



AFTER OIL

After Oil: Imaging The Future Post Oil Obselesence

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PLAGARISM STATEMENT

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ABSTRACT

The adaptive reuse of oil infrastructure throughout the US is necessitated by the incoming obsolescence of oil in our urban infrastructure and the evolution of electric charging system, allowing architects to turn to more site oriented community programming to bridge the divide between humanity and nature. Oil architecture makes it self known in the urban scape most prominently through the paved over hardscape street grid that allows people to quickly move through the urban hardscape. The epicenters fueling these petroscares are the gas stations, precisely sited in placed of high traffic to increase revenue streams. Although with the coming of electric vehicles the transportation automobile oriented hardscape will not be changing, these gas stations can become a beacon of reversing the denaturing created by 19th century interjection by corporatist petrocrats.

A sincere thank you to
all of my past teachers
in every respect of my
life.

ACKNOWLEDGEMENTS

Thank you to Carol Burns who throughout my undergraduate and Graduate Degree has helped me push myself further than I previously thought and to explore relationships with nature, that I never knew architecture could have. Her own work has been cited throughout my thesis and becomes a structure of thought I have found to be very helpful in my own designs. A kind acknowledgment to Mark Pasnik who has been a constant help and kind face in the architecture office of Wentworth Institute Of Technology, although I'm sure when he sees this he will have more than a few notes. I would also like to acknowledge Curtis Perrin who played an instrumental role in the formulation of this thesis and the goals of it.

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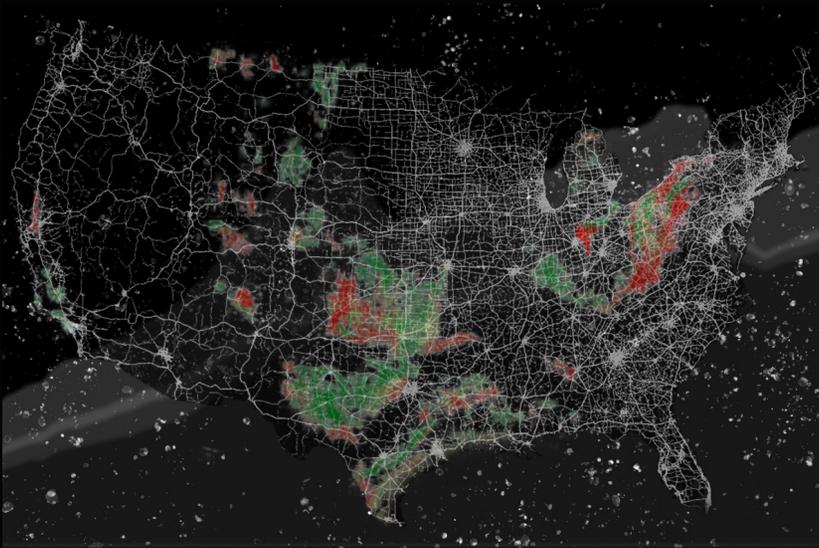


Figure 001

Overlaid Map Of US Roads and US Oil Production Overlaid over Graph of US Oil Usage

Thesis Statement

The adaptive reuse of oil infrastructure throughout the US is necessitated by the incoming obsolescence of oil in our urban infrastructure and the evolution of electric charging system, allowing architects to turn to more site oriented community programming to bridge the divide between humanity and nature. Oil architecture makes it self known in the urban scape most prominently through the paved over hardscape street grid that allows people to quickly move through the urban hardscape. The epicenters fueling these petrosapes are the gas stations, precisely sited in placed of high traffic to increase revinue streams. Although with the coming of electric vehicles the transportation automobile oriented hardscape will not be changing, these gas stations can become a beacon of reversing the denaturing creased by 19th century interjection by corpratist petrocrats.

Arguement

The Adaptation of Gas stations to become community centers that connect the urban populace back to nature and develop a relationship with nature that is not mutually exclusive, will produce a radical system change that transcends architecture. The reintroduction of nature into these sites and then people promotes a nature first approach to the way architects design and the way people interact with nature as a whole. The community based programming will also extend past nature human relationships to create a more wholistic community enviornment that breaks current urban fabric community relationships. The integration of oil reminants on the site such as the gas stations can further the movement away from oil while also connecting us to our energy systems to more fully understand the cost of our energy beyond the dollar.

Reflections On The Past



Figure 002

Diagrammatic collage of oil drilling early in it's conception

Architecture has been inherently built to the tune of energy since the over industrialization in the 18th century and this has led to the grey urban hardscape that shapes the fabric of the landscape of today and the interaction of the human with it. Our urban asphalt-scape shapes a dystopic architecture of one without nature, consequently one also devoid of the human as key driver in that architecture. When we look at how architecture is connected within a city framework it is the car that governs all and thus oil energy that drives our architecture. If architecture frames, it's exploration of the past from the perspective of oil defining our urban landscape then a story is told that shows an architecture wrong footed to suit the needs of the human. Instead it becomes suited to further our reliance on oil as a means of increasing economic output that becomes a drug our country relies on to maintain a competitive edge in the global economy.

The goal of this exploration into oil and architecture is meant to set the stage for understanding our own relationship to oil and nature at odds.



Figure 003

Collage of the current relationship oil has with nature, producing a mutually exclusive relationship where both cant exist at once

Architecture has been inherently built to the tune of energy since the over industrialization in the 18th century and this has led to the grey urban hardscape that shapes the fabric of the landscape of today and the interaction of the human with it. Our urban asphalt-scape shapes a dystopic architecture of one without nature, consequently one also devoid of the human as key driver in that architecture. When we look at how architecture is connected within a city framework it is the car that governs all and thus oil energy that drives our architecture. If architecture frames, it's exploration of the past from the perspective of oil defining our urban landscape then the past shows an architecture wrong footed to suit the needs of the human.



Figure 004

Diagrammatic collage of oil drilling mutalating a natural ecosystem

Architecture has been inherently built to the tune of energy since the over industrialization in the 18th century and this has led to the grey urban hardscape that shapes the fabric of the landscape of today and the interaction of the human with it. Our urban asphalt-scape shapes a dystopic architecture of one without nature, consequently one also devoid of the human as key driver in that architecture. When we look at how architecture is connected within a city framework it is the car that governs all and thus oil energy that drives our architecture. If architecture frames, it's exploration of the past from the perspective of oil defining our urban landscape then the past shows an architecture wrong footed to suit the needs of the human.

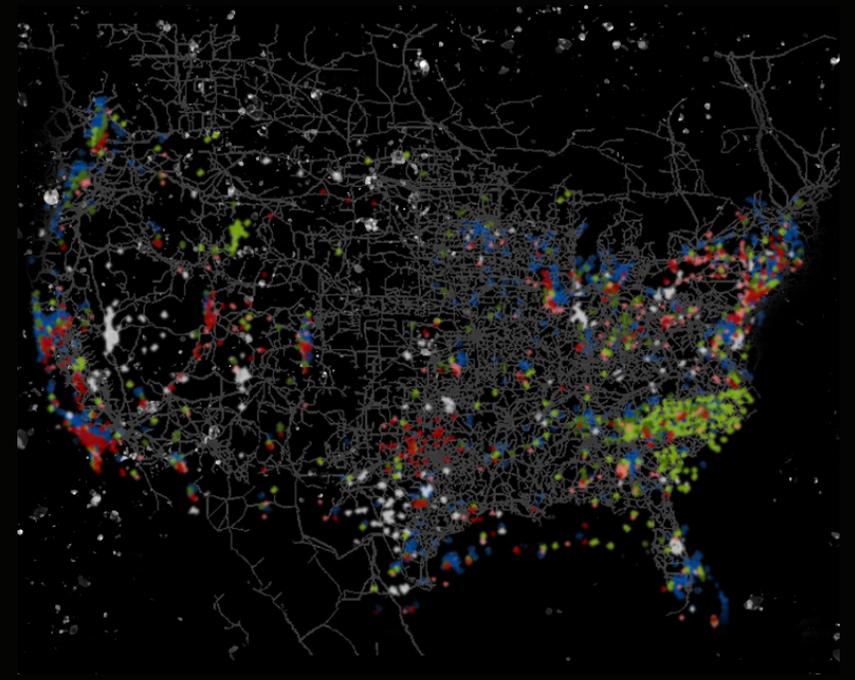


Figure 005

Map Of US Roads and Electric Car Chargin Station

The Petroscape: Introduction to Oil in Architecture



Figure 006, "Oil Wells, Venice, Los Angeles, California" A vision of the integration of energy systems into the daily lives of Americans. Postcard of Venice Oil Wells 1931, Los Angeles by Charles P. Everitt. "Venice Oil Wells, Venice California, 1931" LA Times accessed 5 December, <https://www.latimes.com/california/gallery/vintage-postcards-showing-los-angeles-area-oil-fields>.

