SUPPORTING DOCUMENT 4:
INVENTORY AND ANALYSIS OF
TRANSPORTATION AND MUNICIPAL INFRASTRUCTURE SYSTEMS



City of Jamestown NYS Brownfield Opportunity Area and Local Waterfront Revitalization Program

Inventory & Analysis of Transportation and Municipal Infrastructure Systems

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Inventory & Analysis of
Transportation and Municipal Infrastructure Systems

Greenman-Pedersen, Inc. (GPI) was retained to characterize and analyze the City of Jamestown's transportation and infrastructure networks located within the LWRP study area. The LWRP study area is served by multiple transportation and public infrastructure systems. Transportation systems include vehicular, rail, water and public transportation. The public infrastructure systems include water, stormwater, sanitary sewer, electric, dams, docks, solid waste disposal, district heating/cooling and public parking.

1.0 TRANSPORTATION SYSTEMS

Transportation systems evaluated as part of this study included vehicular, rail, water and public transportation. These systems are described below and depicted on maps where applicable.

1.1 Vehicular Transportation

Early in the history of the City of Jamestown, industries were strategically located along the Chadakoin River where dams, sluices and races could be easily constructed to power their operations. As a result of the geography of the waterfront in which the LWRP is located, the study area is much longer than it is wide. In fact, the corridor is quite narrow from McCrea Point to the eastern terminus of the study area largely due to the steep valley walls, which in turn promoted compact industrial development along the River and on its floodplain.

Single purpose access roads were originally constructed to provide these water powered industries with a means to transport raw materials and finished products. It was inevitable the roadways would become shared facilities as related industrial clusters developed (i.e. sawmills, kilns, milling and planning, furniture manufacturing) both locally and regionally. Logically, the roadways were constructed along the valley walls, where they would be safe from flooding and where road building materials with superior engineering characteristics were readily available. In turn, the roadways provided a means to access the hillsides of the Jamestown area where people built their homes, businesses, churches and schools – all of which were in close proximity to the City's manufacturing base along the River.

Today, the LWRP is served with a well developed network of roadways. There are two primary routes that traverse the LWRP and are generally parallel to Chadakoin River, one is located entirely on the north side of the River, and the other is located almost entirely on the south side of the River. Each of these routes consists of roadway segments with connections to local streets that provide access to the public spaces, residential, commercial and industrial properties that comprise the LWRP. The Vehicular Circulation Systems Map included at the end of this report illustrates the network of roadways within the LWRP.

On the north side of the Chadakoin River, the LWRP can be traversed in an East to West direction by traveling segments of NYS Route 394 (East 2nd Street), East and West 3rd Streets, Fairmount Avenue, West 8th Street, Washington Street and NYS Route 430 (Fluvanna Avenue). Each roadway segment and its NYSDOT functional Classification is identified below.

Street Name	NYSDOT Functional Classification
NYS Route 394 (West 2nd Street)	Principal Arterial
East 3rd Street	Local Street
West 3rd Street	Minor Arterial
Fairmount Avenue	Local Street and Minor Arterial
West 8th Street	Local Street

Washington Street	Minor Arterial
NYS Route 430 (Fluvanna Avenue)	Minor Arterial

On the south side of the Chadakoin River, the LWRP can be traversed by traveling in a West to East direction on Jones and Gifford Avenue, Fairmount Avenue, West 6th Street, Steel Street, Harrison Street and Allen Street. The narrow valley immediately south of McCrea Point is a nexus with respect to both history and the local vehicular transportation network, where the local geography has resulted in the clustering of infrastructure and land development. This southern route through the LWRP briefly crosses the Chadakoin River via the Fairmount Avenue Bridge and back again via the West 3rd Street Bridge to continue back along the south side of the LWRP. The route again crosses the Chadakoin River twice via two bridges on Harrison Street.

Street Name	NYSDOT Functional Classification
Jones and Gifford Avenue	Urban Minor Arterial
Fairmount Avenue	Urban Principal Arterial
West 6th Street	Urban Minor Arterial
Steele Street	Urban Collector
Harrison Street	Urban Minor Arterial and Urban Collector
Allen Street	Urban Collector

There are twelve routes that traverse the LWRP that are generally oriented in a perpendicular manner to the Chadakoin River. By their perpendicular nature, these routes have bridges, both large and small scale that cross the Chadakoin River, railroad and in some cases other roads.

Of these twelve perpendicular routes that traverse the LWRP, three are Urban Principal Arterials or Urban Minor Arterials that carry through traffic over the LWRP.

- Washington Street – The busiest transportation corridor in Chautauqua County that provides linkages to I-86 and I-90 to the north and Pennsylvania to the south, provides an important connection between the northern and southern portions of the City. This highway has the NYSDOT functional classification of Urban Principal Arterial.
- West 6th Street (NYS Route 394) – An important east – west transportation corridor in Jamestown that provides linkages to commercial developments in the Village of Lakewood and the western portion of the City. This highway has the NYSDOT functional classification of Urban Principal Arterial.
- West 3rd Street Bridge. – An important east - west transportation corridor that links the eastern and western portions of the City together. This highway has the NYSDOT functional classification of Urban Minor Arterial.

The bridges and approaches that carry these three routes are large scale, multi span structures that carries through traffic traveling on urban principal and minor arterials over the LWRP, spanning the Chadakoin River, the Railroad and local streets. All three bridges have pedestrian walkways and provide excellent vantage points for viewing the LWRP but offer little in terms of real connectivity with the waterfront. The term "Flyover" is frequently used to describe structures of this nature. The recently reconstructed Washington Street Bridge features a well executed public space and trail connector between Steele Street and the Chadakoin Riverwalk Trail within its footprint; however, the West 3rd Street and West 6th Street Bridges offer little in terms of formal public access or amenities to the LWRP.





A comparison of the footprints of the West 6th Street Bridge (left), West 3rd Street Bridge (center) and the Washington Street Bridge (right).

The remaining nine perpendicular secondary routes provide real access and connectivity between the east/west primary routes that run parallel to the River and the public spaces, residential, commercial and industrial properties that comprise the LWRP. These routes are a mixture of Urban Minor Arterials, Urban Major Collectors and Urban local Streets. The bridges and approaches associated with these routes are smaller in scale and they offer opportunities for pedestrian circulation and formal and informal public waterfront access.

1.1.1 Tiffany Avenue

This route is located on the eastern LWRP Boundary in an area that is zoned M-Manufacturing by the City. This route is classified by the NYSDOT as an Urban Local Street. A large part of this corridor is occupied by important area employer TitanX; however, there is ample parking and room for additional development. The facility where TitanX is located actually spans Tiffany Avenue with an enclosed bridge that connects with the Bush Industries building on the east side of the roadway. There are signalized intersections at East 2nd Street and at Allen Street. Tiffany Avenue is a two lane street with sidewalks along both sides of the street. The roadway features a right hand turn lane at the signalized intersection with Allen Street. Sidewalk ramps for pedestrian crossings are located at West 2nd, Hopkins Avenue, Blackstone Avenue and Allen Street; however, only the West Second Street pedestrian crossing is striped. There is a signalized at grade crossing for the WNY&PA Railroad. Tiffany Avenue crosses the Chadakoin River via a single span, concrete boxbeam structure with concrete abutments. Pavement and sidewalk conditions are generally good and the geometry of the roadway is complementary to the land use along the route.





(Left) Right turn lane at the intersection of Tiffany Avenue and Allen Street. (Center) Tiffany Avenue Bridge. (Right) TitanX facility bridge and at grade WNY&PA crossing.

1.1.2 Hopkins Avenue

This route provides access to areas zoned LM-Light Manufacturing from East 2nd Street to the Chadakoin River and M-Manufacturing from the River to Tiffany Avenue. The western part of the corridor is residential, while the eastern portion is occupied by the Hopes Windows complex and

other manufacturing facilities. It is a two lane roadway with sidewalks along both sides of the roadway, which is classified by the NYSDOT as an Urban Local Street. Nonsignalized intersections are located at East 2nd Street, Flagg Avenue, Bigelow Street, Minske Street and Tiffany Avenue. Although sidewalk ramps are located at the intersections, only the pedestrian crossing at East 2nd Street is striped. Hopkins Avenue is a brick street with an overlay of asphalt applied to the segment between East 2nd Street and the Hopkins Avenue Bridge. Hopkins Avenue crosses the Chadakoin River via a two-span, concrete encased I-beam structure with concrete abutments. The geometry of the roadway is complementary to the land use along the route. Pavement and sidewalk conditions are fair, with some sections of sidewalk in poor condition.



(Left) The Hope's Windows Complex. (Center) Hopkins Avenue north of the River. (Right) Utilities are attached to the Hopkins Avenue Bridge.

1.1.3 Buffalo Street

Buffalo Street is classified as an Urban Collector by the NYSDOT. This route provides access to an area zoned M-Manufacturing, which is largely occupied by the large Dahlstrom Complex. The portion of the complex that fronts on East 2nd Street has been redeveloped; however the complex along east side of Buffalo Street is undergoing demolition. The complex also has a large, unused parking lot on the west side of Buffalo Street. The five-way intersection of Buffalo, East 2nd and Crescent Street is signalized to provide through, left and right turn movements. The skewed intersection of Buffalo and Allen Streets is also signalized and includes right lane slip ramp from Buffalo to Allen. The intersection of Buffalo Street with Blackstone Avenue is nonsignalized. With exception of the channelization at the signalized intersections, the roadway configuration is two-lane with sidewalks along both sides. Pavement and sidewalk conditions are generally good. Buffalo Street crosses the Chadakoin River via a single span, concrete boxbeam structure with concrete abutments. The elevated WNY&PA Railroad corridor transects Buffalo Street, where an overpass structure has been constructed with a vertical limit of 12 feet, which is 1.5 feet less than the NYSDOT limit for legal loads of 13.5 feet; however, trucks taller than the 12 foot vertical limit can access the route from Allen Street or East 2nd Street. With exception of the vertical clearance associated with the overpass which restricts the passage of large trucks, the geometry of the roadway is complementary to the land use along the route.



(Left) Intersection of Buffalo, West 2nd and Crescent Streets. (Center) Buffalo Street Bridge. (Right) WNY&PA overpass.

1.1.4 Chandler Street

Chandler Street provides access to an area that is zoned M-Manufacturing and is classified by the NYSDOT as an Urban Local Street. A large part of this corridor is occupied by important area employers, Webber Knapp and MRC. The single non-industrial structure on this street is the 5th Wheel Bar, directly across from Webber Knapp. There are nonsignalized intersections at Winsor and Allen Streets. Chandler Street is a brick street with an asphalt overlay configured for two lanes with sidewalks along both sides of the street. The intersection with Winsor Street is channelized for a right hand turn lane. Sidewalk ramps for pedestrian crossings are located at Allen, River and Winsor Streets; however, none are striped. The Chandler Street Bridge crosses the Chadakoin River with a two-span, concrete boxbeam bridge. With the exception of its intersection with Winsor, Chandler Street is not striped. Sidewalk and pavement conditions along Chandler Street are generally good and the roadway geometry is complementary to the land use along the route.



(Left) The intersection of Chandler Street and Allen Street. (Center) Chandler Street Bridge and 5th Wheel Bar. (Right) Left turn lane at the nonsignalized intersection of Chandler and Winsor Streets.

1.1.5 Winsor Street

Winsor Street is classified by the NYSDOT as an Urban Minor Arterial and provides access to an area that is zoned C2-Community Shopping and CM-Service and Highway Commercial at East 2nd Street, R2 Double Family Residential north of the railroad overpass, and M-Manufacturing, south of the railroad underpass. The recently Constructed Appleyard Terraces at the intersection of Winsor and East 2nd Streets has improved the residential housing stock of this area. Winsor Street crosses the Chadakoin River with a single span concrete boxbeam bridge. There are signalized intersections at East 2nd, Crescent, and Harrison Streets, while nonsignalized intersections are located at Scott and Chandler Streets. Winsor Street is a two lane street and is channelized to create a left hand turn lanes at the intersections with East 2nd Street and Harrison Street. Sidewalks are constructed along both sides of Winsor Street with sidewalk ramps for pedestrian crossings at all intersections; however, only the West 2nd Street pedestrian crossing is striped. The elevated WNY&PA Railroad corridor has an overpass near the Chandler Street intersection with a 12 foot vertical clearance limit. Pavement and sidewalk conditions are very good along this route, with exception to the limited vertical clearance associated with the Railroad overpass, the roadway geometry is generally complementary to the land use in the area. A foot path has been developed across the vacant properties that link Winsor and Harrison Streets by savvy pedestrians.





(Left) Left turn lane at the intersection of Winsor and East 2nd Streets. (Center) Winsor Street Bridge. (Right) Left turn lane at the Intersection of Winsor and Harrison Streets.

1.1.6 Foote Avenue

This route provides access to areas zoned C2-Community Shopping, R2- Double Family Residential and M-Manufacturing. A single span rolled steel bridge carries Foote Avenue over the Chadakoin River, south of Harrison Street. This corridor is identified by the NYSDOT as an Urban Minor Arterial and is developed with a Church, the High School, The Riverside Industrial Center, and medical facilities. One of which is the Western New York Urology Associates facility that is a redeveloped former brownfield site. Foote Avenue is a two lane street with sidewalks along both sides of the street that descends a steep grade between East 2nd and Harrison Streets. Although the pavement and sidewalks are in good condition, the steep grade is a challenge for senior and handicapped pedestrians. Nonsignalized intersections are located at Chandler, Crane, Briggs and Water Streets and Victoria Avenue and Yorkshire Alley. There are signalized intersections at West 2nd, Harrison and Allen Streets. The roadway is channelized to include right hand turn lanes at the intersections with East 2nd and Harrison Streets, while left hand turn lanes are located at the intersection with Allen Street. Sidewalk ramps for pedestrian crossings are located at all intersections; however, none are striped, with the exception of East 2nd Street intersection. The elevated WNY&PA Railroad corridor crosses over Foote Avenue and the overpass structure has a vertical limit of 11 feet. With the exception of the limited vertical clearance at the Railroad overpass and the steep grade, the roadway configuration as it exists today is generally complementary to the land use in the area. However, if the medical corridor continues to develop in the future, the steep grade could pose accessibility problems for increased pedestrian traffic, especially senior or handicapped pedestrians.





(Left) The intersection of Winsor and East 2nd Streets. (Center) Intersection of Winsor and Harrison Streets. (Right) Intersection of Foote Avenue and Allen Street.

1.1.7 Institute Street

Institute Street is designated as a Urban Local Street by the NYSDOT and it serves areas that are zoned M-Manufacturing on the east side of the street and C4-Central Retail on the west side of the street. The corridor is occupied by a furniture manufacturing facility and the St. James Church and

thrift store and several other commercial buildings. Institute Street crosses the Chadakioin River via a precast concrete boxbeam bridge. Institute Street is a brick street with an asphalt pavement overlay and has intersections with the NYS Route 60 Arterial, Victoria Avenue, Briggs Street, Yorkshire Alley and Harrison Street, none of which are signalized. The roadway is two lane with sidewalks along both sides, with the exception of the segment north of Harrison Street that only has a sidewalk on the west side of the street. An abandoned/closed pedestrian tunnel exists where Institute Street intersects the elevated WNY&PA Railroad corridor. The pavement and sidewalks are in fair condition and the roadway geometry is generally complementary to the land use in the area.



(Left) Intersection of Institute and Victoria Streets. (Center) Institute Street Bridge. (Right) Intersection of Institute and Harrison Streets.

