street art

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Future of Sidewalks
A sidewalk (North American English) – also known as a footpath, Footway or pavement in Australian English New Zealand English, Irish English, South African English and British English – is a path along the side of a road. A sidewalk may accommodate moderate changes in grade (height) and is normally separated from the vehicular section by a curb. There may also be a median strip or road verge (a strip of vegetation, grass or bushes or trees or a combination of these) either between the sidewalk and the roadway or between the sidewalk and the boundary.

In some places, the same term may also be used for a paved path, trail or footpath that is not next to a road, for example, a path through a park.

**History**

There is evidence that sidewalks were built in ancient times. It was claimed that the Greek city of Corinth was paved by the 4th-century, and the Romans were particularly prolific sidewalk builders – they called them semitas.

However, by the Middle Ages, narrow roads had reverted to being simultaneously used by pedestrians and wagons without any formal separation between the two categories. Early attempts at ensuring the adequate maintenance of foot-ways or sidewalks were often made, such as the 1623 Act for Colchester, although they were generally not very effective.
Following the Great Fire of London in 1666, attempts were slowly made to bring some order to the sprawling city. In 1671, ‘Certain Orders, Rules and Directions Touching the Paving and Cleansing The Streets, Lanes and Common Passages within the City of London’ were formulated, calling for all streets to be adequately paved for pedestrians with cobblestones. Purbeck stone was widely used as a durable paving material. Bollards were also installed to protect pedestrians from the traffic in the middle of the road.

A series of Paving Acts from the House of Commons during the 18th century, especially the 1766 Paving & Lighting Act, authorized the City of London Corporation to create foot-ways throughout all the streets of London, to pave them with Purbeck stone (the thoroughfare in the middle was generally cobblestone) and to raise them above the street level with curbs forming the separation. The Corporation was also made responsible for the regular upkeep of the roads, including their cleaning and repair, for which they charged a tax from 1766. By the late 19th-century large and spacious sidewalks were routinely constructed in European capitals, and were associated with urban sophistication.

In the United States, adjoining property owners must in most situations finance all or part of the cost of sidewalk construction. In a legal case in 1917 involving E. L. Stewart, a former member of the Louisiana House of Representatives and a lawyer in Minden in Webster Parish, the Louisiana Supreme Court ruled that owners must pay whether they wish for the sidewalk to be constructed or not.
Benefits

Sidewalks play an important role in transportation, as they provide a safe path for people to walk along that is separated from the motorized traffic. They aid road safety by minimizing interaction between pedestrians and motorized traffic. Sidewalks are normally in pairs, one on each side of the road, with the center section of the road for motorized vehicles.

In rural roads, sidewalks may not be present as the amount of traffic (pedestrian or motorized) may not be enough to justify separating the two. In suburban and urban areas, sidewalks are more common. In town and city centers (known as downtown in North America) the amount of pedestrian traffic can exceed motorized traffic, and in this case the sidewalks can occupy more than half of the width of the road, or the whole road can be reserved for pedestrians, see Pedestrian zone.

Environment

Sidewalks may have a small effect on reducing vehicle miles traveled and carbon dioxide emissions. A study of sidewalk and transit investments in Seattle neighborhoods found vehicle travel reductions of 6 to 8% and CO2 emission reductions of 1.3 to 2.2%
Road traffic safety

Research commissioned for the Florida Department of Transportation, published in 2005, found that, in Florida, the Crash Reduction Factor (used to estimate the expected reduction of crashes during a given period) resulting from the installation of sidewalks averaged 74%. Research at the University of North Carolina for the U.S. Department of Transportation found that the presence or absence of a sidewalk and the speed limit are significant factors in the likelihood of a vehicle/pedestrian crash. Sidewalk presence had a risk ratio of 0.118, which means that the likelihood of a crash on a road with a paved sidewalk was 88.2 percent lower than one without a sidewalk.

