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# A Sustainable Foundation

Mark K. Wizeman

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# A Sustainable Foundation

		<b>* * * * * * * * * *</b>	Cont	e
			Introduction (A	bstrac
			Section One:	AS
		*	Section Two:	The
		R		
		<i>e</i>		;
		~	Section Three:	Prec
	•	•		
		e		
	•	2		4
		4 4 4	Bibliography	
		R		

#### nts

troduction (A	bstract)	1
ection One:	A Sustainable Foundation	4
ection Two:	The Project	
	1. The City: Trenton, New Jersey -History, Development, Analysis	7
	2. The Site: South Trenton	18
	-Roebling Complex, Brief History, Past, Present, and Future 3. The Program: Civic Campus and Mediatheque -Program Outline and Analysis	24
ection Three:	Precedence	
	1. Sendai Mediatheque -Sendai, Japan 1994-2000, Toyo Ito	29
	2. Central Mediatheque -Venissieux, France 1997-2001, Dominique Perrault	32
	<ol> <li>Information, Communications, and Media Center</li> <li>BTU, Cottbus, Germany, 1994-2004, Herzog and de Meuron</li> </ol>	35
	4. Alvar Aalto Civic Center Master Plans -Saynatsalo Town Hall, Finland, 1950 - Avesta City Center, Sweden, 1944	37
ibliography	e du	30
mmanny		54

22

### Introduction

Our world continues to grow smaller. Advances in communication and transportation technology connect people across the globe, both physically and virtually. And unfortunately, the ability for humans to adversely affect the natural processes of the planet at the unprecedented rate and scale in which we are today, our footprints are growing larger. The growing world population needs to take action and confront adverse environmental change now. We need to act as one community with the united objective of becoming a sustainable whole. This requires actively changing the way in which we live in order to not only meet the needs of the present, but also to not compromise the ability of future generations to meet there own needs.

Sustainability takes form in many disciplines. Whether environmental, economic, or political in scope, they often operate as independent fronts rather then having a unified goal and course of action. These current practices also neglect a human and community scale of focus, which lies at the core of the problem, and therefore the solution. A goal of social sustainability as a foundation can allow these multiple fronts to form a cohesive whole and reestablish their focus on human needs. Through creating new, and strengthen existing bonds and relationships among different social groups, social sustainability focuses on the building of community. Urban space has always been a place for the community rather than the individual and thus, its inherent traits make it ideal for the building of a sustainable social foundation. This is why the city itself should not be dismissed as an opportunity to achieve another more sustainable alternative form (Dempsey 13-15). The last two centuries have seen a transformation in cities from being relatively contained, to widespread urban sprawl. Through this, their ecological footprints grow far greater then their area (Dempsey 25). The capital city of New Jersey, Trenton is no different. As its strong industrial identity faded, its population migrated away from the city and into the surrounding rural landscape. Large-scale regional infrastructure improvements divided the city cutting off its capital and immediate downtown districts from dense residential neighborhoods. Resulting were the inner communities falling to blight and neglect. Ironically, recent efforts toward urban renewal in Trenton find hope in the now vacant industrial sections of the city. These sites that were once the economic engines for the city now provide considerable land area for a wide range planning options, close proximity to existing infrastructure connections, and a high potential to reintegrate the regional population. Even though most of the improvements that have already taken place have succeeded in their economic goals, they unfortunately have failed in addressing the local community.

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In order for a sustainable Trenton to be possible, it needs to compound its goals of economic strength and identity with efforts of rebuilding the local community. I propose that portions of the Roebling industrial site located in the southern section of the city be renovated into a community focused civic campus. This campus, comprised of a mediatheque, public meeting halls, art galleries, and performance spaces, can become public space that provides grounds for interaction while reinforcing the local identity and voice. The focal point of the project and campus, the mediatheque, has the potential as an effective social condenser that attracts and filters a wide range of cultures and age groups. The building itself can become an amenity to the surrounding population and a point of destination for the region. The mediatheque is at the heart of the projects aspirations to reconnect the various populations within the city, and the city as a whole to the region.

My intentions of this project are to investigate the potential of architecture to augment its efforts of sustainable strategies with aspirations of achieving a socially sustainable foundation in the urban setting. Within the context of Trenton, the understanding of the local communities, the capital and business districts, the education system, and the areas of renewal efforts can reveal solutions to the rebuilding of the city's community by way of reconnecting these now divided forces. What makes architecture critical in this application is its ability to effectively address the very tangible aspects of sustainable practice and the potential for it to mold and facilitate the non-tangible efforts of social sustainability. The holistic, codependent approach necessary for sustainability to be a reality has every opportunity to synthesize and materialize in the form of truly beautiful architecture.

