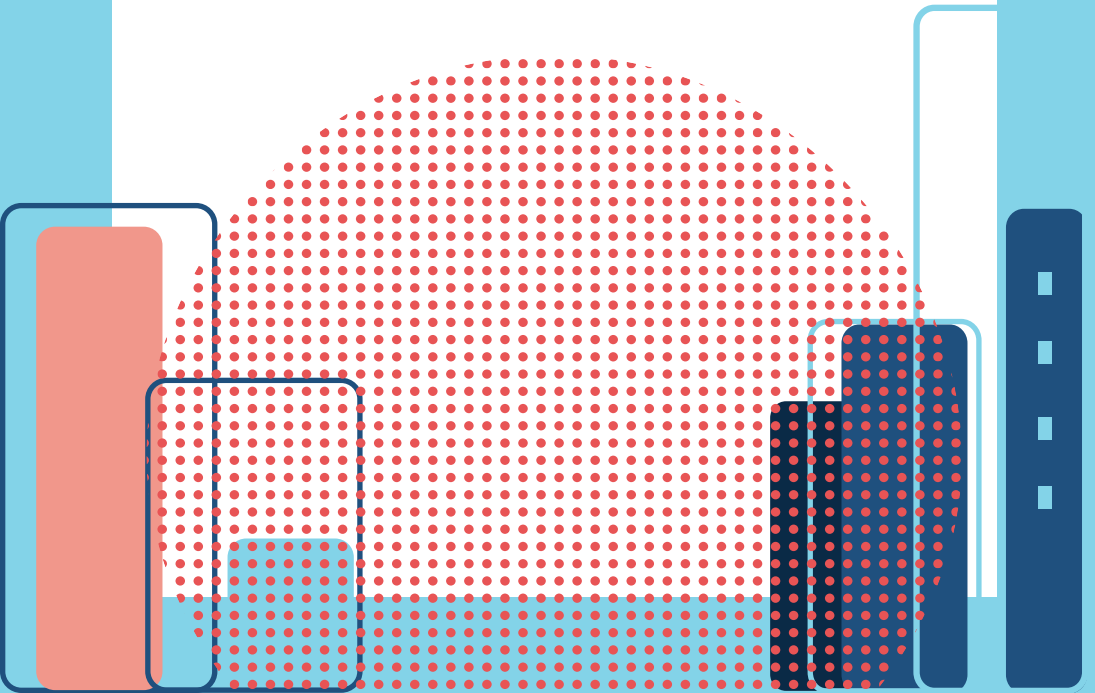


A Field Guide to
4D Citymaking



CIVIC INTERACTION DESIGN



Urban Governance
Social Innovation

▶ Master Digital Design



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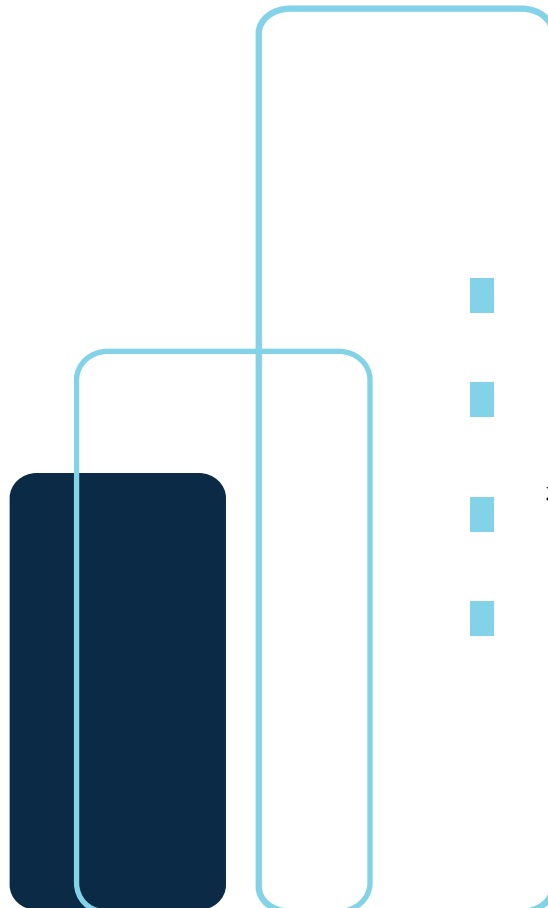
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INTRODUCTION

What is 4D Citymaking?

City models have always been great tools for discussing and planning city developments, showcasing city changes, educating populations and even persuading audiences of a city's future. These models serve as a physical spectacle to present urban development in an aesthetic and accessible way. However, these 3D models are often static, and though the scale allows the audience to get a good overview of the city as a whole, it can be difficult to simultaneously zoom in on specific themes, neighborhoods or developments. Digital and interactive media offer new possibilities for this medium. With projection mapping, augmented reality, virtual reality and the use of real time data, dynamic layers can be added to the city model to allow for temporary interventions in the setup as well as include real time consequences.

The title '4D Citymaking' refers to the 3D arrangement and physical, shared experience of the city model, plus participation, discussion and debate being added as a fourth dimension through programming in the interactive media layer. The 4D Citymaking model could be used as a medium to organise conversations, debates or information provisions about developments in the city in an inclusive manner. The model could function as a platform around which an interactive programme can be made for various subjects.

The lectoraat of Civic Interaction Design, ARCAM, the Master of Digital Design at the AUAS and the Center of Expertise & Urban Governance and Social Innovation have joined up to explore this space of possibilities. Along with our partners, we had discussions in this space, prototyped and tested different solutions and analysed existing case studies. From the insights gathered, we identified the key goals of 4D Citymaking projects and put together an open, adaptable 'how to guideline' for developing such a project.



KEY GOALS

4D Citymaking can take various forms. These goals pertain to what a 4D city model is skilled at achieving. Here, we have identified the five key goals that have come to prominence throughout the research.



Raise Awareness

"I now see that ___ is a challenge."

An interactive city model can be designed to raise awareness of social issues and challenges. It can highlight structural issues in a city, issues related to transport infrastructure, climate change, inequality, etc.



Embrace Change

"I understand that we may need to improve ___ to achieve a better city."

The city model can be used to highlight changes that need to occur in a city and foster embracement of these changes. It can persuade people to consider impending issues or changes that need to or will occur within a city. For example, "Futurama, the City of 1960" was intended as a persuasive piece commissioned by General Motors to convince viewers that the future of the city would heavily feature more cars and highways and that the residents would all be better for it. Today's city models can be used to contribute to gathering support for energy transition, for example.



Education

"I understand how ___ is contributing to the problem."

The model as an educational tool can be used to help people understand how their city functions. It can show traffic flows, the level of air pollution in a city, the racial divide within a city, etc.



Co-Creation

('I can contribute my opinion, views or local expertise in exploring ___')

The city model can be used in co-designing processes between residents, city planners and stakeholders. By providing all parties with a tool that allows them to incorporate their own stories and vision for the future of a particular location, the city model becomes a medium that democratises city planning.



Tool for Testing

"I can see real time consequences of ___ in relation to possible future city changes."

A 4D city model can be used as a way to test future scenarios. They can be great tools for creating simulations of future city changes. For example, a city model could be used to test out new traffic flows or sustainable developments in the city. From these tests, stakeholders can draw conclusions and make judgements on how to bring the project further.

GUIDELINE

The following parameters can be used as a rough 'how-to guide' for designers, city planners and other stakeholders to use when designing an interactive and inclusive 4D Citymodel. We attempted to create a baseline language that all parties can understand and participate in.

The parameters below are by no means an exhaustive list or a 'tick the boxes' method. Separately or together, they can be used to support the planning of a 4D Citymaking project. Our vision is for this framework to create discussions about the important design elements and considerations when approaching a project in this space. The empty bullet points are for you to add in your own questions to each section.

<p>What are the desired outcomes?</p>	<ul style="list-style-type: none"> • What will this piece ultimately be used for? • Is its purpose to raise awareness of a local issue, educate residents on a topic in the city, foster acceptance of change, be a tool for co-creation or act as a tool for testing future scenarios? • Who is the target audience of the project? • • •
<p>What story will you tell and what information is conveyed?</p>	<ul style="list-style-type: none"> • Will the content be about transportation, circularity, physical health, etc.? • What data will be used? • How will you formulate the chosen information into a coherent story for users to engage with? • • •

<p>What techniques will be used to tell the story?</p>	<ul style="list-style-type: none"> • What is the tone of the experience (optimism, fear, pragmatism, etc.)? • What design elements could be used to strengthen the message (juxtaposition, contrast, color, etc.)? • Will the story have characters or a setting? • Will the story be told in the first person, second person, diary format, etc.? • Will the user be able to personalize their experience? • • •
<p>How will the target audience engage with the experience?</p>	<ul style="list-style-type: none"> • How does the user experience the story and interact with it? • What emotional impact should the experience have on the user? • What is the user's journey through the experience? • • • •
<p>What is the experience in the environment?</p>	<ul style="list-style-type: none"> • Where is it located? Is it in one location or many? • How much space does the experience use? • How bright or dark is the space? • Are there sounds and visuals? • Is there a set time/duration for the piece? • Is it something that you experience alone or with other people at a workshop? • • •
<p>What technologies will be used?</p>	<ul style="list-style-type: none"> • Will you focus on one specific technology? • Will you combine technologies to tell your story? • What impact do you expect your chosen technology to have on users? • • •

Notes

CASE STUDIES

City of Sparkles

Lego Urban Planning

Connecting! Block Town

Visualizing the Racial Divide

CITY OF SPARKLES



@DBoyle_Medium

sound of silence I woke to the sound of silence,
and began dreaming. Lost my love,
Lost my footing, Lost my breath,
began and Lost my reach...

