Lake, Land, and Sky: A Design Proposal for Northerly Island, Chicago

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CHAPTER 1

Introduction

1.1. Background

Shortly before midnight on March 30th 2003, without notice and at the orders of Mayor Richard M. Daley, bulldozers destroyed a small airport known as Meigs Field on Chicago's Northerly Island. Planes were trapped on the ground and other flights diverted (Fountain, 2003). This action, dramatic and of debatable legality, effectively ended the struggle between the Mayor's office who wanted the site for a park, and the state legislature who wanted to keep the airport open (in no small part for their own ease of commuting). With the airport now demolished, Chicago has turned its attention to developing a vision for the future of Northerly Island.

The island is, in fact, a ninety-one acre peninsula jutting into Lake Michigan from Chicago's downtown. Envisioned as a public park and constructed in the 1920s, it is the only lakefront structure in Daniel Burnham's famous 1909 Chicago Plan that was actually built (four other proposed islands were never created).

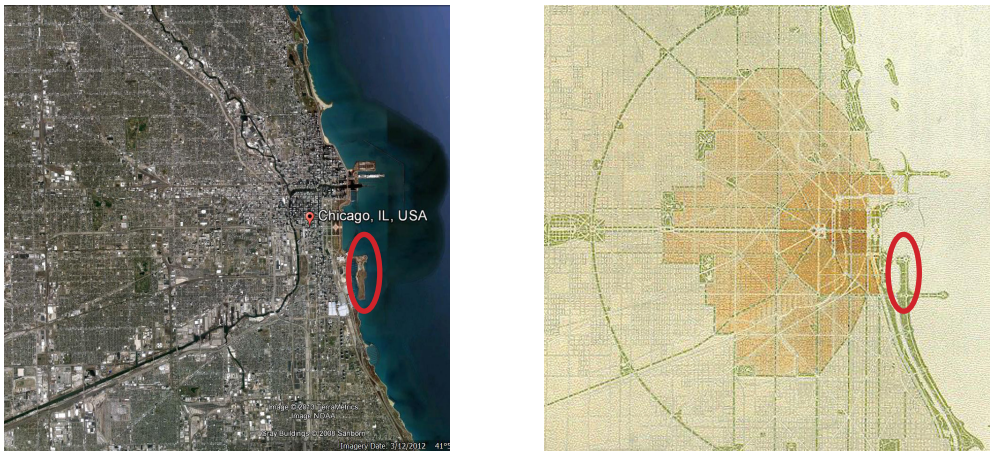


Figure 1.1. Chicago today (left) and in the 1909 Burnham Plan (right). Northerly Island is outlined in red. Image sources: Google Earth and Wikimedia Commons.

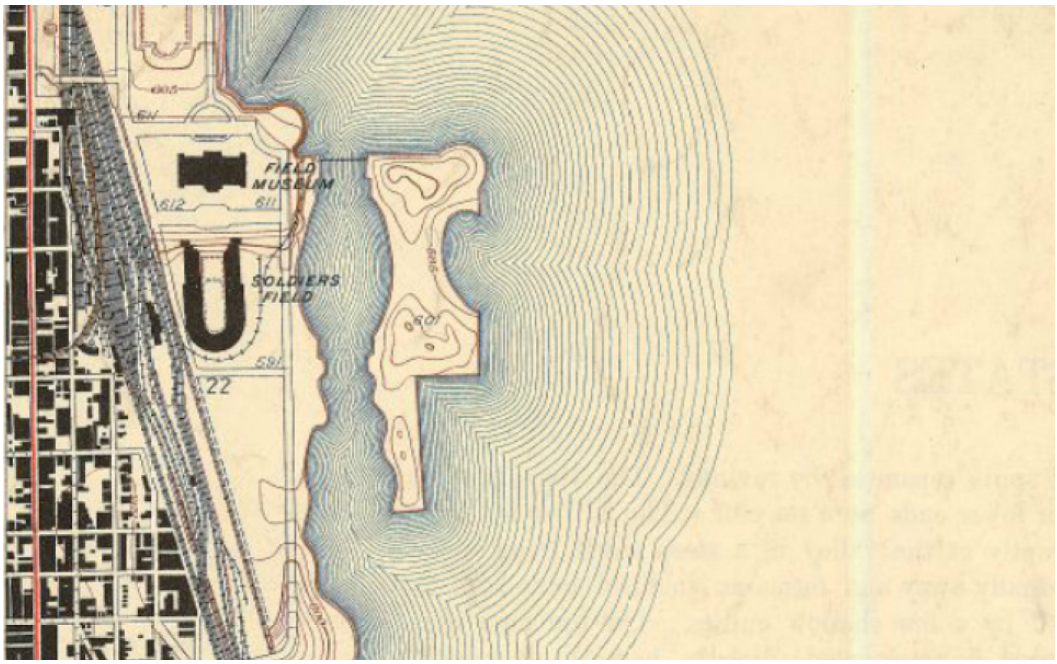


Figure 1.2. This detail from a US Geological Survey map from 1928 shows Northerly Island connected to the mainland by a bridge. Source: University of Chicago Historical Maps Collection.

The Adler Planetarium, now a National Historic Landmark, was built at the northern end of the island in 1930. It was the first planetarium to be built in the Western hemisphere and is the oldest planetarium in existence today.

Figure 1.3. Adler Planetarium seen from the Shedd Aquarium. Photograph by A. L. Weir.

In 1933 Northerly Island was the location for Chicago's second world fair (Figure 1.4, 1.5) and in 1947, now connected to the mainland by a causeway (a 1936 WPA project) that replaced the original bridge and having lost a bid to become the home of the United Nations, Northerly Island became the site of Meigs Field airport (Figure 1.6). Although some public facilities such as the 12th St beach and the planetarium continued to operate, the central idea of Burnham's plan, that of a large public park, was lost (Figure 1.7).

Today approximately one third of the island is planted up as midwestern prairie. In addition to the planetarium and beach, it is also home to a temporary pavilion (the Charter

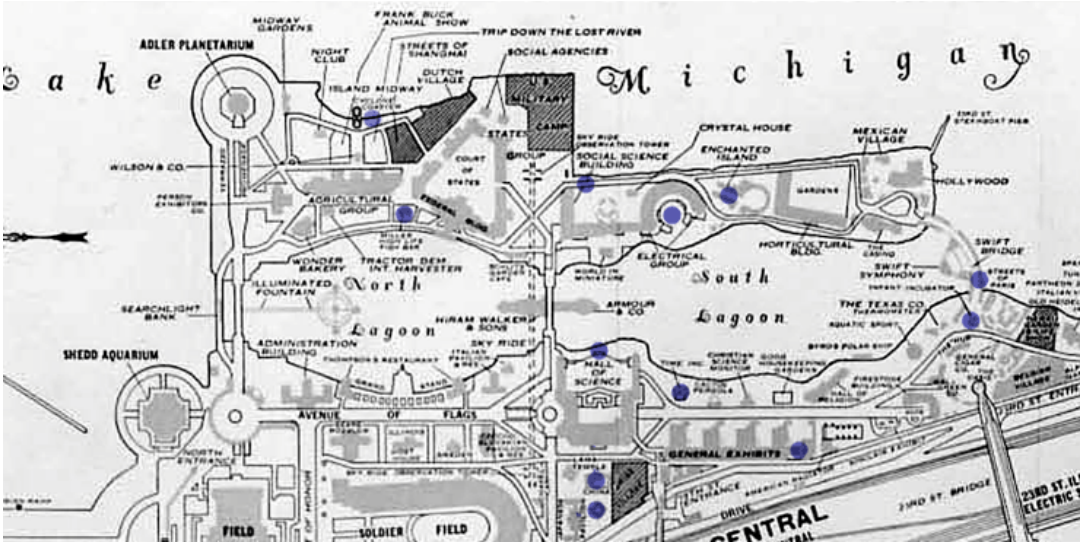


Figure 1.4. Detail from a map of the 1933 Chicago World's Fair. North is to the left and Northerly Island is at the top. Note the three bridges connecting the island to the mainland as well as the large circular plaza terminating the path to the planetarium. Source: cityclicker.net.

Figure 1.5. Detail from a panorama photograph of the 1933 Chicago World's Fair. North is to the left and Northerly Island is at the top in the background The three bridges connecting the island to the mainland are clearly visible. Source: Library of Congress.

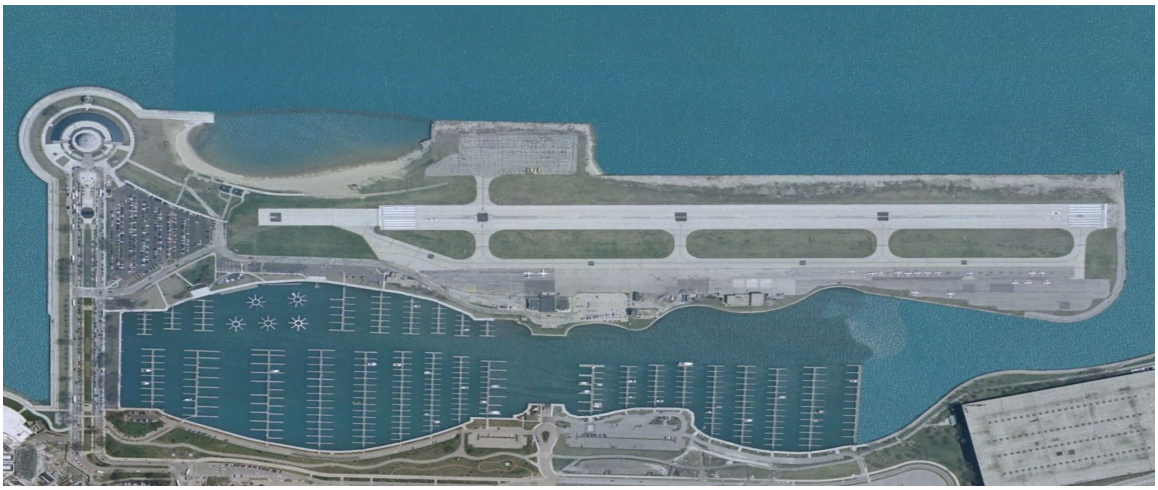


Figure 1.6. Meigs Field as seen from the air. North is to the left. Note also Burnham Harbor occupying the North and South lagoons. Source: USGS.

One Pavilion[1]) used for concerts and other performances, a loop trail popular with cyclists, and a public marina. The new public facilities were intended as temporary placeholders and, in part, to provide resistance to the reconstruction of Meigs Field, a development for which there is still active and vocal support (Johnson, 2005). Meanwhile the City of Chicago is moving forward with planning for a major park. The first framework plan, produced by JJR and Studio Gang Architects and published by the Chicago Parks District in November 2010, envisions a sustainable park that provides natural spaces, water activities, artificial reefs and even a sunken ship, and which connects to the Museum Campus (the new branding for the area containing the Adler Planetarium and the nearby Shedd Aquarium and Field Museum of Natural History).

Politically, however, the development of Northerly Island is under threat. The Daley administration long championed ecological and "green" initiatives (including a green roof on City Hall) but, after seven consecutive terms, Mayor Richard M. Daley announced he would no longer run. While the new Emanuel administration recently announced its commitment to the idea that Northerly Island should be a place for all Chicagoans to experience nature , it appears

1 The Charter One Pavilion has been redesigned and reopened as the FirstMerit Bank Pavilion. However, at the time of writing no details of the new pavilion were available. Accordingly the rest of this project will continue to refer to the Charter One Pavilion and its known design.

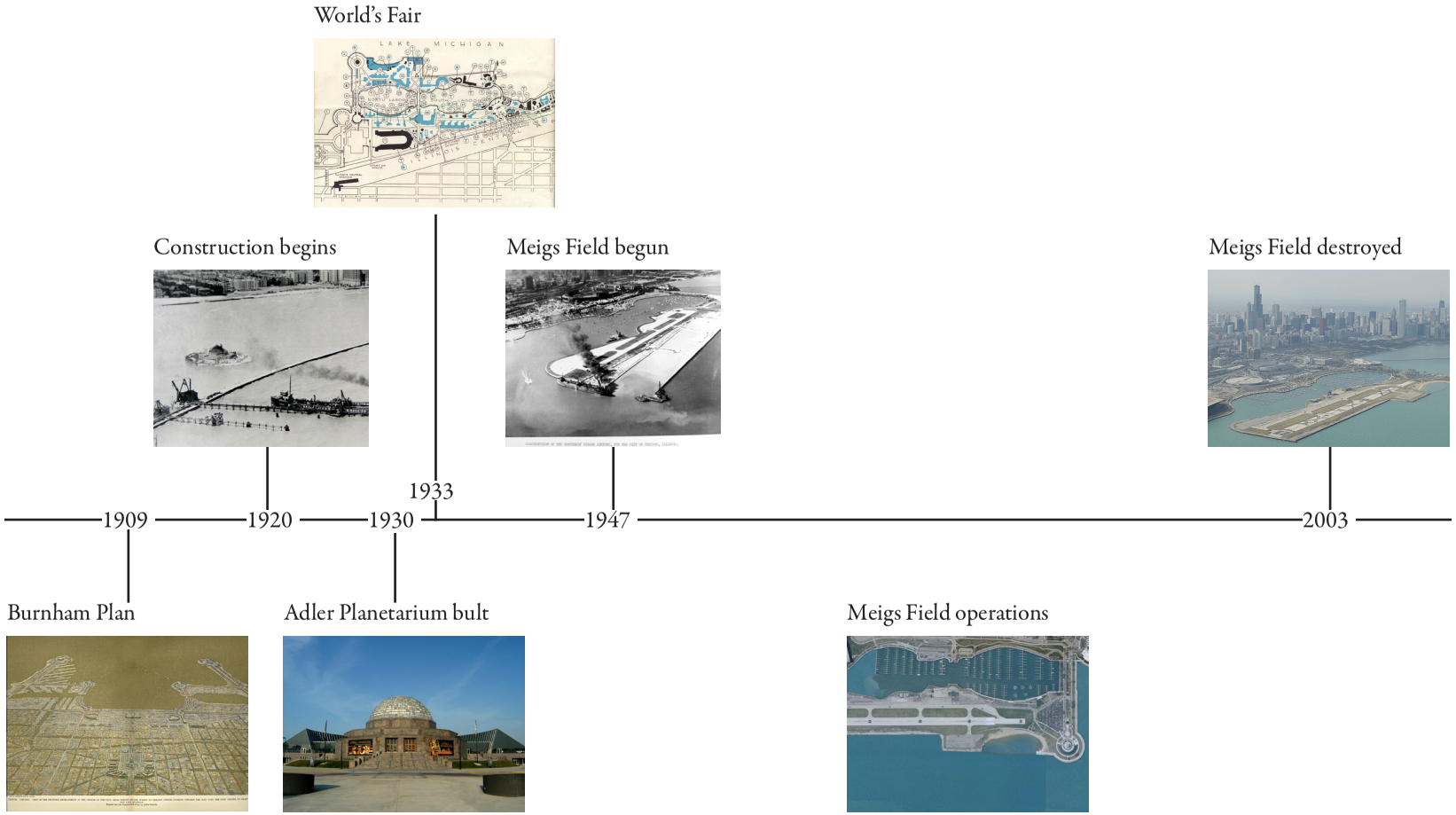


Figure 1.7. Timeline of Northerly Island construction. From left to right images are: Jules Guerin's illustration of Daniel Burnham's Chicago plan (localecologistblogspot.com), beginning construction of Northerly Island (Chicago Maritime Museum), Adler Planetarium (Adler Planetarium photos), a World's Fair map (Chicago History Museum), beginning construction of Meig's Field (Chicago Maritime museum), an aerial view of Meigs Field on Northerly Island (USGS), and an image of the airfield after it had been bulldozed (Wikimedia commons).

notably more lukewarm about actually developing the park. In announcing an urban camping program for Northerly Island (some 900 camping spots will be available of which 300 will be reserved for at-risk youth aged 12-15 who are part of the Wilderness Youth Program), Mayor Emanuel stated that "The other parts of the project, you know are very big and expensive." (Byrne 2012).The Chicago parks department also appears less committed to the vision of Northerly Island as a place to experience nature. A proposal to significantly expand the Charter One Pavilion to generate more revenue from ticket sales was only recently withdrawn after protest from a variety of citizen groups (though see footnote 1). In addition rumors continue to circulate about a possible casino development on the island (Bowman 2011).

Northerly Island thus stands at a crossroads. Physically it connects land, water and (through its historical connection with aviation and the Planetarium) sky. Socially, it connects the dense urban matrix of downtown Chicago to recreational open space and water. But from a landscape architecture standpoint, it connects a visionary plan for one of America's great cities to an uncertain future, poised between a unique opportunity for Chicagoans to interact with nature and for-profit development of the kind already in abundance along the Chicago shoreline.

1.2. Project Goal

This project will honor the intent of both Burnham's original vision and the current Chicago administration by designing a park for Northerly Island that is a resource for all Chicagoans, offering them an opportunity, unparalleled in the urban matrix of downtown Chicago, to interact with the natural world of lake, shore, and sky. Other design objectives will arise from the site analysis and literature review in the following chapters.

CHAPTER 2

Literature Review and Case Studies

2.1. Literature Review

An analysis of American parks (Cranz 1982) resulted in four typologies, each characterized by date (roughly generational in duration), design, social agenda, and stakeholders. These are: the Pleasure Ground (1850-1900), typically large, pastoral environments on the edge of a city aimed at public health and social reform (examples include Central Park in New York, Grant Park in Chicago); the Reform Park (1900-1930), located on a city block scale to provide access for poorer neighborhoods and with an emphasis on play equipment for children (e.g. Park no. 540 in Chicago's South Loop near Northerly Island); the Recreation Facility (1930-1965), a largely suburban system of active recreation facilities such as basketball, baseball fields, etc. (e.g. the McFetridge Sports Facility in Chicago); and the Open Space System (1965-?), a network of varied, free-form sites with the social goals of revitalization and participation (such as Paley Park in New York or Burnham Park in Chicago). Although subject to some criticism (ignoring the impacts of parkways and the automobile for instance, or the effects of crime or the perception thereof, e.g. Stilgoe 1983), this analysis is widely accepted today (e.g. Shores 2010).

Recently Cranz and Boland (2003, 2004) have sought to extend this analysis to a fifth, emerging, type, that of the Sustainable Park. There are three main characteristics of this proposed typology; resource self-sufficiency, integration into a larger urban system, and new modes of aesthetic expression. Each of these principles can, of course, be addressed in a variety of ways and with a varying degree of emphasis. Furthermore, not all applications of these principles are unique to sustainable parks. Indeed, many of them now form aspects of best practice management techniques at parks of all types or can be found in earlier park designs. Resource self-sufficiency, for instance, can include sustainable construction techniques (in the case of Crissy Field, a former airfield on the shore of the San Francisco bay and now a popular park, 15,000 tonnes of rock debris from the shoreline and over 40 acres of asphalt and concrete were removed, ground up, and used as fill on site, Porter 2003), composting (adopted by many

park systems, including New York's Central park, where its use both improves soil and reduces disposal costs), pervious paving to promote infiltration and groundwater replenishment, and plant choices that eliminate the need for fertilizers (clover lawns to replace grass for example which can also produce savings in reduced mowing).

Integration into the larger urban system includes amongst other elements, using the park to collect and clean run off from surrounding impervious surfaces, connection to existing transportation systems (e.g. parkways, bike paths), heat island mitigation, and community building. Again we can find instances of each of these in more traditional parks: Boston's Emerald Necklace was designed as a park and water management system; bike paths are an integral part of many park systems (e.g. Chicago's 18 mile Lakefront Trail extends through Burnham Park); the cooling effect of parks in the urban environment has long been known and is true of all parks that contain sufficient vegetation; and intentional community building in parks goes back at least to the Reform Park with its "clubhouses for the working classes" (Cranz and Boland, 2003) if not before.

The third and final characteristic of a sustainable park is that of new modes of aesthetic expression. As examples Cranz and Boland (2004) give developing appreciation of natural plant communities over more traditional park planting schemes, explicitly embracing temporality in the park design, and making ecological processes legible. As explicit design elements, the implementation of these ideas are rarer in more conventional parks. Instances, however can still be found such as native plant restoration in Central Park (e.g. DeCandido et al. 2007), and the recreation of tidal marshes in Crissy Field (Porter 2003). Clearly addressing temporality, the allowance of unplanned changes and uncertainty is rare in more traditional park design but it may be found in ecological management practices (in forestry for example. disturbances such as fire form an integral part of long range planning). One instance, however, is the Natur-Park Südgelände in Berlin. In this nature reserve, formerly an abandoned freight train yard, sections of the park are deliberately being left to their own devices with no intervention although others are being managed to keep them in preferred states of succession for ecological and aesthetic

reasons (Kowarik and Langer, 2005).

What distinguishes the Sustainable Park from earlier park typologies is not the presence of any one or two of these above sustainable approaches, examples of which can be found in many other parks, but the intentional inclusion of a significant number of them as part of a deliberate design philosophy.

A key component of the Sustainable Park is ecological function. Lister (2007) differentiates between what she terms designer ecology and ecological design. Only in large parks (greater than 500 acres), she argues, can a true operational ecology emerge: that is, one that contains enough biodiversity to be truly resilient and thus sustainable. Smaller parks are characterized by "designer ecology" (her coinage), an ecology that is "vital, indeed essential, for educational, aesthetic, spiritual, and other reasons" but which is also characterized by a management approach predicated on certainty and control. Only when functionally connected through strong landscape linkages such as large greenways can smaller parks develop real sustainable ecologies. Lister's argument may be valid in some senses (apex predators such as wolves, for instance, require large ranges) but is predicated upon a definition of ecology that includes the whole range of land-based flora and fauna. What of smaller areas connected by aerial migratory routes, or with shorelines that connect to large bodies of water? Must any creation or restoration of habitat there be dismissed as "designer ecology," aimed at meeting primarily human values? It appears clear that even small parks such as Crissy Field can provide habitat that serves many species of bird and marine life (National Park Service 2011) but a literature search has failed to retrieve any research that defines what is, and is not, an operational ecology in this context. Indeed, it may well be that it is simply too early in the lives of such parks to make that determination at all.

A more fundamental objection to the "designer ecology" criticism comes from the emerging area of landscape urbanism. Despite being, in some ways, "still a fuzzy cluster of rhetorical positioning and largely unsubstantiated by work on the ground" (Weller 2006), landscape urbanism can be taken to be

> "the conceptualization of and design and planning for urban landscapes that draw from an understanding of, variously, landscape's disciplinarity (history of ideas), functions (ecologies and economies), formal and spatial attributes (both natural and cultural organizations, systems, and formations), and processes (temporal qualities) impacting many scales of work. Landscape urbanism also suggests a particular culture of and consciousness about the land that refrains from the superficial reference to sustainability, ecology, and the complex processes of our environments in favor of projects that actually engage them." (Czerniak, 2006).

In this view, the site is embedded in a system of processes and flows that connect it to the surrounding environment at a multitude of scales and on a variety of levels (social, ecological, aesthetic, etc.). Furthermore, the ecology of the site is not seen as somehow "less" because of size. Rather, the ecology is what is there and can be engaged with, of worth whether the site is a large national park or a small green square in the city. A small park in an urban matrix can have significant and real ecological function when properly viewed in the larger context. Examples of such function include infiltration, urban species habitat, carbon sequestration, and many others.

The issue of designer ecology is also present in Gobster (2007), although not by that name. The author argues that ecological park design in an urban context "must pay as much attention to human values related to the experience of nature as it does to ecological values such as ecosystem health and biodiversity." He would thus seem to embrace the idea of designer ecology as valid, even important, in a successful park that can help dissolve the barriers between the urban experience and nature. What does concern the author, however, is that in many cases restoration projects lead to "museumification," a process in which "everyday places or subjects of the everyday world are transformed in ways that can lead people to think and act towards them as if they had been placed in a museum," the result of which is that people change their behaviors towards such places or subjects, viewing nature instead as an artifact under human control. The Lobos Creek restoration in San Francisco is a case in point. An overgrown meadow and forest is now being extensively restored to native dunes and access. Once free and uncontrolled, access is now limited to a small circular boardwalk trail where native plants are displayed for viewing

complete with educational signage. The Lobos Creek restoration project was visited by this author and while the care and commitment of those involved is evident, the overall experience is one of being tightly controlled with no opportunity for active engagement, only passive learning and enjoyment.

Such adult and preservationist approaches severely limit the kind of nature experiences available, especially to children. As Miller (2005) points out, many rewarding childhood activities are based on an interactive, even destructive interaction with nature (digging holes, picking flowers, etc.) and can be seen to be at odds with ecological preservation and restoration Much attention has been given to so-called "nature-deficit disorder" (Louv 2005) and the need for unstructured and creative play in a naturalistic setting, complete with opportunities to climb trees, splash in streams, and simply explore off the beaten path. Louv, based on extensive interviews and National park attendance, argues that fearful parents made paranoid by sensationalist media, reduced access to nature (driven, in part, by an increasingly litigious culture as well as the desire of restorers to protect their work from human impact), and the lure of the "screen" (videogames, computers, etc.) have all acted to limit childhood exposure to unplanned activities in natural environments. The consequences of this, he claims, are increased levels of attention-deficit disorder, depression, and obesity amongst children. While nature deficit disorder is not officially recognized as a disorder as such, there is independent evidence supporting some of Louv's argument. Rachel and Stephen Kaplan (1989) found that people were more relaxed could concentrate better after spending time in nature or, indeed, after just looking at pictures of nature. This Attention Restoration Therapy (ART) has been subsequently confirmed in multiple studies, pointing to the importance of exposure to natural stimuli in terms of prolonged mental health and academic performance.

Despite the benefits, however, getting children, especially urban children, to play in nature can be difficult. Kong (2000), in a series of interviews, found that many urban children preferred activities such as shopping, skateboarding, computer games, and the like over activities associated with nature which were "boring" and closely associated with schoolwork, echoing

Louv's points above. At the same time parents were often overly anxious (especially in cases where those parents themselves had little direct experience of nature) and communicated this to their children.

There is research, however, indicating that children have certain preferred types of landscape that they are drawn to and this may help overcome some aversion. Balling and Falk (1982) found that children aged 8-11 showed a clear preference for pictures of lush, green savannas over other biomes, while Gobster (1992) found that 6 to 10 year old children showed a preference for parkscapes with large grassy areas and a disliking for thickly forested vegetation that was variously described as "scary" and a place where one could "get lost." Similarly, in a study of children's responses to landscape paintings, Fisher and Shrout (2006) found that prospect, or the ability to see into the distance, was the main factor in determining the "atractiveness" of a painting, indicating that children have an innate desire to be able to see into the distance.

Like children, other groups have also frequently been poorly served by park design. Cranz (1982) points out that, historically, women were relegated to secondary roles in consideration of potential park uses, being seen only in subsidiary recreational roles. While this is almost certainly no longer the case, it is clear that women perceive some issues (notably safety) differently from men. Sustainable landscapes, with their often unkempt appearance, can be read as potentially dangerous by over half the population, an attitude that can be easily transmitted to their children further reinforcing the effects noted above by Louv and Kong. Nassauer (1995) has suggested that such landscapes can be made to appear intentional, and thus both safer and more deserving of respectful behavior, through the use of "cues to care," i.e. visible design elements such as definite edges, mown paths, and other forms of landscape language that place the landscape in context. Experiments with photosimulations of different treatments of suburban lawns showed that evidence of intentionality of a particular ecological approach (i.e. that the "scruffy" ecological lawn was deliberate and planned) made it more acceptable to the average person.

Ethnicity and socio-economic class have also played a factor in who actually uses, or is permitted to use, created open space. Poorer residents and children under the driving age rely more on public transport than other groups. Poor public transport connections to a site can thus discriminate against their use of the area.

Rules intended to provide tranquil experiences of nature (e.g. noise restrictions, limits on ball games, barbecue bans etc.) can be seen as hostile by cultural groups used to large informal outdoor gatherings. Gobster (2002), in a study of Chicago's Lincoln Park for instance found that "significant numbers" of Latinos and Asians came in large groups and this author has witnessed large groups of Russian emigres carrying out everything from barter to barbering in "their" corner of the park. In addition, different ethnic groups show preferences for different park amenities, and the presence or absence of these can seem hostile. Gobster (*ibid*) found that "natural environment" (compared to cultural facilities and activities) was the most highly rated property of Lincoln Park across all racial groups and that access to the lake shore and to sand beaches were the highest rated amenities within this category but that provision of facilities for some activities (boating, for instance, seen as a predominantly white activity) was occasionally perceived as racist by groups who preferred other events.

The lack of recognition of a group's historical role in a place can also result in their rejection of a park or open space (Low et al. 2005). The erasure of a site's history, natural or social, is an issue faced by would-be park designers. In the urban context it is extremely unlikely that any location is free of a complex, even occasionally unpleasant, history. This can range from the uprooting, even genocide, of indigenous peoples, and deliberate pollution and habitat destruction, through to more benign previous uses. Huxtable (1997) referred to the danger of "Disneyification," that is of rendering a site in some sanitized version, free of potentially troubling elements and past. Even the groundbreaking Landschaftspark Duisburg-Nord, noted for the way in which it has incorporated the site's past heavy industrial use into its design and programs, has come in for criticism for failing to make explicit the history of Jewish slave labor in its factories (see e.g. Hargreaves, 2007).

The consideration of time in the evolution of a site leads to temporality, mentioned earlier, and a key component in much writing of landscape urbanism theorists. Here the focus is less on the past than on the future, i.e. how the site may evolve. Corner (2006) for instance emphasizes processes over time as one of the four key themes of landscape urbanism. By this he means that any particular spatial form is "merely a provisional state of matter, on its way to becoming something else" as "dynamic relationships and agencies of process" act out their complex, unpredictable dance." Actors (such as organisms) within an environment act to shape and evolve that environment and are, in turn, shaped by it. The result is a continually evolving and inherently unpredictable system which landscape urbanism must address.

Weller (2008) on the same topic clarifies the role of temporality in landscape urbanism as the need to "emphasize the creative and temporal agency of ecology in the formation of urban life" as opposed to envisaging "an ideal equilibrium between two entities formerly known as culture and nature" and to "understand and manipulate the forces at work behind things" and emphasize less "the resultant aesthetic qualities of things." Other landscape urbanist theorists have also written prominently on this topic.

However, actual examples of this temporality in designs are hard to find. In fact Steiner (2011), noting that there are "very few realized works" in his discussion of landscape urbanism, mentions only three; Fresh Kills, the High Line, and StossLU's competition entry for the Lower Don Lands. Of these, one is built (the High Line), one is underway (Fresh Kills), and one will not happen (a losing competition entry, RIVER+CITY+LIFE by StossLU). Fresh Kills landfill in New York is the site for one of the best known recent park proposals in the US. Lifescape, a James Corner Field Operations project, is a plan for the 2200 acre former landfill that explicitly embraces temporality and is examined in more detail in section 2.2. One built project, generally held in the literature to be an example of landscape urbanist design, is the High Line.

Formerly an abandoned elevated railway line running from Gansevoort Street in the meatpacking district to W 34th street between 10th and 11th avenues, this High Line, also by James Corner Field Operations, is one of New York City's newest parks and rapidly becoming

one of its best known and most popular. Overall the High Line has met with much acclaim and has rapidly become a major tourist attraction in addition to a popular destination for New Yorkers. However evidence of temporality is hard to find. In fact, just the opposite. While a spectacular park the overall experience can be one of "patrol and control." The plantings, while reminiscent of the original urban wilderness that grew on the abandoned railroad, are in fact by renowned designer Piet Oudolf and rigorously maintained. The left-over railroad tracks alluding to the site's past were removed and cleaned before being returned to the park. Rendering the elevated superstructure safe exceeded the estimated cost of demolishing it. Park rules (no dogs, no ball games, etc.) are plentiful. All these leave the park open to the same charges of false nostalgia and "Disneyification" that are often leveled at Postmodern neotraditionalists such as the New Urbanists while posing the question of what does temporality actually look like?

One example, mentioned earlier, is the Natur-Park Südgelände in Berlin. Due to Berlin's somewhat unique and complex history a rail freight yard some 45 acres in size lay essentially abandoned from 1945 until German reunification in 1990. During this time the site was colonized by a mix of native and non-native plants leading to a patchwork mosaic of dry grass, woodlands, and shrubs. Now a park and nature conservation area, different maintenance approaches are taken to these different biomes. In some areas woodlands are left to develop on their own, emphasizing the important role of non-native species in recolonizing abandoned industrial areas. In others, especially grasslands where diversity is high and a number of endangered species dwell, maintenance programs prevent succession to woodland and visitors are kept at bay by cues such as path morphologies (Kowarik and Langer 2005).

It is not hard to see why designers may be uncomfortable with letting a site such as a park evolve in an uncertain direction. Costs are high (Chicago's Millennium Park came in at over 100 million dollars) as are the career implications of failure. Natural systems tend to be dynamic, complex, and unpredictable. Engaging with such systems, while providing unique opportunities, also presents challenges and the possibility of expensive failure. The tidal marsh at Crissy Field is a case in point. Despite advanced modelling using years of wave and tide data,

the marsh inlet silted up and closed after just 1.5 years instead of the predicted 30-50 years and had to be dug open again. In fact, it closed and was reopened on several occasions although it now appears to be stable due to the formation of new sandbars in the San Francisco bay (McIlvaine 2006).

A way to address the possibility of failure can be found in the field of green infrastructure, taken here to mean the various approaches whereby traditional "gray" urban infrastructure such as storm drains are replaced with biological components such as rain gardens, infiltration swales and the like (the same term is also used by some authors to refer to more regional scale networks of open space and natural areas). Innovative techniques and frequently hard to quantify performance mean that such systems can be regarded with mistrust by more conservative decision makers. Ahern (2010, 2011) suggests a safe-to-fail approach in which multifunctionality, redundancy, modularity, connectivity, diversity, and adaptive design all combine so that even if some aspect of a green infrastructure installation fails at one of its designed tasks, it will continue to function at others (e.g. a rain garden may not infiltrate as planned but can still provide habitat) while the rest of the green network picks up the slack (e.g. infiltration swales will deal with the water from the failed rain garden). An important element of this approach is monitoring so that lessons can be learned from both successes and failures. In short, innovative design approaches should be pursued but no one of them should be an opportunity for single point failure.

In conclusion then, a successful design for a small, sustainable park should provide valid ecological function and habitat through multiple innovative designs while promoting full interaction with nature, especially for children, for large numbers of visitors with diverging, even competing, agendas, all while respecting the site's history and context and while preparing for an uncertain future.

2.2. Case Study: Crissy Field

Crissy Field is a successful and widely admired 100 acre park on the shore of the San Francisco Bay and a former military airfield. Designed by Hargreaves Associates and opened to the public in 2001, it includes nearly twenty acres of restored salt marsh, a thirty acre public lawn and amphitheatre, an off-leash area for dogs, a running track, a one and a half mile promenade that includes wheelchair accessible dunes and beach, and an educational center

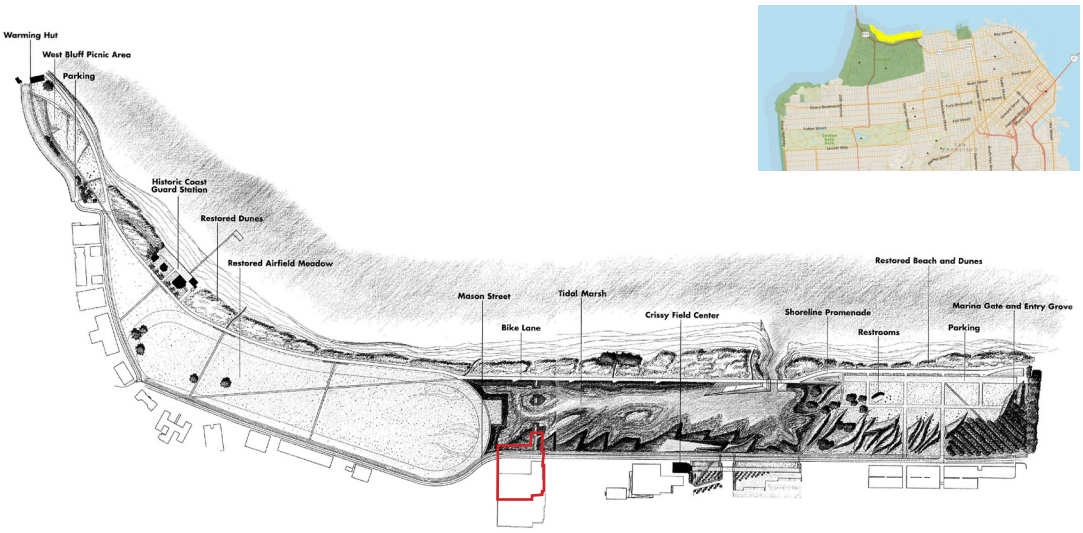


Figure 2.1. A sketch of Crissy Field. The tidal marsh is to the east (right) while the kidney shaped lawn area in the west marks the original airstrip. Source: Boland (2003). The inset locator map shows the San Francisco peninsula with the Presidio in green and Crissy Field in yellow. Source: Adapted from Google Maps. The building outlined in red is used as a reference in historical maps shown later

(Figure 2.1). It connects to an extensive system of trails in the Presidio and to the California Coastal Trail as well as abutting the popular Marina district of San Francisco with its many tourist attractions such as the Palace of Fine Arts and the Exploratorium. Additionally the park offers spectacular views across the bay of the Golden gate Bridge and the Marin headlands (Figure 2.2).

Historically the area where Crissy Field now lies was part of the range of the Yelamu tribe of the Ohlone people, hunter gatherers about whom little is known. The Presidio de San Francisco (a garrison) was founded in 1776 by a Spanish expeditionary force as part of Spain's

Figure 2.2. Restored dunes at Crissy Field on a foggy day. Source A. L. Weir

attempts to gain control over Alta California (Langellier and Rosen 1992). After settlement the Ohlone were used for forced labor, devastated by disease, and extinct within two generations (Milliken 1995) .

After briefly being in Mexican hands, the Presidio passed to the US in 1846 when America seized California. President Fillmore continued the use of the Presidio as a military base, declaring it a military reservation in 1851.