1



### A Sustainable Foundation

Sustainability: meeting the needs of the present, without compromising the ability of future generations to meet their own needs

Through its design and construction a building can, in and of itself, become a sustainable entity. But, solutions at the scale of the building and even the landscape don't completely address the broader, true aim of sustainability. Within the discipline of architecture, conventional approaches to sustainability focus on ecologically based design and construction strategies that are usually contingent on a strong economical foundation. But a holistic approach to the problem will find that the greatest hurdles to achieving sustainability lie neither in the environmental or economic spheres, but in the social (Dempsey 45). Sustainable architecture must not only achieve its own sustainability, but also reach beyond its own boundaries and scale to actively contribute to an urban, regional, and ultimately, global solution. Architecture must augment its conventional sustainable practices to include a social scale of understanding and practice so that it contributes to the broader sense of sustainability in a more holistic manner.

Achieving social sustainability is a prerequisite both for environmental and economic sustainability (Dempsey 45). Without a strong social structure from which to build, the other scopes of sustainable practice become inadequate as unilateral approaches. The aim of social sustainability focuses on the community of people rather then the individual, and seeks to create new, and strengthen existing bonds and relationships among different social groups.

It is through the enriching of what is referred to as "soft infrastructure" and the building of social capital that social sustainability can emerge. Soft infrastructure is the human organizational systems and social networks that exist within society. Through the strengthening of soft infrastructure, social capital begins to build. An accumulating in stock of active connections among people, trust, mutual understanding, and shared values and behaviors that bind the members of human networks and communities and make cooperative action possible (Smith). Across all disciplines that address the issues of sustainability, common practices and processes are generally driven by an environmental agenda. An environmental center of attention falls short of the wider goal because it is very often divorced from a human focus or scale (Dempsey 46). Likewise, through an economic agenda, production, consumption, possession of commodities, and bottom line profit are prioritized; therefore they become the driving forces without much consideration of the livelihoods of residents on a local scale (Dempsey 25). This is not to say that sustainable goals in the environmental and economic spheres are not a vital portion of the larger objective. Rather, it is an understanding that a foundation based on human needs and requirements is needed within society in order to gain cohesion and to form a holistic goal across all campaigns of sustainability. For communities, a shift from economic development to human development will bring significant changes in design and operation. This is because human development is centered on a view of development as an integration of health/social well-being, environmental guality/ecosystem health, and economic activity (Roseland 43). If progress toward sustainability is to materialize, it must be animated by the activites of people and organizations (Portney 2).

A common theme that treads itself through a socially focused approach to sustainability is the need for collaboration amongst individual practices, policies, and people. By transforming and utilizing codependency as an asset rather then a liability and exploiting the potential of wide spread change through groups rather then the individual, sustainable practices can become the communal tools applicable across all disciplines by which society can adapt and evolve through time. Architecture's participation in providing grounds from which the social, collaborative capital to build is critical. The themes of community importance should be threaded through physical and nonphysical conceptions of architecture so that its own sustainable practices are resituated within, and augmented by social goals. As an individual can be seen as a singular part of a collective whole, a single building can be seen as an individual piece within the urban realm and through its grouping constitutes the whole of urban space and fabric. Urban space has always been a place for the community rather than the individual and thus, its inherent traits make it ideal for fostering the building of social capital (Dempsey 15).

Cities are living organisms in which the soft infrastructure brings it alive. They function from the collection of human organizational systems that construct the city and its social networks; cultural infrastructure; economic base and infrastructure, and institutional infrastructure, including political and planning mechanisms. The city is both container and contained the sum of its fabric and the human processes that shape and are shaped by this fabric. The city is the intersection of its people, their processes and the physical place (Dempsey 39).

While the urban realm holds the greatest potential for positive change, cities can be seen as a major contributor to the problem. A broad, simple explanation traces this back to their loss of identity and importance within their own region. The last two centuries have seen a transformation in cities from being relatively contained, to widespread urban sprawl. This has been a worldwide phenomenon. The strengthening of international capital has led to the concentration of economic power in a number of global centers of finance and highly specialized services. At the same time some older industrial cites have seen their influence dwindle as manufacturing becomes less important (Sassen, 2001; Smith, 2002). As production has moved location or closed down, there has been a trend of population migration away from the cities to the suburbs, smaller towns and semi-rural areas (Dempsey 16-17). From an ecological perspective, the lose of a local economy within the region has great impacts. If city economies do not connect with their local region, it is inevitable that they will have ecological footprints far greater than their area (Dempsey 25). The onset of urban sprawl put great strains on the once strong soft infrastructure and depleted the social capital that was originally built from the manufacture and commerce of the city. The lost mutual goals and behaviors, and economic engines blighted communities and threatened the livelihoods of its own citizens by disabling them from meeting their own needs and aspirations. The reason why the metropolitan context for cities play an important role is largely due to the fact the larger geographic area in which cities exist manifests the immediate externalities that the city government must contend with (Portney 25).

