

**Kevin H Gordon**

**Process Book**

**Project Title : Diorama Project**

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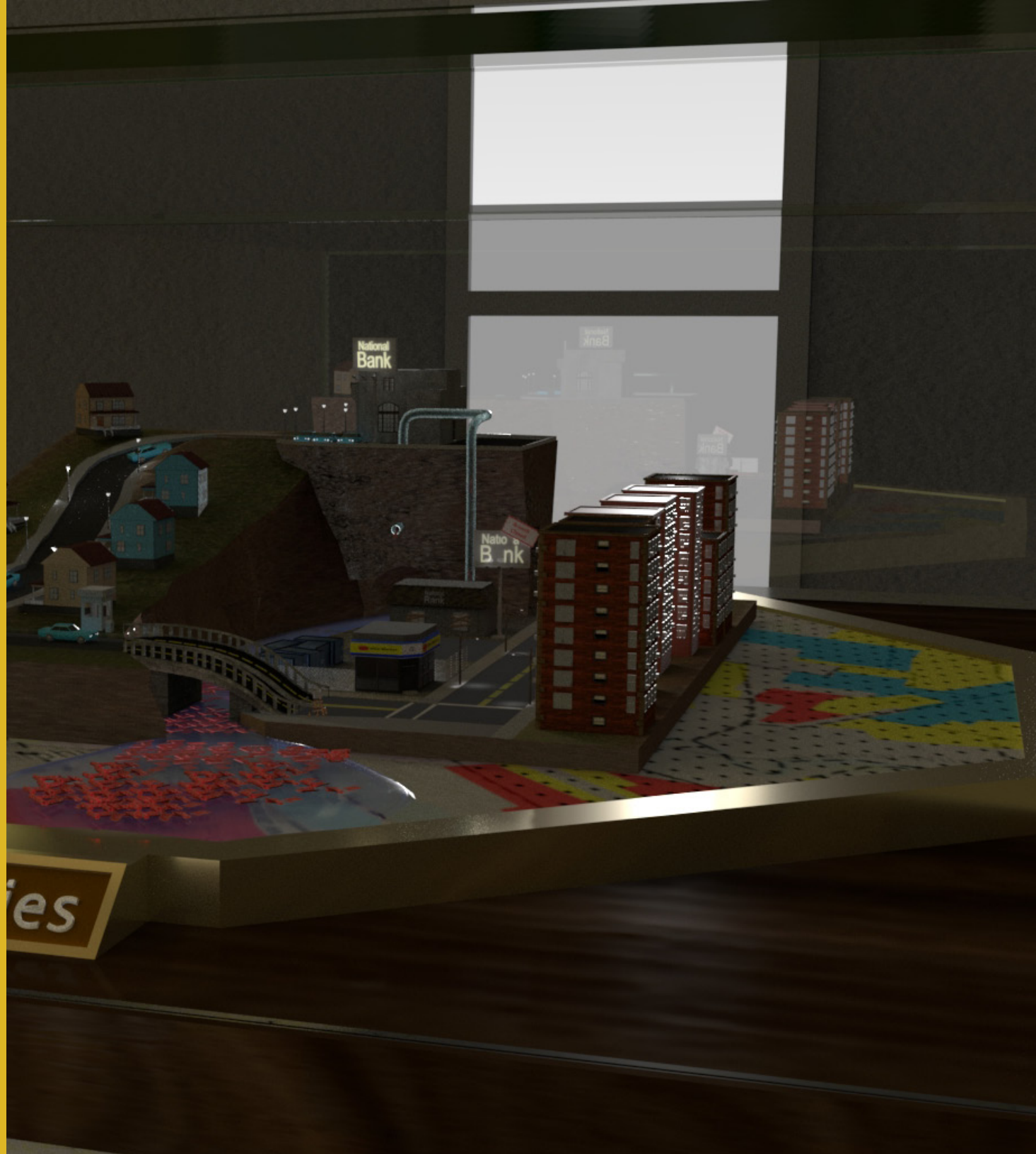
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# The Project



# What is the Diorama Project?

This was the final project for Professor Valentine's Computer-generated Modeling and Design class. This class was one of the first courses I took on-site at SCAD during the Fall of 2018. The objective of this project was to create a 3D diorama scene in Maya and render it using Arnold. Since I knew I'd be working on this project for a while, I needed to ensure I picked a theme or issue that struck a strong accord with me. As a person that is big on history, I began looking to social or economic issues of the past that I felt strongly about.