US occupation of the Presidio and the growth of San Francisco as a city had major effects on the shoreline which, at that time, consisted largely of tidal marshes and lagoons (Figure 2.3). Waste from the 1906 San Francisco earthquake was dumped there, for instance, just as waste from the Great Fire of Chicago was used, in part, to construct Grant Park just next to Northerly Island or, indeed, the way debris from the 9/11 attack in New York was incorporated into the Fresh Kills landfill which had already been closed. However, the greatest change occurred when the marshes and several coves were filled to provide a site for the Panama-Pacific International Exposition in 1915 (Figure 2.4). In 1921 the US Army founded Crissy Field, the first Air Coast Defense Station on the western coast where a polo field and race track

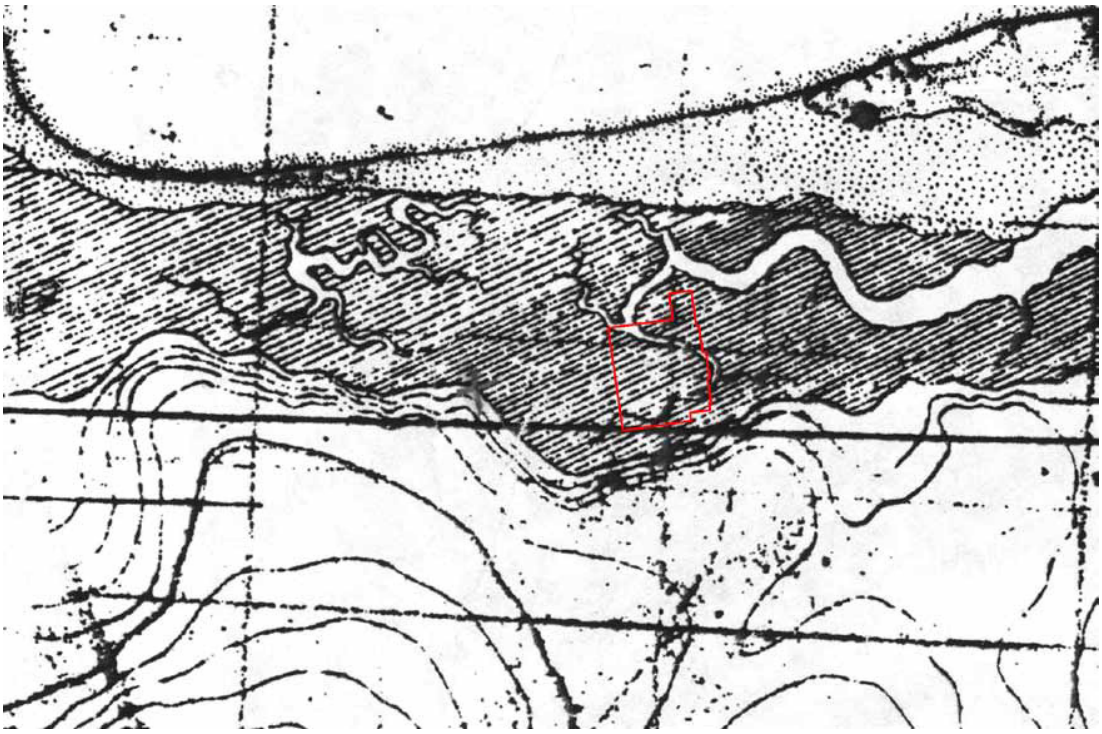


Figure 2.4. A map of the middle portion of Crissy Field from an 1851 US Coast and Geodetic survey. The red building outline can be used to reference the map against Figure 2.1 Note the marshy mix of drainage channels, sand, and mud at the foot of the Presidio hills. Source: Presidio Trust (2011).

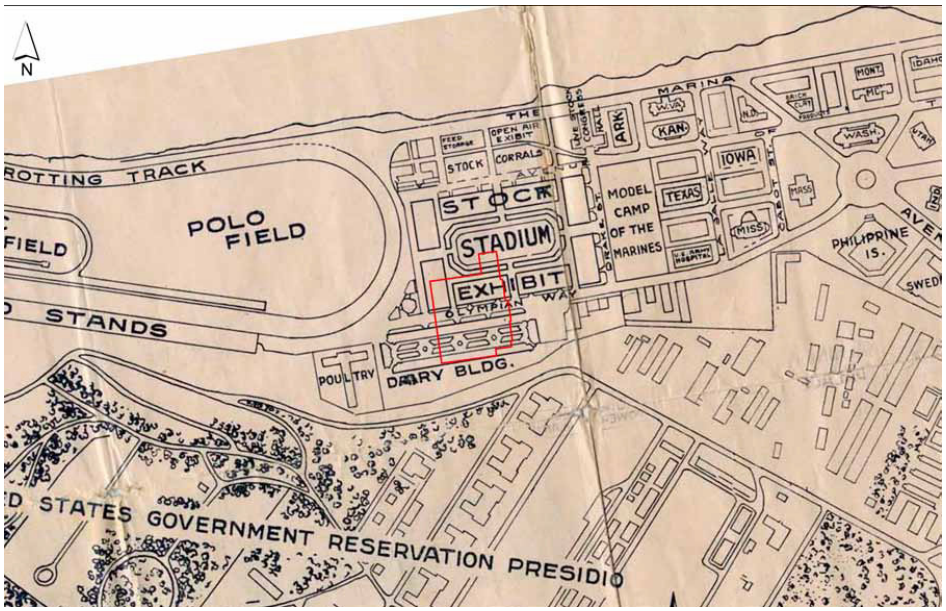


Figure 2.3. A map of the middle portion of Crissy Field as it was during the 1915 Panama Pacific International Exposition The red building outline can be used to reference the map against Figures 2.1 and 2.2. The polo field and running track become Crissy Field. Source: Presidio Trust (2011).

had previously existed (the Air Force did not become a separate entity until 1947). Crissy Field continued to operate until 1974 although frequent bad weather and the Golden Gate Bridge (started in 1933) meant it was abandoned as a primary facility in 1936 (Haller 1994).

The US Army continued to occupy much of the Presidio until 1994 at which time it was turned over to the National Park Service. By this time a portion of Crissy Field was already part of the Golden Gate National Recreation Area (established in 1972 and including areas as diverse as Alcatraz and Muir Woods, Benton-Short 1998). Further complicating the issue, Congress removed control of much of the Presidio from the NPS in 1996 and created the Presidio Trust, a non-profit partnership tasked with making the Presidio self-financing and reporting directly to Congress.

Because of the complex changes in management, planning for the final form of Crissy Field as it exists today was actually the fourth such undertaking. Furthermore, Hargreaves Associates, who were hired in 1997 to carry out the site planning and design, were bound by an overall management plan created during the third process when a site as large as 140 acres had been envisaged. The initial proposal, that of an urban park, had now evolved to one balancing advocates of historical preservation (the airfield and, later, an Ohlone archaeological site), active recreation (especially windsurfers and dog walkers who used Crissy Field as an off-leash area), and ecological restoration. The planning process, which took six years, was described as "contentious" but also characterized by "increasingly larger turnouts" (Hargreaves Associates, 2012).

Of especial interest is the tidal salt marsh and dunes restoration. By the time of the fourth plan, the area for the marsh had been reduced from a possible high of 60 acres to just 20 (and was further reduced to 18 acres to preserve an Ohlone shell midden uncovered during excavation). At the time of the Hargreaves plan, it was unclear if a tidal marsh this small was even feasible. Nor, in fact, were the intentions of the Presidio Trust regarding the watershed which drained into Crissy Field and the proposed marsh area any clearer. The designers'

response was to develop a proposal that was "precise and fixed" in some areas but "deliberately open and evolutionary" in the eastern portion where the marsh was to be (Boland 2003).

Even after the marsh had been deemed possible, the consultants (Philip Williams and Associates, Ltd.) warned that the inlet connecting the marsh to the bay could cause erosion of the East Beach (the site, by now, of no less than four world cup windsurfing competitions) though it was expected to recover, and experience closures due to siltation (estimated at occurring after 30-50 years) and require manual excavation to reopen it (Williams and Josselyn 1996).

Beach erosion did indeed occur. The tidal inlet channel was opened in November 1999 and by 2001 the East Beach had been reduced from 1100 yards in length to just 70 (McHugh 2001). The National Park Service brought in over 3000 cubic yards of sand to replenish it but erosion continued and protests from windsurfers and others mounted. However, the consultants proved correct in their prediction of recovery and by 2004 the beach had achieved a net gain of nearly 17,000 cubic yards (Ward and Ablog 2006).

The consultants were wrong, however, about closures of the tidal inlet. The first such happened after only one and a half years and require mechanical opening. Closures have continued to recur (Hanes et al. 2011 found that this is likely due to littoral transport of sand during periods of large, oblique waves overwhelming the scour potential of the tidal flow in the entrance channel) as have occasional reopenings and the NPS has gradually changed its response from excavating the inlet immediately to monitoring water quality in the marsh and intervening when required.

Despite the closure problem, the marsh is widely viewed as a success. There is evidence that significant wildlife habitat has been created. National Park Service monitoring has found that more than 25 species of fish use the marsh as nursery and for feeding while over 100 species of birds visit at various times of the year as they move along the Pacific Flyway (Ward and Ablog 2006). The marsh is also often admired for its aesthetic qualities (Boland 2003). One thing in particular that may help the latter is a modern bridge that crosses a portion of the marsh (Figure

Figure 2.5. Bridge over the tidal marsh at Crissy Field. Source A. L. Weir

2.5). This allows visitors to view the marsh from "within" but also makes clear the intentional and planned nature of the area, a phenomenon shown to make the "unkempt" and "wild" appearance of more naturalistic plantings more acceptable to the general public (Nassauer 1995). Boland (2003) described the restored marsh as " wildlife habitat, an educational facility, a scenic attraction, a recreational resource, a "sacred place", and on ongoing scientific experiment." In fact the NPS continues to monitor and report on many aspects of the Crissy Field restoration such as beach depth, wildlife, revegetation, and so on.

Community also plays a major part in the story of Crissy Field. Although most of the total $33 million dollar cost came from private donations, over 92% of the number of donations were from individuals and for under $100 (O'Neill 2004). Over 3000 volunteers did park clean

up, weeded invasives, and planted over 100,000 examples of native species. Volunteer groups continue to help maintain the park. In addition, the Golden Gates National Parks Conservancy (GGNPC), a non-profit partner of the NPS, operates a number of programs on site including summer camps aimed at "children and youth who traditionally have not visited national parks" (GGNPC undated).

Buried pollution was also a problem at Crissy Field. Petroleum and related pollutants were present in significant amounts in the soil due to the site's history. Two main approaches to remediation were applied. The first was simply careful design to avoid daylighting buried contaminants wherever possible. The second was low temperature thermal desorption in which contaminated soil is excavated and heated. Adsorbed hydrocarbons are "cooked off" and the soil can be returned to the ground. This was done, on site, for nearly 4000 cubic yards of contaminated soil, reducing the costs and impact of transporting the soil to a treatment facility and back. Similarly soil excavated to create the marsh (230,000 cubic yards) was used to elevate and define the lawn area in order to balance cut and fill on site. Rubble, asphalt, and gravel (the site was originally 70% paved) were crushed and used as fill under the boardwalk and other areas (Hargreaves Associates, undated).

Today Crissy Field is a major success with attendance between 2 and 4 million annually (the exact number is unclear). It has hosted community wide events such as the Bay to Breakers Run and international competitions (e.g. the Americas Cup). On sunny days the park is busy with all manner of activities and even on cold foggy days, the park draws a good number of people such as dog walkers, bird watchers and city residents who simply appreciate the reprieve from the heavily urbanized downtown.

As might be expected, there are some park aspects that do not appear to have worked as intended. An amphitheater at the west end is little used, perhaps because the educational center is at the opposite end of the park. Mounds meant to reproduce the "convoluted landforms generated by bracing wind and wave attacks on an otherwise relentlessly flat site" (Hargreaves

undated) make dramatic pictures when properly lit and viewed from above but on the ground their purpose is unclear and even confusing.

However these are minor quibbles compared to what was achieved. Crissy Field balances ecological restoration, community creation, historical preservation, and active recreation, all while sandwiched on a tight space between a heavily urbanized downtown and open water.

2.3. Case Study: Fresh Kills Park

Fresh Kills landfill in New York is the site for one of the best known recent park proposals in the US. James Corner Field Operations have developed a plan, Lifescape, for the 2200 acre former landfill that explicitly embraces temporality. Although building has already started on the park's first phases (South Park construction began in 2008), the total construction itself is expected to take over 30 years and the draft master plan incorporates the realization that budget plans, public input, and other exogenous factors will invariably impact the process. Indeed, even the landform itself is expected to change as the landfill settles. Rather than being prescriptive, the plan seeks to frame and guide the process of the park's creation (NYC Department of City Planning, 2014).

The overall park concept is that of five parks in one; the North, South, East and West Parks, and the Confluence where they all meet. North Park is largely intended for wildlife and passive recreation with hiking trails and bird watching stations. South Park is intended to be more active (tennis courts, athletic facilities, an equestrian center and so on). East Park is conceived of as meadows, trails, picnic fields, and playing areas, while West Park is expected to be a quiet area with a memorial where the debris from the 9/11 terrorist attack on New York City is buried. These four parks are divided by two waterways that meet at the Confluence, the fifth major park element.

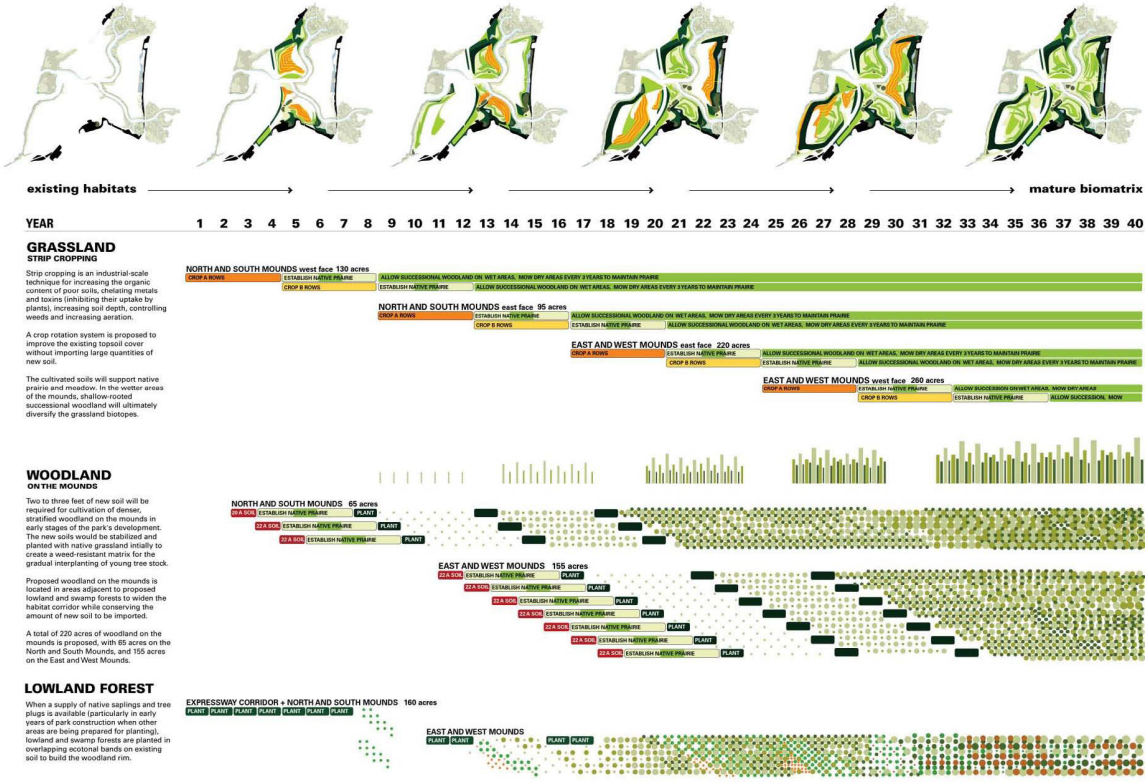


Figure 2.6. This graphic from the Fresh Kills draft master plan shows the expected evolution of different habitats over time. From Lifescape by James Corner Field Operations (2006).

Organizing this whole area are three coordinated systems of circulation, habitat and program. The initial competition entry, however, had a spatial organization of mats, threads, and islands. Mats were wide areas of the predominant surface communities such as salt marsh or grassland, but they also included sports fields and areas. They were interstitial and formed a matrix for the park. Threads were long connecting strands such as roads and paths, but also linear forest and drainage swales, while islands were clumps of vegetation or protected ecological areas but also centers of activity or buildings (Berrizbeitia, 2007). The elegance of this concept is that all aspects of the park - recreation, ecology, etc. - are seen to have the same spatial forms of organization. Rephrasing as circulation, habitat, and program seems to abandon the creative elegance of the initial conception. However, what is clear is that the plan for Fresh Kills will continue to evolve and the final form of the park is far from clear.

The Fresh Kills proposal not only embraces the temporality and uncertain nature of the final park design. It also offers a novel way of conceptualizing the park's spatial organization so that new, unexpected, forms can emerge from this evolutionary process. The emphasis on an evolutionary approach that responds to changing social demands and that permits habitat to develop and change offers a powerful alternative to more conventional, prescriptive park design. The park is envisioned foremost as a process, defined not by boundaries and buildings, but by flows of people, resources, wildlife and by their spontaneous, often unstructured, interaction. In this it offers a model that avoids static prescription, replacing it with a dynamic uncertainty. Park creation can become a thing not of place-making, but of process management, flexible and adaptive in response to an ever changing future.

2.4. Case Study: Harlem River Park

Harlem River Park is a long linear park situated, unsurprisingly, on the river in Harlem, NY. It runs on the west side of the Harlem River from the 145th St Bridge down to 132nd St (Figure 2.7). The existing esplanade, a steel sheet wall topped by a paved pathway and railing, was in severe disrepair and had even collapsed in places. The goals of the planning process were to install surfaces that supported estuarine life, promote filter feeding organisms to help

Figure 2.7. A panorama of the Harlem River Park (right) and locator map (left). The map is not to scale. Source: Designing the Edge (Johnson 2010)

Figure 2.8. The tidal pool when it was first opened in 2009 (left) and later iin November 2012. Trash, volunteer growth, and vandalism to the fence have all combined to limit the pool's attractiveness. Sources: Designing the Edge (Johnson 2010).

reduce pollution, reduce reflected wave energy and stream velocity, emphasize native plants, use bioremediation, use durable materials, provide recreational access to the water, for people and non-powered boats, and provide mooring for occasional large boats (Johnson 2010). The park planning process included extensive public meetings, input from artists, and wave tank testing of various proposed materials and shore morphologies, the aim being to not only design a park for this site but to empirically develop guidelines for future projects. Wave and wake reduction was found to be best when walls were serpentine, made of porous material, and sloping at the wave/wall line. Small tidal pools or splash zones further increased the effectiveness of wave damping. As for materials, in the end, a combination of riverwall replacements were used (modular concrete greenwall, existing steel sheetwall encapsulated in concrete, and gabions), the intention being to further monitor the performance of these approaches and their ability to support flora and fauna.

Of the materials chosen, only the greenwall and gabions are porous. Gabions offer a further advantage in that they are easily filled with rocks, soil and plants, or even mussel shells to promote colonization by filter feeders, are inherently flexible and potentially inexpensive. The *Designing the Edge* study, in fact, leaned strongly towards using recycled tyres as gabions as the rubber would help fend off boats and the tyre treads could provide nooks and crannies for the

seeding of marine organisms. In the end, however, this option was rejected as tyre gabions were not commercially available in sufficient numbers.

Unfortunately no post project monitoring has occurred (Hudson River Sustainable Shores Project undated) so the effectiveness of various approaches is unknown, especially in the promotion of sub-surface colonization. Another problem is maintenance. For instance a tidal pool designed to allow visitors, especially children, to physically touch river water has become overgrown, used for dumping, and subject to vandalism (Figure 2.8). While the more conventional park aspects (bikeway, playground, etc.) may be successful, the park's innovative components have been allowed to languish.

2.5. Discussion

A common theme across all these case studies is experimentation and temporality. In the case of Crissy Field this is evident in the uncertainty surrounding the planning for the tidal marsh (whether it would be constructed, what its effects would be) and subsequent operation (monitoring of its effects, adaptive response to closures, etc.). In the Lifescape proposal for Fresh Kills much of the uncertainty is still unresolved, contained within a plan that is deliberately evolutionary and open but, as yet, little implemented. For the Harlem River Park, experimentation was a major part of the design process but monitoring how that experiment has performed over time has failed. Only in the first case, Crissy Field, has the timeline and commitment been such that we can observe the evolution of the uncertainty as it were, from planning through construction into management and ongoing monitoring. As the Harlem River Park case shows, monitoring is essential to understanding how an experimental approach has fared. Without it, nothing is learned.

The parallels between Crissy Field and Northerly Island are strong. Both were airfields situated on the shore and close to the center of large, vibrant cities. Both were sites for major expositions in the early part of the century. They are approximately the same size (100 acres

or less) but connected to extensive and continuous park systems and both engage significant numbers of visitors (although, in the case of Northerly Island, these are largely restricted to the northern part of the island). Crissy Field thus offers an excellent case study and the lessons learned in terms of public engagement and the creation of year-round interest (off-leash areas, windsurfing and kiteboarding launches for instance) are potentially of immediate use for a plan for Northerly Island. With very similar histories it is likely too that they face similar pollution issues and the approaches to remediation at Crissy Field (avoiding daylighting pollution plumes, low temperature thermal decomposition, etc.) are especially relevant.

However, Crissy Field may be said to fail in one sense - much of the areas of ecological and habitat restoration are off-limits to visitors. Is it possible to remove these barriers between visitors and wildlife, at least to some extent? To avoid what Gobster (2007) called pruning "the spectrum of otherwise acceptable behaviors down to those passive appreciative activities that are deemed appropriate?"

2.6. Summary Design Directions

The following design directions emerge from the findings of this chapter.

- Provide ecological function at a variety of scales (e.g. habitat, but also ecosystem services such as water purification, infiltration, etc.).
- Provide active, experiential and exploratory access to nature, especially for children.
- Make experience of nature attractive and inviting to urban residents who may have little experience of it.
- Studies show that children especially like savanna-style environments and "prospect" or the ability to see long distances. Emphasize these.
- Provide access to shores and beaches.
- Reflect a site's history and the history of the people in it.
- Provide cues to care, making the intentionality of any "wilderness" clear.

- Ensure equitable access to the park.
- Allow for uncertainty in design and planning.
- Embrace innovation, using multiple "small experiments" to limit exposure to failure.
- Monitor the performance of design elements, especially experimental ones, so that improvements can be made.

CHAPTER 3

The Site

3.1. Physical Context

Northerly Island lies on the shore of Lake Michigan at the south western end. Lake Michigan stretches over 300 miles to the north and is over 100 miles wide for most of its length. Tides on the lake are minimal (an inch or so at most) and water level is dominated by the effects of weather systems (barometric pressure, wind-driven surges, etc.). Because of the long unobstructed reach to the north (Figure 3.1), winds are often high (hence Chicago's nickname

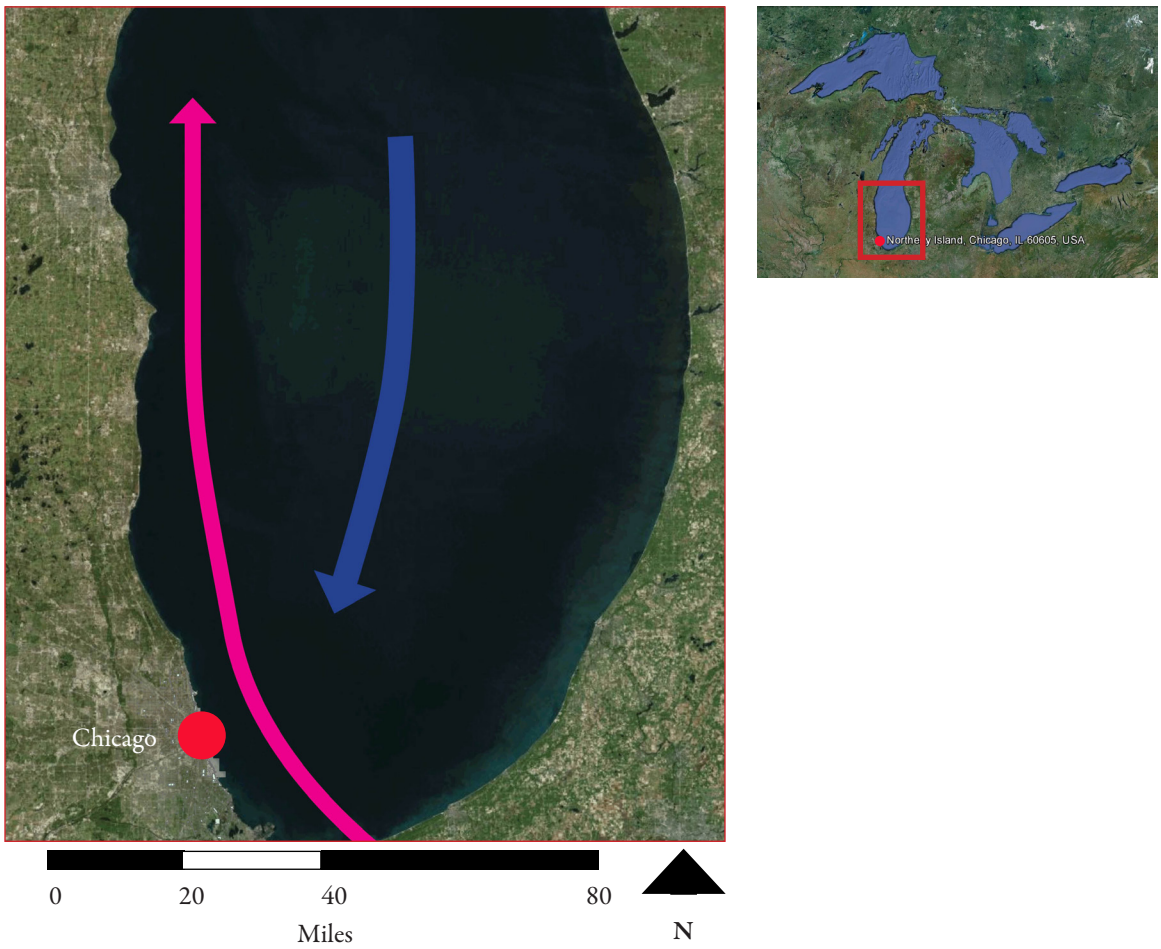


Figure 3.1. The southern portion of Lake Michigan (left) with the Great Lakes (right). The red square on the smaller map indicates the larger focus area. The blue arrow is the direction of prevailing waves, and the pink arrow marks the Michigan Flyway. The small red circle in the lower left marks downtown Chicago.

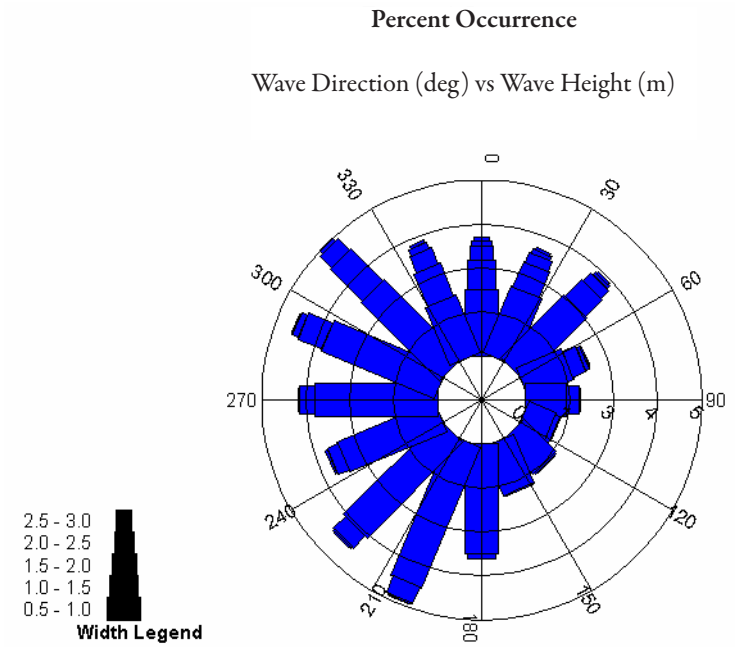


Figure 3.2. This wave rose shows how the largest and widest waves come from the north northwest. Waves from the south are significantly smaller. This rose was obtained at an offshore measurement station and near shore conditions can significantly impact shoreline wave events. Source: Krecic and Wagstaff (2005).

as the Windy City) and waves can reach, in severe storm events, heights of 20 feet or more (Figure 3.2).

The Michigan Flyway is part of the larger Mississippi Flyway and an important route for migrating birds. Many birds have evolved to follow north-south physical features as part of their wayfinding and the Lake Michigan shoreline is an example of this. These birds often fly at night to avoid predators such as hawks that hunt by sight and need daytime resting locations where they can feed and water themselves. In fact ornithologists at the Field Museum of Natural History have estimated that over 5 million migrating songbirds pass along the Lake Michigan shoreline every season (Schilling and Williamson undated). In addition a number of birds remain in Chicago year round while others visit seasonally (especially shore birds during periods when the lake is free of ice). All told, upwards of 300 bird species are known to visit Chicago. Similarly Lake Michigan hosts over 100 species of fish.

Yet along much of the Chicago shoreline habitat for both birds and fish has been destroyed. The original shoreline of dunes, swales, and marshy lowlands has been replaced by

armored walls and artificial beaches. In particular, the Bird Conservation Network has called for the establishment of hemi-marshes (wetlands with significant amounts of emergent vegetation in addition to open water) along the shore as these habitats in particular are now rare (*ibid*).

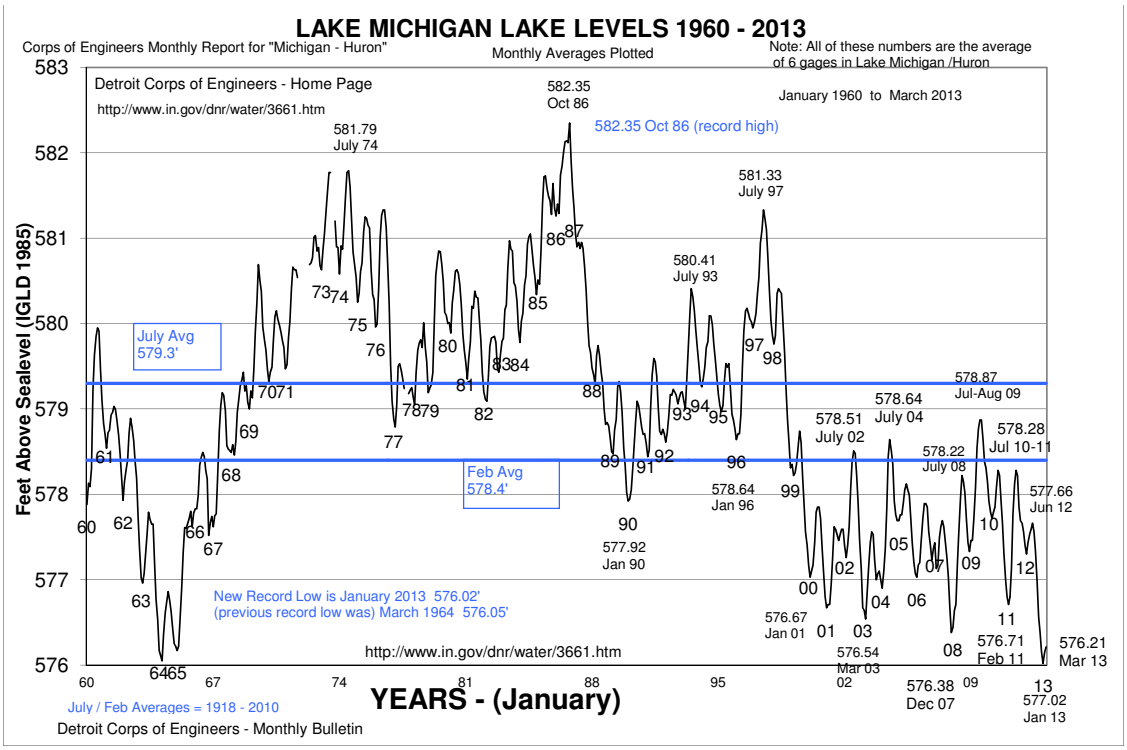


Figure 3.3. Lake Michigan levels have varied over the years with the lake currently being at record or near-record lows. Source: Detroit Corps of Engineers monthly bulletin, March 2013.

Although tidal changes are small, Lake Michigan does experience longer term variations in mean lake height (Fig 3.3). Currently the lake is at record or near record lows (576.02 feet above sea level as measured in January 2013). A previous low in the mid sixties is blamed for much deterioration of the armoring along the Chicago waterfront as it exposed areas not designed for wave impacts (such as rubble slopes) or metal pilings that began to rust once exposed to the air (Krecic and Wagstaff 2005).

Climate change effects on lake levels are difficult to predict, depending as they do on a large number of factors such precipitation, evaporation (both temperature and ice-dependent), thermal expansion, and so on. Models show a worst case estimate of a further 5 inches drop by 2080 (Angel and Kunkel 2010). Actual changes are expected to be much smaller.

Figure 3.4. Northerly Island in Chicago with major nearby landmarks. Source: Google Earth

3.2. Urban Context

Northerly Island lies immediately south of Chicago's historical downtown (known, locally, as "the Loop"). The 320 acre Grant Park lies between the two with Chicago's new - and widely praised - Millennium Park at its northwest corner and Chicago's world class art museum, the Art Institute, just south of Millenium Park. The narrow, six-mile long Burnham Park is immediately to the west of Northerly Island and runs south connecting to Jackson Park at its

southern end. Running through these parks and beyond is Chicago's 18.5 mile Lakefront Bike Trail which connects neighborhoods, beaches, and a host of other recreational facilities such as skateboard parks and volleyball courts. Grant Park itself has a long history but its current, formal layout dates to the turn of the last century. Millennium Park, designed and built at the end of that century is radically different in design yet still highly structured and programmed. Meanwhile Burnham Park is long and linear averaging less than 300 yards in width. Dominated by Lake Shore Drive (a busy "freeway standard" highway that runs through it), it is characterized by manicured parkland of trees, shrubs, and mown lawns. Other, much smaller, disconnected neighborhood parks are scattered throughout the nearby neighborhoods.

A number of significant visitor attractions exist on the island or in the immediate vicinity. The Adler Planetarium, a National Historical Landmark, was constructed on the north end of the island in 1930 (the first such in the Western hemisphere and the oldest planetarium in existence today) and receives some 450,000 visitors annually (Dragotto et al., 2006). The causeway (East Solidarity Drive) connects the planetarium to the Shedd Aquarium (some 2 million visitors annually) and the Field Museum (approximately one and a half million, Museums in the Park 2012) which are immediately opposite on the mainland (together these three buildings now form the "Museum Campus"). Just south of these two institutions and opposite the approximate midpoint of Northerly Island is Soldier Field, home to the Chicago Bears and with an annual attendance of about half a million people, and south of that, opposite the southernmost point of the island, is McCormick Place, the largest convention center in the US and visited by some two and a half million people per year. While the above attendance numbers represent repeat visits as well as one person visiting multiple sites, it is clear that Northerly Island has the opportunity to engage an extraordinarily high number of people.

A transect of the approach to Northerly Island from the northwest makes clear the three very different urban morphologies encountered approaching Northerly Island's southern tip from the north west; a dense urban area of commerce and retail, a mix of museums and athletic field, and undeveloped open space on the shore of Lake Michigan (Figure 3.5).

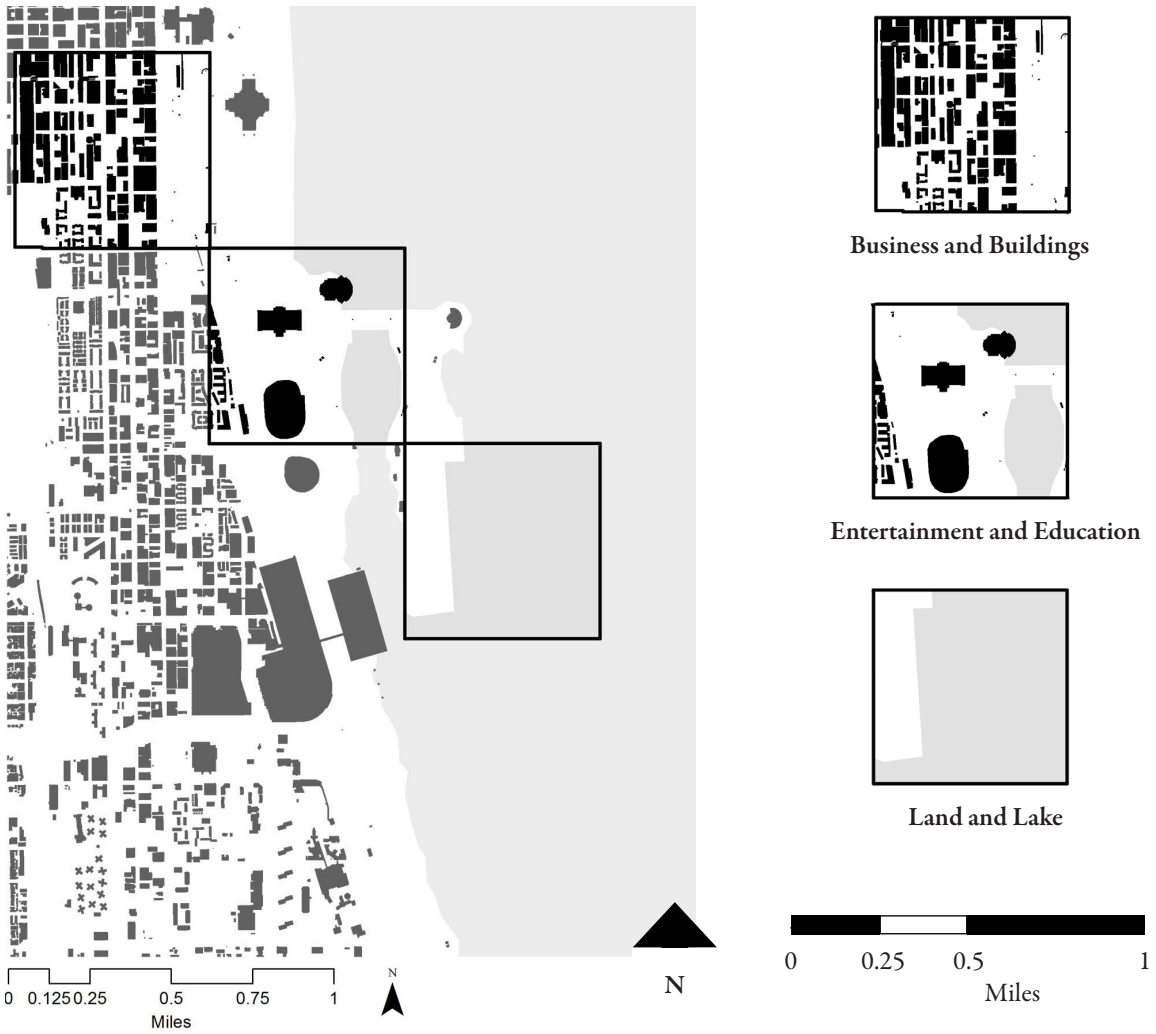


Figure 3.5. Three urban morphologies encountered when travelling from downtown Chicago to the southern tip of Northerly Island: Buildings and Business, Education and Entertainment, and Land and Lake.