The relationship between our energy systems, architecture and capitalism is wholesically integrated within one another and take shape in nearly every aspect of our modern physical world. A simplified view of the relationship between architecture, energy systems and capitalism are the sub dominant, dominant and meta-dominant respectively¹. The picture however it not so clearly divided in the influence of each one on the built environment but acts as a framework by which they system can understood. Architecture is the physical representation and tool by which energy can take shape in the built world through infrastructure and accomplish the goal of distribution and utilization. This relationship between to energy and architecture proves to be entirely wrong when designing for a positive outcome for the human that exists within the current energy model and to eventually evolve beyond it to a new. Architecture needs to become the main driver in this relationship to create cityscapes that are built for the pedestrian, the surrounding community, and the cultural reformation of our environmental relationship. To do so we must first look to the past to understand the shortcomings of past design work in addressing this.

Despite the fully integrated relationship oil has with architecture, very little work has been done in the past to explore the relationship between the two and to create architecture that is devoid of oil's malignant manifestations within architecture. The petroscape creates Trans global homogenized urban scapes² that proves to be detrimental to the health of those who inhabit it³. It's integration into the lives of the global societies creates a pipeline of positive feedback loops that further embeds it within our society incapable of being removed without causing collapse of the economic system⁴. People most immediately and obviously experience their relationship with oil through the gas station, however there are deeper underlying relationships that the general consumer is unaware of: globalism and geopolitical ambition (which this paper will not concern itself with due to the political scope it must take), means of transportation and the urban scape, building design and energy systems, consumer products, etc.. To produce a healthier relationship with petroleum and architecture: must explore their integration with oil and the Petro capitalistic system in both the physical and conceptual.

1. Hein, Carola. "Oil Spaces: The Global Petroscape in the Rotterdam/The Hague Area." *Journal of Urban History* 44, no. 5 (September 2018): 888–890.

2. Loredo-Cansino Reina, and José Alayón-González. "Petroleum: A Global History of His Impact on Landscape, City, and Architecture." Lecture Proposal presented at the GAHTC, 2020.

3. Srole Leo, et al., "Mental Health in the Metropolis" *The Midtown Manhattan Study* (New York, McGraw Hill, 1962) 10-11.

4. Arjun Appadurai, "Disjuncture and Difference in the Global Cultural Economy," *Theory, Culture & Society* 7 (1990): 295 – 310

The Urban Scale: Reviewing The Past

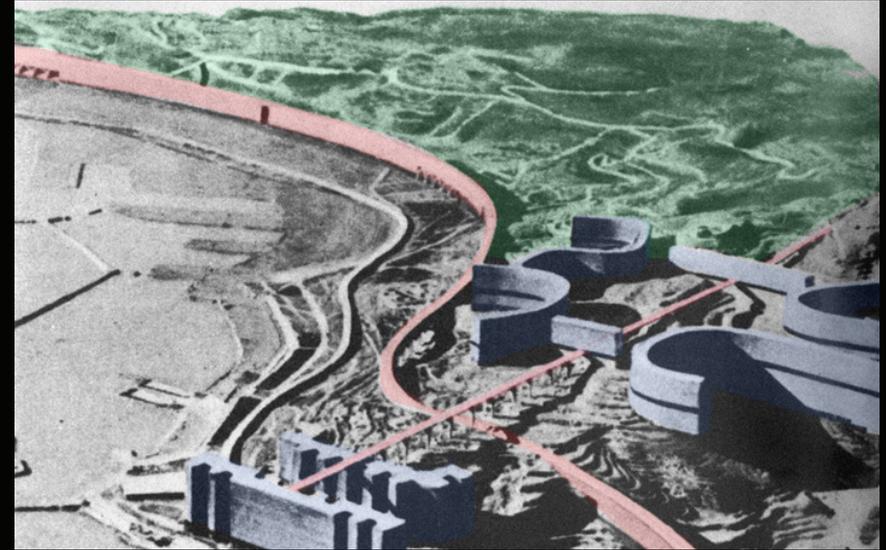


Figure 007, "Urbanisme" Conceptual Project to visualize new urbanism in the 1920s. Photo of Model 1929, Rio De Janiero by Lucien Hervé© FLC/ADAGP. "Urbanisme, projets A,B,C,H, Algiers" Foundation Le Corbusier accessed 5 December, http://www.fondationlecorbusier.fr/corbuweb/morpheus.aspx?sysId=13&irisObjectId=6259&sysLanguage=en-en&itemPos=4&item-Sort=en-en_sort_string1&itemCount=4&sysParentName=Home&sysParentId=11

Petroleum based Infrastructure was originally conceptualized as a net positive by architects: an energy system that could propel us forward and reimagine the urban fabric. Functionalism as defined by Corbusier in the 1930 Athens Charter⁵ and his 95 Theses could create high density housing, allowing for greenery and connectivity by increasing the density of the residential buildings and connecting them through highway systems. These intentions would have created the space for nature that Ian McHarg would later call for in the urban scape but

would still fail to integrate it into the high-density developments and transportation lines that are dropped on the site without any consideration of the existing site⁶. This example exemplifies the beginning of the 20th century reviews by Tauri in his paper utopias ghost⁷ which cites the inability of architecture to diverge from capitalistic intentions to produce a less invasive relationship with capitalism and architecture.

⁵ Le Corbusier. 1973. *The Athens charter*. New York: Grossman Publishers.

⁶ McHarg Ian, "Design with Nature" (New York, Natural History Press 1985) 21.

⁷ Tafuri Manfredo, *Architecture and Utopia. Design and Capitalist Development* (1973, Cambridge, Massachusetts, MIT Press, 1976) 48.

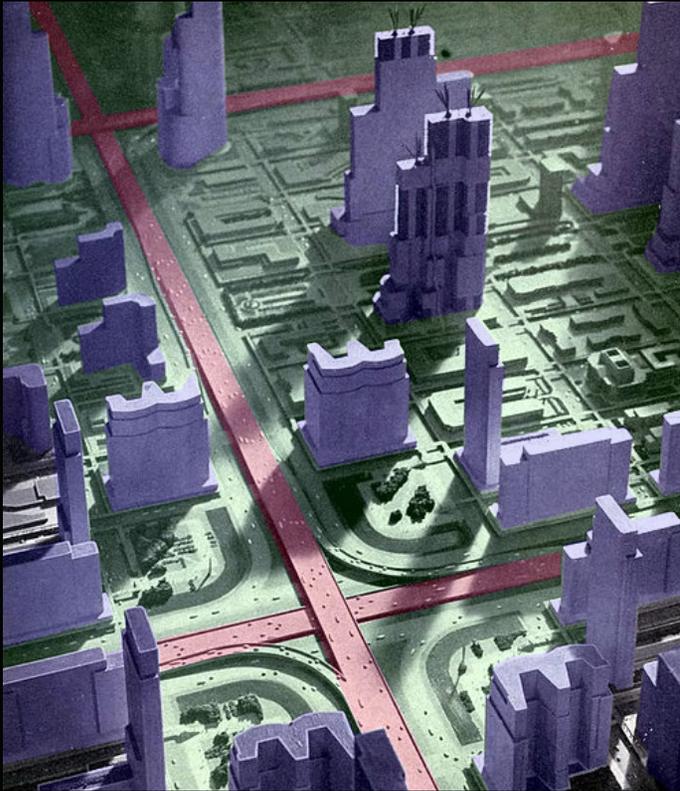


Figure 007, "City of Tomorrow" Detail from the Futurama exhibit at the 1939/40 New York World's Fair. Photo of Model 1940, by Norman Bel Geddes. Shell Oil City of Tomorrow model. Magic Motorways accessed 5 December, https://commons.wikimedia.org/wiki/File:Shell_Oil_City_of_Tomorrow_model_Lc_1936-37.jpg