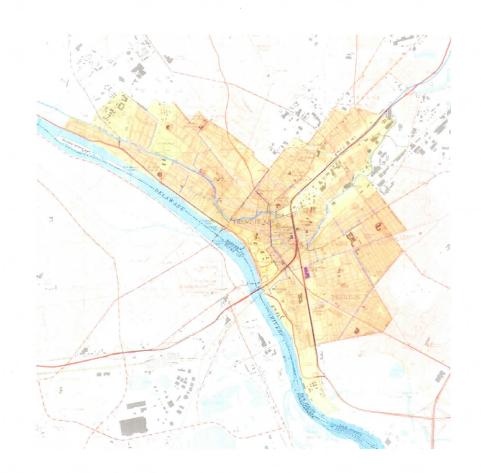
At the same time, cities historically have been the source for social changes and revolutions that endure time and underpin human freedoms and development (Dempsey 14). Cites should be places where the interaction and participation of citizens enable them to meet their own needs and aspirations, and those of the wider community, as well as allowing future generations to meet theirs. If citizens can collectively recover the character of cities as a source of democratic reinvigoration and creative energy, solutions to the challenges of sustainability may well emerge (Dempsey 29). How architecture roots itself within the urban realm in order to foster intense connections and activities across different backgrounds and networks, it can establish itself within a larger system and act as a catalyst to actively contribute to the development of social sustainability. In order to reach such goals, architecture's position towards obtaining them must become an even more critical piece by participating in the shaping of the local social climate and prove itself as an asset to the community in addition to its participation as a physical form within the urban fabric.

#### **Trenton, New Jersey**

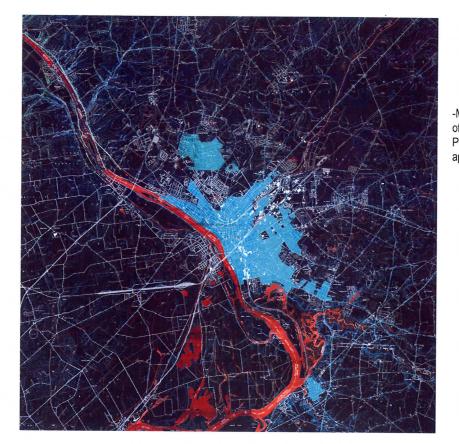
Population:	85,314
Land area, (square miles):	8
Persons per square mile:	11,153.6
Per capita income:	\$15,991
Individuals below poverty level:	22.5%



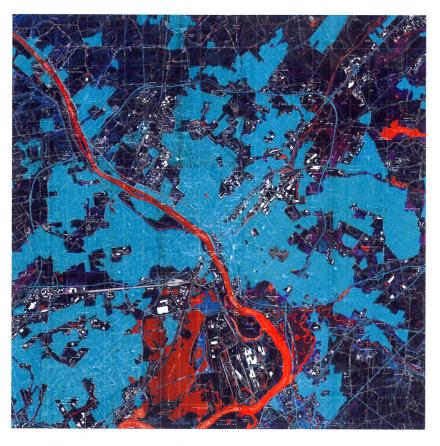
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The city of Trenton, located in central New Jersey along the banks of the Delaware River, comes from humble beginnings. The establishment of the state's first mills in 1679, powered by the waters of the Delaware, planted the seed for what would eventually flourish into an industrial asset to the nation. As early as 1726, its location was capitalized on as a midpoint port between Philadelphia and New York. But, perhaps Trenton's most notable claim to fame was it being the site in which a major turning point in the Revolutionary War took place. General George Washington and his troops crossed the Delaware on Christmas morning to defeat the Hessians in 1776 to retake Trenton and its surroundings. After the war and much debate over whether it should become the location for the nation's capital, it was decided in 1790 that Trenton was to be the capital of New Jersey. The following year, the first State House was built and would later be enlarged and altered into the building that is there today (Cunningham).



-Metropolitan area of Trenton, 1947. Population 1950, approx. 128,000 -Metropolitan area of Trenton, 1995. Population 2000, approx. 85,000



From the potteries came the first sanitary porcelain (sinks, toilets, bathtubs), in the country. Rubber was first manufactured in the city in 1850, and within thirty years Trenton was one of the country's leading rubber producers. The iron industries alone employed a total of three thousand men and produced an annual volume exceeding \$5 million in value in the 1880's. While Trenton took pride in its booming industries, its population grew to 119,289 by 1920 and contained 75 percent of all county inhabitants. In 1932, the Delaware was dredged to 20 feet to establish Trenton as a port for sea-going vessels. But by WWII Trenton would be eclipsed by Philadelphia and New England states as major ports.

As Trenton's industry dwindled so did its population. Near by Hamilton Township's population of 41,156 in 1950 doubled by 1990. Once small rural farm communities across the Delaware in Pennsylvania also started to grow as Trenton sprawled out into the region. Trenton's current population still continues to decrease and its economy suffers with it (Cunningham).

Its location in relation to New York and Philadelphia, development of waterpower by the Delaware Falls Company, completion of the Delaware & Raritan Canal, and construction of the Camden & Amboy Railroad in the 1830's quickened Trenton's transformation from a colonial village to a busy metropolis. The city had four thousand inhabitants and was on the eve of an industrial spurt that started at the time of the Civil War and came to full flower in the 1880's. At the same time the surrounding county grew in notoriety as a strong educational influence. The presence of Princeton University and The College of New Jersey spawned note worthy preparatory schools in the area. And in 1855 the state's first teacher-training school (which would later become Trenton State College), was established.