3.3. Social Context

Northerly Island lies to the south of Chicago's downtown (the Loop), east of the Near South Side neighborhood, and just north of Douglas (Figure 3.6). These are three very different areas. The Loop is Chicago's urban core, home to its main shopping street and numerous attractions. Residents are typically childless high income earners or students and the median annual household income is close to $78,000 (2010 US Census). The Near South Side meanwhile has seen waves of economic success and collapse. Currently it is a desirable

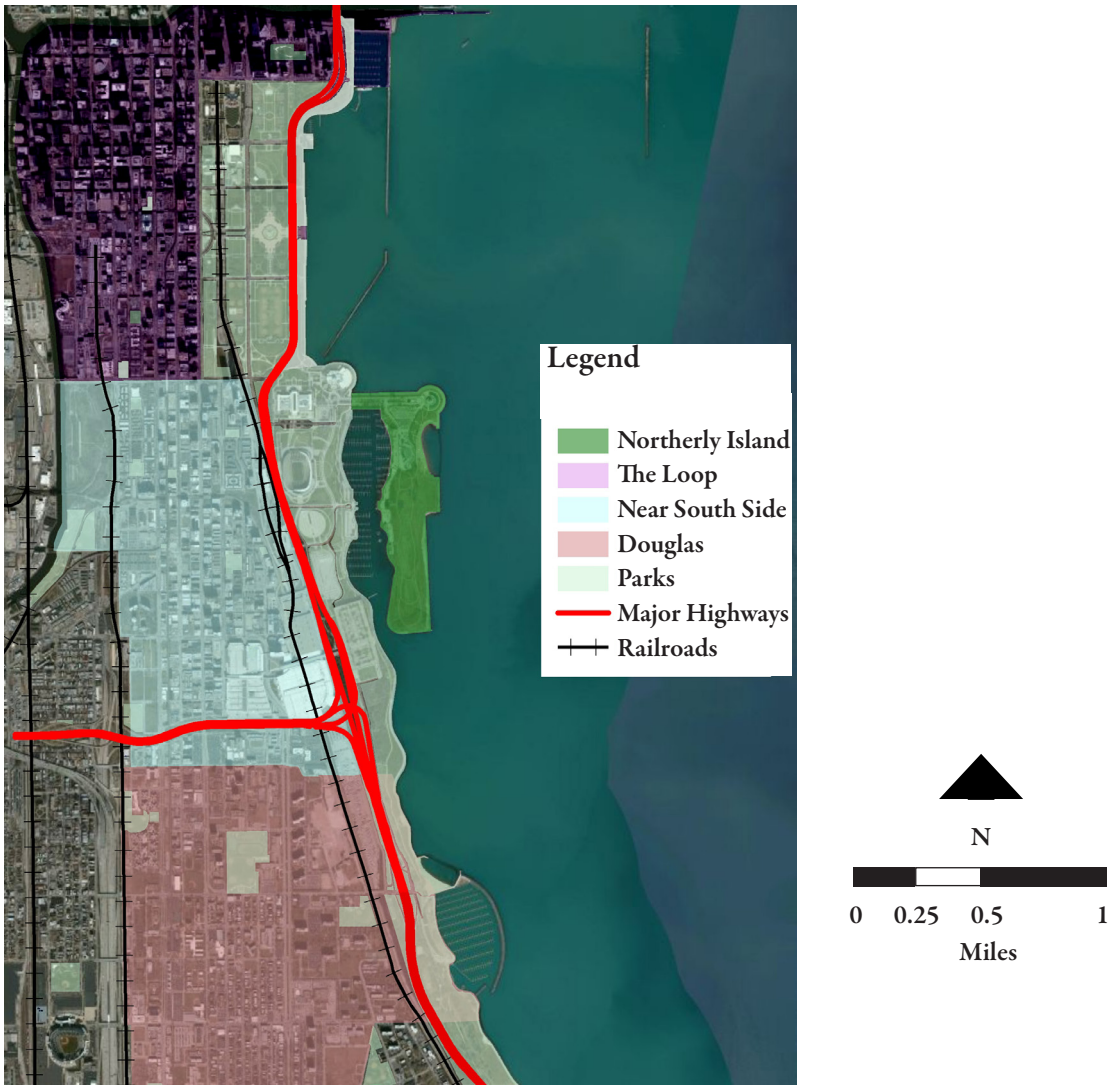


Figure 3.6. Northerly Island and immediate neighborhoods. Also shown are nearby parks, major highways, and railroads.

residential neighborhood undergoing gentrification where warehouses and factories are being converted to apartments and condominiums. The median household income at nearly $75,000 reflects this. Douglas, separated from the Near South Side by Interstate 55 (known locally as the Adlai Stevenson Expressway for no good reason other than to confuse visitors) is very different. It is home to a large number of urban poor (median household income is less than $33,000 per year) and housing projects.

Figure 3.7. Views of the Chicago skyline from Northerly Island. Photograph by A.L. Weir.

3.4. Northerly Island

Northerly Island is an artificial peninsula and has views of both the Chicago skyline and Lake Michigan (Figure 3.7). It is 91 acres in area and approximately one thousand feet wide and five thousand feet long (Figure 3.8). The long axis is parallel to the shore and roughly eight hundred feet of water separates it from the Chicago mainland. The topography is very flat (a legacy of its use as an airfield). East Solidarity Drive, a causeway at the north end, is slightly elevated compared to the rest of the island and connects island to mainland, forming one side of the Burnham Harbor public marina.

The northern third is dominated by the Adler planetarium, a causeway connecting the island to the city, a large - and temporary - concert venue called the Charter One Pavilion, and

Figure 3.8. The location of major structures on Northerly Island. Also visible is a loop trail running around the lower two thirds of the island and Burnham Harbor between the island and main land. Image source: Google Earth.

extensive parking (approximately 550 spaces). There are also some buildings serving the public marina (Burnham Harbor) formed by the island, mainland, and causeway and, on the lakefront side, the 12th St public beach. Other buildings on the island include a small concession stand and changing rooms for the 12th St beach, the former Meigs Field terminal, control tower, and a fire and rescue hangar (now used as a service building garage). These are sited on a concrete apron running some distance along the western edge. The concrete pad is fenced off and appears to be used for parking and access. At the southern end of the island is the McCormick Place outflow where stormwater run off from the conference center is discharged into Lake Michigan (Figure 3.8).

The causeway consists of a four lane highway with large median, four pedestrian paths, and roadside trees. Plantings, parking lot locations and so forth are such that it is entirely possible to go to the planetarium and return to the mainland without ever realizing that one has crossed onto an island. Overall the causeway is very exposed, baking hot with little shade in the summer and cold and windswept in the winter. There are some occasional larger trees planted on the embankment of the causeway but the main double allée consists of fire crabapple (*Malus sp.*

Figure 3.9. View along causeway towards Adler Planetarium. Source: Google Earth

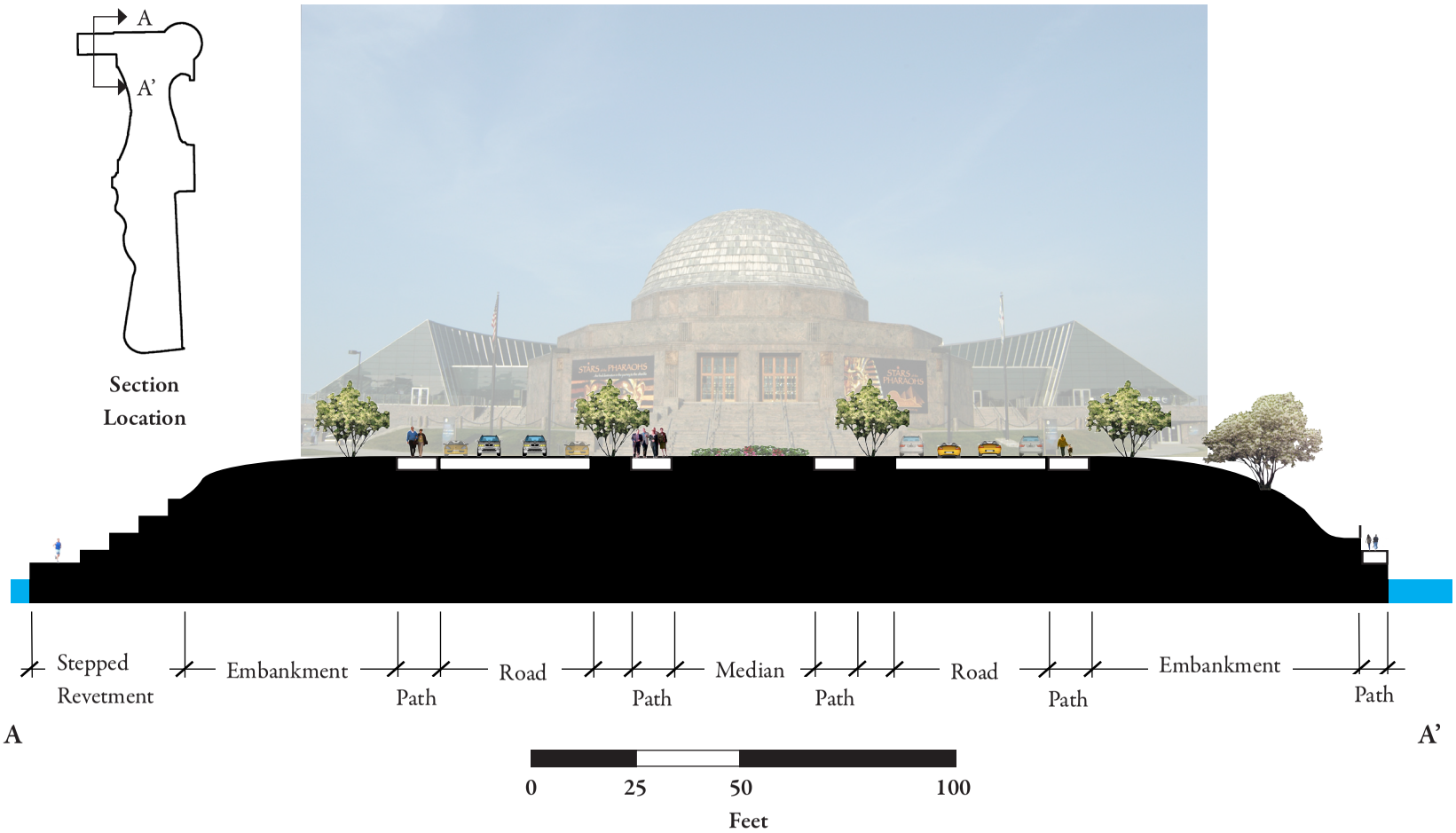


Figure 3.10. Section AA' through the causeway approaching Northerly Island. Looking eastward the Adler planetarium is at the end of the causeway. A stepped revetment armors the shore on the left (north). The marina is to the right (south). A four lane boulevard (with an additional 4 lanes of on street parking) dominates the causeway. Four 10 foot wide pedestrian paths and a median make up the rest of the central portion.

Figure 3.11. The Northerly Island loop trail and the Lakeshore Bike Trail. Photographs are approximately 15 minutes apart. Source: A. L. Weir

'Prairiefire') which only reach 20 feet by 20 feet. They provide inadequate shade in the summer and seem dwarfed by the scale of causeway (see Figure s 3.9, 3.10).

The southern two thirds of the island consist largely of approximately 30 acres each of mown lawn area and swathes of a planted wildflower prairie that is managed for invasives and is off limits to park users (Figures 3.12-3.17). A paved loop trail, approximately ten feet wide, circles the southern portion of the island. Several visits to the site have found very low levels of use of this trail compared to nearby visitor levels at the Museum Campus and on a multi-use pathway that runs along the lakefront (Figure 3.11).

3.5. The Shoreline

The 12th St. beach, Burnham Harbor marina, and a recently restored concrete bulkhead running along the northern edge of the causeway and wrapping round the planetarium form the only areas where users can approach the water's edge. Some informal trails to the water have been made by illicit use but the actual shoreline of most of the non-marina portion of the island consists of a jumble of large concrete blocks, some being from the demolition of the airport runway, placed as anti erosion measures. Walking in this area is difficult to dangerous yet the draw of the shoreline is undeniable given the well established trails (Figure 3.18).

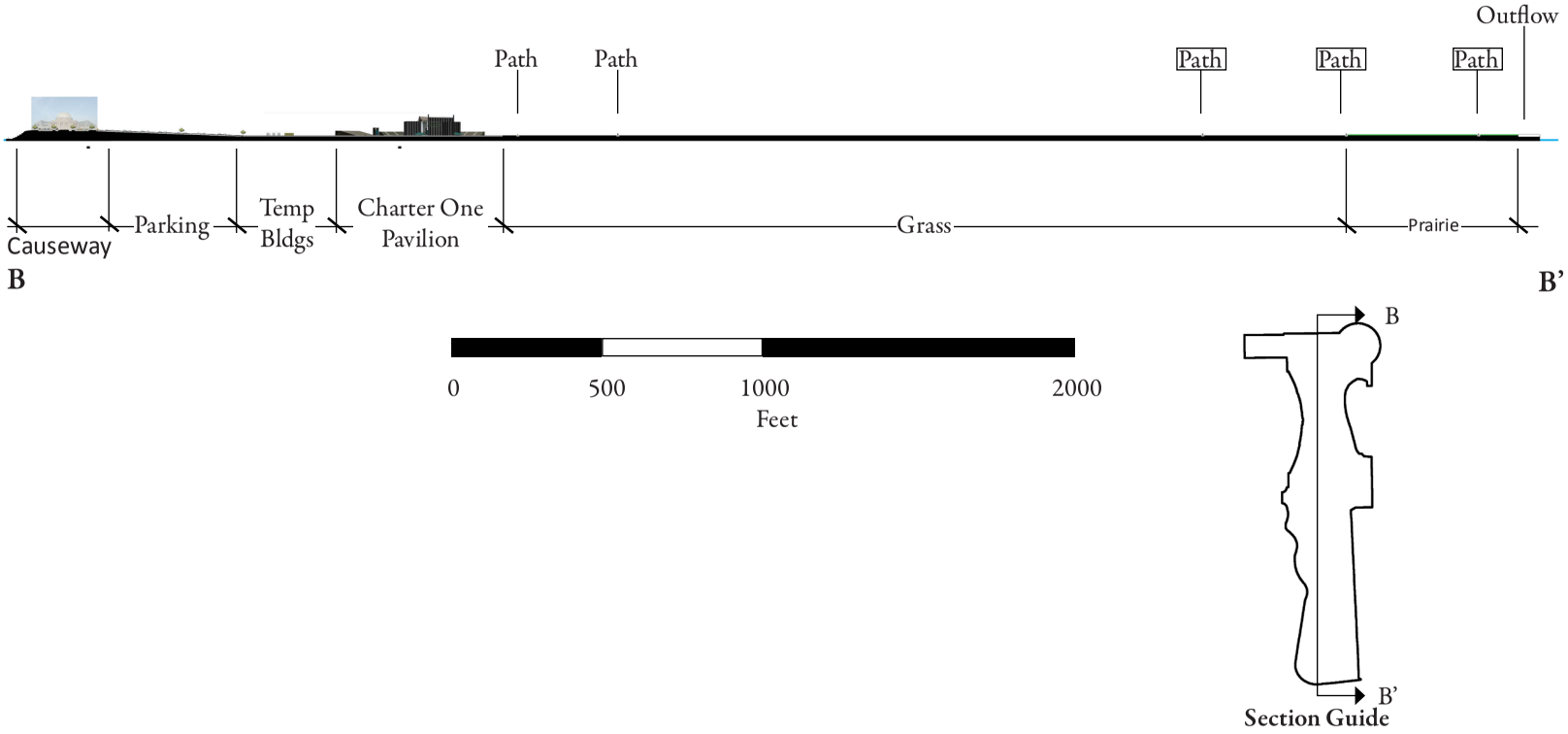


Figure 3.12. Section BB' through Northerly Island north (left) to south (right). The causeway shown in Figure 2.6 is at the left. The northern third is mainly paved while mown grass and then prairie make up the rest. Topography is essentially flat with the causeway slightly elevated (the parking lot is at a 3.5% slope). Occasional paved trails run east-west connecting to the loop trail.

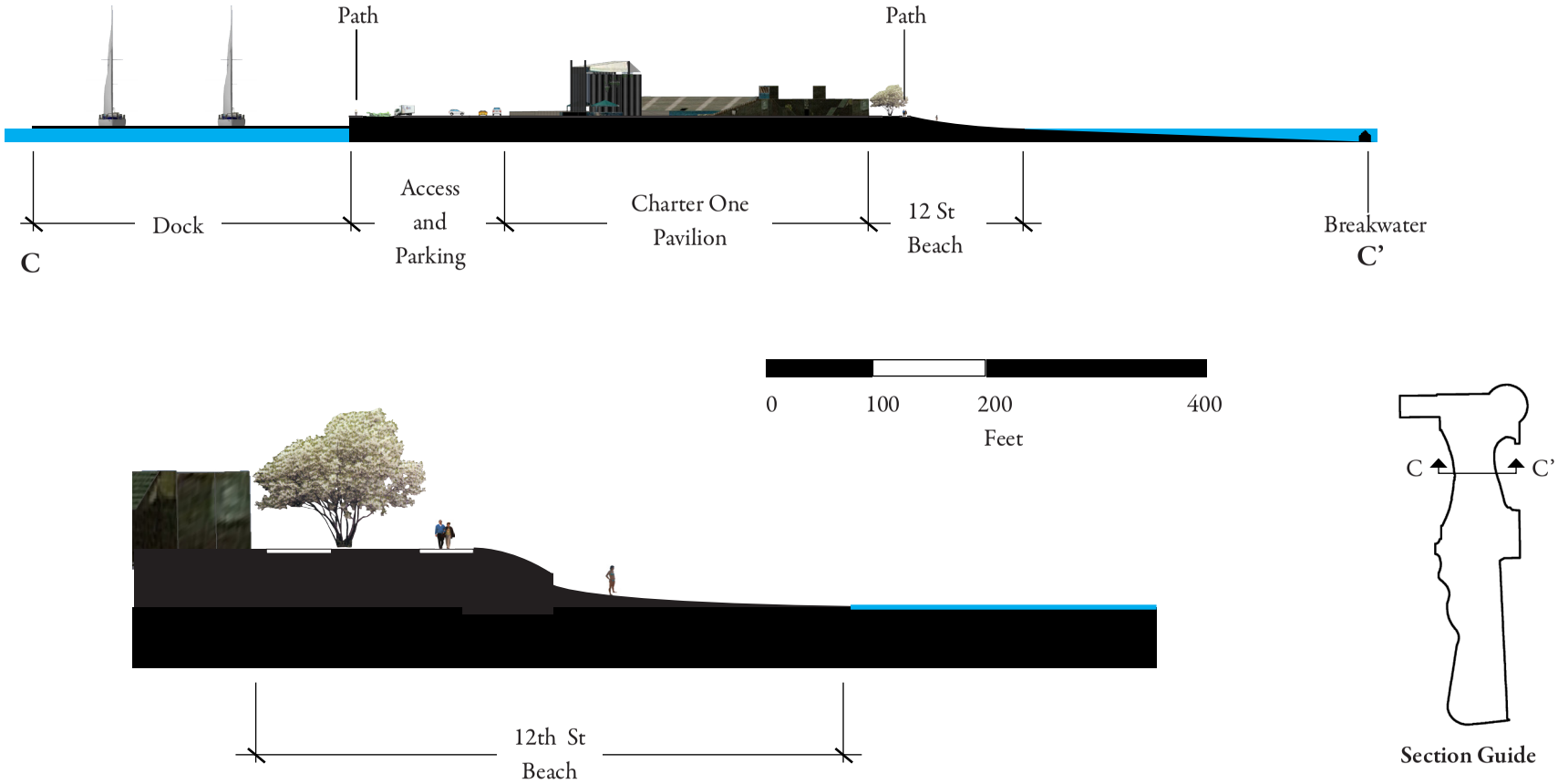


Figure 3.13. Sections CC' through Northerly Island west (left) to east (right). Note how the Charter One Pavilion and associated parking forms a barrier to accessingb the southern portion of the island. Below is an expanded (by a factor of 5) portion of the section showing the 12th St beach and the only actual path (as opposed to road) that connects the southern portion to East Solidarity Drive.

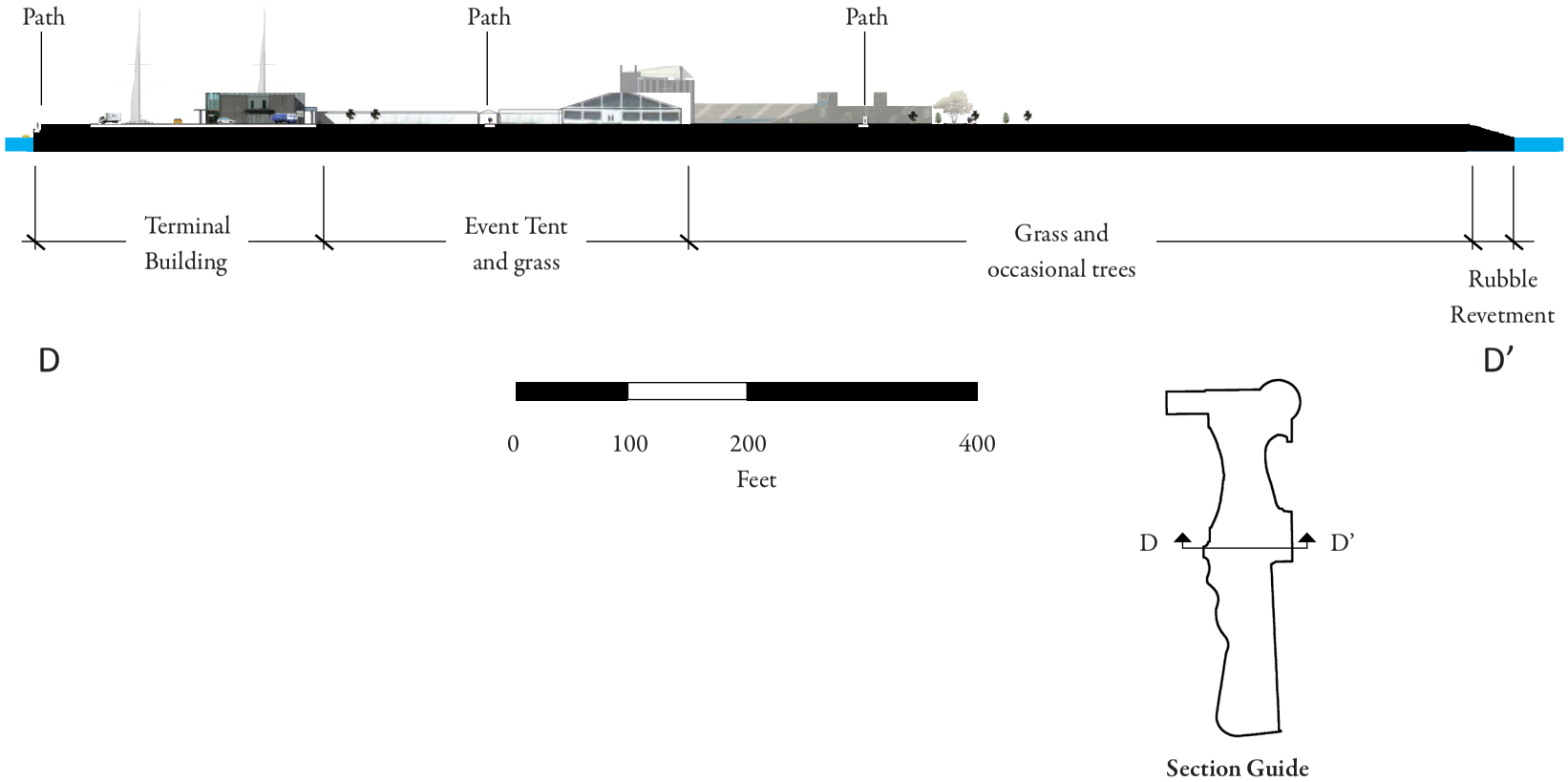


Figure 3.14. Section DD' through Northerly Island west (left) to east (right). Section CC' is in the background. Section DD' shows a temporary event tent connected by a covered walkway to the terminal building.

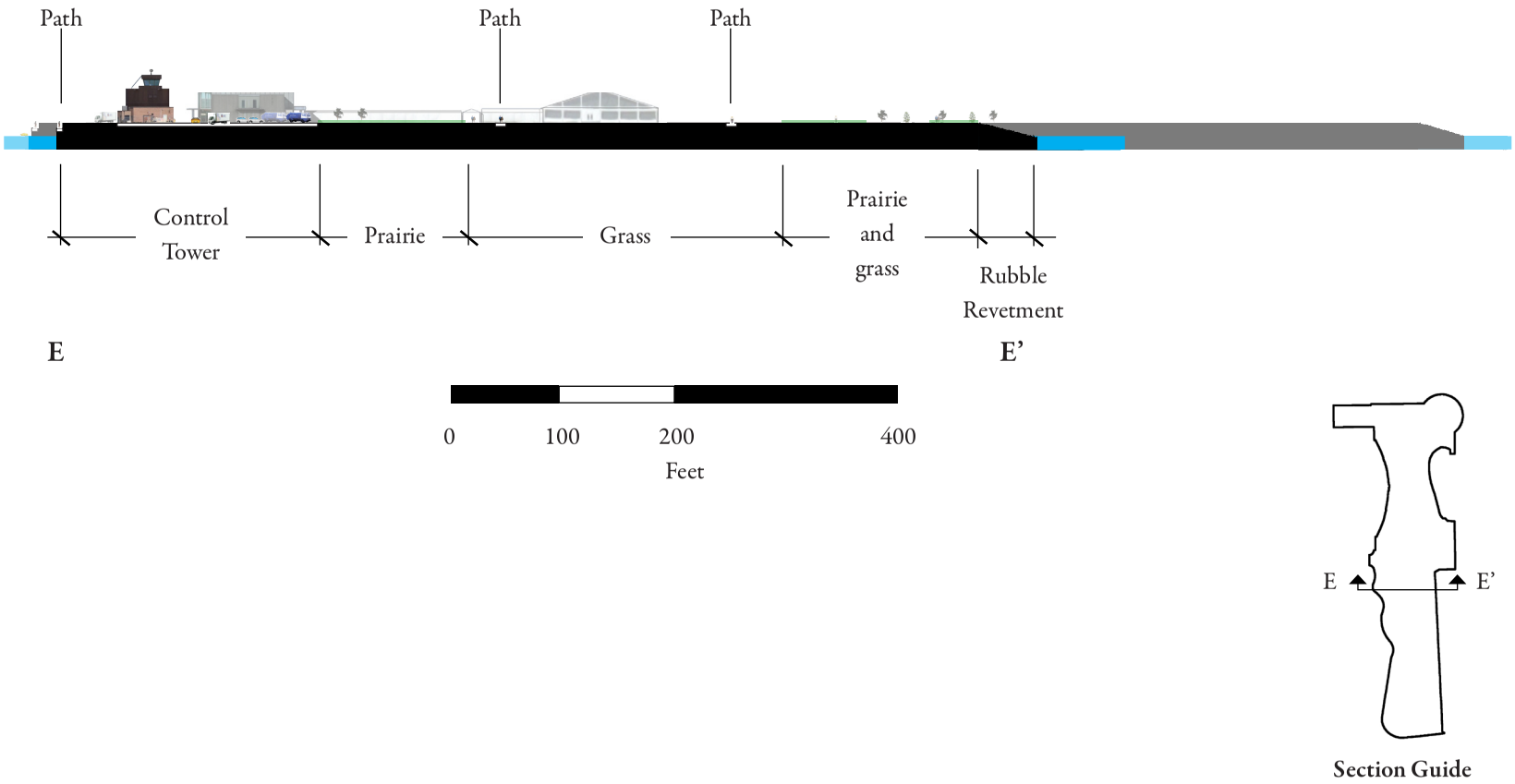
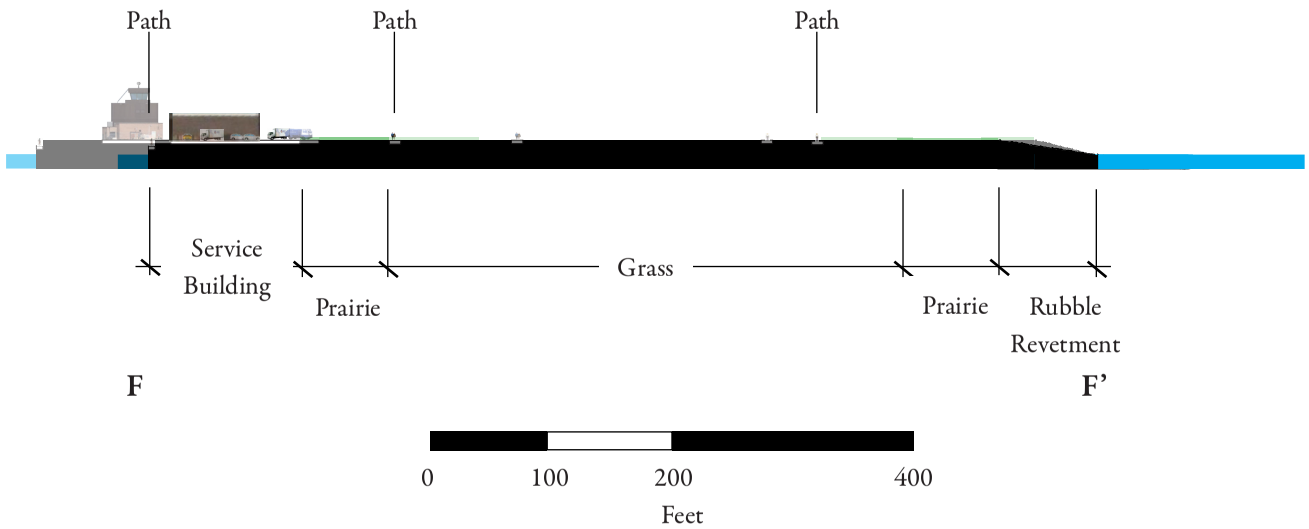
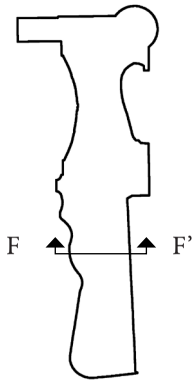


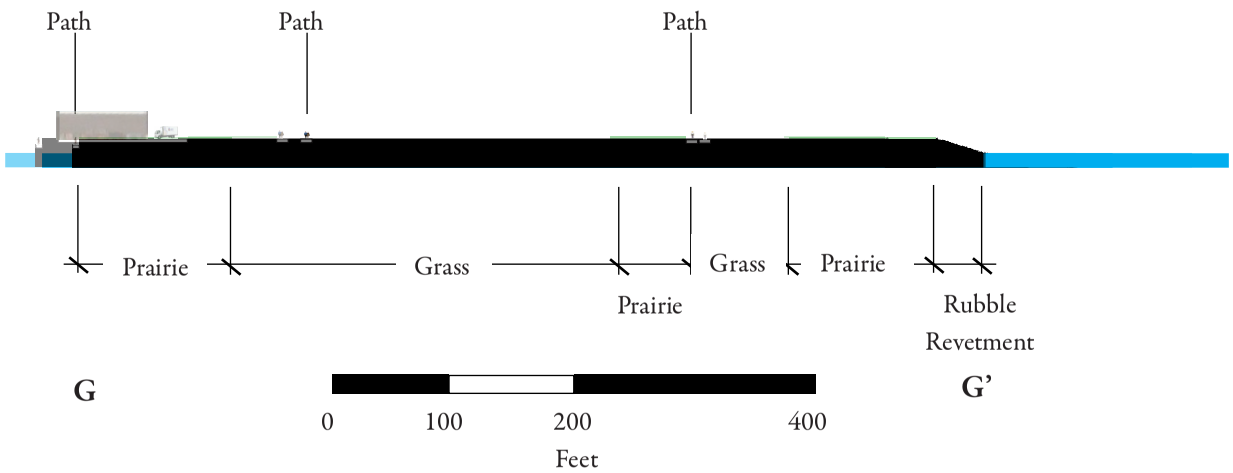
Figure 3.15. Section EE' through Northerly Island west (left) to east (right). Section DD' is in the background. Section EE' shows The old control tower and its relation to the rest of the island.





Section Guide

Figure 3.16. Section FF' through Northerly Island west (left) to east (right). Section EE' is in the background. Section FF' is through the old fire and rescue station associated with the airfield. This building is currently used as a parks department service vehicl garage.



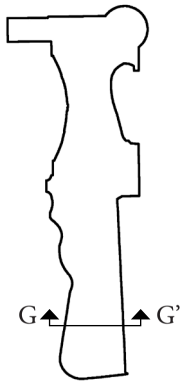


Figure 3.17. Section GG' through Northerly Island west (left) to east (right). Section FF' is in the background. The lowest portion of the island is devoid of structures except for armoring and the McCormick Place outflow (not shown).

Figure 3.18. Illegal access to the lake shore and the conditions found on getting there. Exposed rebar and sharp edges are plentiful. Photographs by A. L. Weir

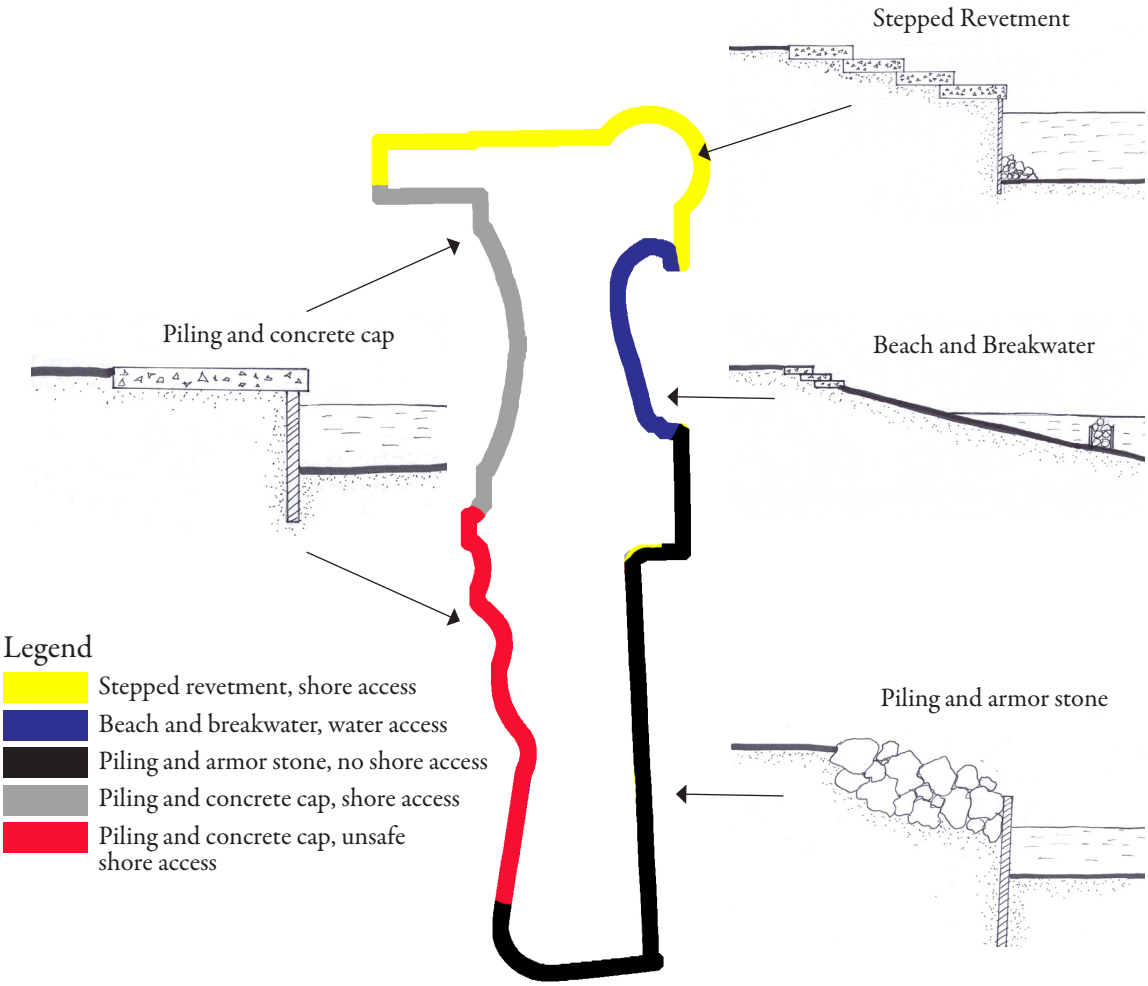


Figure 3.19. Shore conditions schematic of Northerly Island. Blue (the 12th St beach) marks access to water. Yellow and gray are safe shore access. Red is unsafe access and black marks no access. Sketches show the varying construction typologies encountered around the island.

There are a number of different construction forms used along the Northerly Island shore (Figure 3.19). The Adler planetarium revetment was recently refurbished at a cost of 3.2 million dollars (De LaFuente 1998) despite being only 60 years old. The 12th St. beach is sand with a rubble breakwater protecting it. In Burnham Harbor the shore is timber or steel piling with a concrete cap while the rest of the shoreline consists of rubble stabilized with steel or timber pilings (Figure 3.19). While the concrete cap shoring can be used to walk alongside the lake, south of the terminal it is very narrow and clearly not intended for this purpose.

3.6. Access and Circulation: Connection to the City

Despite the wide range of attractions in the immediate area, Northerly Island is not well served by public transit. Two regular bus routes that connect to the Loop but not nearby neighborhoods, one special service for Bears games only, and the tourist-oriented downtown trolley ($30 for a day pass) have stops in the vicinity (Figure 3.20). While many bus routes run along Lake Shore Drive, they are all express routes for this portion of the road. The nearest additional bus stops are approximately 0.5 miles to the west.

The nearby train line is part of a commuter rail system (the South Shore Line) that runs south but has poor connections to the rest of the city or its surrounding neighborhoods. Roosevelt station on the red line is the nearest "L" station (Chicago's elevated rail) at almost 1 mile away. Combined with the close proximity of expressways, large parking lots, and garages, the infrastructure transportation emphasis is overwhelmingly automotive (Figure 3.20).