1.1.8 North and South Main Street

This corridor designated by the NYSDOT as an Urban Minor Arterial and is zoned C3-Central Business and C4-Central Retail with a Historic Preservation overlay north of the overpass for the elevated WNY&PA Railroad corridor. The streetscape north of the railroad is dominated by century-old multistory masonry buildings with storefronts at street level. North and South Main Street have perpendicular signalized intersections at Harrison, East/West 2nd, East/West 3rd, and East/West 4th Streets, while the intersection with East/West 1st Streets is offset and nonsignalized. Sidewalk ramps for pedestrian crossings are located at all intersections, and with the exception of the 1st Street intersection, all of the crossings are striped. Main Street is wide enough to accommodate three lanes, parallel parking and sidewalks on each side of the street. From 4th Street to 1st Street, North Main Street is configured with two northbound lanes and one southbound lane. From 1st Street to the skewed intersection with Harrison and Steele Streets, South Main Street is two-lane with left turn, straight and right turn channelization in the southbound lane at the Harrison and Steele Street intersection. Left turn or right turn channelization of the northbound lane occurs at the 2nd, 3rd and 4th Street intersections. North Main Street descends a steep grade between East/West 4th and the railroad. Although the pavement and sidewalks are in good condition, the steep grade can be a challenge for senior and handicapped pedestrians. The elevated WNY&PA Railroad corridor transects Main Street with an overpass structure that has a 12 foot vertical clearance limit. This vertical clearance limit is the primary reason that Main Street has been supplanted by Washington Street, which has no vertical clearance limitations, as the Urban Principal Arterial though the City. Immediately south of the Railroad overpass, the attractive South Main Street Bridge carries the roadway over the Chadakoin River. The South Main Street Bridge is a dual arch structure with cut stone facing that is in character with the Main Street corridor.





(Left) Left/straight/right turn channelization at the intersection of Harrison and Steele Streets. (Center) WNY&PA underpass. (Right) Right turn lane at the Intersection of Main and East 2nd Street.

1.1.9 Sprague Street

Sprague Street has been designated by the NYSDOT as a Urban Minor Arterial, which serves an area that is zoned LM-Light Manufacturing. Sprague Street is an important connector with the Samuel A. Carlson Electrical Generation Plant, the waterfront, and strategically important to the redevelopment of the vacant railroad properties that are located along the north side of the River. Sprague Street is also an important utility corridor and the location of the unused, but historic Sprague Street truss railroad bridge. Sprague Street has a signalized intersection at Steele Street and a nonsignalized intersection with Jefferson Street. Sprague Street is a two-lane street with a sidewalk along the south side. Sidewalk ramps are located at the intersections but are not striped. The Sprague Street Bridge is currently being replaced with a new structure and the road is temporarily closed to traffic. There are twin WNY&PA Railroad overpasses that have an 11 foot vertical clearance.





(Left) Two-lane configuration of Sprague Street. (Center) WNY&PA twin underpasses. (Right) Intersection of Sprague and Steele Streets.

1.2 Bridges and Bridge Abutments

1.2.1 Fairmount Avenue Bridge

The Fairmount Avenue Bridge is a dual arch filled concrete spandrel structure. This attractive gateway feature marks the southern limit at which power boats are practical on the Chadakoin River. McCrea Point adjoins the north side of the Fairmount Avenue Bridge. With this type of bridge, the arches are also the abutments and are in direct contact with the River. The riverbanks in the vicinity of the Fairmount Avenue Bridge and McCrea Point are armored with a variety of materials including sheet pile walls and riprap.



(Left) A view of McCrea Point from the Fairmount Avenue Bridge. (Center) Fairmount Avenue Bridge. (Right) Sheet pile wall south of the Fairmount Avenue Bridge.

1.2.2 West 6th Street (NYS Route 394) and WNY&PA Railroad Bridge

NYS Route 394 is an important east – west transportation corridor in City that provides linkages to commercial developments in the Village of Lakewood. This Bridge also carries NYS Bicycle Route 17 over the Chadakoin River. This multi-span steel girder bridge has concrete abutments and piers, none of which are in contact with the River. This Bridge is essentially a "flyover" with little to offer in terms of formal access with the waterfront, with exception of a good view of the River from the walkway that runs along the eastbound lane. Within the footprint of the West 6th Street Bridge is the WNY&P Railroad Bridge. This structure is a two-span plate girder bridge that formerly carried two sets of tracks, but now carries only one active track. The structure has concrete abutments and one pier that is located in the Chadakoin River. Together, these two structures create an informal sheltered area along the waterfront that is a popular fishing spot. There are three informal footpaths that provide access to this location; from Fairmount Avenue along the east side of the River and Old Trolley Building (a Vacant and Underutilized Site), from Fairmount Avenue along the west side of the River, and from Steele Street along a footpath that begins at a small parking area near the southwestern bridge abutment.



Looking west under the West 6th Street Bridge. (left), WNY&PA Railroad Bridge pier and fishing spot. (center) Aerial view of the West 6th Street and WYN&PA Railroad Bridges. (right).

1.2.3 West 3rd Street Bridge

An important east - west transportation corridor that links the eastern and western portions of the City together. It spans the Chadakoin River, the WYN&P Railroad and Sprague Street. The West 3rd Street Bridge is a multi-span steel girder structure that has concrete abutments and piers, none of which are in contact with the River. Like the West 6th Street Bridge, this structure is a "flyover" with without formal access with the waterfront, with exception of a good view of the River from the walkway that runs along the eastbound lane. There is a small gravel parking area and green area located along Sprague Street that offers shade and a nice view of the River.





A view of the River from under the West 3rd Street Bridge (left), Footprint of the West 3rd Street Bridge (center) Aerial view of the West 3rd Street Bridge (right).

1.2.4 Sprague Street Bridge

The former two span Sprague Street Bridge has been demolished and the replacement is a single span, concrete boxbeam bridge with concrete abutments. Construction is scheduled for completion in the fall of 2012. West of the Sprague Street Bridge, the Chadakoin River banks are unarmored, with exception of riprap installed in connection with a sewer line that is installed under the River. East of the Bridge, the river banks are armored with concrete and sheet pile retaining walls and riprap. Several stormwater discharges are located along this reach of the River. A historical marker placed at this location commemorates James Pendergast and his construction of the first dam and sawmill on the Chadakoin River in 1811.





(Left) The former Sprague Street Bridge. (Center) Construction of the abutments for new Sprague Street Bridge (Right) Historic through truss railroad bridge and pipe bridge structures associated with the BPU Electrical Generating Plant.

1.2.5 Sprague Street Railroad Bridge and BPU Pipe Bridges

There are several structures that span the Chadakoin River in the vicinity of Sprague Street. Each is somewhat unusual and industrial in nature. The Sprague Street Railroad Bridge is an unused through truss bridge with a pronounced skew. The iron bridge once provided rail service to a cluster of industries along the south side of the River between Sprague and South Main Streets, but has been abandoned for over 50 years. There has been discussion regarding demolishing the structure and even repurposing the structure as a pedestrian bridge; however, it is of interest to the New York State Historic Preservation Office and would be very costly to move and rehabilitate. Its very existence is problematic to the BPU as a security concern and to the City as a public safety concern. There are also two pipe bridges that carry utilities from the BPU Electrical Generation facility to the north side of the River in this area. The first carries a 6-inch high pressure natural gas line, which supplies the BPU's 43 megawatt natural gas fired cogeneration facility that was constructed in 2012. The second pipe bridge carries superheated hot water feed and return lines across the river to serve the BPU's district heat network. This bridge also carries unused cement-asbestos (Transite) conduits that formerly housed electrical primaries. These unused conduits are also hung along the concrete wall that armors the north side of the River in this location.



(Left) Sprague Street Railroad Bridge. (Center) Pipe Bridge carrying natural gas line. (Right) Pipe bridge carrying district heat and unused electrical conduits.

1.2.6 Panzarella Park Bridge

The City of Jamestown owns and maintains Panzarella Park, a small island park that is located in the Chadakoin River just to the north of the BPU Electrical Generating Station. Panzarella Park is connected to the south shore of the Chadakoin River and the Chadakoin Riverwalk Trail by a single span wood deck pedestrian bridge.



A view of the pedestrian bridge that links Panzarella Park to the Chadakoin Riverwalk Trail.

1.2.7 Washington Street Bridge

The recently replaced Washington Street Bridge carries NYS Route 60 over the Chadakoin River, WNY&PA Railroad and Steele Street. NYS Route 60 is the busiest transportation corridor in Chautauqua County and it provides important linkages to I-86 and I-90 to the north and Pennsylvania to the south, as wells as an important connection between the northern and southern portions of the City. The Washington Street Bridge is an attractive multi-span steel girder structure with concrete abutments and piers, none of which are in contact with the River. Like the West 6th and West 3rd Street Bridges, this structure is essentially a flyover; however, there is a right turn slip ramp that provide a connection with Steel Street, and most importantly, the new Bridge features a

well executed pedestrian walkway that links Steel Street with the Chadakoin Riverwalk Trail. The Bridge also provides a excellent view of the River corridor for pedestrians traveling on the walkway that runs along the southbound lane.



Footprint of the Washington Street Bridge (Left), View of the Washington Street Bridge from the Warner Dam. (Center) Aerial view of the Washington Street Bridge (Right).

1.2.8 South Main Street Bridge

The South Main Street Bridge is a dual stone arch structure. This attractive bridge provides significant aesthetic value to the historic Brooklyn Square area and the Chadakoin Riverwalk Trail. West of the North Main Street Bridge, the Chadakoin River is obstructed by the Warner Dam. The Dam represents the practical limit for recreational (non-powered) watercraft on the reach of the River between the Dam and McCrea Point. Downstream of the Dam, shallow water and low head dams present challenges to the safety of recreational watercraft and their occupants. The plunge pool below the dam is a popular fishing spot, but access is prohibited on the north side of the River by the property owner. Access to the waterfront will be facilitated in this location when the Chadakoin River Trail is extended. This reach of the River is armored with armor consisting of sheet pile and concrete walls and riprap. Several stormwater discharges are located along this reach of the River.



(Left) Warner Dam gates. (Center) North Main Street Bridge (Right) River bank channelization east of North Main Street Bridge.

1.2.9 Harrison Street Bridge near Institute Street

Institute Street and the Chadakoin River trail borders the west and east riverbanks of the Chadakoin River to the north of the Harrison Street Bridge. There are large concrete blocks that partially armor the banks along both sides of the River in this location. The Harrison Street Bridge near Institute Street is a single span, precast concrete box structure with concrete abutments that are in direct contact with the River. On the southern side of the Harrison Street Bridge, concrete retaining walls and building foundations armor the east side of the River, while the western riverbank is unarmored until it reached the concrete retaining wall along Victoria Avenue. There are two insulated pipes hung from the north side of the Bridge that are a part of the BPU District Heating system. A stormwater discharge from the north side Harrison Street is located off of the

northwest and northeast bridge abutments. Public access to the waterfront on the north side of the Bridge is very good at this location due to the Chadakoin Riverwalk Trail; however, the trail ends at Harrison Street.





(Left) North of the Harrison Street Bridge. (Center) BPU District Heat piping hung on the north side of the Harrison Street Bridge. (Right) Concrete retaining walls and building foundations armor the riverbanks south of the Harrison Street Bridge.

1.2.10 Institute Street Bridge

The Institute Street Bridge is a single-span precast concrete boxbeam structure that is located at the apex of a near 180 degree bend in the Chadakoin River. The southern bank (outside of the bend) of the River is armored with concrete walls, riprap and sheet piling in this location. Victoria Avenue also follows this bend, where a small mowed greenspace is located along the sheet pile wall. Although this greenspace is not a designated public space, it could certainly benefit from the installation of a railing along the sheet pile wall. A large stormwater outlet is also located near the southern bridge abutment.





(Left) Concrete retaining wall west of the Institute Street Bridge. (Center) Sheet pile retaining wall and stormwater discharge east of the Institute Bridge. (Right) A view of the Institute Street Bridge from above Victoria Avenue.

1.2.11 Foote Avenue Bridge

The Foote Avenue Bridge is a single span rolled steel structure that carries Foote Avenue over the Chadakoin River. The Bridge sits on concrete abutments, both of which are in direct contact with the River. A wastewater pumpstation is located just south of the Bridge and water, wastewater and district heat utility lines are hung on the side of the Bridge. To the west of the Bridge, the Chadakoin River banks are armored with sheet pile and concrete walls. Concrete foundation walls for the Riverside Industrial Center and old piers related to the redeveloped Urology Center armor the riverbanks to the east of the Bridge. Nonetheless, people working in the Riverside Industrial Center can enjoy the waterfront from a small ornamental garden that is located along the building. A large stormwater discharge is located at the northwest abutment of the Bridge.





(Left) Sheet pile armor on the south river bank. (Center) Ornamental garden at the Foote Avenue Bridge. (Right) Concrete foundation wall on the north river bank.

1.2.12 Harrison Street Bridge near Winsor Street

The Harrison Street Bridge near Winsor Street is a single span, precast concrete box structure with concrete abutments. The Chadakoin River banks are unarmored north of the Harrison Street Bridge; however, a concrete foundation wall associated with the dilapidated building armors the southern bank of the River for a short distance. Informal access to the waterfront for fishing is gained by a footpath that runs between Harrison and Winsor Streets and the dam/plunge pool located downstream of this location. A stormwater outlet was visible off of the southwest Bridge abutment.





(Left) Unarmored river bank north of the Harrison Street Bridge. (Center) Harrison Street Bridge. (Right) Concrete foundation walls and riprap south of the Harrison Street Bridge.

1.2.13 Winsor Street Bridge

The Winsor Street Bridge is a single span concrete boxbeam structure with concrete abutments. West of the Bridge, the Chadakoin River passes through a dam and tailrace structure that once provided hydropower for a manufacturing facility located along Winsor Street. A historical marker at this site notes that the presence of the former facility dated back to 1835. Since the facility has been demolished, a foot path has developed that links Winsor Street, Harrison Street and the dam, which is a popular fishing spot. Informal access to the waterfront already exists via the foot path; logically, formal public access could be facilitated in this location relatively easily. With the exception of the dam, bridge abutments and adjoining sheet pile walls immediately downstream of the Bridge, the riverbanks are unarmored along this reach of the River. A large stormwater discharge is located at the bridge.





(Left) Stormwater discharge at Winsor Street Bridge. (Center) Dam and tailrace structure (Right) Winsor Street Bridge.

1.2.14 Chandler Street Bridge and Webber Knapp Pedestrian Bridge

The Chandler Street Bridge spans the Chadakoin River via a two-span, concrete boxbeam structure with concrete abutments. Both abutments are in direct contact with the River. Water and wastewater utility lines are hung on the sides of the Bridge. Upstream of the Bridge the south bank of Chadakoin River is armored by a hand laid stone wall, while the north bank is unarmored. Downstream of the Chandler Street Bridge, both riverbanks are armored by the concrete foundations and retaining walls of the Webber Knapp facility. The south riverbank is also armored with riprap as it passes the Heavy Press facility along Allen Street. The Webber Knap facility has an enclosed pedestrian bridge between its facility buildings that spans the River in this location. Public access to the waterfront is generally limited in this location by chain link fences that surround the Webber Knapp facility buildings and parking areas; however, access to the south side of waterfront is provided for Webber Knap employees by a shaded picnic area located along a parking lot.