The industry that developed was in stark contrast to the surrounding oat and potato fields, and dairy farms. Iron, steel, rubber, pottery, and wire rope were Trenton's main exports (Cunningham).



-The Delaware & Raritan Canal and Camden & Amboy Railroad lines

-Trenton Freeway and US RT. 1 Bridge constructed in 1950's and 60's

-The addition of the Trenton Freeway and the existing rail lines divide the city into four distinct islands.

The strong infrastructural ties that linked Trenton with the major metropolitan areas of Philadelphia and New York were critical in maintaining the city's strong industrial presence. The Delaware & Raritan Canal, and construction of the Philadelphia & Trenton rail connection in 1834, and Camden & Amboy Railroad in 1835 transported raw materials in and final products out. In the 1950's the construction of the Trenton Freeway began. Its purpose was to reroute US RT. 1 off of localized surface roads that ran through the city to and elevated highway. The US RT. 1 Bridge was constructed in 1952 and then widened in 1965 before the completion of the Trenton Freeway in 1967.

After Trenton's industrial presence dwindled, these pieces of infrastructure were anything but a positive presence. They divided the city cutting off its capital and immediate downtown districts from the local neighborhoods.

11



-The Capital State Complex adjacent to the Delaware River



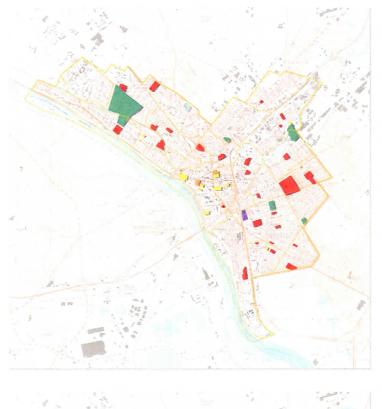
(left): The Sovereign Bank Arena (right): Mercer County Waterfront Park



-The fragmented residential sections of the city resulting from the mostly vacant industrial parks and rail yards

-Portions of the city that have been split and divided into islands of residential, commercial, and business districts resulting from industrial sections, and local scale infrastructure connections

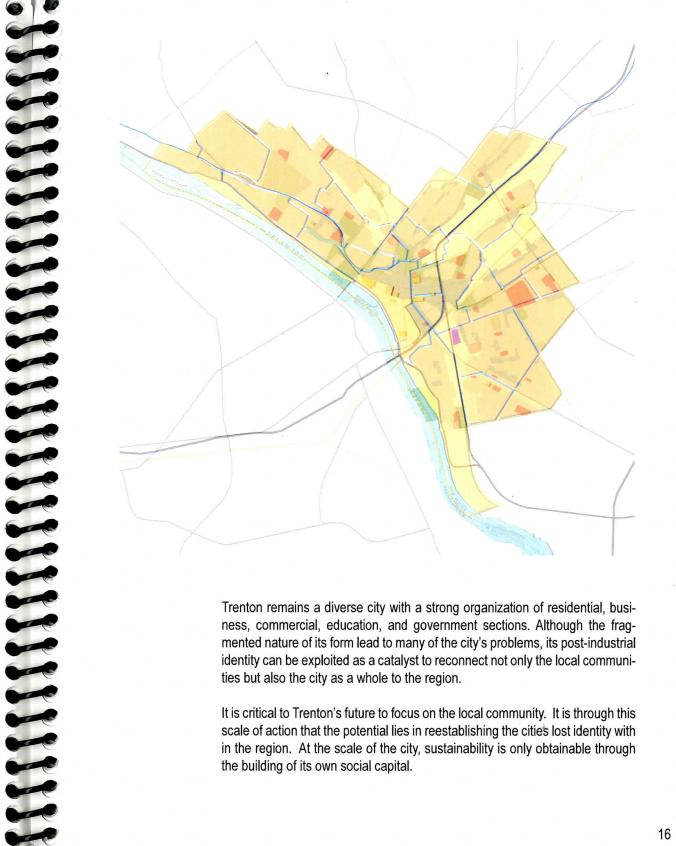
Starting in the 1960, Trenton added several buildings to the State Complex in hopes of reestablishing the city as a strong state capital. But it still has not become the total political center of the state in the manner of most state capitals (Cunningham). The city continues a slow battle of urban renewal. Opened in 1994, the Mercer County Waterfront Park was built on the banks of river along with an office complex and nightclubs to bring a new identity to the city and waterfront. In 1999, the Sovereign Bank Arena opened, and it hosts ice hockey and basketball games, concerts, and other events. The arena and waterfront baseball park have succeeded in drawing spectators into the city from the region, but the city is still confronted with high poverty and crime levels which are making the road of urban renewal slow.





