

# **City of Scottsbluff, Nebraska**

**Monday, March 31, 2014**

**Regular Meeting**

## **Item Reports2**

**Council to receive a presentation on the Downtown Streetscape Master Plan from Drop Seed Studios.**

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# Downtown Streetscape Master Plan

*Scottsbluff, Nebraska*





Document Prepared 31 March 2014



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# Executive Summary

In the time period from January 5 through March 31, 2014, the City of Scottsbluff collaborated with the landscape architectural and horticultural services of Dropseed Studio, the design branch of Kinghorn Gardens to evaluate stormwater management, landscape, and streetscape enhancements within the downtown urban core. The project area was defined by 20th Street to the north, 14th Street to the south, and included the avenues of 1st, Broadway, and A.

In order to gain a responsible perspective of the vision and preferences of the City, merchants, and the community, a public engagement open house followed by a single day concept design charrette was conducted at the Midwest Theater on January 7th and 8th. From this public dialog there were a few common themes that were to aid in the further design efforts of the project which included:

- Acceptance of the recent Broadway Avenue traffic and parking modifications but with the resulting/remaining needs of pedestrian street crossing distances and accessible parking to be further addressed.
- Recognition that the Scottsbluff downtown, as in several communities across the country, was historically the center of commerce and efforts need to continue through mixed uses, retention of merchants, and purpose for the community to be drawn to downtown.
- Identification of the recent landscape and stormwater efforts occurring and to increase the presence of 'green' in the downtown.
- Address not only vehicular and pedestrian circulations, but also be inclusive to the growing bicycling community.

Design solutions to address the City and public feedback were generated with a preliminary review and comment presentation on February 25th and final master plan generation for City Council presentation on March 31, 2014. Outcomes and design recommendations highlight the following:

- A top priority placed on the construction of pedestrian area bump out nodes at the Broadway Avenue intersections. With the modification of traffic and parking patterns on the corridor, pedestrian to vehicle and vehicle to vehicle sight lines are reduced as the intersection curblines are set back such that street parking obscures the view. Bringing the curblines to the back of angled parking stalls increases sight lines, shortens pedestrian crossing distances, and allows for greater street tree placement in lieu of the current trees in conflict with building faces and awnings.
- Improvement to the Broadway Avenue block faces to address the

challenging thin brick pavers and increase the urban landscape experience with the introduction of sub-surface irrigation to better sustain the investment of vegetation.

- Incorporation of both street trees and stormwater garden basins on the east/west numbered streets (15th through 19th).
- Addition of street tree planters along the 1st Avenue and Avenue A corridors as well as propose the designation of downtown bicycle routes on these two avenues.
- Continuation of native vegetation and stormwater treatment within all City public parking lots.
- Individualized public gathering opportunities within the project focus area identifying the east lawn of the Public Safety Building on 18th and Avenue A and expansion of the public park / Farmer's Market space at 18th and Broadway Avenue.

Please accept the content herein as the narratives, design graphics, and probable cost opinions of recommendation which will assist the City to prioritize, budget, and phase implementation in an ordered and concentrated manner.

As Dropseed Studio, the design branch of Kinghorn Gardens, it has been a privilege to serve the community of Scottsbluff in this effort. It is our hope that the recommendations presented provide effective and manageable enhancements to your downtown core while interjecting further beauty and appreciation for the history and steadfast present embodied in the bricks and mortar. If those buildings could speak, oh, the stories they could tell...

*Barbara King*  
*Kinghorn*  
*Theresa*  
*Nadine*

WHAT WE HEARD...

East-West Streets' stop signs and crosswalks are too far back since the change to parking and 3 lanes of traffic.

Need public spaces to provide for social interactions

More Green!

'Beef up' Farmers Market area and book more events, provide seating, etc.

Add more trees where possible but don't block storefronts and signs

Capture the identity and history

Historically, the downtown was the shopping mall. Increase mixed uses that include eateries and entertainment...hold the attention when shops are closed.

Increased provisions for bicyclists!





# Broadway Avenue Corner Node Bump Outs

The recommendation of generating corner node bump-outs at each numbered street intersection along Broadway Avenue is in effect a continuation of the street modifications to three traffic lanes and diagonal parking. Several urban planning principles are achieved through enlarging the pedestrian area at intersections including...

**Increase pedestrian and motorist visibility:** Moving the curbline to the rear of diagonal parking stalls allows a pedestrian to safely approach the street with greater capability to view oncoming traffic without the obstruction of parked vehicles. Likewise, motorists can more readily identify pedestrians at the curb without parked vehicle obscurity.

**Reduced street crossing distances:** Bump-outs shorten the distance across streets to pedestrian zones to the widths of the drive lanes only. Broadway Avenue pedestrian crossings would be reduced to 36' from 46' and east-west numbered streets would reduce pedestrian crossings by 12' to a crossing of 24'.

**Increased motorist to motorist visibility:** Currently the east-west numbered streets intersecting Broadway Avenue are recessed a significant distance from the lane of oncoming traffic largely due to the diagonal parking and three lane conversion of the Avenue. Bump-outs move the motorist stop at each intersection closer to oncoming traffic lanes and allow better visibility from diagonal parking obscurities.

**Traffic speed calming:** Perceptually, narrowed focus as a motorist approaches an intersection with bump-outs will trigger an internal caution to slow (whether that trigger is adhered to or ignored is a human behavior choice that cannot be fully overcome by urban design solutions unfortunately.). This slowing of traffic speeds is in like fashion to approaching a tunnel or garage opening. Compounding the success of narrowing the focus via bump-outs will be the placement of street trees along the Broadway Avenue corridor.

**Street Trees:** The incorporation of street trees within the urban corridor achieve multiple benefits from traffic, aesthetic, and environmental qualifiers. As noted above, street trees further narrow a motorist's focus and triggers speed reduction behavior. A healthy urban landscape will both soften and enhance the visual aesthetic of the corridor and the objective of increasing activity and commerce along it. Environmentally, street trees will reduce the radiant heat load, absorb and filter air pollutants, and provide shade for

human comfort. These benefits work towards achievement of the City's 'green solution' objectives for both stormwater and air quality improvements.

Specific to the Broadway Avenue corridor, it is recommended that street trees are exclusively programed within the intersection bump-outs. One of the most defining elements of Broadway Avenue is the identifiable and positive presence of storefront awnings. Shade and the aesthetic of commerce are achieved through these existing amenities. Street trees along the block faces in the instance of Broadway Avenue would be frequently in conflict with these awnings and potentially with emergency response access to the growing percentage of upper story office and residential uses.

Street trees at the intersection nodes will fulfill an additional design function – the formation of intermittent gateways to each successive block face. The treed bump-outs in this visual perception will enhance a sense of progression as one moves along this defining corridor of the Scottsbluff downtown.



Current 17th and Broadway Avenue



Aerial key



Two other recommended objectives to the design of the intersection node bump outs include:

Extend node curb lines on the oncoming traffic directions to replace the current red striped 'no parking' areas which precede angled parking each block (south end of block, east side, for northbound traffic lane and north end of block, west side, for southbound traffic lane).

Designate the first parallel parking stall adjacent to node bump outs on all east/west-numbered streets as ADA parking stalls. The existing gradient (crown) in Broadway Avenue is not conducive to ADA parking as the head in stalls are striped. Placement on the east-west streets are sloped more favorably and remain nearest the pedestrian corridor of the Avenue.

COMPARATIVE SOIL VOLUME  
RECOMMENDATIONS  
FOR URBAN TREE PLANTERS

**Denver:** Soil Volume minimum of 750 cu.ft. of soil per tree  
Also recommends trenches, root paths, break out zones, structural cells or other un-compacted soil technology to meet the minimum volume requirements.