At the end of my exploration I came across the discriminatory issue of Redlining in America. When I saw that issue I knew that's what the subject of this Diorama would be. From there I knew that I'd have two primary goals for this project.

- Create a diorama about redline practices in America and Canada
- Showcase some of the new modeling/rendering techniques gained from taking this class

Though there were many hardships when it came to designing this piece, at the end of the day the project was a success. In this book, I will break down the journey of this project, and show what went into it at each stage.

# Project Inspiration

As legal discrimination was banned in the country at the time, federal officials had to get creative with how they kept the spirit of the practice alive. What they came up with was the policy of redlining, which was created to keep oppressing minority communities in this country. Though not an outright law, the practice of redlining was practice used by federal, state and local officials to deny services to citizens in minority communities. The chief way in which services were cut was through the denial of bank loans.

Not having access to loans and poor job prospects created a chain effect. This chain led to cramped living conditions, poor community utilities and more which had an adverse affect on minority communities. So much so that the effects are still being felt in those communities today. All of this is because of the maps that were drawn up redlining certain members of the population.

The goal for this project was to create a diorama that symbolized the impact of this practice across two economic groups.

# Reference - Diorama

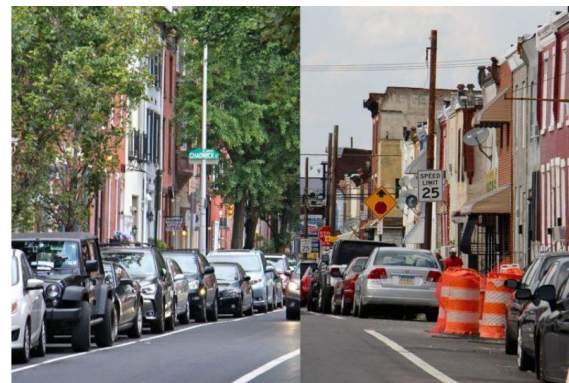
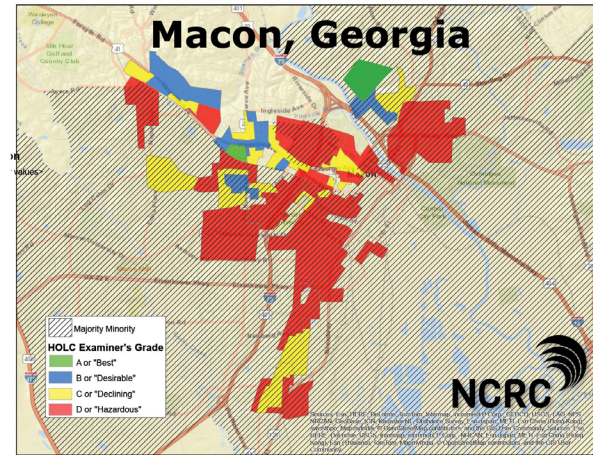
To start this project, I first sought out to gather inspiration for how my diorama should look. I scoured the web in search of various diorama types. Images of this process seen below.



# Reference Redline

While the effects of redlining were likely intended to be discrete, the impact of redlining was stark and loud. The effects of the decades long policy led to poor areas that were visibly more cramped, lacking sufficient community center, and overall more polluted than affluent communities.

Leading up to designing this project, I chose to find images that reflect this state of affairs. Images to the right show examples of this effect in vivid detail.



# First Steps



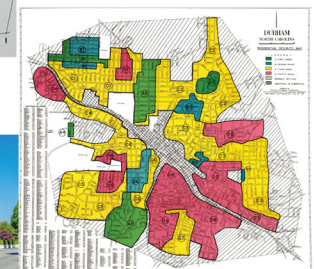
# Design Pitch

Before we could begin modeling this project, we first had to present our design pitch for approval. That pitch featured to the right. The main idea I wanted to convey with my piece is not only the effect of redlining, but also the tale of two cities. Often times during redlining, minority communities weren't that far away from their more affluent counterparts. In some cases, the same umbrella establishment often served both communities. Though in minority communities these establishments would be less equipped to handle the needs of clients. The central issue that exasperated redlining was access to money and loans. As such, I designed my piece to reflect that and the other socio-economic issues that comes with it.