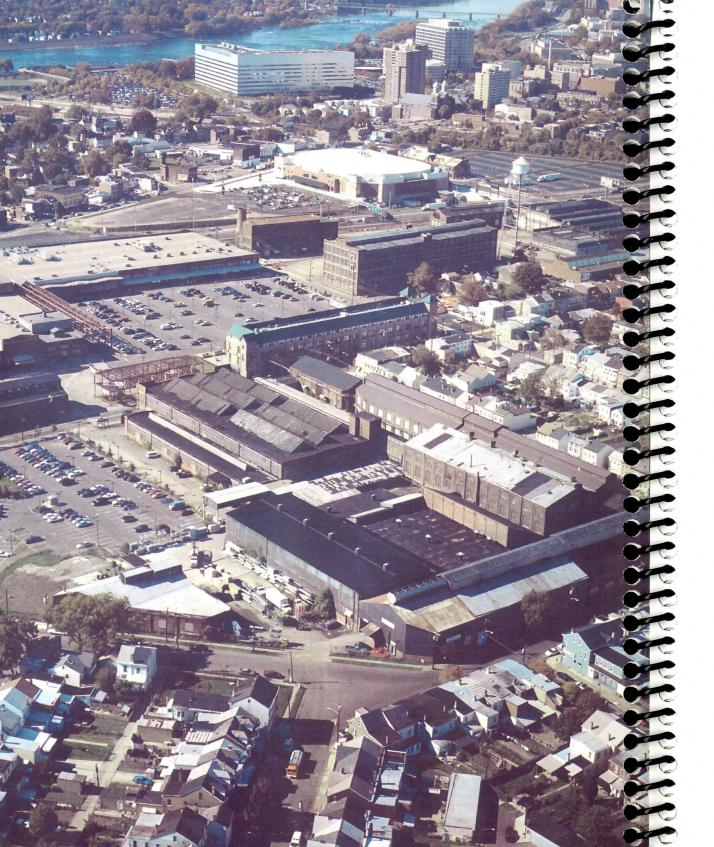


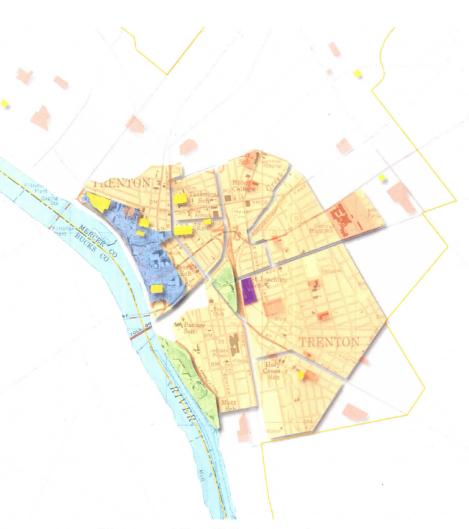
-Existing neighborhoods boundaries within the city. North: predominantly African American South: most diverse, Latin American, Italian, Irish, and African American East: contains the city's main train station and high school West: contains most affluent sections and neighborhoods



Trenton remains a diverse city with a strong organization of residential, business, commercial, education, and government sections. Although the fragmented nature of its form lead to many of the city's problems, its post-industrial identity can be exploited as a catalyst to reconnect not only the local communities but also the city as a whole to the region.

It is critical to Trenton's future to focus on the local community. It is through this scale of action that the potential lies in reestablishing the cities lost identity with in the region. At the scale of the city, sustainability is only obtainable through the building of its own social capital.





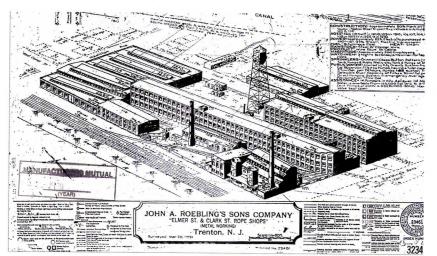
### **South Trenton**

South Trenton holds great potential to be the site for the rebuilding of the city's local community. It contains dense neighborhoods, the youngest and most diverse population, strong infrastructural ties, and is already the focus of current renewal efforts in and around its vacant industrial sections.

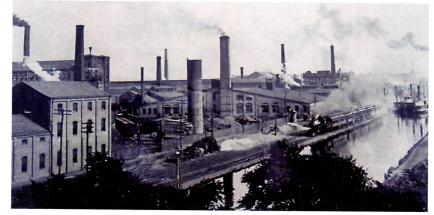
The Roebling Industrial complex is a large mostly vacant site that sits at the intersection of many of these major presences within the area. Although this portion of the city is located on the opposite side of the US RT 1 from the city's major business and Capital districts, its close proximity to them allows for the potential to reconnect with these essential components.