Significant amounts of surface parking, much of it used only intermittently, exist nearby (notably at McCormick Place where there are some 5800 spaces and Soldier Field with approximately 5500). The marina also has another 300 parking spaces on the mainland and there are several smaller lots associated with the Field museum. All together there are close to 12,000 parking spots in the immediate vicinity of Northerly Island. Most of the time this parking is underutilized. The main exception is during home games of the Chicago Bears when

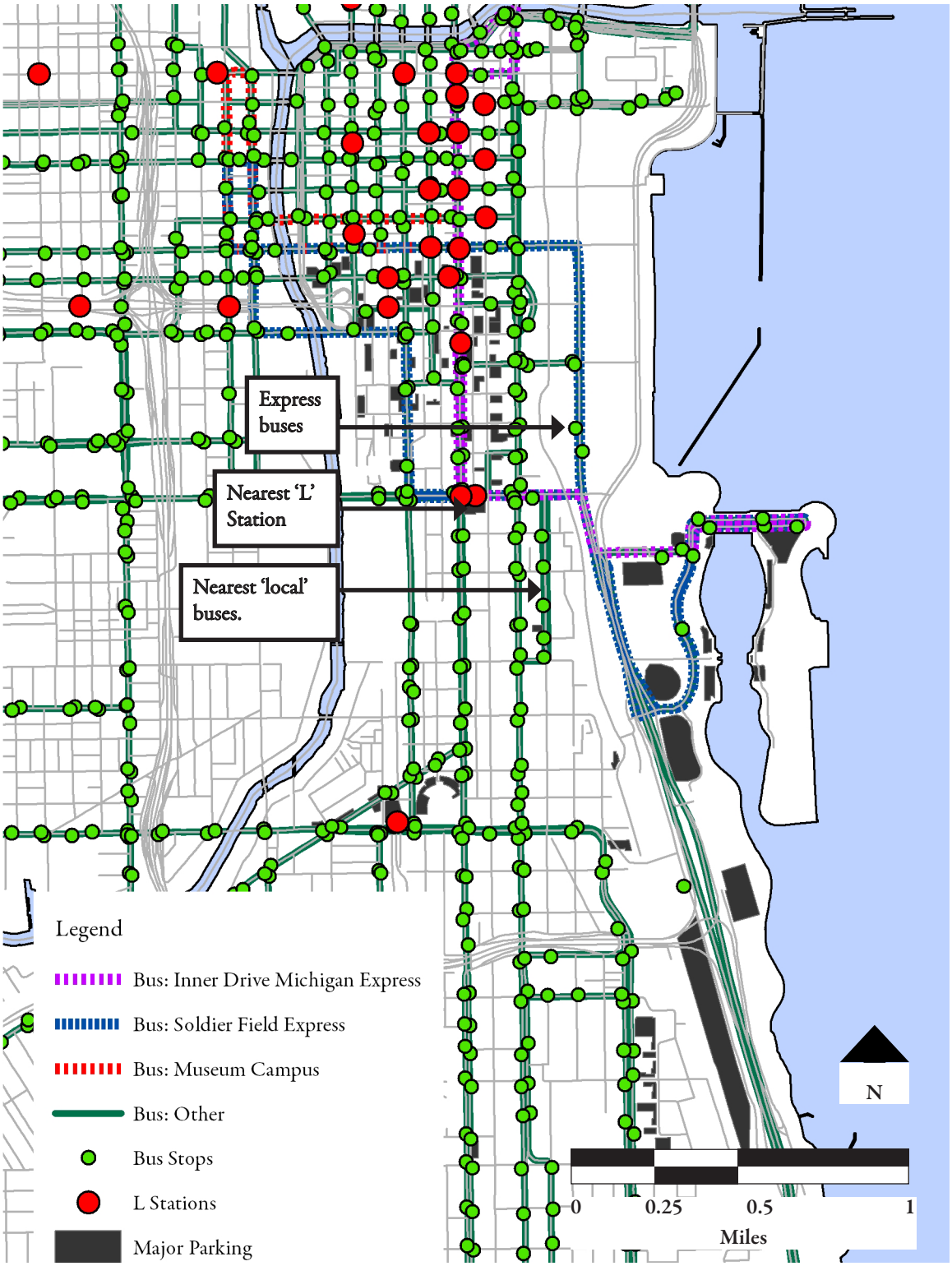


Figure 3.20. Public transport routes accessing Northerly Island. Bus routes connect only to downtown and not to adjacent neighborhoods (the Soldier Field Express runs only during home Bears games). The nearest bus stop with neighborhood connections is along Michigan and Indiana Avenues (the Lake Shore Drive buses are express along this section). The nearest L stop is at Roosevelt station over a mile away. Data from City of Chicago GIS .

demand far outstrips supply (despite parking rates more than doubling to nearly $50 a day on these occasions) and shuttle buses are laid on from other large lots throughout Chicago.

Lake Shore Drive and the Stevenson Expressway as well as the South Shore Line form significant barriers to accessing Northerly Island and the Lakefront Trail for pedestrians and cyclists alike (Figure 3.21). North of the island the railway is sunken and there are numerous crossings from Grant Park to the Lakefront Trail and south to Northerly Island via a pleasant underpass. South of the island, however, there are only three crossings of the railroad and Lake Shore Drive within several miles. Two of those are from the Near South Side and one, from Douglas, approximately two miles south of the Museum Campus. The first crossing from the Near South Side involves a winding pedestrian bridge and an underpass. Given the obstacles, the access is reasonable (the bridge is somewhat narrow). The second is internal to McCormick Place, requires the use of stairs (for pedestrians and cyclists), and is only open during building hours. From Douglas a bike route along 31st St crosses Lake Shore Drive but this is a busy four lane highway with no signage as a bike route. cyclists and pedestrians must use sidewalks adjacent to the traffic that vary as to which side of the road they are on. Bike routes connect Douglas to the Near South Side but these either terminate or appear clearly dangerous (Figure 3.22).

Overall there is a strong impression of deterioration of frequency, quality, and safety of pedestrian and cyclist connections from the city to Northerly Island and the Lakefront Trail as one moves south. Like the bus routes, pedestrian and bicycle connections are strongly oriented towards the downtown with little connection to adjacent neighborhoods. The city does have a master bike plan, however, and upgrades to some of these connections (notably along 31st St.) are under active development.

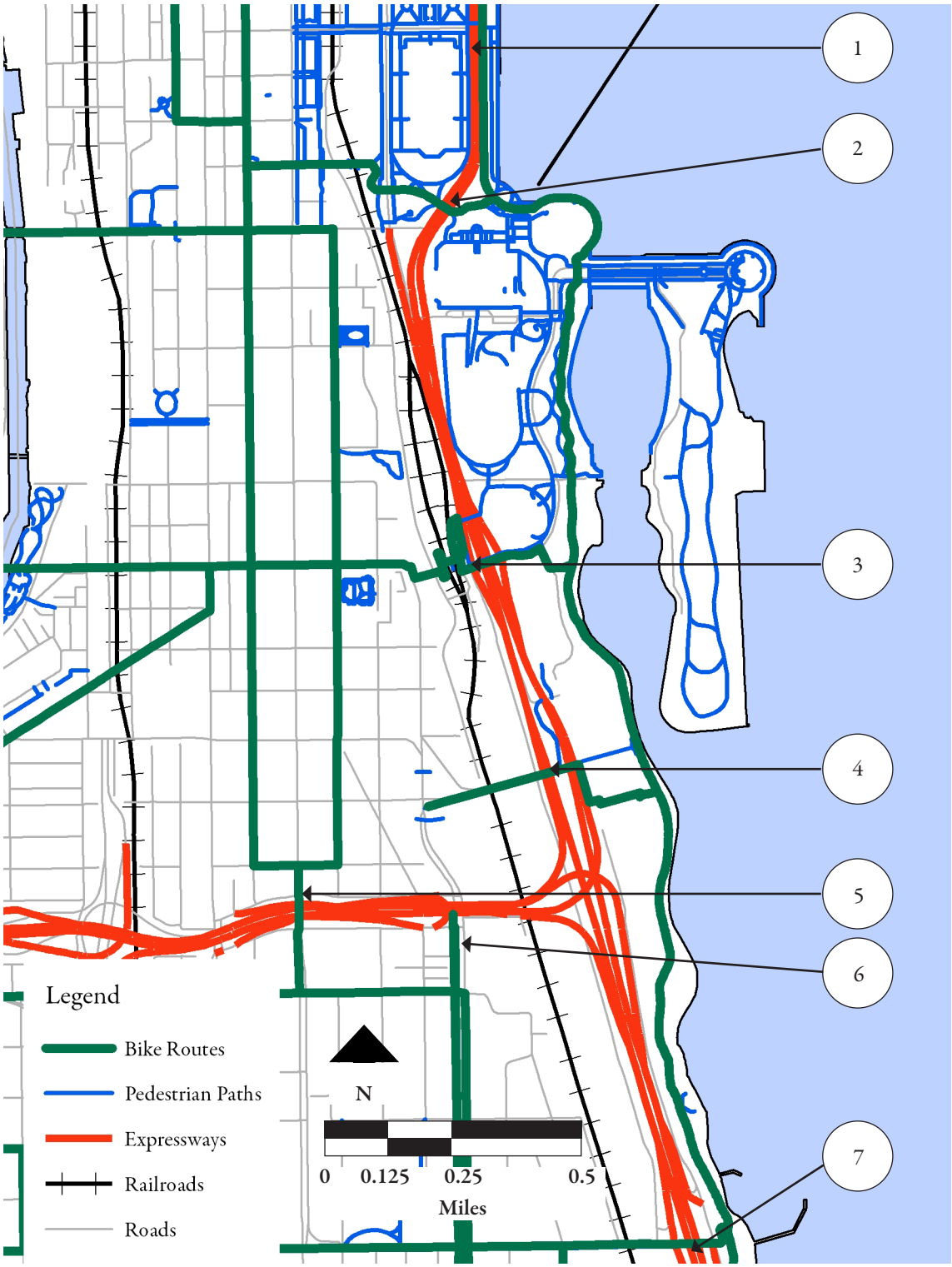
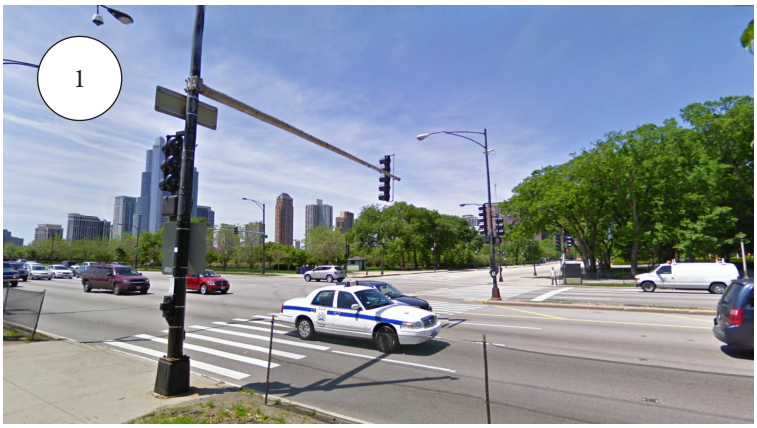


Figure 3.21. Pedestrian paths and official bike routes near Northerly Island. Note how Lake Shore Drive, I-55, and the railway form barriers between Northerly Island and neighborhoods, especially to the south. Only three possible crossings exist within several miles south of the island compared to multiple connections to the north. Crossings (the numbered circles) are examined further in Figure 3.22.



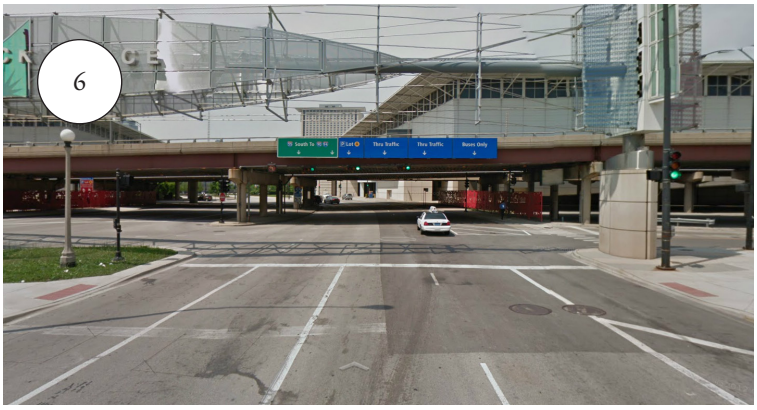
One of many at grade and signaled crossings from Grant Park and downtown Chicago to the Lakefront Bike Trail. At this point Lakeshore drive consists of four travel lanes in each direction and two turning lanes.

A landscaped underpass connects the southern end of Grant Park to the Museum Campus, allowing easy access for cyclists and pedestrians alike.

A bridge (3a, for the railroad) and underpass (3b, for Lakeshore Drive) connect the Near South Side to Burnham Park. There is a significant amount of exposed concrete and no shade for pedestrians and cyclists. The underpass (seen here from above) is generous.

McCormick place contains a pedestrian bridge that crosses both the railroad and Lake Shore Drive. From the Near South Side the user enters via McCormick Place (4a) and exits down a flight of stairs (4b). Cyclists are required to wheel their bikes and to carry them up and down stairs. The bridge is available only during building hours.

An official cycle route along Michigan Avenue connects Douglas to the the Near North Side, crossing I-55. This is a fast four lane highway with narrow 6 foot sidewalks. No indication of designation as a bike route is visible.



A bike route, (10 foot wide multiuse paths separated from traffic by a median) along Martin Luther King Blvd connects Douglas to the McCormick Center but terminates there.

A bike route along 31st crosses Lake Shore Drive. There is no signage for on road cycling. Sidewalks are wide enough for multiuse but frequently obstructed by telegraph poles etc. and intermittent.

Figure 3.22. Pedestrian and cycle crossings of Lake Shore Drive and the Adlai Stevenson Expressway (I-55) depicted in Figure 3.21. There is a steady deterioration of quality and safety of these crossings as one moves south with the exception being the immediate vicinity of McCormick Place. Images from Googlemaps.

3.7. Access and Circulation: Connection to the Museum Campus

The Adler Planetarium causeway (East Solidarity Drive) connects to the Field Museum and Shedd Aquarium in a complex system of paths, bikelanes, driveways, and roads (Figure 3.24). Slightly oddly, there is no clear termination to the beaux-arts boulevard that connects to Adler Planetarium. Historical maps following the replacement of the original bridge with a causeway show a similar lack of clear terminus (Figure 3.23), though the World's Fair map (Figure 1.4) clearly shows that such did exist. Site visits have found wayfinding difficult with

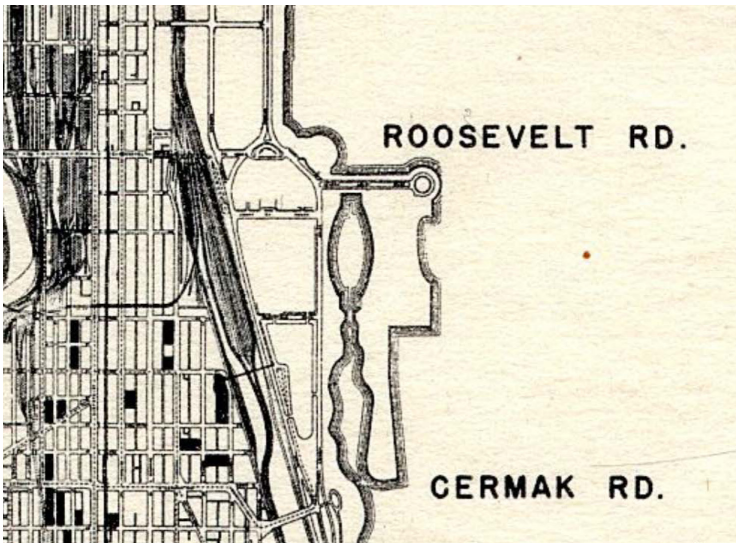


Figure 3.23. This 1945 map by the Chicago Planning Commission is the earliest map found in a search of the University of Chicago online map archive that shows East Solidarity Drive. Note the absence of a clear terminus to the boulevard.

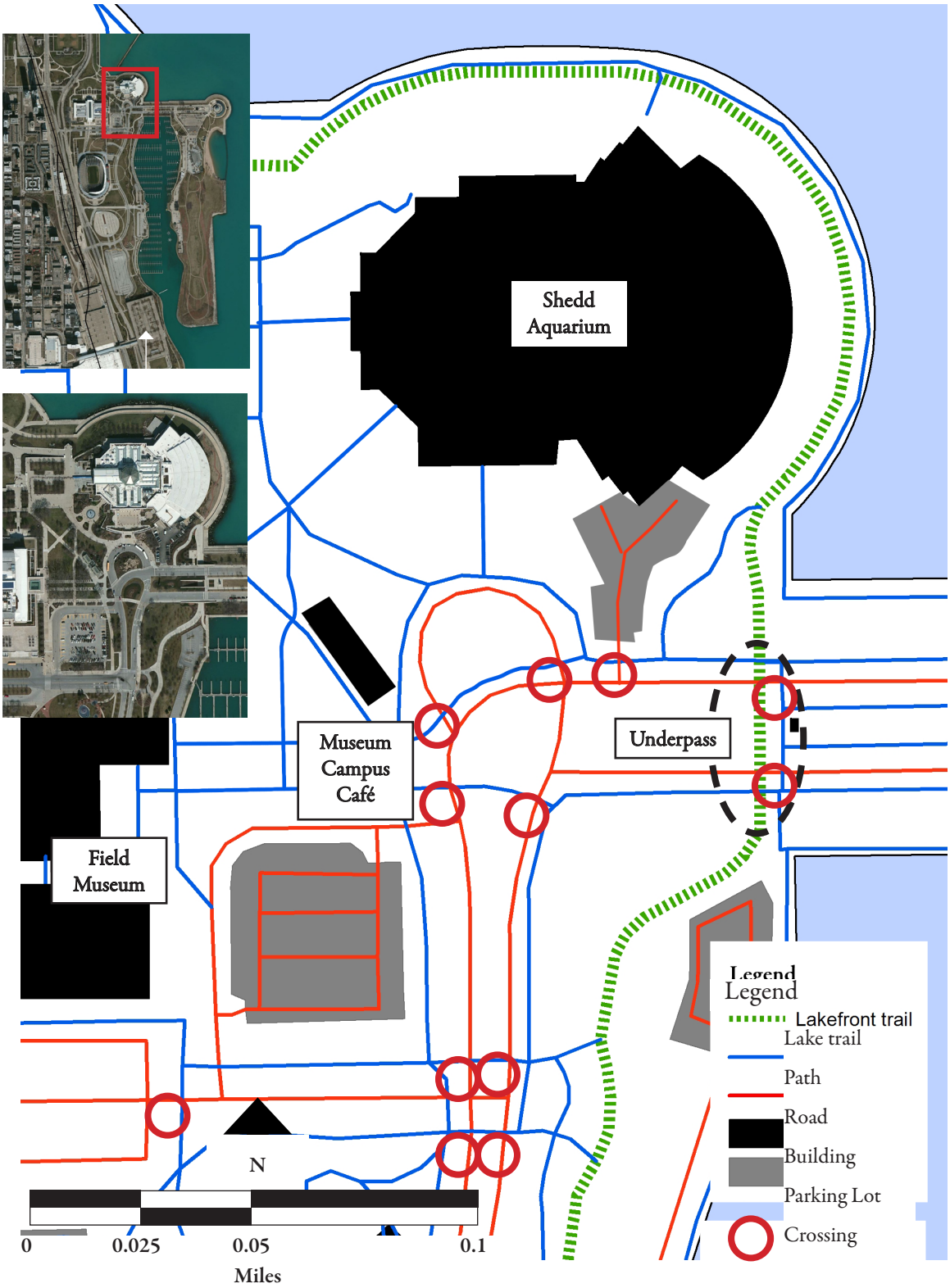


Figure 3.24. The meeting of East Solidarity Drive with the Shedd Aquarium and Field Museum. The Adler Planetarium and Northerly Island are to the east. The larger scale map (upper left) shows the location of the intersection while the lower inset is an orthographic image of the same location.

large expanses of asphalt and concrete devoid of shade. The Museum Campus Café is oddly sited and outdoor seating is arranged along paths rather than under adjacent trees.

The Lakefront Trail passes under East Solidarity Drive and is connected to it, on the northern side, by a paved path but with no connection to southern arrivals or departures in that direction. There are numerous pedestrian road crossings. All are at grade painted crosswalks with stop signs.

3.8. Access and Circulation: East Solidarity Drive to Northerly Island

At first glance Northerly Island appears well connected to existing lakefront parks and recreational opportunities (e.g. Figure 3.8). In practice, however, access to most of the island is unclear, even confusing (Figure 3.25). The significant parking on the island south of the causeway with the Charter One Pavilion behind that mean that it is easy to cross over to the Adler Planetarium and return to the mainland without ever becoming aware of the bulk of the island. This parking (about 550 spaces) and the four lanes of on-street parking on East Solidarity Drive (the causeway) serve both the Adler Planetarium and the Charter One Pavilion as well as providing parking for those visiting the 12th St. beach. An additional nearly 300 spaces exist along the marina on the island. Repeated visits to the site have found extremely low occupancy rates of these lots (and especially of the marina spaces).

On approaching Northerly Island along East Solidarity Drive the first path towards the south takes one along the eastern side of the Marina and terminates just shy of the old terminal building without any connection to roads or other paths. Stairs mean that this route is not handicapped accessible (Figure 3.26). It is possible to continue along on top of the revetment after the path ends, but this is not intended for pedestrian use. It is narrow, poorly maintained, and there are frequent obstructions.

The second southerly path one encounters takes one to the Charter One Pavilion, terminating in a large area of concrete in front of the pavilion. While it is possible to connect to

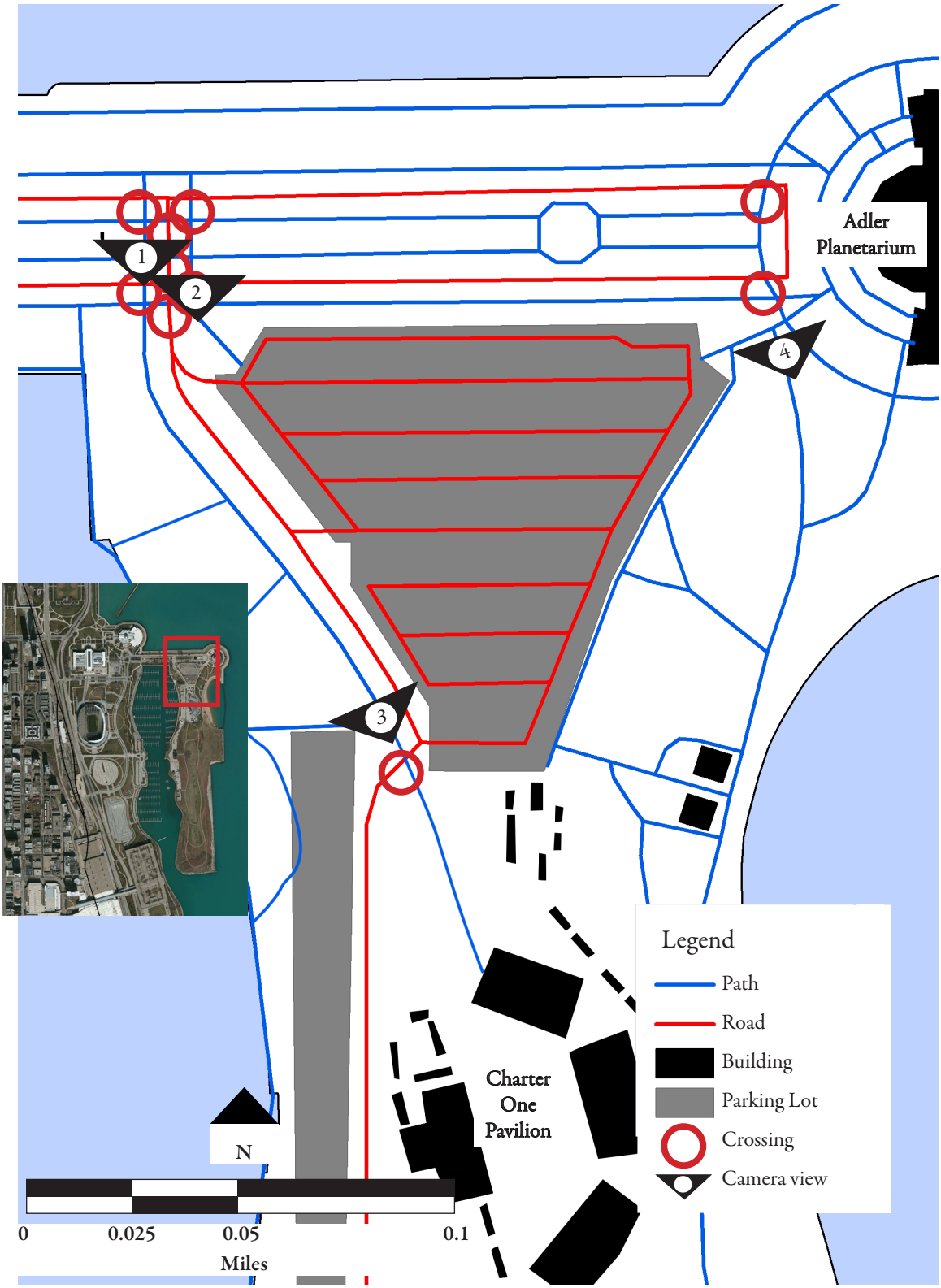


Figure 3.25. The meeting of East Solidarity Drive with Northerly Island. The Adler Planetariurm is at the top right. A large parking lot and the Charter One pavilion prevent clear access. A cluster of pedestrian crossings (top left) is related to parking lot access. City of Chiacgo GIS

Figure 3.26. View 1 in Figure 3.25. The path along the eastern edge of Burnham harbor from East Solidarity Drive. Clear and inviting, this path dead ends shortly. Source: Google maps.

other paths from here (by crossing the parking lot, for instance) the fact is that large amounts of fencing and paving related to the pavilion and the marina, a strew of temporary buildings (pavilion offices,portable generators, and the like) and lack of signage mean that this is completely unclear (Figure 3.27).

It is only after walking past the parking all the way to the Adler Planetarium that a good pedestrian connection to the rest of Northerly Island exists (Figure 3.28). A path runs along

Figure 3.27. Views 2 (left) and 3 (right) in Figure 3.25. The beginning and ends of the second southerly path encountered. There is no indication of a possible route to the southern portion of Northerly Island. Connections are oriented solely towards the marina and the Charter One Pavilion. Source: Google Maps.

Figure 3.28. View 4 in Figure 3.25. A continuous path from the Adler Planetarium to the southern portion of Northerly Island via the 12th St beach.. Source: Google Maps.

the beach and connects to the loop trail around the southern two thirds of Northerly Island. Even here, however, there is no signage and it is only by exploring past the narrow chokepoint between the beach and the Charter One pavilion (see Section CC', Figure 3.13) that this becomes clear.

Figure 3.29. The loop trail. A temporary sculpture is shown in the middleground. Photograph by A. L. Weir

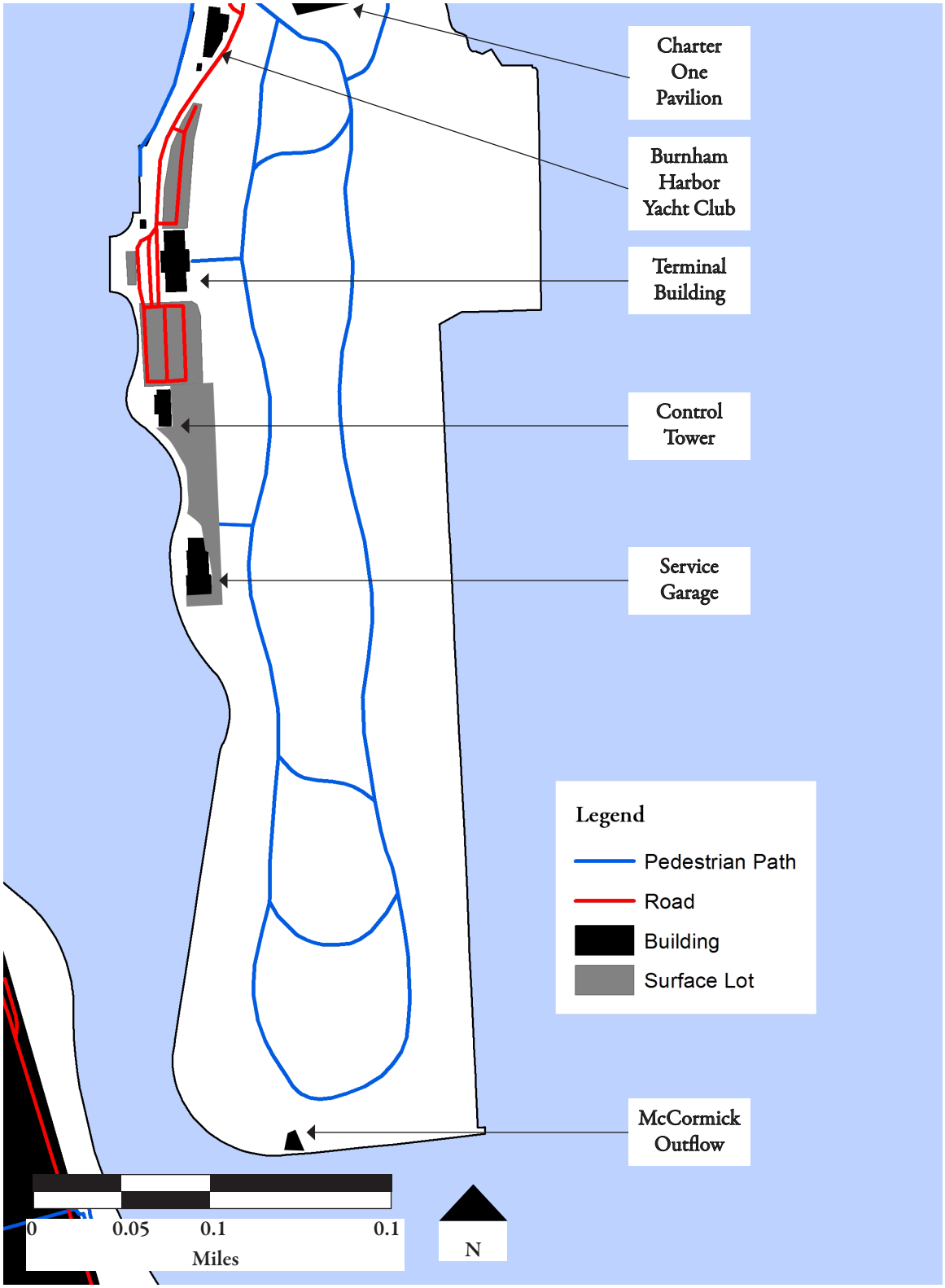


Figure 3.30. The southern two thirds of Northerly Island. Roads and parking dominate the north west shore while internal paths provide no access to the shoreline.

3.9. Access and Circulation: Lower Northerly Island

A loop trail provides access to the interior of the lower two thirds of the island but no access to the shore (Figure 3.30). It has no shade but does offer spectacular skyline views.

3.10. Burnham Harbor

Burnham harbor (see e.g. Figure 3.8) currently provides mooring for 1120 boats at a variety of sizes as well as a harbor store, boat ramp, and the Burnham Harbor Yacht Club (the latter is a private club with undisclosed initiation fees, annual membership dues, and minimum monthly spending). Mooring costs for the season start at over $3000 for the smallest size of boat (30 ft) and range up to $158 per linear foot for boats over 100 feet in length. The northern

Figure 3.31. Harbor master plan proposals for Burnham Harbor. Areas of expansion are in bold. An additional 248 spaces are proposed.

portion of the harbor contains the bulk of the moorings and approximately 190 of them are on the eastern (i.e. Northerly Island) side.

The harbor itself is owned by the Chicago parks department and managed by a private company. A 2007 master plan (JJR 2007) proposed an additional 248 new slips within the harbor (Figure 3.31). The same plan also expands other marinas and proposes two new marina developments adding several thousand possible slips in total to those already available (over 5000) along the Chicago lake front. It also emphasizes a need for transient slips - moorings available on a day-to-day or even hourly basis - for visitors. Such slips are important in that they bring external money into the Chicago economy. Harbor operations i n general are an important revenue source for the Chicago Parks Department.

The amount of parking required for the marina is unclear. The Chicago Lakefront Harbor Master Plan (*ibid*) states that "parking, access, and drop-off standards are somewhat more difficult to describe." It goes on to give figures in the range of 0.5-1 parking spots per slip but also acknowledges that harbors in urban locations with nearby parking, public transportation and taxi service generally provide less parking than do harbors in remote locations.

It is worth noting though that Chicago has a surplus of mooring capability. The $102 million 31st St. marina, completed in 2013 costs $4,320 a season for a 40 foot boat and has an occupancy of just 32 per cent. Even at the Monroe St. harbor where the cost is less than $1,800 for the same size slip, occupancy is just 65 per cent. As with parking, however, marina operation is privatized and attempts to reduce the number of boat slips (and thus possible corporate profits) are strongly opposed by the management company (Bracket 2013).

3.11. Discussion

Northerly Island offers spectacular views of Chicago and Lake Michigan but access to the shore is limited to a small portion of the harbor, the Adler Planetarium revetment, and 12th

St beach. The northern third is dominated by the causeway, the Adler Planetarium, the Charter One Pavilion, and associated parking while marina parking and buildings and former airfield buildings are arrayed along the northwestern shore. The southern two thirds are a mix of lawn and replanted prairie. The topography is essentially flat with the causeway slightly elevated above the rest of the island. There is little shade with the trees along the causeway being too small to effectively provide shade and few trees elsewhere at all.

Connections to the island (public transit, pedestrian/bike) are strongly oriented towards downtown and become progressively worse as one moves south to poorer neighborhoods. There is no clear entrance to the island and wayfinding is difficult. Multiple paths, some dead-ending, and lack of signage can easily lead the casual visitor astray (and have, in fact done just that to this author).

A distinct dichotomy exists between the heavily visited and developed northern third and the underused and largely undeveloped southern portion. The opportunity exists to clearly connect the two and promote visitor numbers. The major impediment to such a connection is the large surface parking lot abutting East Solidarity Drive and the Charter One Pavilion. The parking serves both the Adler Planetarium and the Charter One Pavilion as well as providing parking for those visiting the 12th St. beach. However, significant amounts of surface parking, much of it used only intermittently, exist nearby (notably at McCormick Place and Soldier Field). Facility sharing and shuttle buses for visitors could potentially permit much parking to be moved offsite. East Solidarity Drive, currently a wide four lane highway with extensive median and four lanes of on-street parking, could also be reduced in width to reduce impervious surface and heat island effect and promote pedestrian, bicycle and public transport. This would significantly increase the space for park elements such as additional trees while serving as a model for a less automotive-centric approach.

However, metered parking was privatized in Chicago in 2008 in an attempt to balance the city's budget (Chicago received a $1 billion lump sum from a private consortium for a 75 year lease on metered parking). The result has been higher fees, aggressive enforcement,

cancellation of long running events such as Taste of Chicago, and expensive claims for lost revenue whenever the city has tried to eliminate any metered parking (Mihalopoulos and Fusco 2012). It may well be that metered parking is simply too expensive to remove.

Access to the island could also be created elsewhere with a bridge connecting to Burnham Park as shown in maps of the 1933 World's Fair (Figure 1.4). The main obstacle here is Burnham Marina where boats require access to Lake Michigan. Closure of the marina with moorings etc. replaced by expansion among Chicago's nine other park-owned facilities could allow access to the island, but would reduce potential Park department revenues. A bridge at the midpoint of the island and relocation of some slips to the southern portion of the harbor (similar to the expansion outlined in the Chicago Lakefront Harbor Master Plan) could permit continued operation and revenue generation while providing access. This approach could also create a sheltered lagoon for recreational activities such as kayaking, a toddler beach, provide marine habitat, and improve park visibility from the mainland.

Further barriers, especially to pedestrians and cyclists, exist in the form of Lake Shore Drive and the railroad. The quality and frequency of connections across these barriers decrease as one moves south to poorer neighborhoods. Public transit connections are also heavily oriented towards connections with downtown. Nearby bus routes along Lake Shore Drive are all express and do not stop in the vicinity.

Significant storms impact the island as they do all the Lake Michigan coast. Indeed, as an extreme example, Hurricane Sandy caused waves as high as twenty feet, and last year a new record, twenty-three feet, was set by a storm pushing down from Canada. The traditional approach along the shoreline is one of massive concrete construction. The Adler Planetarium bulkhead, less than sixty years old, was recently replaced as part of a three hundred million dollar to shore up some twelve miles of the Chicago shoreline, and much of the remaining shoreline reinforcements are in dire need of repair. With climate change upon us and the concomitant likely increase in storm occurrence and severity, these tactics seem unsustainable. Instead soft edges of marsh and wetland that can absorb storm damage should be developed.

These would also expand much-needed habitat opportunities for wildlife and provide a unique chance for visitors to experience the pre- European settlement form of the Chicago coast.

The adjacent museum campus offers unique opportunities for educational activities in the park. Unimpeded skies to the north over a dark lake provide superb viewing of astronomical phenomena in the northern sky and the chance to tie in with outreach and education at the Adler Planetarium. A protected lagoon and fishery habitat could be used by the Shedd Aquarium as an outdoor classroom and laboratory, while the Field Museum of Natural History can similarly be involved in the design, creation, and evaluation of inland habitat. Indeed, the island offers an opportunity for educational institutes, NGOs, and civic associations to work together and foster ongoing relationships that can positively impact other projects.

3.12. Summary Design Directions

The following design directions emerge from this chapter.

- **Finding**. Northerly Island is well situated to provide needed bird habitat along the Michigan Flyway and shoreline fish habitat.

  Direction. Provide habitat, especially hemi-marsh, for resident and visiting birdlife. Provide nursery and feeding habitat for fish.
- **Finding.** Northerly Island offers spectacular views of Chicago and Lake Michigan.

  Direction. Open up views and celebrate them.
- **Finding.** Northerly Island is extremely level.

  Direction. Introduce topography to provide a varied experience of the landscape.
- **Finding.** Northerly Island is adjacent to significant tourist attractions and an extensive and varied park network.

  Direction. Leverage other attractions to bring visitors to the park. Give park an identity that distinguishes it from its neighbors.
- **Finding.** Nearby neighborhoods range from very wealthy to very needy.

Direction. Promote equal access for all income groups.

- **Finding.** Low levels of use compared to adjacent Lakefront Trail.

  Direction. Develop strong connections to Lakefront Trail

- **Finding.** There are large areas of roads and parking in the area.

  Direction. Reduce impervious surface to promote infiltration and reduce urban heat island effect. Preserve metered parking for cost reasons.

- **Finding.** Very little shade present.

  Direction. Indicate locations for larger, shade-providing specimen trees.

- **Finding.** Access to the island shore is very restricted.

  Direction. Improve access to the shore and provide different types of shoreline experience.

- **Finding:** Access is strongly oriented towards downtown and wealthier neighborhoods.

  Direction: Improve access, emphasizing lower income neighborhoods.

- **Finding.** Access to the island is unclear. Wayfinding is difficult and there are a number of pedestrian/traffic conflicts.

  Direction. Improve circulation to resolve conflicts and provide clear access.

- **Finding.** The harbor can be reorganized but should not be reduced in capacity.

  Direction. Maintain harbor capacity.

CHAPTER 4

Design Directions

4.1. Directions Summary

The overall project goal and subsidiary objectives arising from the first three chapters are summarized here. They can be grouped into four categories: Access, Nature, Experimentation, and General Guidelines.