Despite the architectural intentions of Corbusier's design and conceptualization of functionalism as the new way forward the urban street grid remained a constant in the urban fabric. The Ideas of the Urban Park model however was bastardized by oil industries and manipulated to exemplify their intentions⁸. The Model Shown on the left is by Norman Bel Geddes and was produced for Shell's City of the Future. This model proposed a city characterized by the sale of petroleum through transportation exemplifies the issues brought to light by Olien who explores the underlying influence of oil in all facets of our lives⁹. The landscape

produced by this new urban grid would be one that integrates oil into the cultural norm of the society that inhabits it making the physical environment a means to produce a designed cultural, architectural and physical outcome¹⁰. The superblock design that this project makes the urban framework less accessible to the pedestrian by increasing the distance between buildings by parks. Although conceptual this project did have implications for the architectural field, even if it was only conceptualized¹¹. This was a canary in the coal mine for architects to pull back from the ambitions of oil industries in shaping architecture on the urban scale.

8. Mehaffy Michael and Tigran Haas, "New Urbanism in the New Urban Agenda: Threads of an Unfinished Reformation", *Urban Planning* 4, no. 5, (March 2020), 443.

9. Roger M. Olien and Diana Davids Olien, *Oil and Ideology: The Cultural Creation of the American Petroleum Industry* (Chapel Hill: The University of North Carolina Press, 2000) 88.

10. Dirk Simons, Jasper Hugtenburg, and Anton van Hoorn, "Landscape and Energy: Designing Transition" (Rotterdam: NAI Publishers, 2014) 12-13.

11. Tim Love, "Paper Architecture, Emerging Urbanism," *Places Journal*, (April 2010). Accessed 02 Dec 2021. <https://doi.org/10.22269/10041>

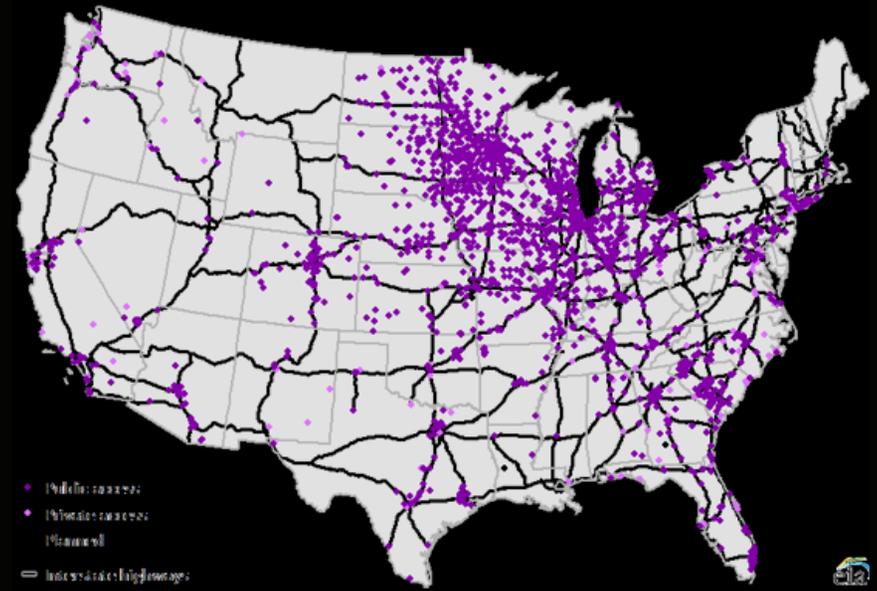


Figure 009, "Ethanol Fuel Stations" Mapping of Ethol pumping stations in mainland United States. Image of Map, Mainland United States by U.S. Energy Information Administration. "Ethanol (E85) Fuel Stations" U.S. Energy Information Administration accessed 5 December, https://www.eia.gov/todayinenergy/detail.php?id=6050#tabs_AltTransportFuelStations-4

The current urban framework is far from the idealized vision of Corbusier and Shell but maintains aspects of both. This can be attributed to the simplistic view of the urban planning taken by either side¹². The urban streetscape we see around was shaped by individual consequentiality and relies more heavily on its influence by capitalistic forces than it does the theoretical work of past architects (Tafuri, 1976, 22.) Shell's design therefore takes precedent into more accurately predicting the future of the urban streetscape. Our typological grid is supported by a hierarchical grid of highways and smaller roads that run within. On either front the road takes precedent as the means of transportation because of its metabolic efficiency. This decreases the prominence of the pedestrian and alternative forms of transportation in the urban fabric and goes as far as to actively discourages it. Instead

of the tower in the park approach that both shell and Corbusier took the park becomes a gas station by which the transportation systems may be supported¹³. The Urban grid remained unchanged in the eyes of urban planners and the park became was instead moved to select sites taking up a much smaller footprint of the city¹⁴. This creates an architectural and cultural relationship with nature where our economic relationships take precedent and nature is minimally included in the design.

12. Jane Jacobs, "The death and life of great American cities" (1961 New York, NY, Random House) 16.

13. Mehaffy, M, "Cities alive: Jane Jacobs, Christopher Alexander and the roots of the new urban renaissance", (1961 Portland, OR Sustasis Press).

14. Allen, Peter, "The End of Modernism?: People's Park, Urban Renewal, and Community Design." *Journal of the Society of Architectural Historians* 70, no. 3 (2011): 360.



Figure 010, "Urban Typology" Mapping from google earth of the typical Urban Grid. Screenshot from google earth, Mainland Austin Texas by Google Earth Pro. "Google Earth Pro Screenshot" Google Earth Pro accessed 5 December, <https://earth.google.com/web/>

Consuming Oil: Taking Built Form

The role of petroleum in our current urban framework makes itself known through the asphalt we drive on, the trash-cans we derive out of petrol-products, but no where more concentrated is it in our gas stations. Adaptive Reuse of Gas Stations¹⁵ cite the lack of exploration into the architectural conceptualization of the gas station and their necessitation to our culture. Giles Tompson visualizes this through the lens of urban biology and the term urban metabolism. The term urban metabolism relates to the input

needs of city to function, and in our modern metabolism the main input has become oil and gas. This is because of the ability of gas to increase the output of a city and its economic profit and consequentially it's need for Automobility. The urban metabolism of the modern era expresses itself through its architecture and automotive infrastructure¹⁶. The infrastructural need for transportation necessitates built form that reflects its relative needs¹⁷. Currently those relative needs are only to distribute gas and oil, and consequently fail to address larger issues that the siting and numerosity of the typology controls. These gas stations because of their need within the fastest economic metabolic areas are placed at key intersections making them a waypoint within cities¹⁸. They are in key areas where there could be important urban programming, but because of their necessity they remain single faceted (Coffey, 2000, 24.)

¹⁵ Coffey, Brian, and Darrell Norris. "The Persistence of Use and Adaptive Reuse of Gas Stations: An Example from Western New York." *Material Culture* 32, no. 2 (2000): 43–44.

¹⁶ Thomson Giles & Newman, Peter, "Urban fabrics and urban metabolism – from sustainable to regenerative cities" in *Resources Conservation and Recycling*, 132 (May 2018) 10.1016/j.resconrec.2017.01.010, 220-222.