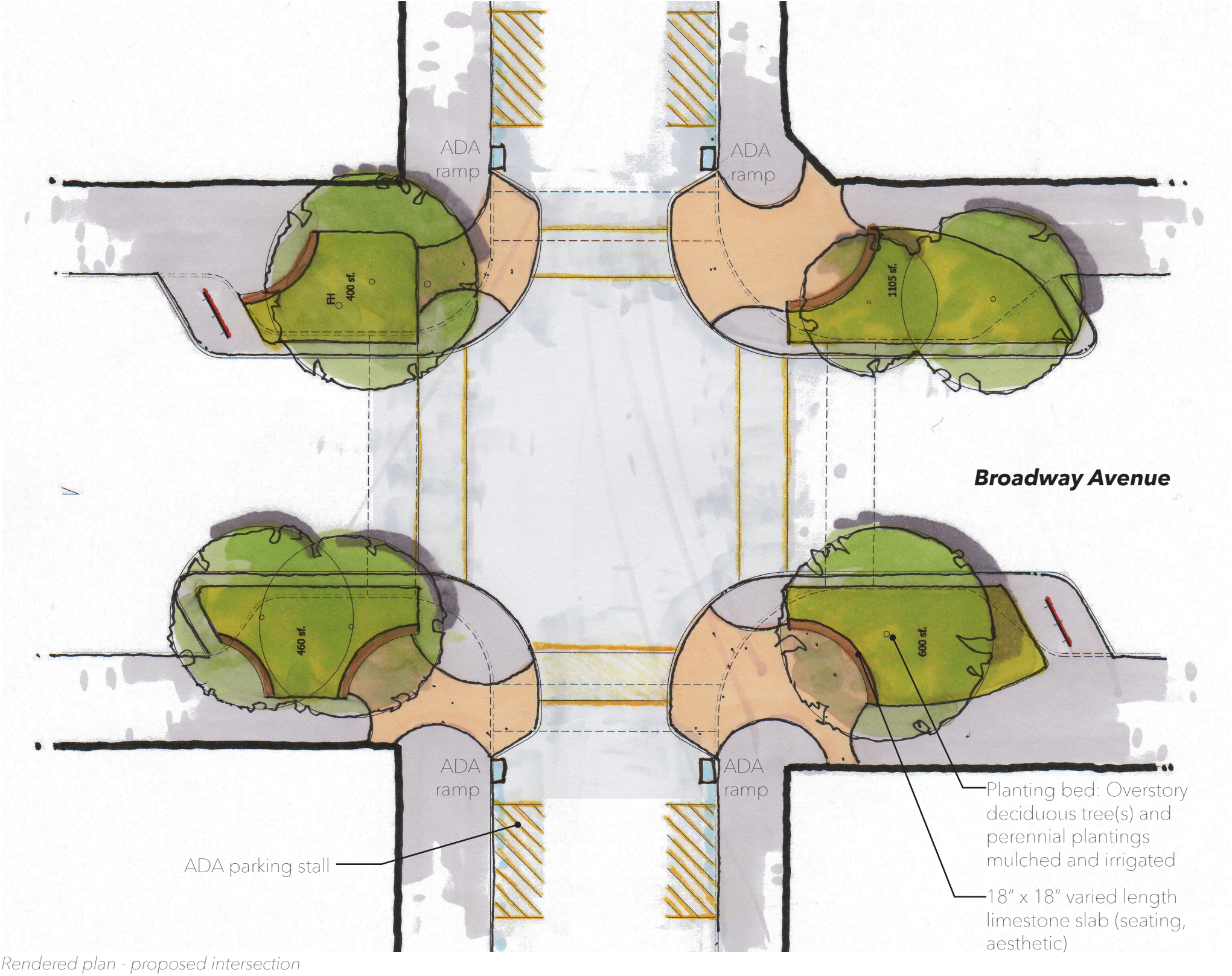
**Chicago:** Parkway trees must have a minimum depth of three feet of soil. Planting areas require a minimum of 24 sq.ft. of surface area with no dimension less than 3 feet.

**Minnesota:** 500 cu.ft. of soil per tree

**Omaha:** Urban tree planters to have 100 square feet of permeable surface area and an over-excavation and recompaction of amended soils to a depth of 2 1/2" feet (250 cubic feet per tree).

**Scottsbluff Conceptual Soil Volumes based upon 6 tree planter beds in presented bump out configurations (with recommended 2.5 feet amended soil depth)**

Bed #1	1,925 cu.ft. for 3 trees	641 cu.ft./tree
Bed #2	1,370 cu.ft. for 2 trees	685 cu.ft./tree
Bed #3	1,000 cu.ft. for 1 tree	1,000 cu.ft./tree
Bed #4	1,150 cu.ft. for 2 trees	575 cu.ft./tree





# Broadway Avenue Corner Node Bump Outs



Stone slabs and native grasses



Native vegetation massing



Natural stone in urban setting



Horticulturally correct tree planting





Sketch image - 17th and Broadway Avenue looking north



# Broadway Avenue Block Faces - typical

Evaluation of the pedestrian zones along the Broadway Avenue block faces should prioritize ease of circulation and provide a functionally aesthetic adornment while not losing sight of the primary objective of commerce and storefronts in service to the community. The previous enhancements to the Avenue's walks introduced a three-foot brick accent band to serve as visual separation between vehicular zone and pedestrian zone – a fundamental technique in streetscape design. Observations of this existing paver band and the context of the streetscape include the following:

The existing brick pavers are a 1 1/2" 'thin brick' material placed upon a sand setting bed. Comments heard during public engagement indicated that differential heaving of these bricks over time have resulted in an irregular surface that is specifically challenging during snow removal activities. Response to this observation is that the use of a unit paver in a pedestrian zone is appropriate; however, the material selection and installation detailing has not sustained over time.

With the significant percentage of awning coverage along the Avenue, the common drip line of rain, snow, and ice falls within this three-foot brick zone. Modifications of the streetscape should take into consideration new landscape beds to intercept a percentage of this drip line and reduce what comes into contact with foot traffic.

The recommendations for this corridor look to retain the fundamental separation of vehicle and pedestrian but to introduce an increased presence of landscape material and a hardscape with versatility.

**The Interchangeable Streetscape:** Consideration of expanding the landscape/hardscape zone to a minimum of five-feet wide to maximum six-feet wide to better facilitate landscape beds and seating/gathering areas off a resulting seven to eight-feet wide north-south circulation along the Avenue.

Arrange the zone based on a modular unit paver product – in concept, a grid pattern. Design an alternation between hardscape areas and landscape beds relating to the current storefront use types along the Avenue.

Specifically proposed herein is the use of a two-feet by two-feet precast concrete paver product. A unit paver of this size will have a thickness of approximately two-inches. The proportion is a larger scale than a four by eight-inch brick paver and relates well to the scale of six blocks of the downtown core. In order to avoid repeating the issue of differential settling,

construction of the paver units should be upon a base of either limestone aggregate (NOT sand) or four-inch concrete base. Setting bed depth and material should comply with a soil stability assessment (geotechnical sampling) and manufacturer recommendations.

Provide landscape beds comprised of suitable groundcovers, herbaceous perennials, native grasses, and a limited percentage of woody shrub material. Maintain a maximum height of three-feet or shorter in all plant material mature sizes (to retain storefront visibility). Selecting plant material to take into consideration required management of the species and the level of care the City can expend. Flowers that require 'dead-heading', shrubs that catch litter or require significant pruning, etc. are not optimum plant selections for this civic application.

Selection of plant species that can be transplanted with ease are recommended to respond to the 'interchangeable streetscape' concept described herein. It is also recommended that fewer number of species planted in greater quantities to form larger massings and 'drifts' will establish an aesthetic that is 'clean', visually substantial, and easier maintained than a random scattering of excessive diversity. A landscaped block face of no fewer than three and no more than five species is recommended (not including the bump out street tree species).

All planting beds should receive a drip irrigation system placed below the mulch layer and anchored to the soil. Drip irrigation provides moisture at the plant root zone, requires less water to suitably irrigate, and does not waste by watering pavement as spray heads do. See Appendix C, Irrigation Strategies at the end of this document for alternatives of this water service infrastructure.

**Integration of planters:** The prior investment made in round concrete planters should be retained in the modifications to the streetscape block faces. Planters are an excellent opportunity to incorporate bursts of annual flower color and place settings for seasonal and holiday ornament throughout the year. Placement of these planters randomly within the designated planting beds will facilitate ease of drip irrigation to the planter and establish vertical structure to the aesthetic of the planting bed as they rise up from the lower vegetation.





Accommodation of streetscape amenities: The proposed dedicated band of alternating hardscape pavers and landscape beds become the zone for nesting the various streetscape amenities that facilitate pedestrian usability and service. Existing light poles, bench seating, litter receptacles, and bicycle parking have this zone to be housed, as the City programs, and does not interrupt the continuity of the circulation zone adjacent to the storefronts. Any opportunity for urban art expressions or displays are additionally accommodated within this paver and planting band.

It is recommended the following additional bench and litter receptacle amenities be considered for addition to the block faces:

- Two benches per block (Locate one each side of street located at approximate midpoint of block. Utilize natural limestone slabs at the intersection nodes to serve as seating amenities).
- Two litter receptacles per block (Locate at diagonally opposing corner nodes – one each side of block.)

Note, these recommendations can be considered a suitable balance of amenities per block; however, quantities should ultimately respond to public need and for specifically litter receptacles, should be at a density that can be regularly serviced by City forces.

**The intent of interchangeability:** Through the use of a modular unit paver and planting beds which are placed dimensionally on a grid driven by the paver module (2’x2’) will allow the City to selectively modify any portion of the block face streetscape within a manageable expense. Example – today a storefront across from a planting bed may be a shop selling a specific ware, but in years later, the storefront usage becomes a café or entertainment use that would benefit from a paver plaza directly in front of the entry. A landscape bed can easily be converted to a hardscape area (and vice versa) due to a successful interchangeable streetscape consisting of...

- A modular unit paver on a proper setting bed that can be pulled up or expanded easily.
- Plant material that can be transplanted and re-integrated into the shifting areas of the streetscape.
- A drip irrigation system that can be inexpensively modified in response to the revisions.

Because of the established grid driven by the paver module, the

rearrangement of this band in the streetscape will be seamless and not appear like ‘patchwork’.