9AM, Apr 22, 2018



CITY OF SPARKLES

Creator: Amber Garage

Location: Digital (based on New York City)

Year: 2019

Description: City of Sparkles in an immersive and interactive VR experience where users can explore the lives of New York City residents through their personal Twitter posts.

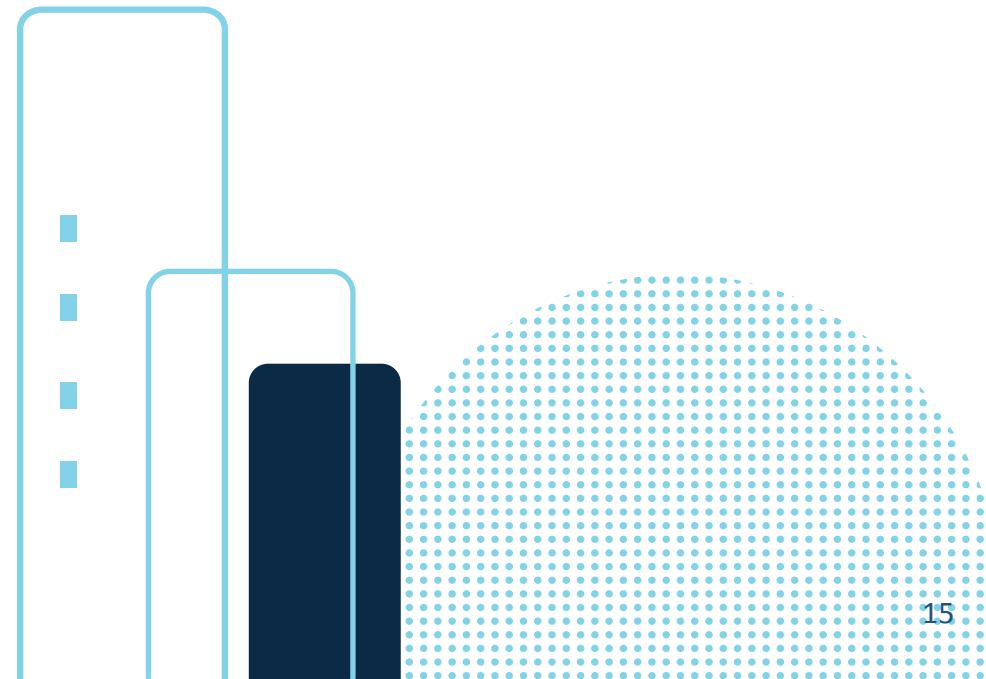
What are the desired outcomes?	<ul style="list-style-type: none"> The goal of this project is to portray the real sense of loneliness that exists in New York City and raise awareness around this social issue.
What story will you tell and what information is conveyed?	<ul style="list-style-type: none"> It tells the story of loneliness in New York City through the lived experiences and emotions of its residents using their real Tweets gathered via the Twitter API. The data gathered are then turned into digital sparkles in a virtual New York. There are several chapters within this experience. Each chapter has a story line and its own emotion or mood.
What techniques will be used to tell the story?	<ul style="list-style-type: none"> Colour is used to portray the mood of certain tweets. The black and white scene represents anger and anxiety; tweets about loneliness and positivity are highlighted in the blue scene. Depending on the emotion, abstract visual effects appear alongside contemporary music that adapts to the mood to intensify the feeling of the audience. Contrast is also a technique that is used; the sparkles are small and numerous until the user zooms in to an individual tweet where they can read the personal account of loneliness.
How will the target audience engage with the experience?	<ul style="list-style-type: none"> During this experience, the user flies through the virtual city made up of sparkles. They choose which sparkles they wish to interact by selecting them with their hands. When a sparkle (tweet) is selected, they read it and experience the additional audiovisual elements. Afterwards, they are left with a sense of how the city inhabitants experience loneliness.
What is the experience in the environment?	<ul style="list-style-type: none"> This is an individual experience. As mentioned above, music and colour are used as tools to depict the story, so the audiovisual element of the experience is crucial.
What technologies will be used?	<ul style="list-style-type: none"> This experience uses a virtual reality headset. Natural language processing is used to curate the tweets to match the mood of the chapter.

KEY GOAL



Raise Awareness

- The scope of the city and its inhabitants is so vast that contrast, demonstrated by juxtaposing the expansiveness of the city against each individual sparkle (tweet), is a very powerful strategy that is used to tell this story of loneliness and raise awareness around this social issue. Framing the story using contrast as a storytelling technique allows viewers to feel the weight of how many lonely people live in this big city.
- By using real tweets as data points to relay personal stories of loneliness, the user is given a window into the lives of others. This allows the issue to resonate with the user on a deeper, more emotional level than if it were simply a graph or statistics. This heightens its ability to raise awareness, as emotional connection and empathy are strong techniques to reach this goal.



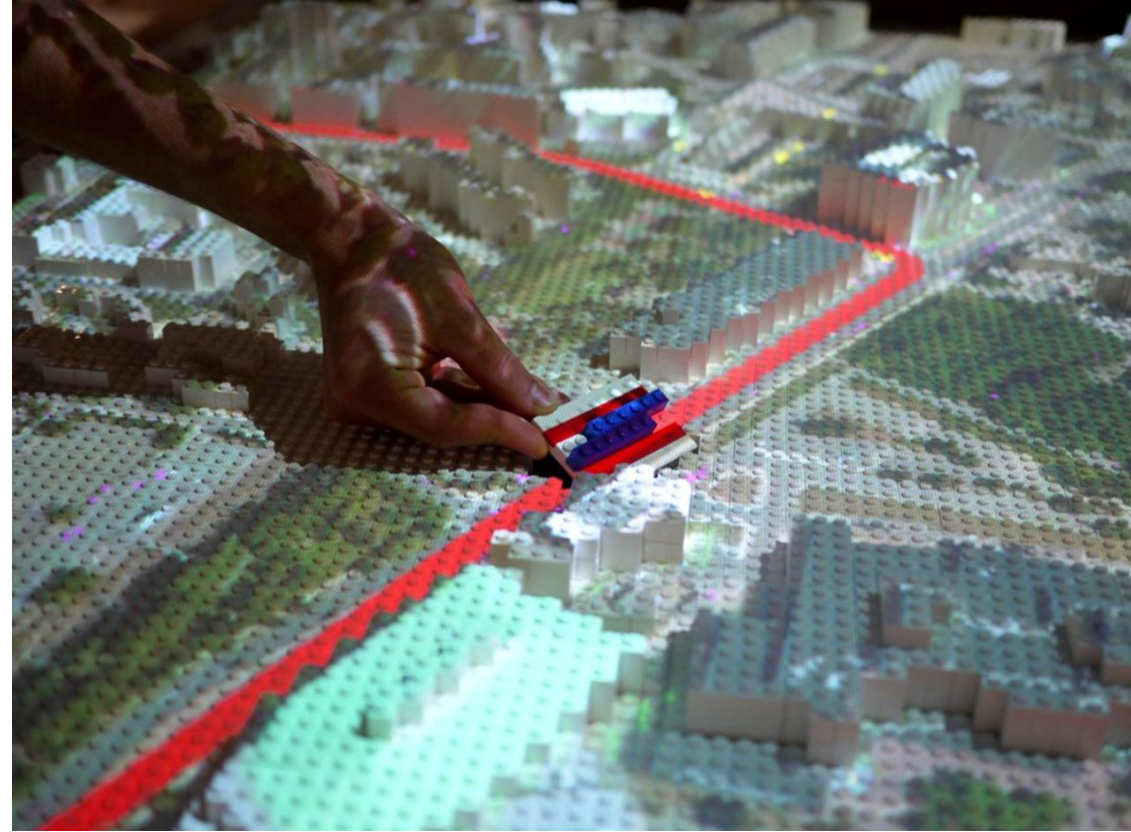
LEGO URBAN PLANNING

Creator: MIT Department of Urban Studies and Planning

Location: Boston

Year: 2015

Description: MIT's urban planning Lego experience is an interactive 4D city planning tool that involves residents in community changes in Boston.



