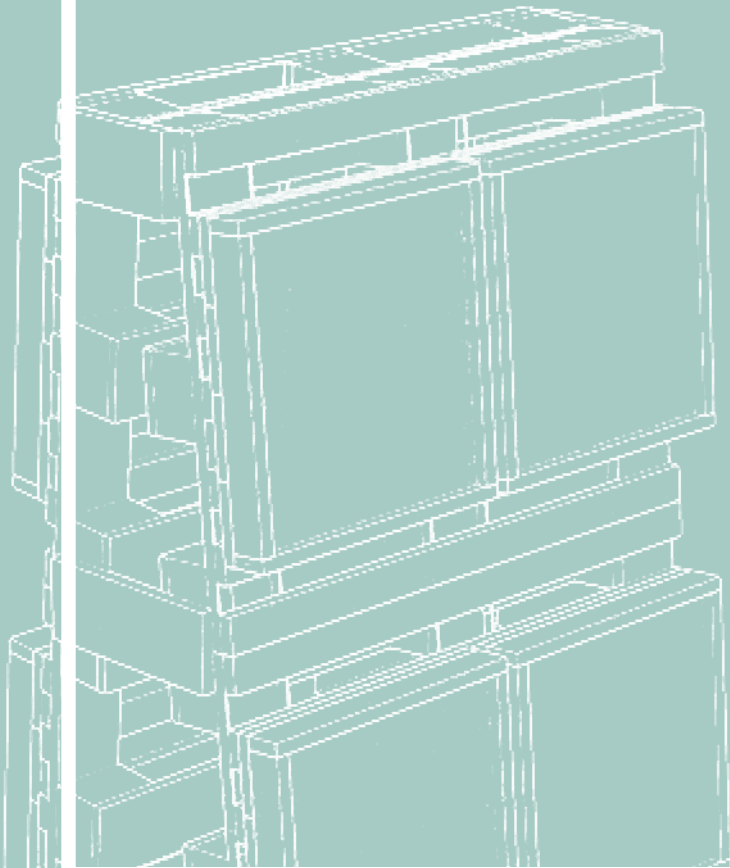


MANCHESTER SCHOOL
OF ARCHITECTURE



Prefigurative Architecture

*Proposal for a Greenification System in Central Manchester
Kiran Milton, Léo Lima & Kieron O'Sullivan
January 2020*

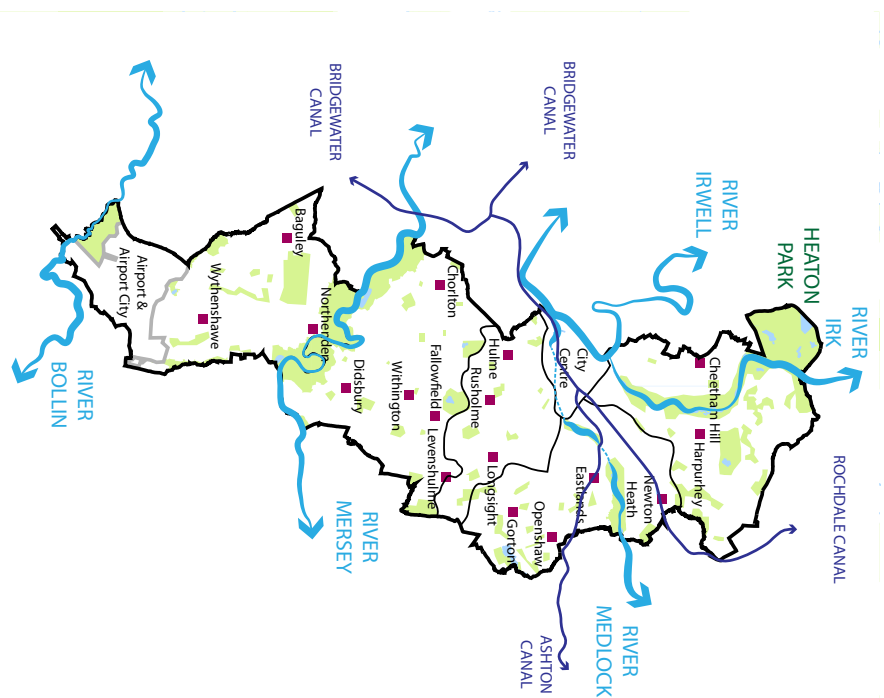


Fig.2 - Map of Existing GI in Manchester
Manchester Green & Blue Infrastructure Strategy

Introduction

Greenifying Manchester - Definitions

Greenification

Greenification is a general term that is typically used in relation to improving the environmental performance of a system. This may be used to refer to the process of reducing environmental impact, enhancing environmental benefits or simply increasing the amount of 'green' within an area. This document will consider greenification alongside the definition of 'urban greening' (Capital Roots :: About Urban Greening, n.d.).

Green Infrastructure

There is no single definition of green infrastructure (GI), however most definitions agree that GI is a multifunctional network of green spaces and other ecological technologies (public or private) that vary in scale and have a range of ecological benefits. (Department for Communities and Local Government, 2008; NE, 2009; MCC, 2015; UKCIBC, 2015; What is green infrastructure?, n.d.)

The “National Planning Policy Framework” (2012) defines GI as:

“Urban greening refers to public landscaping and urban forestry projects that create mutually beneficial relationships between city dwellers and their environments.”

What is important here is the term 'mutually beneficial relationships' which links urban greening with infrastructural processes. Expanding upon this, greenification then refers to the growth of these processes, where strategic architectural/urban interventions can act as a catalyst.

"A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities."

The Manchester Green & Blue Infrastructure Strategy (2015) adopts this definition and further expands upon it, dividing GI into 3 categories; Open Spaces (Parts/ Outdoor Sports Facilities etc.), Linkages (Rivers/ Cycle Routes etc.) and Networks of Urban Green (Private Gardens/

Green-Space

Street Trees etc.) (MCC, 2015). Under this broad definition it can be safe to say that any proposed greening project would align with the Council's GI objectives.

The interpretations of the term 'Green-Space' can be split into two broad categories. The first is that green-space is defined through the presence of nature, such that parks, rivers and vegetation are included. General landcover is a dichotomy of either urban or natural areas. The second refers to green-space within the urban context, considering vegetated areas and features through their relationship and benefits to urban dwellers (Taylor and Hochuli, 2017). The latter interpretation is of more relevance to this investigation, and extends the definition to manmade structures that increase the benefits of green space.

