

# Chapter 2

## Building the Next Seven Wonders: The Landscape Rhetoric of Large Engineering Projects

Ben Marsh and Janet Jones

### 2.1 Introduction

Engineering projects may seem like the least symbolic parts of our culture – isn't engineering pure rationality? But they are potent and important symbols. Being engineered, the projects often submerge their symbolism within a rational and instrumental scheme, but the symbols are present and highly legible. As high cost productions of large corporate or state actors, megaengineering projects carry symbolic content that is almost always about elaborating and sustaining the authority and power of those actors. The archetypal suite of historic symbols of power and authority is the Hellenistic “Seven Wonders of the World” list, which presents a range of cultural landscape tropes that are easily recognizable today in the political and social messages contained within large scale engineering projects.

### 2.2 Reading the Cultural Landscape of Megaengineering

Megaengineering projects reconstruct the physical landscape toward human goals; they are important elements of our cultural landscape. The idea of cultural landscape can be approached in a range of ways that help explicate the societal functions of megaengineering projects.

Cultural landscapes are parts of the natural world transformed by the actions of humans, “manifestations of culture’s traffic with nature,” as Mitchell (2000: 20) puts it. This perspective is rooted in the ideas of Carl Sauer from the 1920s, of course:

A cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent; the natural area is the medium. The cultural landscape is the result.

(Sauer, 1996: 309)

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This human-environment aspect of the cultural landscape is central to *Man's Role in Changing the Face of the Earth* (Thomas, 1956), and is at the explicit intellectual center of this volume, in its homage to Gilbert White. Megaengineering is certainly an important cause of environmental change and also a manifestation of that change. But approaching megaengineering primarily as an interaction with the physical world strips it of its human complexity by downplaying the subjective aspects of landscape and diluting the landscape's cultural-symbolic weight.

Another approach to the cultural landscape is to see in it the practical machinery of the world of our experiences, viz., our built environment. This is an instrumental conception of cultural landscape, comfortable within landscape architecture and urban studies. It is epitomized by J. B. Jackson: "far from being spectators of the world we are participants in it" (quoted by Meinig, 1979: 221). Questions raised for the observer who sees the cultural landscape this way might include: How does a human moving through the world interact with a project? How does the project affect human lives? But this approach is less well suited to comprehending the cultural role of large-scale constructions. The communicative goal of any project derives from human participation, but the "mega" aspect of these engineering projects draws the viewer away from direct experience, toward experience mediated by the media or by institutional message systems.

A third perspective emphasizes the culture in cultural landscapes. Such an approach is able to harvest meaning from large-scale constructions by explicitly regarding the landscape as a set of cultural messages written in human structures, by approaching the landscape as a text.

The landscape . . . is one of the central elements in a cultural system for, as an ordered assemblage of objects, a text, it acts as a signifying system through which a social system is communicated, reproduced, experienced, and explored.

(Duncan, 1990: 16)

The landscape is "a way of seeing," more a method for situating oneself within the world than an object or an image (Cosgrove, 1998: 1). This approach to cultural landscape study has strong connections to cultural studies, as well as to the study of culture. It addresses the world through a search for meaning: seeking the symbolism of an urban layout, of a house type, of a shrine (Duncan, 1976).

When approached as texts and symbols, cultural landscapes offer up diverse elements of meaning. Cultural landscapes must always be within cultural systems, that is, they are symbol systems appropriate to the rhetorical forms current in a society. House-types, funeral monuments, and clothing all convey messages to acculturated viewers about the things that are important to the producer, messages about status, conformity, family, or reverence. Each message system has a vocabulary that is shared between the producer and the reader. The builder must use a symbolic language accessible to the observers of the building. The analogy between cultural landscapes and texts goes beyond just vocabulary. "Landscape rhetoric" implies that there are predictable types of messages within any cultural situation, viz., appeals to power, beauty, nationalism, etc. A common range of landscape meanings and types of meaning recur within any given realm of discourse: images of nature, the heroic

image, sanctity, travelers' images, etc. But meaning also evolves. New forms of thought require new symbol sets. "Green," in the environmental sense, is a modern landscape message, and requires new landscape symbols. And old forms develop new meanings. A period style of architecture may later acquire a revised meaning constructed backwards onto the era, as, for example, 1970s suburban houses may have come to represent anomie or conformity in our retrospect. Symbols are culturally and historically specific, but symbols also derive meaning from the universals of human activity.

A symbol is a repository of meanings . . . Insofar as symbols depend on unique events they must differ from individual to individual and from culture to culture. Insofar as they originate in experiences shared by the bulk of mankind they have a worldwide character.

(Tuan, 1974: 145)

### 2.3 Landscape Messages of Engineering Projects

Large-scale engineering projects represent some of the biggest investments of financial and political capital that most nations and other large institutional entities ever undertake. Like any actions by large institutions, megaengineering projects should be expected, in addition, to performing whatever instrumental functions they have, to transmit strongly conservative messages underwriting the legitimacy of the institutions. Symbolic communication is central to what states do in all their actions: "modern states could neither exist nor operate effectively without an adequate body of symbol and myth, whatever other excuses they may have for their creation" (Zelinsky, 1988: 13). Throughout human history rising cultures have tied themselves into the mythic systems and cultural landscapes of established cultures, to lend themselves legitimacy; this in itself is a performance of power and ideology. The 19th century symbolic landscape of Washington, DC, is an architectural adoption of Greek political antecedents, much as Rome's authority was sustained by a creation myth of its Greek roots 2000 years earlier. States and similar actors are sustained through reinforcement of their political ideology, so their products endlessly justify or elaborate their power.