The images I featured for my pitch reflected the primary disparities that I aimed to highlight in my diorama.

## Project Redline Diorama

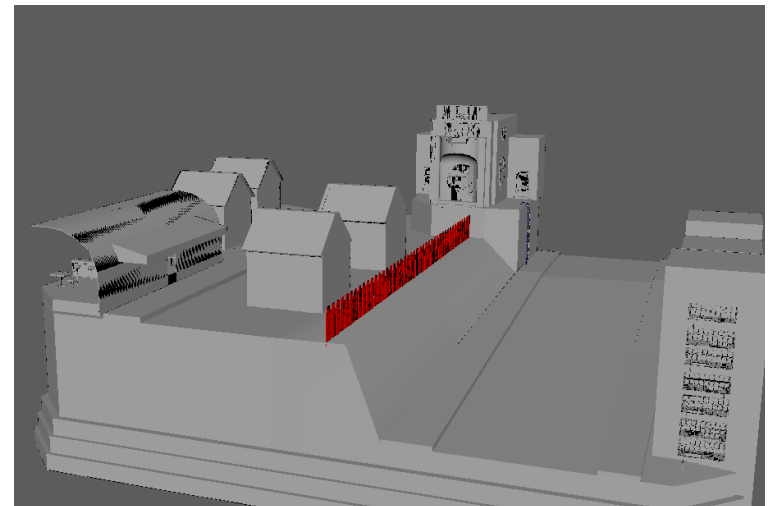
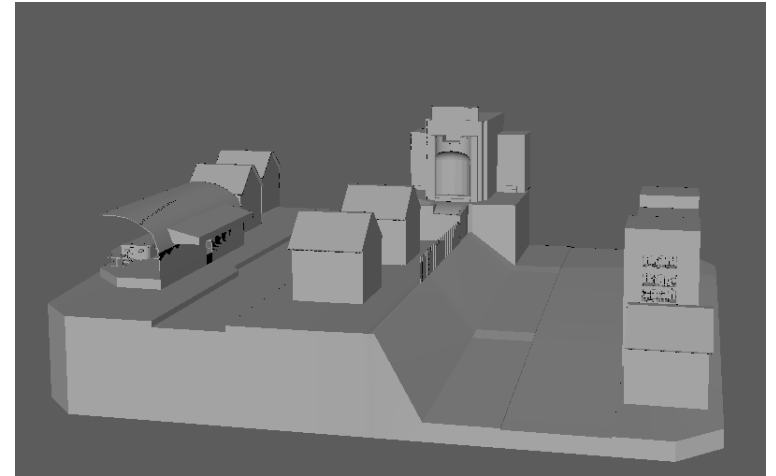
This project will depict a Diorama built to frame the infamous redlining policy that occurred in America after the New Deal.



# Scene Modeling - Phase 1

With all of the reference images and sketch assembled, it was time to begin modeling this piece. I proceeded to make placeholder objects of some key assets, such as homes and buildings, so that I could begin assembling the scene. The original design, featured in the top image, saw me faithfully re-create the image I'd sketched,

Upon viewing the final blockout I became disenchanted with that vision of the project. In my opinion, if I wanted to accurately represent the disparity between the two cities, the differences between the two couldn't simply be the quality of homes and banks. No to accurately visualize the disparity, I had to make the altitude of the two cities vastly different as well. As if the affluent down was literally and symbolically looking down on the minority community. The second image represent the first pass at creating this effect.