(Left) Aerial view of the Chandler Street Bridge and Webber Knap pedestrian bridge. (Center) Utility line hung in the north side of the Chandler Street Bridge. (Right) Enclosed pedestrian bridge and channelization of the River at the Webber Knap facility.

1.2.15 Dawson Metals Bridge

There is a privately owned bridge off of Allen Street that provides access to the Dawson Metals manufacturing facility. This bridge provides vehicular access to one of Jamestown's larger employers; however, fire and emergency services providers are restricted from crossing the structure due to load bearing capacity. Emergency access is through a gated access road off of River Street.



The privately owned bridge from Allen Street to the Dawson Metals facility.

1.2.16 WNY&PA Railroad Bridge Near Buffalo Street

The WNY&PA Railroad Bridge near Buffalo Street is a single span, steel plate girder structure with cut stone abutments. Both of the abutments are in direct contact with the River. The bridge formerly carried two separate sets of tracks; however, today only one track is used. South of the Buffalo Street Railroad Bridge, the Chadakoin River passes over a wastewater utility crossing that forms a low-head dam. The plunge pool/riffle below this structure is a popular fishing spot that is accessed by footpaths from Buffalo and Allen Streets.



(Left) Stormwater discharge at low-head dam and plunge pool. (Center) Buffalo Street Railroad Bridge. (Right). Inactive track on the Buffalo Street Railroad Bridge.

1.2.17 Buffalo Street Bridge and Dahlstrom Complex

The Buffalo Street Bridge is a single span, concrete boxbeam structure with concrete abutments. Both of the abutments are in direct contact with the River. South of the Buffalo Street Bridge, the Chadakoin River passes over a wastewater utility crossing that forms a low-head dam before flowing under the WNY&PA Railroad Bridge and the Buffalo Street Bridge. The plunge pool/riffle below this structure is a popular fishing spot that is accessed by footpaths from Buffalo and Allen Streets. North of Buffalo Street, the River is completely channelized as it passes through the dilapidated Dahlstrom complex. This complex spans the River and in danger of collapsing into it. The Dahlstrom complex also has an enclosed pedestrian walkway and a privately owned single

span steel bridge that also spans the River. Utility lines are hung from the Buffalo Street Bridge. Two large stormwater outlets are located in this area.



(Left) Privately owned bridge at the Dahlstrom complex. (Center) Buffalo Street Bridge. (Right) Channelization of the River as it passes under the deteriorated Dahlstrom complex.

1.2.18 Hopkins Avenue Bridge

The Hopkins Avenue Bridge spans the Chadakoin River via a two-span, concrete encased I-beam structure with a concrete pier and abutments. The abutments and the pier are in direct contact with the River. The Chadakoin River banks are unarmored east of the Hopkins Avenue Bridge; however, a concrete foundation wall associated with the Hope's Windows complex armors the southern bank of the River, west of the Bridge. Informal access to the waterfront for fishing is gained by a footpath located behind the Hope's Windows Complex. There is a wastewater pumpstation located along the west side of Hopkins Avenue, north of the Bridge. Water and sewer forcemain lines are hung from the Bridge. A stormwater outlet was visible off of the southeast Bridge abutment.



(Left) Concrete foundation wall on southern river bank. (Center) Utilities hung on the Hopkins Avenue Bridge. (Right) Stormwater discharge at southeast abutment of the Hopkins Avenue Bridge.

1.2.19 Tiffany Avenue Bridge

The Tiffany Avenue Bridge is a single span, concrete boxbeam structure with concrete abutments. The Chadakoin River banks are unarmored east and west of the Tiffany Avenue Bridge. Access to the waterfront could be facilitated in this location by clearing the brush around an existing set of concrete steps located at the northeast abutment of the Bridge. People have a tendency to gravitate towards water, and this is evidenced by the residents of the Bullfrog Hotel, who have created a patio out of repurposed materials on the north bank of the River.





(Left) Unarmored river banks west of Tiffany Avenue. (Center) Aerial view of the Tiffany Avenue Bridge. (Right) Concrete Steps to the river at the north-east abutment of the Tiffany Avenue Bridge.

1.3 Railroad Transportation

Traversing through the City of Jamestown in an east – west direction is what is historically known as the Erie Railroad. Jamestown railroad's earliest beginnings go back to the mid-1800's and for the next 100 years, railroads served as a main transportation provider for both the public and for goods and services. As a result, the regional economy was centered on the railroads.

Records and maps show numerous areas within the City where single or multiple sidings were constructed to serve business. One particular area where numerous track sidings were found, and in some instances still are, is within the East End Industrial Area along River Street. Several of the buildings that still remain along River Street were constructed with loading docks or such that railroad cars could be brought inside for loading and unloading. The River Street area still offers the potential of rail service. Within the McCrea Point Opportunity Zone, rail sidings were also found along the rear of business fronting Jones and Gifford Avenue. This area also offers the potential for rail service.

Other areas that railroad sidings or rail yards were found were in the Downtown Riverfront Opportunity Zone, immediately west of Brooklyn Square, located at the ends of Cherry Street, Washington Street and Lafayette Street just north of the Chadakoin River; however these areas have been redeveloped for other purposes. Another former rail yard was located immediately west of Sprague Street along the north side of the Chadakoin River. Although this general area remains largely undeveloped, it is underutilized and is over grown with brush.

Other key railroad infrastructure of interest is associated with the former Jamestown, Westfield & Northwestern R.R. Co. Railroad sidings and property for this privately owned company could be found as far east as the Harrison Street, Barrett Avenue, and Steele Street intersection. An iron through-truss railroad bridge which still exists today near Sprague Street spanned the Chadakoin River to allow for access to many of the business that once fronted Steele Street. The J.W. & N.W. Railroad also served many businesses within the McCrea Point Opportunity Zone along West Eight Street and Outlet Street. Today the bed for this former railroad is the location for the proposed Chadakoin Park Bike Path.

In the late 1920's the Erie Railroad Company elevated the railroad through the City to eliminate several at grade crossings within the City's core. From east to west Buffalo Street, Winsor Street, Foote Avenue, Main Street and Second Street were the street intersections altered by this very large improvement project. One can just imagine the higher level of safety and convenience it brought to the City's core not waiting for a train to clear a street's path. One result of the elevation of the main railroad line was that the rail yard at the ends of Cherry, Washington and Lafayette Streets were eliminated. The Erie Railroad was a major player across the southern half of New York State and into Pennsylvania, bringing the travelling public and bulk materials to

Jamestown. Another benefit related to the new elevated railroad was the 1931 construction of the present and recently rehabilitated Jamestown Railroad Station located on West Second Street.

Today the railroad property through the City of Jamestown is owned by the Norfolk Southern Railroad Company, its current leaseholder is the Western New York & Pennsylvania Railroad, LLC. The WNY&P main line extends from Hornell, New York westerly and southerly to Meadville, Pennsylvania. The WNY&P is always looking for new customers and is willing to work with business along the present route to expand their involvement in the community. Presently the current system is limited to freight with no immediate plans for passenger service. The WNY&P typically moves between one and sometimes two trains per day through the City.

1.4 Navigation Channels

1.4.1 Above McCrea Point

The Chadakoin River channel or Chautauqua Lake Outlet between Chautauqua Lake and McCrea Point is navigable for most of the watercraft used in Chautauqua Lake today. Although aquatic vegetation can snarl propellers and plug cooling water intakes, all but the largest powerboats and deep keeled sailboats on the Lake can navigate this reach of the River. From a historical perspective, this reach of River was heavily traveled by the steamboats that once carried tourists and goods from McCrea Point to the numerous destinations along the Lake. Although the steamboats were commonly shallow draft vessels, they were driven by sternwheels and sidewheels that kicked up sediments and chopped aquatic vegetation as the steamboats churned their way up and down the River. Turbidity and downstream migration of fine and suspended sediments was probably a very common condition along this reach of the River. Development is sparse in this portion of the study area, with a only a few residential structures along Clifton Avenue. Today a 5 mile per hour no wake zone is enforced along this reach of the River in an effort to preserve the sensitive riverine wetland environment. It is an outstanding natural resource that is enjoyed by thousands of people annually.





(Left) The Chadakoin River Channel as it enters the LWRP at Clifton Avenue. (Center) The sidewheel driven Colonel. Phillips on Chautauqua Lake, circa 1875. (Right) The River channel at McCrea Point.

1.4.2 McCrea Point to the Warner Dam

The Chadakoin River channel between McCrea Point and the Warner Dam is generally navigable for small powerboats and manpowered recreational watercraft such as canoes and kayaks. The dual arch filled concrete spandrel Fairmount Avenue Bridge is the gateway to this reach of the River. During the Stakeholder interviews it was noted that boating conditions on this reach of the River are strongly influenced by the operation of the Warner Dam. When the Dam is closed or releasing the NYSDEC required minimum 60 cubic feet per minute of water downstream, the current is slow and the water elevation is stable; however, when the Dam gates are open and releasing greater quantities of water, the current is swift and the elevation of the water quickly

falls. This condition has the potential to strand boaters and create unforeseen hazards. Because this relatively narrow waterway is the sole conduit for the runoff from the 160 square mile Chautauqua Lake Watershed, flow can increase significantly during prolonged periods of wet weather. The Warner Dam is a barrier that prohibits any watercraft from passing beyond this reach of the River. Development is sparse along this reach of the River. The Trolley Building from the list of Vacant and Underutilized Sites is located on the north side of the River just below McCrea Point and several commercial and residential structures along the south bank of the River that front on Steele Street. The BPU Electrical Generation is also located along this reach of the River.





(Left) The Chadakoin River Channel south of McCrea Point. (Center) The River channel south of the West 3rd Street Bridge. (Right) The River channel above the Warner Dam.

1.4.3 Below the Warner Dam

Below the Warner Dam, the Chadakoin River channel meanders through reticulated bends, under bridges and factories and over low head dams. Some sections of the River are completely channelized, while other sections, primarily along the outside of the river bends are armored with concrete walls, sheet pile walls and riprap. Many sections of the River have lost connection with the floodplain, nonetheless, there are numerous series of pools and riffles and plunge pools where the river passes over low head dams that make good aquatic habitat. There are numerous opportunities for informal access to the waterfront via footpaths that have been developed by urban anglers seeking bass, pickerel, carp and other common species. Much of the River corridor has a well-developed tree canopy that helps to moderate water temperatures. This reach of the River is heavily developed with industrial, commercial and residential structures. Most of this development occurred well before the Clean Water Act and the structures that are located in, on and over the River were built before current environmental and historic preservation regulations were enacted.





(Left) Plunge pool below the Warner Dam. (Center) The River channel above the South Main Street Bridge. (Right) The River channel along the Chadakoin River Trail at Brooklyn Square, where it once passed under the former Art Metal furniture manufacturing complex.

1.5 Pedestrian/Bicycle Transportation

The *Jamestown Riverfront Reclamation and Development Study, Addendum #1, 1991* promoted the concept of a continuous Riverwalk and bicycle trail from Falconer to Celoron as a key component of the strategy to revitalize Jamestown's waterfront. This Study encompasses the study area of the LWRP and beyond to the Village of Falconer. The development of a continuous trail was identified as a long-term goal, but the Study recognized that such a trail cannot, nor should be located on the riverbank in all areas. The Study divided the waterfront area in to five discrete areas, each of which had proposed walking and bicycling trail alignments identified. The only trail segment that had been completed within the LWRP at the time the Study was published, was a section of the Chadakoin Riverwalk Trail that ran along the south bank of the Chadakoin River from North Main Street to the front side of the then Hills Department Store, which now the Riverside Medical Center.

That portion of the trail was constructed in the late 1970's and was then reconstructed, improved and extended to Harrison Street in 2006. This paved trail follows the waterfront in the Brooklyn Square area, what was once a heavily industrialized area of the City of Jamestown. For nearly 100 years, the River was channelized and ran underneath a sprawling manufacturing complex in this location. The old factory buildings were demolished in connection with the Urban Renewal program in the 1970s. Today, this pleasant meandering trail is adjacent to the Riverside Medical Center and is lined with trees, has access locations to the River to toss a fishing line and several picnic areas. It provides an interesting and in places nostalgic view of concrete and brick walls built to support former factory buildings and the elevated railroad corridor. In and along these walls are openings for the mill races of yesteryear. Also visible from this trail are the chimney stack and remaining buildings of the Brodhead Worsted Mills wool mill that in the early 1900's, encompassed most of all the property located between North Main Street, East First Street, Institute Street and the Railroad Property. At the Main Street end of the trail you will find the Keelboat statute and historical marker, which is a tribute to those earliest travelers and traders who used the River for transportation and commerce. At this location you will find a quaint shaded pocket park paved with brick street pavers and lined trees, shrubs and sitting areas. You will also find the North Main Street Bridge a stone faced duel arched structure straddling the River. And providing a bit of ambience to this area is the rippling of the water and the waterfowl that can be found there year round.



(Left) Keelboat statue in pocket park off of Main Street. (Center) Looking east along Trail. (Right) Looking west along the Trail toward Main Street Bridge.

A possible extension of the Riverwalk from Harrison Street would be along an undeveloped section of Institute Street, a portion of Victoria Street, and through privately owned property. It is here where continuing the trail would be very difficult for numerous reasons, some being building walls actually being the edge of the river channel, challenging and obstructive terrain and the difficulty to maintain a safe environment. The *Jamestown Riverfront Reclamation and Development Study, Addendum #1, 1991* discusses the potential development of a "Riverpark" along the west side of Institute Street as a potential extension of the trail system as it progressed eastward. This Addendum also discusses extending the trail north of Harrison Street, along the

west side of Institute Street through a reconstructed viaduct under the railroad to provide a linkage with the Jamestown High school.





(Left) Looking south across Harrison Street toward Victoria Avenue. (Center) Aerial view of the Victoria Avenue area. (Right) Looking east along Victoria Avenue near intersection with Institute Street.

The Chadakoin Riverwalk Trail continues along the south bank of the River from South Main Street to Panzarella Park, a distance of about 1,300 feet. A segment of this section was constructed up to the Washington Street Bridge in 2007. The remainder of the trail was completed in 2011. It is well illuminated and has benches, tables and trash receptacles. Below the Warner Dam, the Trail passes behind Friendly's Restaurant, the Jamestown Cycle Shop and other businesses.






(Left) Environmental Protection Fund marker. (Center) Looking east at Friendly's Restaurant. (Right) Looking west along the Trail toward the Washington Street Bridge.

Above the Warner Dam, the trail provides important linkages to the public space or promenade located below the Washington Street Bridge and the park at Panzarella Point. Further amenities include a small amphitheater lighting, benches and tables. This portion of the Trail was funded with money from the New York State Environmental Protection Fund and with matching funds from the City of Jamestown. The *Jamestown Riverfront Reclamation and Development Study, Addendum #1, 1991* identified the need for a trail segment in the vicinity of Washington Street that would connect with Barrett Avenue, thereby providing neighborhoods located in the southern part of the City with access to the trail system. The promenade at the Washington Street Bridge is a key component for providing this linkage.





(Left) Looking west along the Trail. (Center) Looking south at the Promenade under the Washington Street Bridge toward Barrett Avenue. (Right) A sign commemorates Marion A. Panzarella and the Park in his honor.

Presently Panzarella Park is the terminus of the Riverwalk trail along the south bank of the River. Challenges and obstacles do exist in attempting to extend the trail further west along the south banks of the River to McCrea Point. The Jamestown Electric Generating Station and, a storage building owned by the City's Department of Public Works at the Sprague Street intersection are two of these obstacles. Also residences and business fronting Steele Street and also abutting the River from Sprague Street to West Sixth Street add to the challenge of extending this trail. Further complicating an extension of the trail is an extensive amount of traffic and above ground and below ground infrastructure, which supports the Generating Station, the Railroad and the Department of Public Works facilities fronting Steele Street.