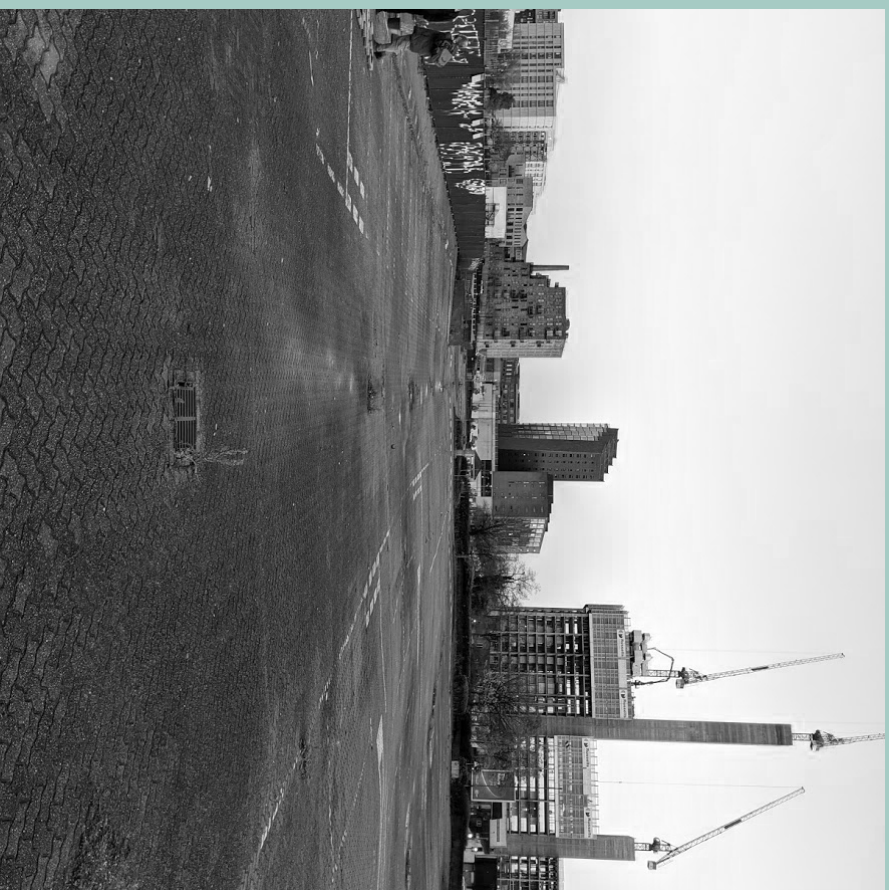


Fig.5 - Photograph of Site
Looking South-East towards Old Mill Street



Fig.6 - Photograph of Site
Looking North-East towards New Islington
Free School

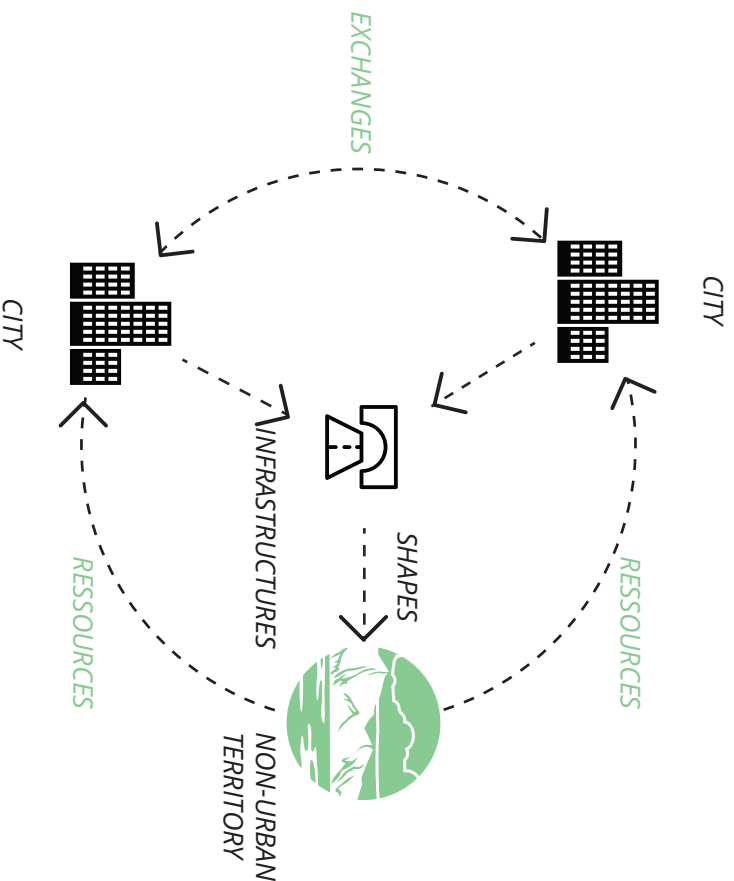


Fig.9 - Diagram exploring links between urbanism and infrastructure

Urbanism

Urbanism and Infrastructure

Infrastructures are historically related to the urban environment and the process of urbanization itself, even though they are not exclusive to it, they are able to link different territories on a wider scale, and even shape future development. Infrastructures give the urban ways of sustaining and developing itself through provision of electricity, water, and now broadband access. (Wakefield, 2018; Easterting, 2014). Parallel to the development of modern urban planning and buildings, the "democratizing" of modern lifestyles previously only available to the rich was made possible, through pipelines, cables and wires (Wakefield, 2018). When modern lifestyles were installed in a territory, infrastructures helped to maintain and discipline them. For instance in the United States, densely concentrated suburbs were "pacified" with disaggregating infrastructures (Harvey, 2008). As stated above, they are also related to non-urban landscapes, helping to produce and re-shape them, including the provision of dams, bridges, highways or

aqueducts. They "were in the 19th and early 20th centuries hailed as potent evidence of western civilization's ability to shape and order both human life and powerful natural forces" (Wakefield, 2018). Thus, "infrastructures were bringing stability to cities while transforming natural forces into usable flows, [...] facilitating commerce and urbanization" (Wakefield, 2018).

Infrastructure is political

Infrastructures, while being rarely talked about in spatial studies even in the early 2000's (Wart, 2003), are now the focus of an important amount of literature and research. For some, they are the "central trope of modern urban thought" (Chatopadhyay, 2012), while for others they have become the "key political question of the Anthropocene" (Wakefield and Dyer, 2005).

Although infrastructural power lies in the fact that these networks are widely distributed, their distribution is not equal to the populations they service, creating

political questions regarding their access. Numerous authors have stated that the environment is political (Latour, 1988) while liberal politics and power are infrastructural (Braun, 2014; Dillon and Reid, 2009). Another insight is provided by Collier (2011), who adds a biopolitical dimension to the analysis of infrastructures by describing how, for instance, Soviet electricity provisions were revealing a total planning system.

Another way of approaching politics in infrastructure is through the anthropological concept of technopolitics (Wakefield, 2018). If liberalism and modern capitalism are adaptive structures that seemingly "disavow" themselves (Larkin, 2013), infrastructures are an interesting subject to study as they reveal the underlying politics behind technological projects. Thus, by understanding infrastructures, we can trace back political ideas more or less hidden by technology.



Fig. 11 - Occupy Wall Street and Tahrir Square (2011)
Sources (<https://rightsanddisent.org/> and <https://en.wikipedia.org/>)

Prefiguration and the city

Production of space and prefiguration

Lefebvre's analysis of space as a spatial product is, according to Asara and Kallis (2018), key to understanding the relations between society, politics and space - and thus a prefigurative movements' use of the city. If each society organises and produces its own kind of space, then our relation to the urban world is directly dictated by bourgeois domination and capitalist powers (Lefebvre, 1991).

The space created is described by him as abstract: it is fragmented, homogeneous and hierarchical. Differences can only be made via class struggles. The importance of Lefebvre's work in the production of prefigurative spaces reside then not only in its critique of capitalist and bourgeois spaces, but perhaps more importantly in the tracing of the possibilities that these spaces holds, particularly through differentiation.

Moments of contestation allows for these differentiations, as they affirm "the differences for human life and the integrity of human needs" (Dhalival, 2012 in Asara and Kallis, p.7).

Prefigurative territories

Referring again to Lefebvre (2014), Asara and Kallis (2018) describe how praxis is linked to the theory of everyday life transformations, which is groundless without the production of an appropriated space. Autogestion then not only defines the structure of a movement's own politics, but also the way they organise the space: prefiguration is then a "spacio-political tactic" (Mimnuchin, 2014,p.3).

Conflicts are seen as unavoidable and welcomed, as they "ensure that prefigurative territories do not turn into "insular enclaves" (Dhalival, 2012)" (Asara and Kallis, 2018, p.9)

Materialities

The Factory of Atuncucho project presents a way in which materials and construction are an essential part of the prefiguration process (Mimnuchin, 2018). Here, not only the sourcing of the materials used for this community-oriented project were part of the prefiguration process (through the use of waste from the engineering and construction industry), but the whole production of space enhances the political autonomy. The author continues in arguing that prefigurative architectures "serves to critically expose the social dimension of architecture beyond the production of forms" (Mimnuchin, 2018, p.2).