“This should not be interpreted to mean that installing sidewalks would necessarily reduce the likelihood of pedestrian/motor vehicle crashes by 88.2 percent in all situations. However, the presence of a sidewalk clearly has a strong beneficial effect of reducing the risk of a ‘walking along roadway’ pedestrian/motor vehicle crash.” The study does not count crashes that happen when walking across a roadway. The speed limit risk ratio was 1.116, which means that a 16.1-km/h (10-mi/h) increase in the limit yields a factor of (1.116) or 3.
The presence or absence of sidewalks was one of three factors that were found to encourage drivers to choose lower, safer speeds. On the other hand, the implementation of schemes which involve the removal of sidewalks, such as shared space schemes, are reported to deliver a dramatic drop in crashes and congestion too, which indicates that a number of other factors, such as the local speed environment, also play an important role in whether sidewalks are necessarily the best local solution for pedestrian safety.

In cold weather, black ice is a common problem with unsalted sidewalks. The ice forms a thin transparent surface film which is almost impossible to see, and so results in many slips by pedestrians. Riding bicycles on sidewalks is discouraged since some research shows it to be more dangerous than riding in the street. Some jurisdictions prohibit sidewalk riding except for children. In addition to the risk of cyclist/pedestrian collisions, cyclists face increase risks from collisions with motor vehicles at street crossings and driveways. Riding in the direction opposite to traffic in the adjacent lane is especially risky.

**Health**

Since residents of neighborhoods with sidewalks are more likely to walk, they tend to have lower rates of cardiovascular disease, obesity, and other health issues related to sedentary lifestyles. Also, children who walk to school have been shown to have better concentration.
Social uses

Some sidewalks may be used as social spaces with sidewalk cafes, markets, or busking musicians, as well as for parking for a variety of vehicles including cars, motorbikes and bicycles.

Construction

Contemporary sidewalks are most often made of concrete in the United States and Canada, while tarmac, asphalt, brick, stone, slab and (increasingly) rubber are more common in Europe. Different materials are more or less friendly environmentally: pumice-based trass, for example, when used as an extender is less energy-intensive than Portland cement concrete or petroleum-based materials such as asphalt or tar-penetration macadam). Multi-use paths alongside roads are sometimes made of materials that are softer than concrete, such as asphalt.

Wood

In the 19th century and early 20th century, sidewalks of wood were common in some North American locations. They may still be found at historic beach locations and in conservation areas to protect the land beneath and around, called boardwalks.
Brick

Brick sidewalks are found in some urban areas, usually for aesthetic purposes. Brick sidewalk construction usually involves the usage of a mechanical vibrator to lock the bricks in place after they have been laid (and/or to prepare the soil before laying). Although this might also be done by other tools (as regular hammers and heavy rolls), a vibrator is often used to speed up the process.

Stone

Stone slabs called flagstones or flags are sometimes used where an attractive appearance is required, as in historic town centers. In other places, pre-cast concrete slabs (called paving slabs or, less correctly, paving stones) are used. These may be colored or textured to resemble stone.

![Installation of paver blocks](image1)

![Installation of crushed stone underlayment for drainage](image2)

Four types of brick-laying for sidewalks. Each is a type of tessellation.
Concrete

Freshly laid concrete sidewalk, with horizontal strain-relief grooves faintly visible

In the United States and Canada, the most common type of sidewalk consists of a poured concrete ribbon, examples of which from as early as the 1860s can be found in good repair in San Francisco, and stamped with the name of the contractor and date of installation. When quantities of Portland cement were first imported to the United States in the 1880s, its principal use was in the construction of sidewalks. Today, most sidewalk ribbons are constructed with cross-lying strain-relief grooves placed or sawn at regular intervals typically 5 feet (1.5 m) apart. This partitioning, an improvement over the continuous slab, was patented in 1924 by Arthur Wesley Hall and William Alexander McVay, who wished to minimize damage to the concrete from the effects of tectonic and temperature fluctuations, both of which can crack longer segments. The technique is not perfect, as freeze-thaw cycles (in cold-weather regions) and tree root growth can eventually result in damage which requires repair. In highly variable climates which undergo multiple freeze-thaw cycles, the concrete blocks will be separated by expansion joints to allow for thermal expansion without breakage. The use of expansion joints in sidewalks may not be necessary, as the concrete will shrink while setting.

