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Minecraft in the Planning Process for the Chief Planner's Office, City of Toronto
Summer 2015

Executive Summary

- The Youth Engagement Strategy is a key component of Growing Conversations – a process meant to improve the relationship between the City of Toronto and its residents and stakeholders through a better community engagement process

- As identified in the Youth Engagement Strategy, a topic that youth care about is play. Play can the form of access to play and/or variety of play. The Minecraft project will be engaging youth through play. This document outlines an engagement campaign around the use of Minecraft in City Planning.

- Minecraft is a popular sandbox video game with players from a diverse demographic, the vast majority being youth, who are less likely to attend community consultation events.

- The Youth Engagement Strategy highlighted barriers to youth participation: lack of trust in government, poor promotion of engagement activities, the lack of youth representation in positions of influence, and intimidation. The Minecraft project will address these barriers through engagement on relevant digital platforms such as social media and video games, and Minecraft consultation events

- The Minecraft project will use two events that will create a solid foundation for the Minecraft project to go public, a hackathon and/or consultation event. Out of these events, a portion of Toronto will be built up in Minecraft, establishing a starting point for other users to continue building on. Hosting Minecraft Toronto online can act as a legacy project for City Planning. By leaving the project open and online, users can log in and view the creations of participants. Going a step further, City Planning could implement some kind of Minecraft Building Permit system, whereby participants will apply to gain permission to build on defined sections of Toronto. This could be a cheeky addition to the project, which creates a simulation of the planning process for participants. City Planning can also host an exhibition (whether online or in person) to showcase the work of participants.

- The Minecraft project can be modified to be plugged into educational curriculum so that city planning concepts can be taught to kids at younger ages. Minecraft can be modified to teach planning concepts like complete communities, floor-area ratios, and disaster planning. The incentive for teachers is that the Minecraft project can be easily complemented with writing assignments, where students can create character biographies, pre/post game reactions, and draw maps.

- City Planning can use the Minecraft project to connect and build relations with Toronto's digital/gaming/creative industries and organizations.

Table of contents

Falling in line with Youth Engagement Strategy

City Planning's Youth Engagement Strategy is a key component of Growing Conversations, a process meant to improve the relationship between the City of Toronto and its residents and stakeholders through a better community engagement process. The strategy identifies topics youth (18-30) care about: transit/transportation, social equity/affordable housing, employment and jobs for youth, safety, the public realm, and play.

Barriers to participation were also identified in the strategy. Youth stated they do not participate because of a lack of trust in government, poor promotion of engagement activities, the lack of youth representation in positions of influence, and intimidation. The strategy also suggests four focus areas to promote youth participation: embed city planning into schools and education, better promotion and communication, create city planning youth hubs, and identify U-30 ambassadors.

Toronto City Planning can incorporate the popular computer video game, Minecraft, into public engagement activities to address some of the topics, barriers, and focus areas outlined in the Youth Engagement Strategy. Minecraft can combine engagement activities with fun and collaborative elements to facilitate discussion about city planning among younger participants. Youth are more likely to engage in activities if they are considered to be fun. Using Minecraft can also bring City Planning to where youth are, whether through hosting consultation events or online.

City Planning's use of Minecraft will create new strategic partnerships with other organizations, specifically in the creative industries. These new partnerships will be created and expanded through the use of digital media for promotion, and service delivery of the Minecraft curriculum. Minecraft will allow City Planning to utilize new methods of engagement which will effective reach younger audiences. Growing Conversations' goal is to make Toronto the most engaged city in North America. With the Youth Engagement Strategy being a key component to Growing Conversations, introducing Minecraft to the engagement toolbox will open new avenues of communication with a fun and collaborative twist.

What is Minecraft?

Minecraft is a sandbox computer game that enables players to build, mine, gather, explore, craft, and battle. A truly open world game, Minecraft has risen to fame (as it is currently the best-selling PC game to date), from its humble beginnings in an independent Swedish game studio, to being bought out my Microsoft for $2.5 billion USD. In Minecraft, players can choose between creative, survival, and adventure modes of play. Each game mode are focused around gathering natural resources and building structures and objects. Minecraft has a strong and vibrant “modding” community; where players develop and publish their own creations, maps, adventure games, and skins.

The canon of creativity among Minecrafters is endless. The community has recreated many famous movie sets and other popular culture motifs in Minecraft for other players to explore, create, and change. A strong example of this is the Lord of the Rings Mod. In this, modders recreated towns and castles from the popular movie trilogy, Lord of the Rings, in Minecraft.