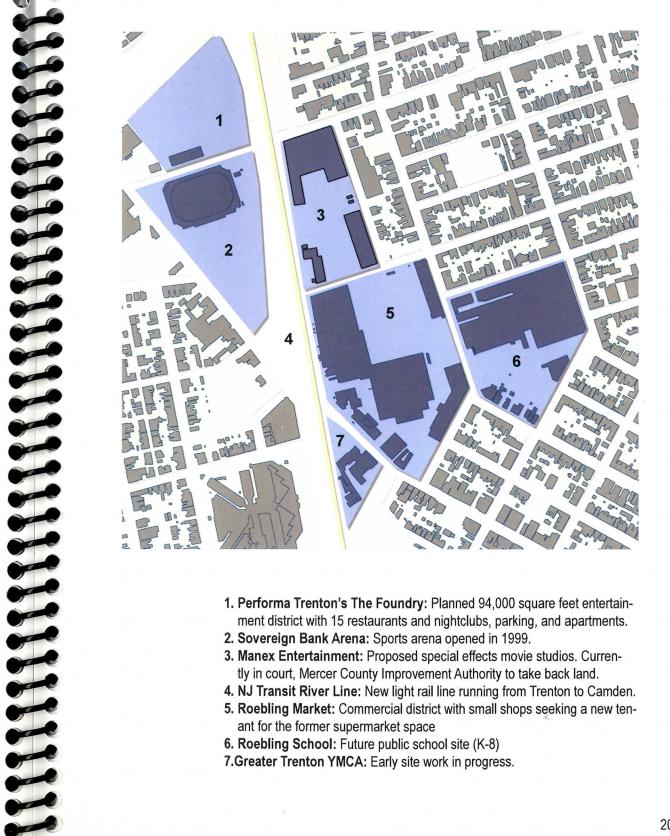
-1924, South Trenton Industrial district



-1931, perspective sketch of the Roebling steel wire and rope shops

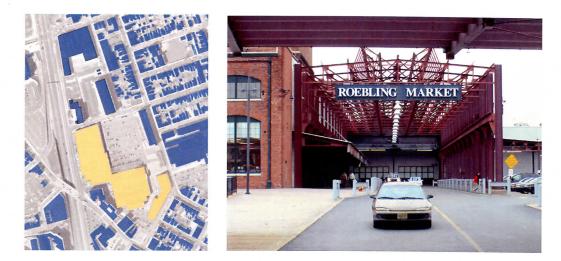


-1908, John A. Roebling's Sons Company steel works



1. Performa Trenton's The Foundry: Planned 94,000 square feet entertainment district with 15 restaurants and nightclubs, parking, and apartments.

- 2. Sovereign Bank Arena: Sports arena opened in 1999.
- 3. Manex Entertainment: Proposed special effects movie studios. Currently in court, Mercer County Improvement Authority to take back land.
- 4. NJ Transit River Line: New light rail line running from Trenton to Camden.
- 5. Roebling Market: Commercial district with small shops seeking a new tenant for the former supermarket space
- 6. Roebling School: Future public school site (K-8)
- 7.Greater Trenton YMCA: Early site work in progress.





-Roebling Market Former Roebling m a n u f a c t u r i n g shops buildings transformed into 202,000 sq. ft., mixed-use retail and office space. The project opened in June of 1996. 

-The design of the markets incorporated the existing building's steel frames and brickwork. Some frames were left exposed highlighting the site's rich history.



John A. Roebling's Sons Company complex was created to produce steel wire rope used in suspension bridges (most notably the Brooklyn Bridge in New York and the Golden Gate Bridge in San Francisco), elevators, and in early commercial aircraft. After almost 50 years of neglect, the Roebling complex has been transformed into a catalyst for Trenton's revitalization and growth. The function of the renewed complex includes an arena, senior housing, museums, shops, offices, a transportation hub, and public education (Clarke).

The Roebling School, designed by Clarke Caton Hintz, will house roughly 1,200 students from Pre-Kindergarten to 8th grade and will inhabit roughly 220,000 SF of renovated and new construction on a 6.5 acre lot. The historically significant structures on the site will be saved and incorporated for the school and the insignificant shed structures will be demolished to create appropriate spaces for courtyards, parking, and playgrounds (Clarke).

The project is currently within the process of site remediation.



-Building #1 Sits on the north end of the site and at the site's only major intersection. It has the largest footprint of the three buildings. Portion of built in 1808 but majority was built in 1930.



-Building #2 Sits on the south east corner of the site. It is the tallest and contains the most floor area of the three buildings. Built in 1917. 

-Building #3 (Proposed Mediatheque) Sits on the south west corner of the site adjacent to the light rail station. Smallest building on the site. Built in 1917.



### **Civic Campus and Mediatheque**

By providing public access to current information through the means of internet, periodicals, books, and audio/visual media, a mediatheque and associated civic campus can become a communal amenity within the neighborhood, city, and even region. Introducing other programmatic pieces of public halls, art galleries to exhibit local work, cafes, and auditoriums, it can further become an asset to a more local community by acting as a form of public infrastructure. The campus provides a space for interaction, and properly sited it has the potential to become a cross-cultural filter. Also, by providing flexible, easily adaptable, unprogrammed space and galleries it can highlight and reinforce the local identity through the exhibition art and culture in a spontaneous and dynamic form.