Fig.12 - Voluntary building in The Factory of Atuncucho Project
Sources (<https://rightsanddisent.org/> and <https://en.wikipedia.org/>)

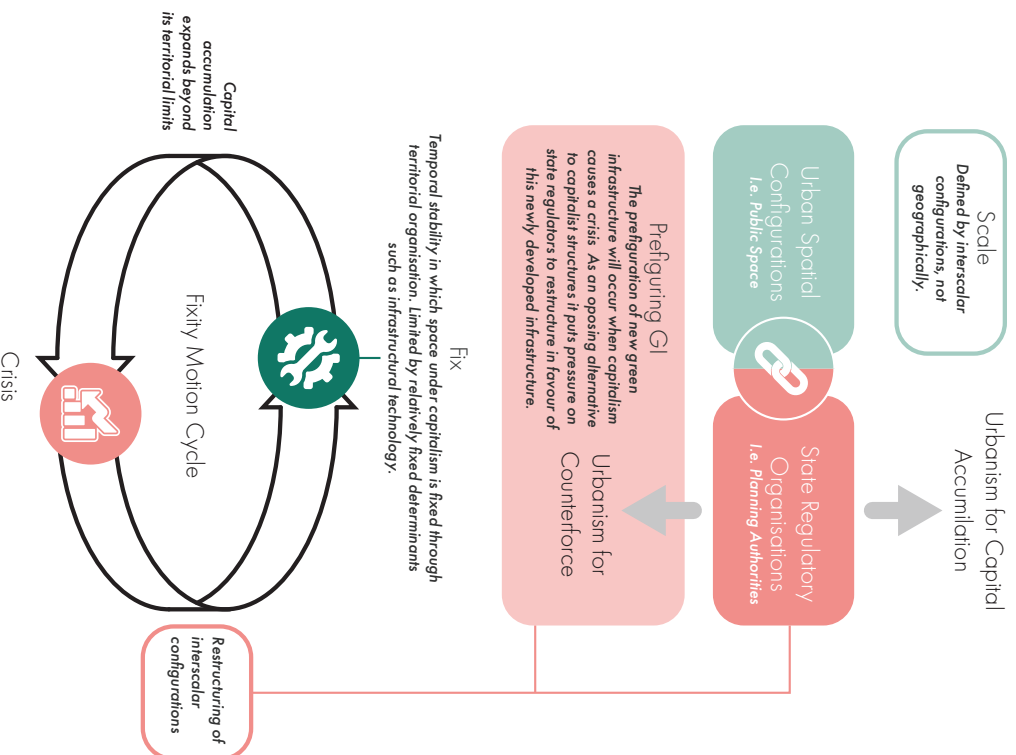


Fig.13 - Diagram exploring the Fixity Motion contradiction
Brenner's concept of fixity-motion in relation to our prefiguring green-infrastructure.

Urban Spatial Configurations

Inter-Scalar Configurations

In the previous sections we highlighted that what constitutes the 'Urban' is no longer geographical as we may have claimed in historical settings. We now look to understand how the urban manifests spatially. Following the thought of Neil Brenner (2019) we look at the conception of scale.

Like urbanism, scale can no longer be seen as geographical but dependent on social perception of scale. These perceptions in turn can be determined by inter-scalar configurations that penetrate between the scales. It is through the strengthening of these inter-scalar configurations that the urban starts to manifest spatially. Brenner puts heavy emphasis on state regulatory organisation as a determinant of spatial configurations as they set the limitations of space through mechanisms like planning authorities. Likewise Minichin (2016) touches upon infrastructure as one of these inter-scalar configurations, with urban space shaping itself around the support of these infrastructures which is vital for the preservation of a particular form of urban living.

Fixity Motion

The fixity-motion cycle conceived by Brenner (2019) theorises on an identifiable pattern of urban space. Capitalism as an economic system will insistently seek the accumulation of more capital, breaking the boundaries imposed on itself, until it can no longer support its growth and a crisis occurs. At this point the inter-scalar configurations that have defined territorial organisation and urban space will restructure in order to create a new stable form of urbanity where capitalism's expansion is relatively settled within its territorial organisation (fix).

Prefiguration and Urban Space

With each crisis created through capitalism's relentless spatial reconfiguration, a countervorce is generated which opposes the process of capitalism. Brenner (2019) in a statement that echoes Marxism, claims that it is during periods of motion and restructuring after crisis, that social groups will attempt to reshape state policy in favour of either existing capitalist intentions or that of the counterforce created by crisis.

Prefiguration in this sense can be seen as a form of counterforce. Offering an alternative to capitalist structures. The prefiguration of green infrastructure as an inter-scalar configuration is therefore an act of shaping urbanism outside of typical state and capitalist control, filling the gap where the current system has failed. This in turn puts pressure on the state to adapt to this new infrastructure as opposed to the force that had caused the crisis.

“[Capitalism], will carry within it the seeds of its own destruction, and its subsequent displacement by the proletariat will be made considerably easier...”

Karl Marx, 1850

Tracing

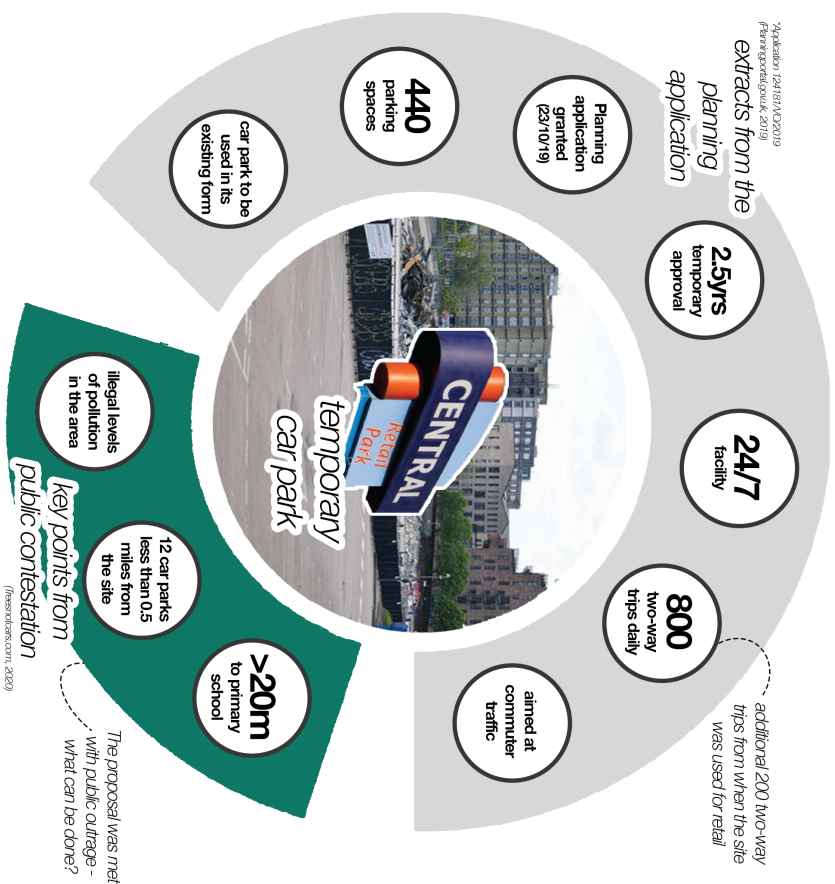


Fig.1 5 - Diagram showing key features of current proposal (temporary car park)
Planning Application 124181/NO2019 on former Central Retail Park site, Great Ancoats Road.

Current Proposal for the Site

Planning Application 124181/NO2019

A planning application was submitted by Paul Butler Associates on behalf of Manchester City Council, on the 10th July 2019 - to use the car park of the former Central Retail Park on Great Ancoats Road as a temporary car park for commuter traffic in the city centre. The application has been met with strong public opposition, notably in the form of action group 'Trees not Cars'.

Despite public perception the application was approved on 29rd October 2019. Temporary use of the site has been granted for 2.5 years (expiring on 30th April 2021).

The application grants use of the 440 spaces which were previously demarcated for the use of the shopping centre. No additional spaces have been created. The application states that the site will be open 24/7, aimed at commuters and those looking for cost-effective parking.

The application suggests that the car park will not generate any extra trips, as many journeys will already be using existing car parks or passing within the area and therefore not qualify as 'new', however public concern relates to the proximity to the primary school and the risks this may pose to parents and children.

Proposed activity has been calculated using B1 office trends due to the assumption that the site will mainly be used by commuters. The increase in activity has been categorized as 'negative or minimal', generating 800 two-way trips daily, which is marginally more traffic intensive than the previous retail offering which generated 600 two-way trips (Manchester.gov.uk, 2019).

It has been requested that prices do not undercut public transport costs, in order to encourage the use of these facilities rather than driving, but no data has been made available.

Manchester City Council have not explicitly stipulated who will run the car park, however we have assumed the provider will be NCP as the council has an ongoing partnership with the company (NCPsolutions.co.uk, 2020).

The money generated by the temporary car park will be used to recoup the cost of purchasing the land. It is worth noting that Manchester council makes more money from parking than any other borough in Greater Manchester. Making almost £10 million in profit in 2017/2018 (Manchester Evening News, 2018)

Key points from the public opposition were: the site's proximity to New Islington Primary School and the illegal levels of air pollution already present on Great Ancoats Road.