Project Goal

Create a park emphasizing the experience of nature and the elements that is accessible to all Chicagoans and visitors.

Nature

While Northerly Island is artificial, it represents a unique opportunity to represent the original undisturbed habitats of the south Lake Michigan shoreline and to do so in a manner that engages visitors, promotes interaction with nature, and creates needed habitat. Benefits include the improved physical and psychological health of visitors, increased resilience of native and migratory non-human populations, and enhanced aesthetics and eco-system services.

- Provide ecological function at a variety of scales (e.g. habitat, but also ecosystem services such as water purification, infiltration, etc.).
- Provide active, experiential and exploratory access to nature, especially for children.
- Make experience of nature attractive and inviting to urban residents who may have little experience of it.
- Studies show that children especially like savanna-style environments and "prospect" or the ability to see long distances. Emphasize these.

- Provide cues to care, making the intentionality of any "wilderness" clear.
- Provide habitat, especially hemi-marshland, for resident and visiting birdlife.
- Provide nursery and feeding habitat for fish.
- Indicate locations for larger shade -providing specimen trees.

Access

Access and circulation need to be addressed on a number of levels. Existing access is unclear and the nearby transportation infrastructure is heavily oriented towards the automotive. Previous policies of "benign neglect" regarding nearby poorer neighborhoods mean that access is heavily oriented towards the wealthier communities. The shore of Northerly Island is largely inaccessible. The project also needs to provide opportunities for visitors to "get into" nature rather than simply viewing it.

- Ensure equitable access to the park, regardless of race, income, or any other population characteristic.
- Provide access to shores and beaches.
- Develop strong connections to the Lakefront Trail.
- Improve circulation to resolve pedestrian/car conflicts and provide clear access and wayfinding.
- Improve access to the shore and provide different types of shoreline experience.

Experimentation

Innovative techniques and new ideas are needed to advance the current state of design and construction. However, it is often politically difficult to implement unproven approaches given the high cost of failure. The southern portion of Northerly Island has no important infrastructure or property to defend and thus offers a "safe-to-fail" environment

for trialing soft edges and green infrastructure approaches. At the same time it is close to institutions that can be involved in designing and monitoring such experimentation.

- Allow for uncertainty in design and planning.
- Embrace innovation, using multiple "small experiments" to limit exposure to failure.
- Monitor the performance of design elements, especially experimental ones, so that improvements can be made and lessons learned.

General Guidelines

There are a number of issues not covered in the previous sections. Generally, they relate to aspects of the built environment and its history or to the economic realities of park construction and operation.

- Open up views and celebrate them.
- Leverage other attractions to bring visitors to the park. Give park an identity that distinguishes it from its neighbors.
- Maintain revenue sources such as the pavilion and marina operations.
- Reduce impervious surface to promote infiltration and reduce urban heat island effect.
- Reflect a site's history and the history of the people in it.

4.2. Design Organization

The overall design for Northerly Island is based on the transect depicted in Figure 3.5. The urban figure grounds nearby - buildings and business, education and entertainment, and land and lake - become the guides for organizing the island (Figure 4.1) so that the northern third is dominated by structures, concessions and so on, the middle third has a mission of

education but also play, and the southern third is devoted primarily to habitat. At the same time access is prioritized, especially to the shore, and the site's history is reflected in a linear unifying element that alludes to the runway previously present through most of the island's history.

4.3. Overall Concept

Access and wayfinding, both from nearby neighborhoods and in the immediate vicinity, are improved. A key element of this is a new bridge connecting the Lakefront Trail to the Meigs Field terminal building which is repurposed as a Visitor Center (Figure 4.1). Other existing airfield buildings are also reused.

The northern third of the island is devoted to existing buildings and parking areas (slightly redesigned). The remaining portion is divided into four different habitats: woodland (thickly treed), savanna (native grasses, occasional trees and shrubs), prairie (native grasses, herbs, and shrubs), and wetland (fed from the McCormick Place Outflow). These provide important wildlife habitat while the savanna also serves to invite younger children into the park. A maintained lawn has little habitat value but does offer a large area for play (ball games, frisbee, etc.) as well as potential revenue through event rental.

Marina operations are moved to the west side of the inner lagoons and away from the northern end (while maintaining overall capacity) so that a small beach and boardwalk can replace them. The armored lakeside edges of the island are replaced with a variety of soft edge treatments that will be monitored to evaluate performance as habitat and for overall resilience.

A long linear path unites these habitats while referencing the site's past as an airfield and a hill provides sledding, play opportunities, viewpoints, and drama in the generally flat local topography (the only other hills this author has seen in Chicagoland are a former landfill and an artificial sledding slope near Soldier Field). These various elements will now be expanded upon.

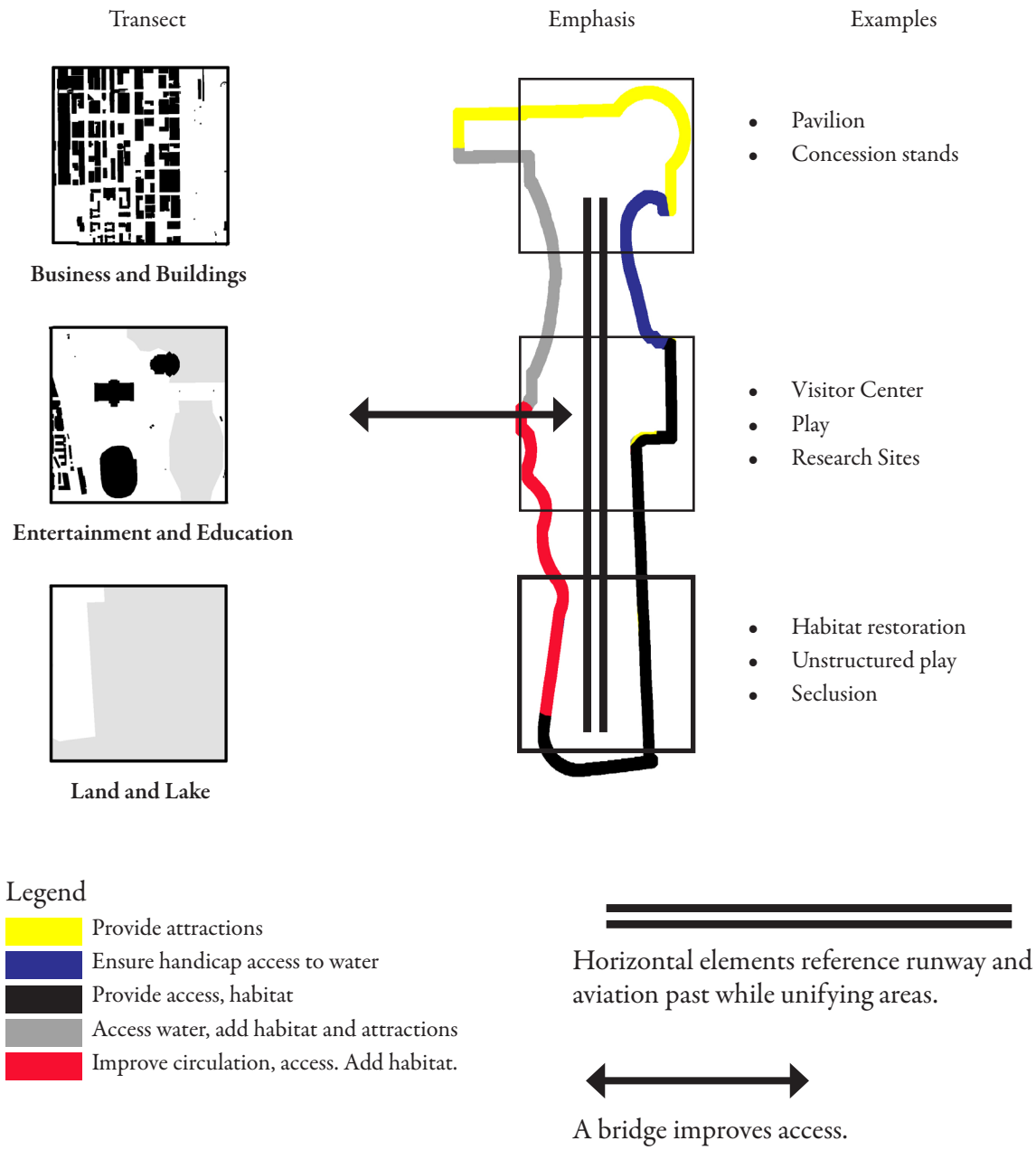


Figure 4.1. Conceptual organization of Northerly Island park elements based on nearby transect, site history, and shoreline access.

4.4. Marina Reorganization

By adding piers in the southern lagoon and selectively lengthening others (all strategies proposed in the 2007 Chicago Lakefront Marina Master Plan, Figure 3.31) it is possible to clear the piers from the northern end of the lagoon and from the western edge of Northerly Island (Figure 4.2). Concentrating marina operations and associated parking on the mainland would create opportunities for water access on Northerly Island and for using the most sheltered part of the lagoon for recreational activities such as a toddle beach, kayak launch, ice skating, and so on, all while preserving existing revenue from slip rental.

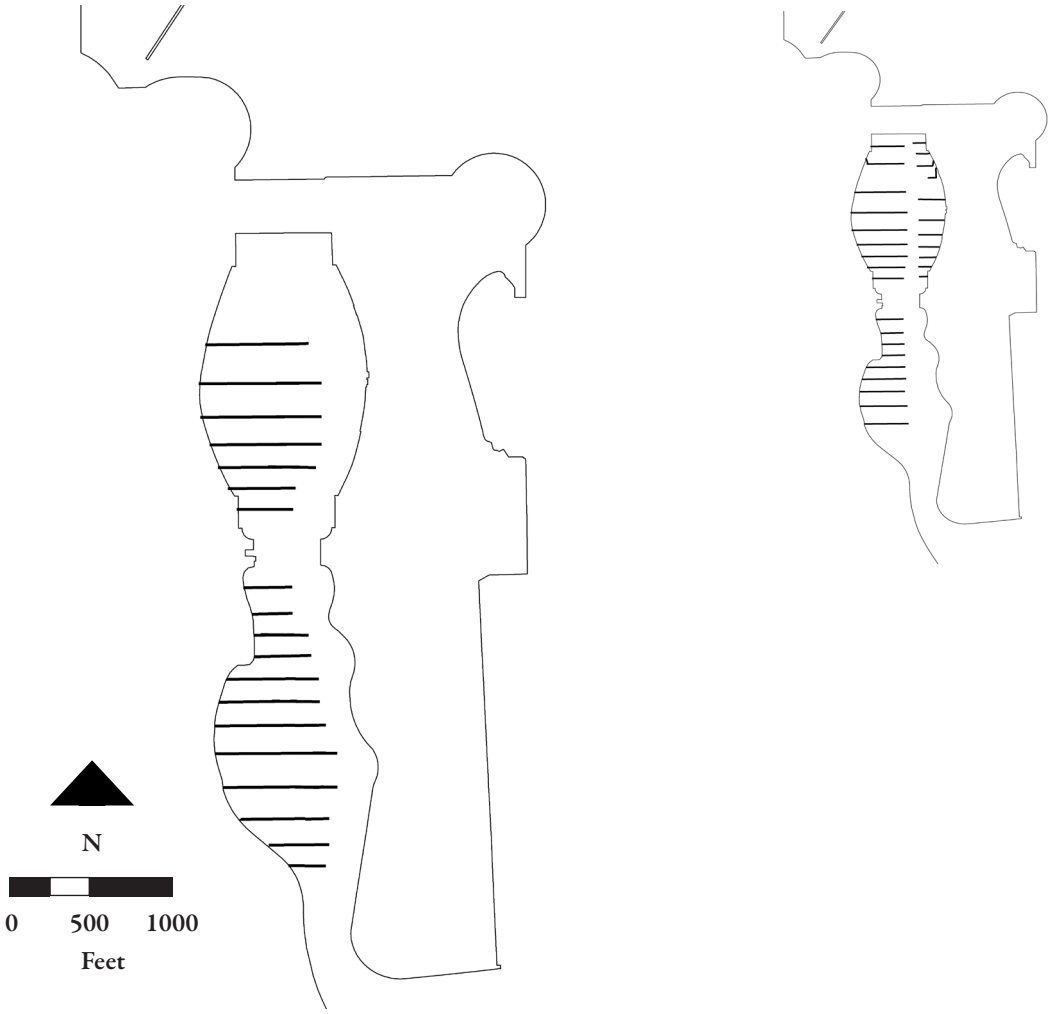


Figure 4.2. Conceptual reorganization of Burnham Harbor (left) and existing (right). Adding some piers to the southern lagoon and lengthening others eliminates the need for marina access from Northerly Island and creates a sheltered cove for water access at the northern end of the lagoon while preserving overall mooring numbers.

4.5. Neighborhood Access

There are two main, relatively inexpensive, opportunities for improving access to Northerly Island by non-automotive means from nearby neighborhoods. A bus stop is currently located on Columbus St. at the pedestrian underpass that connects to the Museum campus from the north side. However, of the six routes that stop here, none stop after that until 47th St. (approximately 5 miles south of the site) and most continue on until Jackson Park (several more miles). These are neighborhoods quite far south and, generally, wealthier than the ones they bypass. Adding more stops on Lake Shore Drive where it passes through Douglas would permit direct connections to Northerly Island at minimal cost. The new marina development at 31st Street would be one such obvious location.

Improving the existing 31st Street crossing (Figure 3.22) of Lake Shore Drive and the railway would facilitate local access to the 31st Marina, the Lakefront Trail, and thus to Northerly Island. The recent redevelopment of the 31st Marina cost over 100 million dollars. However, its traffic analysis report mentions bicycles only once (AECOM 2009) and that is in the context of the Lakefront Trail (which was provided with an underpass to eliminate bike/car problems arising from automotive access to the marina). It is slightly late, perhaps, but this redevelopment still provides a clear rationale for improving this crossing.

4.6. Circulation Concept

The major element of an improved circulation (Figure 4.3) is a bridge connecting the Lakefront Trail to the old Meigs Field Terminal building (repurposed as a visitor's center) and a boardwalk on the west side of the island (marina operations are to be moved to the west side of the harbor). This strengthens connections to the mainland and creates the possibility of looping through the park.

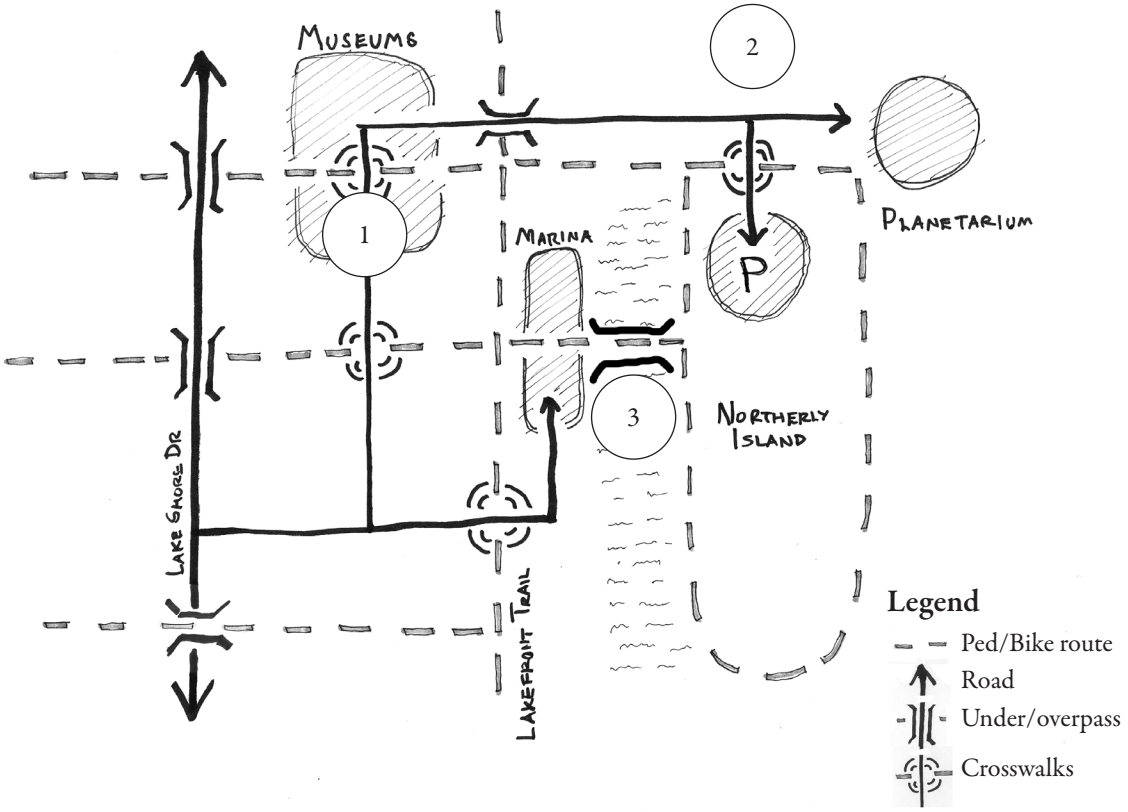


Figure 4.3. Circulation concept diagram for Northerly Island. Major changes are a reduction of conflicts around the Museum Campus area (1) and on East Solidarity Drive (2), and a bridge to the midpoint of the island (3). Improvements to pedestrian/bicycle access from the south are also important. The numbered circles are referenced in subsequent schematics.

Improved wayfinding at the Museum Campus end of East Solidarity Drive (Figures 4.4-4.6), elimination of marina operations on the island (discussed above) and a simplified entry to the large parking lot near the Adler Planetarium (Figures 4.7, 4.8) all serve to improve circulation and reduce pedestrian/traffic conflict.

Replacing the existing complex road pattern at Museum Campus Drive and East Solidarity Drive with a large oval simplifies circulation (see e.g. Figure 3.23), reduces the number of pedestrian crossings required, provides a clear terminus to the East Solidarity Drive boulevard, and creates a large central plaza for a relocated and expanded café, gift shop, and restroom facilities. Trees provide shaded picnicking areas for the many visitors this area receives. To the immediate east of this central grove, a concession plaza with shade structures reminiscent

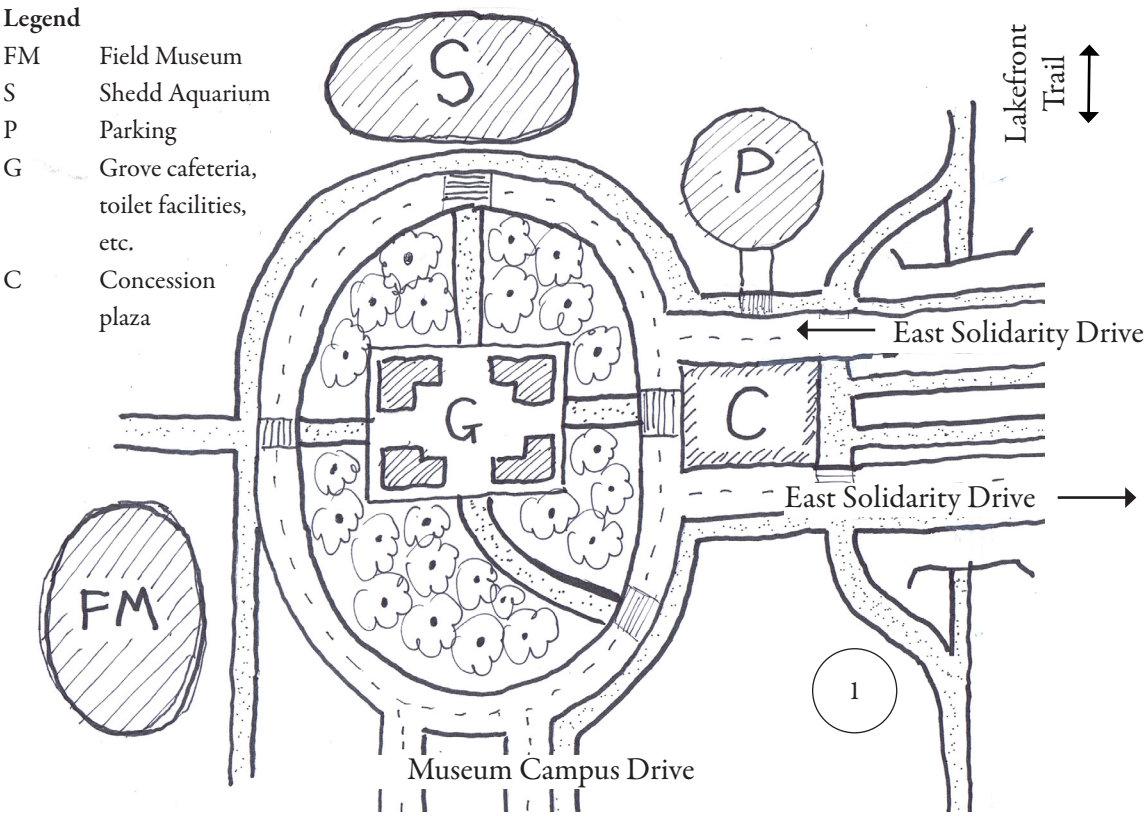


Figure 4.4. Schematic reorganization of East Solidarity Drive and Museum Campus Drive intersection. Cafes, gift shops, and restroom facilities are in a central grove. A shaded plaza for mobile concessions, kayak and bike rentals, etc. are to the right. Number 1 in Figure 4.3.

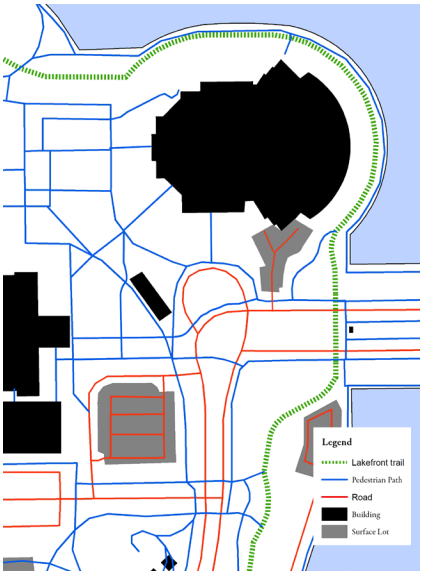


Figure 4.5. The existing complex and unclear circulation at the intersection. See figure 3.23 for more.

Figure 4.6. Inspiration. These canvas structures at the newly remodeled 31st harbor reflect the sails of nearby boats. They provide summer shade but can be removed for winter storage. They would be ideal in the concession plaza.

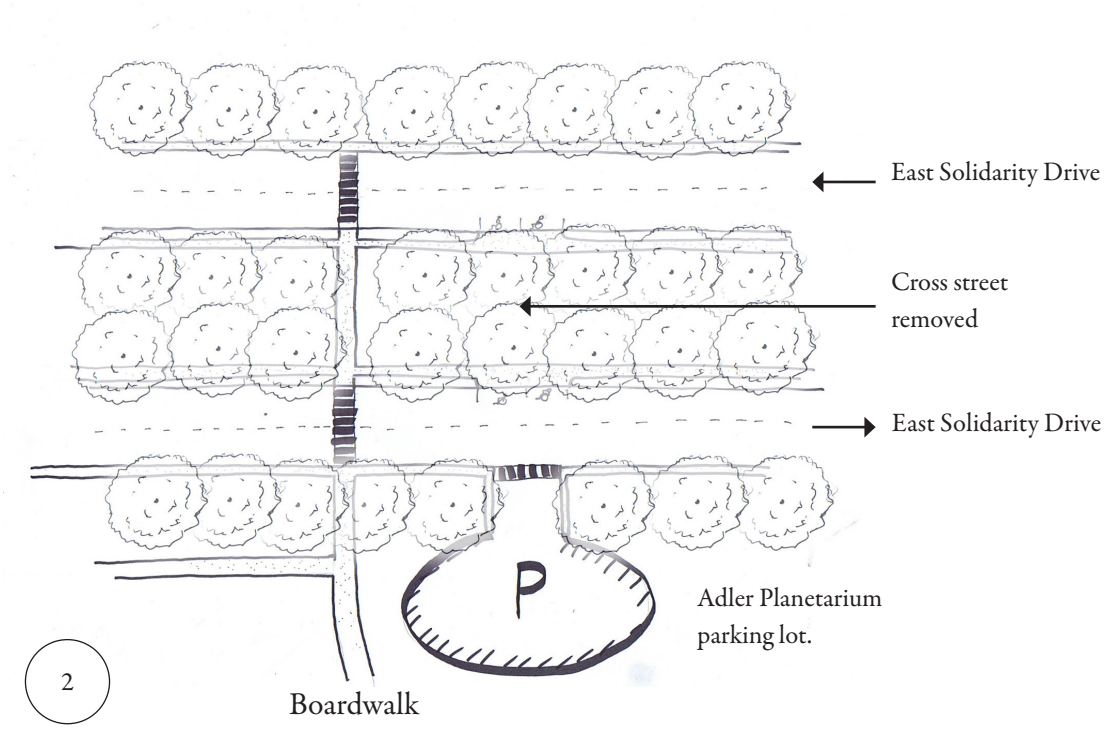


Figure 4.7. Schematic reorganization of access to Northerly Island from East Solidarity Drive in the vicinity of the Adler Planetarium parking lot. The cross street from the Northerly Island parking lot is replaced by the median strip, paths, and disabled parking spots that abut the new sidewalks. Parking lot egress now requires cars to turn in front of the Planetarium, eliminating four crosswalks. Number 2 in Figure 4.3.

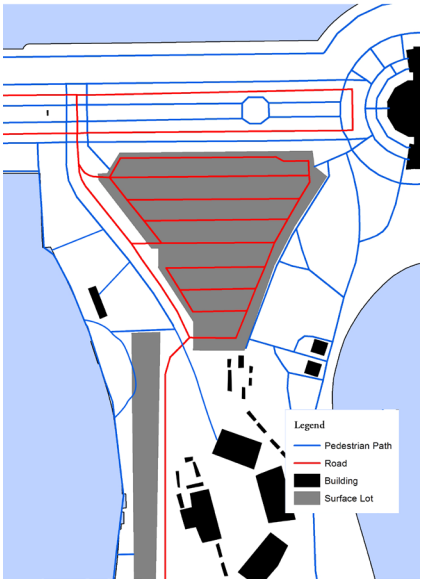


Figure 4.8. The existing complex and unclear circulation at the planetarium parking lot. See Figure 3.26 for more.

of sails acts as a gateway to the park while providing a location for mobile concessions (e.g. kayak, bike, and skate rentals). The Lakefront Trail connection is improved by adding a connecting path to the south to complement the existing one to the north.

On East Solidarity Drive removing the cross street from the large Northerly Island parking lot (Figures 4.7, 4.8) reduces impervious surface, eliminates four crosswalks and their potential for traffic/pedestrian conflict, and actually creates room for four new parking spots (shown as disabled spots with the grass verge replaced with paving at these locations). Introducing one-way circulation for access to the Adler Planetarium parking lot should also simplify traffic circulation during large events.

4.7. Bridge

At the narrowest point of the harbor a bridge (Figures 4.9) connects the Lakefront Trail directly to the Visitor Center forming a strong, automotive-free, entry to the park. This increases circulation routes through the park while recalling, in location, the World's Fair bridge that once stood in its place. A simple arch matches the modernist style of the terminal building while providing sufficient clearance for smaller boats to use the slips in the north lagoon.

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4.8. Toddler Beach

Relocating the marina slips as suggested above (section 4.4) means that the most sheltered and southerly facing portion of the harbor is now available for recreation. A small beach intended primarily for smaller children provides a safe experience of the lake with reduced wave activity compared to other available beaches. A removable ADA accessible ramp (Figure 4.10) provides water access and can double as a kayak launch for rentals from the nearby concession plaza. In the winter this area can also serve as an outdoor ice rink.

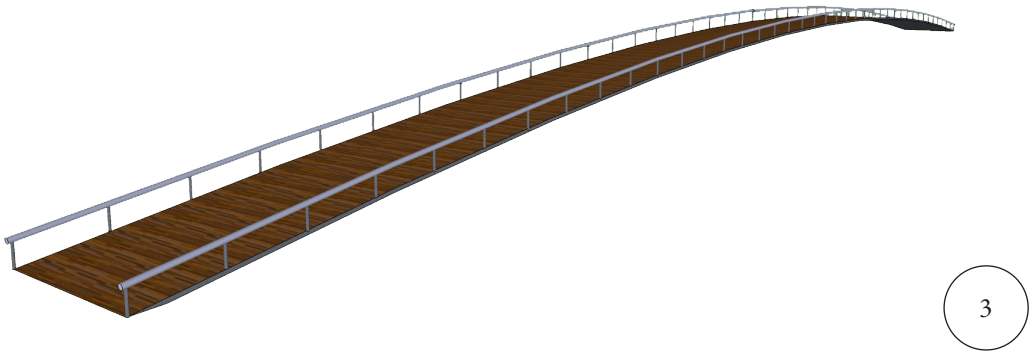


Figure 4.9. This proposed bridge provides a dramatic connection to Northerly Island. Modernist in form to match the terminal building while arcing up to allow passage of boats underneath, it connects the Lakefront Trail to the proposed Visitor Center in the terminal building. Number 3 in Figure 4.5.

Figure 4.10. An inexpensive removable plastic ramp like this one at Crissy Field (foreground) allows wheelchair access across beaches and can double as a Kayak launch ramp.

4.9. Boardwalk

A serpentine boardwalk along the harbor increases the amount of edge and opportunities to enjoy the water. The serpentine form also acts to reduce wave and wake energy, calming the water for boats and people alike. A sloping wall, constructed of recycled tyres used as gabions, further enhances this energy absorption (Figure 4.11). The gabions are filled with rocks for stability at depth, then at the water line and just below, soil for the establishment of aquatic plants or mussell shells to promote establishment of filter feeding colonies. Both plants and filter feeders will act to improve water quality by removing various pollutants. Zebra mussels are an aggressive invasive species in the Great Lakes while many species of native unionid mussels are endangered. Experimenting with different strategies for promoting native mussel habitat and monitoring the results can provide important information in regard to a very serious problem in this region. Buried tree stumps integrated into the wall and a varied lake bottom depth with opportunities for small fish to hide from larger will also increase fish habitat (Figure 4.13).

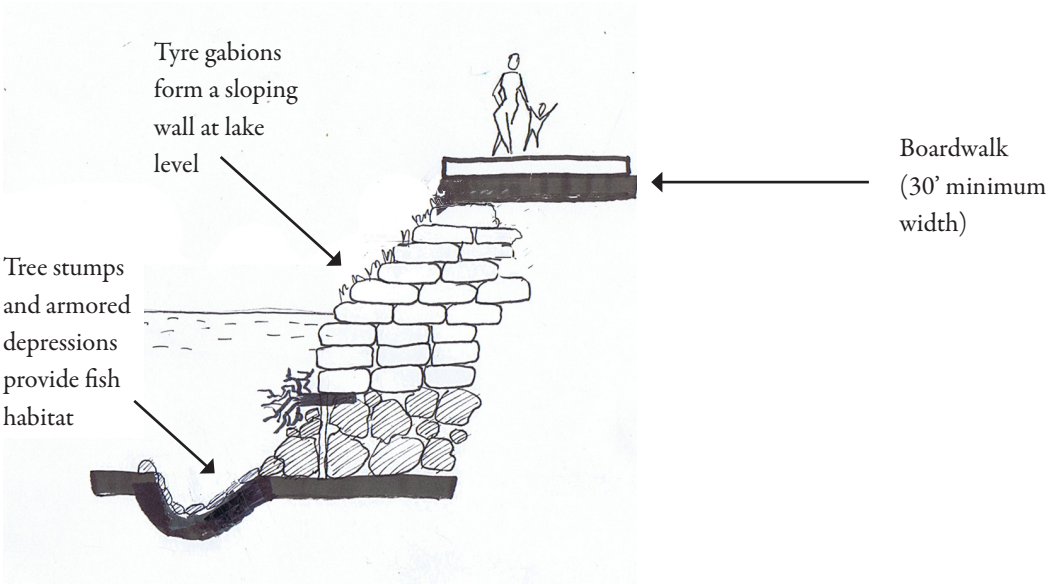


Figure 4.11. Conceptual boardwalk section. The tyre gabions are filled with rock and mussel shells below the water line for stability and to promote filter feeders. At and above the waterline they contain soil for aquatic/intermediate plants. Aquatic habitat is also provided.

Figure 4.12. Inspiration: Left. This dynamic esplanade in Benidorm provides a dramatic edge to the beach. Sources: Office of Architecture in Barcelona (www.ferrater.com)

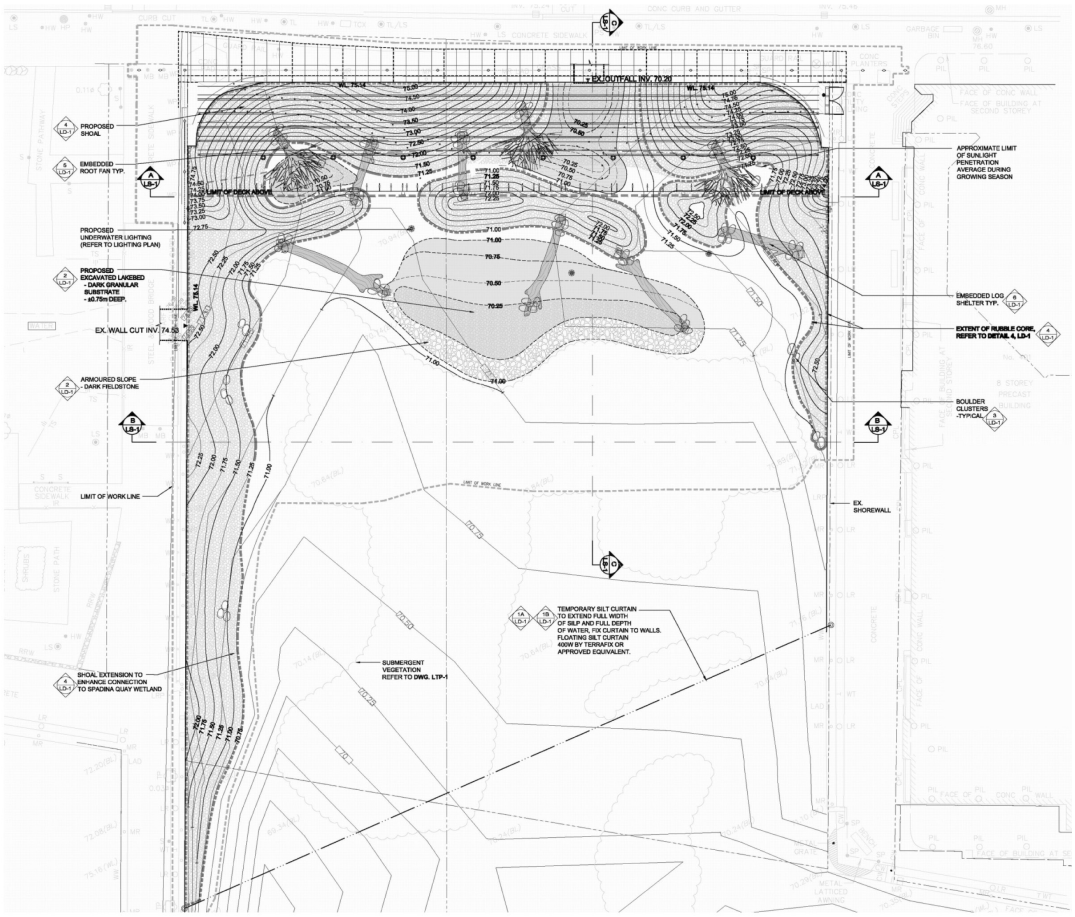


Figure 4.13. Inspiration: This construction detail by West 8 for the Toronto waterfront shows submerged logs and tree stumps used to provide fish habitat. Monitoring shows that this approach has worked.

4.10. Landform

A landform provides a relatively rare experience in Chicago: simply climbing a hill. Created in part, by fill excavated in creating an adjoining wetland, it provides opportunities for play, sledding, cycling , or simply sitting and admiring the view. ADA-compliant paths provide access while steeper slopes provide other opportunities. A nearby sledding hill at Soldier Field has drag lines, stairs, and typically long lines on a winter's day. Here, the experience is intended to be less regulated and open to exploration.

The hill is inspired by the mission of the Adler Planetarium and is shaped like a comet (Figures 4.14, 4.15) , pointing at the planetarium as a comet points at the sun. Comet Hill also helps define the lawn and, at its peak, provides a highly visible location for the park's focal point, a megalithic henge.

Figure 4.14. Comet McNaught provided the inspiration for Comet Hill. This photograph shows the nucleus, coma, amd main ion tail (bottom left) as well as an extensive dust trail arcing across the sky. The striations in the dust tail are caused by complex interactions between gravity, the solar wind, and radiation along with the non-uniform distribution of particle size with ablation time. Source: NASA.

Figure 4.15. A 100 scale physical model of Northerly Island was constructed to assist with hill design and placement. Multiple iterations were performed. The wetland is in the foreground.

The wetland will be fed by the McCormick Place Outflow which currently pours the rainwater from the 70 acre McCormick Center roof into Lake Michigan. Instead this water (as much as 55 million gallons per year (ASCE 2009) will be diverted to a manufactured wetland containing protected islands. pipes with operable valves will connect wetland to lake, allowing the water level to be manually adjusted as needed. Paths will circle the wetland while multi-use bridges cross it to provide access without disturbing wildlife (Figure 4.16).

Figure 4.16. This bridge over the tidal marsh at Crissy Field allows visitors to view the wildlife without disturbing it.

4.11. Henge

A stone circle, or henge, placed on top of the highest mound (see Figure 4.17 for examples) will provide a focal point, draw visitors to the dramatic views available, and act as a prop for imaginative play. Aligned with important celestial events (equinoxes, solstices, etc.) it will also tie in to outreach programs at the Adler Planetarium and further reinforce the astronomical association of Comet Hill. Iron-framed gabions (Figure 4.18) instead of massive

Figure 4.17. Inspiration: Stonehenge (left) is probably the most famous megalithic observatory but others exist throughout the world. Drombeg stone circle (right) in Ireland is one such

granite blocks would provide a modern touch and link to design elements used elsewhere (retaining walls on paths etc.).

Figure 4.18. An iron-framed gabion. Source: KGB Metal products.