A truncated portion of the trail also runs along the north side of the River, beginning at North Main Street and running a short distance to the west, almost to the Warner Dam where the trail ends. This section of the Trail was discussed in the *Jamestown Riverfront Reclamation and Development Study, Addendum #1, 1991* as the Keelboat Landing Extension and was constructed in 2007. It is well illuminated and has amenities such as benches, trash receptacles and picnic tables. Along this section of the trail you will again find several historical markers commemorating the first grist mill in the Village and Jamestown's industrial heritage and association with the Blackstone Corporation.



(Left) Historical marker. (Center) Looking west along the Trail. (Right) Looking east along the Trail toward Main Street Bridge.

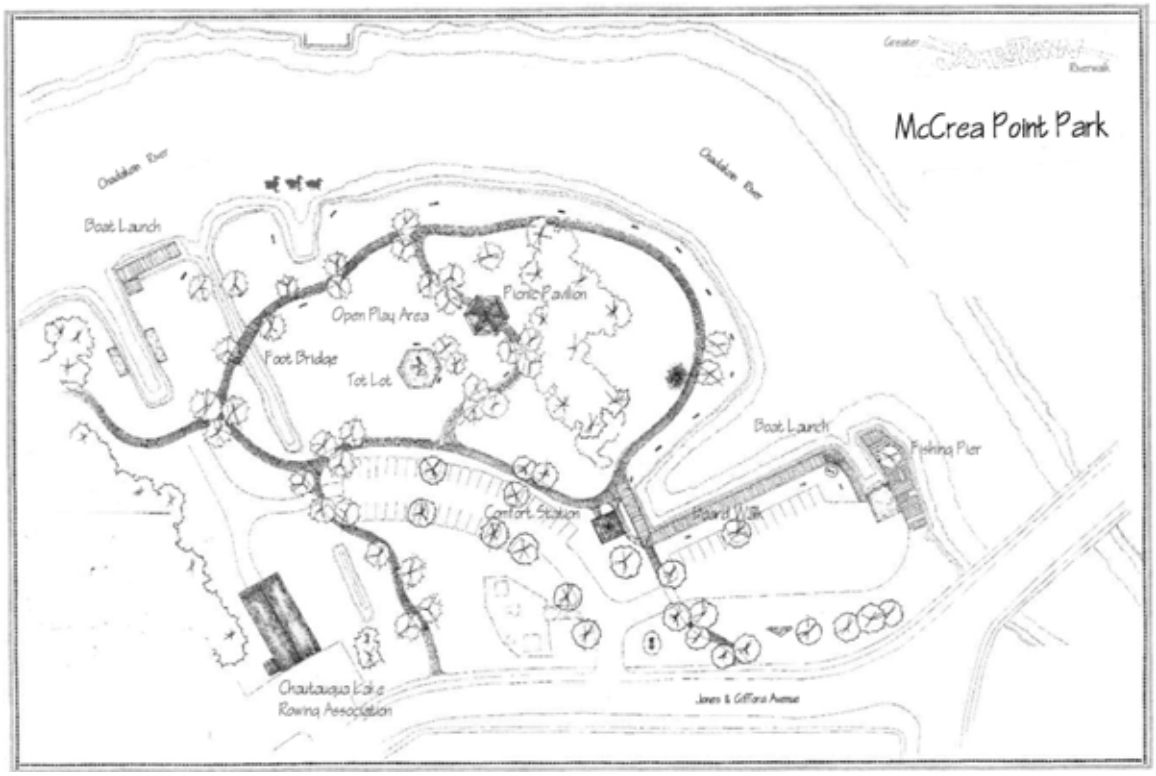
The next expansion of the trail on the north bank of the River will extend about another 420 feet to the west side of the Washington Street Bridge. It is in this general area where a pedestrian bridge has been proposed to connect the two banks of the River. Plans have been completed for this extension; however the City is now waiting for approval and a permit from the NYSDEC to complete this section of the north bank trail. It is also here where the City has looked into extending the trail along the Railroad property, which also adjoins the north and east banks of the river, to McCrea Point. City officials have indicated that they have had several discussions with the Railroad, all being non-productive in the sense the Railroad is not interested in leasing or selling any portion of their property for pedestrian use that would allow for connectivity to Fairmount Avenue and McCrea Point.

It is important the City be able to extend the north side of the trail to the Washington Street Bridge and eventually construct a pedestrian bridge to cross to the south side of the River. The *City of Jamestown Traffic and Streetscape Enhancement Plan, September 2008* focuses largely on the downtown pedestrian core, but also places a great deal of importance on connectivity with the waterfront. The Plan contains a Pedestrian Connectivity Plan that depicts four bridge elements, three of which cross the Chadakoin River (1) at Panzarella Park, (2) at Washington Street and (3) near the Riverwalk Medical Center. Today, pedestrian crossings of the River are limited to the Main, Harrison and Washington Street Bridges. The Harrison Street Bridge to the east and the Washington Street Bridge to the west are not nearly as convenient for Trail users as the Main Street Bridge. A pedestrian bridge(s) that conveniently links Jamestown's Downtown with the Riverwalk Trails should provide improved access to a wider group of potential users and new opportunities for waterfront recreation.

The *City of Jamestown Traffic and Streetscape Enhancement Plan, September 2008* notes that 3rd Street and Main Street should be promoted as the primary pedestrian corridors in the downtown to provide direct pedestrian connections to outlying neighborhoods, as well as the Riverwalk off of South Main Street. The Plan discusses the need for enhancements and signage that is consistent with the design and theme used throughout the downtown core. The Plan also recommends an enhanced crosswalk on South Main Street, possibly including traffic calming devices such as a median or island that would improve the connectivity of the Riverwalk Trail on the east and west sides of South Main Street. As currently configured, there is no defined crosswalk connecting the east and west segments of the Trail and pedestrians who wish to use a crosswalk must either cross Main Street at the intersection with Harrison Street or at an even less convenient crosswalk north of the Railroad viaduct at East/West 1st Streets.

Phase III of the Chadakoin Riverwalk Trail System is currently being readied for construction. Funded by a $263,000 grant from the New York State Environmental Protection Fund, the Chautauqua Park Trail, aka the Jamestown Riverwalk Extension will connect Clifton Avenue to 8th Street near the Fairmount Avenue Bridge along the former Jamestown, Westfield and Northwestern Railroad right of way. The main portion of this segment will be 1.3 miles long, consisting of 10-foot-wide asphalt pavement. At points along the trail, there will be 8-foot-wide stone nature trails that will provide walkable access to the riverbank. Another feature is an observation tower that will be constructed atop an old building foundation. Both ends of the trail will be illuminated; however, the rest of trail will not be lit. The recently completed *Chautauqua County Greenway Plan, January 2012* identifies the Chautauqua Park Trail as one of ten potential demonstration projects intended to further the County's goals of promoting active living and alternative transportation. The Plan identifies a potential route that links the existing trail segment located on the north bank of the Chadakoin River with the Chautauqua Park Trail, but notes the need to acquire easements from the railroad.

Part of this project also includes construction of a trail system through McCrea Point Park that will connect with the Chautauqua County Bicycle trail that runs along Jones and Gifford Avenue. The McCrea Point trail system will consist of about 1,800 feet of paved pedestrian/bicycle trail, the same style lighting as used on the downtown portions of the Riverwalk Trail, a 30 foot pedestrian bridge, repairs and upgrades to the existing boat launch and pavilion.



Proposed Trail through McCrea Point Park

Possible other considerations for pedestrian access to the River would be areas to allow for fishing or to launch a canoe or kayak, or to just sit to enjoy the esthetics of the surrounding area. Some areas of consideration would be at the Harrison and Winsor Street Bridges, or near the Railroad crossing at Buffalo Street. Other locations would be near the Hopkins Avenue Bridge and at the northerly terminus of Bigelow Street.

The Trail Systems Map included at the end of this report illustrates the pedestrian and bicycle paths within the LWRP.

1.6 Public Transportation

The Chautauqua Area Regional Transit System (CARTS) is the sole provider of low cost public transportation for any person living, working or visiting Chautauqua County. The system originated in the late 1970's as mostly a rural service. In 1997 CARTS took over the City of Jamestown's public (busing) transportation system and now maintains daily weekday service in Jamestown, Falconer, Celoron, Lakewood other surrounding communities, including rural service into the Towns. CARTS is managed from their Jamestown offices and maintenance facility located on Hopkins Avenue. In total there are 26 routes throughout the county of which 7 originate in downtown Jamestown and not only serve the immediate downtown area but the populated areas along its perimeter. Route runs being at 6:00 a.m. and end by 4:30 p.m. There is no weekend service.

Funding for this service is primarily from two sources: 1) the New York State of Transportation, which distributes about $3.0 billion annually in Statewide Mass Transportation Operating Assistance (STOA), and 2) the Federal Transit Administration (FTA). Other lesser sources of revenue are from rider fares, local agencies and county funds.

CARTS historically has mostly served low income and disabled individuals, seniors, Jamestown Community College and Jamestown Business College students and others who have limited means of transportation to get them to and from work, shopping trips, and non-emergency medical appointments. CARTS also coordinates, schedules, supplies drivers and provides bus maintenance for the County's Veterans Bus Service. CARTS also coordinates their services county wide with the Department of the Ageing.

2011 records indicate a ridership total of 195,000 one way trips county wide of which about 55,400 or 28 percent are attributed to trips made within Jamestown and the immediate surrounding area. While CARTS does mostly serve disabled individuals and seniors yearly statistics show as fuel prices fluctuate so does ridership. During calendar year 2011 CARTS experienced a county wide jump of approximately 11,000 riders, of which approximately 20 percent are within the immediate Jamestown service area. This increase in ridership has continued into through the first 6 months of 2012.

Within the core of the Jamestown Brownfield Opportunity Area (BOA) and the Local Waterfront Revitalization Program (LWRP) CARTS offers numerous routes throughout the City with some extending into Celoron and Falconer. All of these routes traverse into and beyond the perimeter boundaries of the BOA. The following categorizes the CARTS routes in and around the City of Jamestown.

Routes that access parts of the Chadakoin River West Study Area:

- *Lakewood Route via Jones & Gifford Avenue Route:* originating in downtown Jamestown this route traverses city streets primarily in a counterclockwise direction. Some of the streets along this route are Washington Street, West Eighth Street and Jones & Gifford Avenue. After leaving Jones and Gifford Avenue the route continues into the Village of Celoron, the eastern half of the Village of Lakewood returning along Fairmount Avenue with stops at several shopping complexes.
- *Lakewood Route via Fairmount Route:* this route is similar to the previously mentioned route only it runs in a clockwise direction and at a different time intervals. Again originating in downtown Jamestown this route traverses along several city streets within the BOA area and eventually spilling onto Fairmount Avenue. this route also serves the eastern half of the Village of Lakewood and runs through the Village of Celoron and onto the City of Jamestown along Jones & Gifford Avenue, then connecting into West Eighth Street, Washington Street and back to its origin.
- *North Main Route Route:* this route through north Jamestown traverses along a section of Washington Street between 10th Street and Fluvanna Avenue, which does provides access to the West Study Area.

Routes that access parts of the Chadakoin River Central Study Area:

- *Falconer Route:* this route begins in central Jamestown and proceeds easterly through the core of the Central Study Area along Second Street into Falconer. This route returns along Falconer Street making stops at the Lutheran Home and Jamestown Community College. It then returns to Second Street, then Third Street both being in the core of the Central Study Area.
- *Willard and Baker Routes:* these two routes in a limited sense serve portions of the Central Study Area. Both originate in downtown Jamestown and do traverse along a few of the streets located in the Study Area, but mostly provide access to the southwestern, southern and southeastern parts of the City.

- *City of Jamestown Route:* this route also serves the immediate downtown Jamestown area and provides access to WCA hospital and to shopping opportunities along Foote Avenue near the City line.

Each of the above discussed routes provides boarding or drop-off at designated locations; however buses will stop when flagged or stop at requested locations.

2.0 INFRASTRUCTURE SYSTEMS

The public infrastructure systems include water, stormwater, sanitary sewer, electric, dams, docks, bulkheads, solid waste disposal, district heating/cooling and public parking. These systems are described below and depicted on maps where applicable.

2.1 Water Supply

The Board of Public Utilities (BPU) was created in 1923 to own and operate the City's potable water infrastructure. Currently, the BPU provides potable water to approximately 48,000 people in the City of Jamestown and the Villages of Falconer, Lakewood and Celeron, along with parts of the Towns of Ellicott, Busti and North Harmony. The potable water system is supplied from raw water pumped from aquifers in Cassadaga and Levant. There are two water storage reservoirs in the City; the 10 million gallon capacity English Hill Reservoir and the 1.5 million gallon Buffalo Street Reservoir. Water is provided throughout the LWRP by an extensive water distribution network. The system is old, but it has been well maintained. Waterline breaks occur occasionally, but not at an alarming rate or at a higher frequency than expected for a system of its age and type of construction. Because the water system was built to serve a larger population that what exists today in the City, there is additional capacity for new development in the LWRP; however, proposed developments that may require unusually high volumes of potable water should be evaluated on a case by case basis. The potable water distribution system is depicted on the Water Mains Map included at the end of this report.

2.2 Stormwater Runoff and Storm Drainage

The City of Jamestown and the nearby populated areas in the Town of Ellicott all fall under the threshold of being a MS4 area and almost all of the existing development predates current stormwater regulations. Current NYSDEC and USEPA stormwater regulations and design criteria are incorporated into the City's site plan review process; however, there is very little new development in Jamestown. As a result, the vast majority of stormwater is discharged to the LWRP with little or no treatment. Jamestown is largely "built-out" with a high percentage of impervious surfaces. When rain is not allowed to infiltrate into the ground it creates two problems. The first is a high flow of stormwater runoff into street storm sewers and ultimately nearby streams which can overwhelm collection facilities and result in accelerated erosion and flooding. The second is a phenomenon called first flush, where sand and gravel from roadways, oil from leaking automobiles, fertilizers, animal waste, litter and vegetative debris are washed into the stormwater conveyances and ultimately the streams. First flush pollutants also include high concentrations of dissolved organic and inorganic contaminants. Both of which result in diminished water quality within the LWRP

Stormwater was once combined with wastewater, but today is separate. Stormwater is collected from the streets, basement drains and roof gutters by laterals and trunk lines, which in turn discharge into the Chadakoin River or associated wetlands. In some cases, open channels have been excavated in the wetland areas beyond the outfalls to facilitate drainage. The City's stormwater collection system is old and not completely mapped, but it is fairly well understood.

The City uses a variety of stormwater inlets, depending on the application. Round and square drop inlets of various sizes and cubside inlets of various configurations. The City standard is a cast in place design with a large sump for collecting gravel, silt and debris. The design features a cast iron cover that provides for easy access for cleaning by City DPW crews.

Below are photographs of some of the different stormwater inlets that are observed in the study area.



(Left) Stormwater inlet in the Dahlstrom parking lot. (Center) City of Jamestown standard stormwater inlet at parking lot along Harrison Street. (Right) Cast iron stormwater inlet on Institute Street.