[T]he exercise of power is expressed forcefully in language and in a wide range of written texts whose function it is to defend and propagate the particular system of ideas and values. . . . [I]deologies exert their authority and find expression not only in language but also in landscape. Non-verbal 'documents' in the landscape can be powerful visual symbols, conveying messages forcefully. . . . Ideologies create, unintentionally as well as deliberately, a landscape as a symbol of signification, expressive of authority

(Baker, 1992: 5)

Since megaengineering projects are among the largest statements by these entities, the expression of power is very strong through them.

One can understand how important symbolism is to megaengineering by examining the economics of the projects. Many megaengineering projects require an investment that far exceeds the economic utility of the projects. Any analysis of

megaengineering projects will confront what Flyvbjerg calls the “megaprojects paradox:”

At the same time as many more and much larger infrastructure projects are being proposed and built around the world, it is becoming clear that many such projects have poor performance records in terms of economy, environment, and public support. Cost overruns and lower-than-predicted revenues frequently place project viability at risk and redefine projects that were initially promoted as effective vehicles to economic growth as possible obstacles to such growth.

(Flyvbjerg et al., 2002: 3)

This is only an apparent paradox. Economic performance is not the full measure of success. These projects are planned and executed for a symbolic value that may well exceed their nominal fiscal value.

The symbolism born in megaengineering projects is a variant of the familiar cultural messages that can be seen throughout the cultural landscape. Because of the great size of megaengineering projects, their legibility is different from that of more conventional projects. They exercise outsized instrumental functions (airport, rail system, dam) compared to engineering projects on an urban or intraurban scale (train station, boulevard, fountain). Their messages match the statements of civic pride, heroism, and majesty available from equestrian statues, ceremonial spaces, stylish façades, monuments, and historical markers. But they are far bigger, big enough to make them entirely another sort of symbols, different in kind and not just in degree. The “mega” aspect introduces scale as a design factor. Part of the meaning is their size vis-à-vis human bodily experiences. A very big project is different from simply a big project. The observer’s perspective is taken into account within the design of many of these forms; the symbology is meant to be read from a controlled range of perspectives. The modern observer often needs to be omniscient: island terra-sculpting like that of Dubai could be fully legible only to a society with airplanes or Google Earth. In contrast, the perspective of premodern engineering projects is usually appropriate to direct observation, or the stories or drawings of those who observed them directly. When this is not so, in the case as the Nazca geoglyphs of Peru that cannot be wholly seen from the ground, for example, the apparent contradiction between the form and the observer becomes central to our interrogation of the projects.

Megaengineered landscapes also provide us with huge altered spaces that do not have clear semiotic content: megacities, suburbs, farming regions, expansive mining, and deforestation. Such landscapes may be thick with meaning at a local scale, but they are not a single project, a single “cultural production.” Landscapes like these are not meant to be seen as a whole. Who sees a city, a highway system, a forest? These landscapes carry some meaning, but they are not intentionally freighted with symbolism. Compare a coin and a washer. They are the same size, and they are both cultural products. The coin is far more “legible” in a cultural sense, however, and its symbolic density is far higher. Similarly, landscapes of industrious economic activity often seem strictly utilitarian – the steel mill, the strip mine. Utilitarianism bears a message, too. Even tools are symbolic; they bear the “meaning” of the other tools in the technology that fits against them. A claw hammer says

nail, a nail says wood, nail and wood says frame construction, etc., and thereby “hammer” comes to represent an entire technological universe based on access to forests and a certain way of organizing labor. “Landscapes of material are also landscapes of meaning: praxis is itself symbolic, all landscapes are symbolic in practice” (Baker, 1992: 8). Even the most utilitarian megaengineering projects will construct a cultural superstructure atop their instrumental base, to paraphrase Berger (Cosgrove & Daniels, 1989: 7). Utilitarianism itself is a specific statement of values. A plain Amish buggy is, in its very plainness, highly evocative about humility and related social values.

Power is the foremost statement of large landscape projects, but the actual messages are diverse. Explication of power is the symbolic “project” of the engineering, but it is not the message itself. Exercise of power requires control and cooperation, which can be attained in different ways. Control comes from fear, and control also comes through benevolence, so the state-level messages of landscape projects might communicate about control in either way. Power can be supported by elevated or base emotions, equally by the love within patriotism, for example, as by shared loathing of the “other.” Messages about power draw upon affective dichotomies like these: safety/insecurity, bounty/want, us/them, pride/fear.

The best project has the strongest impact and a strong design seeks to evoke potent emotional responses. A way to understand this is by comparing our modern responses to cultural landscapes with a set of venerable landscape tropes familiar to us from antiquity.

## 2.4 Landscapes of “The Seven Wonders”

The set of landscape symbols found within the classical Seven Wonders of the World is a good map of the symbols of modern megaengineering. Many modern projects seek, in one sense or another, to be the next “wonders of the world.” The messages provided by many megaengineering projects today are shared with the meanings of large projects in antiquity. Looking at past engineering activities is an effective way to understand modern engineering. The psychological distance we have from symbolic projects of the past helps us to see those symbols more objectively. We are not as good at separating ourselves from the symbols that are used today. And the experience of encountering a familiar symbol system in a 2,200-year-old landscape reminds us of how much is immutable in our basic landscape rhetoric.