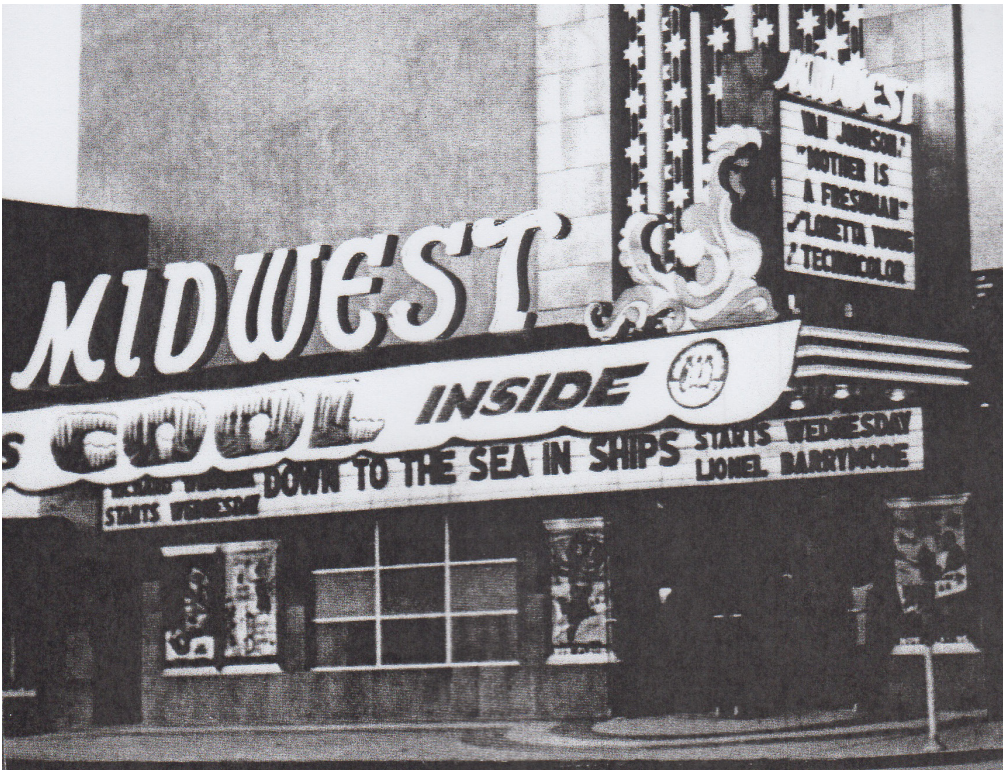
It is recommended that if expansion of hardscape is considered (to respond to a change in storefront use or other factors), a modification which retains a level of landscape beds should be prioritized. The ratio between landscape and hardscape from the initial construction of the block face does not need to remain the same due to a modification; however, exclusive addition of hardscape without retention of some landscape would diminish the original intent of the blended streetscape objective. Balance ‘give and take’ as the block face shifts around- thinking ‘relocate’ vs. ‘replace’ plant or pavement wherever possible.

**The Midwest Theater Frontage:** As the theater is a historic landmark on the Avenue and frequently experiences the greatest intervals of pedestrian densities, it is recommended that a deviation from the interchangeable streetscape band be provided. Design concept enhancements include the following:

- Greater expanse of hardscape pavement to accommodate not only the theater traffic, but also take into consideration the current coffee shop adjacent south and potential for seating and enjoying a cup.
- Relate to the historic black and white arcs that formerly banded the concrete across the Midwest’s frontage. Recommendation to utilize the same unit paver manufacturer and develop a black and white band of saw cut 2’x2’ pavers in an arc composition as shown herein. Within the concrete fields between bands and building front, consideration of sandblasted concrete. This technique is relatively inexpensive to pavers and will provide a textural and color contrast to standard gray sidewalk concrete while being constructed of the same material. While it becomes almost a ‘terrazzo’ appearance, it still provides the necessary surface friction against slipping.