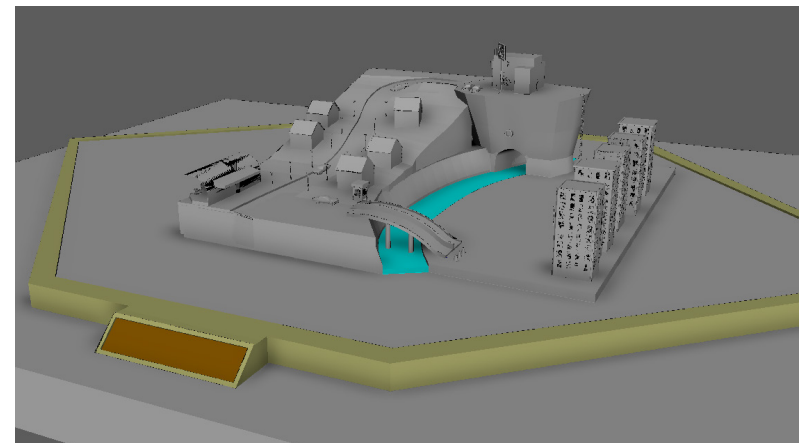
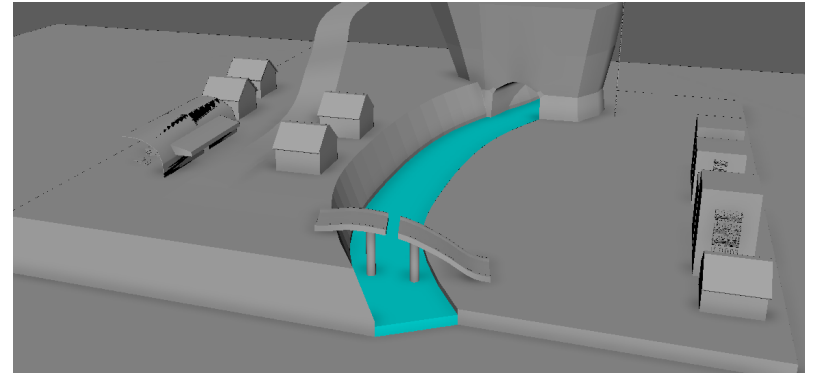
# Scene Modeling

## - Phase 2

From examining the initial passes at creating this striking separation of cities, I knew that it could be pushed more. The next phase of the modeling process involved playing around with different design iterations before moving onto the next section.

While having the affluent community, and it's services by extension, on a separate elevation creates a degree of disparity I felt even that could be pushed. As such I added a river in between the two cities, with bridge access being controlled by the affluent side. This was a nice addition to the visual symbolism of the piece.

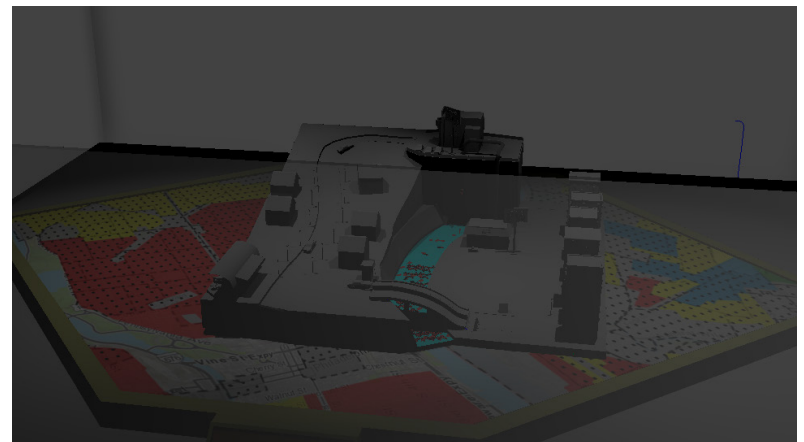
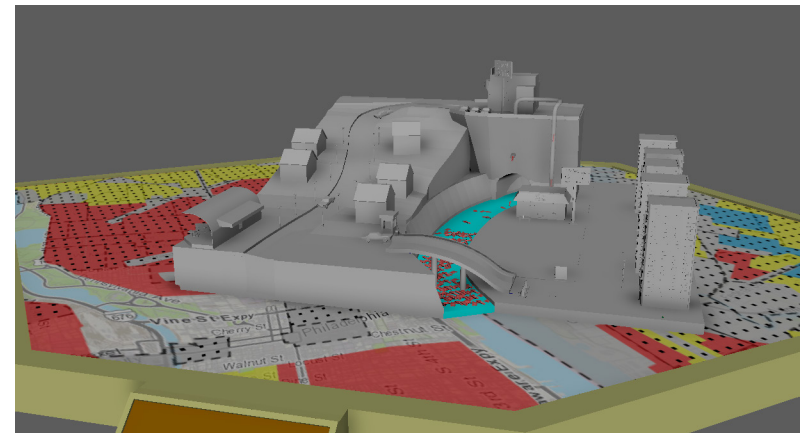
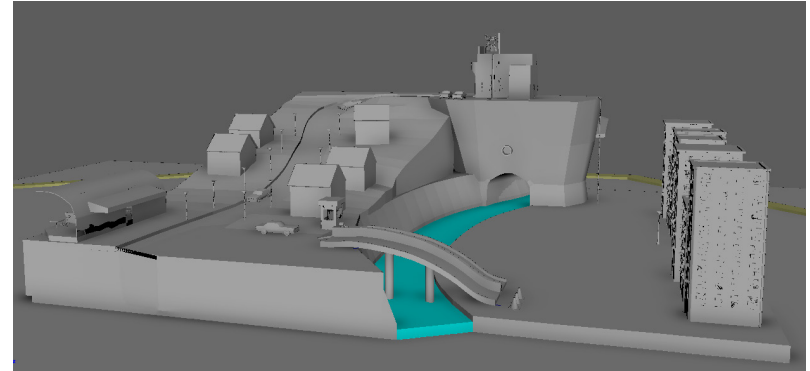
To the right showcases some of the different design iterations I played around with.