The stormwater collection and piping system is constructed from a variety of materials, including brick, vitrified tile pipe (VTP), reinforced concrete pipe (RCP), corrugated steel and aluminum pipe, cast iron (CI) and ductile iron pipe (DIP), polyvinyl chloride pipe (PVC) and high density polyethylene pipe (HDPE). The materials and applications vary greatly, depending upon the age of the piping and repairs, if necessary. Stormwater outlets are also constructed from a variety of materials. Below are photographs of some of the different stormwater outlets that are observed in the study area.



(Left) Stormwater discharge near Allen Street. (Center) Stormwater discharge from Steele Street. (Right) Stormwater discharge above Foote Avenue Bridge.



(Left) Stormwater outlet at Foote Avenue Bridge. (Center) Stormwater outlet at Institute Street Bridge. (Right) Dual stormwater outlets near the Washington Street Bridge.

2.3 Wastewater Disposal

Like many communities that were had a busy waterfront in the 1800's, wastewater and stormwater simply flowed back to the waterfront. The earliest reference to a sanitary sewer system within the City indicates that the system was begun at the corner of Sprague and West Second Streets in April, 1893.

The original system discharged into the Chadakoin River approximately three miles east of the City line. By the 1920's Jamestown had its first wastewater treatment plant. The original plant was replaced by a more advanced facility in 1956. The plant was expanded in 1966 to provide secondary treatment, and again in 1983 when tertiary treatment capabilities were constructed. The plant is currently permitted to discharge 12,000,000 gallons per day. As with the potable water system, the wastewater collection and treatment system is old, but it has been well maintained. Because the wastewater collection and treatment facilities was built to serve a larger population that what exists today in the City, there is additional capacity for new development in the LWRP; however, as is the case with potable water use, proposed developments that may require pretreatment or unusually large loadings at the wastewater treatment plant should be evaluated on a case by case basis. The wastewater collection system in the LWRP is shown on the Sewer Lines Map included at the end of this report.

2.4 Electricity

The City of Jamestown Board of Public Utilities (BPU) currently owns and operates the Samuel A. Carlson Electric Generating Station which consists of both coal-fired and gas-fired units that produce electrical energy for the City, the Villages of Falconer and Celoron and portions of West Ellicott. The facility is located between the Chadakoin River and Steele Street near the intersection of Sprague Street and is one of the oldest municipally-owned power plants in the country and is the largest in New York State.

The City first began generating electricity in the 1890's to provide lighting for downtown streets. Finding the ownership of this facility to be of interest to the community and at the same time profitable, the city fathers decided to expand the facility to serve all Jamestown residences. In 1923 the BPU facilities was created to improve upon and manage the community's electric and water resources, with the District Heat Division added in 1985 and the solid waste and wastewater added in 1994.

Presently the Generating Station operates four coal fired boilers which produce steam to drive two turbine generators capable of producing approximately 50 megawatts of electrical energy. The facility also operates a gas turbine generator capable of producing approximately 43 megawatts of electrical energy. The ability of using either coal or gas gives the BPU fuel flexibility related to market purchase price of material and the ability to produce more electric energy during peak periods. The BPU also has the added benefit of being able to purchase low cost hydropower from the New York Power Authority, thus during peak periods, primarily during winter months, the BPU is able to sell electricity to their residential and commercial customers a lesser per kilowatt hour cost then marketplace owned corporations. In the mid 1980's the Generating Station was modified to co-generate hot water heat, which supplies Jamestown's central business district with thermally heated water. This upgrade in a sense maximizes the use of the facility and shows the importance of the Generating Station as both a producer of electricity and heat for its present customers.

The existing facility has and still does provide excellent service to the City of Jamestown and its surrounding communities; however this facility is approaching the end of its useful life. The coal-fired units are not currently economical compared to market energy costs. Additionally, the costs of maintaining these units as well as the costs for complying with new and pending environmental

regulations also make their continued operation economically unviable. Therefore, as part of their evaluation of future energy supply options the BPU examined the potential decommissioning of these units. Also, as part of this evaluation the BPU examined new power generation alternatives that could be installed on BPU's system to provide reliable and economical capacity and electrical energy. One of these options proposed by the BPU is to construct a new fuel efficient, environmental friendly, state of the art coal fired facility, which is a costly endeavor.

The City's least favorable option would be to discontinue the operation of the Generating Station, which of course would eliminate the City's ability to provide low-cost electric energy to its customers; result in a loss of good paying jobs; and result in a loss of both City and School district tax revenue. This option would have an overall detrimental effect on the City in general and in particular to its manufacturing and industrial base.

As the community looks to the future it is important to note in time the Generating Station will need to be replaced or require costly upgrades if the City is to continue supplying low-cost power to its customer base. This ability to supply low-cost that is viewed as a key element in the plans for revitalizing the Jamestown economy.

2.5 Dams

2.5.1 Warner Dam

There have been a number of dams on the River corridor from McCrea Point to the east side of the study area. The first water powered grist mills and sawmills were built near this location. The first Warner Dam was built to replace an older structure at this location in 1915. The river channel between McCrea Point and Chandler Street was also realigned as a part of this project. Historic engineering drawings archived at the offices of Greenman-Pederson, Inc. in Jamestown depict the design elements of the dam, the alignment and profile of the new channel. The drawings indicated that sediments excavated from the new channel were deposited in spoil areas along the River and in the floodplain, which was developed with channels and races from the early mills. The map also depicted the channelization of the River under the former Art Metal facility and armor on the outside of the river bend at Institute Street. Interestingly, the drawings indicated that the dam increased the upstream elevation of the River by approximately two feet. This change would have had significant impacts on the wetlands located along the Chautauqua Lake Outlet and the navigability of the channel above the dam. A new dam at this location was constructed in 1978 as a NYSDEC Flood Control Project. The stated purpose of the dam is to maintain the level of Chautauqua Lake during the summer months; however, the Dam is ineffective at mitigating flooding around the Lake during periods of high rainfall and runoff due to the restricted River channel below McCrea Point. When wet weather is anticipated, the Dam gates are opened to drop the Lake level 1-2 inches per day to increase stormwater storage.

One of the outcomes of the Stakeholder interviews and public participation process was that floating trash and debris collects above the Warner Dam. The amount of trash can be significant, and when one considers the size of the 187 square mile watershed above the Dam that receives and transports the trash, the volume of trash is not at all surprising. What was surprising is that this trash is flushed downstream as a result of normal operation of the Dam. It's therefore reasonable to assume that a significant portion of the floating trash and debris observed within the LWRP is a result of this practice.





(Left) Immediately upstream of the Warner Dam. (Center) Floating trash accumulation at the center gate. (Right) Floating trash accumulation off of Allen Street.

2.5.2 Former United Lumber Low Head Dam (Winsor Street)

This low head dam is located upstream of the Winsor Street Bridge and is a remnant of a former water powered manufacturing facility that has been demolished. The Dam's gate forms a plunge pool that is a popular fishing spot, easily accessible by a trail that runs between Winsor and Harrison Streets. The Dam is located on a tight bend on the Chadakoin River, between the Harrison and Winsor Street Bridges and poses a hazard to the navigation of the River by small watercraft.





(Left) Plunge pool below the Former United Lumber Dam . (Center) Aerial view of the Dam. (Right) Spillway of the former United Lumber Dam.

2.5.3 Utility Crossing Low Head Dam (Buffalo Street)

This low head dam is located upstream of the Buffalo Street Bridge and is the result of a wastewater utility line crossing that is owned and maintained by the BPU. The Dam forms a plunge pool that is a popular fishing spot, accessible by trails that lead from Buffalo and Allen Streets. The Dam poses a hazard to the navigation of the River by small watercraft.





(Left) Plunge pool below the Utility Crossing Dam . (Center) View of the Dam from Buffalo Street. (Right) North riverbank at the plunge pool.

The location of dams within the study area is depicted Dams, Docks and Bank Amor Map included at the end of this report.

2.6 Docks

2.6.1 Private Docks along Clifton Avenue and Sprague Street

There are a number of private docks on the River above the Warner Dam. Six residences located along Clifton Avenue have installed docks along the northern riverbank. There are also several powerboats that were tied to the docks or moored along this reach of the River. There is one additional private dock for one of the few residential properties located along Sprague Street, which is located along the south bank of the Chadakoin River.



(Left) Water patio at Clifton Avenue public access. (Center) Other docks along Clifton Avenue. (Right) Dock for residence along Sprague Street.

2.6.2 Docks at McCrea Point

McCrea Point is the City's best developed public waterfront access. Although the Chadakoin Riverwalk Trail affords walking and bicycling along the River, and has amenities such as benches, tables and lighting, McCrea Point provides opportunities for contact recreation such as boating and fishing. There are docks, slips and a boat launch available for public use. The facility also has parking, playground equipment, a gazebo and restroom facilities. The Chautauqua Lake Rowing Association maintains a boathouse at this location that continues to keep the sport of rowing alive, a sport that has been alive in the area since the 1870s. McCrea point also has historical significance which is commemorated with historical markers:

- De Longueuil Expedition, circa 1739;
- Celoron Expedition, circa 1749;
- American revolution, circa 1782;
- First home built in Jamestown, circa 1810; and
- Steamboat Landing, circa 1828.



(Left) A view of the dock at McCrea Point from the Fairmount Avenue Bridge. (Center) Aerial view of McCrea Point. (Right) Boat launch at McCrea Point.

2.6.3 Docks at Panzarella Park

Panzarella Park is an important node on the Chadakoin Riverwalk Trail. The Park is located directly behind the BPU Electrical Generation facility, and while the Park appears to be an island, it is actually an isthmus and is accessed by a single span bridge. The Park is named after a former community leader Marion Panzarella. The dock at Panzarella Park serves primarily as a platform from which to fish and enjoy the beauty of the Chadakoin River, but could also serve as a place to tie off small watercraft.





(Left) A view of the dock at Panzarella Park. (Center) Aerial view of Panzarella Park. (Right) Commemorative plaque celebrating the contributions of Marion Panzarella.

The location of docks within the study area is depicted Dams, Docks and Bank Amor Map included at the end of this report.

2.7 Bulkheads

Erosion is a natural process and without it, rivers and streams would not meander and change course. A cut bank is a very common feature of streams. Cut banks are found in abundance along mature or meandering streams, they are located on the outside of a stream bend. They are shaped much like a small cliff, and are formed by the erosion of soil as the stream collides with the river bank. Not only are cut banks steep and unstable, they are also the area of a stream where the water is flowing the fastest and the deepest, making them rather dangerous.

Urban development typically decreases the amount pervious surfaces, and increases the amount of impervious surfaces, which can result in increased bank erosion and channel migration rates. Bank erosion and channel migration rates are also increased when development occurs in the floodplain. The buildings and other structures that have been built in and along the river have cause bank erosion and scour, which has happened extensively in the study area.

Scour is the removal of sediment such as sand and rocks from around bridge abutments, piers or dams. Scour, caused by swiftly moving water, can scour holes that will compromise the integrity of a structure. Scour is the main cause of bridge failure. It has been estimated that 60% of all bridge failures result from scour and other erosion related causes. Water normally flows faster around piers and abutments making them susceptible to scour. At bridge openings, scour can occur when water accelerates as it flows through an opening that is narrower than the channel upstream from the bridge. Scour occurs both upstream and downstream from a bridge over large areas. Over long periods of time, this can result in lowering of the stream bed.

Armor is used try to keep a river from moving. This can be done for habitat restoration or to prevent a river from changing course into land or a building that is being used by people. One

way that this is done is by placing some type of armor along the river bank. Armor is used extensively in the study area. The location and extent of the armored riverbanks within the study area is depicted Dams, Docks and Bank Amor Map included at the end of this report.

Armor can be the result of natural processes. Tree roots and other roots, stumps, fallen trees, brush and large stones can work together to slow erosion and scour. All types of armor work by absorbing and deflecting the energy of the current. With respect to riprap, the size and mass of the riprap material absorbs the impact energy of current, while the gaps between the rocks trap and slow the flow of water, lessening its ability to erode soil or structures on the river bank. The mass of riprap also provides protection against impact damage by ice or debris, which is particularly desirable for bridge supports and pilings.

Below are photographs of some of the different armor that is observed in the study area.





(Left) Concrete retaining wall below the Warner Dam. (Center) Sheet pile wall below the Institute Street Bridge. (Right) Riprap under the 6th Street Bridge.





(Left) Stone riprap at Clifton Avenue. (Center) Concrete rubble at Buffalo Street. (Right) Stone riprap at the Sprague Street Bridge.





(Left) Riverside Industrial Center below the Foote Avenue Bridge. (Center) Steel pile and railroad tie armor off Allen Street and near River Street. (Right) Natural armor of roots below Hopkins Avenue Bridge.

2.8 Solid Waste Disposal

The BPUs Solid Waste Division collects solid waste throughout the LWRP. The City is divided into five zones, all of which are partially located within the LWRP. The customers in each zone have a specific day of the week to set out their waste and recyclables. The sanitation crews rotate to a different zone each day of the week. Each residential unit is charged a flat fee of just over $12 per month. Items over 40 lbs are assessed a $10 pickup fee and landfill charges. Commercial and industrial customers have larger containers and dumpsters available for their use.

The BPU has an established recycling program for glass, metals, plastic, paper and cardboard. There is also a household hazardous waste disposal program offered to BPU customers sponsored by Chautauqua County twice per year.

The solid waste is in turn taken to the Ellery Landfill, located at 3889 Towerville Road in Ellery NY, approximately 12 miles from the study area. Chautauqua County owns and operates this solid waste disposal facility, which also accepts solid waste from other municipalities outside of the County at a higher rate. This preferential rate structure provides an economic advantage to businesses that are located within Chautauqua County and the City of Jamestown.

2.9 District Heat

The City of Jamestown owns and operates its own gas and coal fired electric generating plant. This facility is known as the Samuel A. Carlson Electric Generating Station and is located between the Chadakoin River and Steele Street near the intersection of Sprague Street. The Jamestown Board of Public Utilities (BPU) is the manager of the Generating Station, which not only generates and distributes electrical energy throughout the City but also converts unused thermal energy for customer use throughout a small portion of the City, but most of the downtown business core.

Steam is the energy source used for turbine generators to make electricity, however thermal energy is wasted during this process. Capturing this unused energy, passing it through a heat exchanger and into a closed network of looped piping is the model of the City of Jamestown's District Heating System. Jamestown operated a steam district heating system from approximately 1948 to 1969. The system was eventually abandoned because the high costs of maintaining the system out-paced the prices for oil and natural gas and users of the steam system began to install gas-fired furnaces and boilers to supply their heat requirements.

As the costs of natural gas began to rise in the early 1980's and as new technologies and methods were being developed to allow for the transmission of thermal energy, in this case super-heated hot water instead of steam, the City went to work on developing a new system. In 1981 the City began preliminary engineering review of utilizing waste heat energy from the Electric Generating Station to be the source for a hot water distribution system. This source energy was to become an alternative to gas fired furnaces for commercial users. With the assistance of grants and additional monies from the City's general fund the City moved ahead with its final engineering design. In 1984 the City approved a bond to begin construction on its present District Heating System. The "initial" or "pilot" program that was constructed to serve some of the then larger commercial and municipal facilities within the immediate area of the Generating Station, such as the City's Department of Public Works and Board of Public Utilities building facilities. The system proved to be financially successful for the "pilot" system users and for the City.