Some government supported ventures come from Denmark, the United Kingdom, Sweden, the United Nations, and other non-government organizations. The government of Denmark has recreated the entire country in Minecraft and has freely released it on their Ministry of Environment's website (*gst.dk*). Denmark in Minecraft is quite detailed with 1:1 scaling, built forms, road networks, and natural spaces. The United Kingdom's Ordnance Survey has also recreated the entire country in Minecraft (*ordnancesurvey.co.uk*). It is, however, much less detailed, with a scale of 1 block to 25 miles, and no buildings. Minecraft's UK only features different coloured blocks to represent different land uses. Blockholm is a project that recreated Stockholm, Sweden in Minecraft. Started by the Swedish Centre for Architecture and Design, the project invited architects, planners, and local gamers from all ages and skill levels to help rebuild Stockholm in Minecraft.

Non-government ventures in education, planning, and Minecraft includes UN-Habitat (the United Nations Human Settlements Programme) and MinecraftEDU. UN-Habitat, in Partnership with Mojang (Minecraft's creator studio), brought computers and Minecraft to communities to ask how community members would like to see public spaces changed. UN-Habitat then took the insights generated from these engagement activities and built the spaces that community members asked for. MinecraftEDU is a service that uses Minecraft for education. They host servers and offer lower rates to classes and school that order licenses for the game. Essentially, MinecraftEDU is a mod that allows teachers to program educational components into Minecraft, from resource management to mathematics. Refer to **Appendix A: Notable Civic Minecraft Projects/Initiatives** for more information on other creative Minecraft initiatives.

There is potential for Minecraft to be used in the context of municipal land-use planning process. Minecraft can be a fun and innovative way to engage younger audiences and Toronto's maker and digital communities. Some engagement activities can teach floor-area-ratios in order to visualize density, showcase mid-rise developments and its context to the neighbourhoods, compare/present complete streets, and/or allow users to (re)create streets, blocks, or entire communities.

Using Minecraft in City Planning

Minecraft can be effective used to engage the public about general planning fundamentals. Engagement activities can be hosted in-person and online. In-person consultations can take the form of formally hosted civic hackathons, guided lessons using Minecraft, and/or tying in Minecraft into existing public consultation processes. The online component can be hosting a server that holds Toronto's spatial data and building footprints, and having users build "up" the entirety of Toronto. Another avenue for online engagement can spawn from the in-person consultations. For instance, at one consultation event, participants can collaborate and build sections of a neighbourhood, the City can later upload that data online to be viewed and expanded on.

These engagement activities will help boost the public's general knowledge of the City Planning Division, and processes using new methods of engagement that will connect with people who don't normally attend public meetings. Through leveraging strategic partnerships with Toronto's digital industries, and maker-culture communities, City Planning can attract younger tech-savvy participants.

Educational components of using Minecraft in public engagement can include visualizing different floor-area-ratios to illustrate different densities, and/or building complete streets and communities. Minecraft is excellent as a visioning tool that can depict general massing. The collaborative elements add fun community oriented experiences and the sandbox space incubates creativity.

The downside to Minecraft is that the graphics are not realistic at all, since all measurement units are in "blocks". The issue of scale can be misleading to some audiences if they cannot accept Minecraft as a purely visioning tool meant for fun and collaborative engagement activities. Minecraft also has a block height limit of 256 blocks. Building/visualizing tall buildings may be an issue here. With Minecraft's low-fi graphics, audiences may see this tool as too unrealistic thus unprofessional. Some audiences may perceive this as "not serious planning".

Reach

Crafters come from a very broad spectrum. According to minecraft-seeds.net[1], a Minecraft blog, teenagers make up for over 60% of all the total number of Minecraft Players. Over 20% of players are children and young teens, and over 15% of players are over 30. 94% of Crafters are male. From these numbers, it is obvious that the audience of Minecraft is very young.

By tapping into Minecraft, City Planning can open new modes of communication with Toronto's younger community members who are active on Minecraft. Auxiliary communities can include Toronto's maker-culture sector, creative industries (web devs, game devs, and other professions of the like). City Planning will be able to reach people who one wouldn't expect to see at the average community consultation meeting

Minecraft City Planning Campaign

The following section will outline how City Planning could run a public engagement and educational campaign around the use of Minecraft.