The Seven Wonders of the World represent the archetypal framework of comparative political landscape symbols. They compose a catalog of ancient state-supported and state-supporting large-scale symbolic landscape projects. They were certainly the megaengineering projects of their day. The Seven Wonders are still very much alive in popular landscape appreciation (Fig. 2.1). The list is a Hellenistic structuring of the ancient cultural landscape, completed ca. 240 BCE (Table 2.1). The Seven Wonders represent only a small slice of the great landmarks of antiquity, of course. These particular features were chosen because they share certain characteristics (Romer & Romer, 2001). They were thematically linked through references



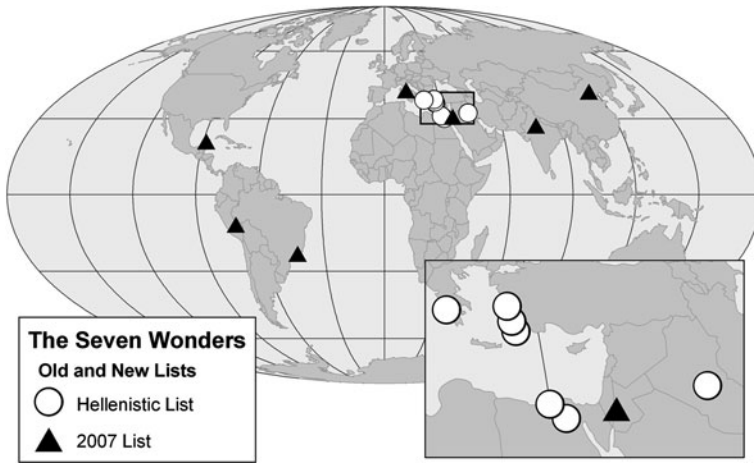
**Fig. 2.1** Traditional 20th century popular presentation of the sole surviving Wonder, The Pyramid of Khufu at Giza, from a vintage postcard. (Postcard by Detroit Publishing Company, ca. 1910)

**Table 2.1** The Seven Wonders of the ancient world

Wonder	Site characteristics	Landscape message
Pyramid of Khufu at Giza	Tomb of a pharaoh; resurrection symbol	Sanctity, memorial, abundance
Hanging Gardens of Babylon	Rich urban garden in a desert	Abundance, control of nature
Statue of Zeus at Olympia	Large sacred monument	Sanctity
Temple of Artemis at Ephesus	Large sacred building	Sanctity
Tomb of Maussollos at Halicarnassus	Large, ornate funeral monument for Persian satrap	Sanctity, memorial
Colossus of Rhodes	Heroic statue of a Greek god in a commercial port	Exchange, military success
Lighthouse of Alexandria	Lighthouse in a Hellenistic city	Exchange

to Alexander, who had died in 323 BCE. As a unifier of the lands of west Asia, Alexander first brought an awareness of the cultural complexity of the larger world to the Mediterranean heartland, and created the first audience for this globalized sense of wonder.

The Wonders display a high level of similarity. Geographically, they follow the travels of Alexander as he moved through the Near East (Fig. 2.2). They were each legible in the landscape to the contemporary viewer in a similar way: they tended to be elevated and they are mostly maritime. They shared a landscape function in that they are nearly all landmarks that would be important to the traveler. These unities among them invite the observer, modern or ancient, to see the Wonders as a set. The



**Fig. 2.2** Location of the Hellenistic Seven Wonders and of the 2007 “New 7 Wonders.” The older list (*circles*) was cosmopolitan within the Hellenistic world of the eastern Mediterranean; the newer list (*triangles*) delimits popular international travel destinations for European and North American tourists

original political function of each of the Wonders was parochial aggrandizement of a local ruler. The list was a product of an historical moment when the unity of Greek culture was challenged by the new awareness of the complex, cosmopolitan world in which it existed. The presentation of the landmarks as an ensemble linked the fractured Hellenistic society that elevated them back to the idealized coherent world of Alexander. His greatness was reflected in the authority and power of the lesser kings whose realms fell under the shadow of the hero.

The Seven Wonders are landscapes of authority. Among them they demonstrate the range of landscape elements that were recognized in Hellenistic society as projecting and reinforcing a sense of political power. Most of them are unsurprising today as ways to show power.

- The cult of personality inherent in memorial structure for great rulers, like Mausollos’s mausoleum or Khufu’s pyramid at Giza, imbues the landscape with the authority of the dead ruler whose majesty demanded the monument. These Wonders are dramatic memorial landscapes used to enlarge and support the legacy the ruler.
- Defense is a literal manifestation of power. Defensive works are strong representations of state power. The earliest list of wonders included the walls of Babylon, an expression of Babylonian military authority.
- Economic exchange is a potent reinforcement of political power, as it celebrates the material benefits of an effective government. This is illustrated among the Wonders by the lighthouse at Alexandra, as well as by the Colossus of Rhodes, which was an explicit navigation aid as well as a celebration of a military success.

- Sanctity is a manifestation of power in many ancient realms. Sacred sites were state projects in antiquity, linked closely to the divine royal role in preservation of a harmonious cosmos. The religious Wonders are the oldest structures on the list, drawing on already venerable linkages between power and worship. The sacredness of the fifth century Statue of Zeus epitomized Greek identity in Hellenistic times as did the Temple of Artemis. The pyramid of Khufu supported an important politico-religious function. The afterlife of the pharaoh needed to be sustained to preserve the lives of all Egyptians.
- Control over nature to generate abundance is the theme of the Hanging Garden, a landscape whose symbolic connection to power may otherwise seem indirect. The Edenic symbolism of a garden in a desert is potent. The Hellenistic story of this Wonder is that it was a reconstruction of her native northern forests for a beloved homesick queen. It represents the power to alter the very ecology of the desert, and by extension, the ability to provide food in a harsh world by irrigation. The most bucolic of the Wonders is also a symbol of power.