4.12. Soft Edges

The standard approach to the Chicago shoreline is armoring of one form or another (concrete revetments, vertical sheet pilings, etc.). These approaches typically offer little to no habitat value, are extremely costly, and have to be replaced every generation or so. The soft edge approach replaces this engineered edge with a biological one, generally relying on natural slopes and vegetation to resist erosion (Figure 4.19). Such edges have typically evolved to survive local conditions and also provide a variety of habitat for native flora and fauna. There are several possible "soft edge" methods as well hybrid approaches (e.g. live stakes buried in rip rap slopes to promote plant growth on a reinforced shore). Alternately, opportunistic species may achieve a similar result as shown in Figure 4.20. While the arguments for replacing armored edges may seem compelling, there is very little empirical evidence as to design standards, best management practices, effectivity, or longevity of the soft-edge approach. Northerly Island offers a near unique chance to explore this question. The nearby museums and universities can monitor the effectiveness of different approaches along the shoreline in terms of habitat and storm resilience

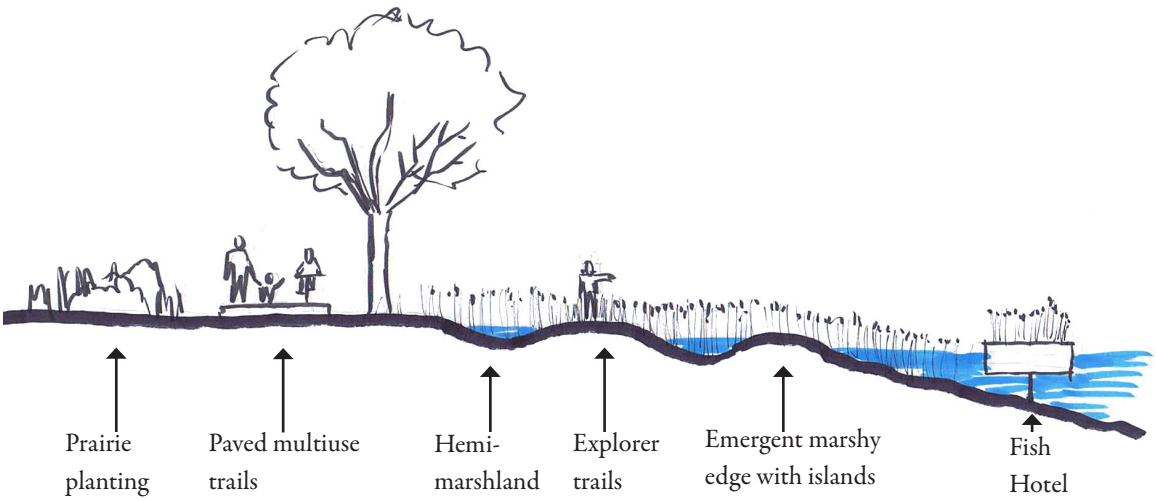


Figure 4.19. Conceptual soft edge treatment. Paved trails permit views while unpaved "explorer" trails allow access into the wetland. Isolated islands in the marsh allow nesting but limit foot access. Fish hotels add additional habitat and can be removed for winter storage and maintenance.

Figure 4.20. As this existing conditions photograph shows, rubble and rip rap can become colonized by local plants and may well provide excellent habitat for a variety of species. Source: A. L. Weir.

while, if one of those techniques fails, there is no costly infrastructure exposed (unlike the case almost everywhere else in the Chicago area).

A related issue along the Chicago shoreline is beach replenishment. With much of the shore now built up, new sand from erosion north of the city is no longer deposited along the coast. Existing beaches erode away and have to be replenished if they are not to be lost. While conventional beach replenishment is the responsibility of the Army Corps of Engineers and requires expensive grading, an alternative approach is being tried in the Netherlands. The Sand Engine is, essentially, a large volume of sand dumped into the North Sea just off the coast. Natural processes will distribute this sand along the coast, eliminating the need for expensive replenishment and the associated habitat disruption (Zandmotor undated, Figure 4.22). A similar approach, albeit on a smaller scale, could be tried and evaluated here.

Figure 4.21. The Zandmotor in the Netherlands. The sand is piled up by dredgers and redistributed along the beaches by natural currents. Source: Yale Environment 360.

4.13. Art Installation

Providing unique destinations within the park encourages people to enter and explore. Examples of such attractions include Sea Organ (Figure 4.22) which has become a popular tourist attraction in its own right in Zadar. Steps cut into the quay provide water access while buried tubes and resonant chambers turn the swell of the waves into music. Water Steps in Pittsburgh (Figure 4.23) is another way of breaking down the armored edge of the water and inviting play and interaction with the lake. Similar installations within the park would help draw in visitors and activate the site.

Figure 4.22. Inspiration: Sea Organ by Nikola Bašić in Zadar, Croatia. Polythene tubes and resonant chambers built into the marble steps create random, but harmonious, music. Source: Andrej Šalov.

Figure 4.23. Inspiration: Water Steps by EDAW in North Shore Riverfront Park, Pittsburgh PA. Sandstone blocks and an interactive fountain invite water play.

4.14. Conclusion

Design directions have emerged from an understanding of overall project goals, site analysis, and a review of the appropriate literature. Initial concepts for the site and a variety of proposed site elements have been laid out. Integrating these design directions, concepts, and inspirations we can create a park for Northerly Island that emphasizes nature and access to nature for all Chicagoans. This process begins in the next chapter.

CHAPTER 5

Design

5.1. Overview

The final design integrates the approaches discussed in earlier chapters (Figure 5.1). The northern third is dominated by the Adler Planetarium, the Charter One pavilion, and associated roads and parking. The middle third contains the lawn and Comet Hill for active play and entertainment. The bottom third is dominated by the wetland. Woodland hugs the western edge of the island and prairie the eastern. Savanna and wetland lie between them. A network of paths connect these areas and define the edges of the different habitat regions, providing visual indicators of their deliberate organization. The central ideas of the plan are illustrated in Figure 5.2 and further clarified in Table 5.1. Broadly, from north to south there is a change of emphasis from people to flora and fauna. Views and activities emphasize the human element in the north, the outward landscape and active play in the middle, and wildlife and reflection in the south. In a sense the visitor moves from a focus on themselves through awareness of the greater world and arrives at contemplation of its other, non-human, inhabitants. At the same time, the plan maintains traditional approaches in places (boardwalks etc.) as a way to give visitors common and comfortable referents but moves towards more green infrastructure and experimentation as one enters deeper into the park. The plan is shown in Figure 5.1 while Figures 5.3-5.9 show before and after sections of the proposed plan.

5.2. Habitat

The different habitats are, essentially, arranged in north-south strips (the main exception being the wetland, Figure 5.10). Typical images of these varied habitat types are shown in Figure 5.11. The woodland and savanna are relatively clear of shrubs and understory to the north, less so to the south. This preserves open sight lines to provide a more inviting arrival experience and

Figure 5.1. The final plan for Northerly Island. Woodlands dominate the western side and prairie the right. Between lie savanna and wetland. A number of artificial islands and an extended groin catch sand to create emergent beach and habitat. The circled numbers refer to habitat explained in Figure 5.10.

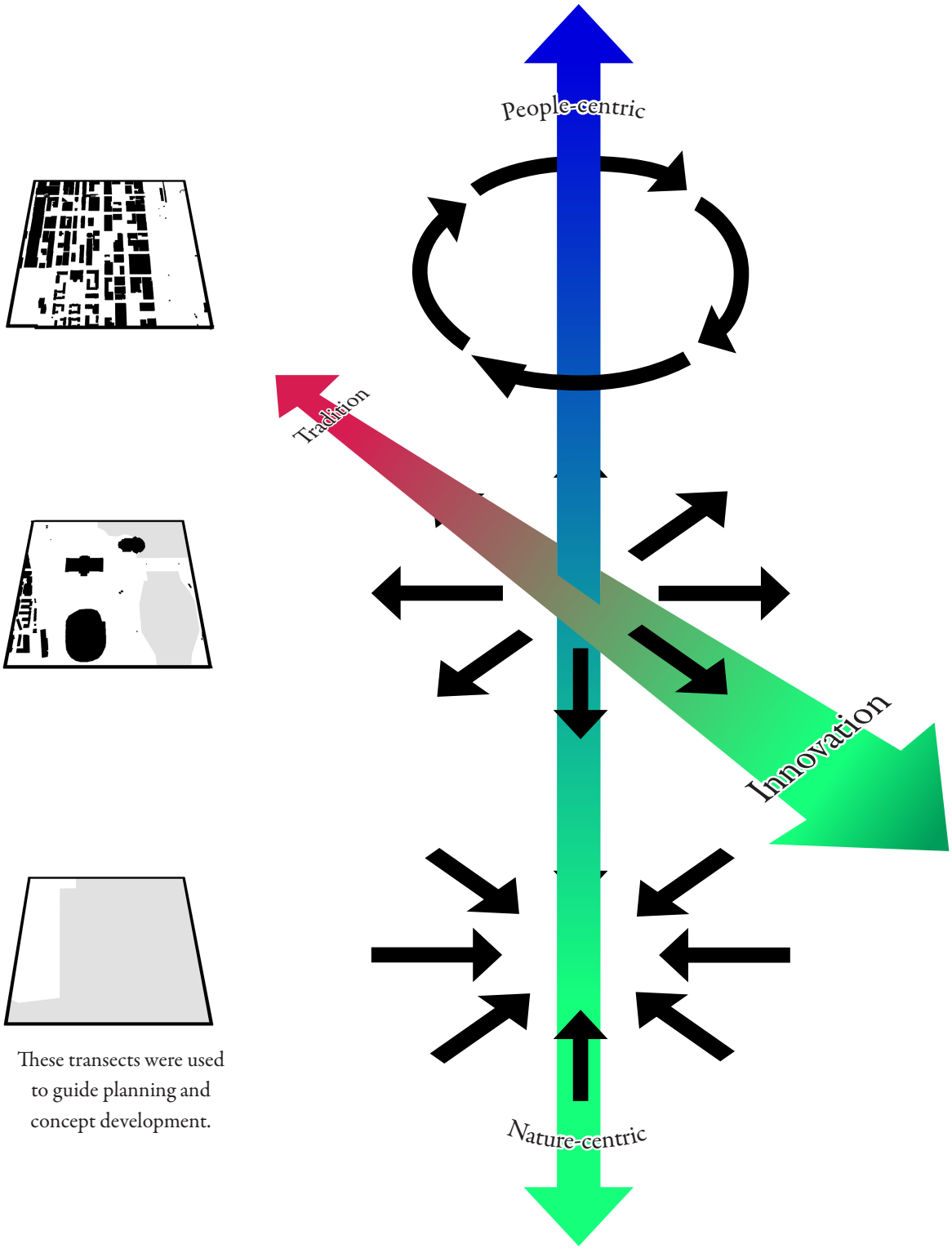


Figure 5.2. The central concepts embedded in the proposed plan and how they relate. From north to south their is a change of emphasis from people to flora and fauna. At the same time, there is a transition from conventional to experimental approaches as one moves away from the more developed park areas. See Table 5.1 for how views, activities, etc, are affected by this transition. See Figures 3.5 and 4.1 for more on the transects shown to the left.

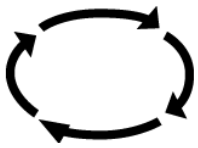
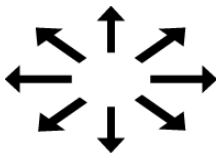
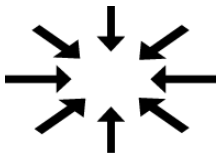
Focus	View Emphasis	Activities	Access and Circulation
	People watching.	Socialising. Swimming at 12 St beach. Concerts.	Improved vehicle circulation. reduction in vehicle/pedestrian conflict.
	Landscape and sky. Cityscape.	Active play and exercise. Exploration and adventure.	Connection to Lakefront Trail via bridge. Loop trail in park.
	Wetland and wildlife. Shoreline.	Reflection, strolling	Internal trails. Connection to "wild" shore.

Table 5.1. The differences in focus along the north south axis of the proposed plan. See Figure 5.2.

increase apparent safety. It also allows variation within the different habitats for different species (see Table 5.2). A list of recommended plants for a variety of situations is included in Table 5.3. In general the 15 acre woodland serves to shelter the island from the mainland and emphasize the experience of being outside of the urban environment. However, woodland trees should not exceed 35 ft in height in order to avoid blocking dramatic views of the Chicago skyline from the top of Comet Hill.

The five acre lawn, cradled by the topography of Comet Hill, provides an open, sunny spot for relaxing, ball games, and so forth. It could, in combination with the reconfigured terminal building, also generate revenue through facilities rentals for receptions and other events. The savanna, 30 acres in size and supposedly the most attractive and reassuring type of landscape, is situated so as to invite visitors to enter the park whether arriving from the north along East Solidarity Drive or from the west over the new bridge. The prairie is not, in essence, too unlike the savanna. It has no trees and more flowering shrubs but offers a similar visitor experience.

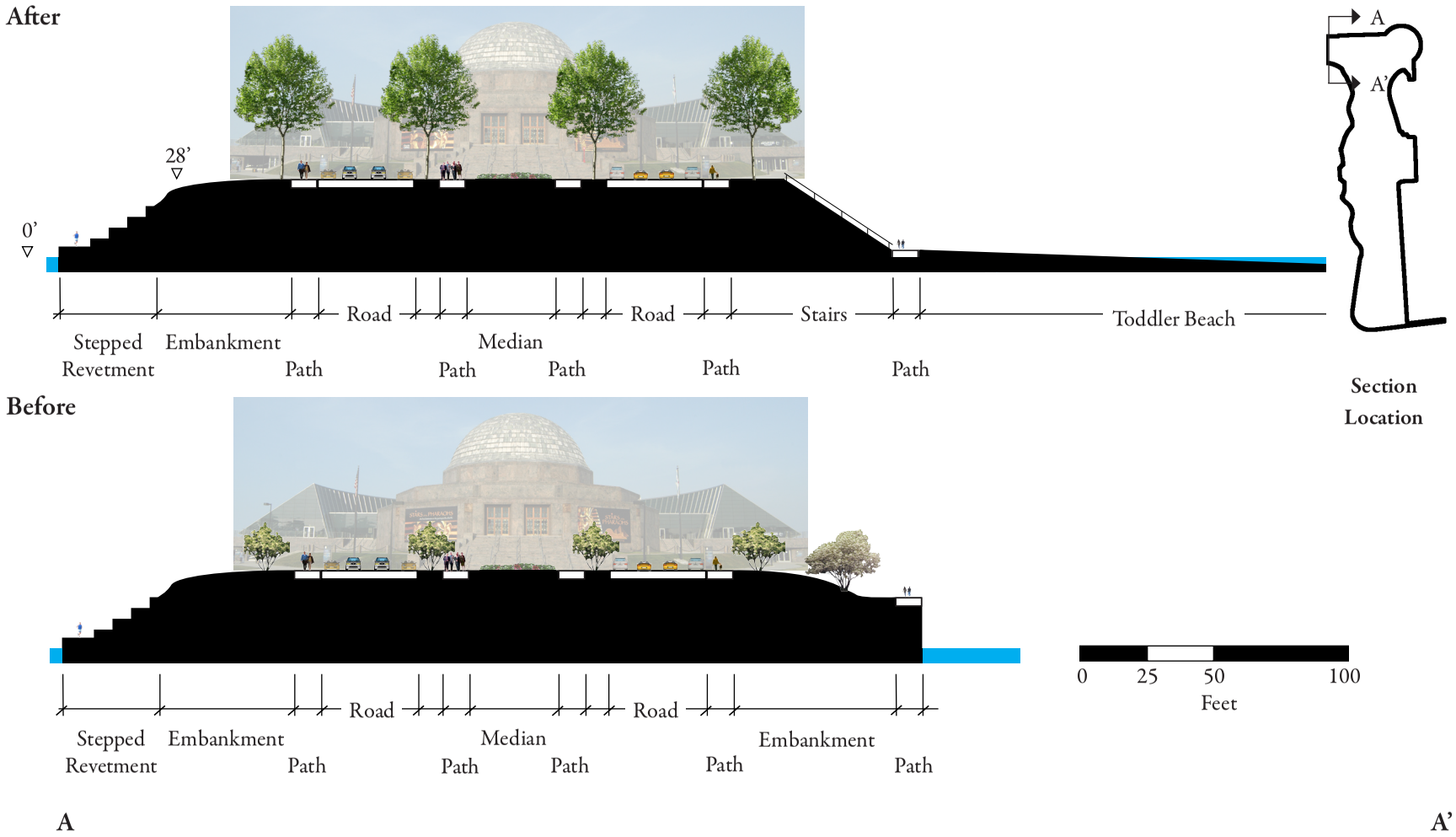


Figure 5.3. Section AA'. The section below is existing conditions while that above shows the plan. Major elements are a path down to the new beach and trees more appropriate to the Beaux-Arts style boulevard.

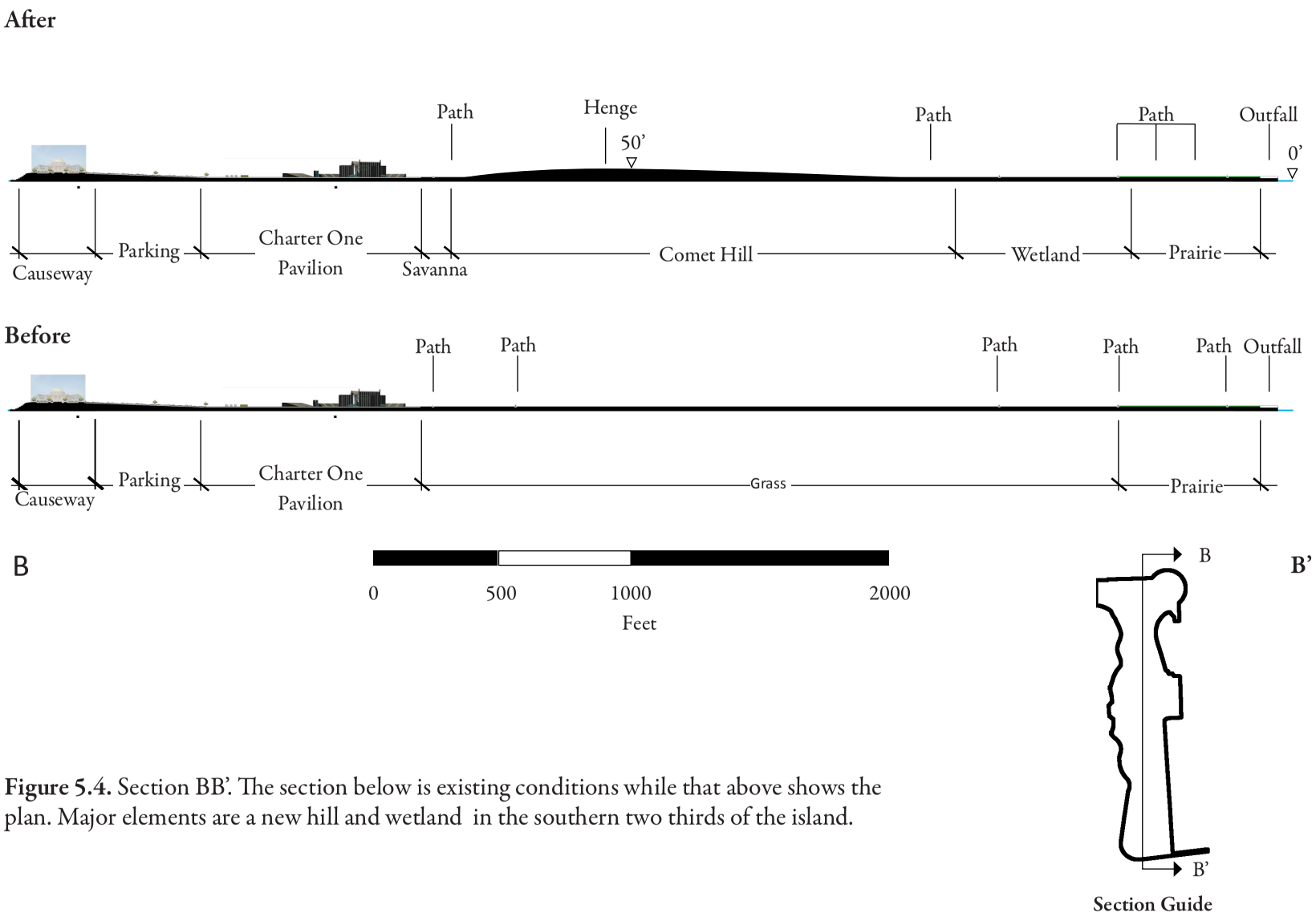


Figure 5.4. Section BB'. The section below is existing conditions while that above shows the plan. Major elements are a new hill and wetland in the southern two thirds of the island.

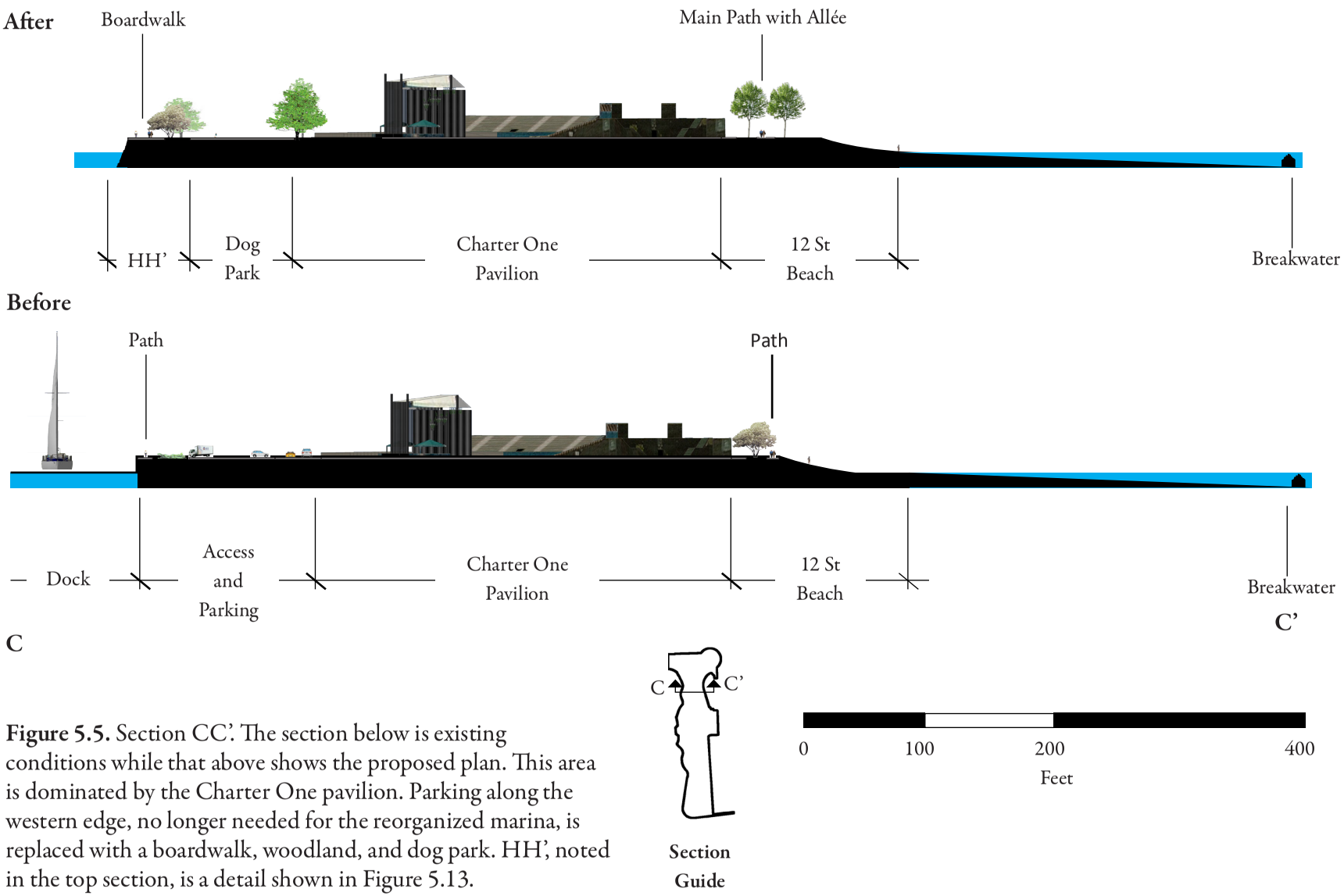


Figure 5.5. Section CC'. The section below is existing conditions while that above shows the proposed plan. This area is dominated by the Charter One pavilion. Parking along the western edge, no longer needed for the reorganized marina, is replaced with a boardwalk, woodland, and dog park. HH', noted in the top section, is a detail shown in Figure 5.13.

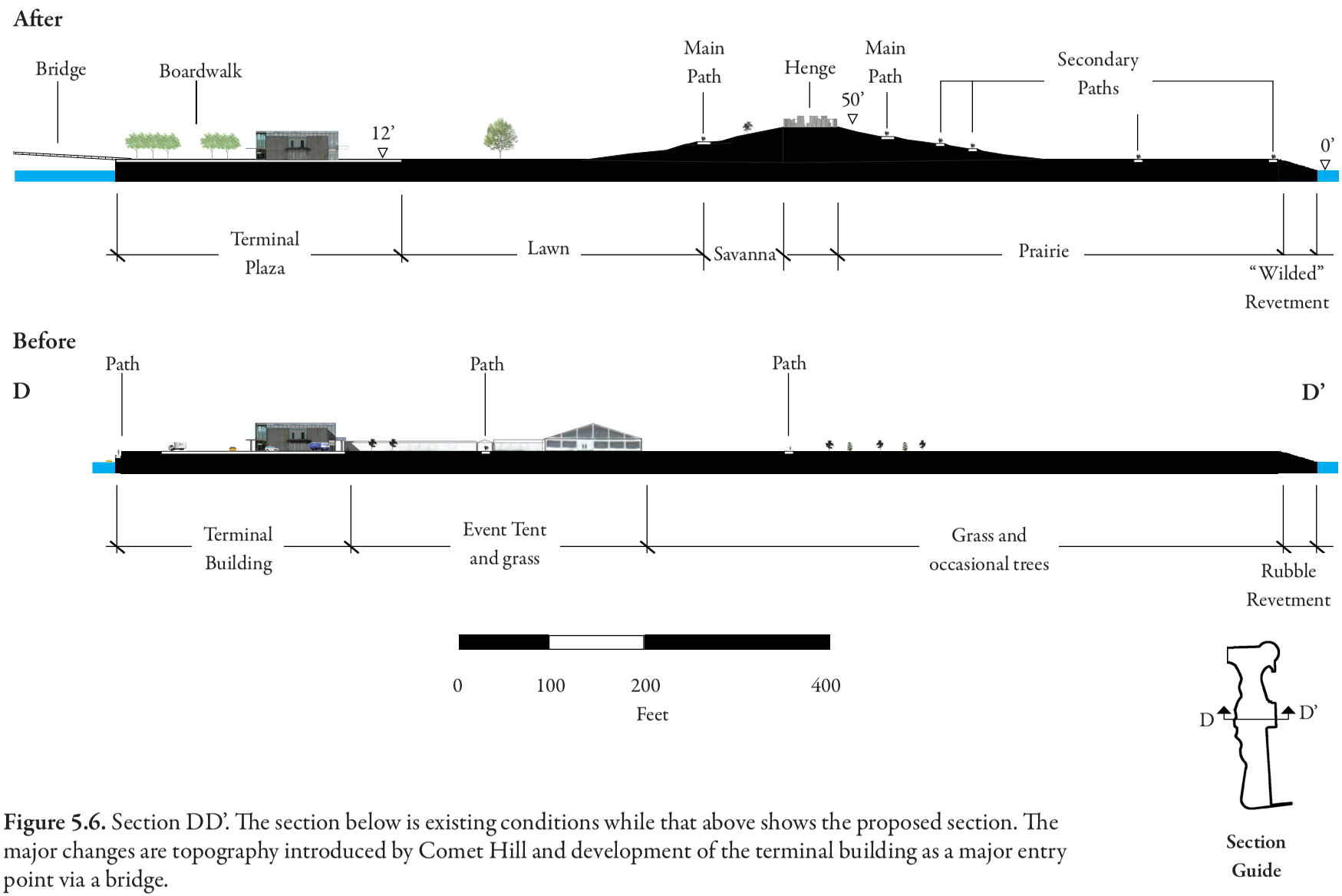


Figure 5.6. Section DD'. The section below is existing conditions while that above shows the proposed section. The major changes are topography introduced by Comet Hill and development of the terminal building as a major entry point via a bridge.

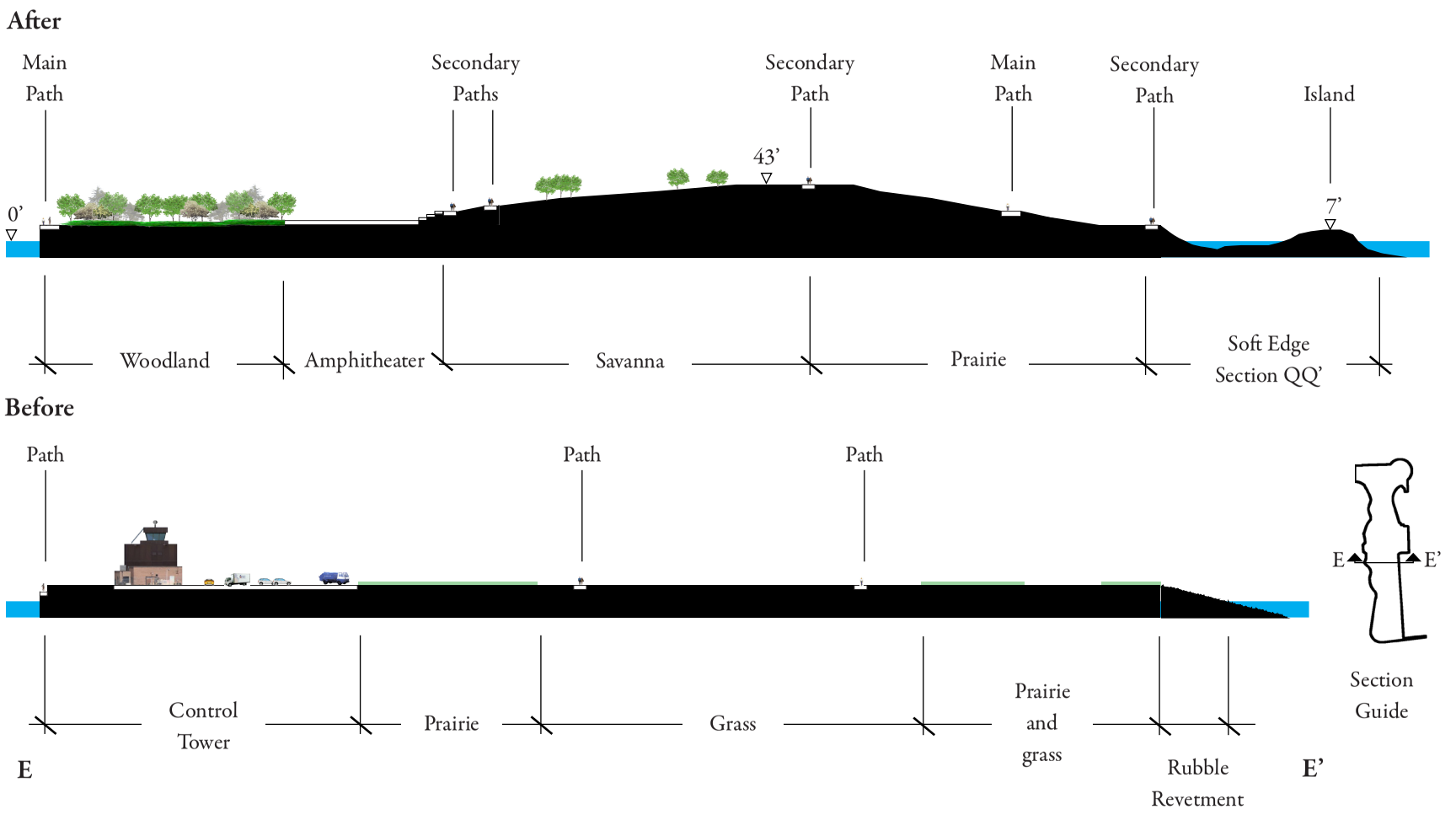
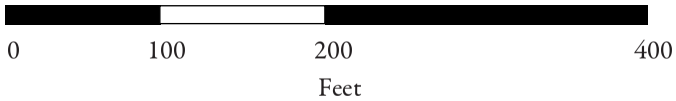


Figure 5.7. Section EE'. The section below is existing conditions while that above shows the proposed design. The control tower has been moved and replaced by an amphitheater and woodland. Also visible are Comet Hill and one of the small islands created for habitat. Section QQ' is shown in Figure 5.29



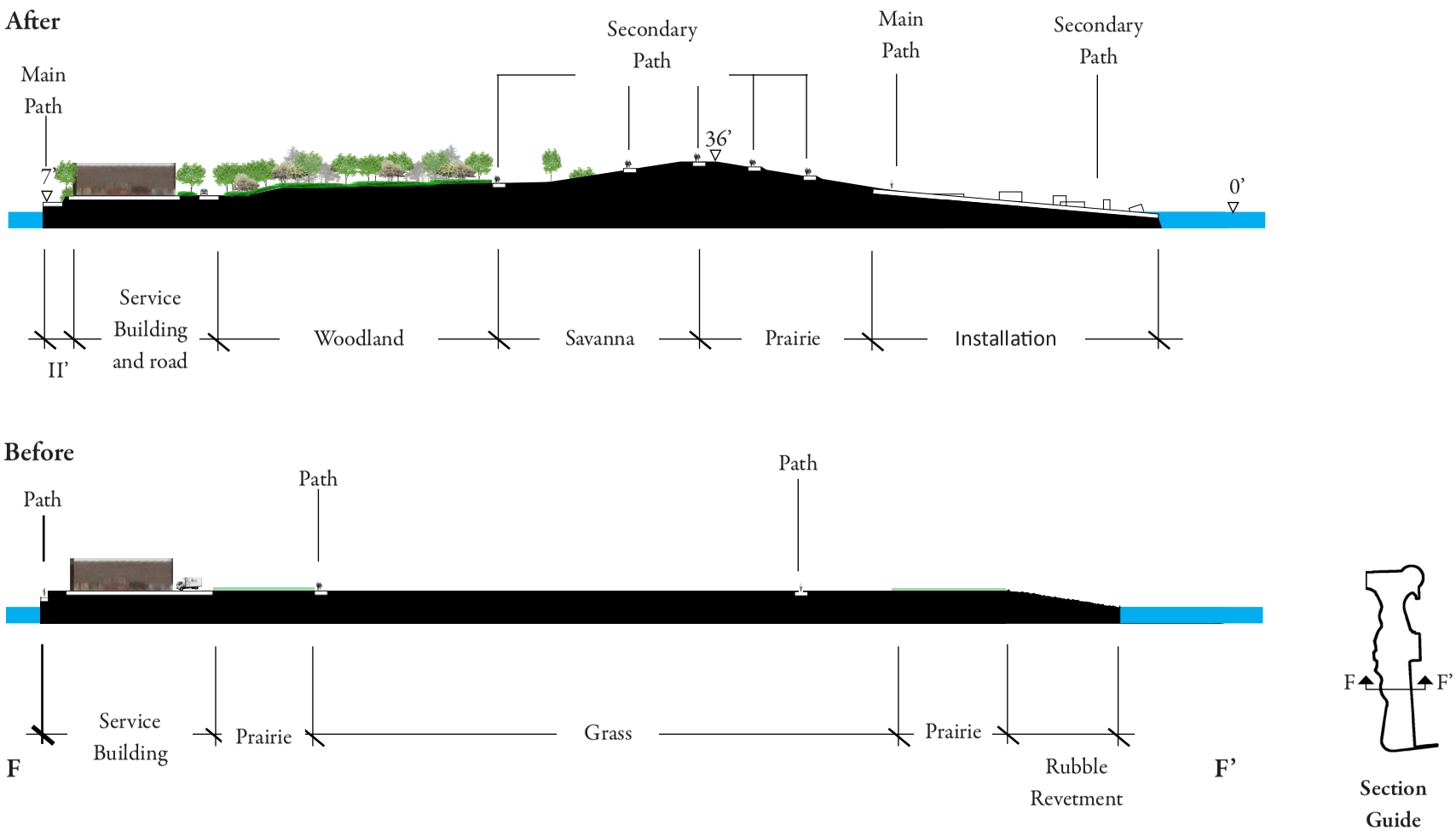
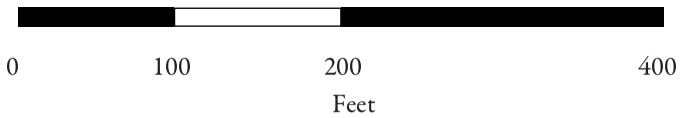


Figure 5.8. Section FF'. The section below is existing conditions while that above shows the proposed design. The service building remains but is now hidden by trees. On the lakeside shore a large art installation slopes down offering options for interaction with the water. II', noted in the top section, is a detail shown in Figure 5.14.



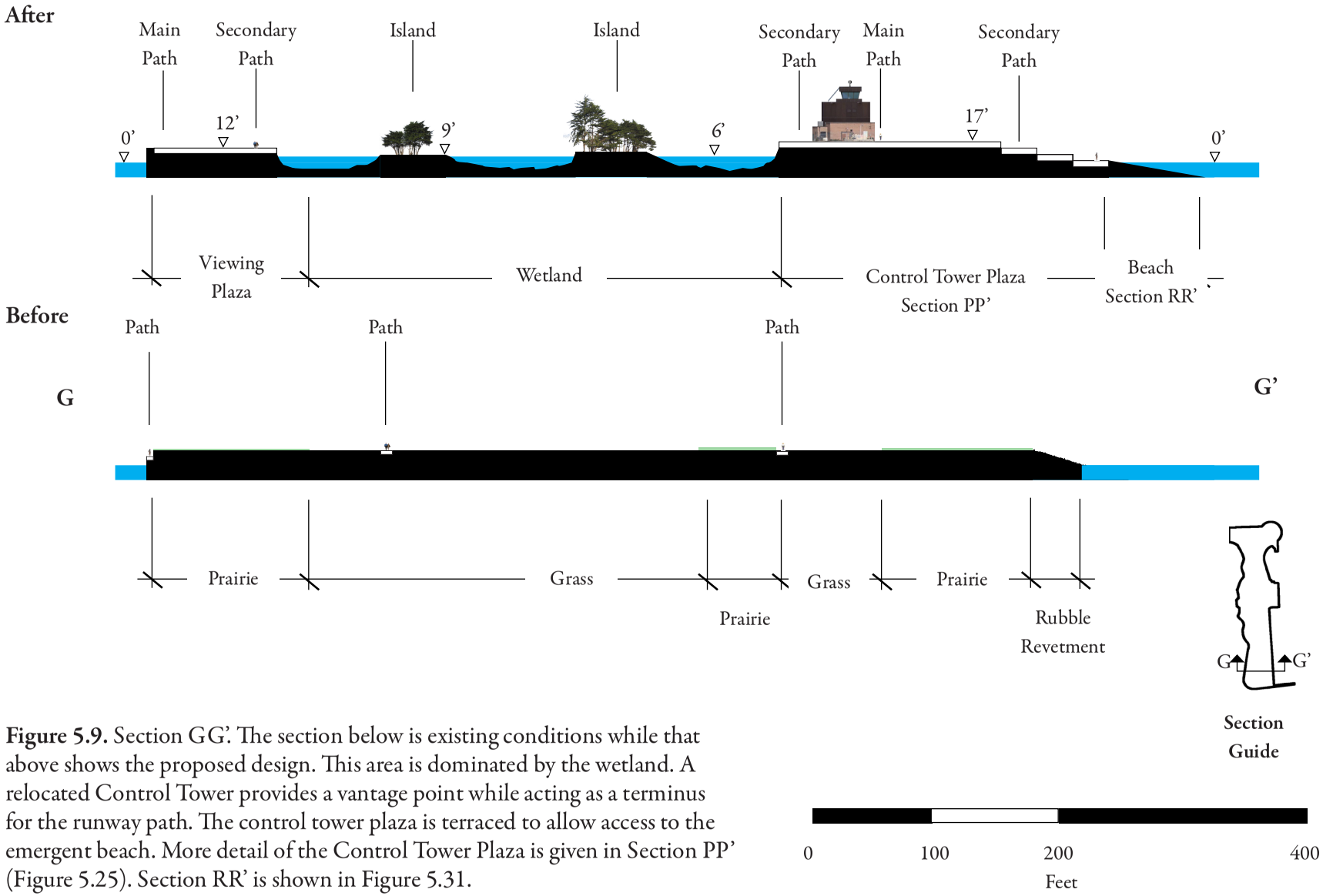


Figure 5.9. Section GG'. The section below is existing conditions while that above shows the proposed design. This area is dominated by the wetland. A relocated Control Tower provides a vantage point while acting as a terminus for the runway path. The control tower plaza is terraced to allow access to the emergent beach. More detail of the Control Tower Plaza is given in Section PP' (Figure 5.25). Section RR' is shown in Figure 5.31.