What are the desired outcomes?	<ul style="list-style-type: none"> This project has multiple objectives including creating a space for co-creative urban planning, being used as a tool to test future scenarios and helping community members embrace the new change. Researchers at MIT created this interactive tool to test how bus-rapid transit systems could affect the city. They wanted to test how this type of tool could be used to involve the public in city planning.
What story will you tell and what information is conveyed?	<ul style="list-style-type: none"> This case tells a speculative story of transportation in Boston. It explores the potential effects of different plans on a regional scale, such as how changes to public transit might affect people's access to jobs.
What techniques will be used to tell the story?	<ul style="list-style-type: none"> This piece uses hands-on modification as a technique by allowing the users to switch out different pieces and watch the simulated change in traffic flow directly on the Lego platform. This influences the story and allows users to experience the consequences first hand.
How will the target audience engage with the experience?	<ul style="list-style-type: none"> Users enter the room and begin to walk around the 3D Lego model. Residents and local policy members are invited to test out these tools together. As they interact with the Lego pieces, they learn about decisions and repercussions of city planning, in particular reference to the proposed bus rapid transit system. The intention is for them to interact with each other and begin to discuss and debate the city's future.
What is the experience in the environment?	<ul style="list-style-type: none"> The room in which this is set up is dark to allow for projection mapping on the Lego models. The experience is intended for groups as to encourage an open dialogue about the city's future, so the room is large enough to facilitate this.
What technologies will be used?	<ul style="list-style-type: none"> Each Lego piece that a user can interact with is outfitted with a chip that communicates to the projectors overhead. The projectors then relay the proposed scenario on top of the 3D model.

KEY GOALS



Co-Creation

- In order to include residents, stakeholders and city planners in co-creation, it is important that the space is set up to accommodate groups of people.
- Most people played with Legos as children. Choosing to use this as the main medium lowers the barriers to entry. This familiar and non-intimidating medium makes the experience feel more approachable to different people, not just advanced urban planners.



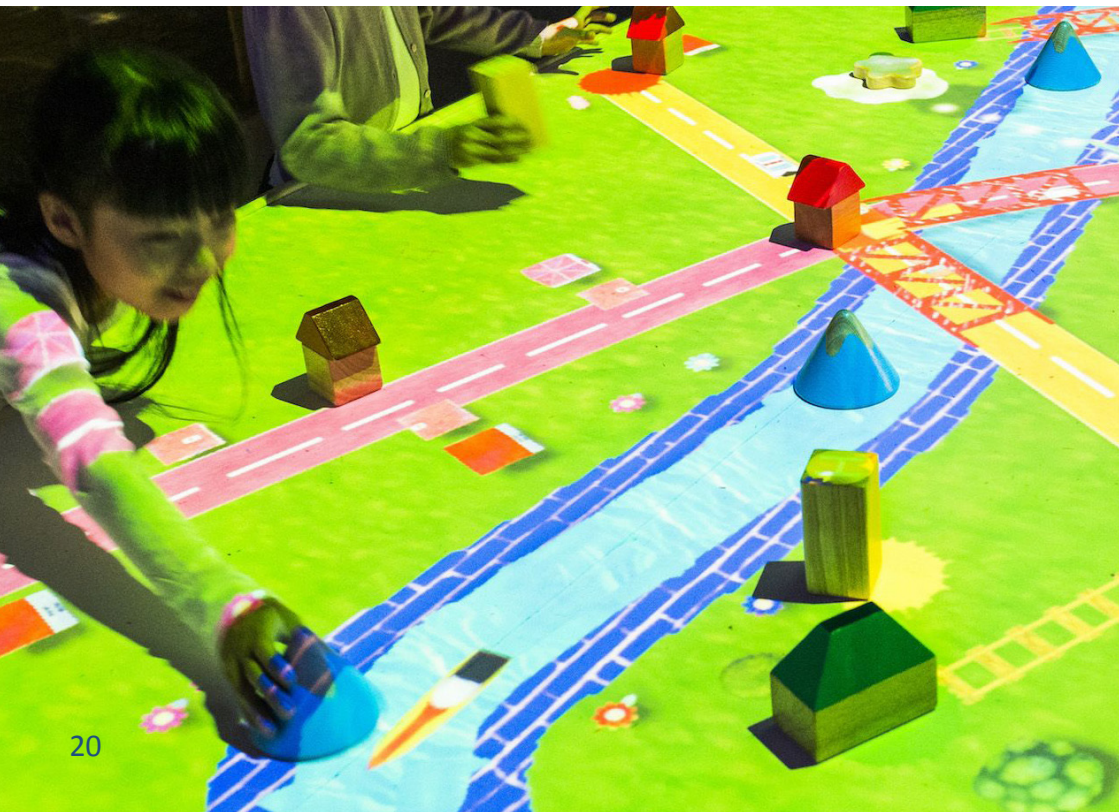
Embrace Change

- Users can personalise their experience by seeing how a new bus stop near their work could ease their daily commute. The goal is that users will begin to accept this vision for the future by situating themselves in it and seeing the consequences play out in real time.



Tool for Testing

- This model was used to test future scenarios on the city and to gain helpful feedback from the participants. It allowed city planners to test if the new proposed changes would be beneficial to the community.
- MIT's ultimate goal with this project was to test the user interaction and see if such a model was fit for purpose.



CONNECTING! BLOCK TOWN

Creator: TeamLab

Location: Japan

Year: 2016

Description: Connecting! Block Town is a learning tool designed for children to build their own cities. It is an interactive table where cars and trains travel along digitally projected roads and tracks. These are connected by wooden blocks that can be moved around.

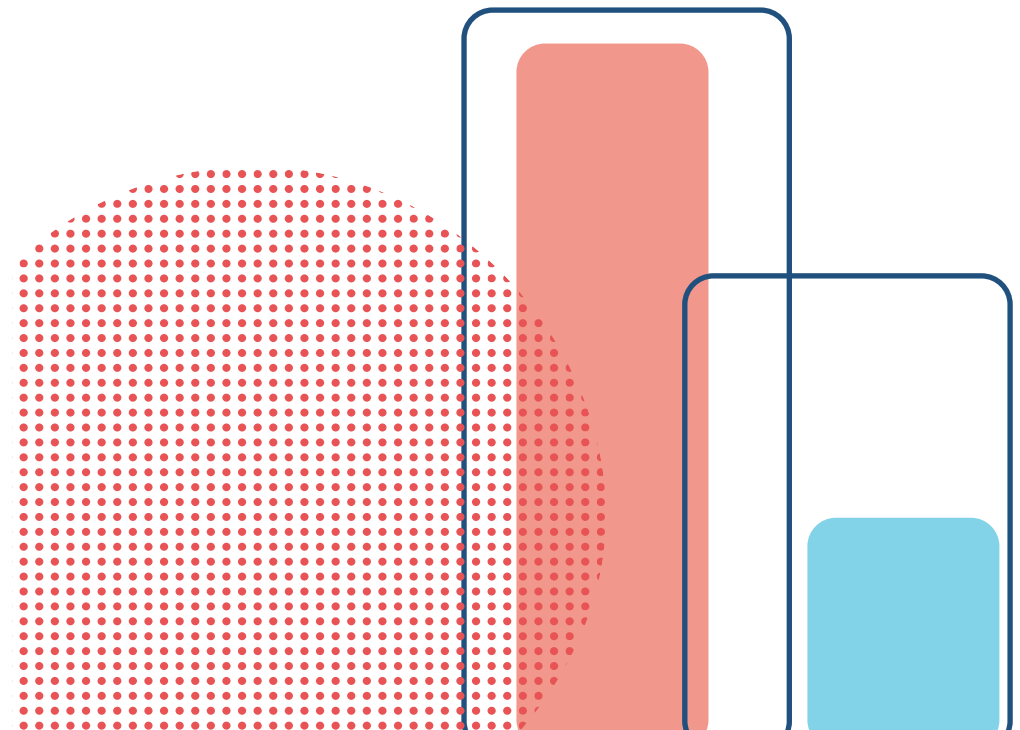
KEY GOAL



Education

- This experience allows for learning in a way that is fun and accessible to young audiences.
- Hands-on interaction allows the children to experience the real time consequences of their decisions. They are able to take ownership of their townscape creation, making the learning process more personal.

What are the desired outcomes?	<ul style="list-style-type: none"> • Connecting! Blocktown's goal is to educate children and improve their skills in pattern recognition, spatial awareness and logical thinking. It uses a learn-through-play approach.
What story will you tell and what information is conveyed?	<ul style="list-style-type: none"> • It tells the story of city planning from the perspective of a city planner or city resident. The children consider, 'If I add a bridge here, how does that affect my city?'. The child learns from the repercussions of their decisions.
What techniques will be used to tell the story?	<ul style="list-style-type: none"> • It is a hands-on and personalized experience where the child is in control of how the narrative plays out. Discovery is the core technique used, as the children build up their own city narrative and reflect on their decisions.
How will the target audience engage with the experience?	<ul style="list-style-type: none"> • As children place different wooden blocks on the table, more cars and trains appear, forming a townscape. They are left to freely discover and explore this piece on their own.
What is the experience in the environment?	<ul style="list-style-type: none"> • This piece is located in a dark space to allow for maximum visibility of the project visuals. Many users can experience and explore it together as they place the wooden game pieces anywhere on the table.
What technologies will be used?	<ul style="list-style-type: none"> • Projection mapping is used to display the changing landscape that develops through placing the wooden blocks down on the table. This is enabled by object tracking.