Self-conscious modern versions of the Seven Wonders are less reliant on the “power” messages than the original Seven Wonders. Modern efforts to list wonders favor the touristic over the powerful. Wonders on recent lists, such as the web-based, commercialized “New 7 Wonders,” are usually linked not to native political power, but to the subsidiary power of the tourist dollar as it is drawn to the scenic and the exotic. The New 7 Wonders list was announced in 2007 – on the numerologically weighty date of 07-07-07 – after a reported 100,000,000 votes worldwide (Table 2.2; see Fig. 2.2). Individual countries, and their tourist organizations, campaigned tirelessly for votes. The National Geographic Society webpage sniffed “The winners were voted for by Internet and phone, *American Idol* style.” (Owen, 2007) A more scholarly list of wonders, unconstrained by the occult numerology of 7, is UNESCO’s World Heritage Committee’s “World Heritage Site” list of “878 properties forming part of the cultural and natural heritage which the World Heritage Committee considers as having outstanding universal value” (UNESCO, 2009). This list is highly Euro-centric: Belgium has nine cultural sites but Thailand has only three. The selection criteria for the cultural sites are focused on the role of the site within a specific cultural tradition rather than on any universal or global meaning. Related lists abound. A modest empire has been founded by the author of *1,000 Places To See Before You Die* (Schultz, 2003) to follow up her lusciously illustrated,

**Table 2.2** “The New Seven Wonders,” a 2007 list derived from worldwide popular vote. (New7Wonders Foundation, 2007)

Wonder	Location
Christ the Redeemer	Rio de Janeiro, Brazil
Colosseum	Rome, Italy
Taj Mahal	Agra, India
Great Wall	China
Petra	Jordan’s
Machu Picchu	Peru
Chichén Itzá	Mexico



best selling catalogue of tourist destinations; at the [www.1000beforeyoudie.com](http://www.1000beforeyoudie.com) site one can buy regional versions of the list, place-a-day calendars, blank journal books, jigsaw puzzles, and board games.

Like the Hellenistic list makers, we are still subsuming the cultural landscapes of others into our world, but now through the power of tourism. Taj Mahal and the Great Wall become part of our own cultural landscape, in the same way that archaeological museum displays have captured others' landscapes: the Elgin marbles and "Cleopatra's Needle" were located into the cultural landscape of London, not the Mediterranean (having been previously disassociated from their original locations by the Ottoman Empire). The landscape role of features such as these derives from the individual personal experiences of tourists, rather than from external political actors.

The Strip in Las Vegas may provide the best synopsis of the role of wonders-of-the-world in modern life. The classic Wonders and other wondrous sights of the world are replicated in desert. Great cultural symbols – The Sphinx, Eifel Tower, Brooklyn Bridge and the cityscape of classical Rome – are harvested from their sites and returned to us as farce, having been stripped of detail, context, scale, and sincerity. Las Vegas reminds us of the importance of the tourist to the symbolic geography of the modern world. MacCannell suggests that it is through the tourist that the modern world makes sense of itself, by providing "a way of attempting to overcome the discontinuity of modernity, of incorporating its fragments into unified experience" (MacCannell, 1976: 13).

Modernity is not the only source of "discontinuity" for tourism to overcome. The original Wonders list unified the Hellenistic worlds in the same way, by "incorporating its fragments into unified experience." Alexander's soldiers were also tourists. But wonders favored by modern tourists reflect a more benign and self-indulgent worldview than the old Wonders did, and only one of the New 7 Wonders could be considered a recent engineering project. The rougher symbol system of the old Wonders is perpetrated more clearly within megaengineering than in the new lists of tourists' wonders.

## 2.5 Seven Wonders of Megaengineering

How might the landscape tropes derived from the Seven Wonders be mapped onto familiar cultural landscape components of contemporary megaengineering? Table 2.3 offers our list of seven landscape messages broadly derived from the Seven Wonders, matched with contemporary U.S. and ancient examples of such features. Potential negative readings of the same features – "second thoughts" that modern society might have about these feature types – are suggested as well.

Perhaps the most common symbolic freight of a modern megaengineered project is *abundance* through the *control of nature*, like the Hanging Garden. Dams and irrigation systems show the generative power of their creator, the government. NASA's space program is another display of the ability of the government to overcome the limits of nature, although its material return to the citizens is limited. Bureau of

**Table 2.3** Examples of modern “wonders” in the U.S. organized by themes derived from the ancient Wonders

Familiar and traditional landscape tropes	Possible representative U.S. “wonders”	Hellenistic Seven Wonders comparison	Additional ancient comparanda	Modern “second thoughts” about the trope
Abundance, control of nature	Lower Colorado water system, TVA, NASA space programs	Hanging garden	Granaries, irrigation works	Ecological complexity; obliviousness to natural limits, unintended consequences
Memorial of rulers; celebration of the state; secular sanctity	Washington DC, National Mall complex, Arlington	Mausoleum, Temple of Zeus, Temple of Artemis	Column of Trajan, Acropolis	Cult of personality, incipient authoritarianism
Military Security	Norfolk, Nevada Test Site, Fort Hood	Ishtar Gate	Hadrian’s Wall, Great Wall, city walls	Ruinous expense, imperial over-reach
Transport, commerce	Interstate highways, Panama Canal, JFK airport	Lighthouse at Alexandra	Roman roads, Phoenician fleet, Corinth canal	Resources and energy consumption, sprawl,
Civic identification, Civic pride	New York skyline, Brooklyn Bridge, Golden Gate bridge	Colossus	Aqueducts, theaters, temples	Vulnerability to attack, and to shifting fortunes
Societal protection	Lower Mississippi flood control, Clean water act	Pyramid of Khurfu	Sacrifice sites: Parthenon, Teotihuacan	Vulnerability; the technological fix
Conspicuous consumption, whimsy	Palm Springs, Las Vegas, Disneyworld, mega-cruise ships	Hanging Garden	Colosseum, Taj Mahal, <i>panem et circenses</i>	Excess, inequity, resource consumption; new economic limits

Reclamation water projects are said, clichédly, to “turn the desert green.” Billions of dollars are spent to provide irrigation and urban water to the arid Southwest, from the Colorado River and elsewhere. The TVA and the Columbia River Project are additional symbols of productivity, of the government’s capacity to provide. It is notable that many of these projects are rooted in the Great Depression, when the need for material support was strongly felt. The importance in antiquity of water projects as demonstrations of government benevolence is a truism; Wittfogel

famously hypothesized that the supply water was the primary benefit to the citizens for incorporation into the “pristine state” (1957).

