Philadelphia's Historical Maps and Green Initiatives

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ABSTRACT: The 'Greene Countrie Towne,' William Penn's seventeenth century vision for Philadelphia, has served as the spatial framework for the city throughout its history. Penn's settlement in the New World in the 1680s was focused on equality and religious freedom. The city layout reflected and housed his ideal settlement. Throughout history, the initial city plan has been a central force guiding Philadelphia's urban imagination. Penn's vision of a 'Greene Countrie Towne' is responsible for initiating and driving idea of 'green' that characterize Philadelphia. With Penn's plan and vision as guide, Philadelphia's ideas of 'green' along with the city's green infrastructure have developed over time and have served as a driver of Philadelphia's identity. This paper outlines the thread that links Philadelphia's initial plan and vision to the current day. Current planning and policy initiatives for Philadelphia include a new idea of 'green,' a focus on the sustainable city and a pledge by Philadelphia's mayor to become the country's greenest city by 2015. William Penn's city vision and plan continue to guide the city's consciousness and initiatives. The reflective quality of the sustainable city, directly linked to the 'green' vision for Philadelphia, has the potential to impact the urban imagination in a new and innovative manner while building on the historical thread that links back to the vision of the 'Greene Countrie Towne.'

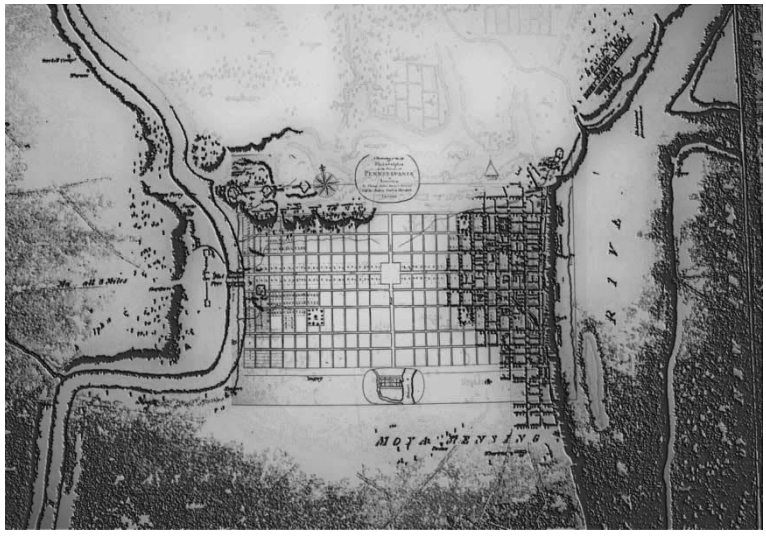

Figure 1: The 1683 Penn-Holme Plan of Philadelphia overlaid with the 1779 British Encampment Plan by William Fadden. The two together clearly show the relationship of the ideal plan to landscape features on the site.

1.0 The green context

Philadelphia was one of many cities on the eastern seaboard of the United States that were initiated in the seventeenth and eighteenth centuries, but one of only a handful that was propelled forward by such a strong vision of urban identity. The development of Philadelphia's urban context can be followed by examining the relationship between spatial planning alongside the role of civic and institutional organizations. Where urban infrastructure development was slow, taking about a century and a half to fully develop, civic institutions and

cultural identity, guided by Penn's vision and its meaning for a city in the New World, kept the vision for Philadelphia alive. This is clearly seen in the manner in which Philadelphia's green infrastructure and the idea of 'green' have developed over time. In addition to the urban plan, Philadelphia's green infrastructure has included a focus on public space and recreation, botany and horticulture, and public health and well-being, all attributes that support the initial values of the city and all which are reflected in parallel spatial and institutional development; the development of the idea of 'green' as part of the city's civic consciousness has consistently referenced the city's spatial infrastructure throughout the city's history.

