urban-future-and-their-destinies/

Vries, T. d. (2005). Campus Universiteit Twente ligt onder vuur. ArchiNed.

Wiegman, T. (1989). Kleine historie van Enschede. Hengelo: Broekhuis.

Wilmink, W. A. (2017). Verzamelde liedjes en gedichten. Amsterdam: Prometheus.