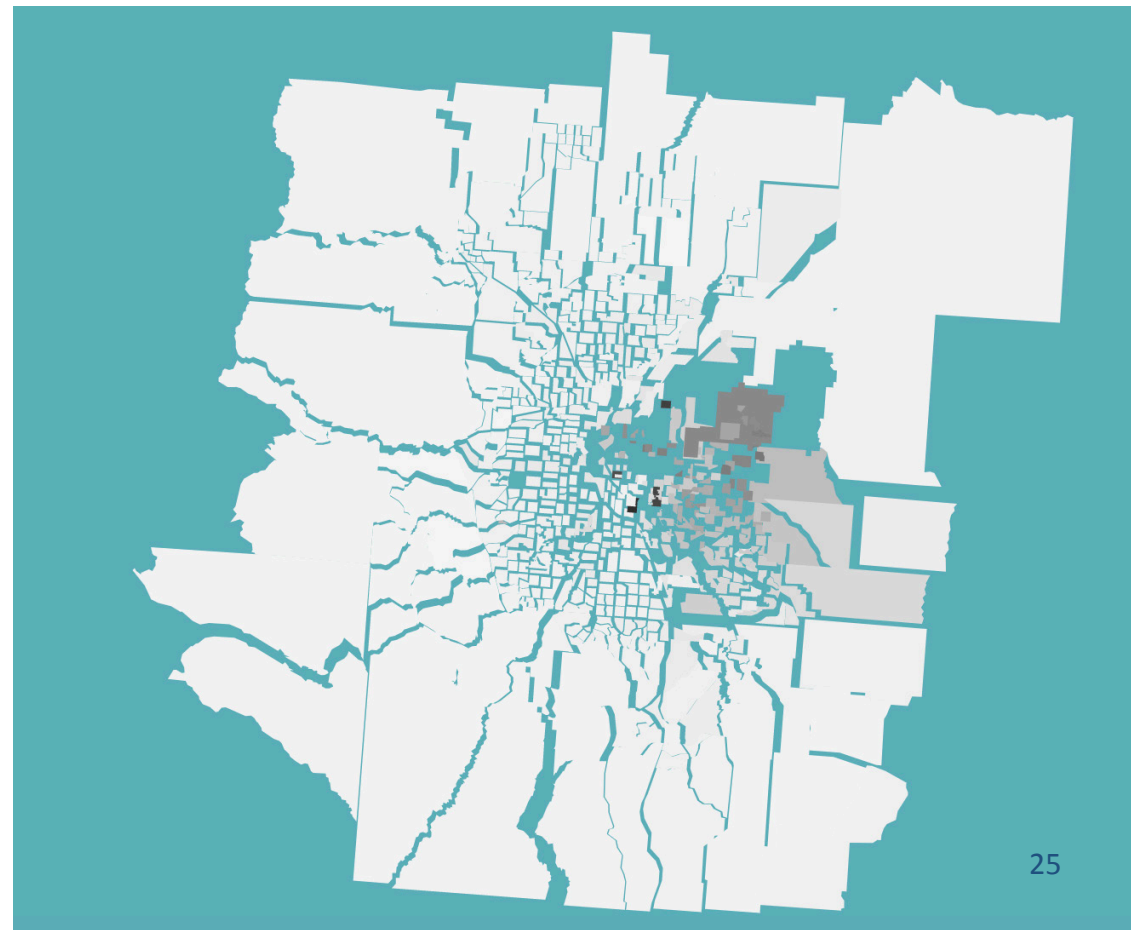
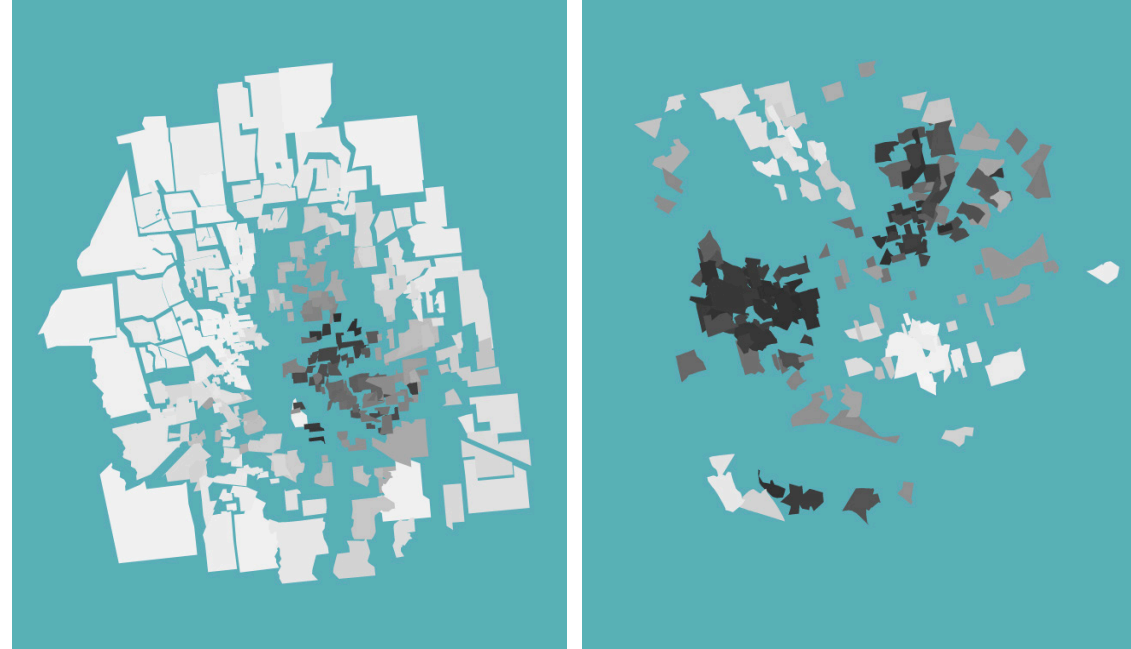
VISUALIZING THE RACIAL DIVIDE

Creator: Jim Vallandingham

Location: United States (online)

Year: 2011

Description: Visualizing the Racial Divide is a visceral web-based data visualization of racial segregation among 14 U.S. cities.



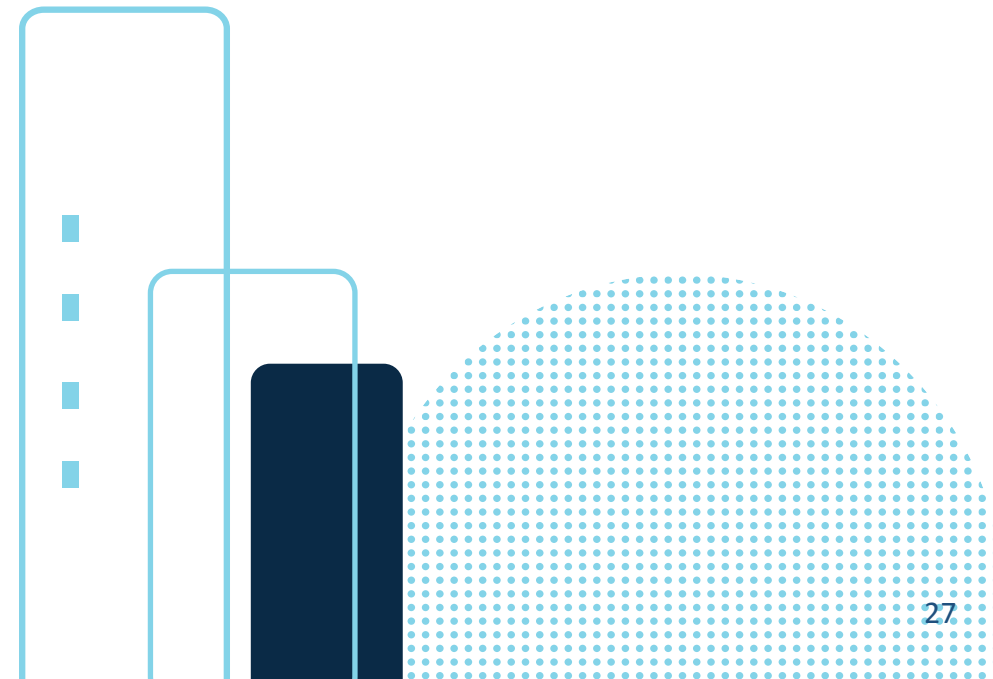
What are the desired outcomes?	<ul style="list-style-type: none"> The intention of this piece is to highlight the impact of the segregation that exists in many cities across the US. and to raise awareness about these divides and the boundaries they create in and around communities.
What story will you tell and what information is conveyed?	<ul style="list-style-type: none"> These visualizations tell the story of the systemic racial divide in the US. Data from the 2010 census maps the proportion of white and black residents across city districts.
What techniques will be used to tell the story?	<ul style="list-style-type: none"> Contrast and colour are used as narrative techniques in this experience. If a dominantly white area is connected to another dominantly white area the connection is short. When there is a sharp change in the proportions of white and black populations between areas a longer connection occurs. These longer connections force areas apart. The contrast of divided areas evokes a sense of surprise and often horror in viewers. Colour is used to further highlight the divides. White is used to represent white populations, black for the black populations and grey for mixed race populations. This makes clear colour juxtapositions to the viewer.
How will the target audience engage with the experience?	<ul style="list-style-type: none"> Once a user selects a particular city, they witness the spectacle of that city breaking apart. Having the option to choose from different cities allows the viewer to make comparisons and connections between cities, hopefully enlightening them in some way about the impact of the racial divide in the US.
What is the experience in the environment?	<ul style="list-style-type: none"> This piece exists in the digital space and is an individual experience.
What technologies will be used?	<ul style="list-style-type: none"> This experience is presented online. The visualization uses d3.js and works best with the Google Chrome browser.