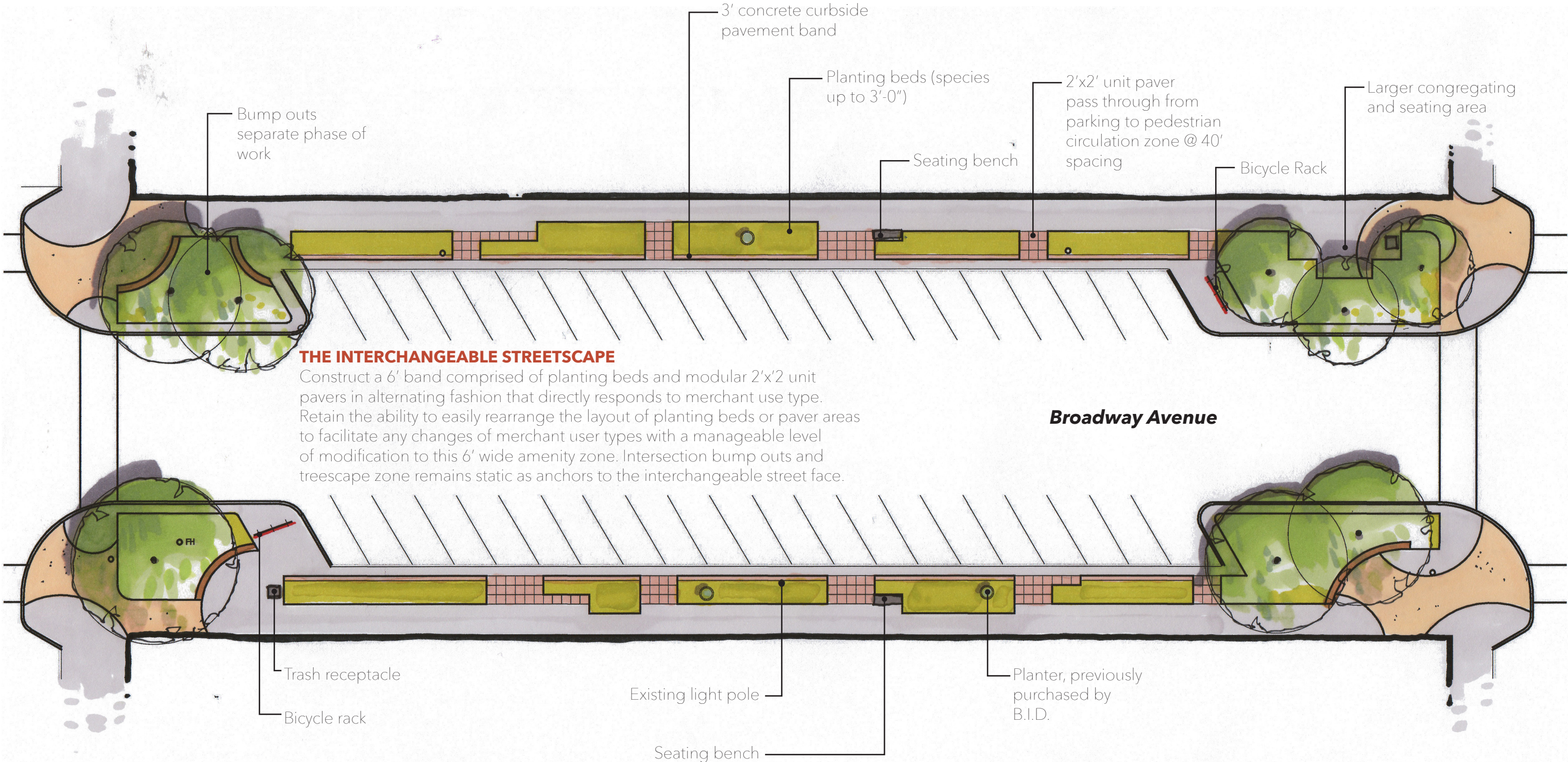
Large, modular unit pavers



Historic image of the Midwest Theater



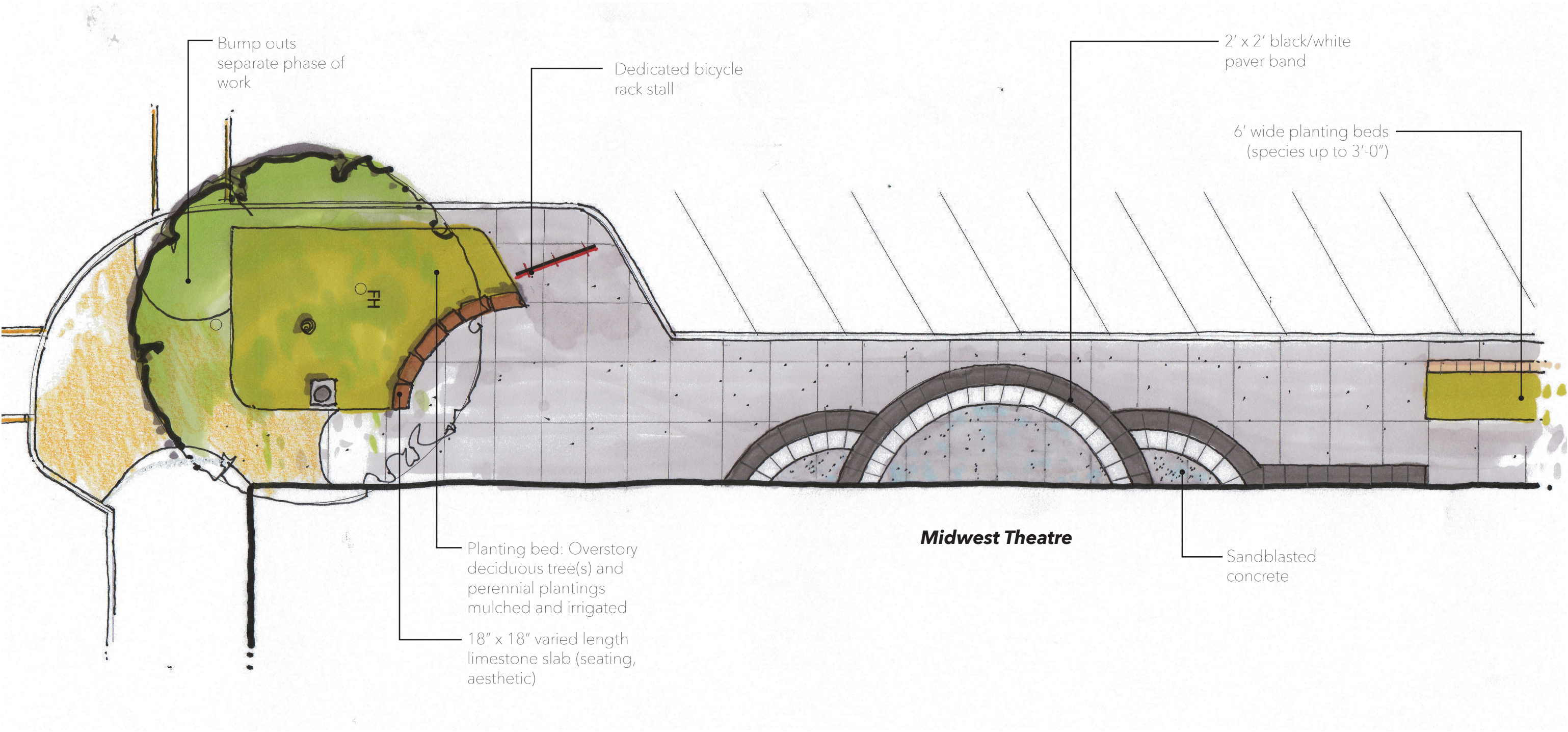
# Broadway Avenue Block Faces - 17th to 18th