# Scene Modeling - Phase 3

At this stage in the development process, I'd more or less finalized all of the major elements of this piece. The final design idea came about as I was designing the second bank for the minority community. The idea here being that since the bank is smaller, it would have to send all loan applications to be processed at the main bank. As previously established when the redlining policy was in full effect, banks would reject most loans being processed. As such I designed a funnel that sends those applications straight into the water.

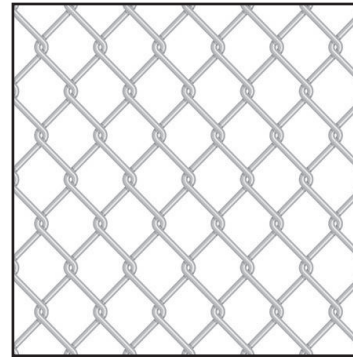
With the inclusion of a glass box to house the diorama, the scene assembly was complete.



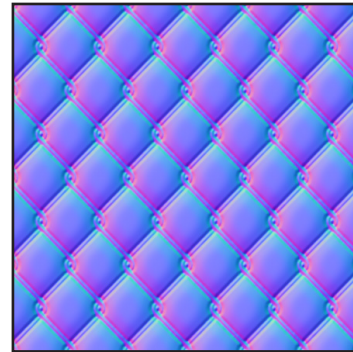
# Designing 3D Assets

With the scene mapped out, it was time to begin creating the various assets that would be required for this piece. As this project was a diorama, a scene full of realistic models and textures wouldn't fit within the context of the assignment. As such, I elected to keep the modeling and texturing process relatively simple. Assets, such as the bank and buildings, containing tillable components were created using Substance Painter. This was chosen because the tiling features in substance are unmatched across the program I know.

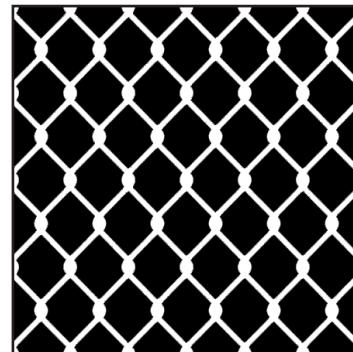
I approached assets that didn't require tiling through the use of Photoshop. Throughout this 3D modeling class we learned of several unique ways to texture in Photoshop. I definitely wanted to use some of those skill in this project. Examples of the use of Photoshop textures can be seen to the right.



Diffuse of Gate material.