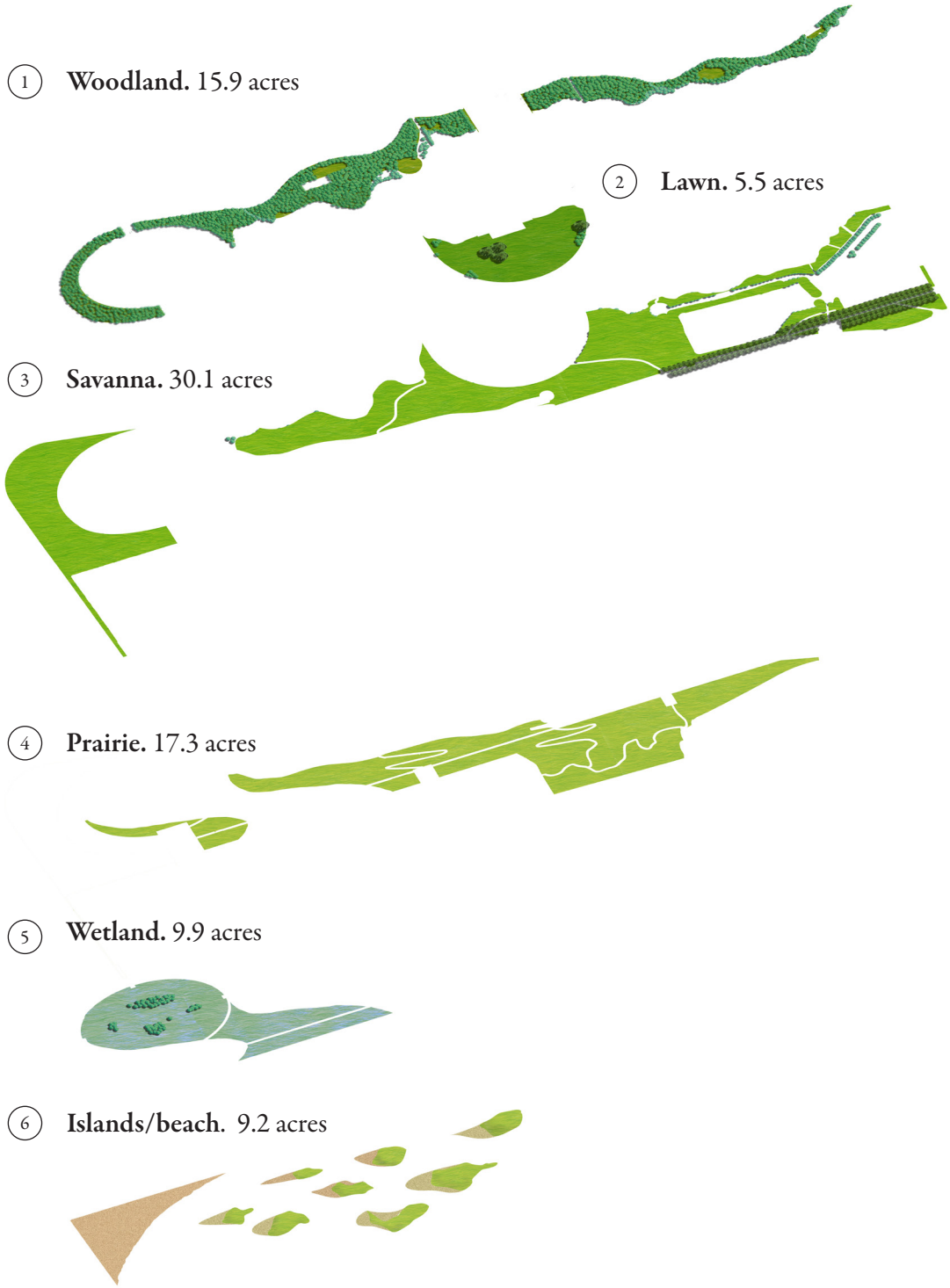


Figure 5.10. Axonometric projection of the different habitat regions in Figure 5.1 and their acreage. Exemplar images of these habitat types are in Figure 5.11.

1 **Woodland.** McDonald Woods. Source: Chicago Botanic Garden

2 **Lawn.** Meigs Field. Source: A. L. Weir

3 **Savanna.** Fort McCoy, WI. Source: US Forest Service.

4 **Prairie.** Meigs Field. Source: A. L. Weir

5 **Wetland.** Calumet Open Space Preserve. Source: Chicago Parks Dept.

6 **Islands/beach.** Crissy Field. Source: A. L. Weir

Figure 5.11. Exemplar images of the different habitat types in Figure 5.10.

	Habitat value	Description	Bird Species
Lawn	Low	Regularly mown grass, occasional shade trees	None
Woodland	Good	Native trees. Increasing understory to south.	Cooper's Hawk, Red-headed Woodpecker, Great Crested Flycatcher, Eastern Wood Pewee, Cedar Waxwing, Blue-gray Gnatcatcher, Rose-breasted Grosbeak, Indigo Bunting, Baltimore Oriole;
Savanna	High	Native grasses and occasional trees. Increased number of shrubs to south.	Bird Species: Red-tailed Hawk, Red-headed Woodpecker, Northern Flicker, Eastern Kingbird, Eastern Bluebird, Baltimore Oriole; (with shrubs) Black-billed Cuckoo, Eastern Towhee, Blue-winged Warbler, Yellow-breasted Chat, Indigo Bunting, Orchard Oriole, American Goldfinch.
Prairie	High	Native grasses, herbs, flowers etc.	Willow Flycatcher, Brown Thrasher, Field Sparrow, Yellow-breasted Chat, Bell's Vireo, Blue-winged Warbler
Wetland	Excellent	Freshwater marsh. Approx 50% open water, 50% reeds etc. Islands as refuge.	Green Heron, Black-crowned Night Heron, Willow Flycatcher; (with shrubs) Pied-billed Grebe, American Bittern, Least Bittern, Blue-winged Teal, Ruddy Duck, Virginia Rail, Common Moorhen, American Coot, Marsh Wren, Yellow-headed Blackbird
Beach	Moderate	Emergent beach/ mudflats and island refuges.	Green Heron, Black-crowned Night-Heron, Greater Yellowlegs, Whimbrel, Least Sandpiper, Buff-breasted Sandpiper, Short-billed Dowitcher, Wilson's Phalarope, Black-bellied Plover, American Golden Plover, Solitary Sandpiper, Hudsonian Godwit, Ruddy Turnstone, Red Knot, Sanderling, Semipalmated Sandpiper, Western Sandpiper, Dunlin, Wilson's Snipe, Northern Phalarope.

Table 5.2. Habitat descriptions and typical resident and migratory bird species.

Category	Official Name	Common Name
Large shade/specimen trees.	*Acer x freemanii* *Celtis occidentalis* *Ginkgo biloba* *Gymnocladus dioicus* *Quercus rubra* *Tilia americana*	Red Maple Hybrid Common Hackberry Ginkgo Kentucky Coffeetree Red Oak American Linden
Small ornamental trees.	*Amelanchier x grandiflora* *Cercis canadensis* *Cornus mas* *Crataegus crusgalli inermis* *Malus var.* *Viburnum prunifolium*	Apple serviceberry Eastern redbud Corneliancherry dogwood Thornless Cockspur hawthorn Flowering crabapple Blackhaw viburnum
Flowering plants (forbs) for full sun.	*Amorpha canescens* *Anemone patens* *Asclepia Tuberosa* *Aster ericoides* *Aster novae-angliae* *Baptisia alba* *Coreopsis lanceolata* *Desmodium canadense* *Echinacea pallida* *Echinacea purpurea* *Heliopsis helianthoides* *Kuhnia eupatorioides* *Lespedeza capitata* *Liatris spicata* *Lobelia spicata* *Parthenium integrifolium* *Phlox paniculata* *Phlox pilosa* *Potentilla arguta* *Ruellia humilis* *Solidago nemoralis*	Lead Plant Pasque Flower Butterfly Weed Heath Aster New England Aster White Wild Indigo Sand Coreopsis Showy Tick Trefoil Pale Purple Coneflower Purple Coneflower Early (False) Sunflower False Boneset Round Headed Bush Clover Spiked (Dense) Blazing Star Pale Spiked Lobelia Wild Quinine Garden Phlox Prairie Phlox Prairie Cinquefoil Wild Petunia Gray Goldenrod

Table 5.3. Plant recommendations. Trees are recommended by the Chicago Parks district. Other plants are from the City of Chicago recommended Native Plant List.

Category	Official Name	Common Name
Flowering plants (forbs) for rain gardens, wetland edges, etc. Full sun.	*Asclepias incarnata* *Coreopsis palmata* *Dalea purpurea* *Eryngium yuccifolium* *Geum triflorum* *Liatris aspera* *Liatris pycnostachya* *Ratibida pinnata* *Solidago reddellii* *Vernonia fasciculata* *Viola pedatifida*	Swamp Milkweed Prairie Coreopsis Purple Prairie Clover Rattlesnake Master Prairie Smoke Rough Blazing Star Prairie Blazing Star Yellow Coneflower Riddell's Goldenrod Ironweed Prairie Violet
Grasses. Full sun.	*Andropogon gerardii* *Grama Bouteloua curtipendula* *Eragrostis spectabilis* *Koehleria cristata* *Panicum virgatum* *Sorghastrum nutans* *Sporobolus heterolepis* *Stipa spartea*	Big Bluestem Side Oats Purple Love Grass June Grass Switch Grass Indian Grass Prairie Dropseed Porcupine Grass
Grasses for rain gardens, wetland edges, etc. Full sun.	*Schizachyrium scoparium* *Calamagrostis canadensis*	Little Bluestem Blue Joint Grass
Shrubs for full sun.	*Corylus americana* *Sambucus canadensis* *Vaccinum corymbosum* *Viburnum dentatum*	American Filbert Elderberry Highbush Blueberry Arrowwood Viburnum
Shrubs for rain gardens, wetland edges, etc. Full sun.	*Ilex verticillata* *Spiraea alba*	Winterberry Meadowsweet

Table 5.3 (continued). Plant recommendations. Trees are recommended by the Chicago Parks district. Other plants are from the City of Chicago recommended Native Plant List.

Category	Official Name	Common Name
Flowering plants (forbs) for full sun to part shade.	*Allium cernuum* *Anemone cylindrica* *Aster oolentangiensis* *Dodecatheon meadia* *Lobelia cardinalis* *Penstemon digitalis* *Phlox glaberrima interior* *Veronicastrum virginicum* *Zizia aptera*	Nodding Wild Onion Prairie Thimbleweed Sky Blue Aster Shooting Star Cardinal Flower Foxglove Beardtongue Smooth Phlox Culver's Root Heart-Leaved Meadow Parsnip
Flowering plants (forbs) for rain gardens, wetland edges, etc. Full sun to part shade.	*Aster laevis* *Aster novae-angliae* *Eupatorium maculatum* *Eupatorium perfoliatum* *Iris virginica shrevei* *Monarda fistulosa* *Rudbeckia hirta* *Solidago ohiensis* *Tradescantia ohioensis* *Zizia aurea*	Smooth Blue Aster New England Aster Spotted Joe Pye Weed Common Boneset Blue Flag Iris Wild Bergamot (Bee Balm) Black-Eyed Susan Ohio Goldenrod Spiderwort Golden Alexander
Grasses for full sun to part shade.	*Carex sp.* *Cinna arundinacea* *Elymus canadensis* *Elymus virginicus* * *Glyceria striata* *Hystrix patula*	Sedges Common Wood Reed Canada Wild Rye Virginia Wild Rye Fowl Meadow (Manna) Grass Bottlebrush Grass
Grasses for rain gardens, wetland edges, etc. Full sun to part shade.	*Leersia oryzoides* *Scirpus validus* *Scirpus atrovirens* *Spartina pectinata* *Chasmanthium latifolum*	Rice Cut Grass Great Bulrush Dark Green Rush Prairie Cord Grass Northern Sea Oats
Shrubs for full sun to part shade.	*Aronia arbutifolia* *Hamamelis virginiana* *Hydrangea arborescens* *Physocarpus opulifolius* *Ribes americanum*	Red Chokeberry Common Witch Hazel Smooth Hydrangea Ninebark Wild Black Currant

Table 5.3 (continued). Plant recommendations. Trees are recommended by the Chicago Parks district. Other plants are from the City of Chicago recommended Native Plant List.

Category	Official Name	Common Name
Shrubs for rain gardens, wetland edges, etc. Full sun to part shade.	*Rosa palustris*	Swamp Rose
Flowering plants (forbs) for part shade.	*Aquilegia canadensis* *Arisaema triphyllum* *Asarum canadense* *Dicentra cucullaria* *Erythroniuim americanum* *Hydrophyllum virginianum* *Podophyllum peltatum* *Sanguinaria canadensis* *Trillium spp.*	Wild Columbine Jack-in-the-Pulpit Wild Ginger Dutchman's Breeches Yellow Trout Lily Virginia Waterleaf Mayapple Bloodroot Trillium
Flowering plants (forbs) for rain gardens, wetland edges, etc. Part shade.	*Viola canadensis* *Chelone glabra linifolia* *Eurybia macrophylla* *Geranium maculatum* *Mertensia virginica* *Polemonium reptans* *Polygonatum canaliculatum* *Smilacina racemosa* *Tiarella spp.*	Canada Violet White Turtlehead Bigleaf Aster Wild Geranium Virginia Bluebells Jacob's Ladder Solomon's Seal False Solomon's Seal Foamflower
Grasses for part shade.	*Elymus hystrix*	Bottlebrush Grass
Shrubs for full sun to part shade.	*Aesculus parviflora* *Hydrangea quercifolia*	Bottlebrush Buckeye Oak Leaf Hydrangea

Table 5.3 (continued). Plant recommendations. Trees are recommended by the Chicago Parks district. Other plants are from the City of Chicago recommended Native Plant List.

Possibly the most interesting landscapes, however, are the wetlands and the new islands and beaches. The wetland is just under 10 acres in size and is fed from the McCormick Place Outflow which drains 70 acres of rooftop. Currently this water, of fairly high quality owing to the McCormick Center's extensive green roofs, is simply fed into Lake Michigan. It could easily be diverted to feed a wetland instead (with a system of culverts and valves to allow overflow into the lake or possible replenishment during dry spells). A strong elliptical path with viewing platforms around the wetland make clear its intentionality and two bridges over the wetland allow the visitor to move through it without disturbing wildlife. "Refuge" islands in the middle provide habitat that is protected from visitor access, not by signs and fences, but by mud and distance.

New beaches, sandbars, and the like will be formed by sand, transported from an offshore dump site by wind and current, and deposited in the lee of islands or against an extended groin at the south east tip of Northerly Island (this latter is constructed from rubble removed from the existing shore armoring). This experiment, deliberately analogous to the Sand Engine in Holland (albeit on a much smaller scale) will allow new forms of beach replenishment to be explored. At the same time, a variety of edge treatments along shore will allow monitoring and evaluation of alternatives to armoring.

5.3. Access and Circulation: Paths

There are four main circulation systems (Figure 5.12). These serve to direct the flow of visitors and guide them away from more sensitive areas, all while inviting them in to enjoy the park. However, they are intended as guides and not as rigid constraints.

The first is the main multi-use network of a new bridge, the boardwalk (Figure 5.13), and major paths. The boardwalk is 30 feet wide while other major trails are 15 feet wide. They are paved and should be cleared in winter. On the west side of the island these paths run along the shore, dipping down towards the lake in places (Figure 5.14). On the eastern side a

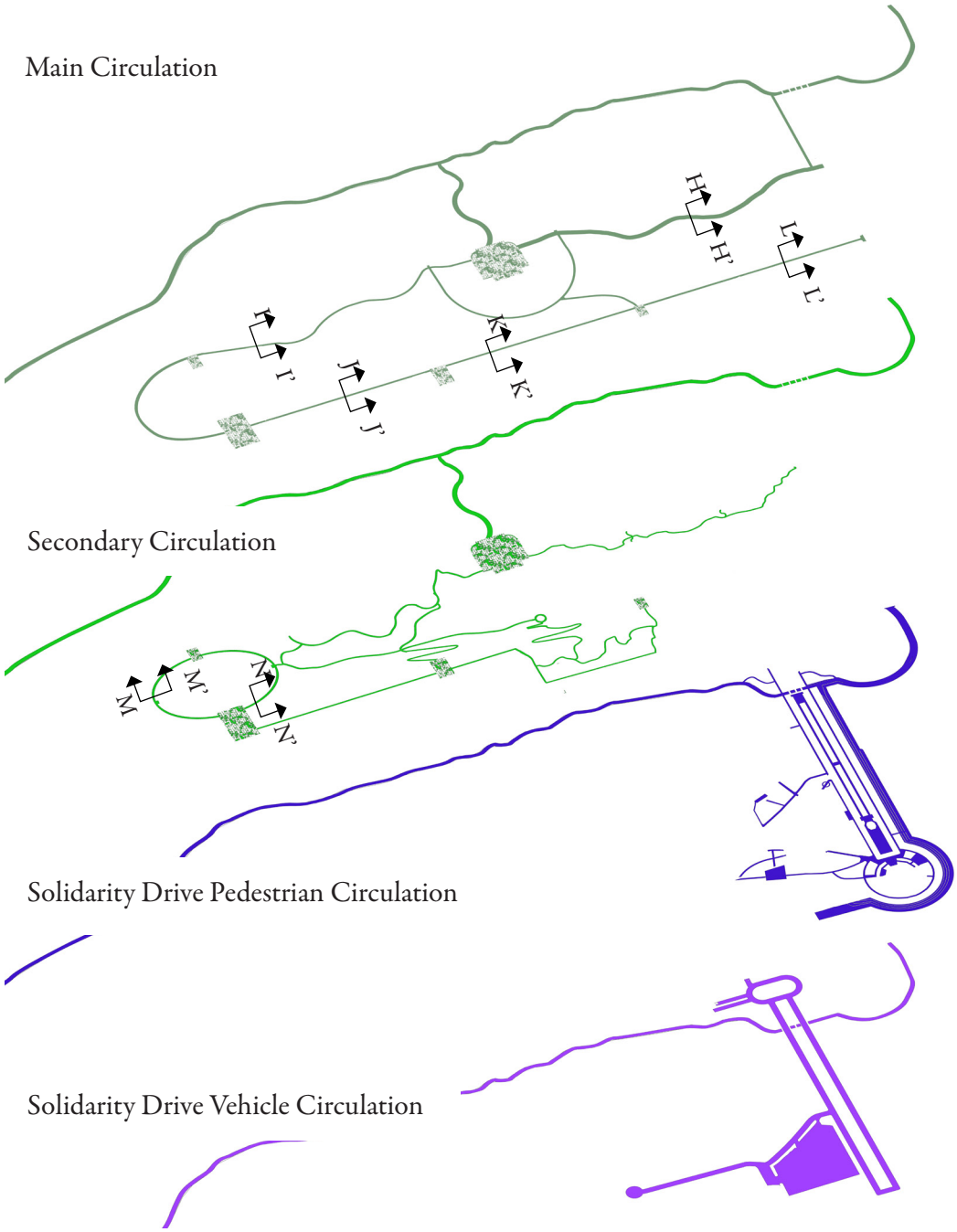


Figure 5.12. Axonometric projection of the different circulation systems in Figure 5.1. The Lakefront Trail, the long wavy line at the top each diagram, is included for reference as are the plazas and bridge in the secondary circulation graphic. The location of detail sections, discussed later, are also shown.

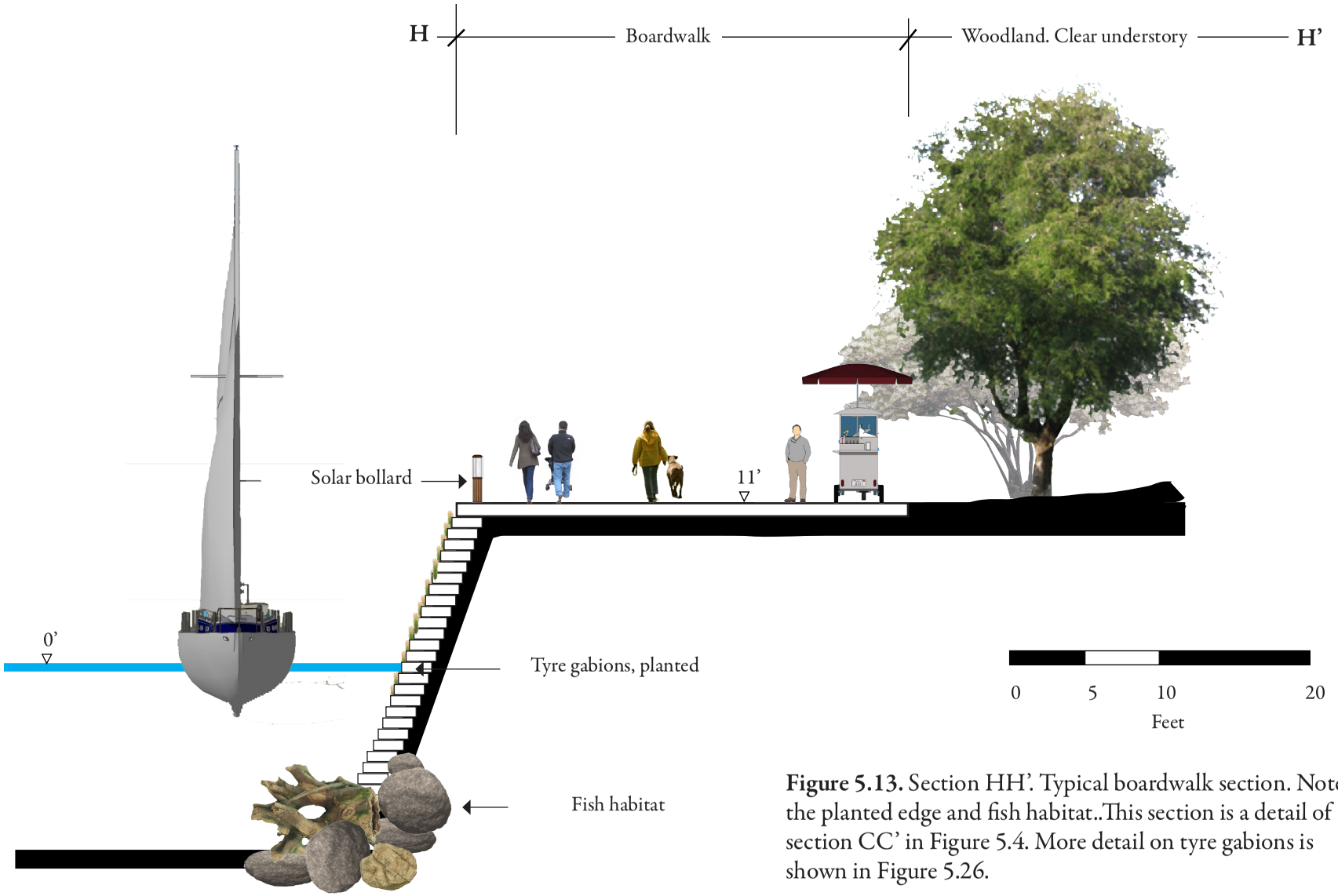


Figure 5.13. Section HH'. Typical boardwalk section. Note the planted edge and fish habitat..This section is a detail of section CC' in Figure 5.4. More detail on tyre gabions is shown in Figure 5.26.

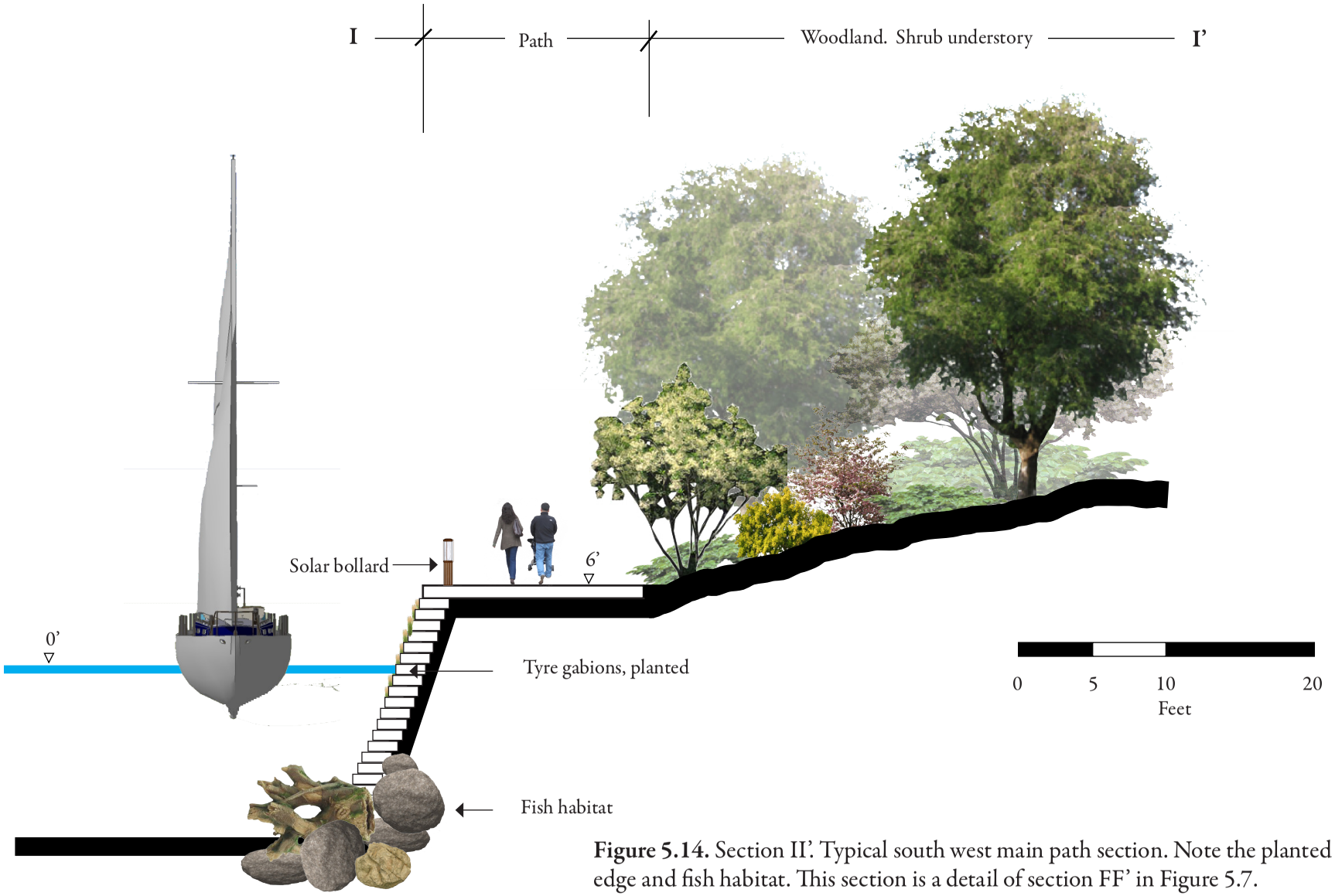


Figure 5.14. Section II'. Typical south west main path section. Note the planted edge and fish habitat. This section is a detail of section FF' in Figure 5.7.

long straight "runway path" references the Meigs Field runways (Figures 5.15- 5.17). Existing entrances from East Solidarity Drive to the island are strengthened by having the boardwalk connect directly to the existing pedestrian circulation along the drive. Further east, near the Adler Planetarium end, the runway path, lined at its northern end with an allée of trees to match those along East Solidarity Drive, connects via a small entry plaza (the existing bus stop is relocated slightly westwards to permit this). The major element of this network, however, is a bridge that connects the Lakefront Trail to the former terminal building. Intended as the primary pedestrian access , this bridge provides a clear and highly visible statement as to the existence of the park and how to enter. It leads visitors directly to a new visitor center and café in the repurposed terminal building. A loop allows cyclists, runners, etc. to perform multiple laps, including hill ascent and descent, for fitness purposes or simply enables a pleasant stroll through a variety of habitat and topography.

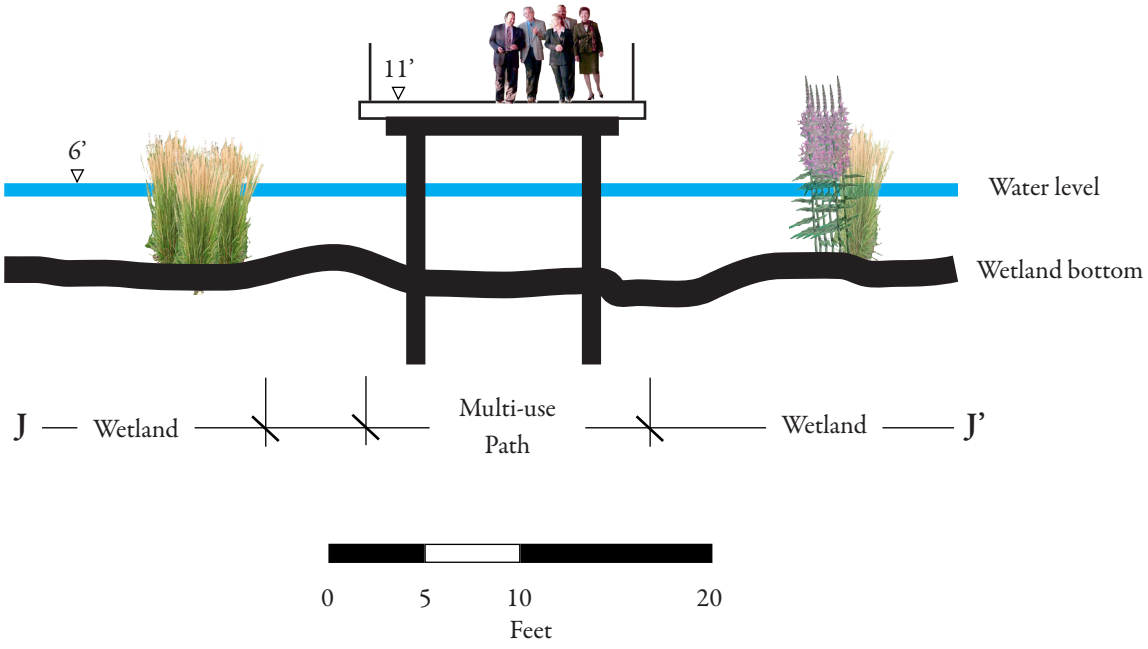


Figure 5.15. Section JJ'. The runway path includes a portion elevated above the wetland. Railings provide a sense of safety and an opportunity to lean and look. Note that the wetland level is 6' above the level of the lake. Section locations are shown in Figure 5.12.

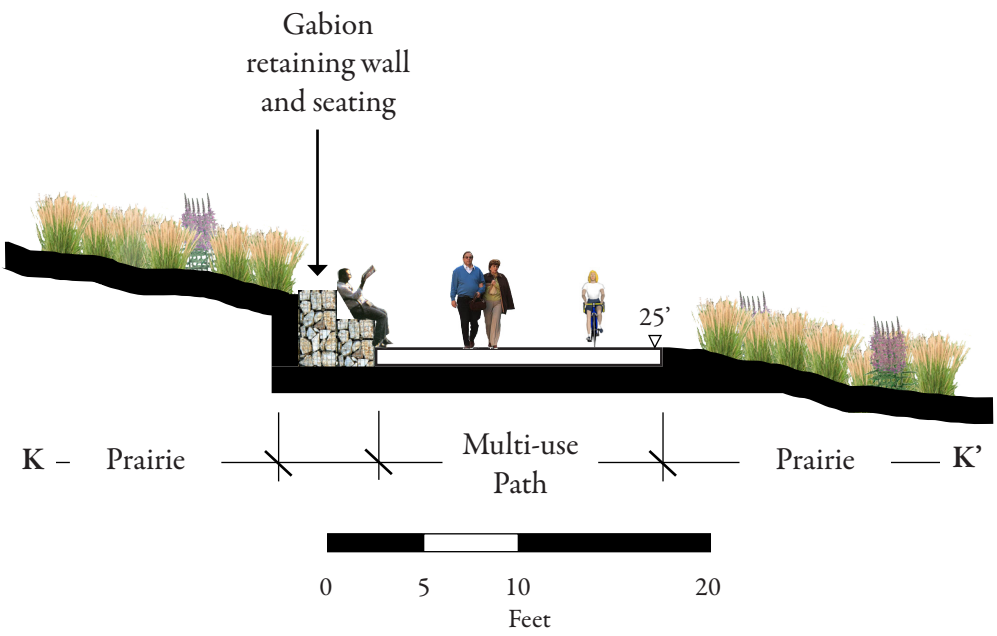


Figure 5.16. Section KK'. The runway path climbs the side of Comet Hill and offers views out over Lake Michigan. Section locations are shown in Figure 5.12.

A secondary path network acts to delineate the habitats shown in Figure 5.10 and to provide signals to the intentionality of the diverse areas, all while allowing users to explore the island. These paths are ten feet wide and surfaced with an approved ADA material such as decomposed granite. They are not meant for snow clearing. This network connects to the major path system via plazas that serve a variety of functions (wetland overlook, main entry point, lake access,) It also connects to various park destinations (amphitheater, henge, dog park) that provide foci of activity and help activate the park. These paths also provide the main access to the wetland (Figures 5.18, 5.19). The existing pedestrian circulation along East Solidarity Drive is little changed. A southbound connector to the Lakefront Trail removes the undue preferencing of northern connectivity and a small plaza at the western end allows space for mobile concessions. Stairs connect directly to the toddler beach at the north end of the north lagoon and the ADA accessible path that defines its northern edge. The most visible change, however, is the replacement of the existing trees with larger species more appropriate to the strong Beaux-Arts style boulevard.

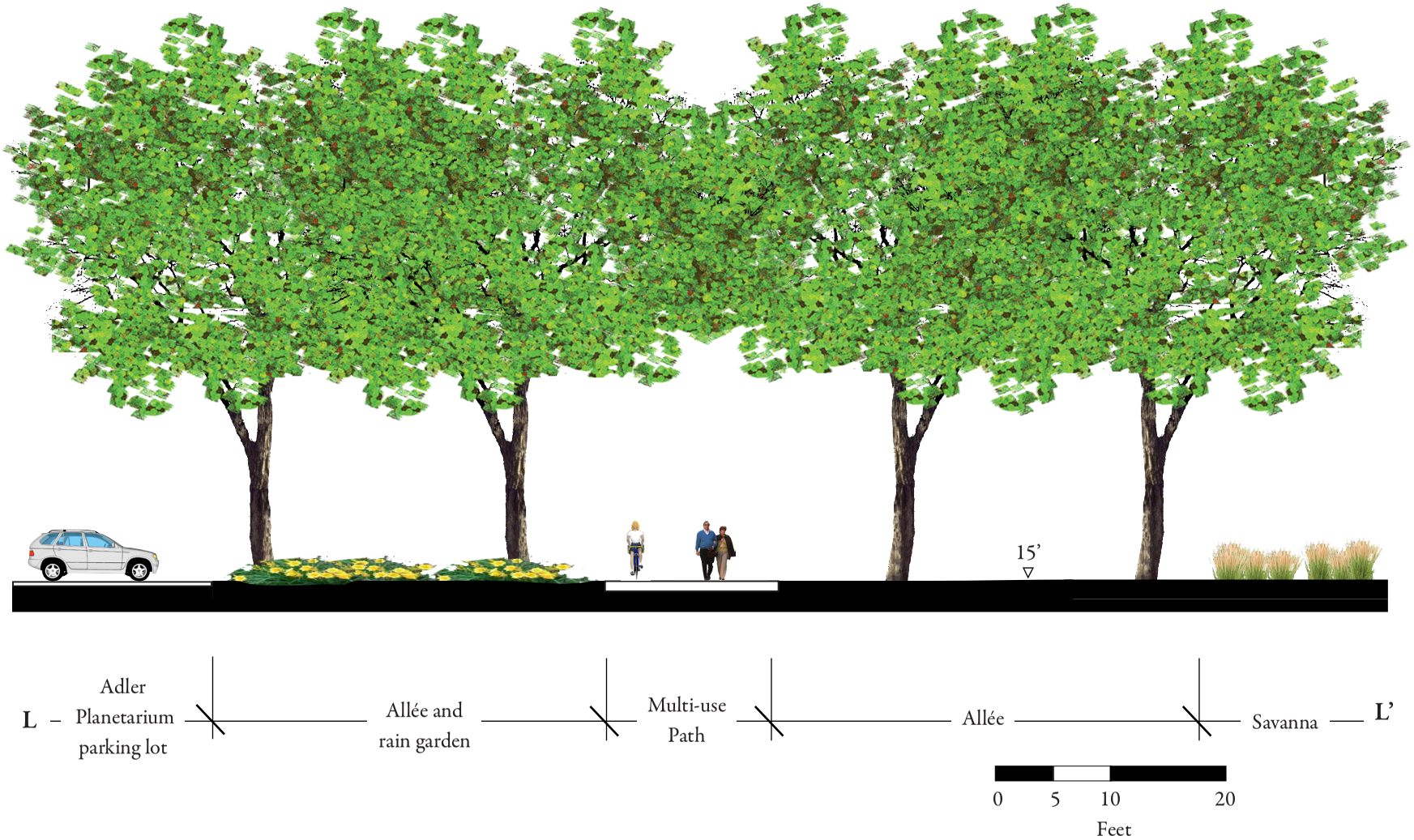


Figure 5.17. Section LL'. The runway path connects to East Solidarity Drive via an allée. Raingardens help infiltrate run off from the Adler Planetarium parking lot. Section locations are shown in Figure 5.12.