¹⁷ Ross Barrett and Daniel Worden, *Oil Culture* (Minneapolis, Minnesota University Press, 2014), xix

¹⁸ Vieyra Daniel, "Fill'er Up: An Architectural History of America's Gas Stations, (New York, Macmillan Publishing Co, 2005)

Toward a New Future: New Designs and Adaptations of Building Energy



Figure 011, "Mies Van Der Rohe Gas Station" Perspectival Image of Mies Van Der Rohe Gas Station in Montreal, Canada. Photo of Building, Montreal, Canada by Steve Montpetit. "Conversion of Mies van der Rohe Gas Station / FABG" Conversion of Mies van der Rohe Gas Station / FABG accessed 5 December 2021, <https://www.archdaily.com/214540/conversion-of-mies-van-der-rohe-gas-station-les-architectes-fabg>

Past attempts bringing high architecture to the gas station have been attempted by prominent architects such as Mies Van Der Rohe and Frank Lloyd Wright. These designs do little address the larger cultural issue that is created by these designs and produces little more than a well-designed shed¹⁹. They remain still placeless and could conceptually exist anywhere, a problem of the global oil cultures homogenization of space and 20th century high modernity²⁰. These do serve a purpose in the overall conversation though because of their ability

to bring tourists to them, a manifestation of the Bilbao effect in gas station design²¹. For that reason, they prove that these places can become cultural influential. The design would become so well liked that it would be later turned in to an office designed by the firm FABG. This proves the point of Kathryn Merlino who defines the significance of buildings with cultural value²². This project begs the question of: what can these gas stations do when they are designed with the intent of becoming cultural hubs and urban city centers?

¹⁹ Venturi, Robert, Denise Scott Brown, and Steven Izenour. 1972. *Learning from Las Vegas*. Cambridge, Mass: MIT Press 24-26.

²⁰ King, Anthony. "Globalization and Homogenization: The State of Play." In *Homogenization of Representations*, edited by Modjtaba Sadria, (2012) 17-34.

²² González, Sara. "Bilbao and Barcelona 'In Motion'. What an Urban Regeneration 'Models' Travel and Mutate in the Global Flows of Policy Tourism." *Urban Studies* 48, no. 7 (2011): 1397–1418.



Figure 012, "Manana Convenience Store" Photo of Manana Convenience Store expressing no green technology. Screenshot from google earth, Mainland Pearl City Hawaii by Google Earth Pro. "Google Earth Pro Screenshot" Google Earth Pro accessed 5 December, <https://earth.google.com/web/>

New cultural and governmental pushes are being implemented on the gas station level, but the extreme push by gas stations to be economically profitable has allowed them to expose the holes within the environmental system: making it a prominent example of the issues that Tafuri Notes (Tafuri, 1976, 22.). This Gas station that is Leed Certified, does little to address the fundamental environmental issues it causes. The asphalt hardscape that is universally used in current gas station design remain in this project a constant. This station does nothing to truly address problems with the current urban culture around design that Ian McHarg addresses²³, therefore creating no room for natural landscape architecture. For the visitor to this site the architecture fails to exemplify and clearly show it's supposed Green Design strategies. overall negative force for the architecture

| LEED BD-C: New Construction (v2.2) | | CERTIFIED, AWARDED APR 2020 | |
|------------------------------------|--|-----------------------------|-----------|
| 1 | SUSTAINABLE SITES | AWARDED: 6 / 14 | CONTINUED |
| SS1.1 | Location sensitive design | 1.0 | 1.0 |
| SS1.2 | Minimize site disturbance | 1.0 | 1.0 |
| SS1.3 | Protect or restore natural resources | 1.0 | 1.0 |
| SS1.4 | Protect or restore riparian habitat | 1.0 | 1.0 |
| SS1.5 | Protect or restore wetlands | 1.0 | 1.0 |
| SS1.6 | Protect or restore wildlife habitat | 1.0 | 1.0 |
| SS1.7 | Protect or restore sensitive areas | 1.0 | 1.0 |
| SS1.8 | Protect or restore cultural resources | 1.0 | 1.0 |
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| SS1.12 | Protect or restore geologic resources | 1.0 | 1.0 |
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Figure 013, "LEED- NC 2.2 Scorecard" PDF of Scorecard for Manana Convenience Store in Pear City, Hawaii. PDF of scorecard, by USGBC. "Manana Convenience Store/Gas Station" USGBC accessed December 5 2021, <https://www.usgbc.org/projects/manana-convenience-storegas-station>

landscape; on this site it provides a test to the forces that oppose its environmental impact through green design.

²³ Marshall, Adrian. "DESIGN FOR NATURE." Landscape Architecture Australia, no. 165 (2020): 62.

Alternative projects that more effectively address the issue of environmental health is a project by Cobe in Denmark, which designs an entirely new electric vehicle charging station changing the profit oriented, grey scape into an environmentally focused station. This project integrates a biomimetic structure meant to look like trees to improve the beauty as perceived by the inhabitant²⁴. These trees also utilize a prefabricated design made from individual wooden panels that can be recycled after the station is no longer being used, improving the environmental impact of the building²⁵. To address the hardscape that typically defines the site of a gas station, this electric vehicle charging station doesn't utilize the entire site to make way for environmental architectural landscaping that are both positive to the health of the environment and to the health of the inhabitant²⁶. For the visitor this project expresses a new picture of the typological gas station being an expression of how we should star to design for the future.

In the case of the gas station bought and transformed by Juerg Judin a gas station becomes a residential property changing the program and usage entirely. The hardscape can be removed from the site, to provide the site with more infiltration, which intern will reduce the overall environmental impact of the project²⁷. The addition of new greenery can be added throughout the project to allow for privacy and a connection to nature that is deemed a necessity in new architecture by Kenneth Frampton²⁸. Both features have positive environmental impacts for the surrounding site but also for the people who inhabit it. The vigilance that the typology of the gas station commands becomes muted through the use of the greenery to provide privacy to the new residential program. In this project the interior of the gas station become a home while the exterior structure of the canopy creates an exterior patio for the residents. This adaptive reuse of a gas station to a residential home proves the ability of inhabitation for new program in these structures. Still though the question of is this all that a gas station can become is still not answered.



Figure 9, "From gas station to recharge station" Rendering of gas station showing interaction by public in Denmark. Render of conceptual gas station, Denmark by COBE. "From gas station to recharge station" Cobe accessed 5 December 2021, <https://cobe.dk/place/ultra-fast-charging-stations-for-electrical-cars>



Figure 014, Converted Gas station photos of exterior of house showing new usage and new greenscape. Photo of rear of house, Berlin Germany by Cyril Foiret. "Inside Juerg Judin's 1950's converted gas station" Juerg Judin accessed 5 December 2021, <https://trendland.com/inside-juerg-judin-converted-50s-gas-station/>

²⁴ Ripley, Renee L., and Bharat Bhushan. "Bioarchitecture: Bioinspired Art and Architecture—a Perspective." Philosophical Transactions: Mathematical, Physical and Engineering Sciences 374, no. 2073 (2016): 1.

²⁵ Ripley, Renee L., and Bharat Bhushan. "Bioarchitecture: Bioinspired Art and Architecture—a Perspective." Philosophical Transactions: Mathematical, Physical and Engineering Sciences 374, no. 2073 (2016): 1–36.

²⁶ RAINEY, REUBEN. "NATURE AS PHYSICIAN: The Return of the Garden to High-Tech Medical Facilities." In Healthy Environments, Healing Spaces: Practices and Directions in Health, Planning, and Design, edited by REUBEN RAINEY, TIMOTHY BEATLEY, and CARLA JONES, 122–40. University of Virginia Press, 2018.

²⁷ Lovejoy, Derek. "The Vital Role of the Landscape Architect in Solving Environmental Problems." Ekistics 60, no. 360/361 (1993): 124–126.

²⁸ Kenneth Frampton. "RAPPEL A L'ORDRE: THE CASE FOR THE TECTONIC." In Architectural Design, ed. Kenny Cupers, Isabelle Document 60, no 3-4 (April 2990), 19-25.