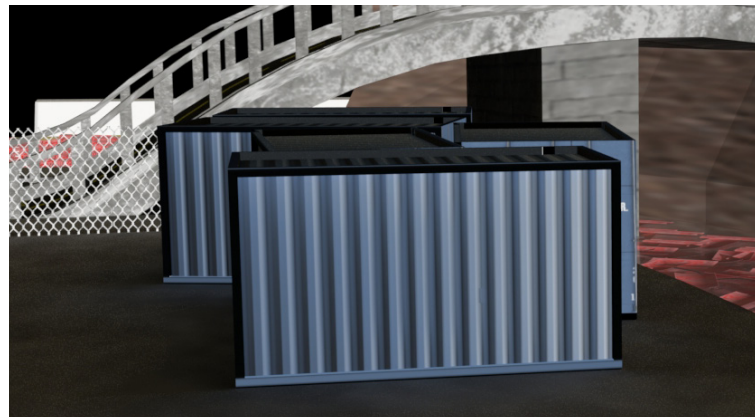
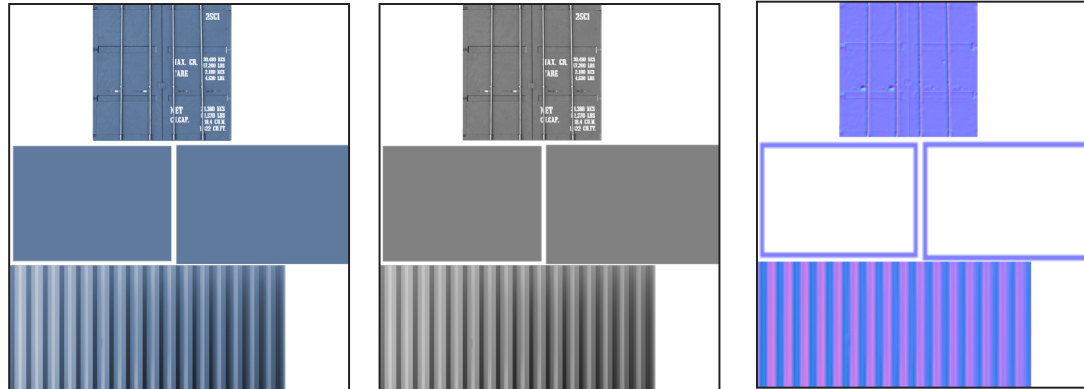
Normal of Gate material.



Alpha of Gate material.  
Used to control  
transparency in Arnold.

# Texturing in Photoshop

In using Photoshop, I was able to create a couple of assets that had modular components. An example of this process is shown in the shipping container asset. As 4 sides of container remain the same, the same texture could be applied to several sides of the model. The diffuse, specular and normal map featured below was created in Photoshop and applied to the model.



# Final Model Set

After working on this project for some time, I finally finished modeling all of the important assets. Most of these assets are featured in the model set to the right.



# Symbolic Design - Two Banks

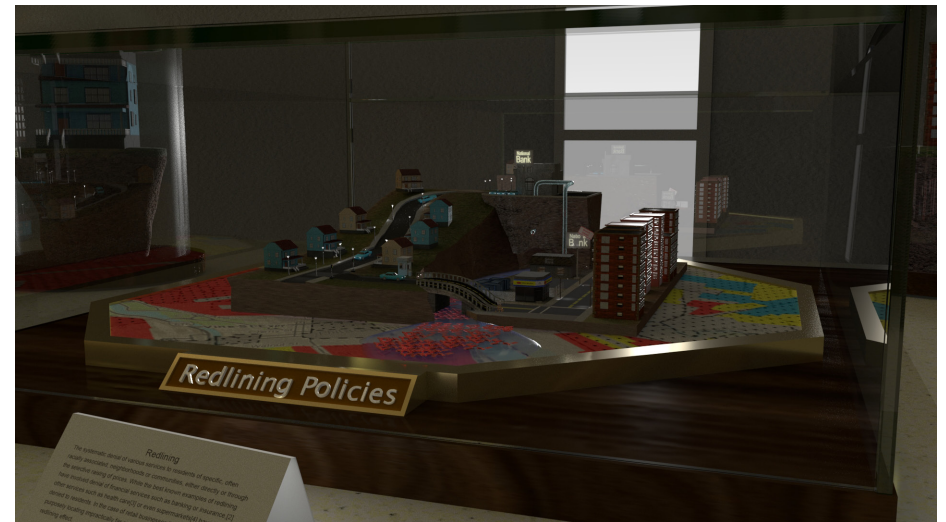
In this piece I decided to include the imagery of two banks, one in each city. The purpose of this was to showcase not just the size disparity between the two locations, but also the resource disparity. As is often the case, the establishment with the least amount of resources don't last long. Especially in times of redlining, the amount of resources allocated to critical structures was incredibly small. As such, even if people in those communities wanted to gain access to loans, they often couldn't.



# Symbolic Design

## - Two Homes

As a consequence of not having access to loans, people in minority communities often had to rent their living space. This is all while more affluent communities were able to gain loans and build houses. One thing I wanted to stress with this piece is, though these communities are close in distance their opportunities are vastly different. In addition, being cut off from essential services means that those born in those communities have no real chance of making it out.