Tarmac and asphalt

In the United Kingdom, Australia and France suburban sidewalks are most commonly constructed of tarmac. In urban or inner-city areas sidewalks are most commonly constructed of slabs, stone, or brick depending upon the surrounding street architecture and furniture.
A sidewalk is designed to meet a variety of characteristics that have a direct impact on usability, such as grade, cross slope, width, surface type, etc. Even mildly difficult features in combination can make a sidewalk hard to access for someone with a disability. Sidewalk design criteria are based on providing access to all pedestrian users to the maximum extent feasible. This policy is in accordance with federal standards set out by the US Department of Justice, based on recommendations of the US Access Board. Refer to Pedestrian Facilities and the Americans with Disabilities Act for further discussion.

To better understand some of the challenges faced by disabled users, four U.S. Access Board videos showing design issues for pedestrians with disabilities. The videos cover:

1. Design issues for pedestrians who use wheelchairs (10:00).
2. Design issues for pedestrians with ambulatory impairments (7:51).
3. Design issues for pedestrians with low vision (11:24).
4. Design issues for pedestrians who are blind (11:19).

When sidewalks are constructed the following basic items will be considered (detailed design information follows later on in this article):

- Sidewalks or pedestrian paths will be accessible to the maximum extent feasible to all people according to the Americans with Disabilities Act of 1990 (ADA).
• Barrier curb. When sidewalks are constructed, a barrier curb is sufficient to separate pedestrians from vehicular traffic on low-speed roadways (posted speed of 45 mph or less). At higher speeds, a vehicle can mount a barrier curb at a relatively flat impact angle. In the event a sidewalk located adjacent to a high-speed roadway is necessary, another type of physical separation between the vehicle and the pedestrian will be considered. Guardrail and concrete traffic barriers are two of the options that may be considered.
• In rural areas where it is necessary to accommodate pedestrian movements, a paved shoulder at least 6 ft. wide may be used. The cross slope must be 1.0% (minimum) to 2.0%.
• A sidewalk located at least 2 ft. from a curb should be a minimum of 5 ft. wide. Exceptions may be made for local conditions, but ADA requirements must be met.
• A sidewalk proposed within 2 ft. of a curb will be placed adjacent to the curb and be a minimum of 6 ft. wide. Exceptions may be made, but ADA requirements must be met.
• For sidewalk widths less than 5 ft., a 5 ft. by 5 ft. passing space is to be provided at intervals no greater than 200 ft.
• The cross slope on all accessible routes must be 1.0% minimum to 2.0% maximum.
• The running slope should be as flat as possible, up to a maximum of 5%. However, sidewalks may follow the slope of the adjacent roadway if less than 5% is technically infeasible.
• Sidewalks across private and commercial approaches will be the same thickness as the paved approach and will maintain less than 2.0% cross slope. Accessible routes across side streets and alleys will be less than 2.0% on new construction and reconstruction projects. Less than 2.0% cross slope will be maintained across streets and alleys where feasible on all alteration projects.
• A clear airspace of 80 in. above the sidewalk will be maintained free of tree limbs, signs, fountains, poles or planters. Protrusions into the area of the sidewalk must not exceed 4 in. Where the curb is separated from the parallel sidewalk by a parkway (border), all house walks will be extended across the parkway Housewalks will be 4 in. thick and at least 3 ft. wide.

• Steps to a house will be at least 3 ft. wide. Steps and housewalks will match the width of the existing housewalk. Steps other than house steps will be of sufficient width to fit a particular situation. Stairs located on MHTC right of way will be replaced with ADA-compliant curb ramps, where technically feasible, or an alternate route may be provided.

Sidewalk Location and Width

In the United Kingdom, Australia and France suburban sidewalks are most commonly constructed of tarmac. In urban or inner-city areas sidewalks are most commonly constructed of slabs, stone, or brick depending upon the surrounding street architecture and furniture.