Integrating The Human: From Car to Human Inter- face

The Gas station of the Future design winning project by Michael Sklenka, and Mollie Decker effectively adapts an existing abandoned gas station to create a social hub that connects us to the energy systems we use in our everyday lives. This project is located on the corner a neighborhood making it a prominent spot within the larger urban fabric and increasing its visibility. That visibility is further illustrated in the adaptation by the addition of windows along the front expressing its program on the exterior. The addition of the gym programming provides a twofold advantage to the building: the communal activity of exercise proves a powerful tool to create community as described by Bartolomeo²⁹. The gym also provides the energy that is used in the electric car charging, allowing people to understand where their power is coming from and to understand it's relative cost. The site originally designed for cars, gives back space to the pedestrian in the form of a woonerf that allows for the pedestrian movement gas stations once engaged against. The programming of both the charging station and the power plant speaks to a future that is not as singular as being only designed for cars or for people, but both

sharing spaces. Still though this project fails to address the positive relationship people and the environment have through the integration of natural features onto the site³⁰. Could this project have gone farther to incorporate more biophilic design philosophies to further increase the health of the users and neighborhood? The conceptual program design created by Gensler and funded by BMW addresses the issue of long charging times in the electric vehicle charging stations that may replace the gas station in the future. This design would allow for community and retail to exist in the same building, catering to the surrounding populace through the addition of local amenities such as cafes, event areas and entertainment area, all of which are make this a place of congregation for the local resident³¹. While also catering to the passer by who the gas station has traditionally served, by including lounges, pods, and workspaces. These two programming scopes effectively adapt the electric vehicle charging station to being a hub, something that could have been accomplished by gas stations but has never come to fruition.

Figure 015, Conceptual Section of new community and retail programming of gas station. Cross-section rendering of various zones in future vehicle service stations., by Gensler/ BMW DesignWorks. "Cross-section rendering of various zones in future vehicle service stations." Gensler accessed 5 December 2021, <https://www.forbes.com/sites/edgarsten/2021/03/10/evs-may-turn-filling-stations-into-places-to-work-play-pause/?sh=f09bd391b5b9>



²⁹ Di Bartolomeo, Giovanni, and Stefano Papa. "The Effects of Physical Activity on Social Interactions: The Case of Trust and Trustworthiness." *Journal of Sports Economics* 20, no. 1 (January 2019): 52.

³⁰ HEERWAGEN, JUDITH H. "CAN NATURE BE A HEALTH INTERVENTION?" In *Healthy Environments, Healing Spaces: Practices and Directions in Health, Planning, and Design*, edited by TIMOTHY BEATLEY, CARLA JONES, and REUBEN RAINEY, 107. University of Virginia Press, 2018.

³¹ Palyou, Clairy. "Outdoor Space in Minoan Architecture: 'Community and Studies 12 (2004): 208. <http://www.jstor.org/stable/40960778>.

Privacy." *British School at Athens*



Figure 017, Diagrammed Render of new energy station showing integration into the urban fabric. Gas Station of the future design competition grand prize winner. view of exterior of project, by Subject Studio. "Gas station of the design competition grand prize winner." Gensler accessed 5 December 2021, <https://www.godesignclass.com/designs/134>

With or Without: Reimaging

The obsolescence of gas stations is on the horizon and the future of gas stations and Petro-architecture should be shaped by more human and environmental design elements that in the last century were overlooked by designers. There are over 150,000 gas stations in the US, therefore calling for adaptive reuse of these buildings is very important to decreasing the construction emissions for new building projects³². These sites typically are all hardscaped and concentrated in high density areas, adding to the heat island effect of these areas. To address this the typology of the gas station, need to include both green and blue architectural elements. The gas station typically is site less even in the cases of Frank Lloyd Wright, and consequently creates a homogenized typology that exists across the entire world. To break this down the designs for these sites should be rooted in local building traditions and the architecture of the local culture. This should also be achieved through an integrated environmental detailing of the site that informs the design decisions to create a more cohesive and non-limiting relationship with nature³³. The framing of our relationship with nature should also be one that is represented in the programming of the site, to exist within nature and not exempt from it. Thus, in the case of flooding on a site the project should embrace the flooding and see it as an active force on the site that should be designed with.

The goals any adaptive reuse

of these sites should be to integrate the public into newly established program that highlights both our energy system and our interconnective relationship with one another³⁴. The inclusion of new active community-oriented programming would change this negative aspect of these sites into a positive for the urban whole. The current programming also elicits a necessitation of cars, and that impact expands far past the site of an individual gas station. To address this pedestrian and bicyclist infrastructure such as woonerfs that put both the car and the pedestrian on equal terms, must be added to the project. This will change the social relationship between the pedestrian and the car and decrease the grip that automobility has on the city³⁵. By doing all of this the typical gas station post obsolescence will not be demolished and will instead take the architectural prominence that it's siting, cultural influence, and environmental impact demand

³² Robiglio, Matteo. "Why Adaptive Reuse?" *The Adaptive Reuse Toolkit: How Cities Can Turn Their Industrial Legacy into Infrastructure for Innovation and Growth*. German Marshall Fund of the United States, 2016.

³³ McHarg, Ian L. "The Place of Nature in the City of Man." *The Annals of the American Academy of Political and Social Science* 352 (1964): 2.

³⁴ BEATLEY, TIMOTHY, CARLA JONES, and REUBEN RAINEY, eds. "CONCLUSION: The Challenges and Opportunities of Designing Healthy, Flourishing Communities and Spaces." In *Healthy Environments, Healing Spaces: Practices and Directions in Health, Planning, and Design*, 247. University of Virginia Press, 2018.

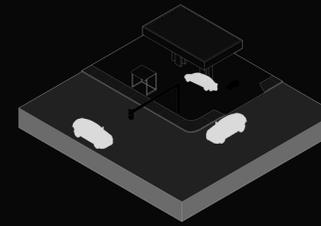
³⁵ Urry, John. "The 'System' of Automobility." *Theory, Culture & Society* 21, no. 4–5 (October 2004): 25–39. <https://doi.org/10.1177/026327640404046059>.

Design As Research



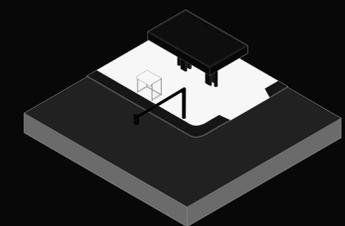
Understanding Relations

Gas stations are typically located at high traffic areas with corner street conditions to create an urban interface that makes them a highly important location to the larger urban fabric and consequently bring more people into the site. This is meant to serve the function of making the gas station more profitable while also metaphorically solidifying the role of gas and petroleum in our larger urban fabric. These high traffic areas are then underutilized in comparison to the larger urban whole to produce a singular non community oriented goal. They begin to disregard the pedestrian interface that typically occupies spaces near the site because of it's relative importance and further the necessitation of petroleum in our cities. Their hardscapes are one of their main features in the steamrolling of any artifice of nature that previously existed on the site, making the site: siteless. Their need for gas to be stored on site also lends these gas stations to have a large liquid capacity below grade that could be utilized for green energy such as geothermal heating, and other green opportunities like water storage. These sites are therefore in optimal areas for community programming, transportation infrastructure, and low carbon-dioxide emission buildings. A tactical solution is to correct these mistakes while also constructing new opportunities within the existing structures. The way forward would not be to demolish these structures entirely; Instead the best way to utilize these spaces and buildings would be to maintain the buildings for new usage, while demolishing the hardscape and bringing back the nature it has erased. A tactical solution is to



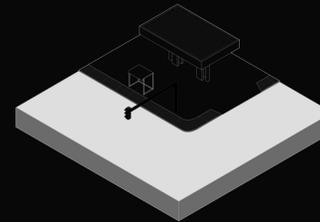
HIGH TRAFFIC

THE LOCATION OF GAS STATIONS IS TYPICALLY NEAR HIGH TRAFFIC AREAS OR NEAR LARGE URBAN TRANSPORTATION INFRASTRUCTURE. THIS IS DUE TO THE HIGHER NUMBER OF CUSTOMERS THESE BUILDINGS MAY RECEIVE. BECAUSE OF THEIR KEY LOCATIONS IN AN URBAN FABRIC AND THEIR EXCLUSIVELY VERNACULAR DESIGNS, THEY NEGATIVELY EFFECT THE SURROUNDING AREAS BY TAKING A KEY LOCATION AND SEVERLY UNDERUTILIZE IT.