1.1 City vision and site

Philadelphia's urban form gets its character from the grid. The 1683 ideal plan for Philadelphia was delineated by Thomas Holme, the Surveyor General of Pennsylvania, and was guided by William Penn's vision for the town. The Penn-Holme ideal grid is a strong conceptual image but also a strong ordering device. The plan, entitled *A Portraiture of the City of Philadelphia in the Province of Pennsylvania"*[i] measures one mile north to south and two miles east and west. The platting of the city was guided by the initial plan, and as an image to promote the city to potential investors, the drawing presented an opportunity to highlight the city as an ideal environment. The divisions, layout, and street measurements are based on the numbers five and ten. The city has five squares, a central square and four additional squares in the four city quadrants, all of which are represented in the plan delineated by Thomas Holme as green parks linked together to form a network of public spaces within the city grid.[ii] The occupation of the grid as a city of gardens, the 'Greene Countrie Towne' was envisioned for Philadelphia and importantly the limits of the site between the rivers delineated the grid's enclosure and recognized it as a centralized system that supported the overall vision for the city. The city was conceptualized according to innovative planning principles of the time, a site both beautiful and practical by nature and design. Within each city block and on each individual site, green garden areas were envisioned as settings for individual structures. The gardens add to the overall beauty of the town, and the distance between structures was considered to be the best way to prevent the spread of fire.

The Philadelphia plan is situated according to natural features and existing conditions of the site. The city plan was sited at the shortest distance between the Delaware and Schuylkill Rivers just north of the area where the two rivers merge. East and west limits locate the plan in an area that was relatively easy to level while still accommodating the watersheds within a peninsula. The site's malleability comes from the alluvial soil deposited between the two rivers in an area that was fairly firm and uniform. In larger geographic terms, the ideal grid lies in the eastern US Coastal Plain, just below the eastern Piedmont that cuts through Philadelphia. The Piedmont and Coastal Plain juncture can be discerned where the city topography rises at the north edge of the Penn-Holme plan. It is represented in the plan in the northeast corner by Faire Mount. The ideal plan's southern limit is just at a point where the soil was solid enough to settle, just north of the wetlands that characterized the peninsular site in the 1680s.

With plan measurements corresponding to natural features, it is possible to think of the ideal plan as a framework that reveals site characteristics. As such, settlement bound by a grid became a measure of the site, incorporating its geomorphic structure, using surface features and adding vegetation as ordering and envisioning devices. The use of the site's natural features was further supported through the architecture; buildings were made out of bricks from the soil of the site.[iii] The grid was laid fairly true to Holme's plan, and also proved to be flexible as it incorporated major water courses and topographic features. In addition to Faire Mount and the Piedmont to the northwest, the plan was delineated by the Cohocksink Creek, the large stream and wetlands area to the northeast. At the eastern edge of the plan the large bay-like body of water, The Dock, was accommodated within the plan.[iv]

Figure 2: John Paxton's 1810 map showing city districts and long distance roads out of the city center.

The Penn-Holme plan took approximately a century and a half to complete. There were changes and adaptations that occurred while it was platted and after its completion. The change that most significantly affected Penn's vision beginning in the first half of the eighteenth century was the unevenness of settlement. Where in the ideal plan Penn conceived a city with equal density of building from river to river, the garden sites in the eastern quarter of the city along the Delaware were given over to a denser urban fabric due to the intensity of commerce and activity in that part of town. The Penn-Holme plan proved to be flexible enough to allow adaptations over time. In its present form the plan remains representative of the overall form and vision that was conceptualized in the 1683 plan.[v] And importantly, the initial vision that the plan represents continues to hold unprecedented value as an image of the city.

1.2 Regional growth and urban space

Philadelphia's plan was one of three commissioned by William Penn representing three scales of settlement: the city, the region and the state. Plans of the city and the region were delineated by Thomas Holme in 1683, and the state was delineated by John Thornton in 1681. Three scales of envisioning correspond to scales of occupation. Land in the city, the region, and sometimes even the larger realm of the state was part and parcel of investment and settlement by individuals or families. Penn's settlement provided a comprehensive framework for obtaining real estate in the new world setting. The conceptual understanding of Philadelphia – the *City of Brotherly Love* - within the state of Pennsylvania - *Penn's Woods* - completes the visionary idea; Pennsylvania provided the larger context of a natural world and the region provided the agricultural setting for the city.