Planning Application 124181/NO2019

A second minor planning application was submitted by Paul Butler Associates on behalf of John Sisk & Son Ltd, on 29rd August 2019 - for the creation of a contractor's cabin with associated parking on the site. The application was approved on 29th October 2019, for a temporary use of the site for 3.5 years (expiring on 30th April 2022) (Manchester.gov.uk, 2019)

Public opposition and the 'Trees Not Cars' movement

Prefiguration in Manchester 2019

Beginning in July 2019, an action group of campaigners was formed around the slogan 'Trees Not Cars', united by their opposition to the use of the former Central Retail Park site as a temporary car park. The group was up made of locals, concerned parents and environmental activists, amongst others. The group are an example of prefiguration theory in action, creating a community garden on the site from donated plants and protesting their right to the future of their neighbourhood.

There are clear links between the Trees Not Cars movement and the Indignados Movement in Barcelona, opposing political authority and embodying their protest through the creation of a community garden, to have their voices heard. The actions of the Indignados movement eventually led to legislative change which acts

as a precedent for Trees Not Cars, who have voiced their ambition to change the consultation process to actively include the public in the process - a nod to Kaninier's thoughts on theories of participation (2017).

Genma Cameron, a lead campaigner for Trees Not Cars said: "The consultation process needs to be reformed. We need to have our voices heard and acted on. We need to be part of the planning process from the very beginning."

The group have documented their struggle with the council across via several social media accounts: they have held public rallies on the site, attended planning committee events, and met with councillors in various settings to discuss the future of the site.

One of the key points of contestation for the Trees Not Cars movement is New Islington Free School (the city's only primary school) which is located next to the

former Central Retail Park.

A number of parents joined the campaign to voice their concerns over increased exposure to emissions from cars, such as Julia Kovaliova who has spoken passionately on several occasions regarding her objection to the proposal.

Julia's son (who is now 10) was diagnosed with asthma when he was 6 - her concerns are anchored in the health of her son, and what the increased exposure may mean for him. When addressing the planning committee, she asked members to vote with their conscience and not prioritise business and economic gain over their children's health.

Though the application was approved, the council have unofficially agreed not to use the portion of the site closest to New Islington Free School as a car park; allowing the area to be used for a community-led initiative instead. (TreesNotCars.com, 2020)



Fig.16 - Community gathering on the site led by Trees not Cars
Trees Not Cars, 2019. Greater Manchester Clean Air Plan [Online]. 11/4/2020. Available from: <https://mappinggm.org.uk/clean-air-plan/>

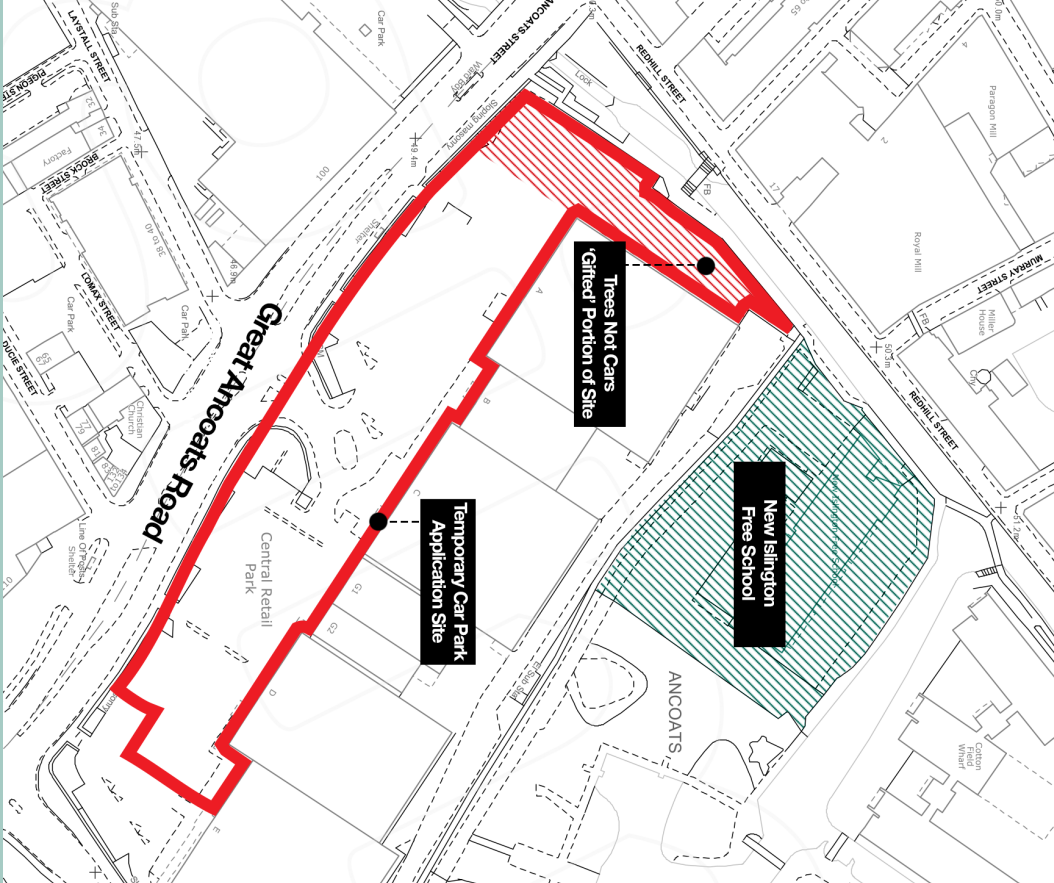


Fig.17 - Application site for temporary car park, showing adjacent primary school (1:2500@A5)
Planning Application 124181/VO/2019 on former Central Retail Park site, Great Ancoats Road

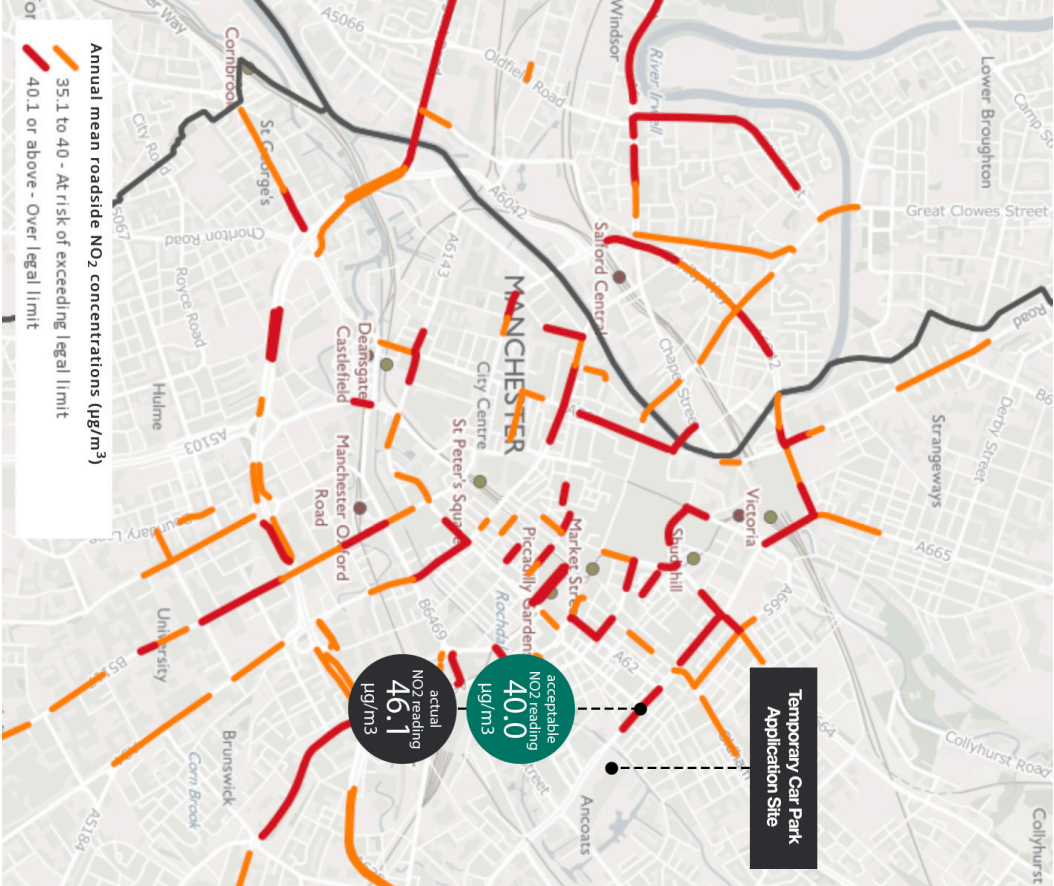


Fig. 19 - Diagram showing recorded nitrogen dioxide pollution levels in Manchester Greater Manchester Combined Authority, 2020. Greater Manchester Clean Air Plan [Online]. 11/4/01/2020]. Available from: <https://mappinggm.org.uk/clean-air-plan/>

Air Pollution

Legislation

In accordance with national legislation (*Environment Act 1995*) Manchester City Council must periodically measure air quality in the city and make the results available to the public. Seven pollutants are measured: Carbon monoxide (CO), Nitrogen dioxide (NO₂), PM10 particulate matter, Sulphur dioxide (SO₂), Lead, Benzene and Ozone (O₃) (Manchester.gov.uk, 2020).