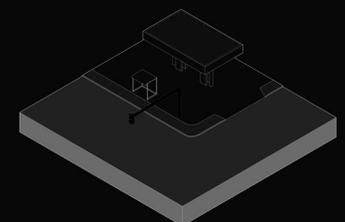
HARDSCAPES

THE VERNACULAR NATURE OF THESE PROJECTS AND ITS RELATIVE PROGRAMMING MITIGATES THE ROOM FOR SOFTSCAPES AND EXCLUDES NATURE FROM ITS MATERIAL PALLETTE. BEYOND THE IMMEDIATE VISUAL EFFECTS OF THIS, THIS DECISION TO ONLY INCLUDE HARDSCAPES SIGNIFICANTLY CONTRIBUTES TO THE HEAT ISLAND EFFECT.



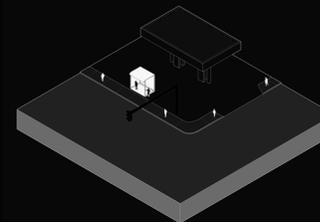
STREET CONDITION

GAS STATIONS ARE TYPICALLY LOCATED ON CORNER CONDITIONS TO MAXIMIZE ITS SITING TO INCREASE ITS VISIBILITY IN THE URBAN STREET SCAPE.



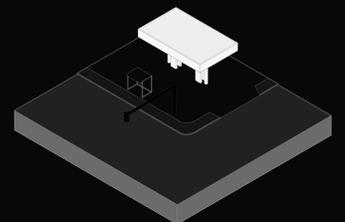
LIQUID CAPACITY

SOMETHING SOMETHING URBAN FABRIC



PEDESTRIAN INTERFACE

THESE STRUCTURE IGNORE THE ON FOOT PEDESTRIAN THAT MAY BE TRAVELLING BY ITS SITE AND ONLY CATERS TO CUSTOMERS. HOWEVER BECAUSE OF THEIR KEY SITING THEY ARE ALSO OFTEN LOCATED NEAR BUS STOPS AND ALTERNATIVE FORMS OF TRANSPORTATION



URBAN INTERFACE

GAS STATIONS HAVE BEEN CONDITIONALLY FORMATED TO BE FIT ANY URBAN CONTEXT AND ARE IN ESSENCE PLACELESS. THIS HIGH MODERNIST ARCHITECTURAL THEORY THAT HAS BEEN BAKED INTO THESE VERNACULAR, CAPITALISTIC STRUCUTURES DISREGARDS THE COMMUNITY AS A WHOLE AND IGNORES CONTEXTUAL RELATIONSHIPS.

Figure 018

Overlaid Map Of US Roads and US Oil Production Overlaid over Graph of US Oil Usage



Figure 019
Site Sectional Analysis

Site

This radical new building project will be within the newly designated Innovation District in Austin Texas. This district was established in 2019 and currently is experiencing rapid increases in market value, population density, green design and capital innovation. The main drivers on the site leading innovation are: Central Health's downtown redevelopment, innovation tower, numerous health care facilities (ranging from the development of biotech, medical devices, pharmaceuticals, diagnostics and healthcare information technology), Texas's Global Life Sciences Hub, the Autonomy Institute, Waterloo park reopening, Symphony Square (a mixed use residential project), City of Austin Office Of Innovation, and a new gold line public transportation system. This multitude of different fields and programmatic uses creates a multi disciplinary center for the city of Austin Texas.

The Urban infrastructure currently in place and the ones in development offer this site complex relationships to the city around it and can serve as an urban epicenter of the city. This site along with it's developing urban context stands very close to the local downtown area of Austin Texas and near it's capital building requiring the site to negotiate it's relationship to both the large FAR structures and with the smaller parcels of land that juxtapose it on the eastern side of the highway. This site also offers greenery that runs next to it, that creates a highway of it's own, this one for people and bikes. The 2.5 km path winds through the district and finally out to the Lady Bird Lake. This development is further expanded beyond its linear borders by the large-scale waterfront development that redefines the lake.



Figure 020
Impermissible land in the Austin Texas Landscape

The area around the proposed site is underdeveloped when compared to the reshaping of the urban fabric that is fast approaching. Any development will have to reconcile the current upscaling of the area along with its current less developed state. Specifically, the site that the proposed building will be located on is parking lots that have remained stagnant, awaiting new development in the surrounding areas. The addition of a new mixed use residential block would be supported by these new buildings and the consequential influx of new residents and companies looking to stake their claim in the district. For the resident or the entity that occupies the proposed building opportunities outside of the site are numerous.

Site Relations

The site in this case is immediately connected to a small river called Waller Creek that runs through the innovation district and emptys into Lady Bird Lake. The current plan to prevent flooding of this district by this river and by the impermeable land that surrounds the river is to diver the creek through underground tunnels that will empty directly into the River and bypass the typical stream, destroying the natural ecosystem along that river. A better means of handling this flooding would be to increase the amount of surface area that could absorb the water and to include programming along the river that could be flooded without harm to the surrounding buildings. The solution could be to include a park that could flood at certian times of the year and then also be occupied by residents the rest of the year.

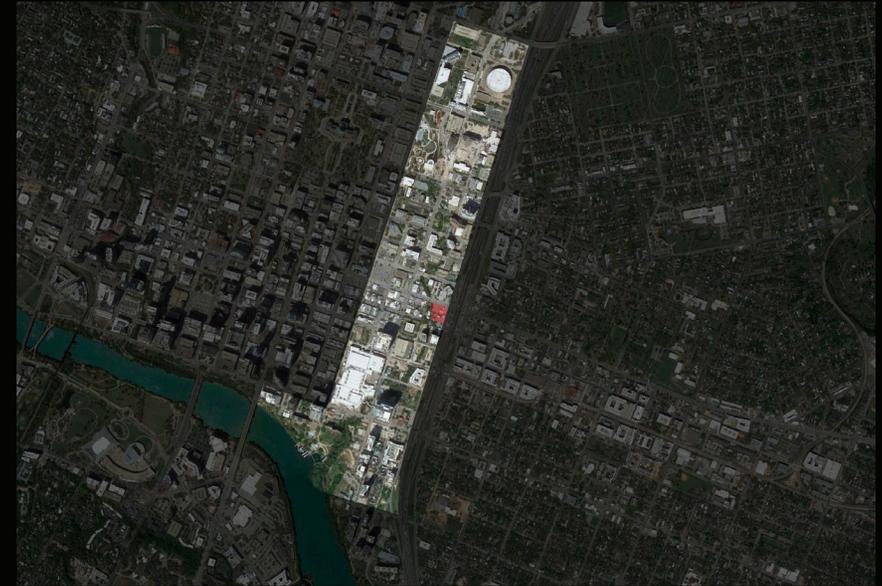


Figure 021
Austin Texas Innovation District Mapping



Figure 020
Site Intervention Section

Programing

To increase the relationship the community has to this site programming such as community buildings that could house activities such as yoga classes and other community events would bring poeple back to the site. To address the need for greenery and nature on the site htse spaces could also become parks that house mycelium bays below to abosrb the water on the site and promote a healty sub terrainain root system for the plants that grow above. The space below the gas canopy could then become a patio area that is shaded and protected from the elements making this site habitable in numerous weather conditions. The third option would be to use the structure of canopy to build a green house that would be able to provide food for the community on this site. The third option would also address the local food disparities in urban enviorments while also connecting people to the food they consume.