The 1683 plan suggests a centralized and finite city. The Penn-Holme plan's ideal character is expressed as a clearly delineated and centralized grid system; the five squares that occupy the center of the grid represent a strong urban idea that continues to be discernible in the Philadelphia city scape. But the grid by nature is an open ended system and Philadelphia's development extended beyond the seventeenth century plan's limits to expand the city through extension and adaptation. The city was surveyed over time beginning at the eastern edge of the Delaware River and moving westward. By the time the grid was fully inscribed onto the landscape in the first half of the 1800s there were extensions beyond the limits of the initial plan. Roads connected other nearby settlements out of the city center, often located along former Indian paths and long distance trails. Passyunk Avenue headed south and southwest across the wetlands and the Schuylkill River and connected with other roads southwest of the

city towards Baltimore. Frankford Avenue headed northeast towards Frankford, following the Delaware River and continuing northwards towards New York. Germantown Pike and Ridge Pike headed northwest, the first road to the settlement of Germantown; the second followed the high ground along the Schuylkill River connecting the city with sites in the region and the state. These were the links to the state's natural and agricultural resources. When the grid spanned over the site's natural features such as wetlands and streams, it extended and adapted the grid system by incorporating other nearby settlements. It is in this manner that the city grew substantially along the Delaware River in the 1700s. Northwards this included Kensington and Port Richmond and southward included Southwark and Moyamensing. The early extensions from the core of Philadelphia added character and variation to the grid as they followed water and land features and stitched the outlying context to the ideal plan through these junctures. Maps throughout the nineteenth century show the Philadelphia grid developing through the incorporation of distinct domains.[vi]

Through the early years of the nineteenth century, only the two squares in the northeastern and southeastern quadrants were incorporated into the city fabric. Maps from the time continued to represent the five squares as green, tree-lined parks set within the urban fabric, even though permission was granted for the two eastern squares to be used as burial grounds. All of the squares hosted other uses that were not in keeping with the public park vision set forth in Penn's *Portraiture.*[vii] For example, Center Square included a place for public hangings and the site of the southwest square was an area of the city that was focused on brickmaking. Use of the squares as public parks for all citizens for the purposes of recreation and leisure continued to be part of the public dialog, but as a secondary conversation at a time when the city's attention was focused on growth of industry and commerce. And with the city not fully platted, public space was a secondary issue because there was still an abundance of woodlands in the western areas of the city. But the strength of the urban plan along with historical reflection on Philadelphia's origins kept the goal of the five interconnected public squares in the city center as an important manifestation of Philadelphia's identity. Towards the mid-nineteenth century the squares in the Penn-Holmes plan emerged as a system of urban public parks, at the time unique in the American city. Importantly, the ideal plan as a centralized system held the urban infrastructure together while the flexibility of grid structure allowed for growth and change as the city expanded. With the five squares and four quadrants in place, the order of the city was anchored in the central plan.[viii] With time, each square adapted in relation to the needs of the city and place in the grid.[ix]

1.3 Civic and cultural development

Philadelphia's culture is reflected in its institutions and industries, many of which were initiated early in the city's history. With Philadelphia an important national center in the nation's early years, institutions were in the forefront of intellectual development. Included among these was the American Philosophical Society (APS), an organization that continues to be actively engaged in the promotion of knowledge in the humanities and sciences. Founded by John Bartram and Benjamin Franklin, the Society's promotion of 'useful knowledge' overlapped with Bartram's role as a botanist and horticulturalist and Franklin's role as a diplomat and inventor. Throughout its history, APS boasts many prominent intellectuals and citizens in its membership, who were authorities in a range of fields. The Society's activities included national and international topics, but also had local impact. One of note in the early nineteenth century was the role APS served in relation to the Lewis and Clark Expedition. Its members were advisors and the institution served as a destination for specimens from the expedition. The plant and animal specimens sent from the continent's uncharted territory were at the time unknown to the Philadelphia audience. The introduction of plants into the eastern context had the potential to be useful and beautiful, as demonstrated through the use of species in the developing urban environment. Seeds from a tree species from the Rocky Mountains, collected by the Lewis and Clark Expedition, were among those used for the fifty varieties of trees planted in the newly designed square in the southeast quadrant of the city.[x] It is interesting to reflect on the significance of the fifty varieties of trees in the public garden in one of Philadelphia's five squares, at the time when the city's green infrastructure was finally realized. Their planting would have had the effect of offering to the public increased knowledge

of plant species and the territories from which they came. The symbolic act reflected the importance of the city in relation to the opening up of the North American continent, one of the most important events of the time, connecting the city to world events of the time. The impact would have been world changing, supported by the activities of one of Philadelphia's preeminent institutions.