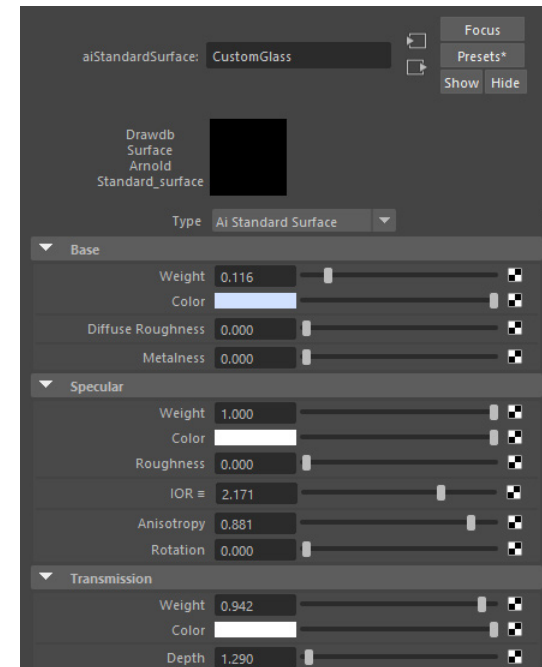
# Lighting the Scene

Since it'd been quite a while since using Arnold, I knew that the lighting process would be a challenge. I first started off by adding my key and fill lights to the scene. Then an HDRI image was added to the scene to increase overall brightness, as well as add specular highlight and reflections. Some techniques that I employed in Arnold was the use of a portal light to brighten up the back of the scene. Through it all, I kept adjusting various light settings within Arnold until I reached a desired outcome.



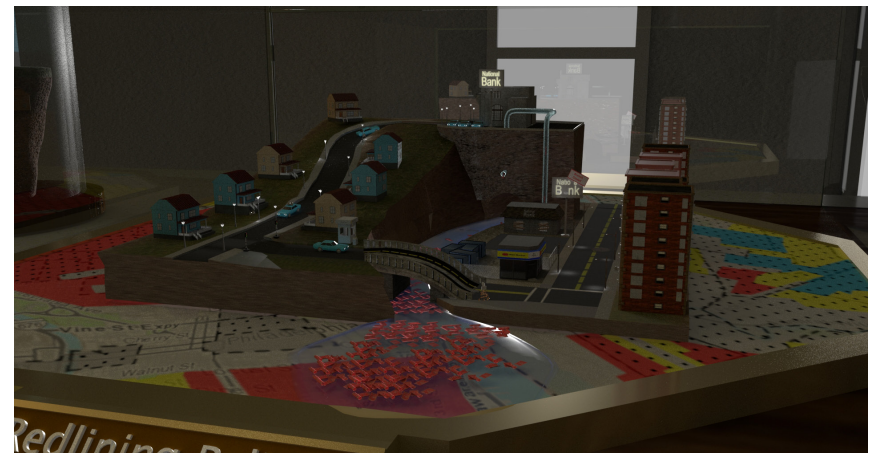
# Fixing the Glass

Aside from the issues with lighting, the material was one of the aspects I struggled with the most. In particular the glass was a nightmare to fix. The glass had to be designed with a thick outer layer, to account for the green oxidation that occurs when thick glass is being created. From modeling the inner glass, the object was able to more accurately reflect and bound light around. The image to the right showcases how this process was achieved, as well as the outcome.



# Final Reflections

Though adjusting and testing the various lighting settings in Arnold, I finally landed on the results seen to the right. As this was my first 3D class at SCAD, I was immensely impressed with how far one class was able to push my skills. The best part of the project for me is hands down the glass, as I spent a great deal of time playing around with the material and light settings until I achieved the proper effect. The skills I learned in Photoshop that term definitely helped me in the long run, towards making game assets with more efficiency.



# **Special Thanks**

Special thanks to all of my friends, family and professors who've supported me throughout the years. Without them, none of the work featured in this book would be possible!



## Redlining Policies

**Redlining**  
The systematic denial of various services to residents of specific, often racially associated, neighborhoods or communities, either through the selective raising of prices. While this practice has been widely discredited, other forms of redlining still exist.