The amount of pollutants found in the air are then reviewed against 'acceptable limits' based on a vast body of scientific research. If any of the seven pollutants are found to be above the acceptable limits; an action plan must be introduced by the council, setting out clear steps that will be taken to reduce the pollutant in question below the acceptable limit.

Currently, all pollutants are within the acceptable limits, except the concentration of nitrogen dioxide, which exceeds the suggested figure in multiple instances (Manchester.gov.uk, 2020).

Nitrogen dioxide levels are particularly high in the city centre, including Great Ancoats Road - which borders the former Central Retail Park site (CleanAirGm.com, 2019). Manchester council has set up an air quality management area along with an air quality action plan, tasked with proposing viable plans to reduce levels of NO₂.

The reality of poor air quality on health

Every year 181 people in Manchester die because of toxic air (Manchester.gov.uk, 2020). Air pollution can be fatal to specific groups of people - including children, pregnant women, the elderly and those suffering with medical conditions such as asthma or COPD (WHO, 2019).

In 2016, air pollution was responsible for over 4.2 million deaths. Worldwide, air pollution is estimated to cause about 16% of deaths associated to lung cancer, 25% of deaths relating to chronic COPD, 17% of deaths pertaining to heart disease or stroke, and around 26% of respiratory infection related deaths (WHO, 2019).

Manchester is one of the worst places in the UK for air pollution (MEN, 2019). Improving air quality is likely to have noticeable positive effects on the health of people in Manchester, and should be made a high priority.

Illegal levels of Nitrogen dioxide on Great Ancoats Road

The level of nitrogen dioxide on Great Ancoats Road measures 46.1µg/m³ - the acceptable limit for nitrogen oxide has been set as 40µg/m³ (MEN, 2019).

Action Plan

GMCA have stated that they are working hard to tackle issues regarding air pollution. They have suggested a congestion charge for pollution heavy vehicles driving through the city centre, and proposed financial support to local business allowing them to upgrade to cleaner vehicles.

Key statements within their air pollution action plan include: "improving traffic flow to reduce congestion and idling on key routes" and "encouraging people to change their travel choices, to use public transport, walk or use their bikes" (Manchester.gov.uk, 2020).

The reality

However, the approval of the temporary car park on Great Ancoats Road shows that the issue of air pollution is not at the forefront of the council's agenda.

Increasing car use on this stretch of road will do nothing to reduce the levels of nitrogen dioxide, and providing more parking spaces will only encourage people to drive rather than use alternatives.

The fact that the council approved the application after highly publicized public opposition, illustrates that they are not actively set on achieving their green climate goals but instead, are focused on business as usual, and making a profit from car use.

What is considered 'Green Infrastructure' in Manchester

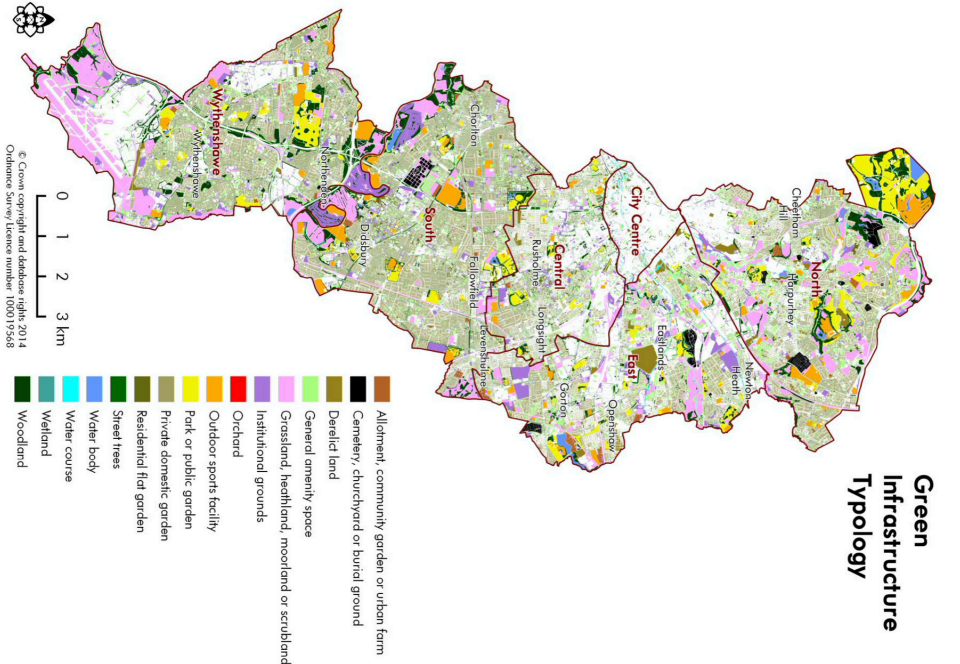


Fig.21 - Diagram of Green Infrastructure Typology taken from Manchester Green Infrastructure Strategy - derelict land is considered 'green infrastructure' due to the process of natural succession



Fig.22 -. The derelict site on the corner of Princess Road and Whitworth street was categorised as Green Infrastructure' as part of the Manchester Green Infrastructure Strategy. The site was derelict for 20 years. Manchester Evening News (2020). Derelict City Centre Site on corner of Princess St Whitworth St. [image] Available at: <https://www.manchestereveningnews.co.uk/news/greater-manchester-news/derelict-city-centre-site-on-princess-st-whitworth-st-19961570> [Accessed 17 Jan. 2020].

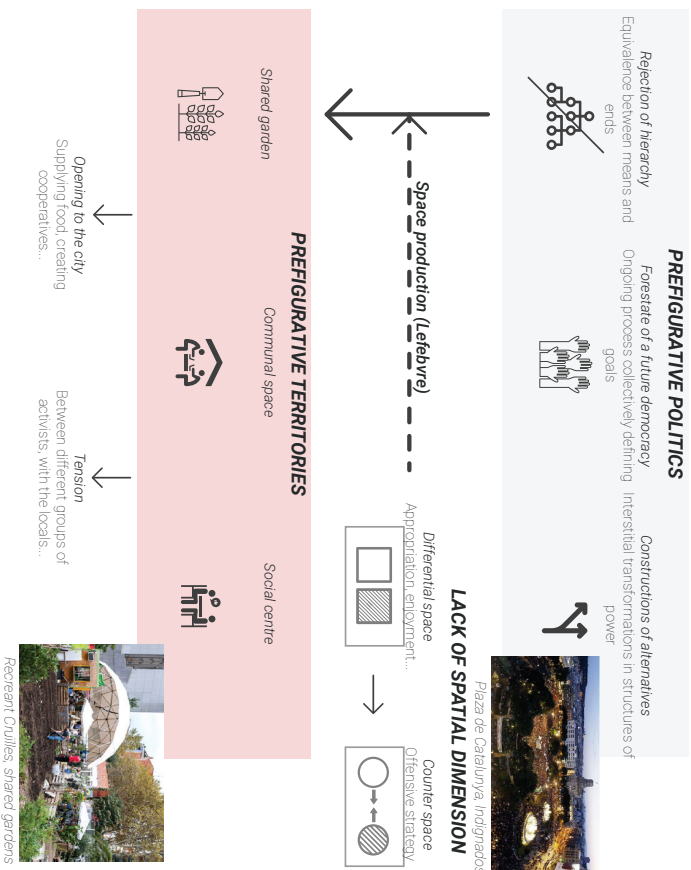


Fig.25- Diagram of Indignados Barcelona action.

Precedent Studies

Indignados Barcelona

The first case study seeks to precise how prefiguration can produce spaces for political collective action in the city, through the analysis of the Indignados movement in Barcelona by Asara and Kallis (2018).