Outline of the Campaign:

1. Create basemap of Toronto in Minecraft
2. Host consultation events to build upon basemap
    - Minecraft hackathons
    - Minecraft consultation events
3. Deliver educational components
4. Maintain ongoing initiatives
5. Showcase work

1.) Setting up the basemap

[1] http://minecraft-seeds.net/blog/minecraft-player-demographics/

First and foremost, we will need a basemap of Toronto in Minecraft. It is suggested that the basemap should include the City of Toronto's elevation data, and its building footprints. The basemap will provide a starting point to host consultation events with. Refer **Appendix B: Technical Aspects of the Minecraft Project** for further instructions on how to build the basemap.

2.) Community Consultations

There are two suggested events that will create a solid foundation for the Minecraft project to go public. Ideally, out of these events, a portion of Toronto will be built up in Minecraft, establishing a starting point for other users to continue building on. Hosting Minecraft Toronto online can act as a legacy project for City Planning. By leaving the project open and online, users can log in and view the creations of participants. Going a step further, City Planning could implement some kind of Minecraft Building Permit system, whereby participants will apply to gain permission to build on defined sections of Toronto. This could be a cheeky addition to the project, which creates a simulation of the planning process for participants.

This initiative will advance the Youth Engagement Strategy because it engages youth through play and addresses barriers to participation. Minecraft will introduce planning concepts to youth either through its consultation events or through the educational components of the campaign. Youth are more likely to participate in when the activity is fun and interactive. Minecraft players are a diverse group of people, and they are notably younger than the average community consultation attendee. By engaging individuals while they are young, City Planning has the ability to build interest in planning-related issues in hopes that youth will grow to be publicly engaged and involved adults.

From the research phase of the Youth Engagement Strategy, youth identified barriers to participation. These barriers are: a lack of trust in government, poor promotion of engagement activities, the lack of youth representation in positions of influence, and intimidation. The Minecraft project will address these barriers through engagement on digital platforms such as social media and video games, which are more relevant to youth. In doing so, City Planning can address the intimidation of participation and the lack of trust between government and youth.

2.1) Hackathons and Consultation Events

To run the Minecraft campaign, City Planning should host Minecraft-focused events outside of traditional community consultation events. This could take the form of an intensive hackathon, or a Minecraft-centric community event. These events should be complementary to a community consultation event since the two will bring in very different audiences. This is also to protect the sensitivity of community consultants, whereby opponents of Minecraft as a planning tool can perceive these efforts as unprofessional and/or "not serious planning".

Special consideration is required with regards to access. Since Minecraft is not free, City Planning needs to consider the fact that some audiences may not have access to the game, or will be able to access these events. Participants that this project will bring in will be the ones who own the game and play. City Planning might be able to purchase multiple licenses if they contacted Microsoft directly to potentially negotiate a group buy deal. Best point of contact is *Bruce Chau, Microsoft Canada Open Source Community Manager, a-brchau@microsoft.com, 289-305-9808*

A traditional hackathon is generally defined as an event where programmers, designers, and/or project managers come together to build a rapid prototype (could either be software or hardware) for the purposes of education and/or socialization. A Minecraft hackathon would bring in users from Toronto's gaming and digital media industry. City of Toronto's City Planning division can host a hackathon where participants will work together and start to build up Toronto's structures in Minecraft on the aforementioned basemap. Refer to **Appendix C: Minecraft City Planning Hackathon Curriculum** for an outline of how to host a Minecraft hackathon.

Another event that City Planning can host is a Minecraft-focused consultation event, which would be less intense than the hackathon. This is because the title of hackathons can draw in the hardcore programmer and/or gamer who would be much more experienced with rapid prototyping, which could dissuade and intimidate novice players and participants.

At Minecraft consultation events, planners and organizers can engage better with participants through teaching participants how to play Minecraft, and how to build together. These consultation events will feature more interactivity between City staff and participations in comparison to the hackathon. City staff will be able to introduce and discuss planning concepts to participants during the gaming sessions. Refer to **Appendix D: Minecraft Consultation Event Curriculum** for an outline of how a consultation event may look.

The goal of these events is to populate the basemap with structures so that the map of Toronto could be made publicly accessible for further development. Essentially, these events will create the anchor to an online Minecraft campaign where Toronto Minecrafters can view and contribute. The Minecraft project could be further expanded for outreach to schools and community organizations.

3.) Educational Components

Down the road, City Planning can utilize Minecraft to engage children and teens in schools. With the Toronto map being online, kids could be able to log in and explore from home. But with more concrete lesson plans, City Planning can approach schools in order to plug city planning concepts into the school curriculum. These engagement activities can use either the Toronto map that people have been contributing too, or it can use a fresh Minecraft map.