Figure 021
Programming Axon Diagram 1

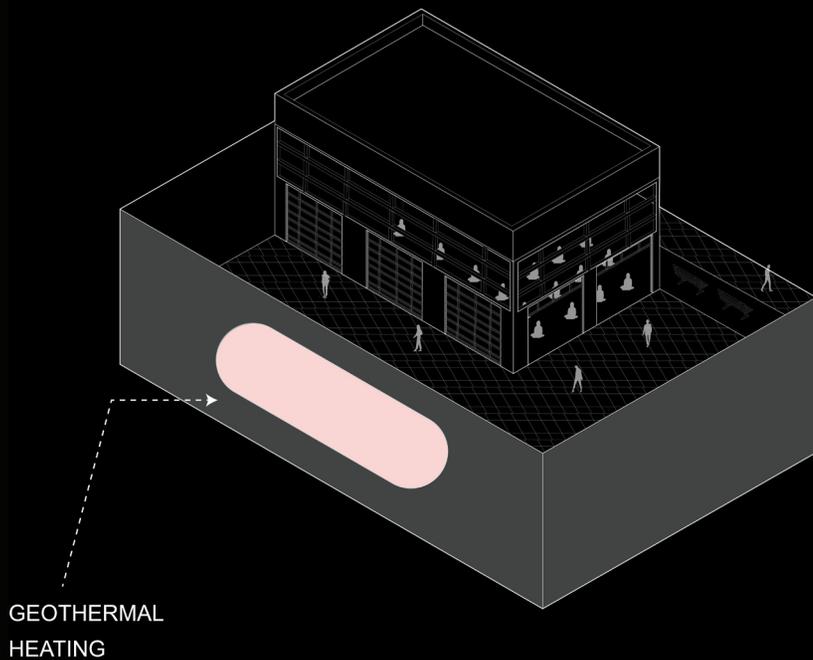


Figure 022
Programming Axon Diagram 2

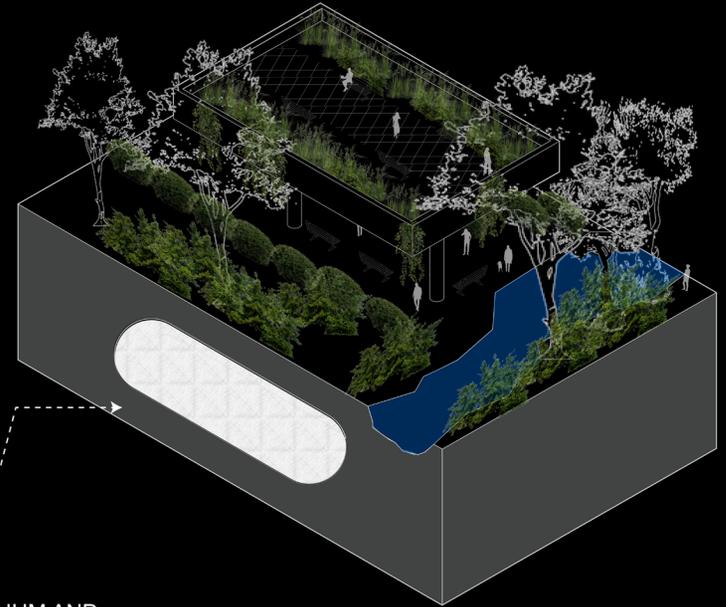
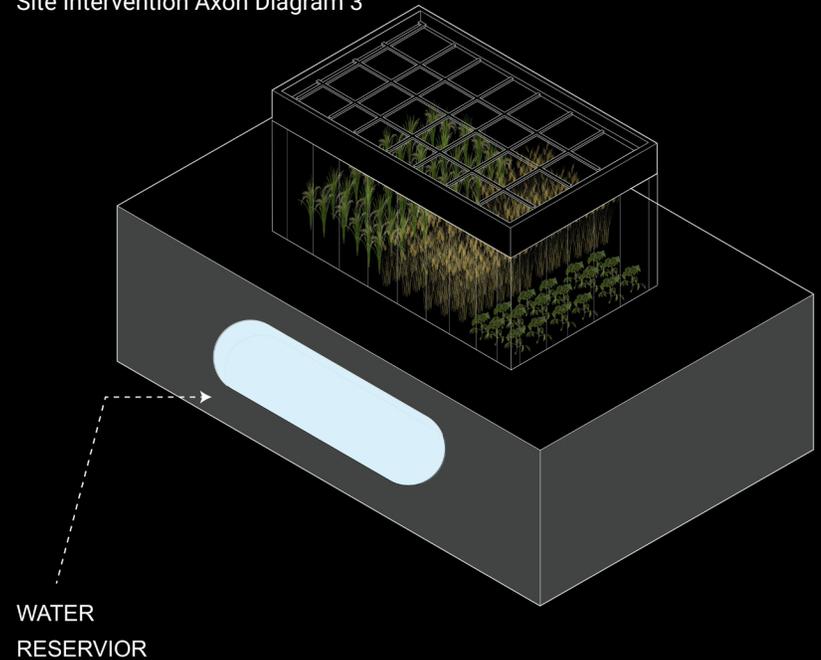


Figure 023
Site Intervention Axon Diagram 3



Experience Mapping

To create a community experience on this site numerous tests and renderings were done trying to depict the experiences of the community on this site after an adaptive reuse project had been completed. The existing site conditions such as the canopies could become glass capsules on the site protected from the weather and providing indoor programming. The existing billboards could become projection screens that could display movies and bring the community together to take part in a community gathering event. The hardscape could be replaced with greenery and a new site could be imagined. These sites from these explorations begin to express the habitability of these sites for humans, even if they were originally designed for cars and automobiles.