KEY GOAL



Raise Awareness

- These ‘force directed maps’ utilise the strategy of contrast to emphasise the severity of the divide and draw attention to it.
- Motion is used to emphasise the ‘breaking apart’ of segregated neighbourhoods. The speed of this motion and the distance that it moves creates drama and emphasis in comparison to the two maps.
- These maps use real census data to bring awareness about the extent of these social issues and where exactly these segregations are most severe.



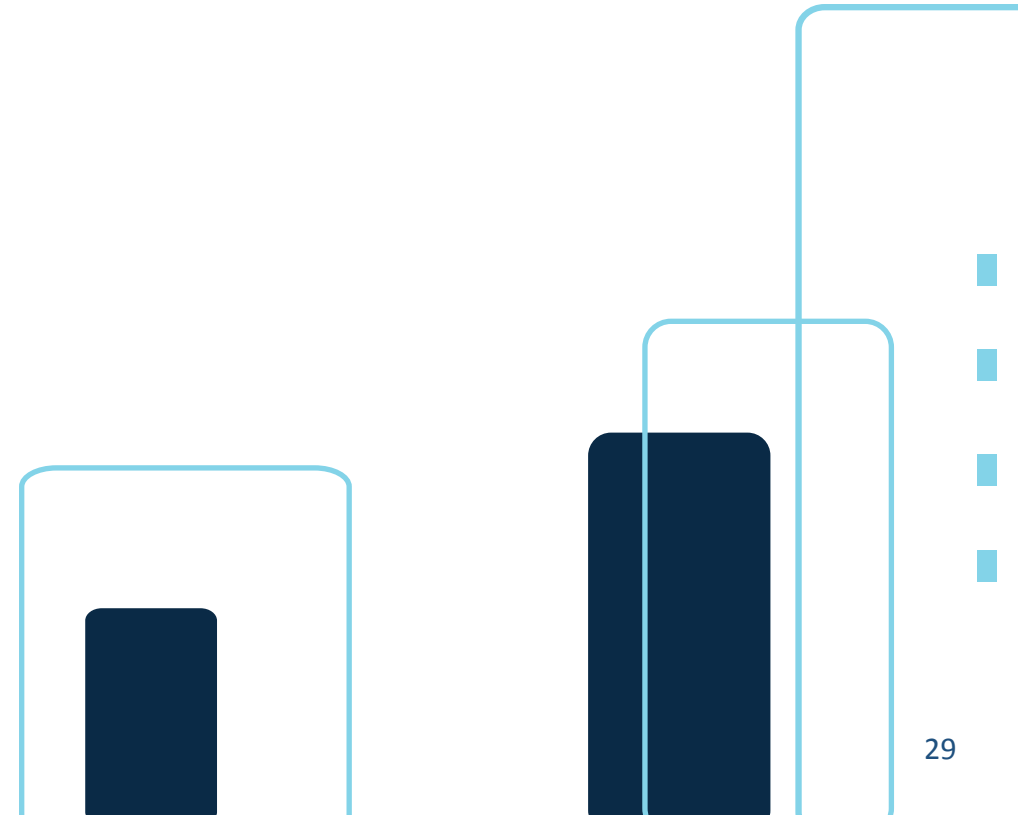
STUDENT PROJECTS

Notes

Lime Productions

Octonauts

Studio Playa



LIME PRODUCTIONS

Team: Claire Crawford, Martijn Fleurkins, Koorosh Gharehdaghi

Project 1

Brief: Lime Productions were asked to look at how a mix of tangible media and technology can interact within a physical space. Their brief was to explore how a city model could be transformed into a tool to showcase, experience and discuss the future of the city in an experiential and inclusive way.

KEY GOAL

Co-Creation



PROBLEM SPACE

How can we build an interactive urban planning tool that invites the local community to get involved and become a part of the discussion of the future?

Lime Productions used Bijlmer as an inspirational starting point to build their multiple prototypes. Their goal was to explore interactive formats and make prototypes that would allow existing residents, new residents, and city planners to engage in a collaborative dialogue about the future of Bijlmer. The idea was that this could then serve as a model for the future of Amsterdam.

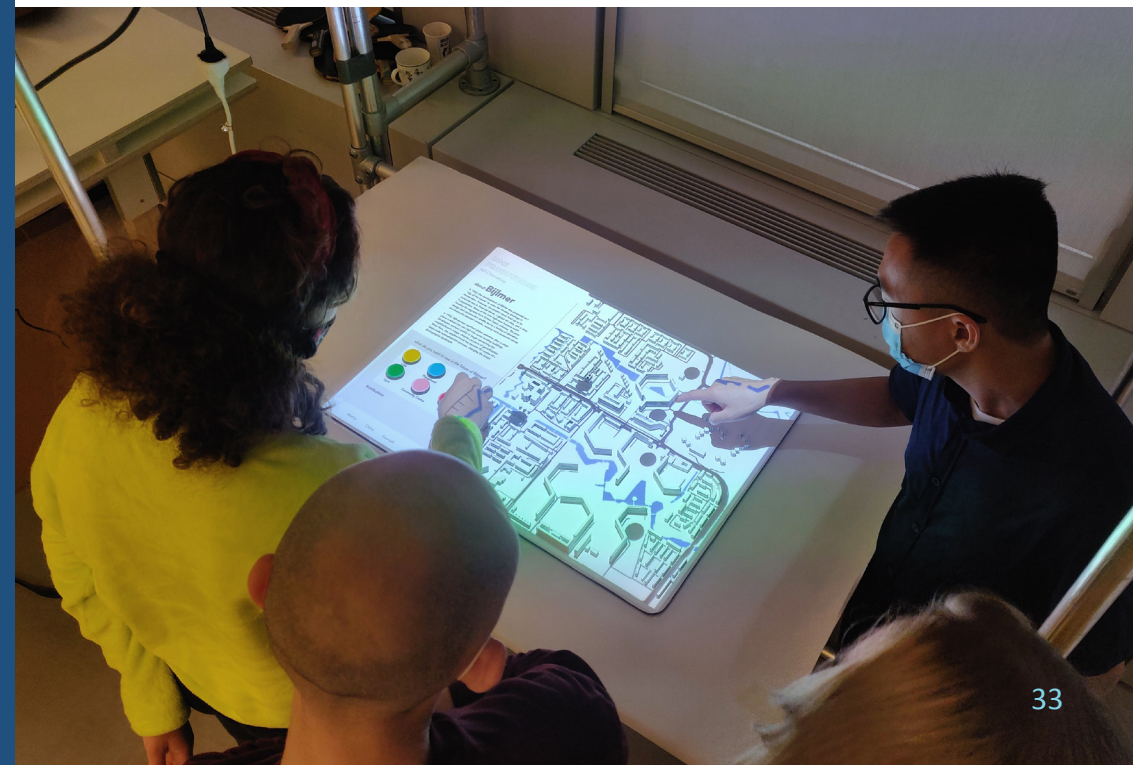
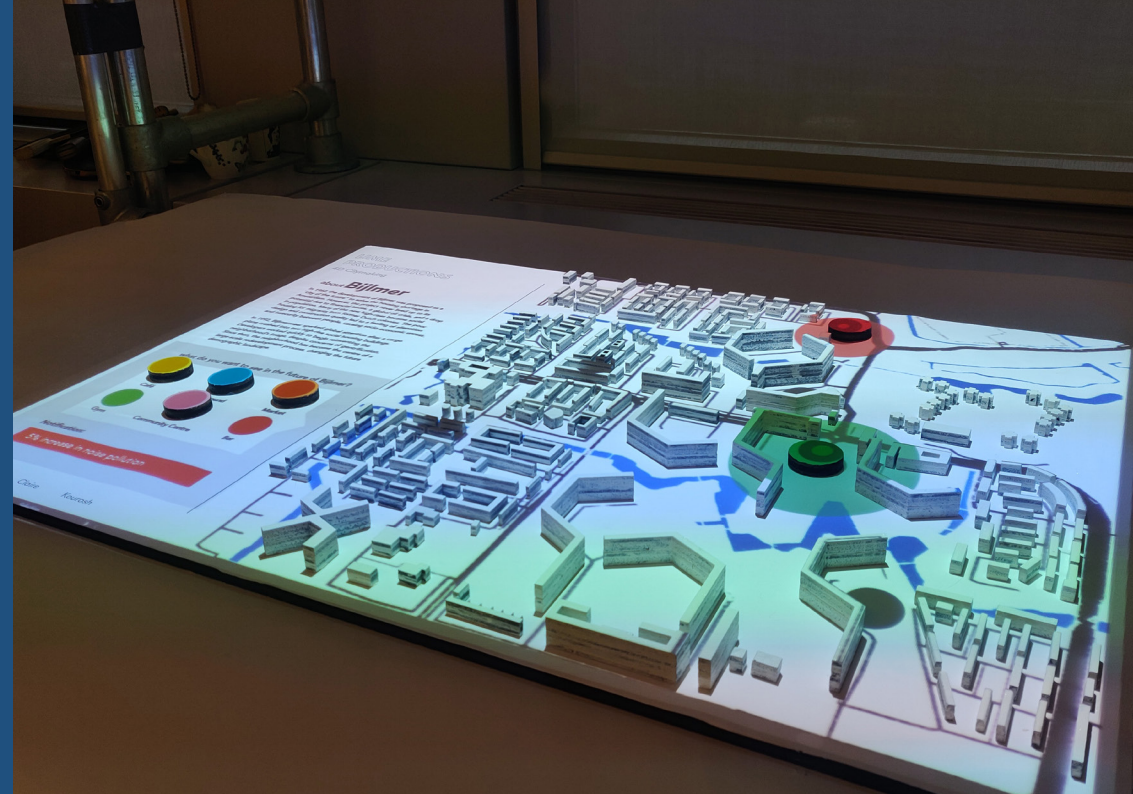
FINAL DESIGNS