In developed areas on low-speed roadways (posted speed of 45 mph or less), sidewalks are to be separated from the travelway by a barrier curb (see Standard Plan 609.00). At higher speeds, a vehicle can mount a barrier curb at a relatively flat impact angle.

“...stable, firm and slip resistant...” “...minimize surface discontinuities...”

Pedestrian Access Route
In the event a sidewalk is located adjacent to a high-speed roadway, another type of physical separation between the vehicle and the pedestrian such as a guardrail or concrete traffic barrier will be considered.

Sidewalks are not to be designated on paved shoulders located behind a mountable curb; nor shall paved shoulders be designated or striped as a pedestrian pathway, however if pedestrian use is anticipated, efforts should be made to meet ADA standards wherever possible, such as a 2% cross slope.

Sidewalks are to be at least 5 ft. wide. However, if necessary due to geometric constraints, the width of the sidewalk may be reduced to 4 ft. minimum width, as required in PROWAG, by completing the Design Exception process. A 2 ft. grass strip or planting area should separate the sidewalk from the curb. A sidewalk proposed within 2 ft. of a curb will be placed adjacent to the curb and be at least 6 ft. wide.

When a project alters the right of way space, the existing ADA elements within the limits of the project shall be made to comply with the applicable requirements for new construction to the maximum extent feasible (per PROWAG R202.3). This will include repairs and upgrades to existing sidewalks so the facilities provide a continuous minimum width of 4 ft. with a maximum cross slope of 2.00% (per PROWAG R301).

For sidewalks narrower than 5 ft., 5 ft. x 5 ft. passing spaces need to be provided at intervals that are no greater than 200 feet. Such features as driveways, building entrances, parking lots and sidewalk intersections are considered acceptable passing spaces if they are 5 ft. x 5 ft. and meet the 2 per cent maximum cross slope requirements.

Figure 642.1.2 Clearances and obstructions for pedestrian access routes
Clearances and Obstructions

The width of the accessible sidewalk route should meet the requirements above. Obstructions are objects within the pedestrian access route that reduce the clearance width, protrude into the circulation route, or limit the vertical passage space or of a sidewalk. These guidelines apply to permanent and temporary objects. The full width of the circulation path should be free of protruding objects, if possible. Permanent, stationary objects are not to project into the pedestrian access route more than 4 in. from 27 in. to 80 in. above the ground. Freestanding objects mounted on posts, pylons, etc., may overhang a maximum of 12 in. from 27 in. and 80 in. above the ground, although this situation should be avoided whenever possible. Figure 642.1.2 illustrates this protected zone.

Obstacles below 27 in. are not to reduce the sidewalk width to less than 3 ft. Obstacles reducing the sidewalk circulation path (width) below 5 ft., but not less than 3 ft., should be corrected, but if not, documented why the sidewalk width was reduced and the obstacle was not moved or corrected at that location.
Sidewalk Surfaces

Surfaces of sidewalks and all parts of the pedestrian network must be stable, firm and slip-resistant. Care must be taken to provide an even and level surface. Highly textured surfaces such as cobblestones may cause discomfort for a disabled person with a spinal injury.

Changes in levels up to ¼ in. may be vertical and without edge treatment. Changes in levels between ¼ in. and ½ in. will be beveled with a slope no greater than 1V:2H (2:1). Level differences greater than ½ in. need to be removed or ramped.

Over time, sidewalks may settle, become worn, or fall victim to people or nature. Maintaining a safe surface for everyone is very important. When the sidewalk is not owned or maintained by MoDOT, but may be adjacent to one that is, it is important to notify the proper authority that maintenance is needed.
Some examples of sidewalks distresses/deficiencies requiring correction are:

- **Step separation.** A vertical displacement of ½ in. or greater at any point on the walkway that could cause pedestrians to trip or prevent the wheels of a wheelchair or stroller from rolling smoothly.
- **Badly cracked concrete.** Holes and rough spots ranging from hairline cracks to indentations wider than ½ in.
- **Spalled areas.** Fragments of concrete or other building material detached from larger structures.
- **Settled areas that trap water.** Sidewalk segments with depressions, reverse cross slopes, or other indentations that make the sidewalk path lower than the curb. These depressions trap silt and water on the sidewalk and reduce the slip resistant nature of the surface.
- **Tree root damage.** Roots from trees growing in adjacent landscaping that cause the walkway surface to buckle and crack.
- **Vegetation overgrowth.** Groundcover, trees, or shrubs on properties or setbacks adjacent to the path that have not been pruned can encroach onto the path and create obstacles.
Utility covers, such as for manholes, drainage or water meters, need to have a slip resistant top, as much as possible, and meet changes in level criteria. Lifting holes on covers need to be less than ½ inch in diameter or be satisfactorily plugged so a cane cannot get lodged in the hole. If grates are located in the sidewalk or other walkways paths, the grates will have spacing no greater than ½ in. wide in one direction. If grates have elongated openings, then the grates will be placed so that the long dimension is perpendicular to the dominant direction of travel. Refer to Figure 642.1.3.
Running Slope, or Grade

The running slope, or grade is defined as the slope parallel to the direction of travel, with the running grade defined as the average grade along a continuous grade. The grade of a sidewalk should be as level as possible allowing easy use by travelers. For pedestrian facilities on public access routes, the running grade of sidewalks will be a maximum of 5%. If this is technically infeasible, the sidewalk may be consistent with the running grade of the adjacent roadway.

The rate of change in grade, the algebraic difference, measured over 2 ft. intervals, is not to exceed 13%. An example of a 13% change in grade is shown in Figure 642.1.4.1. Figure 642.1.4.2 illustrate how excessive slopes impact wheelchairs.

Figure 642.1.4.1. The gutter slopes counter to the slope of the curb ramp to promote drainage.

Figure 642.1.4.2

Excessive slope differences between a gutter and a ramp can cause wheelchairs to flip over backward

Excessive slope differences between gutter and ramp can cause wheelchairs to tip forward
Cross Slopes

Cross slope is defined as the slope measured perpendicular to the direction of travel. A minimum slope of 1% should be provided to allow proper drainage. When necessary the maximum 2% cross slope allowed by ADA standards may be used. Cross slopes of less than 2% are desirable to provide easier passage and to allow for some construction tolerance and settlement. Sidewalks with a cross slope greater than 2% are noncompliant and must be made compliant by whatever means necessary and including replacement.

Cross slopes are very difficult for some people with mobility impairments to negotiate because it is harder to travel across sloped surfaces than horizontal surfaces. People with mobility impairments who are ambulatory or use manual wheelchairs must exert significantly more energy than other pedestrians to traverse sloped surfaces. Both powered and manual wheelchairs can become unstable and/or difficult to control on sloped surfaces. Whenever possible, slopes are minimized to improve access for people with mobility impairments.

Landings

Landings are level areas built to provide pedestrians with a place to rest or make turning maneuvers, or where it is necessary to have a level, stable area to allow access to another feature such as a pedestrian pushbutton. The slope of a landing should allow for drainage and be designed and built with a minimum 1% slope and may not exceed a slope of 2.0% in any direction.
How we navigate the streets has changed radically over the past decade, thanks largely to new technologies. To take just one example, smartphones have made an ever-widening array of maps and information available to the public, enabling new ways of seeing and experiencing the urban landscape. iPhones allow the street to become a museum without walls, support pop-up events, and enable the creation of thematic journeys.

While our modes of navigating streets have transformed, the streetscapes themselves have remained fundamentally unchanged. We still have traffic signs, phone booths, historical plaques, and bus stops that look and operate much the way they did twenty or even fifty years ago. Why are our streets so slow to adapt? The time is ripe to reconsider how public infrastructure could operate and how it might transform the way we navigate and experience the public realm. Could there be alternative ways to access location-based information, beyond personal digital devices—ways that help make information more widely accessible to all and lower the digital divide? Could a public media infrastructure achieve secondary aims such as reducing carbon footprints and creating more habitable cities? How can the street itself learn from the open source, mobile platforms that characterize the latest turn of the digital revolution?