Some examples of how Minecraft exercises can teach students about planning concepts are: building complete communities, floor-area ratios, and disaster planning. Refer to **Appendix E: Build a Complete Community Exercise** for the exercise outline for building complete communities. In this exercise, students learn about what complete communities are and work collectively to build a complete community. **Appendix F: Floor-Area Ratios Exercise** is an exercise where participants will use Minecraft to build and visualize different densities. This can be achieved by setting building parameters prior to constructing structures, for example: players can build no higher than 10 blocks and can only use 100 blocks. In **Appendix G: Disaster Planning**, participants can play through simulated disasters (such as flooding or earthquakes) whereby participants will generate creative strategies for disaster relief and prevention.

The exercises introduced above are only three of many ways planning concepts can be embedded into the school curriculum. The incentive for teachers, principals, and school boards from these exercises is that these are easily adaptable and creative lesson plans. For the

schools, these exercises can be complemented with assignments that ask students to draw maps, write character biographies, or create walkthroughs and guides as learning activities in place of traditional learning materials and styles. Students will learn/hone their writing skills by producing pre and post game writing reflections.

4.) Ongoing Initiatives

The two ongoing initiatives that will come from the Minecraft project include the online Toronto Minecraft server and strategic partnerships (both new and existing). As mentioned above, the ongoing live Toronto server can allow users to log in and view the creations users make. A creative spin to this would be to add a Minecraft building permit system, where users register parcels of land (or blocks) to build upon. The Blockholm project in Sweden utilized a permit system, where users had to apply in order to participate.

Pursuing the Minecraft project will allow City Planning to reach out to many different branches of Toronto's strong creative digital industries. Refer to **Appendix H: List of Potential Partners** for a list of digital and creative industry companies that can help City Planning deliver the Minecraft project, whether that is through providing space to host events out of, or by embedding planning concepts into their programming.

It is important to reach out to these industries since Toronto is known for its digital industries. This sector of employment should be fostered through innovative ways of engagement. The demographics of these professionals and Minecraft players are notably younger than those who are more likely to attend community meetings. The Minecraft project will create a new and innovative avenue for City Planning to engage the public, youth in particular, in planning concepts.

5.) Showcase Work: Exhibition

More on the ambitious side of this project, the Minecraft project should host an exhibition that showcases the work of its participants. A notable example of a Minecraft project that ended in an exhibition is Blockholm, where the Swedish Centre of Architecture and Design built scale models of structures users built on their Minecraft server.

Toronto has many cultural institutions and a strong maker community that would love the idea of a Minecraft x City Planning exhibit. City Planning can reach out to sites like Artscape, the Power Plant, Harbourfront Centre, or the Ontario Science Centre to have them exhibit the creativity of the Toronto Minecraft City Planning project. It would be amazing if the structures in Toronto can be rebuilt as scale models using Minecraft's blocky design. Other sites for exhibition can take place in the neighbourhoods participants contributed to or redesigned. Prizes and recognition could be offered for skills and creativity to encourage participants.

The Good from Minecraft

Minecraft encourages creativity and facilitates collaboration. Its immersive and collaborative elements can allow City Planning to utilize new methods of engagement to connect with young audiences. Minecraft can be a fun way to incorporate digital tools into the municipal planning processes. It is also a quirky way to visualize planning elements without any

formal architectural and technical training. Minecraft's online community is vast and very dedicated. This creative initiative can build the awareness of Toronto City Planning on online communities through discussion boards about Minecraft.

Appendix A

Notable Civic Minecraft Projects/Initiatives

UN-Habitat x Mojang – Block by Block

UN-Habitat partnered with Mojang (Minecraft's developer) to help (re)build communities around the world, mainly in developing nations. Block by Block brought computers to communities and asked the community how they imaged the space in question. UN-Habitat would then take the feedback and (re)build the sites as per the comments received. Sites include: Nepal, Mumbai, Haiti, Lima, Nairobi, and many more.

The Danish Geodata Agency – All of Denmark in Minecraft

The Danish Geodata Agency converted all of its spatial data into Minecraft format for the public to freely download and explore. The Minecraft version of Denmark is set to a 1:1 (1 block : 1 metre) scale, and works pretty well. Users go on gst.dk and from there they can download parcels of the country. Technical issues are navigation. There is no compass, but the Geodata Agency provides a web service that translates real world coordinates to Minecraft coordinates.