Benevolent governmental projects extend far beyond water works. Many governments created their legitimacy through storage and redistribution, borrowing abundance from the population in good times and giving back in poor times. The great granaries of the Inca, Egyptians, and Hittites served this function, and the year-to-year stability that the state provided in this way was essential to societal survival in marginal environments. Some of the greatest expenses of the modern state are similar but non-landscape methods of wealth redistribution to assure the ongoing productivity of the citizens. Social Security and Medicare generate huge political support for the power of the state by transferring wealth between generations. Governmental food subsidies and surplus food distribution are similar phenomena to express abundance by taking relative surplus from a more favored part of the population and giving it to another part.

Negative readings of such features of control and abundance are almost as common as positive ones. Gilbert White wrote at length about the ecological hubris of human attempts to control the Colorado, how they generated extensive unintended consequences by altering fluvial systems, and how designers displayed obliviousness to natural complexity (1968). The negative interpretations of human control of nature gain salience as the megaimpacts of megaprojects upon the environment become more widely recognized, viz., deforestation, nuclear war, radioactive waste, ocean pollution, and ultimately global warming.

Memorials to leaders and celebrations of state “*sanctity*” are common uses of public spaces. The state is supported by *cults of personality* directed toward deceased leaders, or other representatives of the state like soldiers, because these associate the state with the important people and merge that association with the reverence in which the dead are held. The ancient world was thick with grand tombs, burial mounds, and memorial shrines. In Mogul India, leaders would begin building their memorials as soon as they rose to power; those who died young are commemorated only by ambitious foundations. In the U.S. we honor deceased presidents most highly; large engineering projects like cities, airports, a U.S. state, and the entire interstate highway system are named for them. Military cemeteries are some of the most extensive memorial landscapes that can be found in the U.S., and lesser memorials stand in every town in America to hallow senators, generals, and soldiers. The memorials to wars and to past presidents along the National Mall are the grandest examples of these messages in the U.S. But those out-sized monuments from the 19th and early 20th centuries are readily caricatured today by comparison to the massive cult-of-personality installations of the same sort that have been popular in authoritarian states: giant bronze Lenins, Maos, and Saddams. In awareness of this modern re-reading, many recent memorials have been intentionally human-sized, such as the 1997 Franklin Roosevelt memorial at which visitors can approach a bronze statue of a man in a wheelchair or pet his bronze Scottie. The famously intimate geometry of the Vietnam memorial on the Mall has a similarly human-scaled feel, especially when compared to the retro formalism and self-conscious neo-neoclassicism of the newer WWII monument.

Few large memorials commemorate women, beyond an occasional homage to a monarch (Victoria Station or Queen Maud Land) or a religious personage (Notre Dame de Paris, or Calcutta, which was named after the goddess Kali). As with so much about megaengineering, memorials remind us of the extent to which the cultural landscape is usually gendered, and the portions of the landscape associated with authority and power will be male. Of the original Wonders, only two involve women closely, and again it is a queen and a goddess (the Hanging Gardens and the Temple of Artemis). The overall male aspect of the engineering landscapes is pointed up by the fetishization of bridges, towers, machinery, and waterworks – “engineering porn,” as they say – in civic and national imagery. Perhaps only the landscapes of leisure and commerce escape dominance by the masculine.

The political obligation for the modern Western state to be secular has diminished the role of the sacred in civic landscape symbolism. But the state capitalizes in non-religious ways on the same sensations of awe that are produced in religious contexts. The state creates a range of spaces that can be considered sacred, including those that are sacred in a nationalistic or secular sense, as well as the literally religious like a cathedral or a shrine. All sacred landscapes bear memories of the most critical cultural productions of a people – moments of literal or figurative worship, moments of awe or reverence. War memorials enshrine the sacrifice of the fallen and, therefore, the authority of the ones who can order the war. Sites of loss, like Arlington, Gettysburg, Normandy, and Ground Zero, are engineered into expansive sites of secular sanctity. And the monument always also commemorates the commemorator; every war memorial is a message from the group that built it to the citizens who see it and about proper personal investments in the state.

Some landscapes are venerated in themselves rather than through a personality, such as the historical district or the cultural heritage site like Plymouth Rock. Capital cities express political power through the reverence that is given to them as nationalistic symbols as well as in the majesty of the structures provided by the state. Capital cities are the most common planned cities, and are megaengineered as cultural sites with careful sightlines and artful clusterings of monuments. There are more than a dozen examples of brand new national capital cities having been built, such as Brasilia, Islamabad, Canberra, New Delhi, and Washington. Typically the new city is nearer the center of the state than the previous capital and designed to encourage economic development as well as political unity. New capitals are usually emphatic design statements, using extravagant architecture and formalized and geometric landscapes. Cosgrove (1989) demonstrates the layers of verbal, geometric, and numerological symbolism underlying the landscape of Washington, DC, for example.

*Security* is the plainest imperative of the state. The modern political discourse of security often seems shrill to scholarly observers, but an appeal to security is still the one of the surest ways to capture public wealth. Military security is a perennial concern, and a perennial topic for engineered landscape messages. A few huge military complexes can represent the genre in this country – the Newport News naval yards, the Nevada Test Site, or the Pentagon itself, the world’s largest office building. A critical take on these modern security features is also familiar, viz., that they are

signs of a paranoid worldview and represent ruinous expenses incurred to support imperial overreach.