Rendered plan

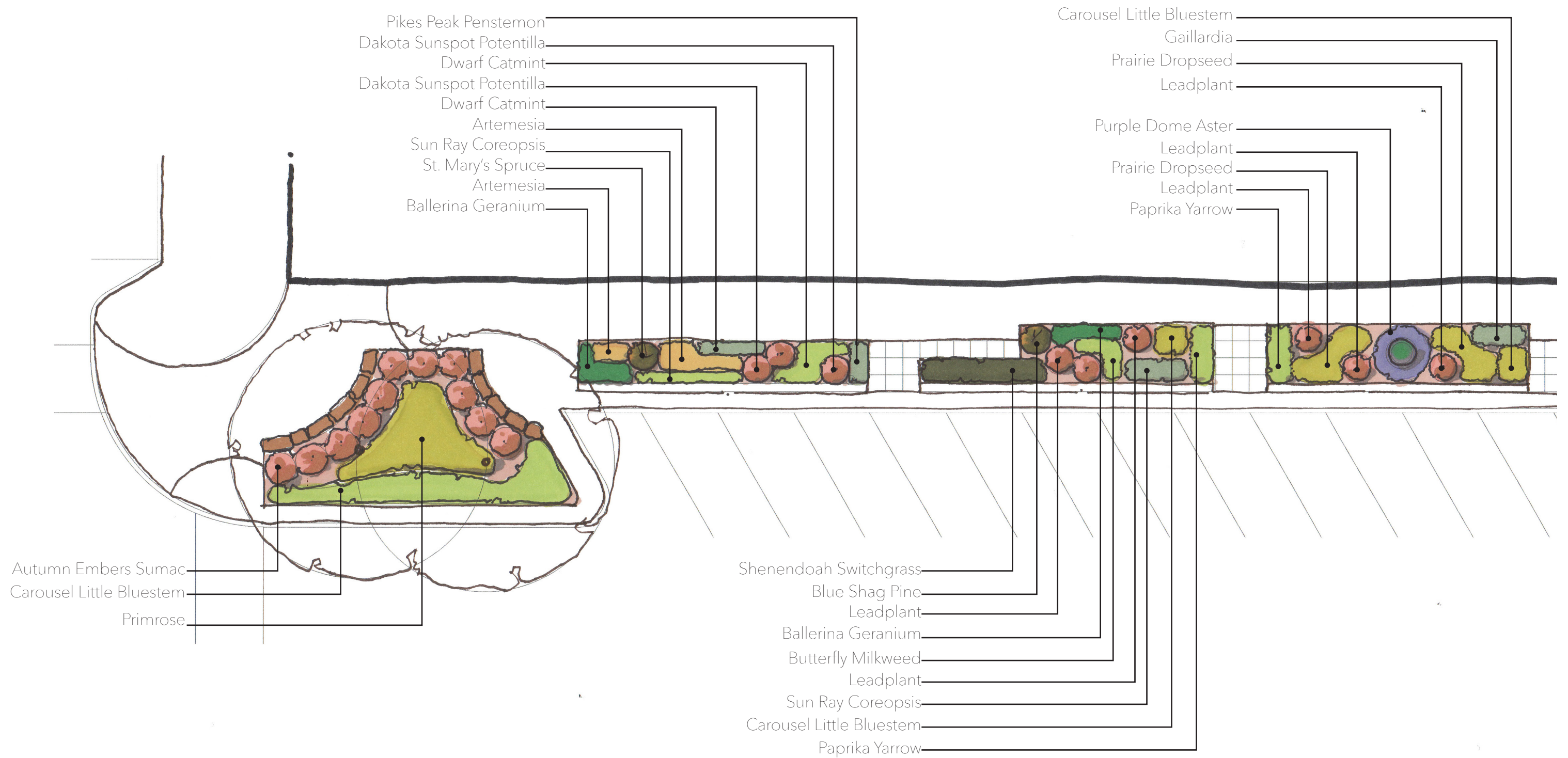


**Broadway Avenue**



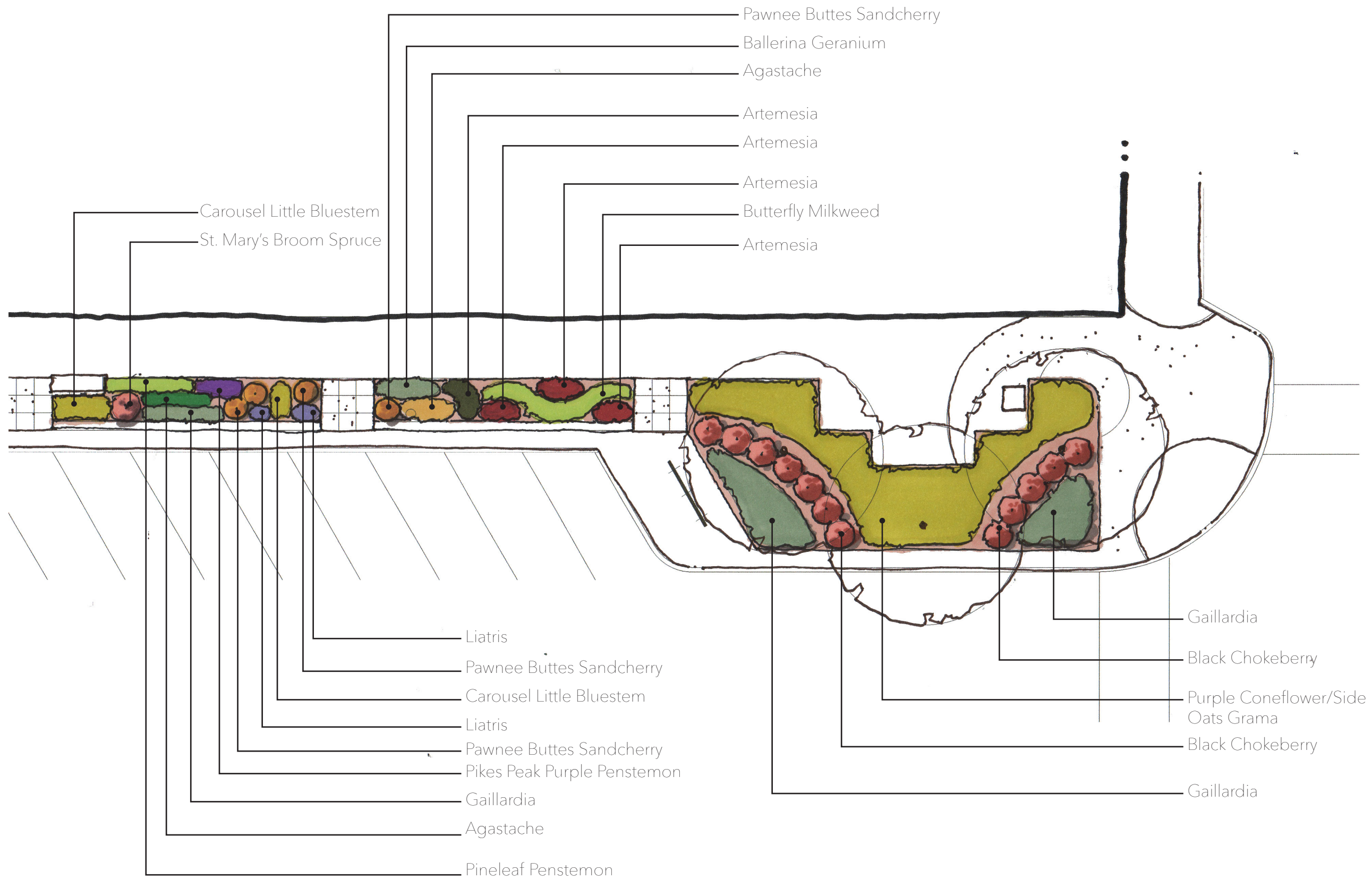
Rendered plan





Rendered plan







# Broadway Avenue Block Faces - 17th to 18th



Identified landscape zone



Bike rack alternatives



Bench alternative



Litter receptacle alternative



Grama grass





Sketch image - Downtown sidewalk looking north



# City Public Parking Lots

The City has set a positive precedence with the conversion of the public parking lot at the northeast corner of 18th Street and 1st Avenue from 100% impervious coverage to partial vegetated rain capturing planting beds. The original design of the public parking lots in the downtown have walks between parking bays and a drainage pattern that are opportune for this conversion. It is recommended that the remaining public parking lots be converted in like fashion as the 2013 completed lot.

Reduction of pervious pavement and filtration + capture of stormwater prior to entering the storm system benefits water quality. Integration of regionally native and adaptive vegetation suitable for stormwater inundation not only facilitates the stormwater benefits, it also develops a unified 'vocabulary' designating public parking and infuses the downtown with the sense of place of the surrounding Scottsbluff/Western Nebraska identity.

It is recognized and recommended that drip irrigation be incorporated into all parking lot landscape conversions. While the vegetation palate is sustainable to the general climatic influences, the additional stresses from urban conditions and heat off of pavements require these hardy species to receive supplemental water.



Example city parking lot planting



Example city parking lot planting

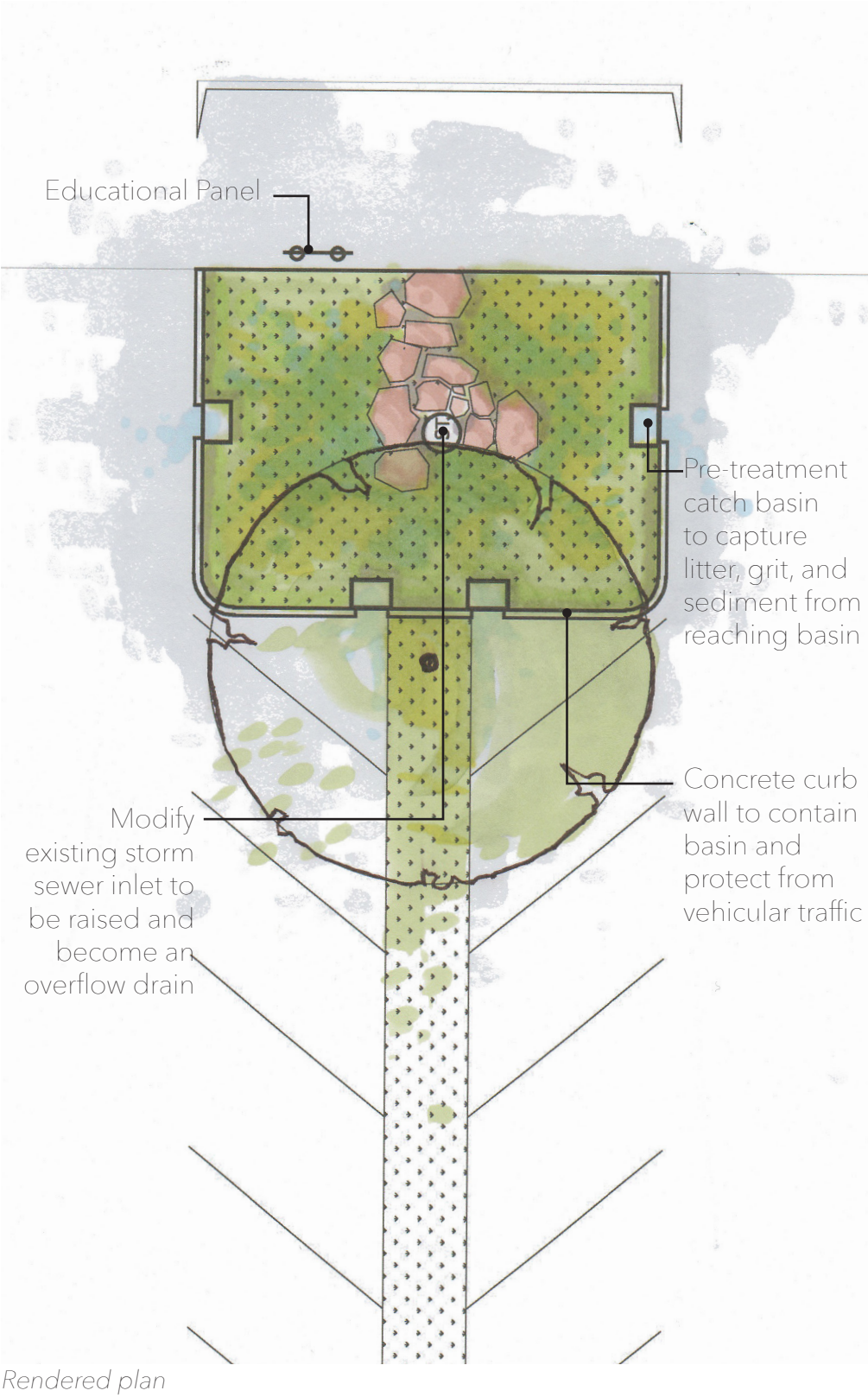


Aerial key



**17th Street and 1st Avenue Demonstration Stormwater Basin:** In addition to the recommendations cited for all City public parking lots, the parking lot at the northwest corner of 17th Street and 1st Avenue provides an additional opportunity for demonstration and educational interpretation of stormwater capture benefits. The parking lot has an existing storm sewer inlet surrounded by a pavement sloping in bowl-like fashion. The inlet is located on the center axis of a parking bay and does not interfere with vehicular circulation – situated as a prime location for a larger stormwater basin. Specifics pertaining to this proposed basin include:

- Removal of six-hundred (600) square feet of pavement to serve as a raingarden type infiltration basin.
- Lower elevation of the vegetated basin one-foot (1'-0") below pavement elevation for increased storage capacity and surround with a perimeter curbing due to vehicle proximity.
- Construct 'pre-treatment' basins at each intake location in order to capture litter, grit, and sediment prior to entering the vegetated basin.
- Convert the existing storm sewer inlet to an overflow riser by adding a concrete collar to the existing pipe and raise the elevation of the grate approximately 9" above basin soil elevation. This will allow larger volumes of stormwater during a rain event to enter the storm sewer system rather than back up onto the parking lot pavement.
- Provide an educational interpretive panel at the east perimeter of the basin adjacent to the sidewalk to display the objectives and benefits of the City's stormwater management efforts.



Interpretive signage



Pre-treatment litter catch



# City Public Parking Lots

**1800 Block of Avenue A Parking Lot:** Approximately mid-block on the east side of Avenue A exists a narrow public parking lot with identified issues related to parking spatial requirements. The double loaded head in parking bay has proven to be too narrow to accommodate vehicles without frequent encroachment onto the adjoining south sidewalk. As conversion of public parking lots takes place, modifications to parking layouts in this lot is recommended. Modifications include:

- Maintaining south facing head-in parking stalls.
- Convert current north facing head-in stalls to four (4) parallel parking stalls, designating two (2) stalls as accessible. (Note: while it was considered to decommission the entire north parking bay and provide a continuous landscape area, the costs to maintain a public parking lot and efficiencies of maximizing parking while addressing challenges encourages retention of some level of parking along this north side of the lot.)
- Incorporation of a single tree planter to increase shade canopy in the downtown. (Note: a single overstory deciduous tree averaging a mature canopy diameter of thirty-five (35) feet provides over nine-hundred, sixty (960) square feet of shade canopy area. Just one tree can make a difference!)
- Incorporation of stormwater flow-through vegetated basins each side of the parking bays at the east end to filter and capture stormwater within the lot prior to entering the alleyway.