Birth of the movement

The Indignados movement is an anti-austerity group born within a global anti-austerity movement united against the global crisis. They focused not only on protestation, but also on actions, as their slogan highlighted: "from indignation to action". When in October 2011 their march was diverted by the police from their original destination, the group occupied another place, by the "Arc de Triomf", and started to dig and plant, creating a garden in the public space. This symbolized the evolution of the movement towards action.

From prefigurative politics to prefigurative territories

The original protest can be seen as a claim for prefigurative politics. The movement called for new ways of making democracy more participative, by a rejection of vertical hierarchisations of power, and a collective definitions of goals through ongoing process. Thanks to the spatialization of the protest through the gardens, an opportunity to make realize these demands appeared.

Asara and Kallis relate this process to Lefebvre's (1991) notion of "production of spaces". If the original protest created "differential spaces" related to appropriation, the setting up of the garden developed "counter-spaces", where offensive strategies against other ways of making the city could unfold. Thus the authors of the analysis see this process as a creation of prefigurative territories, where theories can be put into concrete

actions and be understood through experimentations. In this case, shared gardens, communal spaces (kitchen, desks...) and a social center were framing new experiences of a public space in the city.

This also resulted in different relations with surrounding spaces. If supplying food via cooperatives was seen as a sign of opening by the locals, tensions appeared with them and within the prefigurative space in itself.

After the square

The camps were dissolved, but in some instances the self-governed green spaces stayed. If there have been several studies on the physical encampments, few research have been made of the aftermath. The movement morphed following the contradictions and oppositions and moved into neighborhood planning and organisation, applying the abstract ideas of the square. Thus, it led to institutionalized political movements and may lead to other possibilities in the future. This case



Fig.26 - CityTree installed in in Piccadilly Circus, London
Dezeen, 2018. [Online]. [16/01/2020]. Available from: <https://www.dezeen.com/2018/03/21/moss-covered-citytree-bench-combats-urban-pollution-london-uk/>

City Tree (Green City Solutions)

Background

Green City Solutions emerged as a collaboration between professorships of innovative cultivation techniques, vegetable gardening and greenhouse management of the University of Applied Science Dresden, the Institute of Agricultural System Technology and the Institute of Building Theory of the University of Technology Dresden. The collaboration built on previous research, developing the concept for CityTree over a ten year period (Spittigerber and Saenger, 2018).

The Design

The CityTree is marketed as the world's first intelligent biological air filter (Dezeen, 2018). Each tree is designed around a 'living wall', which is filled with a variety of specific moss types which have the ability to absorb pollution directly from the air. The structure uses a fraction of the space that would be necessary to achieve the same air-purifying results using real trees (ICLU, 2018). The CityTree, makes use of cover planting to protect and provide shade to the cultivated mosses. No soil is used in the tree, the cover plants are planted directly into the moss substrate. In line with the green objectives of the project, the tree is powered by solar panels. Rain water is collected and used to water the moss and plants via

an inbuilt irrigation system (GreenCitySolutions, 2019).

The structure is not anchored to the ground, which allows it to be placed in most locations. The position is chosen depending on the prevailing wind direction, the prevalence of sun (indirect sunlight is preferential) and the exposure to pollutants in an area - the optimum alignment is calculated through a series of data collection activities and algorithms.

Following the introduction of the CityTree, there will be a nitrogen oxides reduction up to 10–15 per cent and a fine dust reduction up to 20–25 per cent (Spittigerber and Saenger, 2018).

Differences to facade greening

Facade greening aims to reduce air pollution in a similar fashion to CityTree, by absorbing particulate matter and nitrogen dioxide directly from the air, however the process is limited by both fine-regulations and the pre-determined urban fabric. Whilst facade greening can be effective when utilised as part of a broader approach to green-design, it cannot effectively reduce pollution in hotspots'. The free-standing CityTree rose as a response to these limitations (Spittigerber and Saenger, 2018).

Statistics Overview

Effects are recorded within a 50M distance of each CityTree (ICLU, 2018):

1. 15% reduction in NOx
2. 25% reduction in particulate matter
3. 150kg direct CO₂ absorption (daily)
4. Ambient temperature reduction of >17 ° kelvin (due to evaporate cooling)
5. Area of moss per tree: 16.75M
6. Leaf area index (LAI): 30
7. Capturing capacity for fine dust: 22g/qm
8. Leafed phase: 365 days



Fig.28 - Sketch visual of moss nursery on site
New Islington Free School is shown in the background

Our Intervention - MossBalling

Proposal Overview

Physical proposal

In its simplest terms, the 'gifted' portion of the site will act as a nursery for growing moss, which has the ability to absorb high levels of nitrogen dioxide - thus reducing the air pollution in the surrounding area, bringing the reading within the 'acceptable level'. Frames to cultivate the moss and pallet walls to hang the frames on will be constructed on the site from reclaimed materials. Once the moss reaches maturity (optimum levels of nitrogen absorption) - the frames will be transported around the city; to spread the air-pollution effects (45% reduction in nitrogen dioxide within a 50m range of a double wall unit). Once a frame has left the site, the next cycle of construction will begin.

Foundation of scientific research

Our proposal is grounded in the theoretical readings that framed the Prefigurative Architectures module, but also poses a viable solution to a very real problem regarding air pollution in

Manchester.

Building on the research carried out by *Green City Solutions* and the successful implementation of moss as a natural method of air purification (as seen on the CityTree project) - we have proposed a low-tech moss filtration system, with the site acting as a moss nursery from where the 'filters' will be grown and assembled, to then be disseminated across the city.

Each CityTree can absorb the fine particles of up to 417 cars, and can reduce the local air pollution within a radius of 50m by up to 30% - with the potential to reduce the daily nitrogen dioxide reading by 15% (UCCN, 2018).

With a lack of scientific research available on specific strains of moss being used to absorb nitrogen pollution from the air (as opposed to strains of moss being used as a bio-indicator for nitrogen pollution, which has been well documented - see; Schröder et al (2010), Conti and Cecchetti (2001), we have based our calculations on the limited information available from the CityTree project - which we recognise from the outset is a limitation to our proposal. The

CityTree project makes use of two specific strains of moss: *ceratodon purpureus* and *raconitrium canescens* (Spittigber and Spittigber, 2018) which naturally grow in the UK. While all mosses absorb nitrogen oxide to some degree, and would contribute to negating the effects of the pollution in the air - we have worked on the basis of using the aforementioned species for the sake of confidence in the calculation of pollution reduction and working range of our 'trees'.

In an ideal world we would be able to have access to a wider body of supporting research, however we are confident that the principles taken from CityTree would work in a similar essence to how we have proposed them. There are currently CityTrees in London, Newcastle and Glasgow with several more being introduced in 2020, confirming that the climate is suitable for this type of green infrastructure.