In earlier times security was shown by forts and other military establishments. In antiquity the wall defined the city, and the wall symbolized the power of the state to protect its people. The Ishtar gate and the Walls of Babylon, from the earlier lists of Wonders, were theatrically grand defensive features. More recent derivative lists of Wonders often include the Great Wall of China, the most emphatic ancient security symbol in the world as well as Hadrian's Wall. (There is an irony about security being engineered onto the landscape. Although it is a strong symbol, it often falls victim to attackers not connected so tightly to the landscape. The German sweep around the Maginot line during WWI may be the best known example of the contradiction.) Security bears a message for those on the outside of the defended space as well as those within. Security constructions should generate highly levels of confidence and dependence for those within them. And the defenses should project a sense of impregnability from outside, to forestall attack. The best defenses are never challenged.

In the post 9/11 world security has become an especially visible landscape element, as U.S. citizens trade freedom of movement and rights to privacy for a (nominal) freedom from fear, which is supported by widespread surveillance in public places, by armored architecture, and by ubiquitous police presences. Today security from violence and terror is often an overprint onto the rest of the landscape: seen in the bomb-proofing applied to buildings, for example, or the securitized structure of the modern airport. Individuals show personal-sized symbols of power by investing in landscapes of security, such as buying into a gated community or hiring guards to accompany them. Ideas of security refer most directly to military power, but modern state security is a more nuanced idea. The U.S. government has been engineering a 2,000 mi (3,200 km) "security fence" on its southern border to protect the country from foreign threats. The threats are not risks of violence, but rather economic threats from low wage labor competition and from drains on the public budget. Security means economic security as well as military security.

*Transport* and *commerce* are recurrent cultural landscape themes affirming society's investment in communication and trade. These are highly visible in the U.S. today in the Interstate Highway system, Amtrak, and a dozen giant airports. Travel facilities are overrepresented in the suite of megaengineering projects, as they were among the Seven Wonders. Airports, ports, high speed rail lines, gateway symbols, highways systems, bridges, and tunnels are among the most common examples of megaengineering (Fig. 2.3). The Panama Canal was one of the strongest landscape symbols of the Twentieth Century, an enormous engineering project understood at its time as symbolic of the capacity the United States to alter the landscape to its ends, to make the oceans meet. A modern flip side of the positive image of transport is the great economic cost, and the environmental cost in sprawl, of course, and in the energy and material resource consumption, that these represent.

There is a direct political connection from travel facilities to power. In antiquity the road system defined the extent of the empire. The Roman roads were explicit symbols of state power; they were how soldiers traveled quickly to maintain



**Fig. 2.3** The Los Angeles Freeway Interchange, symbol of efficient modern travel – and also of sprawl and profligate energy consumption. (Source: ifoto, copyright 2009, reproduced with permission from Shutterstock Images)

control of an expansive empire. “All roads lead to Rome,” thus they also lead from Rome when that need arises. The Roman roads themselves symbolized the reach of the empire, even when the soldiers were not there. The roads were engineered above the landscape, “sunken walls” as some call them, to be ready reminders to restive locals. The U.S. Interstate Highway system was authorized in 1956 through “The Defense Highway Act,” ostensibly for a similar military reason; the overpasses were engineered to fit the dimensions of the intercontinental missile.

Social control is often based on the control of the movement of individuals in time and space, and control of movement is a central power of the modern state as it regulates immigration, labor mobility, long distance commerce, vagrancy, and passports (Torpey, 1998). In antiquity travel could be used as a cultural weapon; for example, the Hebrews were transported in the Babylonian Captivity to separate them from their roots in the landscape and thus to assault their identity. The same rending of cultural roots happens in modern times when populations are dislocated, such as the exchange of Muslims and Hindus between the new states of Pakistan and post-colonial India during the Partition, or the territorial displacements of the Armenians, Kurds, Greeks, and Greek Cypriots during stages of the development of modern Turkey. Conversely, pilgrimages imprint a broadly shared cultural identity on otherwise diverse groups. The Hajj unites Muslims from around the world, and travel to the sacred ghats at Varanasi gives a shared landscape meaning to Hinduism. Christianity offers examples of formal and informal pilgrimage sites. In Medieval

Europe the faithful walked to cathedrals for the heightened religious experience. In the automobile landscape, driving to suburban megachurches – larger even than the cathedrals – is the optimal religious experience for many.

The perceptual significance of travel is important as well. The emotional power of bodily movement upon participants is apparent in the symbolic importance of gates and harbors and terminals, as well as in the ceremonial perambulations that guided the construction of sacred spaces like Hindu temples and Egyptian funereal shrines, and in the processional music of weddings and commencements and inaugurations, in parades, and in military music leading soldiers into battle. Engineering projects related to travel draw on that same psychology of how movement will “transport” the participant.

Investments in transport infrastructure also support societal wealth of course; they pay dividends in a simple financial sense. But travel facilities are especially effective carriers of symbolism. Overinvestment in airports and in airport access is common in poor countries. Such facilities are good examples of Flyvbjerg’s megaprojects paradox: hundreds of millions of dollars spent on an airport that handles a dozen international flights a day. Such places are symbolically very important. Travel facilities welcome the stranger, and tell the crucial first story about how well the state supports the interests of its people. Travelers from afar unavoidably witness these projects.