Existing conditions

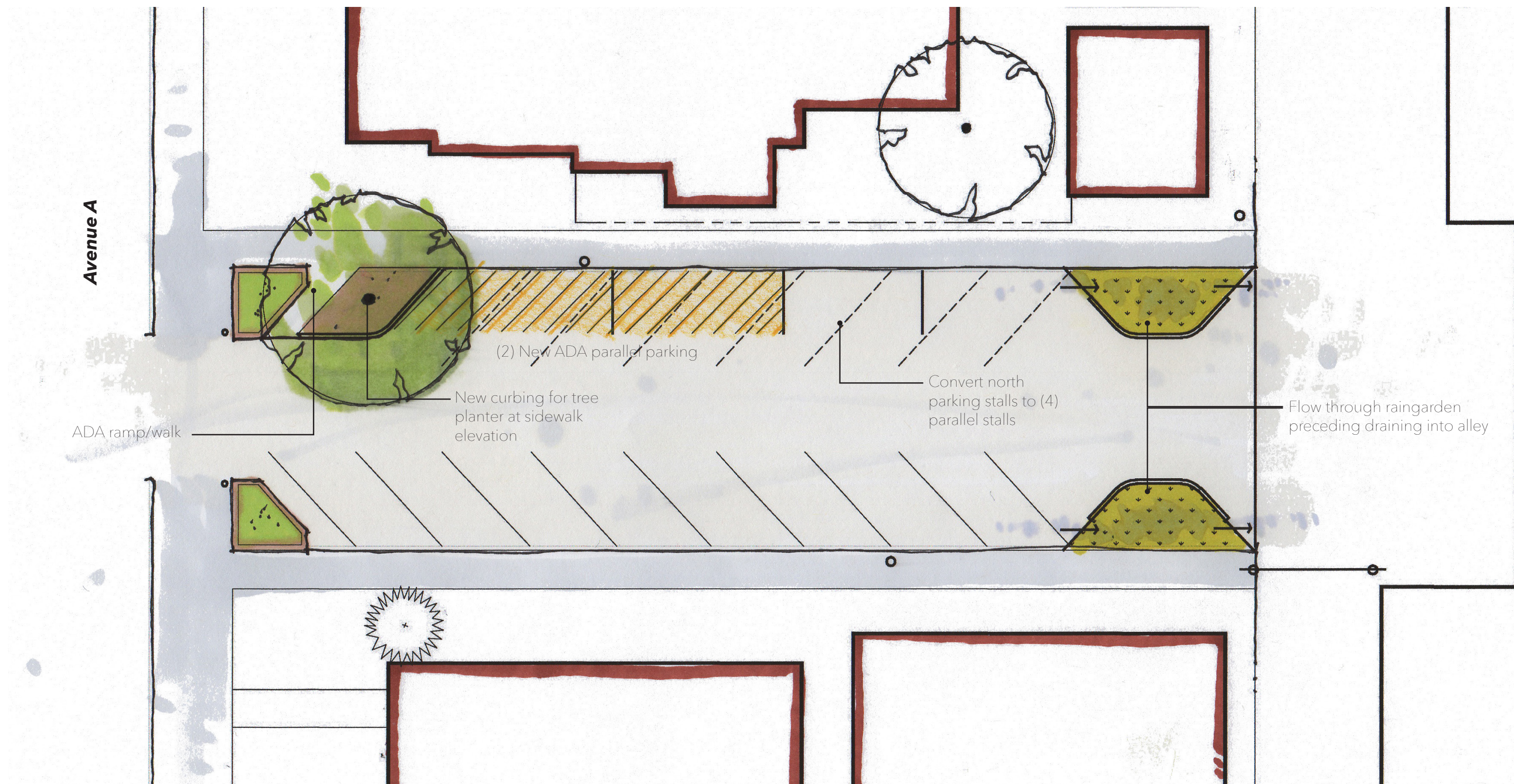


Example flow through urban raingarden



Existing city parking lot planting





Rendered plan - 1800 block Avenue A parking lot modification



# East/West Streets Tree Planters and Stormwater Basins

The recommendations for both tree planters and stormwater basins on the numbered streets, from 15th to 19th Streets, prioritize a number of factors from water quality benefits, urban heat island reduction + pedestrian comfort via shade, and visual aesthetic of these east/west connectors. Prioritization of benefits are as follows:

**Stormwater Flow-Through Basins:** Each block from 1st Avenue to Avenue A includes a total of four (4) storm sewer inlets to receive runoff from not only the numbered street, but also the bisecting alleyways. Placement of a flow through stormwater basin in the form of a raingarden preceding each sewer inlet would filter if not capture the majority of the stormwater volume within the right-of-way. Each basin is to be the size of a single existing parallel parking stall – thus decommissioning the stall (4 stalls total each block).

Constructed components of each basin would include a permeable pavement ‘pre-treatment’ basin – a hard surface catchment area to intercept the majority of litter, grit, and sediment from impacting the vegetated basin. Second – the vegetated infiltration basin comprised of amended soil and plant species not exceeding 3’-0” in mature height and suitable for the Scottsbluff region, the urban condition, and raingarden applications.

**Note:** Consideration should be given to include a perforated underdrain to convey excess water once soils are saturated which taps into the corresponding storm sewer inlet . This consideration is regarding the proximity of infiltration to building footings. It is recommended that a geotechnical engineer be consulted for recommendation of underdrain due to soils and annual rainfall expectations.

**Urban Tree Planters:** Incorporation of street trees within the right-of-way as shown recommend the decommissioning of a single parallel parking stall per planter which will provide approximately 85 square feet of permeable soil area for a single overstory deciduous tree.

The placement of the tree planters within the parking zones are recommended for the following reasons:

- The relatively narrow right-of-way between building faces provide a pedestrian walk width not conducive to further reduction by planters.
- Moving the planters to the parking zone provides greater space for tree canopies to spread and reduces interference with building faces.
- Street trees within the parking zone will serve to narrow the focus of the roadway and create traffic calming measures similar to the corner bump

- out nodes on Broadway Avenue.
- Street trees should be located in alternating fashion, north/south face of block and respond/avoid existing storefront entries, overhead power, or other potential conflicts.

**Note:** As these tree planters are not stormwater flow-through basins, it is important to maintain the existing gutter flow line.

**Accessible Parking:** As additionally noted in the bump out notes, while not a stormwater or landscape benefit, it is recommended to include in the transformation of the block to incorporate accessible parking stalls nearest the Broadway Avenue bump outs. Observations of the roadway crown and slope of Broadway Avenue parking stalls and curb elevations may be a greater challenge to incorporate accessible parking stalls and circulation, drawing greater attention to the numbered east/west streets’ parking. This observation remains as such and consulting a traffic engineering analysis to further determine is recommended.

**Sidewalk Modifications:** While it is not necessary to modify the existing sidewalks on the east-west streets in order to construct the tree planters or flow through basins, it is recommended that the opportunity is taken to address the inconsistent shrub planting areas and brick paver accents. It is recommended that all planted and accent paving elements within the pedestrian zone be removed and the block face is unified through standard concrete. These pedestrian corridors are narrow, will benefit from an unobstructed flow of foot traffic, and allow the proposed planters and basins serve as landscape enhancement to the streets.

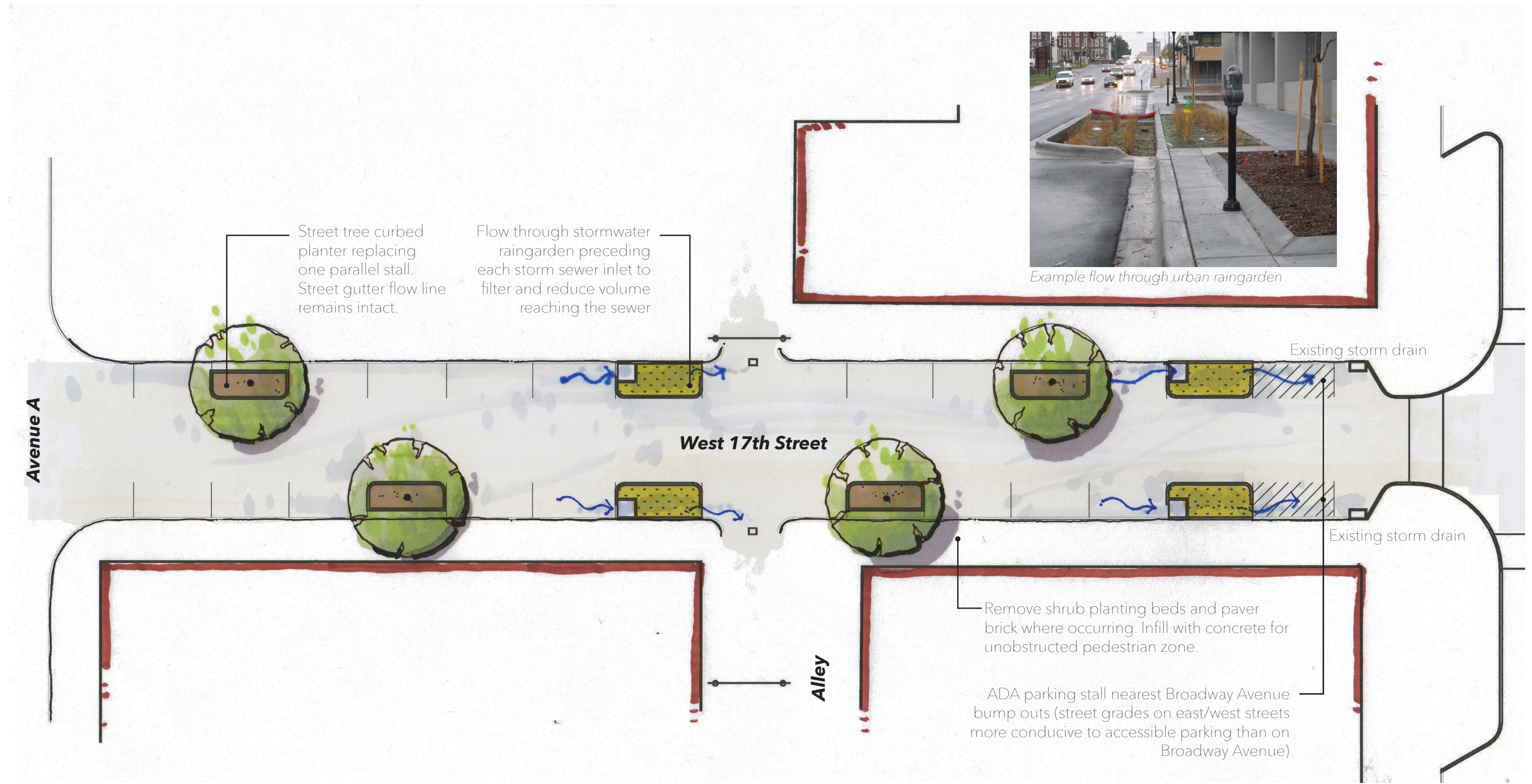
For both the stormwater basins and the urban tree planters within parallel parking stall zone, phased implantation and limited construction disturbance allows a great level of flexibility to incorporate these amenities. The basins and planters are independent to each other and require isolated saw cutting and pavement removal.