Ordnance Survey – Great Britain Minecraft

The entirety of Great Britain has been translated into Minecraft format through the Ordnance Survey. This project includes topographic data, land-use zoning information, and the road network of the country. It is not to scale, and there are no built forms. It is valuable in the way they translated data and that it presents a new way to visualize the data. It does not, however, provide many fun elements. Its usefulness is limited, but the methodology is valuable and adaptable.

Swedish Centre for Architecture and Design – Blockholm, Sweden

Blockholm is the best example of using Minecraft for public engagement yet. The Swedish Centre for Architecture and Design uploaded topographic data and building footprints onto a Minecraft server, and allowed members of the public to log in and rebuild Stockholm. Users could rebuild buildings as they once were, or they could redesign them completely. This provided very interesting results, and generally interesting ideas about how tall buildings could look in Stockholm. The project was crowdsourcing what Stockholm could be. After the project, the Centre hosted an exhibition where they build scale models of users' creations.

Vilans Strandangar – City of Kristianstad

Celebrating its 400th year as a city, the City of Kristianstad, Sweden decided to conduct a public outreach campaign that focused on sustainable redevelopment of an aging neighbourhood. The City teamed up with a Swedish engineering agency to translate LiDAR and 2D data into a Minecraft world using FME. From this project, the City was able to reach a younger audience. Youth in this project created interesting architecture when they reimagined some buildings.

During the consultation events, some children were teaching city planning staff how to craft things. This project utilized a building permit system, where users would register for the properties they wanted to build on. They were also not allowed to modify other players' structures.

Minecraft Niagara Project - Niagara College

Geospatial Niagara commissioned students in the Niagara College GIS program to create a 1:1 scale replica of Niagara's elevation, roads, hydrology, and green spaces. The ideal outcome of the project was to have local schools engage with the area's natural geography. Niagara College used Safe Software's FME to convert all of their data.

Appendix B

Technical Aspects of the Minecraft Project

In order to use Minecraft as an educational tool, City Planning must first build a basemap to work off of. The basemap requires two main datasets:

- Toronto's elevation data, which can be found on Ontario's Open Data catalogue: "2010 digital elevation model"
- Toronto's building footprints, which can be found on Toronto's Open Data catalogue "3D Massing"

After securing the datasets, there are three methods of creating the initial basemap for the Minecraft project.

Method 1: Safe Software FME

From research, it seems that Niagara College had the *least* complicated methodology of converting spatial data into Minecraft format. They advised me to look into Safe Software's FME data conversion tool.

With FME, you should be able to directly upload SHP files and have the program convert the files into Minecraft files. From there, you will be able to directly specify attributes to each feature (for instance, basemap being one material and having building footprints a different colour)

Niagara College was able to get a free copy of FME from Safe Software because they were using it for educational purposes. The students at Niagara College recommended that we contact Safe Software, and mention that we were looking for something similar to them, and Safe Software should understand what exactly is needed. From there I would assume they could negotiate a price. This project will require the Professional version of FME. The price of FME Desktop Professional is $3000 CAD and it will be able to read and write ArcGIS and Minecraft files. Safe Software's customer service is very active, so getting in touch with the company shouldn't be hard.

Essentially, FME could set up the Minecraft map for you as a Minecraft save file, you would just have to host the file at this point on some kind of server (whether a live server, or just any laptop/computer). Then users can log into the server and start crafting.

A webinar hosted by Safe Software FME with a tutorial at the end
http://www.safe.com/webinar/minecraft-2015/

Written Tutorial:
https://knowledge.safe.com/articles/Samples_and_Demos/How-to-make-Minecraft-worlds

Method 2: Worldpainter

The price point of Safe Software's FME may be a constraint… an alternative method would involve seeking out someone with advanced technical capabilities or trying it yourself. I have attempted to create a basemap for Toronto, but could not figure out how to automate the process.

Essentially, I downloaded the Digital Elevation Model (DEM) from the Province of Ontario's open data catalogue. Then I styled it as a gradient from white to black, white being highest, and black being the lowest points. From there, I clipped the data to the boundaries of Toronto. Export the elevation data as a .png or .jpg.

In World Painter, you can import a "height map" which would be the greyscale elevation map you just made. Import that, and then export it for Minecraft. It's a pretty simple process; the step I had issue with was embedding building footprints into this file.