Cities, especially, build monuments to their own *capacity to command resources* and generate *civic identification* (Fig. 2.4). The term “civil boosterism” was created for exactly this sentiment. Public landscapes speak of economic power of their builders, and the landscape is often the clearest way for cities to brag about their wealth. Aesthetic style is a manifestation of economic power – elegance speaks glowingly of the power to purchase it. A hundred years ago Veblen recognized “conspicuous consumption” as a tool of social differentiation, explaining the



**Fig. 2.4** Civic pride of New York incorporated into a U.S. postage stamp, featuring the Manhattan skyline and the gateway symbols of the Statue of Liberty and the Hudson River waterfront

political economy of fancy cars and stylish clothes (1912). A version of this effect can be seen on the cultural landscape in conspicuous construction by cities, states, corporations, and real estate developers. Witness the architectural exuberances of the great urban museums, galleries, opera houses around the world. Sports complexes are examples of this activity, as are skylines and bridges (see Fig. 2.4). However, civic identification is ephemeral, and the monuments are vulnerable either to direct attack like the New York skyline on 9/11, or to vagaries of economics as when a city finds itself with a stadium named after a bankrupt and disgraced company, like Houston, TX, recent home of Enron Field.

Societies invest heavily in protecting themselves in non-military ways. Security includes security from *threats of nature* as well. Flood defense on the Lower Mississippi, one of the largest megaengineering projects in the U.S., was the pride of the region, in the simpler days before Hurricane Katrina. The lower Mississippi flood control systems represent a clear social good, but they are also a strong landscape symbol of government protection. The billions of dollars of pollution control facilities that the government has purchased or mandated, seen in the thousands of expensive sewer plants all over America that keep our water clean, have a similar role. The ancient antecedents for this trope are subtle, or absent in most cultures. The pyramid of Khufu at Giza was understood as a facilitator of societal continuance, since the well being of the Pharaoh in the afterlife was essential for the flood of the Nile and thus the success of the state. Sites of religious sacrifice, such as the great Aztec temples, served to stabilize the ancient world for those people. In modern America landscape features of protection may have come to represent vulnerability rather than safety, after the loss of New Orleans. The diminished sense of security that followed the failure of the levees at New Orleans and an insufficient government response is seen by many as the major assault on the domestic credibility of the administration of George W. Bush. Security is a very important message, in success or in failure.

The state is protected through the control of its own citizens. Engineering is often social engineering, to affect the behavior of residents. Buildings that confront explicit security threats are often carefully constructed to guide and divide the occupants. Prisons, airports, high schools, and government buildings are familiar examples. To visit a U.S. embassy abroad in the age of terror is to enter an Orwellian landscape of blank walls, layers of doorways, ill-lit hermetic spaces, and disjointed communication through thick glass. The visitor's inevitable sense of powerlessness before the strength of the US government may be a by-product of the need for security, or it may be an explicit design goal. Ancient palaces were designed to inspire helplessness in those who approached them; the Flavian Palace or Mycenaean palaces were heavily guarded, and accessible only through bewilderingly circuitous pathways. The city of Naypyidaw, the new capital of Myanmar that was started in 2005, is a sophisticated social engineering project, protecting the embattled generals from domestic upheaval through the city's isolation and its dispersed components. Journalist Siddharth Varadarajan referred to the social engineering context of the new city as a "dictatorship by cartography."



Vast and empty, Burma's new capital will not fall to an urban upheaval easily. It has no city centre, no confined public space where even a crowd of several thousand people could make a visual, let alone political, impression.

(Varadarajan, 2007: 69)

The modern American city itself is a space that is engineered – or at least evolved – to control people. Central to this control is in the functional apartheid that is imposed on minority residents all across America, through the use of roads and other infrastructure to physically divide populations, through differential access to public resources, and through the use of redevelopment and annexation to control political enfranchisement (Johnson, Parnell, Joyner, Marsh, & Christman, 2004).

Finally, much investment by wealthy individuals or by entertainment companies is meant simply to *amuse* and to *display conspicuous wealth*. Las Vegas and the desert leisure communities of the Southwest are prime examples. Resorts and gated developments are semi-privatized examples of landscape expressions of economic power. A discussion of these landscapes inevitably turns to narcissists like Donald Trump, but many others have the same inclinations and the same tastes, if not the same resources. The magnitude of geoengineering at resorts, islands, marinas, ski slopes, and golf courses responds to these inclinations. Landscapes of *whimsy* might be the purest manifestation of this: the extravagant, but entirely functionless, Dubai coastal construction, Christo-like urban-scale art installations, and the fantastic architecture of gambling venues in Atlantic City and Las Vegas are examples. Commercial spaces also engineer human behavior toward more willing expenditures. The architectural analysis of *Learning from Las Vegas* provides the classic description of the semiotic commercial landscape into which American car culture is immersed (Venturi et al., 1977) and thousands of commercial strips across the country survive through the same principles. Pedestrian commercial spaces are even more manipulative; the intricate design of a department store or an enclosed mall steers the shoppers' paths through space, and steers their desires and their commercial behavior as well. But these landscapes also represent wretched excess to many viewers, and remind us of the huge economic, social, and environmental cost of the great income inequities within the US. In today's economic climate, even extravagant landscapes have come to reflect the new economic limits. As growth slows, resorts are under-occupied and leisure real estate values decline sharply.

## 2.6 Evolving Meanings Within Megaengineering

The landscape symbol systems behind our interpretation of megaengineering projects are evolving rapidly in modern times. Changes in the world are forcing changes in the symbolic weight of megaengineering projects.

Political landscape symbolism is always unstable in time. Monumental landscape alteration is an activity favored more in some political and historic circumstances than others. Noting that the period of the building the large Wessex henges, including Stonehenge, was followed by a period of much humbler landscape constructions,

Thomas suggests “It follows that the monuments of the Neolithic are something specific, something which defines a particular social formation” (1991: 29), especially a risky, shifting political environment. The aggrandizing power of monumental features is used more for totalitarian political entities needing enhancement than, for example, for stable and populist social democracies. As political climates shift toward or away from authoritarianism, the political landscapes, including the megaengineered parts, become more or less explicitly about power and authority. Many of our most grandiosely expressive political landscapes are from times of widespread stress, when government paternalism was most welcome. Periods of political uncertain in the 20th century U.S. history are drawn onto the landscape as the massive public work projects of the Depression, the megalithic bureaucratic landscapes of Washington that expanded during WW II, and the many extensive military constructions from the Cold War.