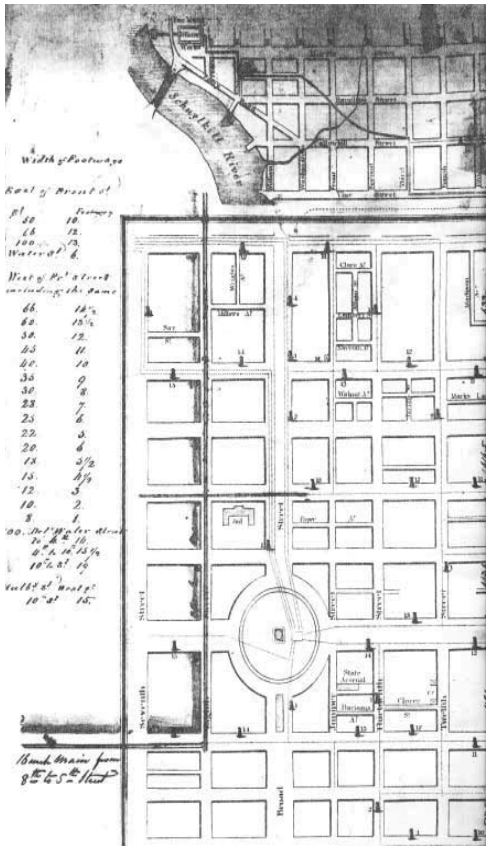

Figure 3: Benjamin Latrobe's early 19th century plan of the first water system in Philadelphia.

Figure 4: Lindsay and Blackiston's consolidated plan of Philadelphia, 1855.

The field of horticulture has important roots in Philadelphia through John Bartram. His forays into the woods and forests of the eastern seaboard of the United States provided Philadelphia with a connection to the natural world of the North American continent. Bartram's discoveries of plant species and his seed and plant business contributed to the importance of Philadelphia as an international center for horticulture in the eighteenth century. Through his children, Bartram's horticultural enterprise thrived into the nineteenth century. And a half-century after Bartram's death the horticultural thread would continue in the public realm with the founding of the Pennsylvania Horticultural Society (PHS). In 1829, early on in its existence PHS initiated a flower show that continues to be held annually and has grown to national importance. But the horticultural society also has had impact on the greening of the city. The city-wide network of volunteers and educational programming has made PHS an institution that is well-woven into Philadelphia's cultural fabric. City-wide community gardens have expanded the city's green network into neighborhoods. More recently the *Plant One Million* initiative, organized by PHS and carried out with regional partners, seeks to restore the tree canopy in the region by increasing the number of trees in the metropolitan area by thirty percent. Where in its early

years the Pennsylvania Horticultural Society advocated for the city's beauty by noting the number and variety of trees, it is interesting to note that almost two centuries later the advocacy for tree planting for the city's overall health to impact public well-being continues to be led by PHS.

Greening of Philadelphia in the nineteenth century was also initiated for health reasons. The architect Benjamin Latrobe was commissioned to design Philadelphia's water system in the first years of the nineteenth century and Frederick Graff expanded and improved the system in a second phase of design. It was the first major water system in the country. The first phase included a pump house on Center Square and a network of log pipes that distributed water. Relying on the city streets to run the underground network of pipes and Center Square, Faire Mount, and other open spaces in the public domain to house the above-ground parts of the system, the waterworks had the auspicious role of also supporting the city's green infrastructure by siting the system in primary areas of the city that were in the public domain. As the city grew in population, the need for fresh water increased and the water system needed additional green infrastructure along the Schuylkill River to assure a clean water supply. Plots of land were acquired by the city, beginning just north of Faire Mount and continuing northwards in the watershed along the Schuylkill River. This eventually resulted in the establishment of Fairmount Park in 1867, extending the watershed area to include 2800 acres stretching from Fairmount Waterworks to the northwestern edge of the city.