While each block recommendation is for a total of four (4) basins and four (4) planters, it is recommended that a parking needs determination is made by the City. Identify allowable total decommission of the number of stalls that is acceptable in conjunction with total public parking utilization in the downtown. This recommendation is not an ‘all or nothing’ solution – any level of tree and basin modification will serve the downtown better than no modifications.



Aerial key





Rendered plan



# 1st Avenue and Avenue A Street Trees

The primary recommendation for the 1st Avenue and Avenue A is centered around incorporation of urban street tree planters. The visual aesthetic will be enhanced, the pedestrian walkability experience will improve, and environmental quality benefits will be realized. All principles of urban treescapes as cited in other recommendations of this master plan document apply to these corridors.

It is recommended that street tree planters be located in alternating fashion either side of the streets with no specific spacing between them. The irregularity of driveways, power poles, and other urban amenities will dictate the cadence of planter spacing each block.

Each planter should strive to achieve a minimum of one-hundred (100) square feet of pervious soil area to sustain a single overstory deciduous tree. A suitable tree planter dimension would be 5' x 20' in order to retain ample pedestrian circulation patterns. Construction details of the planters as shown in this section. Note: while the newly constructed perimeter curb (angled) is not essential, it is recommended as a means to detect by the visually impaired and reduce the potential for a wheel chair or stroller wheel from dropping into the planter. Additionally, this curbing will better contain the mulch bed within.

While there is not a specific formula for the required quantity/density of tree planters along the corridor, the greater number of trees will increase the benefits and aesthetics of the corridor. For a mature overstory deciduous tree canopy diameter averaging 35', shade coverage near 900 square feet is provided. Canopy shade that will reduce the urban heat island effect, increase stormwater capture, and provide a beneficial visual aesthetic to the pavement dominant corridor.

See Appendix A for recommended urban overstory deciduous street trees for the Scottsbluff downtown.

**Dedicated bicycling corridors:** While not a landscape or stormwater management objective, it merits bringing attention to the bicycling community and the opportunity to further enhance the multi-modal usage of these two avenues. With Broadway Avenue containing head in parking stalls, the relatively wide street profile and exclusively parallel parking designation of 1st Avenue and Avenue A provides a better mode of cycling access to the downtown core.

It is noted here for the City's consideration to designate both 1st Avenue and Avenue A as posted bicycle routes in the downtown. A first phase implementation would be incorporating post-mounted signage. As popularity and frequency of use increases, the City can further enhance cycling provisions through pavement markings (bicycle symbols) or extend to a full commitment of decommissioning one side of the street parking and designating an exclusive bicycling lane. Parking utilization and bicycling daily loads on the avenues should first be conducted to warrant such a commitment however.

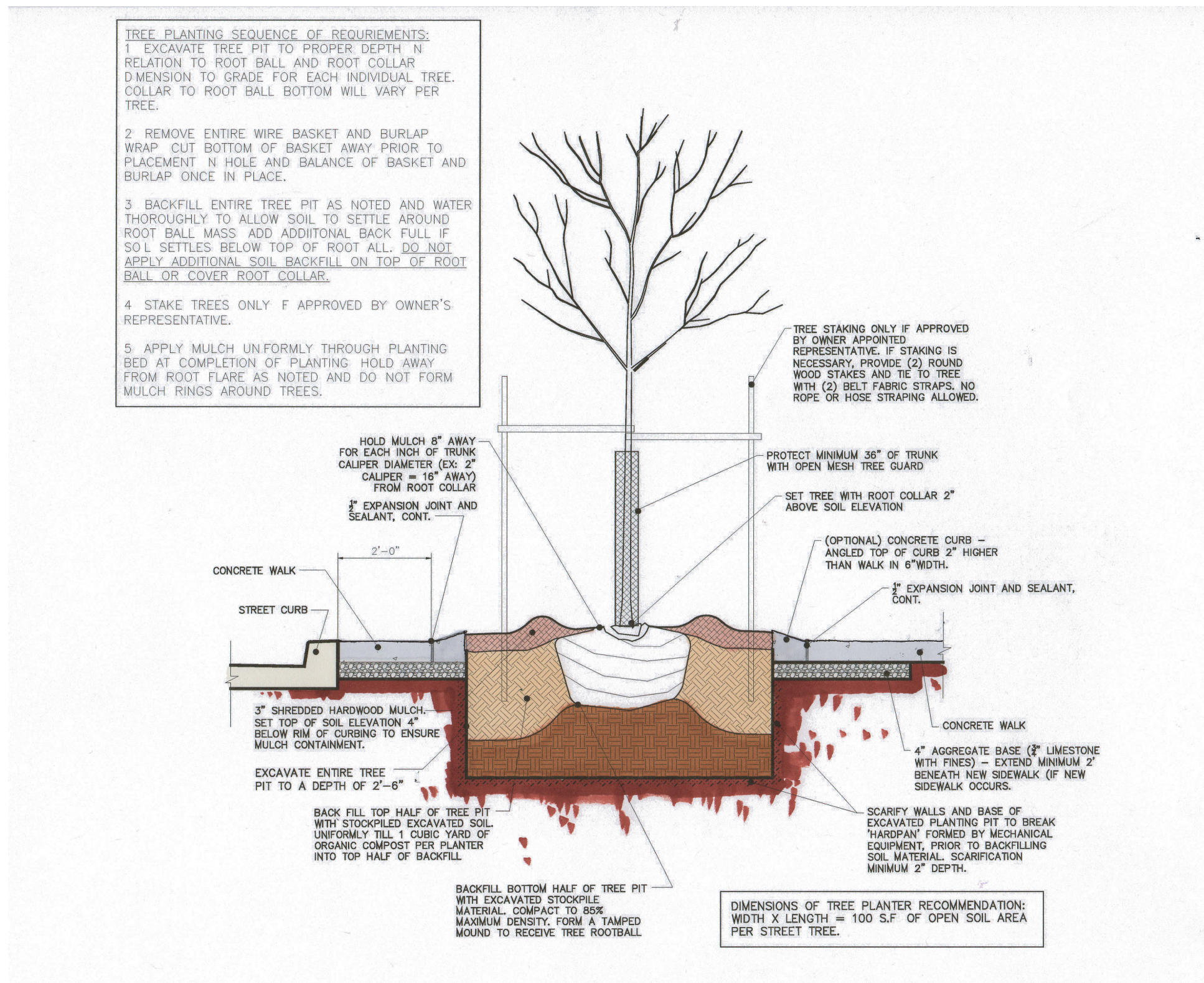


Existing conditions



Aerial key





Example urban tree planter detail



Bicycle lane signage



Bicycle lane marking



# East 17th Street Drop Off Lane

During the public engagement activities of the master plan effort, there was a voiced interest to provide a designated loading zone in proximity to the Midwest Theater. Primarily the request is focused on facilitating school bus drop off for student activities at the theater; however, this zone can serve vehicular drop off and pick up for individuals arriving in the downtown.

Implementation of the loading zone will require the decommissioning of six (6) parallel stalls along the half block face from Broadway Avenue bump out to the bisecting alleyway. For accessibility compliance, it is recommended to saw cut and provide a minimum of two (2) accessible ramps with detectable warning panels along the block face. Basic ‘no parking this side of block’ post mounted signage to designate the zone is the recommended minimum demarcation.