An interesting discourse is emerging within the landscape vocabulary about state and corporate behavior. The concept of abundance now includes the new element of “environmental health.” One’s world is only as rich as it is healthy; ironically abundance now can include the idea of *not* using resources. National parks have projected the concept of wilderness preservation – a variant of the abundance meme – for over a century, but a new measure of state power is the restoration of the previously degraded. States invest in cleanliness, as do corporations. The Kissimmee River in Florida is being restored to its meandering form from before it was “improved” in the 1950s, through billions of tax dollars spent to undo previous engineering. Chesapeake Bay, New York Bight, Boston Harbor, and Lake Erie receive equivalent levels of megaengineered ecological remediation. The ongoing investment of money into removing dams from rivers turns on its head the oddly anthropocentric language once used for control of nature: “reclamation” was what we did to wetlands and rivers when we brought them under human control. Now they are being liberated from human control, although we do not have symmetrical language for “unreclaiming” them. Corporations invest heavily in their own aggrandizement by proclaiming the cleanliness of their effluents; more may be spent on trumpeting some corporate environmental successes than had been spent on the success itself, it seems.

Landscape symbols are now experienced from afar far more than before. Landscape features are commonly only seen by secondary presentations of imagery for most people, seen on television far more often than experienced directly. The design of mega-features may be calibrated more for the camera than for the traveler. The internet in general, and perhaps Google maps in particular, level the public experience of distant landscapes: the best view of many places might be digital, no matter how rich you are. As graphical reproduction techniques have improved over the last few centuries, imagery has been displacing direct experience of the built and the natural environments throughout Western consciousness. Even when one is actually on the ground, landscape interaction is often guided by stylized understandings of the correct perspectives on a scene. Tour guides lead their charges to the particular spots from which standard postcard or travel poster images of a site are taken so that tourists’ own pictures will look “right.” Earth itself, with which we

should be entirely intimate, is frequently represented by the most remote of images, the canonical 1972 Apollo 17 “Blue Marble” whole disk photograph centered over the South Indian Ocean.

The mega-landscape “winners,” the makers of the most wondrous megaengineering projects, are a now different group of people than in even the recent past. A couple decades ago landscape extravagance was largely an enterprise of the Eurocentric states. Now conspicuous construction is more apparent in Asia, in the Persian Gulf, in oil-rich Russia, and especially in China. Shanghai has 4,000 skyscrapers, twice the number that New York has, and another 1,000 are expected in this decade (French, 2006). This is exactly the point of conspicuous consumption, of course: it is important that someone can afford a luxury solely because someone else cannot. The “someones” have been shifting eastward (Fig. 2.5).



**Fig. 2.5** Skyline of Shanghai, which has thoroughly eclipsed New York in density of skyscrapers. Quintessentially urban landscapes have become more prevalent in Asia than in the Eurocentric world over the last decade. (Source: Claudio Zaccherini, copyright 2009, reproduced with permission from Shutterstock Images)

Of course, the economic deck is getting reshuffled right now, and the near future is especially unclear. In March 2009, the BBC reported that half of Dubai’s residential and commercial construction planned for the next three years, worth US\$ 76 billion, has been canceled or suspended. (BBC News, 2009) In the U.S. government investment is typically up during recessions, but the favored projects are less ostentatious and more labor-friendly than during boom times – fewer opera houses and more mass transit systems or greening projects.

The messaging success of extravagant projects may be harder to assess these days, as social values shift in response to outside events. What may recently have been confidently presented as a grand and elegant gesture, a luxurious tropical resort, for example, can as easily be seen as an embarrassing symbol of waste and indulgence. Notice that the resale market for corporate jets became glutted early on in the most recent recession, as companies dumped the newly embarrassing symbols. Expanding public concern about poverty, environmental impact and human rights issues can force reinterpretation of the messages. The heterogeneity of global

culture vastly increases the risk that messages cannot be interpreted as they were sent. The intricate internal power memes of the North Korean autocracy are just tragic and comic to most of the world. The global impacts of macroprojects themselves complicate the semiotics of their landscape manifestation. How should people read a project like the Three Gorges Dam that, in some fashion, glorifies a state, but maybe best known worldwide for its massive degradation of the local environment? Meaning becomes increasingly mutable within the globalized information field.

## 2.7 Conclusion

No aspect of macroengineering makes sense unless it is understood as being part of a landscape symbol system. The magnitude of investment in large projects reflects not only an economic calculation; the projects are also investments in symbolic content. That is why macroengineering seems to present an economic paradox. Many design decisions about large projects act to increase their landscape legibility at the expense of their utility; the engineering itself may become subordinate to symbolic concerns.

The messages that are typically linked to the “mega” part are themselves oversized. The project needs to be obvious and emphatic; it needs to evoke “wonder” in a fashion that would be familiar to designers from antiquity. Each large product by a powerful actor supports the ideological legitimacy and authority of that actor. Large scale engineering constructs a landscape that reinforces the power of the builder, whenever it was built. The themes of Hellenistic landscape interpretation represented by the list of Seven Wonders continue to be relevant.

As the world evolves, as the world is changed by globalization, geopolitical conflict, economic disruption, and environmental degradation, the landscape symbol systems will change. The most powerful economic actors are likely to be different every few decades, and statements that were admired by one generation may be embarrassing the next. But in many ways the root meaning of large scale alteration of the landscape will continue to resemble the 2200 year old of landscape wonders chosen to track Alexander’s successes through the Near East. Landscape transformation is an explicit representation of economic, military, ecological, and social power, and power is always used to justify more power.

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