In early 1985 as gas prices continued to rise and with the success of the "pilot" system the City of Jamestown decided to continue expanding the system and approved an additional four million dollar bond to facilitate with the expansion and construction of the hot water co-generation district heating system into the central business district. The downtown project consisted of about 4 miles of transmission piping and was an immediate success to businesses that were able to access

the transmission lines. Not only were businesses able to save on heating cost they were also able to free up floor space not occupied by large furnaces and boilers. The number of customers throughout the community that use the City's district heat system has recently fallen to approximately 30 from more than 70. These customers include the hospital, schools, churches, private office buildings, community buildings and large residential housing facilities. The system is presently working at about one half of its capacity and now consists of approximately 11 miles of twin polyethylene coated piping externally insulated with polyurethane foam.

The closed loop system simply consists of a supply line and a return line and isolation valves along its route. Thermally heated water is supplied to the customer at a peak temperature of about 250 degrees Fahrenheit. It is then the customer's responsibility to make arrangements with a private contractor to retrofit the supplied water to their system. With the benefit of heat exchangers customers draw energy from the water and begin the process heating their facility. Circulated water is then returned to the system and piped back to the Generating Station where the cycle then commences again. The District Heat Map included at the end of this report illustrates this system.

District Heat has saved users costs for furnace and boiler maintenance, chemical treatments, stack emissions assessments and has reduced pollution caused by the operation of many smaller and less efficient boiler systems as well as freeing up space occupied by on-site boiler systems. The attached map shows the network of piping throughout the downtown area north of the Railroad and along Steele and Harrison Streets south of the Railroad. The system reaches to the north as far as the Holy Family School on North Main Street and the Euclid Gardens Apartments on Euclid Avenue, to the east up to Winsor Street, and to the south as far as the Heritage Park nursing facility on Prather Street and the WCA hospital on Foote Avenue.

2.10 District Cooling

This system primarily servers business and housing locations along Third Street, and the City of Jamestown's municipal building located on the east side of the business district. The cooling systems origin is the Jamestown Savings Bank Ice Arena located at the intersection of Third and Lafayette Streets. At this facility, a specially designed chilled water plant was incorporated into the design of the Arena, which is to not only serve the Arena and auxiliary spaces but to serve additional development in the downtown area. Water is chilled utilizing ice storage tanks and a plate frame heat exchanger. An ice melting process then cools water that is then piped to buildings along Third Street.

The District Cooling System is also managed and operated by the Board of Public Utilities. Cooled water is distributed much the same way as the District Heat System in a closed loop system using the same piping materials. Cooled water is pumped within a closed loop system with laterals to buildings. Each user of the system must have its own heat exchanger to with draw energy from the chilled water to cool its own building. The resultant of this system is lesser electricity cost and maintenance costs to outdated air conditioning systems found on roof tops, in basements, and along the exterior perimeters of buildings.

2.11 Underwater Cables And Pipelines

A number of underwater utility crossings are located within the LWRP. These include:

- Electric
- Fiber Optic Cables
- Sanitary Force Mains
- Gravity Sanitary Sewers

- Water Lines
- District Heat

The Pipelines and Cable River Crossings Map included at the end of this report shows the approximate locations of these underwater utility crossings.

2.12 Parking

Business and community leaders and members of the public in the City of Jamestown have had long standing issues and concerns about parking. The City's geography and compact land development combine to make convenient parking a challenge in some areas of the City. As a result, the City has created focus groups, commissioned parking studies and made substantial investments in parking infrastructure, all of which have focused on the Central Business District and the West End developments.

- *Center City Project Parking Study by Saratoga Associates, July 31, 2000.* This study examined the City's parking needs in response to a proposed development in the west side of the central business district. The project was to include an ice arena, cinema, hotel, medical offices and a parking garage to be located in an area bounded by West 4th Street, Washington Street, West 2nd Street and Jefferson Street. Although some, but not all of the development scenarios envisioned were constructed, the study concluded that approximately 1,400 to 1,816 parking spaces would be required to serve the project area and an additional one-half block surrounding the project area.
- *Downtown parking Discussion Group, February 12, 2002.* This focus group was composed of City and community leaders, economic development officials and members of the business community. The outcome of their discussions included the following recommendations:

    - Replacement of the then closed Cherry Street Parking Ramp at an estimated cost of $4,290,000, which would create an additional 280 parking spaces and satisfy commitments to local businesses.
    - Redevelop the Main Street Ramp at an estimated cost of $1,650,000, for a net gain of 149 metered and leased spaces that would help to reduce increasing parking pressure associated with West End developments and North Main Street parking needs.
    - Additional Surface Lots and On-Street Spaces would create an additional 322 spaces in the West End.
    - Additional surface lots parking in the vicinity of Baker Park will create 68 new long-term metered spaces, for an overall increase of 839 new parking spaces that were not previously available.
    -

- *Comprehensive Parking Plan, Phase III by ALLPRO, January, 2007*. This study noted that Phase I of the City's Parking Plan had been completed by the construction of the 296 space Cherry Street Ramp in 2006, which was a response to additional parking needs associated with the new ice arena and hotel projects. Between the North Main Street Ramp and the Cherry Street Ramp, a total of 416 off-street parking spaces and 254 metered spaces, for a total of 670 new spaces were added in connection with Phase I. ALLPRO's study noted that Jamestown now had a total of 1,957 municipal parking spaces, of which 892 were metered. Phase II of the Parking Plan centered on enforcement, where ALLPRO became responsible for collecting meter money and collecting fines for violations. Hand held computerized ticket issuing equipment provided greater efficiency for enforcement personnel and better tracking of vehicles and scofflaws. Phase III of the Plan

involved standardizing meters, restructuring parking rates and meter timing periods to best suit the available parking infrastructure and demand.

GPI's reconnaissance of the LWRP study area on July 23, 2012 indicated the presence of numerous public parking locations scattered throughout the downtown business area. The parking ramps and surface lots are attractive, well illuminated and generally well maintained. There were three parking ramp structures, they are described in the sections below:

2.12.1 Cherry Street Ramp

Reconstructed in 2006 this reinforced concrete structure provides 280 parking spaces. This structure provides parking for the Jamestown Ramada Inn and for the long-term parking needs of the Jamestown Housing Authority as well as other nearby buildings.





(Left) East side of the Cherry Street Ramp. (Center) Cherry Street Ramp along West 4th Street. (Right) Entrance/exit to Cherry Street Ramp along West 5th Street.

2.12.2 Main Street Ramp

Constructed so as to take advantage of the steep natural slope of North Main Street, the two-level structure is attractively landscaped. This reinforced concrete structure was built in 2004 presently provides 20 metered parking spaces and 51 leased space on level with West 2nd Street. The ramp also provides 65 parking spaces in the ground (1st Street) level for Jamestown's local newspaper, the "Post Journal".





(Left) East side of the North Main Street Ramp. (Center) North Main Street Ramp. (Right) West 2nd Street Entrance.

2.12.3 Spring Street Ramp

Rehabilitated in 2009, this reinforced concrete structure contains about 340 leased and metered parking spaces on 5 levels between East 3rd and 4th Streets. The attractive structure has two murals commemorating Jamestown's association with Lucy and Desi Arnaz.






(Left) Spring Street Ramp with Luci & Desi murals. (Center) Entrance/exit off of Spring Street. (Right) East side of the Spring Street Ramp.

Metered parking is mostly found along the public streets within the core downtown area of the Central Study Area. There are however many non-metered locations along Third Street from the Federal Building westerly to Washington Street. These parking spaces are mostly designated 15 minute to 2 hour locations and are for the convenience of patrons and customers to business and public buildings fronting Third Street. Metered off street parking facilities and designated leased spaces can also be found at the following surface lots:

2.12.4 West 3rd and Clinton Streets

This paved surface lot has 24 parking spaces and is intended to provide long term off-street parking for West End businesses and attractions, such as the ice arena. The lot is conveniently accessed from Clinton Street and West 3rd Streets. It is landscaped and well illuminated.




Looking southwest at the surface lot at West 3rd and Clinton Streets (Left) Aerial view of the surface lot at West 3rd and Clinton Streets (Right)

2.12.5 West 4th and Lafayette Streets

This paved surface lot has 34 parking spaces and is also intended to provide long term off-street parking for West End businesses and attractions. The lot is accessed from West 4th and is landscaped and well illuminated.





Looking southwest at the surface lot at West 4th and Lafayette Streets (Left) Aerial view of the surface lot at West 4th and Lafayette Streets (Right)

2.12.6 East 3rd near East 2nd Street

This surface lot has 37 parking spaces and is intended to provide long term off-street parking for the central business district and the high school. The irregularly shaped lot is accessed from East 3rd Street. ALLPRO has placed a sign that advertises the availability of leased spaces at this location. The pavement is in fair condition, and with exception of the street lights along East 3rd Street, the lot is not illuminated.





Looking northeast at the surface lot at East 3rd near East 2nd Streets (Left) Aerial view of the surface lot at West 4th and Lafayette Streets (Right)

2.12.7 East 4th Street near Pendergast Avenue

This surface lot has approximately 30 leased parking spaces and is intended to provide long term off-street parking for the central business district. The gravel lot is accessed from East 4th Street and Pendergast Avenue. ALLPRO has placed a sign that notes all of the spaces at this location are leased. The pavement is in fair condition, and with exception of the street lights along East 4th Street and Pendergast Avenue, the lot is not illuminated.





Looking northeast at the surface lot at East 4th Street and Pendergast Avenue. (Left) Aerial view of the surface lot at East 4th Street and Pendergast Avenue. (Right)

2.12.8 East 2nd and Pine Streets

This surface lot has 28 parking spaces and is intended to provide convenient off-street parking for the central business district. The paved lot is accessed from East 2nd Street and is landscaped with trees and brick pavers. The pavement is in good condition and the lot is illuminated from lights along East Second and Pine Streets.





Looking northeast at the surface lot at East 2nd and Pine Streets. (Left) Aerial view of the surface lot at East 2nd and Pine Streets. (Right)

Unfortunately all of these locations are north of the elevated Railroad, which symmetrically splits the Central Study Area. Other than the Main Street Parking Ramp not one of the mentioned locations is convenient for immediate access to the downtown section of the Chadakoin Riverwalk Trail or the waterfront without an extended walk or when returning from the River having to walk the steep street slopes of North Main Street, Foote Avenue or Jefferson Street, via Sprague Street and West Second Street.

South of the Railroad, of course lies the Chadakoin River and a much flatter terrain. A public parking area exists in the westerly end of the LWRP at McCrea Point Park, which is discussed below and a public parking lot also exists behind the Board of Public Utilities Offices on Steele Street. This parking area provides access to the westerly terminus of the Chadakoin Riverwalk and to Panzarella Park. Within the immediate proximity of North Main Street, Harrison Street and the River is a historic section of the City known as "Brooklyn Square", which today is comprised of several drug stores, several restaurants, the Riverside Medical Center, a bank, and a moving and storage business. Adjacent to these businesses along Harrison Street are a small plaza, and a retail sporting business. Each of these locations particularly the Riverside Medical Center, the adjoining

CVS drug store, Friendly's Restaurant and the Plaza on the south side of Harrison Street have large parking areas that were probably built because of zoning requirements. In most instances these private parking lots are underutilized and overly constructed.

Besides the locations identified, one moderately sized parking lot located at the southwest corner of Harrison Street and Foote Avenue and a much larger parking lot located at the northeast corner of Harrison Street and Foote Avenue also are located within the proximity of "Brooklyn Square" and near the Chadakoin River. These lots however are both owned by Chautauqua County and are designated for use by their tenants in the Riverside Industrial Center. Other privately owned parking locations found along and near the River as it traverses through the City include: a large unused parking lot on Blackstone Avenue opposite the Blackstone Business Company, just east of the Dalhstrom Complex, and underutilized parking lots located at the intersection of Chandler Street and River Street and near the intersection of Tiffany Avenue and Hopkins Avenue.

In all instances these privately owned lots could provide pedestrian and vehicular access to the River for recreational opportunities. Of course the City would need to enter into ingress, egress and parking agreements with the owners of these properties and they would need to enter into agreements with these private land owners for the right to occupy their property for River access. Because of the geography of the City, parking north of the River provides many challenges. The steep gradient away from the River heading north and the fact the only access to the River from the north is to cross under the elevated Railroad at limited locations particularly throughout business core of the City. Other than the designated public parking area located near Panzarella Park and a small pull off parking area owned by the City along Allen Street west of the Dawson Metal Property public parking locations to access the River are limited. It is clear private land owners will need to be cooperative and equally involved in creating pockets for public use or the status quo will continue into the future.

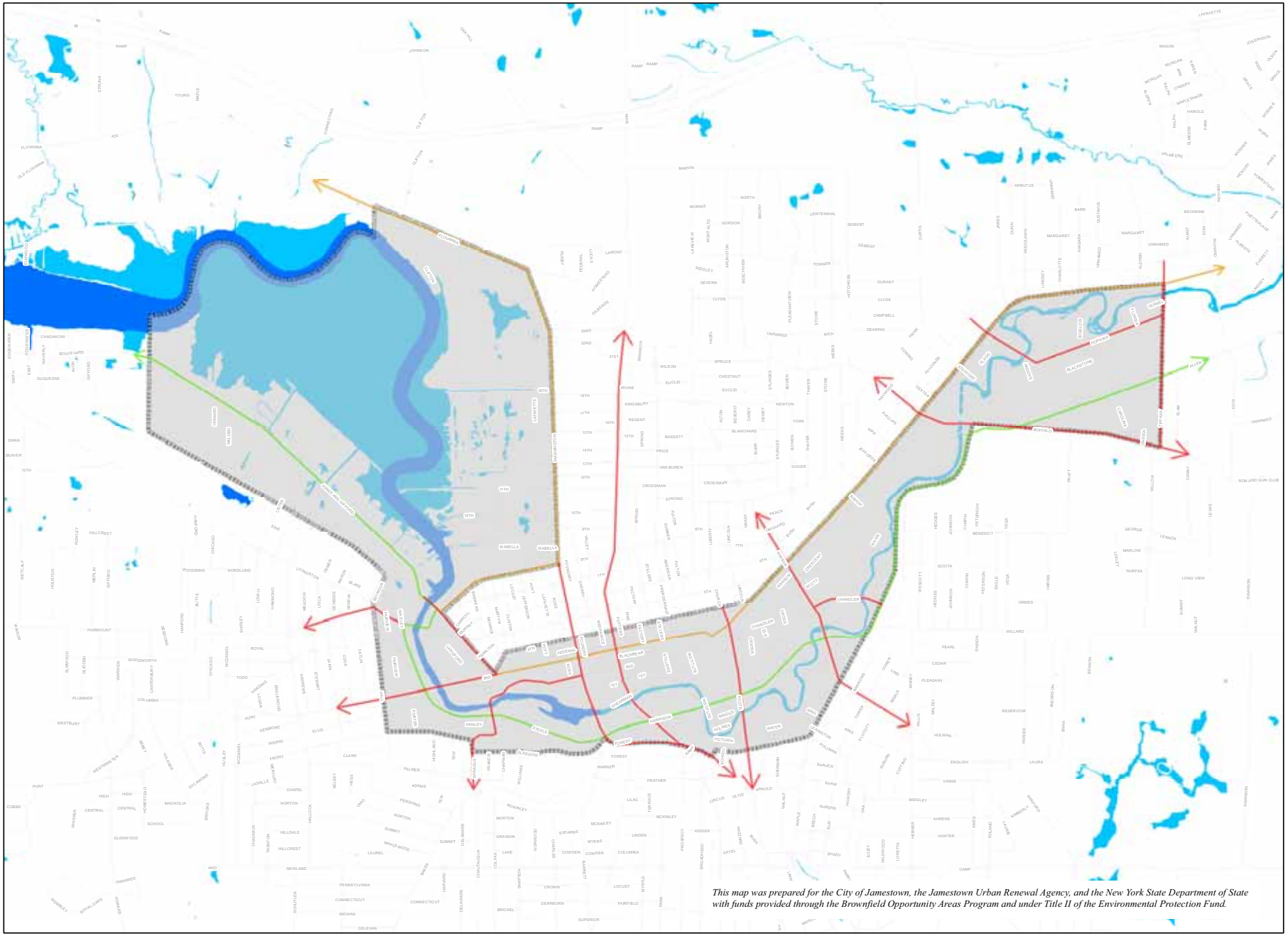
As mentioned located in the westerly end of the LWRP is McCrea Point Park or what is many times referred to as the "Boatlanding". This area is improved with a boat launch, boardwalk, a small children's playground, restroom facilities, a small pavilion, sitting benches along the perimeter of the banks of the River, plaques and signs containing brief descriptions of this area's historic past, and a large gravel unlined parking area. This parking lot serves those who trailer boats, fisherman who fish from the surrounding banks or people visiting the park to enjoy the Park's amenities and ambience. As discussed in the Trails section of this publication a plan has been put in place to improve the Park with trails and paths that will border along the River and also connect to with the Chautauqua County Bike Trail that extends along the shoulder of Jones and Gifford Avenue leading to Celoron and points beyond. Also discussed in "Trails" is the soon to be constructed Chadakoin River Trail, which is a 1.3 mile bike path connection between Clifton Avenue located on the east side of the Chadakoin River near the north City line and West Eight Street near its intersection with Fairmount Avenue. Both the McCrea Point Park Trail and the Chadakoin River Trail will benefit by the large parking area now located at McCrea Point Park. This will allow people who carry their bikes on the back of their vehicles to drive to this location and park to pick up either or both of these trails because of their proximity to the Park itself. Many opportunities now exist at this location with more amenities still being planned; this location and its parking advantages is one of the few throughout the City that allows unobstructed access to the River.