2.0 Finding the landscape infrastructure

Philadelphia was a series of separate political entities until 1854. With consolidation of municipalities that were working closely together, there were opportunities to re-envision Philadelphia as one complete network for municipal services and one expanse of land rather than a series of separate municipal entities. The transformation is clearly depicted in speculative maps from the mid-nineteenth century. A grid of dashed lines on maps laid over the areas north and south of the center represented future plans for growth. In maps from an earlier period, such as the Paxton map from 1810, settlement was characterized by growth that accommodated ridge roads, valley roads and stream beds, and other natural features of the Piedmont and Coastal Plain. The vision of Philadelphia at the time of consolidation shows a desire for uniformity that comes from a continuous rectilinear grid. Laying the grid to the north, west, and south of the center resulted in cutting and filling of the land to achieve a degree of uniformity. Development of the Philadelphia grid in the mid-nineteenth century was carried out in a manner that tended to ignore the natural features of the site.

As the city expanded, the five squares in the center of Philadelphia also experienced change. Center Square was eventually covered by City Hall, a behemoth of a building completed in 1901 that covers a large portion of the open space on the 10-acre site. City Hall has a courtyard that serves as Philadelphia's locational center. City Hall and the courtyard fundamentally changed Center Square. But with Broad and Market Streets crossing in the center of the interior courtyard, the courtyard provides a central point of orientation from which to conceptually understand the overall plan of the city, its four quadrants, and the interconnectivity of public spaces through the five squares. In other words, in the dense city that developed using the Penn-Holme plan as a framework, City Hall and its interior courtyard emphasize the ideal plan and make it discernible. Of the four remaining squares, Rittenhouse, in the southwest quadrant, emerged as the square truest in form to the original plan of Philadelphia. It is a distinct six acre site that is surrounded by buildings of a scale that holds it within the urban environment. Washington Square in the southeast also has these qualities, but with its location adjacent to the State House grounds behind Independence Hall, it became the initiator of a network of small urban neighborhood parks and green spaces during mid-twentieth century urban renewal. Franklin Square in the northeast quadrant and Logan Square in the northwest were incorporated into major urban plan changes. Now they each serve as part of larger infrastructure that reaches beyond the city. On its east flank, Franklin Square is adjacent to the landing point of the Ben Franklin Bridge, in theory serving as the open space to welcome those arriving by automobile. In the northwest quadrant the southeast-to-northwest

diagonal uses Logan Square to guide the direction of the tree-lined Ben Franklin Parkway. The parkway, built in the early twentieth century, is urban infrastructure that best exemplifies the City Beautiful Movement in Philadelphia. The Parkway connects City Hall to Fairmount Park, bringing landscape infrastructure directly into the center of the city.[xi]

The spatial and cultural dimensions of Philadelphia and its green infrastructure were fully realized in the twentieth century. The city is well illustrated in the 1967 image looking westward that is included in Edmund Bacon's book, *Design of Cities.* The image is a re-envisioning of the ideal plan, showing incorporation of the changes made in the twentieth century, including the network of green spaces in the southeast quadrant of the city and the extension of green spaces that begin at Center Square and continue through the northwest quadrant connecting to Fairmount Park and beyond. The image is a testament to the 'green city' narrative that propels the understanding of Philadelphia's ideal city plan forward.

2.1 Green initiatives

Current planning initiatives in Philadelphia consider both the spatial and institutional dimensions of city greening. Philadelphia *Greenworks*, [xii] an initiative by the Philadelphia Office of Sustainability, has as its primary goal to make Philadelphia the greenest American city by 2015. The terms *Energy, Environment, Equity, Economy, and Engagement* are used as guiding principles to frame initiatives. To accomplish the goal, *Greenworks* relies on the power of collaboration. Links between private institutions and government agencies are important, relying on the civic and cultural capacity of the city. The Philadelphia City Planning Commission's 2035 Comprehensive Plan[xiii] is a spatial framework that has incorporated the sustainable initiatives for the city. Cross-agency alignments enhance these efforts. The 2035 Plan considers, for example, economic development alongside green initiatives, and seeks coordination with initiatives such as *Green City Clean Waters*[xiv] by the Philadelphia Water Department, and Vacant Land Management[xv] by the Philadelphia Redevelopment Authority. Some of the most innovative thinking about green initiatives considers the current conditions and context of the city and poses ways to reverse negative aspects of the changed environment. For example, a land bank has recently been initiated in Philadelphia. With the ability to consider larger areas for development, urban blight has the potential to be reimagined and positively transformed through development. Stream restoration is another initiative. This work addresses regional infrastructure and is part of an ongoing effort to reform storm water management in a city and region where population growth has impacted services for more than a century.