Figure 024
West Facing Photoshopped Perspective



Figure 023
South East Facing Photoshopped Perspective



Figure 025
South West Facing Photoshopped Perspective

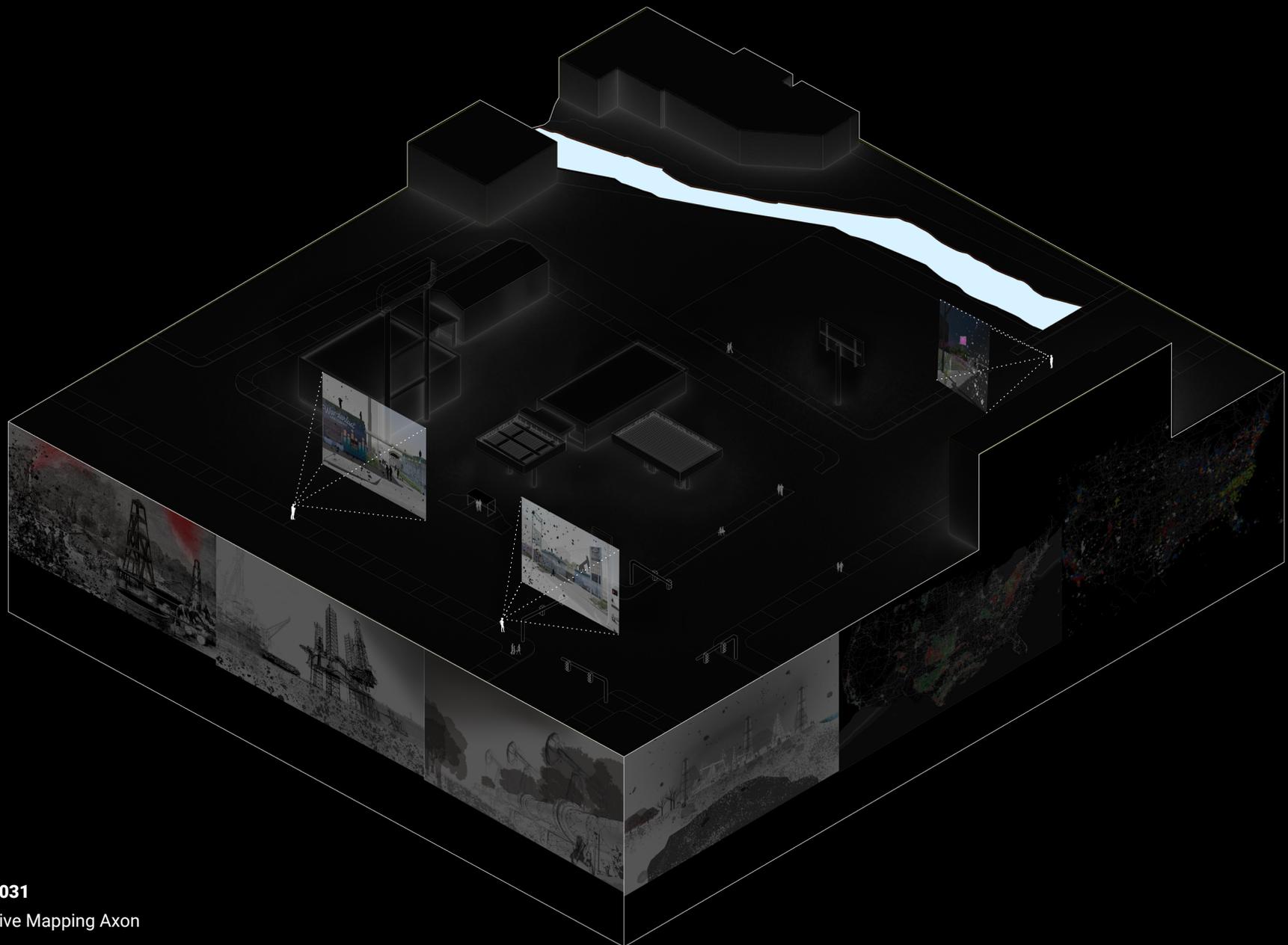
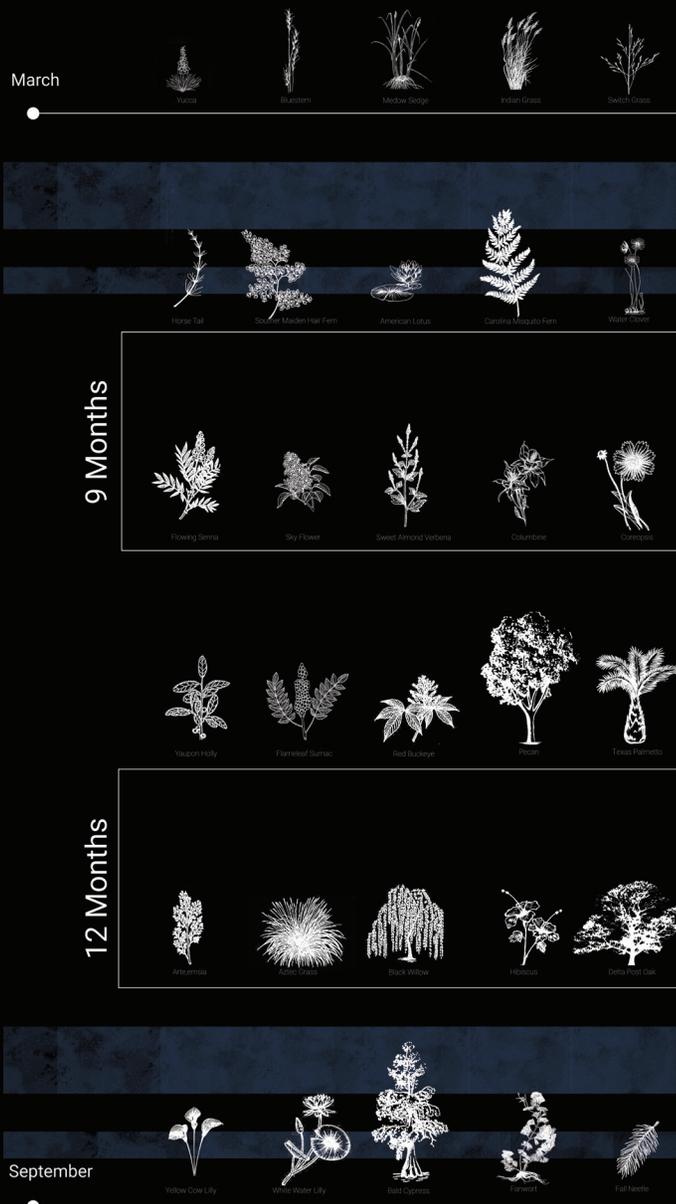


Figure 031
Projective Mapping Axon



Regeneration

The need for regeneration on this site would not take place overnight. It would be a long process that is expected to take over 18 months to bring back a thriving ecosystem. In figure 26 the timeline of what plants would come back after a certain timeperiod is shown. First would be the small flora that previously had existed around the site, mostly taking place in and around the water of the Waller Creek. Then after flooding takes place around March and June the flora in the river and on the park would begin to thrive with the newly deposited nutrients on the site. Slowly the fauna would become the landscape that could connect the community back to nature. The plants become incrementally larger and larger with the largest and slowest plants coming later in the timeline. The end goal of this would be to create an ecosystem that would extend past the site and create a systematic change in the whole of austin texas. This final step in the timeline would also bring back the animals that previously inhabited the site, and completes the relationship of people and nature as a single living entity.

Figure 026
Regenerative Plant Timeline



Figure 027
Existing Site Section

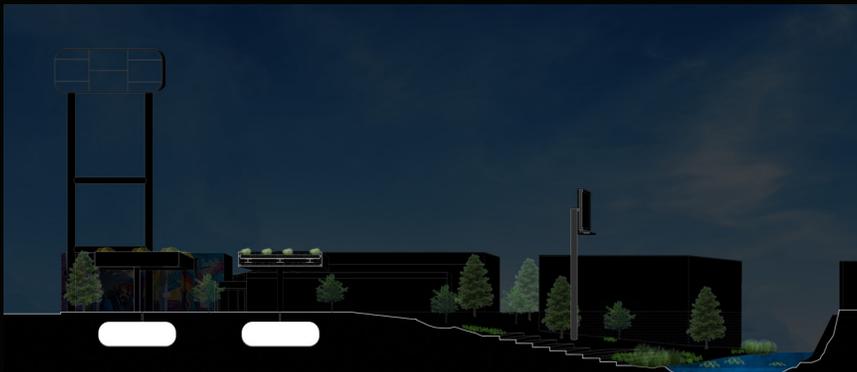


Figure 028
Site Section 6 Months After Intervention



Figure 029
Site Section 9 Months After Intervention

Regeneration Over Time

The timeline for bringing back both people and nature into the site is not as straight forward as producing a building, planting the landscape and inhabiting. The current framework bucks the typical construction trend discribed, instead it starts with the landscaping of the site which will take the longest time to be constructed without the help of people. Then after the site has begun to grow back and reaches a point of self sufficence and resilience to human contact, people will be reintroduced within the site. They will like the landscape be programmed into the site without boarders, but will not take precedent over the newly created ecosystem. Instead their space on the site will be delegated to certian areas with the landscape taking precedent over the human engagement on the site. This approach may be different than the normal route taken by developers, but it will help to create a more equitable connection with nature.

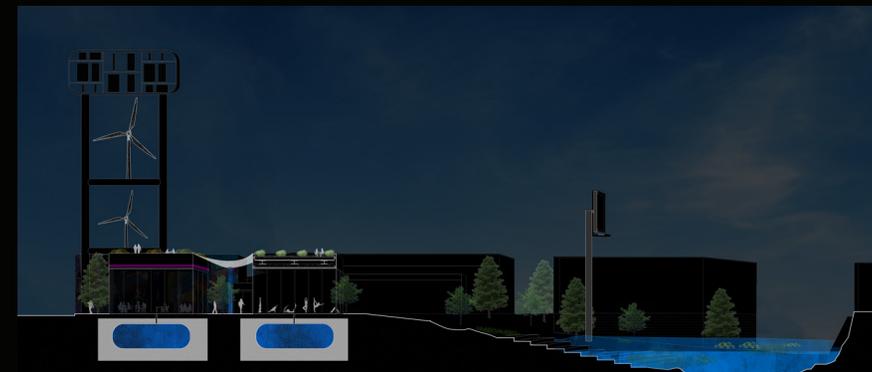


Figure 030
Site Section 1 Year After Intervention

PART IV | Outcomes

PART V | Critical Reflection