Parking area at McCrea Point

FIGURES

GPI



This map was prepared for the City of Jamestown, the Jamestown Urban Renewal Agency, and the New York State Department of State with funds provided through the Brownfield Opportunity Areas Program and under Title II of the Environmental Protection Fund.

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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

VEHICLE CIRCULATION SYSTEM WITHIN LWRP STUDY AREA

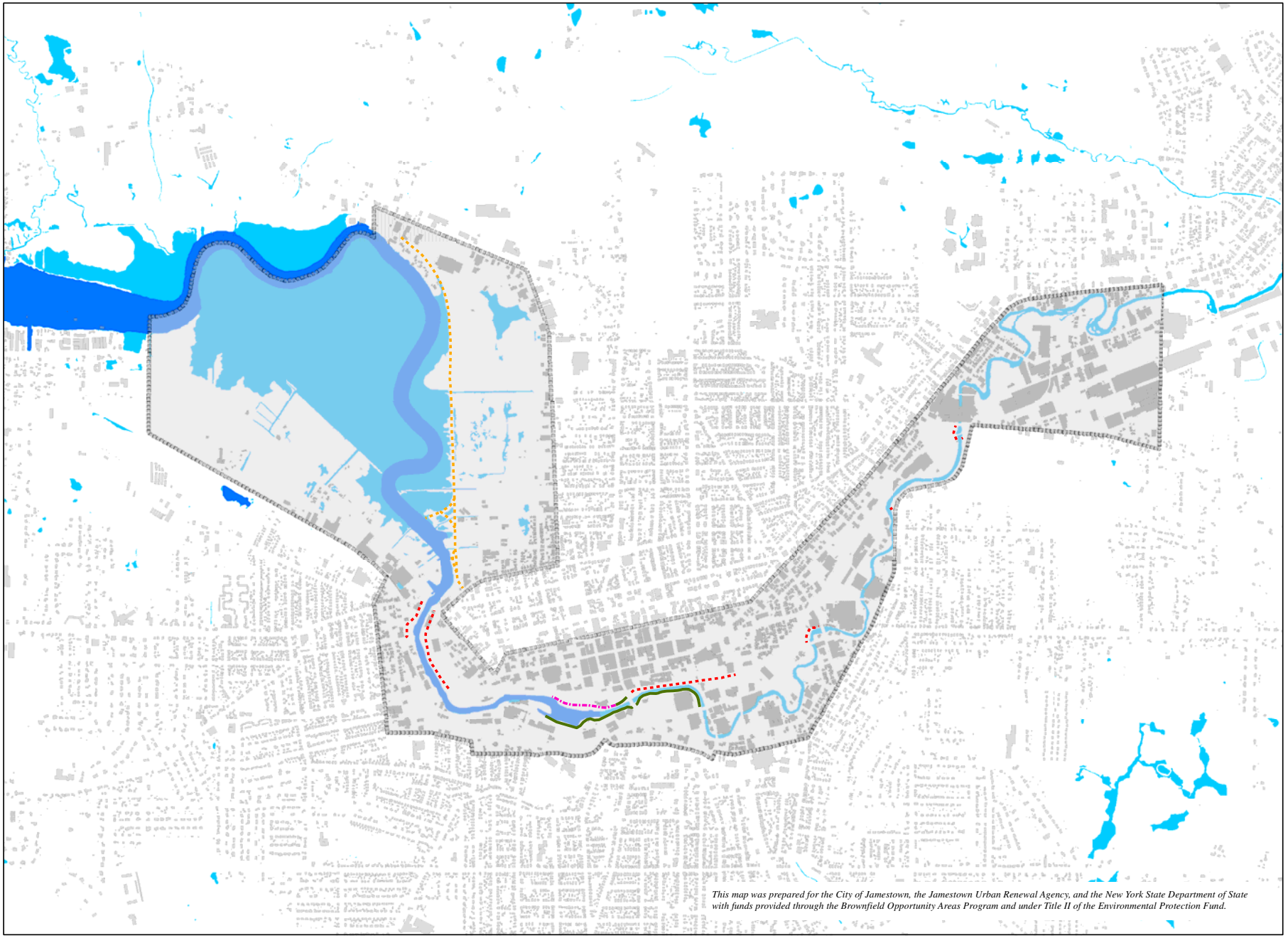
Legend

- CONNECTORS & FLY OVERS
- NORTH SIDE VEHICULAR CORRIDOR
- SOUTH SIDE VEHICULAR CORRIDOR

0 1,400 Feet

1:18,000

Sources:
1. Original BOA Shapefiles provided by the City of Jamestown - Edited by LaBella to reflect steering committee revisions.
2. City of Jamestown Local Waterfront Revitalization Program Work Plan Maps - Edited by LaBella to reflect steering committee revisions
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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

TRAIL SYSTEM WITHIN LWRP STUDY AREA

Legend

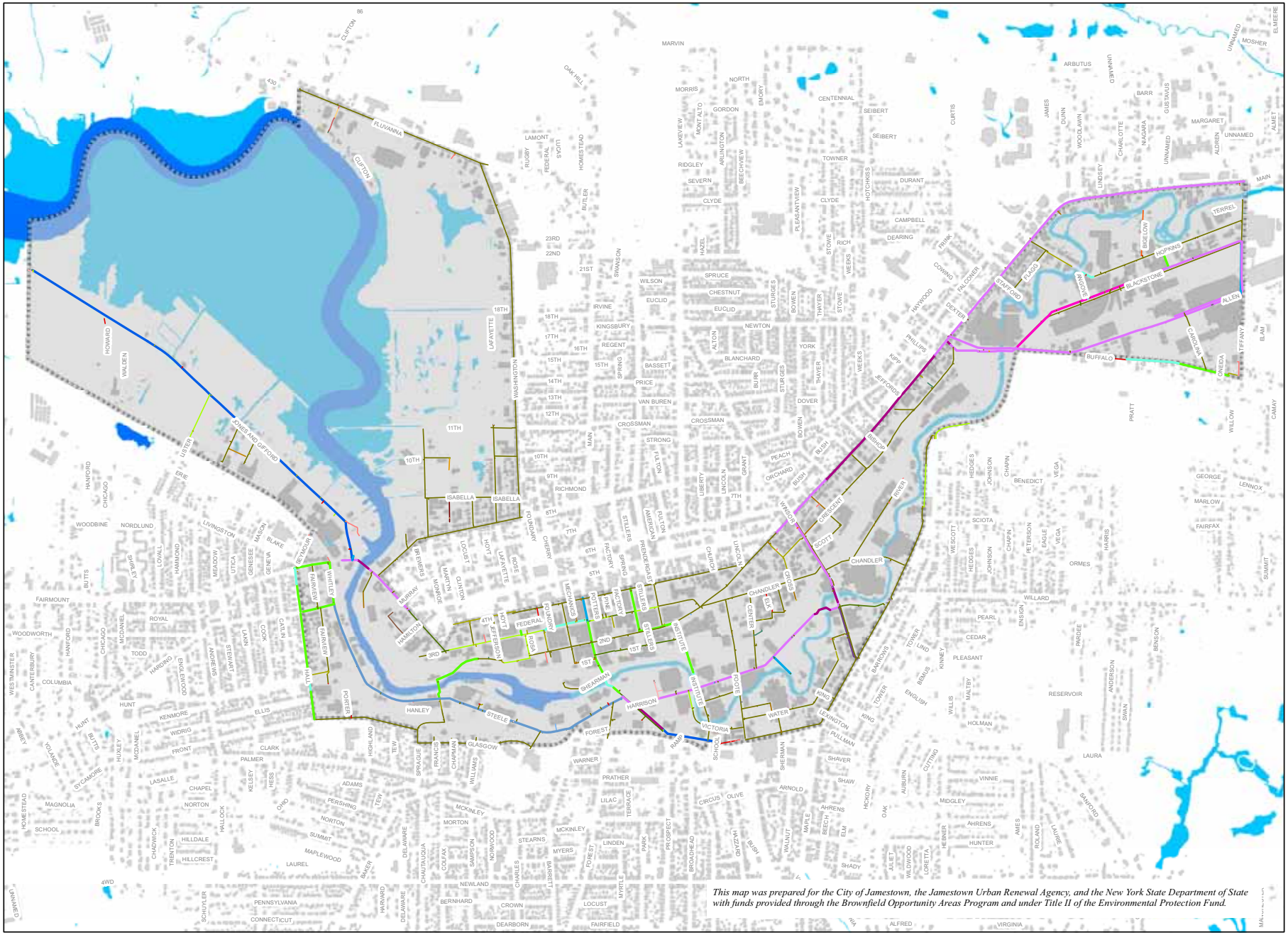
- Informal Footpath or Trail
- Proposed Chadakoin River Extension
- Chadakoin Riverwalk Trail
- Proposed_Chadakoin_BikePath

0 1,500 Feet

1:18,000

Sources:
1. Original BOA Shapefiles provided by the City of Jamestown - Edited by LaBella to reflect steering committee revisions.
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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

WATER MAINS WITHIN LWRP STUDY AREA

Legend

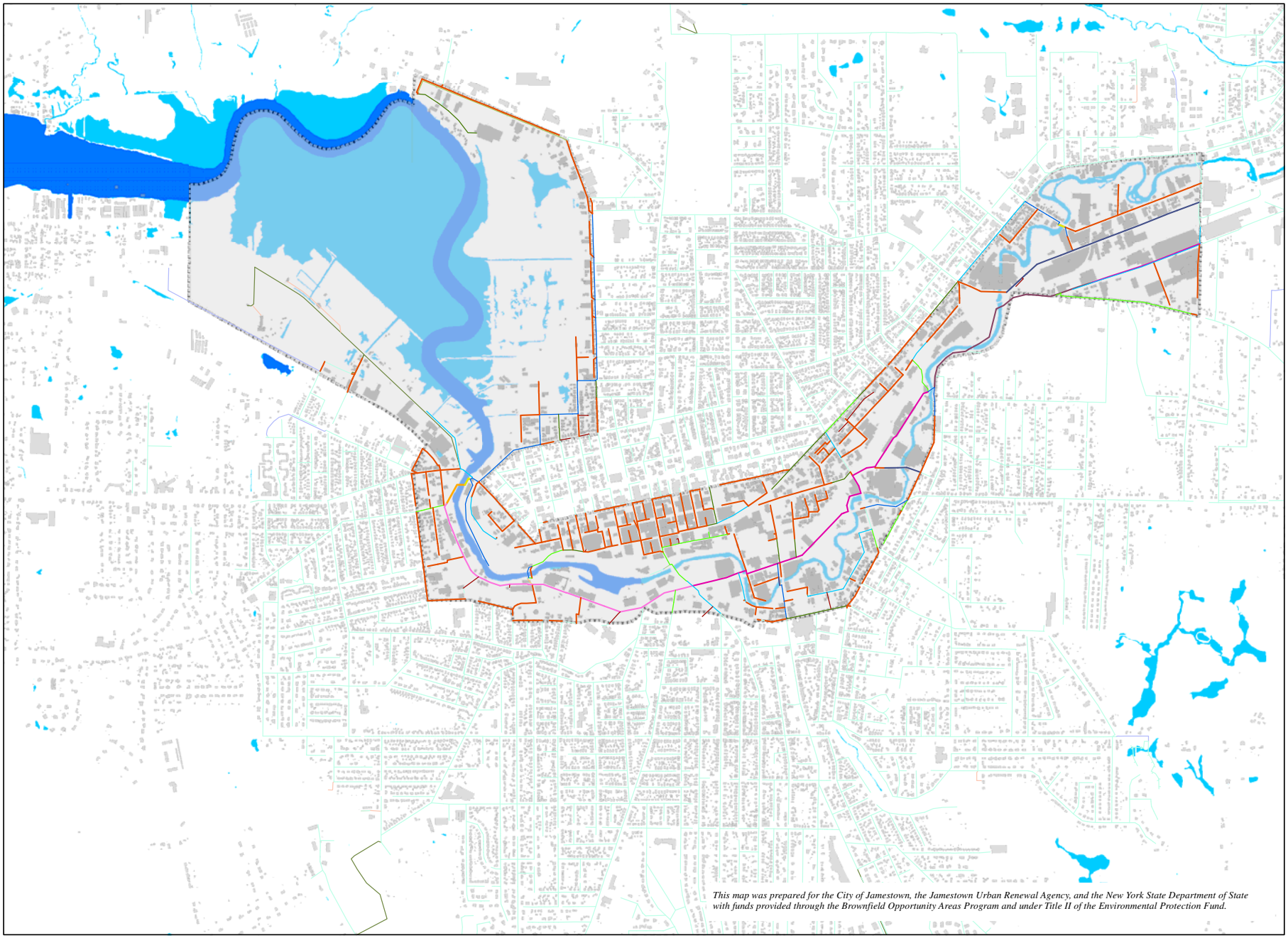
PIPEDIAMET, Material

- 1, Copper
- 1, Iron
- 1, Galvanized
- 1.25, Copper
- 1.5, Copper
- 1.5, Unknown
- 1.5, Iron
- 2, Galvanized
- 2, Cast
- 2, Copper
- 2, Unknown
- 2, Iron
- 3, Cast
- 3, Iron
- 4, Plastic
- 4, Cast
- 4, Ductile
- 4, Unknown
- 6, Ductile
- 6, Cast
- 6, Unknown
- 6, Iron
- 8, Unkown
- 8, Cast
- 8, Ductile
- 8, Iron
- 10, Ductile
- 10, Cast
- 12, Cast
- 12, Ductile
- 14, Cast
- 16, Ductile
- 16, Iron
- 16, Cast
- 24, Cast