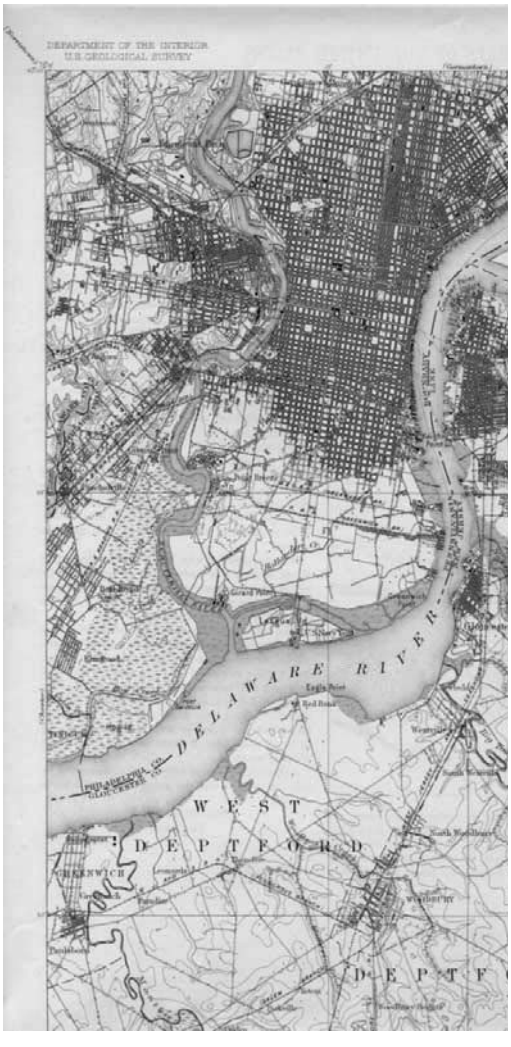

Figure 5: 1898 United States Geological Survey Map, Philadelphia.

The Philadelphia Water Department, fully aware of its legacy and importance as one of the first municipal water systems in the United States has been an active leader in transforming the green infrastructure in Philadelphia. The *Green City Clean Waters* initiative includes solutions for storm water management in the densest part of the city. Underground infrastructure is at the heart of the effort, but the infrastructure is also exhibited to the public through green areas on the ground surface. Like many post-industrial American cities, density in low income areas parallels the lack of trees, and extensive pavement that in turn creates urban heat sinks that have a negative impact on the quality of life in the affected neighborhoods. Initiatives in these areas include additional park and recreational spaces and green areas for communities. Infrastructural improvements include creation of water retention basins underneath the ground, introduction of green roofs wherever possible, recharge areas in public places such as schools, increased use of pervious pavement, greening of streets along with improved street drainage. The initiative also encourages individual property owners to implement change. *Green City Clean Waters* includes practical goals for property owners such as decreased utility costs, and for the city the buy-in of individuals has a positive impact through increasing the quality of urban spaces and daily life experiences for residents. The effort is aided by other initiatives such as *Plant One Million* through the PHS and its partners, demonstrating once again the importance of institutional efforts guided by an urban vision.

3.0 Conclusion

The Philadelphia Planning Commission's current planning framework is expressed in the 2035 Plan for Philadelphia. Where the 1960s era Philadelphia plan directly referenced the 1683 Penn-Holme central plan of Philadelphia, the current city plan presents Philadelphia as a more complex whole. The city is presented as a network of systems and neighborhoods in multiple maps and diagrams. The images present the whole of Philadelphia up to the borders that were established after consolidation in the mid-nineteenth century. The image of Penn's city in relation to the whole city is present in the 2035 plan, but the overall complexity of Philadelphia and its extensive grid predominates. In the images of the city, Penn's 'Greene Countrie Towne' appears to be less significant. Importantly, the historical importance of vision and plan together are still at work. In a similar fashion to the process of building the initial plan for Philadelphia, the 2035 plan will be fully realized and is kept alive through civic dialog and urban institutions. The current plan is process based and relies on connections within the city as a whole and in the larger contexts of the region, the state and the continent.