Tutorial: importing height map to Minecraft
http://electricarchaeology.ca/2014/09/30/historical-maps-topography-into-minecraft-qgis/

Method 3: Outsourcing

It is possible to seek outside help for creating the Minecraft basemap. It is possible to comission a geomatics studio group from Ryerson University to take on converting spatial data into Minecraft formats. Claus Rinner from Ryerson University has dabbled in turning Toronto's open data files into Minecraft format. Rinner is the chair of the Geography department at the university and would be a knowledgeable asset to reach out to.

Rinner on building Toronto's elevation map in Minecraft
http://gis.blog.ryerson.ca/2015/06/08/toronto-elevation-model-in-minecraft/

Appendix C

Minecraft City Planning Hackathon Curriculum

Objective

- To get a solid start in building the entirety City of Toronto in Minecraft
- To engage with Toronto's gaming and digital communities (whom we can assume are younger, more tech-savvy, and less likely to attend community consultation events)

Scope

- Participants must have a basic understanding of the gaming dynamics in Minecraft, creative mode in particular. In creative mode, users can freely build structures with every material available in the game, rather than gathering materials and building tools in order to craft structures.
- Participants are expected to enjoy working in teams and communicating with other players and City staff.
- Participants will learn about the planning process as they explore Toronto in Minecraft format through discussions with each other or with City staff and planners.

Approach

- City Planner will set up a space for participants to play Minecraft
    - Space can be leveraged through strategic partnerships with gaming companies and offices.
- Participants work collectively in building the structures of Toronto based on the building footprints embedded on the basemap

Deliverable

- A portion of a Toronto neighbourhood will be built up in Minecraft

Appendix D

Minecraft Consultation Event Curriculum

Objective

- Less intense compared to the hackathon
- Participants to begin building structures of Toronto
- To engage with audiences who are less likely to attend community consultation events
- Foster new and existing partnerships

Scope

- Participants must have a basic understanding of the gaming dynamics in Minecraft, creative-mode in particular.
- Participants are expected to enjoy working in teams and communicating with other players and City staff.
- Participants will learn about the planning process as they proceed within Toronto in Minecraft format through discussions with each other or with planners.

Approach

- Similar to the hackathon model, City Planning will need to find a space to operate out of, and also provide networking abilities for participants' computers
- Participants work collectively in building the structures of Toronto based on the building footprints embedded on the basemap while chatting with planners and each other about the city.
- Consultation is imagined to be more personable than the hackathon. Planners and organizers can help participants are not familiar with Minecraft.

Deliverable

- A portion of one of Toronto's neighbourhoods will be built up in Minecraft

Appendix E

Build a Complete Community Exercise

Objective

- To engage participants with the idea of complete communities.
- Have participants learn and understand what complete communities are.

Scope

- A basic understanding of Minecraft and how to play is helpful. But as the activity plays out, learning computer skills can be tied into the exercise.
- Participants will learn what goes into a complete community, and then they will work collaboratively to build one in Minecraft.

Approach

- Participants will be taught what complete communities are, what they include, how they might look, and why they are important.
- Participants will then work with one another to build a complete community in Minecraft

Outcome

- Participants will develop and understanding of what a complete community is, its various components, and how they come together
- Participants will work together to build their own complete community.

Appendix F

Floor-Area Ratios Exercise

Objective

- To engage participants with the concept of floor-area ratios. In other words, this is a new way to visualize density through a new medium.

Scope

- A basic understanding of Minecraft and how to play is helpful. But as the activity plays out, learning computer skills can be tied into the exercise.
- Participants will learn about the different build densities that can be allocated on a given site.

Approach

- Participants will be given set parameters on how a plot of land can be built up. For instance, you can only build 40 blocks high, and cannot use over 2000 blocks on a property.
- As the exercise progresses, parameters will change, and participants will be able to change their development. It might have started at single detached and/or townhouses, but it will eventually turn into mid- to high-rise buildings.

Deliverable

- Participants will develop an understanding of floor-area ratios and will be able to visualize different densities when thinking about subdivisions, townhouses, and/or mid-rise developments

Appendix G

Disaster Planning

Objective

- To engage participants in thinking about disaster planning

Scope

- A basic understanding of Minecraft and how to play is helpful. But as the activity plays out, learning computer skills can be tied into the exercise.
- Participants will work collaboratively to create solutions in order to survive

Approach

- Can plan for different scenarios (some more playful than others, depending on likelihood and realism)
- Organizers should create a back story or fiction for participants to play through.
- Example disasters: flood, volcanic eruption, forest fire, rising sea levels, and zombies

Deliverable

- Creative strategies for disaster relief and prevention efforts
- Participants to become more aware of vulnerability, sustainability, and resilience.