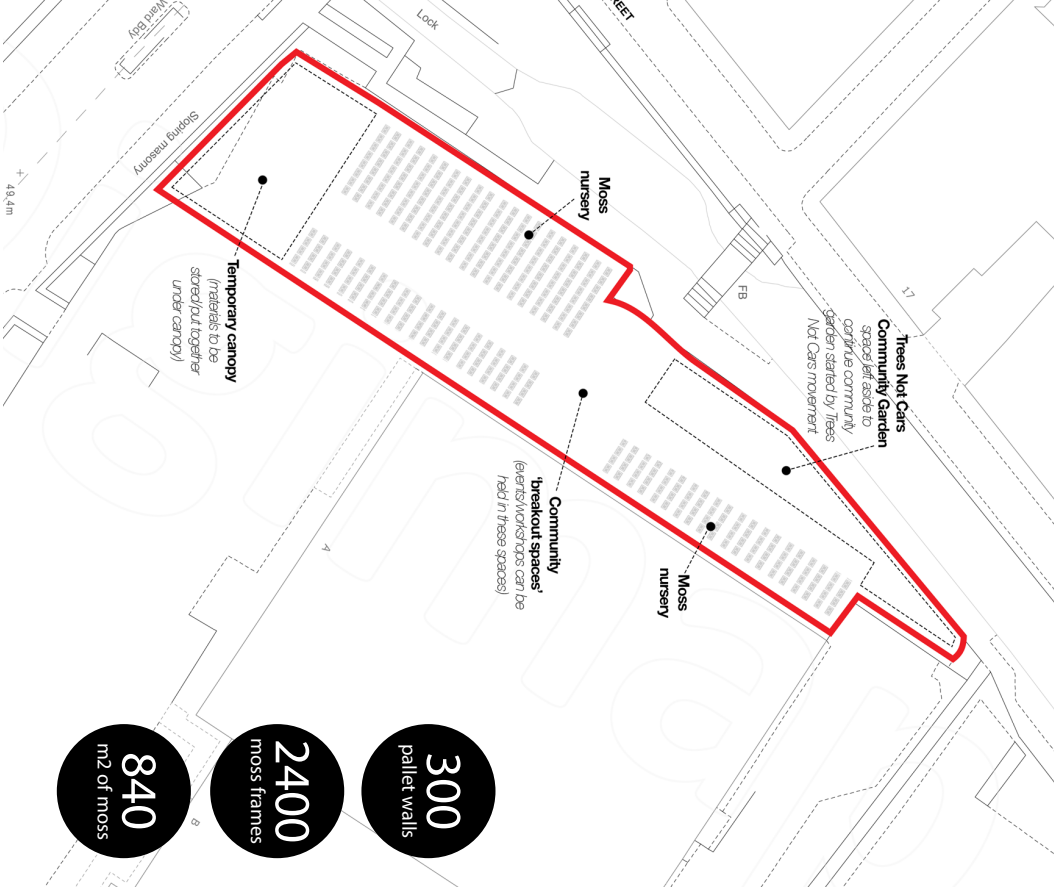
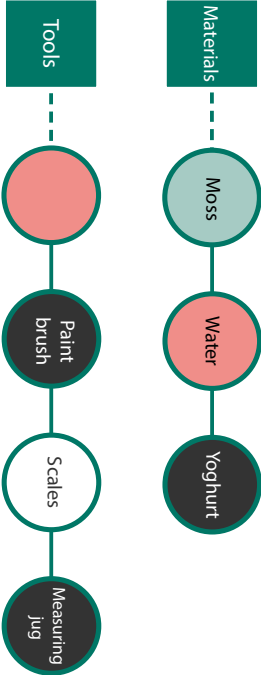


Fig.31 - Plan showing how moss nursery could be laid out on the site (1:5000@A5)
Plan remains sketchy to reflect the transient/evolving nature of prefigurative interventions

Materials/tools required:

To cultivate the moss:



To construct the wall/frames:

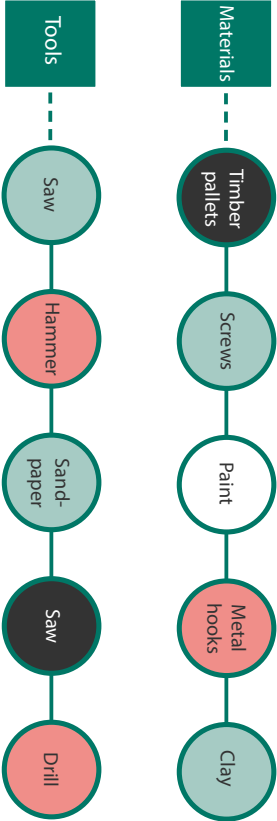


Fig.32 - Tools/materials required to facilitate project.
Low tech approach has been taken, with simple construction methods favoured over complex design.

Growing moss via the 'milkshake' method - growth over time

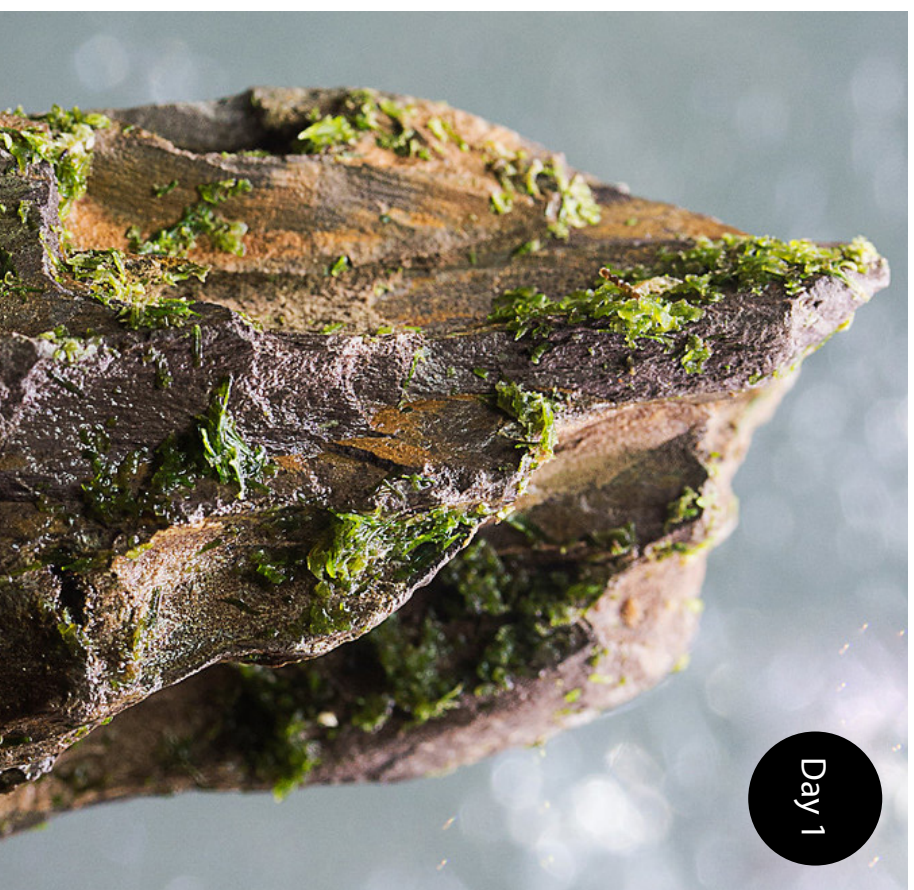


Fig.35 - Photo showing 'moss mixture' applied to a rock: Day 1
Aquiscaping, N. (2020), day 1 vs day 51 dem. [image] Available at: <https://www.flickr.com/photos/137209880@N06/43937024055/> [Accessed 17 Jan. 2020].



Fig.36 - Photo showing 'moss mixture' applied to a rock: Day 51
Aquiscaping, N. (2020), day 1 vs day 51 dem. [image] Available at: <https://www.flickr.com/photos/137209880@N06/43937024055/> [Accessed 17 Jan. 2020].