0 1,000 Feet

1:15,000

Sources:
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2. City of Jamestown Local Waterfront Revitalization Program Work Plan Maps - Edited by LaBella to reflect steering committee revisions
3. Original BOA Shapefiles provided by the City of Jamestown - Edited by LaBella to reflect steering committee revisions
4. Water Main layer provided by the BPU



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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

N W E S

SEWER LINES WITHIN LWRP STUDY AREA

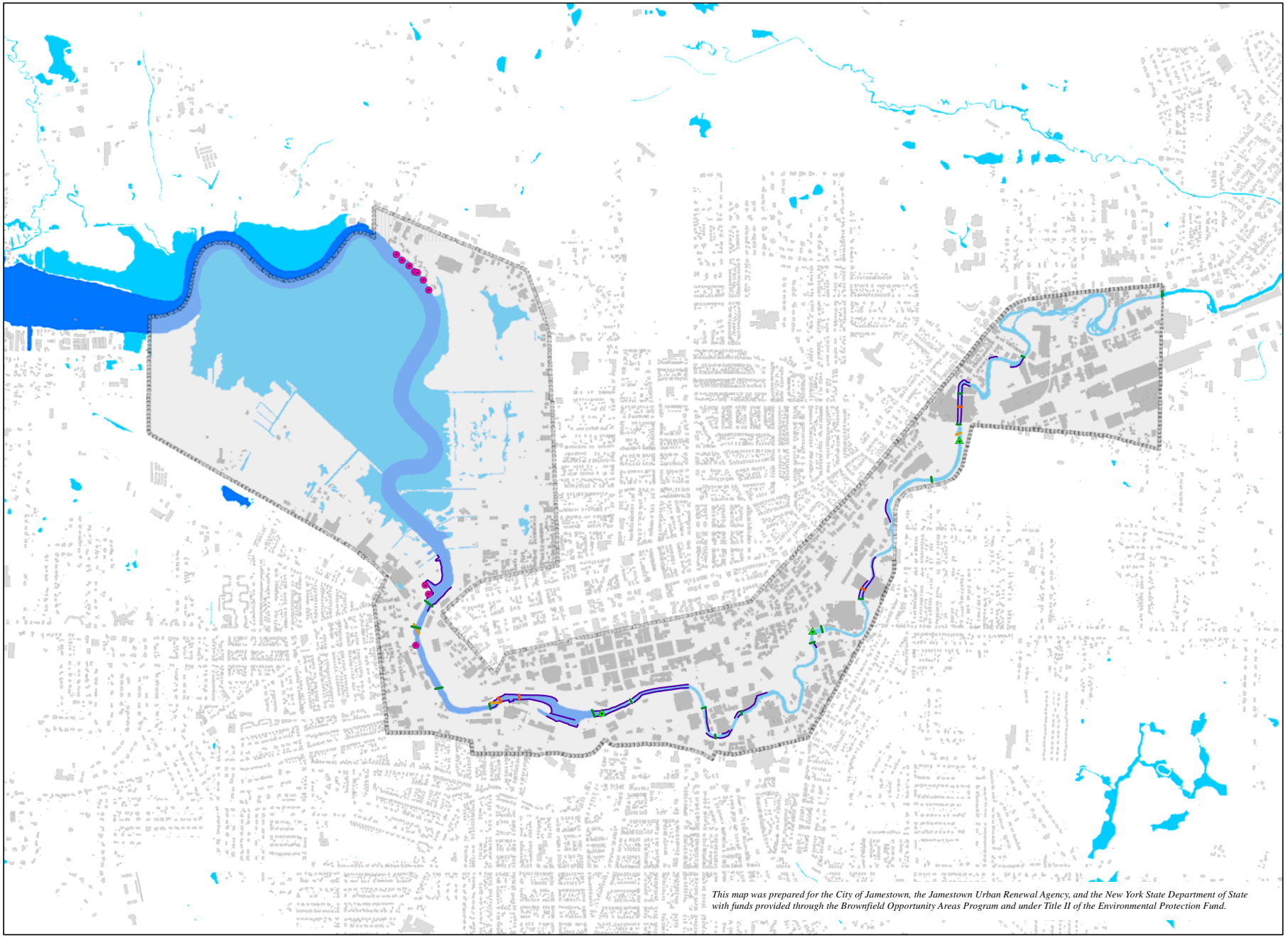
Legend

Gravity Main	ForceMain
6	Unknown
8	1.5
9	1.75
10	2
12	3
18	4
24	6
30	8
36	10
42	12
	14
	18

0 1,500 Feet

1:18,000

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3. Original BOA Shapefiles provided by the City of Jamestown - Edited by LaBella to reflect steering committee revisions
4. Gravity Main and Force Main sewer layers provided by the BPU



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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

DAMS, DOCKS AND BANK ARMOR WITHIN LWRP STUDY AREA

Legend

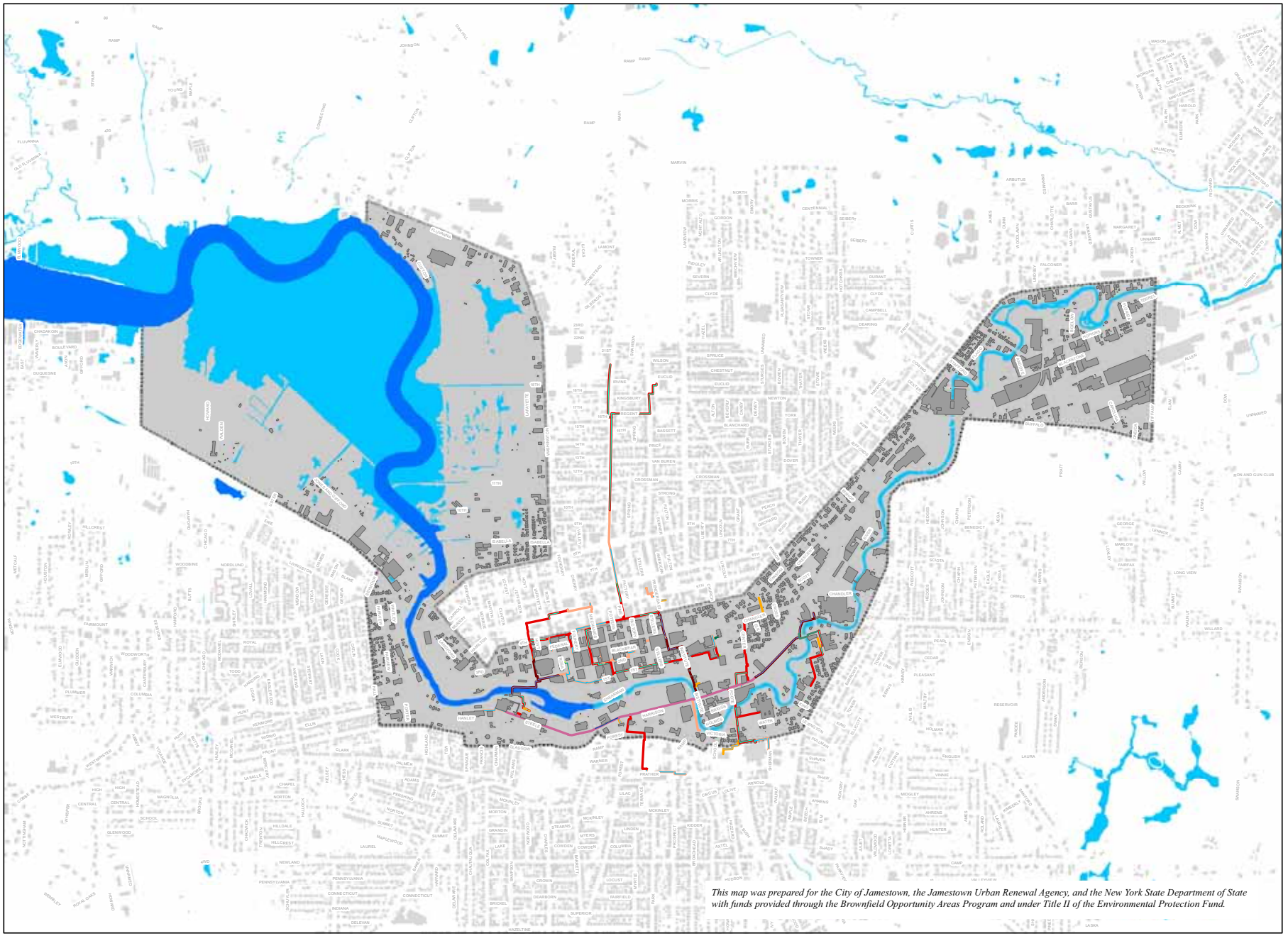
- Dams
- Docks
- Walkway or Pipe Bridge
- Public & Private Bridge
- Rail Road Bridge
- Concrete, Sheet Pile or RipRap

0 1,500 Feet

1:18,000

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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

DISTRICT HEAT WITHIN BOA NOMINATION STUDY AREA

Legend

HeatDistributionLine

Diameter, Type

- UNKNOWN, SUPPLY
- UNKNOWN, RETURN
- 2, SUPPLY
- 2, RETURN
- 3, SUPPLY
- 3, UNKNOWN
- 3, RETURN
- 4, SUPPLY
- 4, RETURN
- 5, SUPPLY
- 5, RETURN
- 5, UNKNOWN
- 6, RETURN
- 6, SUPPLY
- 8, SUPPLY
- 8, RETURN
- 12, SUPPLY
- 12, RETURN

HeatServiceLine

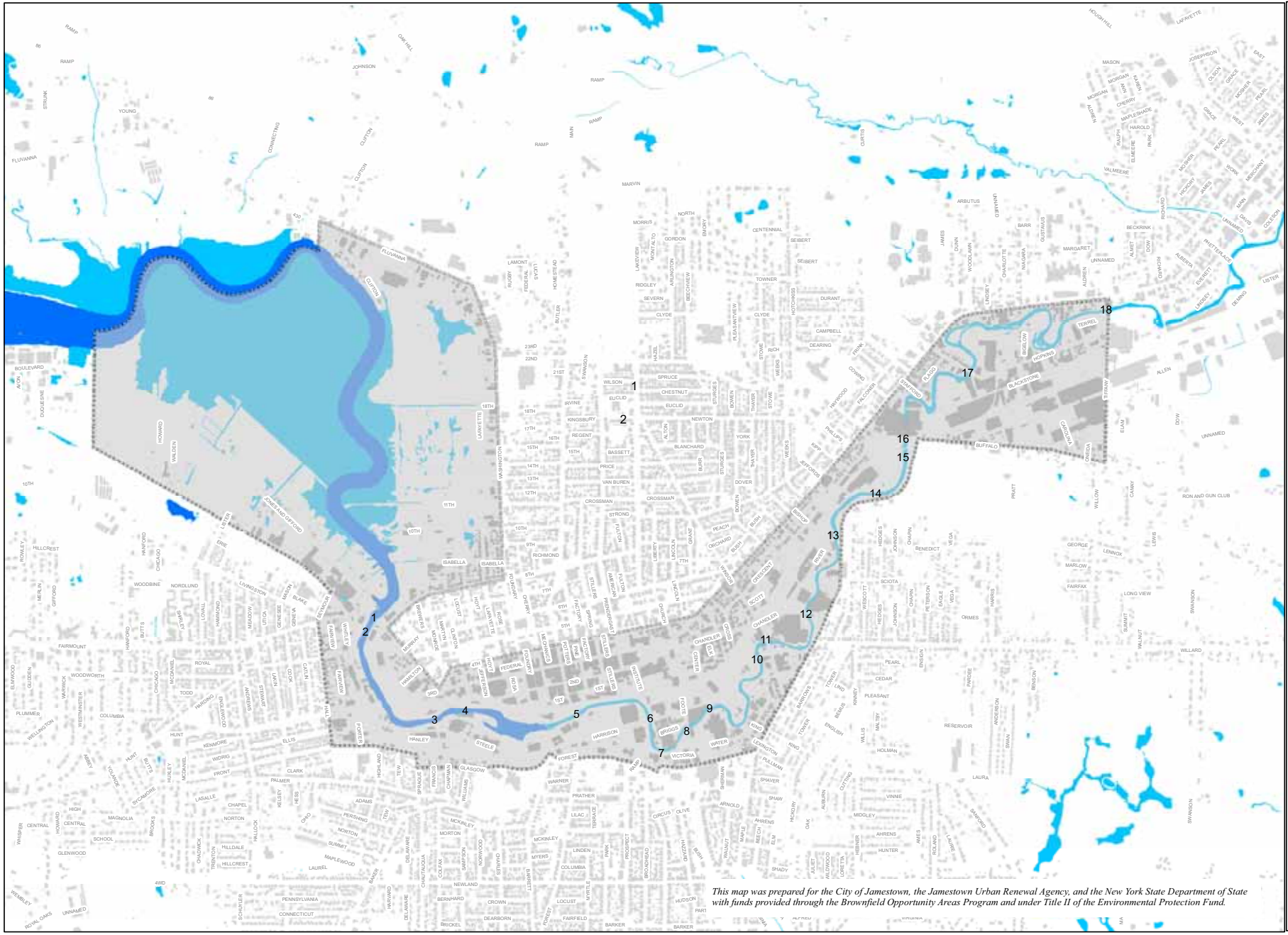
Diameter, Material

- 1, Steel
- 2, Steel
- 3, Steel
- 5, Steel

0 1,000 Feet

1:18,000

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3. Original BOA Shapefiles provided by the City of Jamestown - Edited by LaBella to reflect steering committee revisions
4. District Heat and District Cooling layer provided by the BPU



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CITY OF JAMESTOWN

CHADAKOIN RIVER REVITALIZATION STUDY

N W E S

PIPELINES AND CABLE RIVER CROSSINGS

Legend

EL = ELECTRIC
FOC = FIBER OPTIC CABLE
FM = SANITARY FORCE MAIN
G SAN = GRAVITY SANITARY SEWER
WL = WATERLINE
DH = DISTRICT HEAT

1 FAIRMOUNT AVE.
EL, 12" G SAN, 16" WL
2 BETWEEN FAIRMOUNT & 6th STREET
18" FM
3 SPRAGUE STREET
EL, FOC, 18" G SAN, 10" WL
4 EAST OF SPRAGUE STREET
8" DH
5 SOUTH MAIN STREET
EL, 10" G SAN, 10" WL
6 HARRISON ST. @ INSTITUTE ST.
EL, 12" DH, 36" G SAN, 16" WATERLINE
7 INSTITUTE STREET
6" WL
8 FOOTE AVENUE
EL, FOC, 5" DH, 18" & 8" G SAN, 6" WL
9 EAST OF FOOTE AVENUE
EL
10 HARRISON ST NEAR WINSOR ST
EL, FOC, 5" DH, 16" WL
11 WINSOR STREET
16" WL
12 CHANDLER STREET
EL, FOC, 24" G SAN, 6" WL
13 RIVER STREET
32" G SAN
14 ALLEN ST @ DAWSON METAL
42" G SAN
15 ALLEN ST SOUTH OF RAILROAD
42" G SAN
16 BUFFALO STREET
EL, FOC, 8" G SAN, 2-16" WL
17 HOPKINS AVENUE
12" FM
18 TIFFANY AVENUE
FOC

0 1,500 Feet
1:18,000

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