In this paper, I will use a recent competition, sponsored by the City of New York, to “Reinvent Payphones” as a springboard for discussion about the future of public communications infrastructure. The competition brief prompted participants to ask: “What should the payphone be in the age of mobile?” This paper will attempt to answer this question while also asking some broader questions about public infrastructure, public space, and the future of place-based communications technologies.
SMARTER SIDEWALKS

For many of us, the sidewalk is simply a grey grid filling the space between the street and buildings, a bland stretch of concrete that is the ubiquitous mark of any urban landscape. But, the history of the sidewalk is a history of urban exchange. The sidewalk is the mediator between public and private zones, the buffer between different types of movement, an ephemeral and transient zone of public interaction. The Greeks and Romans both had sidewalks, but sidewalks disappeared by medieval times, when carts and pedestrians intermingled. Sidewalks reappeared in the seventeenth and eighteenth centuries, and those of the nineteenth century were asphalt, just like the streets of today. (Loukaltou-Sideris 19) The intention of many of these early sidewalks was not that different than now: they facilitated mobility, segregated types of movement, and helped shield pedestrians against the dust from horses and carriages.

Questions over propriety emerged from the beginning: Were sidewalks and streets for locals or for outsiders? Sidewalks are a place where individual preferences continually compete with collective desires. Take, for example, this letter written from a resident of New York to the editors of The New York Times. The letter writer complains that “the badly paved and often filthy roadways are the only place to walk to and from the ferries or elevated road. Take Cortland Street any hour, great cases obstruct the sidewalks for hours...the path is ever crowded with pedestrians. Newsboys show their wares on empty cases driving the hurrying commuter to the mud. On the narrowest part of the sidewalk on Maiden Lane to air a cellar a coal hole is left open in the very center of the walk and a nine inch cage put over it.
Every day someone falls over the obstruction and scores are diverted to the gutter.” This letter was published on June 4, 1903, yet none of the issues mentioned in it are foreign to contemporary residents of the city: the sidewalk is a place of congestion, negotiation, and attempted segregation, with varying degrees of success.

Furthermore, the materiality of the street and sidewalk has evolved along with citizens’ ideas about proper movement through urban spaces. Sidewalks are made from a range of materials representing both locally cheap and abundant materials, but also materials that best facilitate the speed of desired movement. Through this logic, early sidewalks were often made of better material than the street to encourage local travel while dissuading passage by outsiders. Early streets were generally supported by the adjacent owners, and their preferences regarding sidewalk use—whether it should serve travel by locals, visitors, commercial or residential use—was often a point of contention. (Loukaltou-Sideris 20)

Issues of congestion continue to plague New York’s newest sidewalk infrastructure. Take, for example, the bike sharing system just in the process of being rolled out. In the ongoing competition for sidewalk space, the newly installed bike pedestals have met a deluge of criticism, with some residents complaining that the pedestals are simply “corridors of trash and water.” (New York Times, 2013) Never mind that the bicycle stands provide necessary infrastructure for an innovative way to navigate the city: they are still competing for precious, and hotly contested, sidewalk space.

You may have also noticed, many of these systems run off the grid, powered, for example, by photovoltaics, making it somewhat mobile and independent, at least theoretically, from dependence on other infrastructural systems.
Additionally, a change that might not be quite as visible is that the information produced by civic infrastructure is becoming increasingly open to the public. Take a look, for example at the thousands of data sets available at the website of NYC Open. In other words, the infrastructure that surrounds us physically, also is available, in a sense, in the digital world. And there is a growing chorus, from the Smart City movement, to Hackathons, to the Occupy Movement, telling us that the ecology between these two worlds will be primary in the re-formation of the urban landscape.