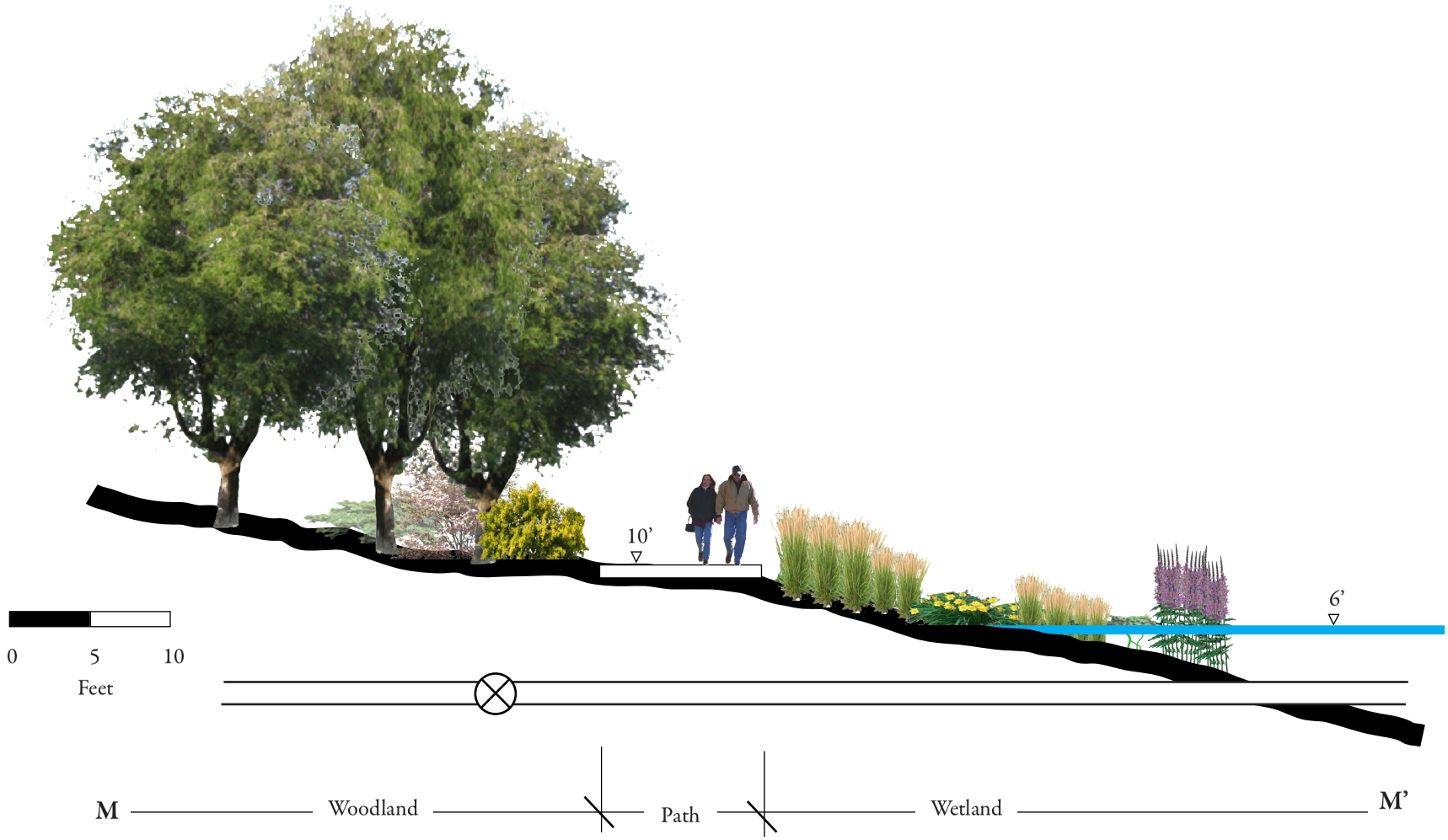


Figure 5.18. Section MM'. The wetland is bordered by a strolling path that allows visitors to appreciate its wildlife. Natural barriers of mud and vegetation are used to dissuade unwanted access. Also shown is the connector between the wetland and the McCormick Place outflow. Section locations are shown in Figure 5.11.

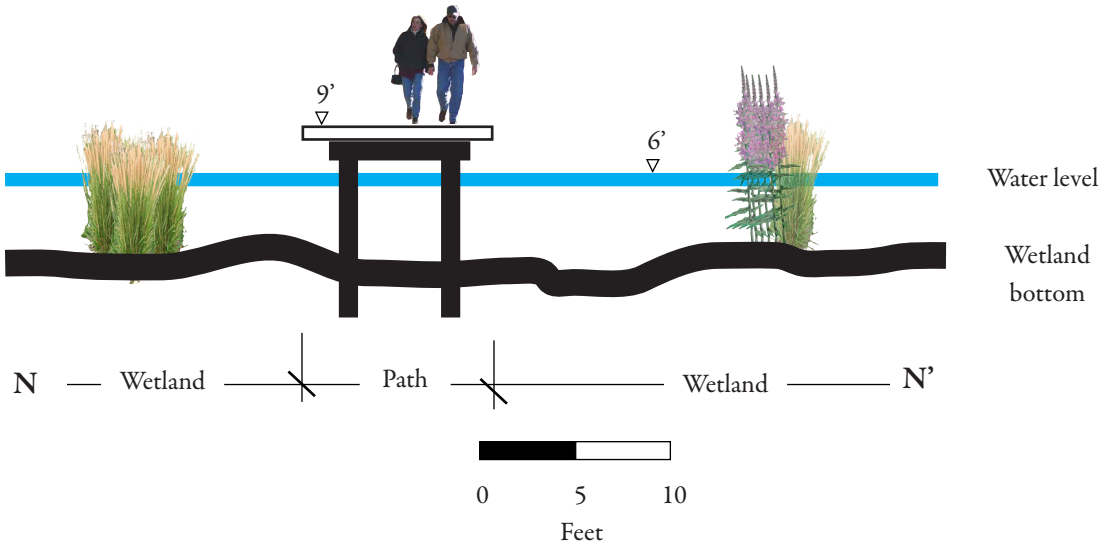


Figure 5.19. Section NN'. The strolling path over the wetland is lower than the runway path and is meant to deliver the experience of actually walking through the marsh. Thus no railings are present (though wheelchair bumpers should be installed). Section locations are shown in Figure 5.11.

Bigger changes are suggested for the vehicular circulation. These include a large rotary at the beginning of East Solidarity Drive that reinstates the spirit of the original design while also simplifying circulation, eliminating some pedestrian vehicle conflicts, and providing an obvious site for a relocated Museum Campus Café. An existing cross street, allowing traffic to turn directly left from the Adler Planetarium parking lot, disrupts pedestrian paths and serves little clear utility beyond parking convenience. This has been removed so that all vehicles turn right along East Solidarity drive and circle around in front of the Planetarium. In addition, this action also allows four new on-street parking spaces where the sidewalks can be brought out to the cars, suitable for disabled parking spaces. The Adler lot, itself, has been reconfigured, while preserving parking space numbers. This allows the long linear path of the main circulation to connect directly to East Solidarity Drive. It also provides an opportunity to install and monitor the performance of pervious parking approaches. Rain gardens along the edges promote infiltration and help clean run off from the parking lot. Planting strips with porous edges (i.e. non-continuous curbs) and trees inside the lot further enhance rainwater handling, reduce

the heat island effect, and provide important shade for summer parking, reducing automotive cooling costs and fuel expenditure.

In addition to the paths above, an informal tertiary network should be allowed to develop. Users should be able to define their own park experience through exploration whether it's trails beaten through prairies in the summer or snowshoe paths in the winter. Finally, the City of Chicago should work to improve access to and from poorer neighborhoods such as Douglas. Bike lanes and increased bus stops can all go someway towards addressing what has long been a policy of neglect in terms of access to recreational opportunities.

5.4. Access and Circulation: Plazas

There are five plazas (or plaza-like areas) in the proposed design. These are, in decreasing order of size; Terminal Plaza housing the former Meigs Field terminal where the new bridge connects to the Lakefont Trail, the Control Tower Plaza housing the relocated control tower and overlooking the wetland and emergent beach, Lake Organ Plaza which is a large participatory art installation allowing interaction with waves and water, the wetland overlook plaza, and the small plaza at the foot of Comet Hill (these klast two are the same size).

The terminal building, designed by Consoer & Morgan and opened in 1961, is a fine example of Modern architecture (Figure 5.20. 5.21). It still operates as a building, functioning in the summer as the Field House for the Chicago Park District and also housing the Flint Creek Wildlife Rehabilitation Center for injured birds.

This plan proposes expanding the role of the terminal building to add a café, bicycle rental, and education/exhibition space on the ground floor. Since some of the approaches being tried at Northerly Island are experimental (particularly soft edge treatments as well as some of the habitat restoration approaches) it is important to explain these actions so they can be understood by a broader public. Additionally, this area could also be rented out for receptions etc. to generate revenue. The upper storey is seen as offices and conference space, providing

Figure 5.20. Meigs Field terminal building seen from the Chicago shore. Photograph by Gregory Tejeda.

Figure 5.21. The bright and airy interior of the terminal building. Photograph by Marty Yawnick.

facilities for park maintenance but also to those involved in implementing and monitoring green infrastructure and habitat restoration. This will promote the cross fertilization of ideas and the building of constructive interdisciplinary relationships that can serve future possible collaborations.

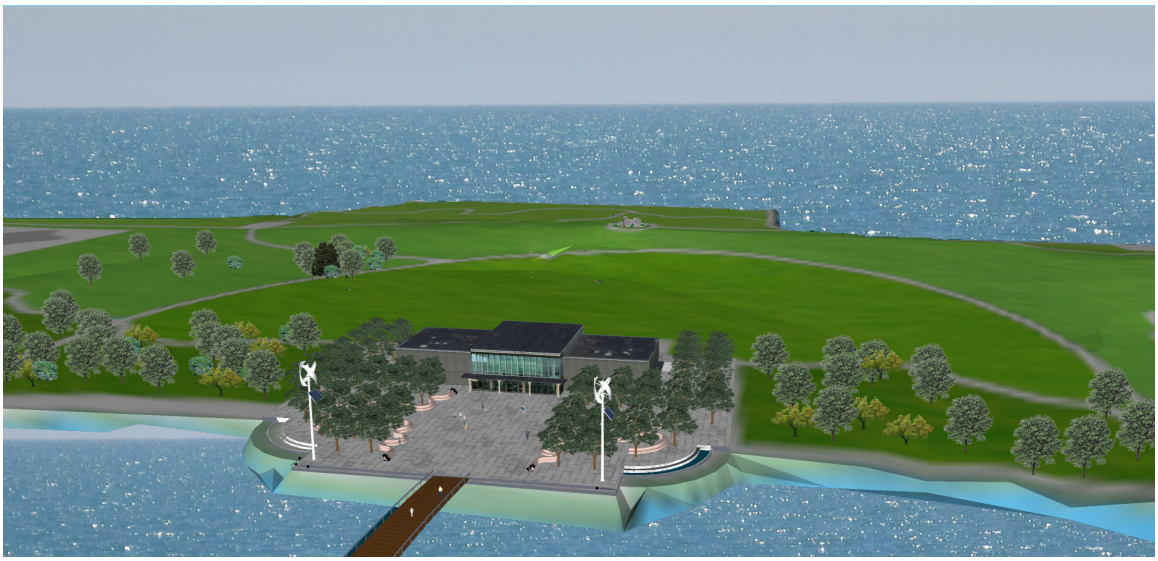


Figure 5.22. A Sketchup model of the redesigned Terminal Plaza. The bridge is in the foreground while the henge atop Comet Hill is in the background.

Figure 5.23. Closer view of the model in Figure 5.22 showing the benches and main arrival space.

The Terminal Plaza itself connects to the Lakefront Trail via a dramatic bridge (Figures 5.22, 5.23). It is planted with trees on the western (Chicago) side, but open to the park and with configurable seating (i.e. moveable tables and chairs on the eastern (lake) side. Benches wind through the trees providing conversational groupings and a variety of sun/shade exposure. Two combination wind turbine/solar panel towers provide the electricity to circulate lake water

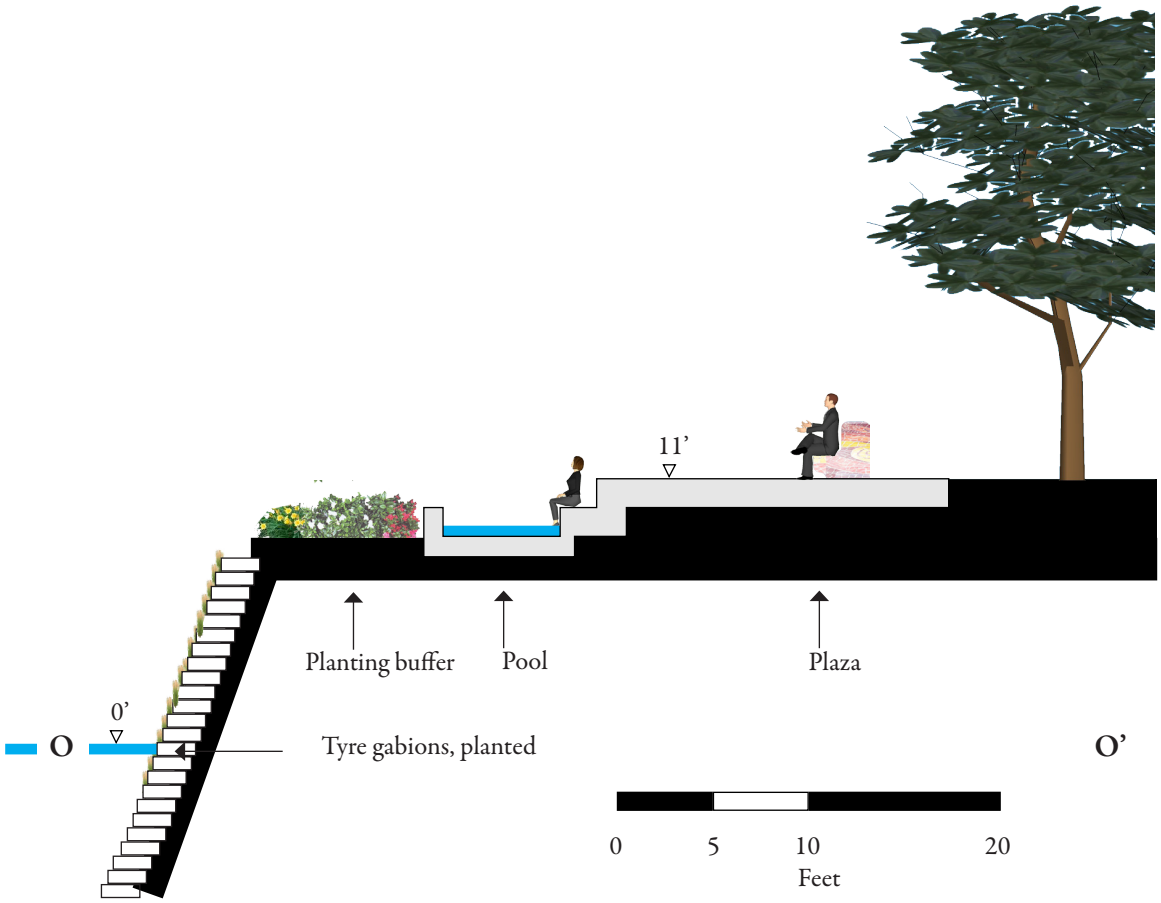


Figure 5.24. Section OO' through the northwest corner of Terminal Plaza. A pool allows weary visitors to cool their feet while a planting buffer avoids obstructing views while providing safety.

through pools at the plaza edge where hot visitors can cool their feet and admire the spectacular views (Figure 5.24).

The Control Tower Plaza (Figure 5.25) lies at the south eastern tip of Northerly Island. and serves as one end of the runway path. It houses the relocated control tower which provides an elevated vantage point over the wetland and emergent beach. A series of terraces linked by stairs and ADA accessible ramps lead down to the beach. The control tower plaza is balanced, on the other side of the wetland, by a small overlook area where visitors can step off the path and spend a while watching the wildlife.

The hideously named Lake Organ Plaza also connects the main "runway" trail to a secondary trail and to the water, but it does so in the context of a large interactive art installation

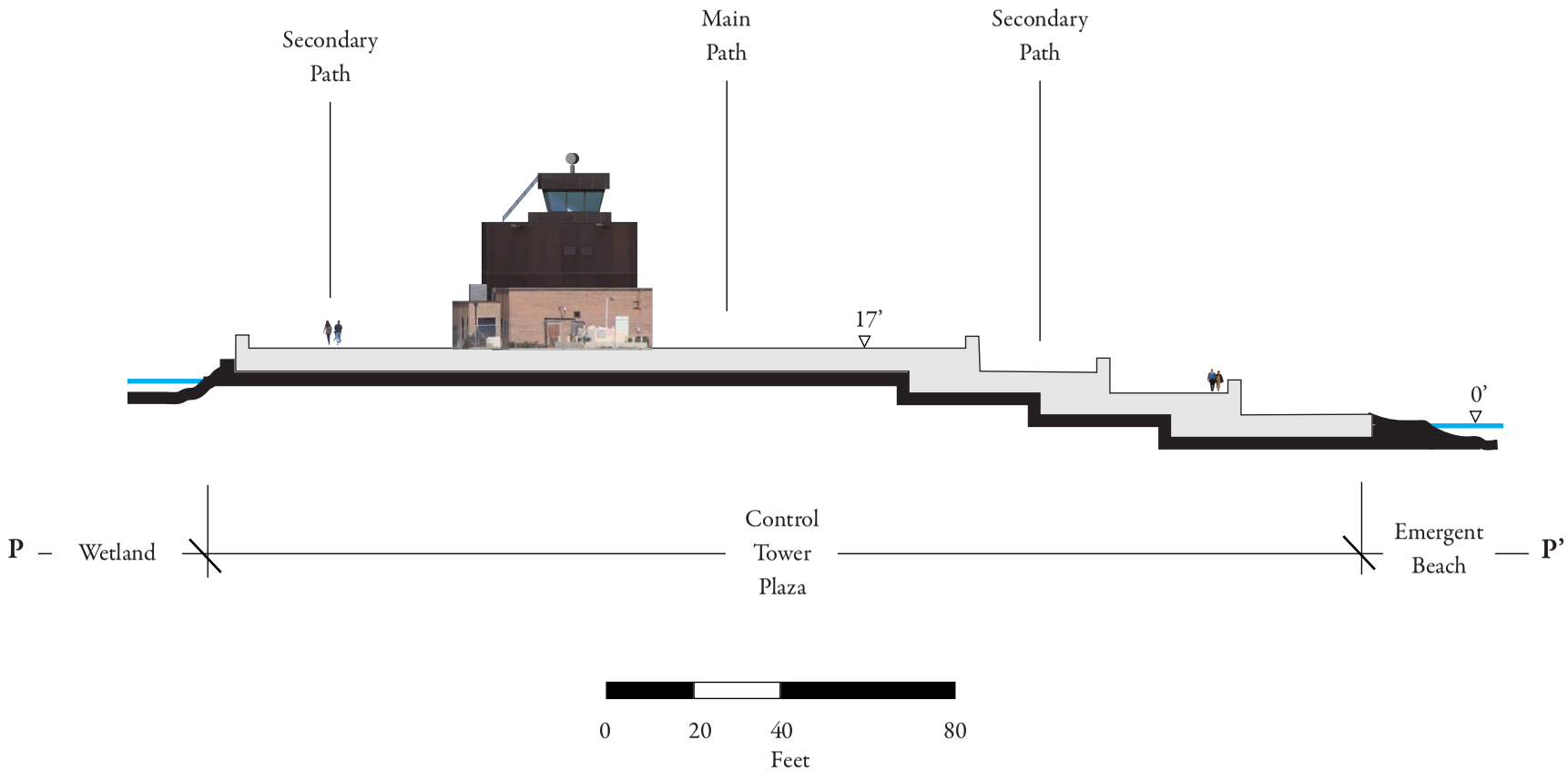


Figure 5.25. Section PP'. The relocated control tower overlooks both the wetland and the emergent beach, providing access to both. The terraces are linked by stairs and ADA accessible ramps. This section is a detail of section GG' in Figure 5.9.

on an ADA accessible slope. Waves are used to generate noise through bells, organ pipes, and other water powered instruments. At the same time, crashing waves or surging waters are forced through constrictions and blowholes to create dramatic spray, Blocks and platforms create spaces for people to climb and play, or simply watch and listen.

Finally, a small plaza at the northern tip of Comet Hill serves to end the allée along the northern portion of the runway trail and to connect to secondary trails.

5.5. Edge Treatments

The tyre gabions (Figure 5.26) used along the western edge of Northerly Island are shown in various sections (notably Figures 5.13 and 5.14). They are chosen for this location (i.e. on the quiet, lagoon side of the island) as they are flexible and can be either planted or used to provide habitat for molluscs. On the Lake Michigan side, three different approaches are suggested in addition to the existing armoring and recreational beach. The aim is to evaluate these alternatives to the expensive - and short-lived - armoring option generally used along the Chicago shoreline in an area that is "safe to fail", meaning little to no expensive infrastructure will be exposed should they fail to perform as hoped. A location schematic of these different areas is in Figure 5.27.

Figure 5.26. Tyre gabion. recycled tyres have holes cut in them and are filled with rock, gravel, planting mix or mollusc shells as appropriate to their intended use and location above or below the water line. In the image above, the tyre is filled with rock and soil and planted. Adapted from Johnson 2010 and Sketchup models by littlebugger, intresto, and mr.architect.

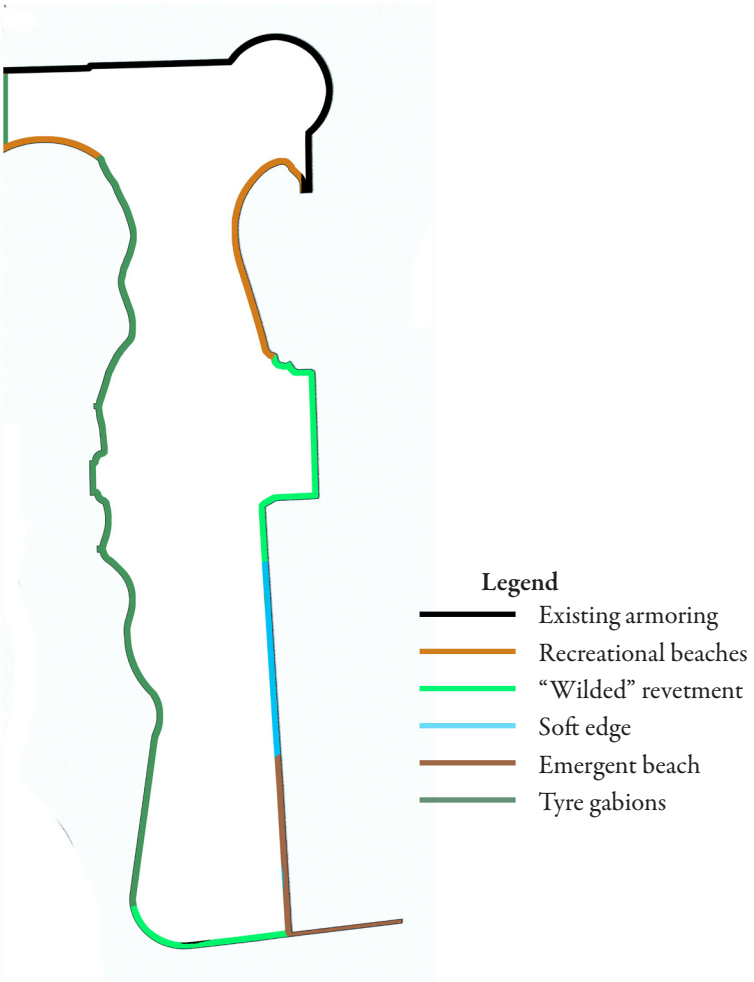


Figure 5.27. A schematic outline of Northerly Island showing the location of different edge treatments.

The first approach, the "wilded revetment", essentially leaves things as they are and allows plants to colonize (Figure 5.28). Safety can be improved by removing exposed rebar and other hazards where appropriate.

There are two areas where this approach is applied (see Figure 5.27) and two proposed management practices. The rubble revetment along the southern edge of the island should be managed for non-natives while that along the eastern edge should simply be monitored and, in only in special cases, should invasives be removed (such as when they are problematic for other park areas). In general, conventional best management practices in naturalistic areas promotes invasive management. However, a more nuanced view is more appropriate here. Plant communities are never static. Instead they are dynamic and ever-evolving, sometimes slowly,

Figure 5.28. The existing rubble revetment is already being colonized by plants. Photosimulation. Source images by A. L. Weir.

but sometimes very rapidly through catastrophic boundaries and punctuated equilibria. Indeed, with climate change occurring at an ever increasing rate, we may well be living through one of those transitions right now. As such, studying how plant communities are changing and how they can stand up to shoreline conditions is likely to prove a valuable source of relevant knowledge.

The soft edge approach (Figure 5.29), also known as soft armoring and living shoreline, involves removing the existing revetment and replacing it with mudflats, sand, gravel, and other natural shoreline materials. Plants such as reeds and grasses help stabilize these slopes. Wave energy is dissipated against sloping edges which are permitted to move and change in response to the water. Because energy is absorbed rather than reflected back as is typical with hard armoring approaches, erosion elsewhere along the cost is also reduced. Shorelines such as this are extremely rich habitat for a variety of birds and insects, not to mention crustaceans

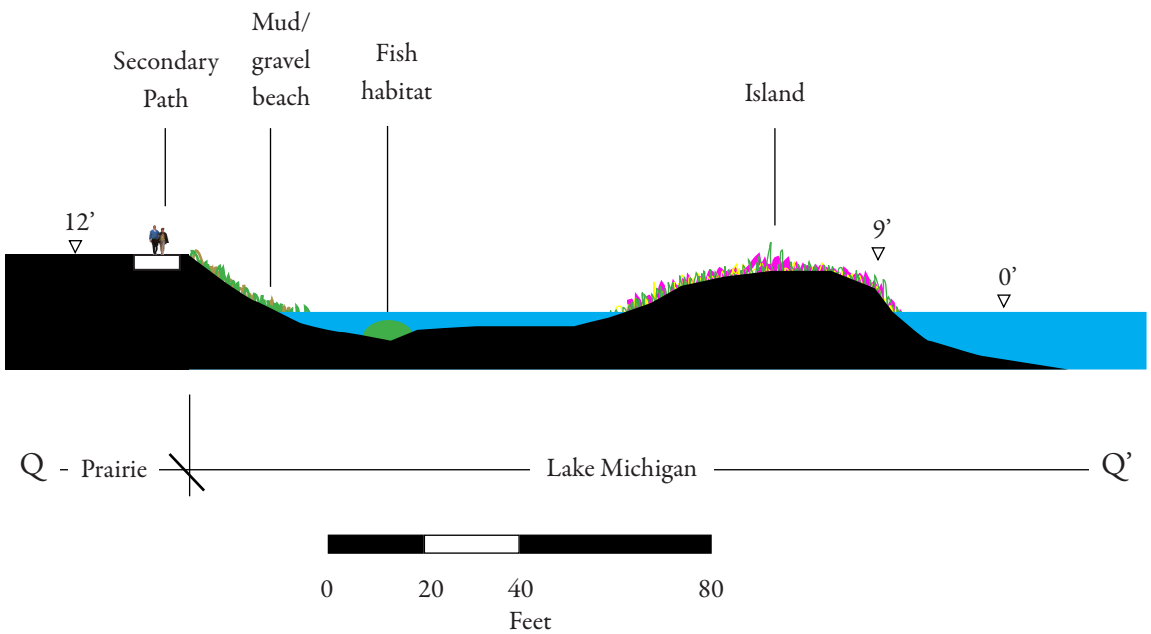


Figure 5.29. Section QQ'. Typical soft edge approach. This section is a detail of Section EE' (Figure 5.6).

and mudpuppies (a type of salamander). In combination with a scattering of near shore islands (which themselves will further protect the shore), the effect is to significantly increase habitat while offering a chance to evaluate a flexible, low-cost, environmentally-friendly alternative to concrete walls. Artificial fish habitat structures (see e.g. Williams 2014 for a discussion of these) can also be placed just off shore for ongoing evaluation.

The final edge treatment is the "emergent beach" method being pioneered in the Netherlands (Figure 4.21). In this approach, sand dredged from the sea (or lake) floor is piled in one location and distributed along beaches in need of replenishment by naturally occurring currents. The plan is to trial this technique, albeit on a smaller scale, on Northerly Island. Chicago beaches are subject to significant erosion and, owing to development and shoreline stabilization north of Chicago, little sand is transported down from eroding sandstone cliffs as used to be the case. Existing replenishment techniques, however, are expensive.

An off shore sand pile, located to avoid interfering with boating and shipping, can be allowed to erode naturally, sand being caught by an extended groin running from the south eastern tip of Northerly Island out into Lake Michigan (Figure 5.1). As the beach develops, the

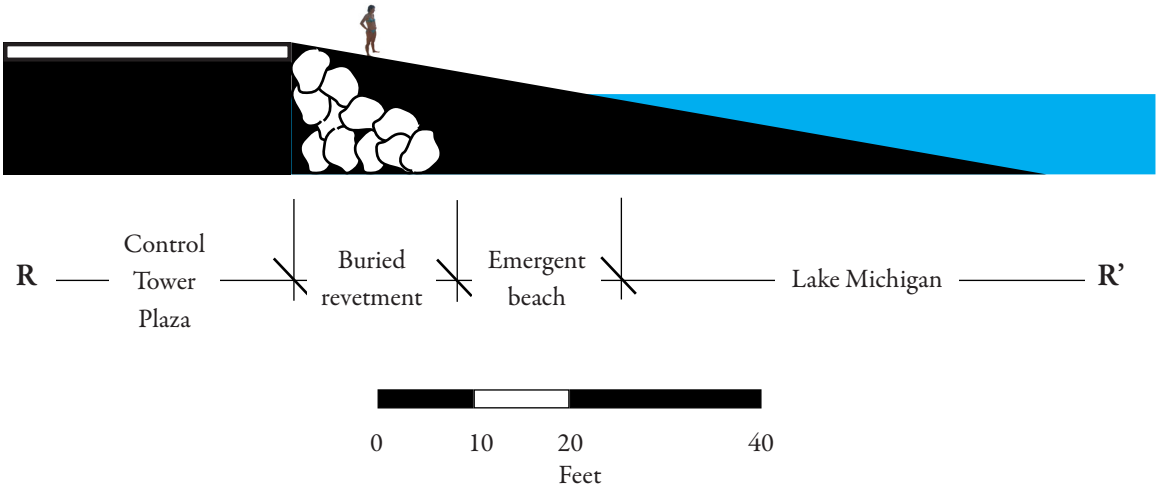


Figure 5.30. Section RR'. As the beach develops, the revetment is buried. The shore becomes a dune.

adjoining rubble revetment is buried with sand and soil and planted (figure 5.30). This approach thus provides another form of soft edge without the expense of removing heavy rubble.

As already mentioned, the aim of exploring these different approaches is to evaluate their effectiveness and possible use on a much larger scale. In this way Northerly Island becomes not a restoration of past nature, but a laboratory for exploring the future.

5.6. Other Features

There are several significant components of the proposed plan that have not been subject to design development. In conjunction with Lake Organ plaza (briefly discussed in Section 5.4) the amphitheater, henge, and dog park all provide draws, inviting visitors to enter and discover the park but have, of necessity, received little attention in this proposal.

The amphitheater, built into the side of Comet Hill, provides an outdoor performance space/lecture room conveniently situated near the bridge from the Lakefront Trail.

The dog park, situated between the Charter One pavilion and the boardwalk, provides a rare amenity in downtown Chicago; a large (approximately 2 acres), natural, off-leash area for dogs. The nearest dog friendly facility to Northerly Island is the 0.06 acre Coliseum Park located

under elevated tracks though Grant Park does have a 0.4 acre dog friendly area that is largely paved (owing to the high traffic volume) slightly further away. In fact inspection of existing dog parks shows that once again they preference the north with lower income neighborhoods such as Douglas having no facilities while the Near South Side and the Loop have six or seven each. In addition to going some way to redress this imbalance, a dog park provides a steady stream of visitors at all times and in all weathers, activating the park and making it more appealing to other potential users. It is, of course, also one more way for people to interact with the natural world, even if its only in the context of their own pets.

The henge, visible in Figure 5.21, marks the peak of Comet Hill. Based on Stonehenge (the name "henge" for a stone circle of this type is, itself, a reverse formation from "Stonehenge": henge is actually an Anglo-Saxon word meaning "hanging"). It is intended as a megalithic observatory, connecting to the Adler Planetarium educational mission. However it is also a play space, a visible destination within the park, and a unique addition to the Chicagoland area. Rather then giant granite blocks, however, iron framed gabions could be used. These would tie in with the gabions seen in section KK' (Figure 5.16) as well as make clear the modernity of the construction.

5.7. Phasing

In a sense, part of this project is already underway. Figure 3.18, for instance, shows that plants are colonizing the rubble revetment as planned for certain sections of the experimental edge approach. However, this neglects one of the most important elements of green infrastructure experimentation: monitoring. Only by building a body of knowledge as to actual performance can new techniques be evaluated and widely accepted. Thus the first phase of this project must be establishing a baseline inventory of plant and animal species (both resident and migratory) as well as a mapping of existing conditions. These will provide the background against which the effectiveness of various interventions can be evaluated.

Phase 1: Wetlands

The first phase of construction should be the wetland and adjacent landscaping and infrastructure. The wetland requires a system of buried culverts and spillways that should be in place before edges are redefined or significant topography developed. Since wetlands are notoriously fragile to disturbance, completing the areas around the wetland will allow further park development without future impact.

Since the wetland excavation will require removal of rubble along the lake edge (where the soft edge approach will be trialed), this is also the ideal time to extend the groin at the southern tip using that material.

Phase 2: Comet Hill

Fill excavated during the wetland excavation can be used to construct the southernmost landforms and to begin Comet Hill. However, significant amounts of fill will be needed and should be sourced locally (highway construction projects etc.) to minimize the transportation footprint. Once completed Comet Hill will be a significant draw owing to its rarity in the Chicagoland area, yet alone along the waterfront.

Phase 3: Eastern Edges

Completion of the soft edge started in phase 1 and the start of dredging to create a "sand engine" will complete the lakeside shore re-engineering. Monitoring must be continued.

Phase 4: Marina Reorganization

The proposed plan preserves the number of mooring slips in Burnham Harbor. However, as mentioned earlier, marina occupancy is currently well below the 50% mark along much of the Chicago shoreline. Re-evaluation of the number of moorings needed should be considered. Surplus spaces could be removed from the north lagoon, increasing the area

available to the toddle beach and associated activities. Ideally the entire north lagoon would be free of docks. At this point harbor parking should also be removed.

Phase 5: Lagoon Side Edging

Replacement of the existing armoring with tyre gabion construction. Installation of the toddler beach and access from east Solidarity Drive.

Phase 6: Paths and Plazas.

All paths and plazas should now be laid out and constructed, including the bridge. The allée should be planted and the control tower relocated (or demolished and rebuilt as appropriate). The terminal building and the service garage should be upgraded to fulfil their new roles. All areas should be planted with trees, native shrubs, and grasses.

Phase 7: East Solidarity Drive

East Solidarity Drive circulation should be reworked to install a large rotary at the western end. The Adler parking lot cross street should be removed.

This schema, admittedly rough, provides a logical framework for implementation of the ideas contained in this proposal. The emphasis is on monitoring first, installation of much needed habitat second, and access third. Monitoring, as mentioned earlier, must be a continuous and ongoing activity.

5.8. Conclusion

The proposed design balances access and habitat, inviting visitors to engage with nature through a variety of attractions and techniques. It encourages exploration and investigation, adventure and play, but also education and reflection. It offers exposure to the land and its

diverse regional biomes, to the sky and the tremendous views across the lake, and to the water in all its moods and tempers. Monitoring of experimental techniques allows the park to function as learning laboratory. Northerly Island can, and should, be a resource for all Chicagoans to explore and rejoice in nature while learning from it. Let us hope that Burnham's original and visionary dream for this piece of land comes to pass,

CHAPTER 6

Concluding Remarks

"Make no small plans." said Daniel Burnham. As landscape architects and planners we do, of course, make many plans, both big and small, few of which see the light of day and even fewer of which are ever implemented. At the small scale we are typically landscape architects, creating detailed designs that specify everything from plant placement and irrigation systems to material selection and precision grading. At the large scale we become planners, dealing more in guidelines and vision, frameworks in which program and development can occur in ways that are, we hope, ultimately beneficial. Somewhere in between lie sites like Northerly Island.

Too large for detailed design, too small for regional planning, this project is more of a master plan, a hybrid that offers both a vision of what could be and a basic design for much of that vision. Were this plan ever to be implemented, it would certainly undergo massive revision (one only has to look at the Crissy Field case study in Chapter 2 to see how that might happen). Of course it won't ever be implemented. The site is in flux and sections of this document are already obsolete. The Charter One Pavilion has been redesigned and is now the FirstMerit Bank Pavilion. Meanwhile the Army Corps of Engineers are planning to construct a wetland at the southern end of the island, the design of which is still evolving. And yet this should come as no surprise. Design is surely a process, iterative and evolving. Any fixed document can never be more than a snapshot, fixed in time, of this dynamic process.

Limited though they are, however, documents like this do have a role. They can set out a vision and act as a resource for information, ideas, and inspiration. And there are some new ideas in here (notably the experimental edge treatments and a more nuanced approach to invasive plant management). They are not the author's new ideas and they have certainly been written about elsewhere but that does not mean they are not worth repeating. Furthermore, perhaps a future reader will be unaware of them, or unaware of them in the context of the Great Lakes as opposed to the ocean coast.

Innovation and experimentation are, I believe, vital for the future of landscape architecture and regional planning. Change tends to happen slowly in these fields and for obvious reasons (long consultation processes, large budgets that drive conservative "safe" solutions, and so on). However, this may well be a luxury we can no longer afford. Times are changing fast. Climate change is happening now and the future is unclear. The only certainty is that it will be very different from the past. Solutions that have worked well and robustly for decades may no longer be applicable. Only by developing a significantly greater toolkit of techniques can we hope to offer solutions that will work in this century and the next. Every design should push the envelope in some way. It should try new techniques and seek to broaden our understanding of what is, and isn't possible. It is my small hope that, in some way, this project does just that.

Finally, I would like to thank my committee, Professors Frank Sleegers and Robert Ryan, for their support during this process. The good ideas are theirs, the mistakes, mine.

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