Lime Productions chose to build three prototypes to compare and contrast user interactions through testing.

Prototype 1: Projection Mapping with Object Tracking

Description: The projection mapping with object tracking prototype is a 4D city planning experience. To make it interactive, the users can move game pieces around the physical maquette. The game pieces represent different attractions the user wishes to see in their neighborhood, such as a park, a cafe, a playground, a community center, etc. As the users move the game piece onto the model, a data visualization is triggered.

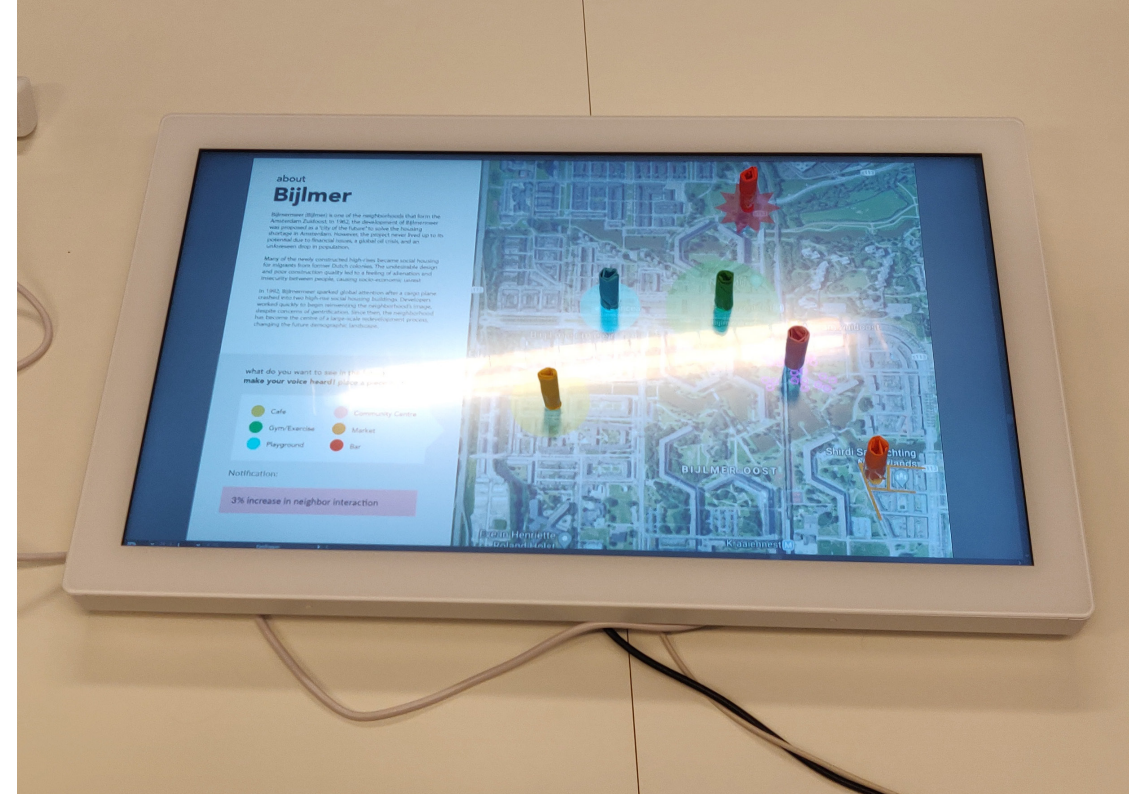
Technology: This prototype combines projection mapping with object tracking. It utilizes a projector to map visualizations on a 3D maquette. For example, when the park or cafe game pieces are placed onto the maquette, object tracking is initiated and the relevant visualization is projected on the city model.



Prototype 2: Tangible Touch Table

Description: The tangible touch table features an interactive screen-based map that users can place game pieces on to represent what they'd like to see in their neighborhood. Each game piece represents a different feature, such as a bar or a market. When placed on the map, the objects trigger a data visualization on the screen. For example, the visualization might show that adding a park and a community center would increase the amount of people out on the streets. On the side of the screen, there is a written description of the featured neighborhood, to provide context about the scenario. Multiple users can stand around the table to discuss and interact with the map together; the goal is for them to work collaboratively to plan the future of their neighborhood.

Technology: This prototype was made with a touchscreen table and uses object tracking. Different data scenarios are visualized on the screen when the user places game pieces onto it.



Prototype 3: Projection Mapping with Interactive Touchscreen

Description: The projection mapping with interactive touch screen prototype allows users to explore and customize the map of their neighborhood on the touchscreen and project their decisions onto a 3D maquette. The participant uses the touchscreen to drag and drop points of interest they'd like to see in their neighbourhood. When the point is placed, a visualization appears on the screen and on the maquette as a projection.

Ultimately, Lime Productions imagines four to six touchscreens surrounding the maquette, to allow users to work collaboratively on building their future city. They also recommend that in order for this prototype to be more collaborative, each individual tablet could display what other users are doing on their own tablets to foster dialogue.

Technology: This prototype uses projection mapping in combination with an interactive touchscreen. The tablet responds with a data visualization and haptic feedback, when users interact with it. At the same time, the maquette responds with light and harmonic sounds as it projects what the touchscreen users are adding to their maps.



APPROACH

Lime Production's approach was to focus on technology and user interaction. They first began by researching existing interactive technologies and comparing their qualities. They knew that their prototypes should aim to be collaborative, easy to use and accessible to the widest possible audience. The team determined which technologies were the best solutions moving forward based on trend analysis, literary research, a user survey and expert interviews. Their final decisions were based on accessibility, feasibility, likeability, collaborability and the ability to represent changing data.

DESIGN DECISIONS

How will the target audience engage with the experience?

Accessibility is key

Through their research, Lime Productions decided against the use of VR, AR and holograms. For these technologies, they found that accessibility was a major issue for older people and those with visual impairments. Although this technology can display complicated, dynamic data and create an immersive experience, this was not a trade off that they were willing to make as their brief was about making the prototype accessible to the widest range of stakeholders. If they were to choose one of these technologies, they may be choosing to deliberately leave out certain community members.

What technologies will be used?

Tangibility fosters collaboration

Lime Productions noted how purely digital technologies such as VR, AR and holograms are more adaptable to changing city landscapes than physical static models with predetermined borders, buildings, streets etc. Though the lack of adaptability for static models may lead to complications in a fast-changing society when real, up to date data is overlaid on top of the outdated model, they found that people using the tangible interfaces tended to collaborate better together. The team chose to move forward with combining and creating hybrid, physical-digital prototypes using tangible maps, projection mapping and touch screens. Additionally, they found that to further foster discussion and playfulness, it was important for users to be able to physically engage with the experience. This inspired the use of the game pieces in two of the prototypes.