TECHNOLOGY OF THE STREET

So while there is technology that is embedded in the street, and data connected to this, there is another macro level of information theoretically accessible to everyone who walks around with a PDA. Thus the conscious and unconscious agents of information are us. And as we create larger, deeper data networks, their trails will increasingly impact the way the streets are inhabited. Take the Boston bombing, for example. As events unfolded, we saw that not only were the brothers being watched by surveillance videos, but they showed up in numerous videos taken by pedestrians, videos that are all time stamped and geo-tagged. Other recent events such as Occupy Wall Street have built on the ecology between physical and digital spaces. Personal digital devices and the software and apps they support—such as Twitter and Facebook—allowed large numbers of people to strategically occupy swaths of cities far removed from each other, pushing the boundaries and regulations governing the use of urban spaces, while forming part of a larger national, and even international network or community.
TECHNOLOGY OF THE STREET

And then there is the aesthetic dimension of the street that I mentioned earlier. Increasingly, a virtual network of apps, maps, and walking tours, taking their cue from the work of artistic movements like Situationists, have reinvented the way we might experience the sidewalk. A few of these include Janette Kim’s Safari 7, Janet Cardiff’s walking tours of New York, and our project Museum of the Phantom City. Each of these projects offer alternative visions of the city. Safari-7 offers podcast tours along the number 7 train in New York featuring a range of species in relationship to the urban ecology. Janet Cardiff’s tours blur the line between fact and fiction, allowing users to peer into dreamlike scenarios all while walking through Central Park. And our project, Museum of the Phantom City, allows users to see visionary but un-built architecture on the projects’ intended site.

And the realm of urban navigation software is expanding rapidly. Currently on the iTunes store, there are hundreds of maps and guides for various cities: 385 for Philadelphia, 812 for San Francisco, 687 for Los Angeles, and 2489 for New York. Each of these offers a distinct, and technologically mediated, new way to see and experience the city.

Reinventing Payphones

What does all this have to do with payphones—something that many of us probably think of as a nearly archaic technology of the last century, something increasingly made obsolete precisely by the new technologies I’ve been discussing. In their brief for the Reinvent Payphones competition, New York City asked designers to reconsider the lowly payphone in the age of mobile.
Our response to the question posed by the brief was to reconcile two competing aims: to pack as much function into a single device as possible and to reduce the phone booth’s footprint. Our idea was to try and pack “everything”—meaning all kinds of functionality, from communication to sustainability to wayfinding—into “nothing.” That “nothing” took the form of a 6”-wide interactive strip that folds up from the sidewalk. The proposal works within the existing 5 foot x 5 foot sidewalk grid and has two main components: The first component is flush with the ground, and contains a combined sensor and display with storm runoff storage below. The second component is vertical and functions as a touch-screen, Wi-Fi hub, energy source, and a charging station, as well as providing several other performances. In short, it is a location-tethered smart-phone.

The bent form is shaped by considerations of accessibility, viewing angle, and optimal solar exposure for a photovoltaic power source. A curb-cut bleeds storm water into storage cells, dissipating it into existing soil. Sidewalk space is freed, while the invisible space below the space is put to work. The horizontal and vertical strips can exist independently or in conjunction. Under ideal conditions they are charged by PVs and also have backup systems—that is, hardwiring and batteries. Thinfrasstructure is self-sustaining and can go off-grid when infrastructure fails. Hermetically sealed units can be swapped, repaired, and upgraded.

The user interface is concentrated on the front panel and includes touch screen, camera, and sound inputs. The screen vertically scrolls, accommodating a range of user heights. On the side are a credit card swipe, speaker, and charger.
The user interface is concentrated on the front panel and includes touch screen, camera, and sound inputs. The screen vertically scrolls, accommodating a range of user heights. On the side are a credit card swipe, speaker, and charger. Built on the Android platform, existing apps are white listed by NYC. New ones would be developed by third party vendors. NYC’s urban specific apps could be accessed by an increasingly diverse range of public users: think of it as a 21st-century library without walls. While the smart sidewalk can function as a stand-alone device, it also networks, charges, and augments existing mobile devices. The 6”-wide ground strip both conveys and gathers information. Like a vehicular road counter, Smart Sidewalks passively tallies every wheelchair, child, and jogger 24/7, feeding information back to the City, to help it better address the needs of users. New York will be a sentient city.