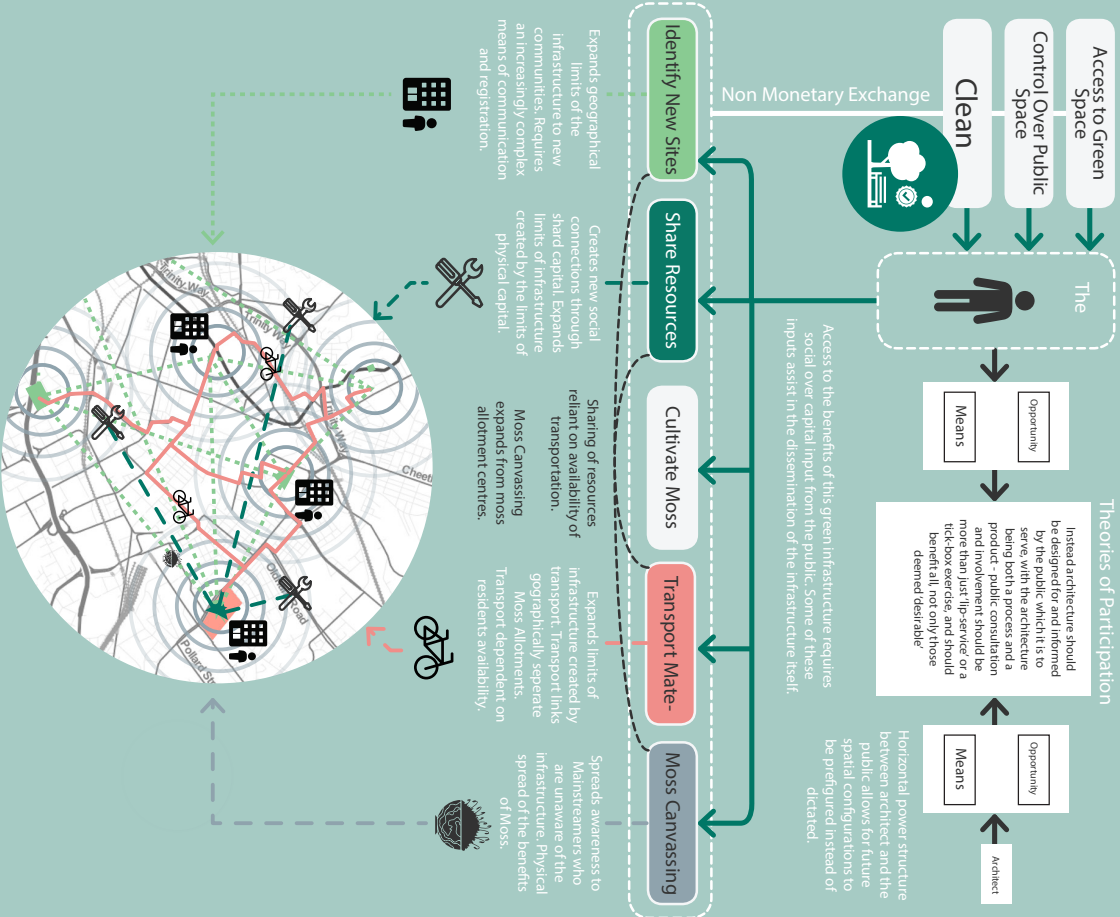


Fig.38 - Dissemination Process
Diagram showing the contributing actions to dissemination.

Dissemination of the Idea

Spreading the Word

Dissemination of green infrastructure as an idea, requires interaction with the various stakeholders. An idea is more likely to be accepted if it is presented as an innovation 2) provides a service to the user. Following the amoeba model organisations that wish to promote green infrastructure (innovators) need to target two key stakeholders: Change Agents, which would be represented in our case by established 'green' organisations such as NGOs, And Transformers, which in our case would be represented by people directly benefiting from the intervention and are willing to actively promote it. With these two stakeholders Main-streamers (the neutral public) and Controllers (the local authority) are more likely to follow.

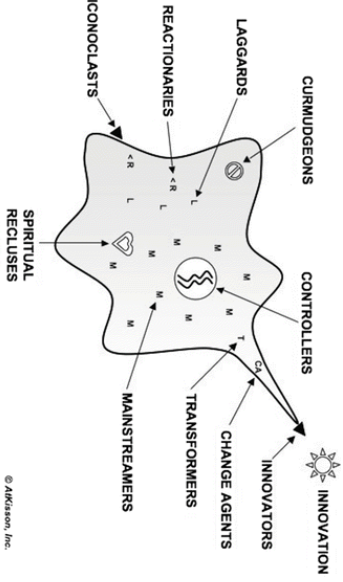


Fig.X - The Amoeba Model
Diagram explaining the key stakeholders and their roles with the spread of any idea.

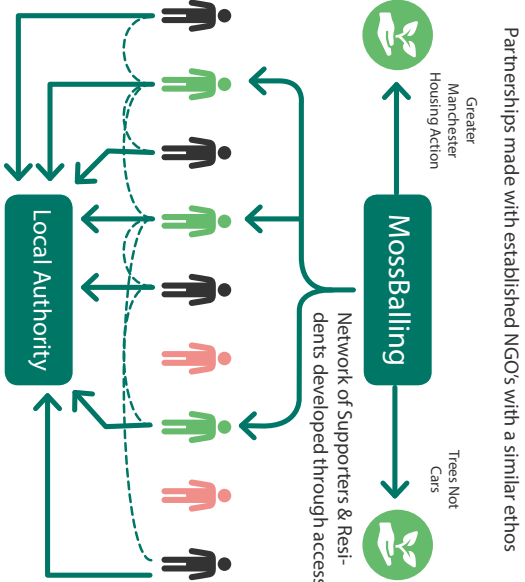


Fig.39 - Spreading the Idea
Diagram explaining the key stakeholder targets for the spread of the idea of MossBalling

Details of Construction

Low-tech Construction

The design has been kept intentionally simple, in line with limited knowledge of construction and tools of the site-users, and the temporary nature of the intervention at this stage. Using waste materials where possible helps to reduce costs and works towards a more sustainable future, compounding the aim of the project.

Moss Frames:
Construction Process

1. Timber pallet in raw form. Light sanding to remove any large splinters before working with the material.
2. Nails to be removed to pallet and timber separated into its three forms.
3. Using two top strips, a simple frame is constructed from four pieces of timber. A single piece of timber is used as cross bracing.
4. Larger timber slats are nailed together to form backing for frame.
5. Frame and backing are nailed together.
7. Coating of foamcrete inside the frame. Foamcrete keeps the frame light while providing a smooth surface for the moss to attach and grow.
8. Simple hooks are attached to the back of each frame, allowing them to be hung once moss cultivation has begun.

Palette Wall:
Construction Process

1. Timber pallet in raw form. Light sanding to remove any large splinters before working with the material.
2. Two pallets stacked vertically to make one side of wall.
3. Second side of wall is created and nailed to the first. Walls are tilted by 5 degrees to create a wider base - reducing risk of the wall toppling over.
4. Wider slats from the pallets are used as bracing to secure the two sides of the wall together.
5. Frames are painted to protect against the elements. Timber blocks from the pallets are placed in the bottom of the walls along with other weights to increase stability.

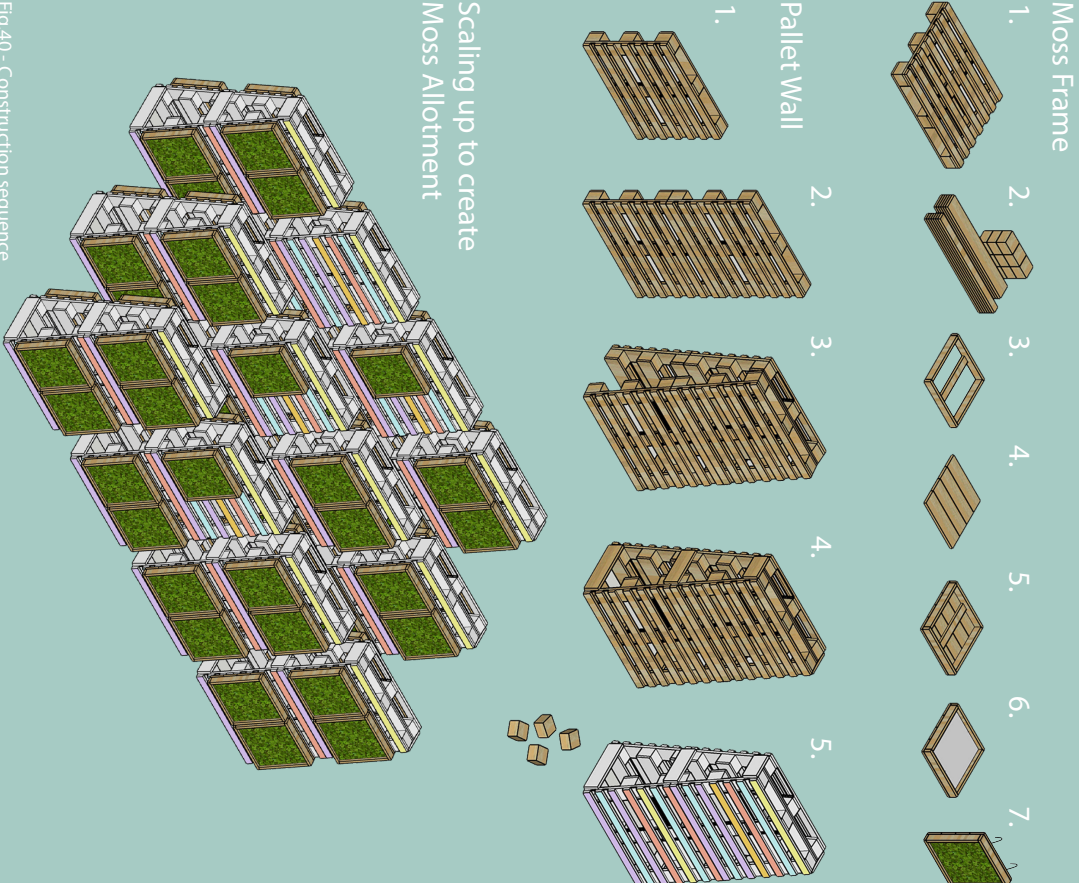


Fig.40 - Construction sequence
Simplified construction process