KEY USER TEST FINDINGS

- Users wanted to see how different data interacting could be visualised.
- Users wanted to compare scenarios and futures.
- Users wanted a clearer representation of what the data visualizations meant.
- Users expected more detail in the map and more in-depth information about the data.
- Users wanted less text on the interface.

TAKEAWAYS FOR CO-CREATION

- It is important to use technology and data that engages many users in multiple levels of interaction.
- Combining interactive tangible objects with digital spaces makes the experience more engaging for groups.



OCTONAUTS

Team: Bianca Brandner, Aljoscha Gleser, Jessica Livon, Lena Overkamp

Project 1

Brief: Octonauts were asked to look at how a mix of tangible media and technology can interact within a physical space. Their brief was to explore how a city model could be transformed into a tool to showcase, experience and discuss the future of the city in an experiential and inclusive way.

KEY GOAL

Embrace Change



PROBLEM SPACE

How can we best visualize the impacts of a 30-hour work week on the city?

Team Octonauts based their prototype around the question above. They used this scenario to create their prototypes and data visualizations:

“Imagine a 30-hour work week is introduced as a program in Amsterdam and across the Netherlands. According to research, working less is supposed to lead to a decrease in mental health hospitalizations due to the employees’ abilities to live a better balanced life. In some cases, more family time could lead to better quality at-home relationships, leading to happier children and more learning time with parents. It also should lessen the pressure on the public transport system, as workers can choose which days/hours they will have off, therefore easing rush hour. Most companies will have to employ more people due to filling the new work gap, leading to a more favourable career landscape for the unemployed.”

Team Octonauts considered the following datasets:

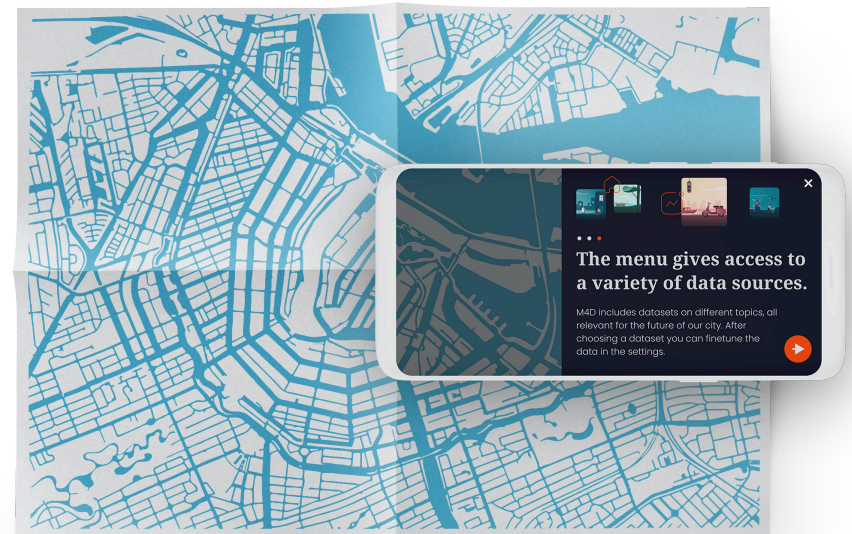
- Unemployment across the city
- Public transport use and density
- Mental health hospitalizations
- Children’s school grades
- Heart health and other health conditions related to increased exercise

FINAL DESIGN

Prototype 1: Printable Map with AR

Description: The users first download and print a physical map of the city of Amsterdam. Then using the AR app, users are free to explore different scenarios and datasets around the concept of a 30-hour work week in Amsterdam. This can be done individually or collaboratively. In the app, users can send messages and save changes.

Technology: This prototype combines a physical paper printed map with AR technology that allows the map to come alive and present different scenarios.



APPROACH

Team Octonauts first conducted desk and user research into existing urban planning tools. From there, they developed this heuristic list of qualities that they believe every 4D Citymaking project should have:

- Collaboration
- Interaction
- Accessibility
- Understandability
- Specified time
- Adaptivity
- Engagement
- Empowerment
- Feasibility

Additionally, Team Octonauts did desk research into different technologies. They made the following pro and con judgments based on the heuristics above.

Projection Mapping

Pros:

- Intuitive operation method
- Engages people to work and collaborate without the use of screens which can sometimes be a barrier

Cons:

- Interaction is limited

Virtual Reality

Pros:

- Physical location not a barrier

Cons:

- Complicated and expensive development
- Health concerns (sickness, blackouts, seizures...)

Augmented Reality

Pros:

- Feasible, with little hardware requirements
- Adaptable to many environments and contexts
- Save-feature on phone for revisiting discussion

Cons:

- Not multi-sensory

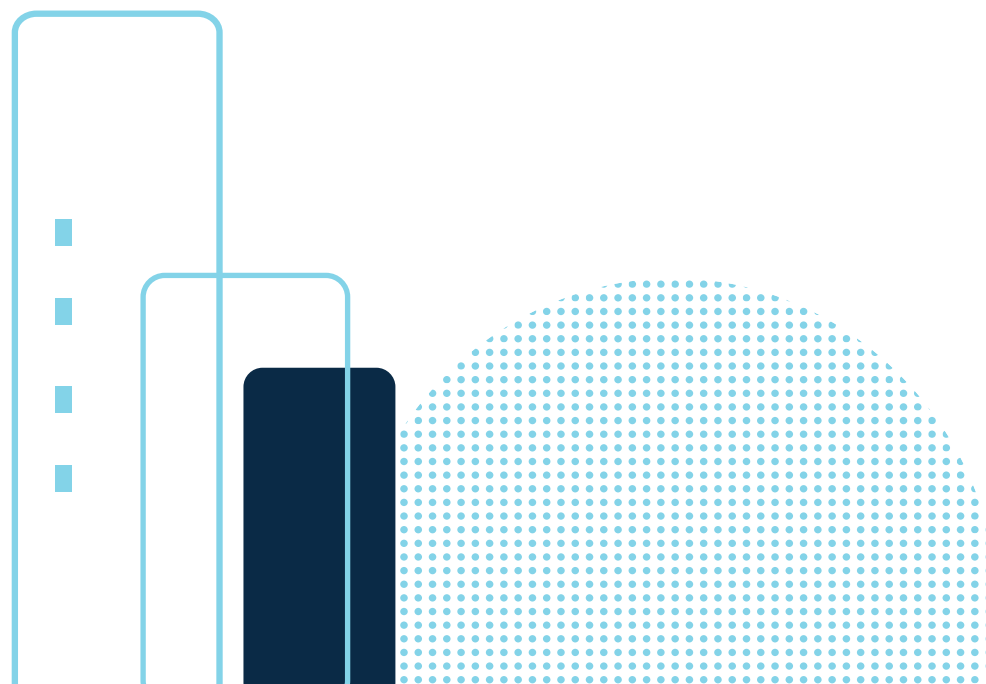
Mixed Reality

Pros:

- Most immersive

Cons:

- Feasibility would be most difficult



DESIGN DECISIONS

What is the experience in the environment?

Do it Yourself Experience

Team Octonauts focused on creating an accessible city planning experience. Anyone can easily download and print the map of their city. As long as they have a smart device, they can engage with the experience. Because of this, the barrier to entry is quite low. The user can engage with the AR map wherever they choose.

What technologies will you use?

Modular tiles vs. printed map

The team originally designed 3D printed hexagonal tiles which fit together to make up a city map. The idea was to allow city planners to switch out tiles of the city when developments were made, to keep the model up to date. However, after testing this concept early on, they decided that a printed map would be a cheaper, quicker and a more feasible solution.

KEY USER TEST FINDINGS

- Users enjoyed having a device in their hands that held all the information they needed, proving that tablets do not get in the way of the interaction.
- Users wanted to be able to bring the experience home by printing their own map and using their own devices.
- Users gave feedback that this solution allowed for both professional and informal discussions.

TAKEAWAYS FOR EMBRACE CHANGE

- To embrace new change around the future of a city, it is imperative that the information is accessible to a wide audience. Octonaut's "take it home" prototype achieves this goal by making the model available to many different levels of stakeholders because it can be as simple as printing a map at home and using your personal smartphone to engage with the experience.



STUDIO PLAYA

Team: Beauchamp Bagenal, Sophie de Haan, Luca Lago, Carlos Rodríguez

Project 2

Brief: Studio Playa were tasked with looking at how city models, maps, data visualisations and storytelling techniques can be used to empower citizens to take part in discussions about the future of the city.

KEY GOAL

Education



PROBLEM SPACE

How can we educate Amsterdam citizens about the circular economy using urban planning models and storytelling techniques?