Philadelphia's urban imagination has always included ideas of 'green' and a green infrastructure, recognizing the importance of ideal values in driving prominence and innovation. Themes that support the Philadelphia's green vision and help to develop the city's green infrastructure include the need for public space in the urban environment, the role of horticulture in the development of a green infrastructure, and the importance of a green landscape infrastructure for a city's health and the well-being of its citizens. Now and throughout the development of the city, all of these themes are reflected in the physical plan through aspects that are both practical and beautiful and have shaped urban innovation. Current dialog about sustainability includes all of these themes. The goal to be the greenest city in the United States supports the utopian vision of the city as a green environment that has always been present in Philadelphia. Current methods used by the city planning commission and the mayor's office recognize the opportunity for Philadelphia as a leader in shaping sustainable cities in the 21st century. As such, the ideal plan framework continues to serve the city, but less for the specifics of the plan and more for the inherent values of planning, flexibility in the planning process that allow the city to innovate according to current urban needs. This posits Penn's plan and vision less as a fixed entity and more as a system for finding inherent values that drive the vision.

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[i] Referred to in this paper as the Penn-Holme plan.

[ii] For more information see for example, Read, Gray, *The Miniature and the Gigantic in Philadelphia Architecture: Essays on Designing for the Human Scale.* Lewiston: Edwin Mellen Press (2007).

[iii] For more information see Heinzen, Nancy M., *The Perfect Square: A History of Rittenhouse Square.* Philadelphia: Temple University Press (2009). Chapters 1 and 2 have detailed information about brickmaking in the southwest quadrant of the city prior through the first half of the 19th century. Also, the 1796 Peter Varle plan (and other plans) shows ponded areas around Rittenhouse Square in the southwest quadrant of the city, brickmaking sites in the 18th and early 19th century prior to expansion into that quadrant of the city.

[iv] The present day Dock Street is an unusual diagonal street in the plan. It covers a channeled stream and gives the original water body a continued presence in the city.

[v] For more information about the uneven development see, Milroy, Elizabeth, "Repairing the Myth and Reality of Philadelphia's Public Squares," *Change over Time.* vol. 1, number 1. Philadelphia: University of Pennsylvania Press (Spring 2011): 52-79.

[vi] The Frankford Historical Society plan (1810) shows the city at a time of transition.

[vii] For a thorough account of ownership, legal parameters, and use of the city's five squares in the first century and a half of Philadelphia see: Milroy, Elizabeth, "Repairing the Myth and Reality of Philadelphia's Public Squares," *Change over Time.* vol. 1, number 1. Philadelphia: University of Pennsylvania Press, Spring 2011): 52-79.

[viii] Read, Gray, *The Miniature and the Gigantic in Philadelphia Architecture: Essays on Designing for the Human Scale.* Lewiston: Edwin Mellen Press (2007): 1-20. Read discusses the plan in relation to architectural traditions that were to build on and within the city.

[ix] Milroy, Elizabeth, "Repairing the Myth and Reality of Philadelphia's Public Squares," *Change over Time.* vol. 1, number 1. Philadelphia: University of Pennsylvania Press (Spring 2011): 72.

[x] Milroy, Elizabeth, "Repairing the Myth and Reality of Philadelphia's Public Squares," *Change over Time.* vol. 1, number 1. Philadelphia: University of Pennsylvania Press (Spring 2011): 63.

[xi] It is important to note that the architect Paul Cret was connected to the redesign of three of the four squares – he designed Rittenhouse Square, he designed the Ben Franklin Bridge at Washington Square, and with Jacques Greber, he designed the Benjamin Franklin Parkway which incorporates Logan Square.

[xii] http://www.phila.gov/green/greenworks/index.html

[xiii] http://phila2035.org/

[xiv] http://www.phillywatersheds.org/what_were_doing/documents_and_data/cso_long_term_control_plan

[xv] http://www.econsult.com/projectreports/VacantLandFullReportForWeb.pdf