EXISTING SITE		PROP
Building #1.	75,500 s.f.	(housing
Building #2.	28,500 s.f.	-Basket
Building #3.	12,000 s.f.	8,000 s
subtotal	116,000 s.f.	
Open Space	229,000 s.f.	-Olympi
TOTAL:	345,000 s.f.	
		-Locker
		-r
EXISTING BUILDIN	IGS	-Theate
Building #1.	105,000 s.f.	-Dance
-footprint:	75,500 s.f.	<u>-Admini</u>
Building #2.	<u>115,000 s.f.</u>	-Storage
-footprint:	28,500 s.f.	-Mecha
Building #3.	27,500 s.f.	-Circula
-footprint:	12,000 s.f.	TOTAL

PROPOSED BUILDING	#1.
(housing large scale program	n elements)
-Basketball Courts:	
8,000 s.f. (x3)	24,000 s.f.
-bleachers:	6,000 s.f.
-Olympic pool:	14,000 s.f.
-bleachers:	4,000 s.f.
-Locker Rooms	
-men/women:	6,000 s.f.
-Theater/Auditorium:	12,000 s.f.
-Dance Hall/Club:	8,000 s.f.
-Administration:	3,000 s.f.
-Storage:	4,000 s.f.
-Mechanical:	5,000 s.f.
-Circulation: (15%)	12,000 s.f.
TOTAL:	99,000 s.f.

#### PROPOSED BUILDING #2.

CITIES CONTRACTOR CONT

(housing creative learning studio program elements) -kitchens, textile, metal, ceramic, music, general art, lecture halls, gallery, small café. administration, storage, mechanical, circulation TOTALING: 115,000 s.f.

#### PROPOSED BUILDING #3 - MEDIATHEQUE

(the proposal would include a 65% addition to the existing buildings footprint area)

-Open, unprogrammed space (w/ storage):	5,000 s.f.
-Library: reading space	3,500 s.f.
stacks	6,500 s.f.
-Internet/computer access area:	6,000 s.f.
-Periodical access area: reading space	5,000 s.f.
stacks	3,000 s.f.
-Audio/Visual Library	4,000 s.f.
-Small Theater: (w/ storage & mech.)	4,000 s.f.
-Book Shop:	2,500 s.f.
-Café:	1,500 s.f.
-Administration:	3,000 s.f.
-Bathrooms:	2,000 s.f.
-Storage:	4.000 s.f.
-Mechanical:	2,000 s.f.
-Circulation: (15%)	8,000 s.f.
TOTAL:	60,000 s.f.



#### Precedence

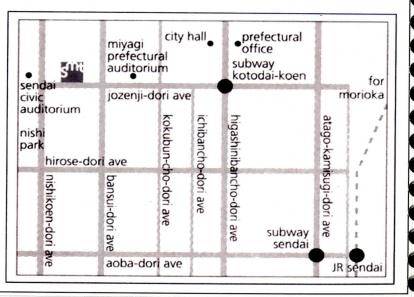
# Sendai Mediatheque

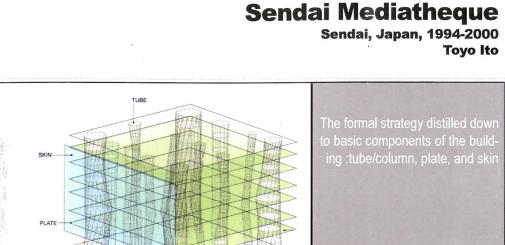
Sendai, Japan, 1994-2000 **Toyo Ito** 213,000 sq. ft.

# Located within a dense urban





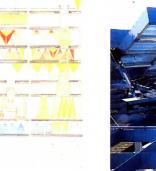




structure is utilized to house the

Each facade of the building has a mechanical demands

roof deliver light deep into the





**Toyo Ito** 

# Sendai Mediatheque

Sendai, Japan, 1994-2000 **Toyo Ito** 

1st & 2nd SUBLEVELS

**GROUND FLOOR** 

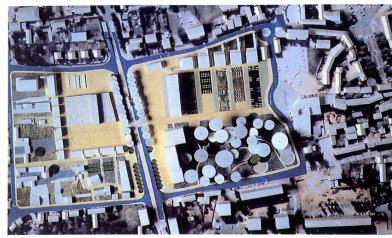
# **Central Mediatheque**

Venissieux, France 1997-2001 **Dominique Perrault** 43,000 sq. ft.

Positioned at the intersection of

multi-purpose shelter open to the

that closes itself off from its



















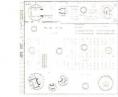


2nd FLOOR:

#### 7th FLOOR:















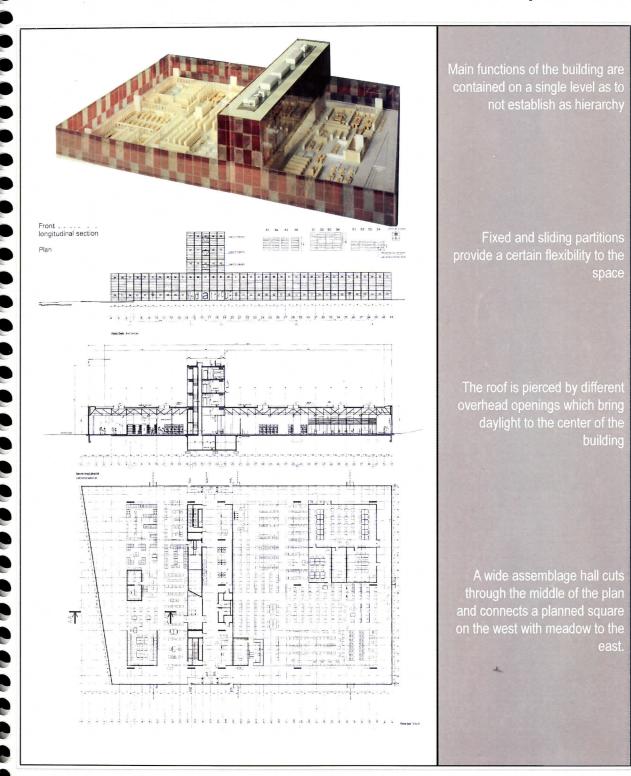
# **Central Mediatheque**

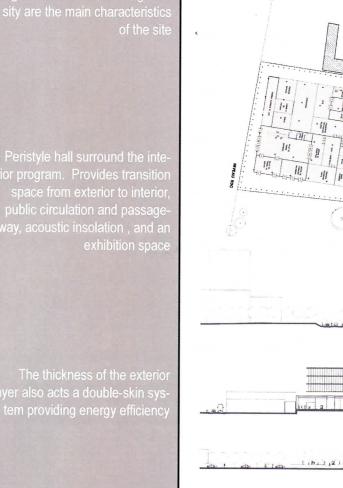
Venissieux, France 1997-2001 **Dominique Perrault** 

Vegetation and low building den-

# **Central Mediatheque**

Venissieux, France 1997-2001 **Dominique Perrault** 





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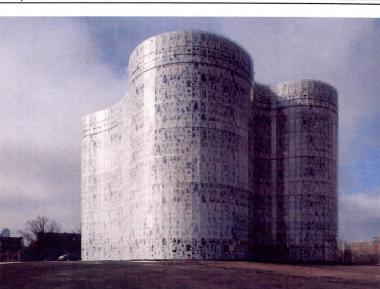
FFF

A wide assemblage hall cuts

through the middle of the plan

# Information, Communications, and Media Center

BTU, Cottbus, Germany, 1994-2004 Herzog and de Meuron 45,000 sq. ft.





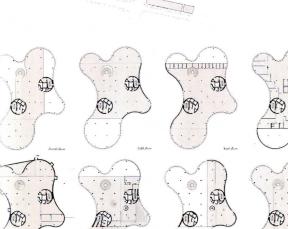


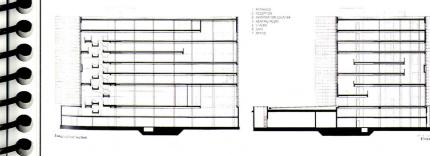












## Information, Communications, and Media Center

Site plan

BTU, Cottbus, Germany, 1994-2004 Herzog and de Meuron

The building stands alone in the

The amoeba-like ground plan is of views to the exterior

at different moments on each level to provide variations in floor

#### Saynatsalo Town Hall Finland 1950

Alvar Aalto

# **Avesta City Centre**

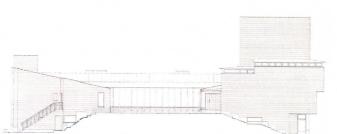
Sweden, 1944 Alvar Aalto

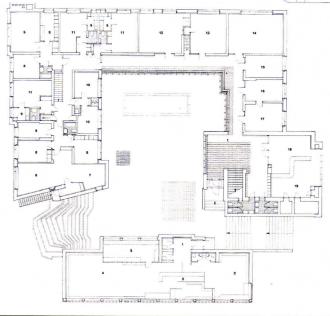
...[Aalto,] determined to create buildings which resonate with the past, place and human needs and aspirations

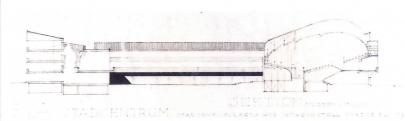
felt that small-scale local government provides an effective forum for the direct, individual, voluntary assumption or responsibility he wished to build upon

Aalto stated that he used the courtyard form as the main motif because "in parliament buildings and courthouses the court has preserved its inherited value from the time of ancient Crete, Greece, and Rome to the medieval and Renaissance periods."

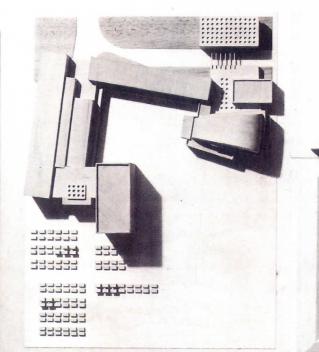












-competition for new local government offices. Comprised of town hall, library, hotel, court house, and a workers' institute.

additional program: hotel, library, theatre, restaurants, central kitchen, cafe, dance hall, administrative and office spaces, shops, archives and exhibition galleries, assembly hall and winter garden

the square was designed to function as open-air theatre, pandstand, or a place for holding meetings

workers' institute housed severa lecture halls and conference rooms for union business, club activities, and leisure pursuits

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