Their brief was to look at how city models, maps, data visualisations and storytelling techniques can be used to empower citizens to take part in discussions about the future of the city. Their project's mission was to educate citizens about Amsterdam's goal to become a circular city by 2050. RebelGroup provided Studio Playa with data around three value chains which they based their prototype on: the built environment, food and organic waste and consumer goods.

FINAL DESIGNS

Prototype: Circular City Educational Tool

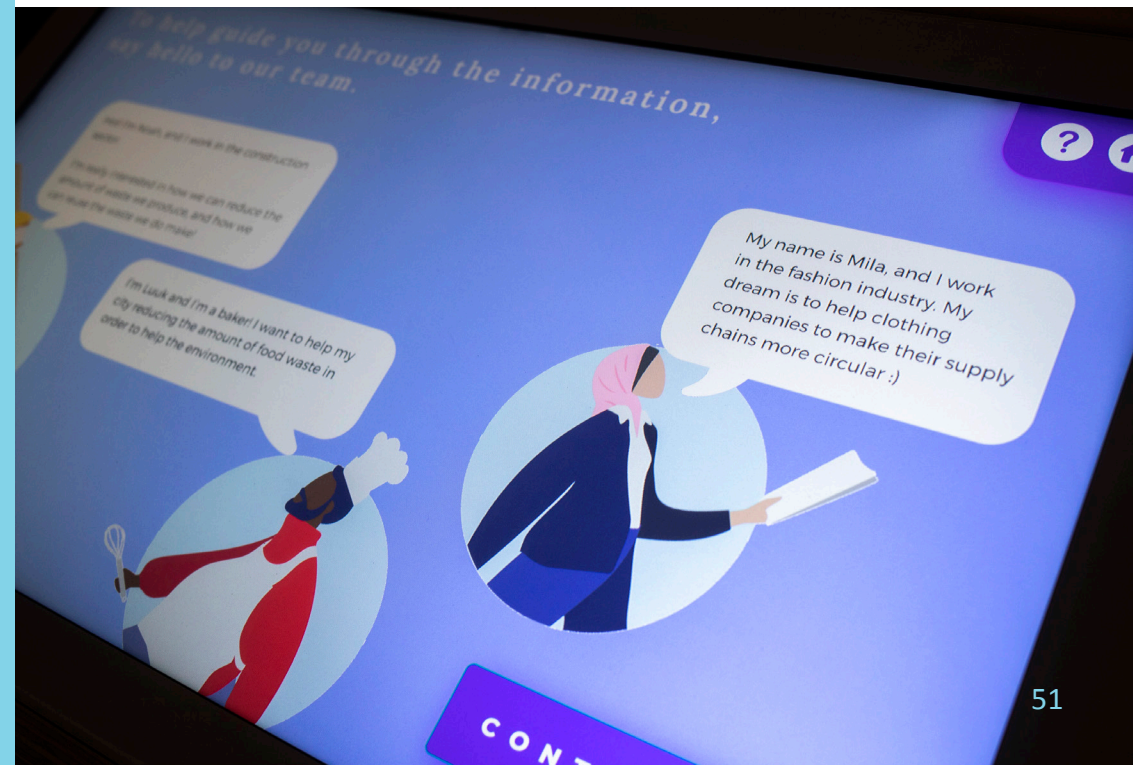
Description: Studio Playa designed an interactive storytelling experience that informs citizens and sparks dialogue about Amsterdam's circular goals for 2050. This experience allows users to use a touch screen to navigate through a narrative that is projected in front of them. This was set up in the Amsterdam Centre for Architecture as part of the Exhibition EndLESS Amsterdam by Amsterdam University of Applied Sciences, Amsterdam Institute for Advanced Metropolitan Solutions and Rebelgroup in December 2020. They wanted audience feedback and participation in reaching these goals, so their final prototype was ultimately to be used for further testing.

Technology: This prototype uses a touch screen connected to a projector and was built using HTML, CSS and JavaScript.



APPROACH

Since narrative plays a big role in making citymaking projects accessible and digestible to audiences, Studio Playa first dove into researching storytelling techniques that can be applied to tools for city planning. They referenced transmedial storytelling, which is the development of character (interaction and personas), story (narrative and scenarios), worldbuilding (place), and audience (participation and emergent culture) across multiple platforms. They originally identified these five storytelling techniques that they were interested in testing: role playing, gamification, character development, open dataset exploration and user stories.



DESIGN DECISIONS

What techniques will be used to tell the story?

Characters and narrative

To help make the complex information more digestible and build a human connection between the visitor and the experience, they developed three characters representing the three value chains. The characters were placed on the touch screen and would help explain the data on the projector as though they were having a conversation with each other.

Audience participation

To help visitors become more actively engaged with the content, question and answer elements around the circular economy were included. Through testing this proved to be a positive element as the participants said that they felt more involved.

What technologies will you use?

Digital over physical

The team was originally tasked with designing for a physical maquette of Amsterdam and its surrounding regions. Trying to zoom in on localised datasets on such a static model was difficult since the model was at a regional scale. It was additionally problematic because cities are constantly changing, so the technology must also be adaptable. In the end, they chose to use a touchscreen table with a projector as it allows for more dynamic displays and real time changes.

KEY USER TEST FINDINGS

- Users feel more connected to the data and the message when characters and storylines are included.
- Users can more easily qualify the true scale of what's being shown by using tangible data comparisons.
- There is a tension between developing digestible, fun and interactive experiences and teaching people about complex ideas such as circularity.
- If there are different stakeholders involved (ie. citizens and policy makers), it is challenging to figure out what the correct specificity level of the information should be.
- To spark dialogue between visitors, direct questions that focus on what they should be thinking can be helpful.

TAKEAWAYS FOR EDUCATION

- In order to direct the audiences' thinking, question and answer features can be used to prompt them to reflect on the most important points that the designer would like to get across.
- It is important to design the experience with the target audience in mind and to make sure that the level of detail is understandable to them.
- Narratives can be used effectively to explain complicated data and concepts and also have the ability to make users feel more connected to the experience.



EPILOGUE

As an initial exploration of this space, this project has produced rich insights into how future designers and other stakeholders can set up their own 4D Citymaking project. After working closely with our partners, hosting consortium discussions, analyzing case studies, guiding student projects and developing a 'how-to guide', we have summarised the most essential takeaways to remember in relation to each key goal.

Raise Awareness

Cases that did this well: City of Sparkles & Visualizing the Racial Divide

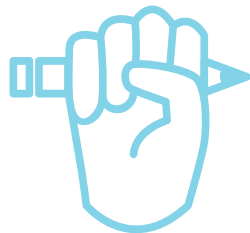
When trying to raise awareness, it is important to consider the visual elements that help to portray the message. These two projects visualise real data through the use of juxtaposition and contrast.



Education

Cases that did this well: Connecting! Block Town & Studio Playa

Both of these projects address the goal of education in different ways. Connecting! Block Town is playful, open and full of discovery while Studio Playa's Circular City Tool takes a more pragmatic approach through its application of real data and moderation.



Embrace Change

Cases that did this well: Lego Urban Planning & Octonauts

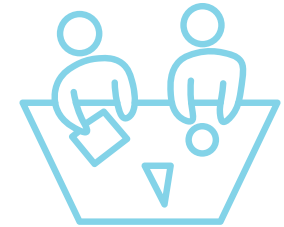
These projects give audiences autonomy over their own experience. This allows users to internalise the information in relation to their own life and experience. They achieve this in different ways. Lego Urban Planning allows users to test out personalized scenarios such as their own commute time to work on the maquette. Octonauts give users autonomy over the experience by allowing them to take it home and interact with it in their own time.



Co-Creation

Cases that did this well: Lego Urban Planning & Lime Productions

Having multiple levels of interaction, including physical and digital interaction, facilitates co-creation in both of these projects. As well as this, both projects considered designing for a group-oriented space.



Tool for Testing

Cases that did this well: Lego Urban Planning

Lego Urban Planning allows a wide range of stakeholders to test the proposal of a new rapid-bus transit system and make conclusions as to whether this would be a positive addition to the city. Trying out new scenarios on the model can help visualize logistics and gauge community acceptance.



Notes

NEXT STEPS

This publication was a first step into exploring the possibilities of creating a 4D Citymaking project. The case study analysis and student projects brought valuable insights into light. More exploration into the use of narrative techniques could greatly benefit this project. In the future, we imagine professional designers and developers to create a fully developed prototype to generate more insights from testing with a wide variety of users.

COLOPHON

Pamela Nelson, Katy Barnard & Martijn de Waal (2021) A Field Guide to 4D Citymaking. Amsterdam: Amsterdam University of Applied Sciences AUAS Civic Interaction Design & Architecture Centre Amsterdam ARCAM

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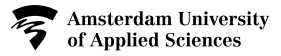
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IMAGE CREDITS

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<https://www.hva.nl/urban-governance>

CIVIC INTERACTION DESIGN



Amsterdam University
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Urban Governance
Social Innovation



Master Digital Design



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