Using a single color for the web portal—coordinating the sidewalk bands and the vertical interface—allows the city to use a variety of schemes that will differentiate neighborhoods on one day, denote flood zone locations, and celebrate a Subway Series. This offers bold, free information for all, while other specific services would be available for a time-based fee.

This massive nodal network senses wind speed, rain fall, temperature, and foot traffic with unprecedented granularity. In emergencies, Smart Sidewalks guides citizens away from danger to higher ground. As a publicly accessible database, information gathered from the streets of NY will stand to fundamentally reshape the city. With a single curb cut and a thin strip of technology NYC prepares for a changing climate, gives maximum functionality to the technological savvy, and lowers the digital divide.
Beyond our own proposal, a few common themes emerged in the six selected winners: touch screens, WiFi, emergency functions, a self-sufficient, off-the-grid energy supply. While these might not seem revolutionary, they seem to take a distinctly new approach from all other street infrastructure. The phone of tomorrow will be multifunctional and ecological. In other words, it will key in to the way the city is as well as the way it might change. One of the most interesting winners was Wind Chimes, which was designed by students from Cooper Union and the NYU ITP School. The project was fundamentally a miniature weather station that would allow micro-climatic data to be stored and shared. This is interesting because the payphone becomes as useful when it is being unused as when it is used—and it leverages the fact that it doesn’t ever move.

Future Streetscapes

So what are the lessons we might learn about sidewalks, and how might we think about them differently in the future? A place to begin, I believe, is to look at the biggest issues of our day: we use too many resources, we’re reducing biodiversity across the planet, we’re plagued by inequality that includes disparate access to technology. One could argue that the answer is right beneath our feet—and that rethinking the sidewalks might offer a key to addressing these and other issues. Crowd sourcing information about the city and its users is the other huge area that our infrastructures could support and take advantage of. Data collection and analysis methods that, it’s important to note, are careful to respect user privacy, offer a way to potentially connect latent desires with the realities of the street. During the recent NYC Ideas Festival, projects such as the Lowline and Pluspool were voted on and resources were channeled accordingly, allowing users to have a direct and immediate impact on the public event. And projects like David Benjamin and Natalie Jeremijenko’s Amphibious architecture set up similarly unique dialogues.
This project, in the words of the designers, “is a floating installation in New York waterways that glows and blinks to provide an interface between life above water and life below.” The project establishes a network of communication among and about fish, water quality, and visitors walking by the East River. Such projects hint at a new dynamic in the city where we might not just speak with each other, but we might also find new ways of engaging previously hidden ecologies.

But more down to earth, we can certainly learn a lesson from Janette Sadik-Khan, the innovative, and sometimes controversial, Transportation Commissioner of New York City who has chipped away at what has typically been a slow, bureaucratic process. In implementing a range of test strategies, she has truly used New York as a test bed for new ways of inhabiting the street. Often using simple means such as street graphics, movable furniture, or plantings, she has allowed the public to test and judge a wide range of prototypical strategies that have then been replicated and recalibrated.

In her essay, “Making Cities Work,” Sadik-Khan argues that “you can change a city at minimal expense and bring vibrant, healthy green spaces to communities across a city in close to real time.” There are many metrics here that suggest a radical way of rethinking our sidewalks: in other words, how can our sidewalks be leveraged as a testing ground for new ways of thinking, new types of exchanges? Just as cities like New York and San Francisco have rolled out experiments using the sidewalk as temporary lounging, dining, and park areas, we might also think of other useful experiments in street design and planning that are not only pedestrian centric, but are environmentally sensitive, ecologically minded, and that take full advantage of the functional, as well as aesthetic potentials offered by new media technologies.

Streets comprise one of the largest network systems of our urban infrastructures. They exert a powerful, and often invisible, influence on the operations, character, and experience of cities. It is high time that we start to reimagine them.