As a stormwater quality benefit and demonstration, there is an opportunity to retrofit all or a percentage of this 8’ wide loading zone lane to a permeable pavement. Whether in the form of a permeable unit paver (clay brick or concrete) or pervious concrete, this pavement would be constructed on a suitable aggregate substrate and perforated underdrain laid and tapped into the existing storm sewer at the alleyway. This contrasting pavement to the street asphalt as well as signage would further designate the loading zone.



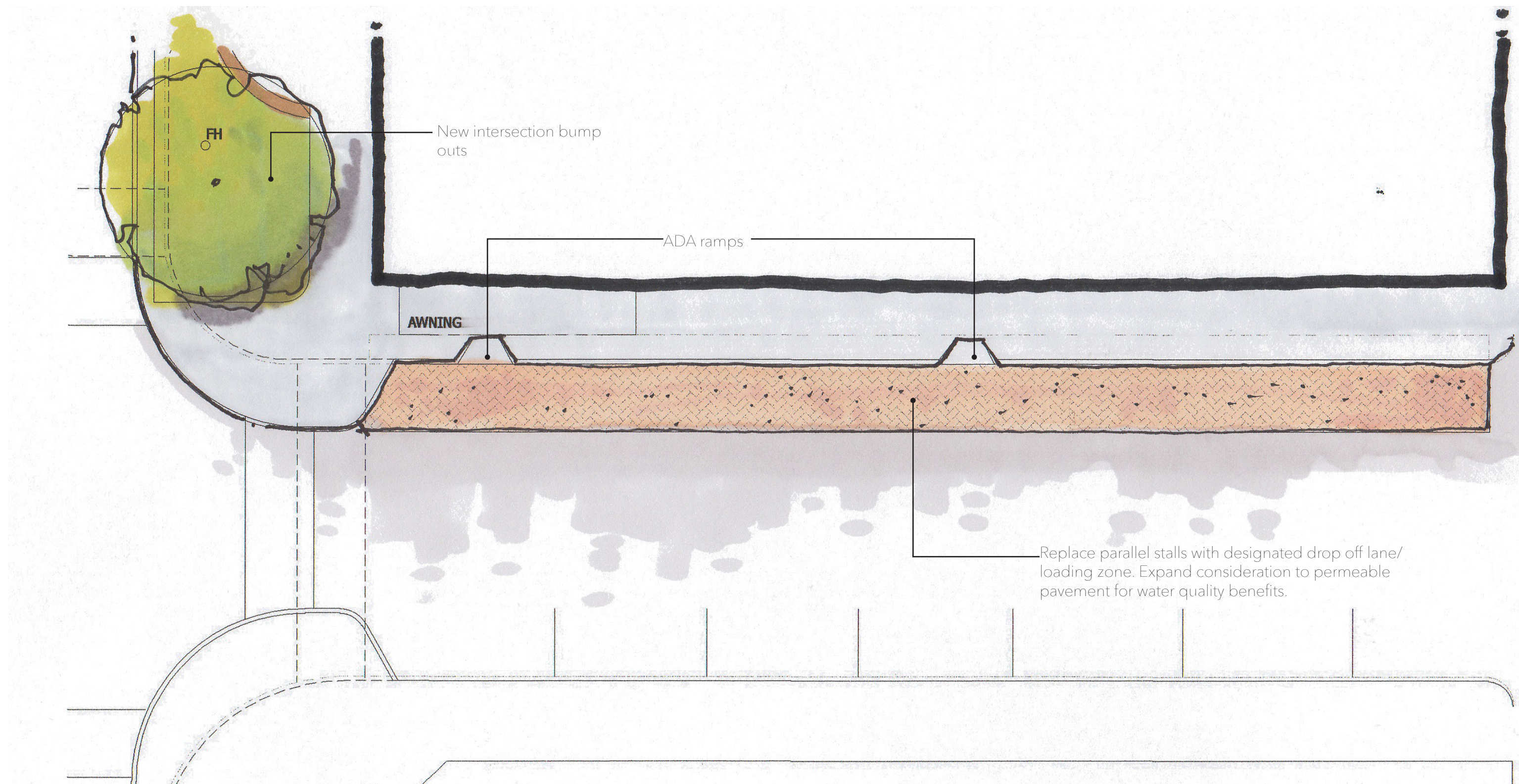
Existing conditions



Example permeable paver parking







Rendered plan



# Public Safety Building East Lawn Arboretum

The relatively expansive turfgrass lawn bounding the east side (Avenue A frontage) of the facility is currently the single largest pervious coverage area within the bounds of this master plan study. Recognizing the merit as a ‘green solution’ as it currently exists as reduction of urban pervious surfaces is valued. From a stormwater quality benefit, this approximately 17,550 square foot greenspace does reduce the volume of rainfall reaching the storm sewer system. However, increases to the stormwater volume capture and water quality improvements are not present without a significant lowering of the lawn’s gradient. All surrounding paved drainage patterns are either lower or flowing away from this greenspace.

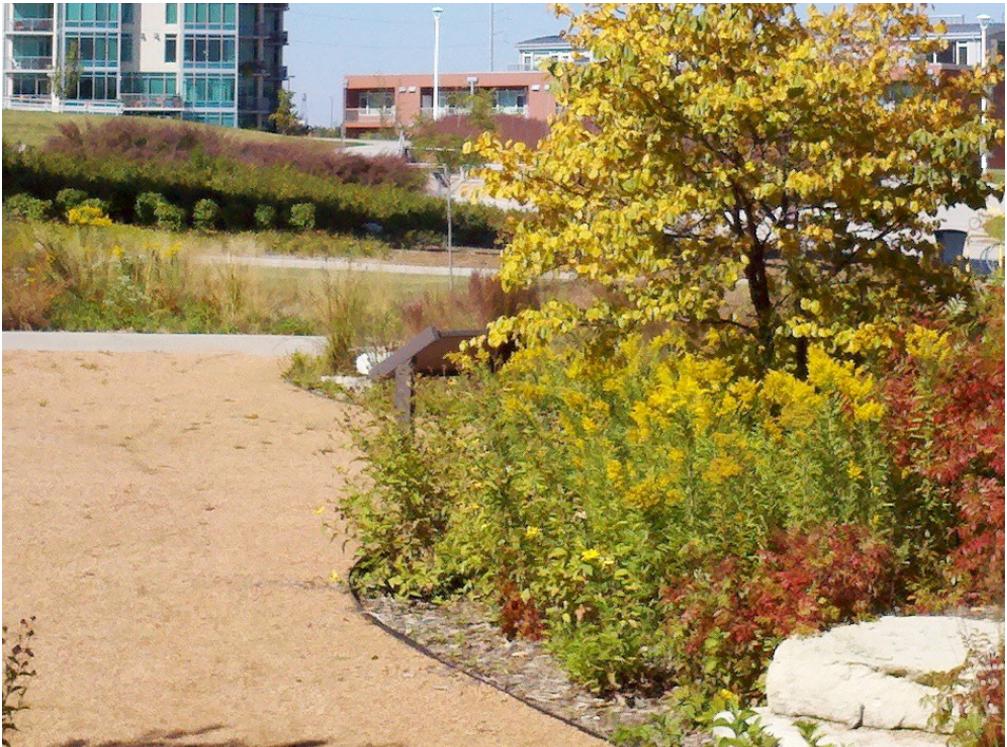
Opportunities for further enhancements and environmental quality benefits are available within this existing greenspace. As ornamental turfgrass, it is expected that site management efforts of mowings, fertilization and herbicide applications, and supplemental irrigation take place at some frequency for approximately two-thirds of the calendar year. Conversion of a percentage of this turf coverage to modify or reduce annual management ‘inputs’ as well as apply a more diverse aesthetic is recommended. Modifications to include:

**Establishment of an urban arboretum:** Deciduous tree canopies provide ‘double duty’ in rainwater capture both within the leaved canopy and the root zones. Tree species diversity would be showcased as regionally suitable plant selections for use within the Scottsbluff climatic influences and educational opportunities would be available. For reduction of turfgrass area, tree massings could be unified at the ground plane within sizable mulch beds encapsulating multiple trunks in a single bed. These planting beds can be further enhanced with suitable groundcover to provide living material not requiring a mowing regimen or chemical applications.

**Establishment of a native grassland patch:** In similar fashion to the City public parking areas of the downtown, a percentage of this lawn is an opportune location for integrating regionally native grasses and perennials. It is recommended that this area be established by seed, plugs, or a combination of the two – primarily for landscape cost efficiencies.

Awareness of a necessary establishment period of care and maintenance must be recognized. Until grassland matures and ‘knits’ together, site management attention will be necessary to keep weed pressure in control, irrigation, and intermittent re-seeding or re-plugging activities where voids are present from the initial germination.

**Pathway and stone:** to encourage engagement with the grassland and arboretum there must be the ability to circulate within and invite purpose to being within the space. Consideration of including an aggregate or paved path as well as pockets of large slab limestone is recommended. The pathway facilitates movement while the stone slabs provide not only a visual Western Nebraska sense of place, but also become seating or impromptu climbing and play by children.



Example urban garden

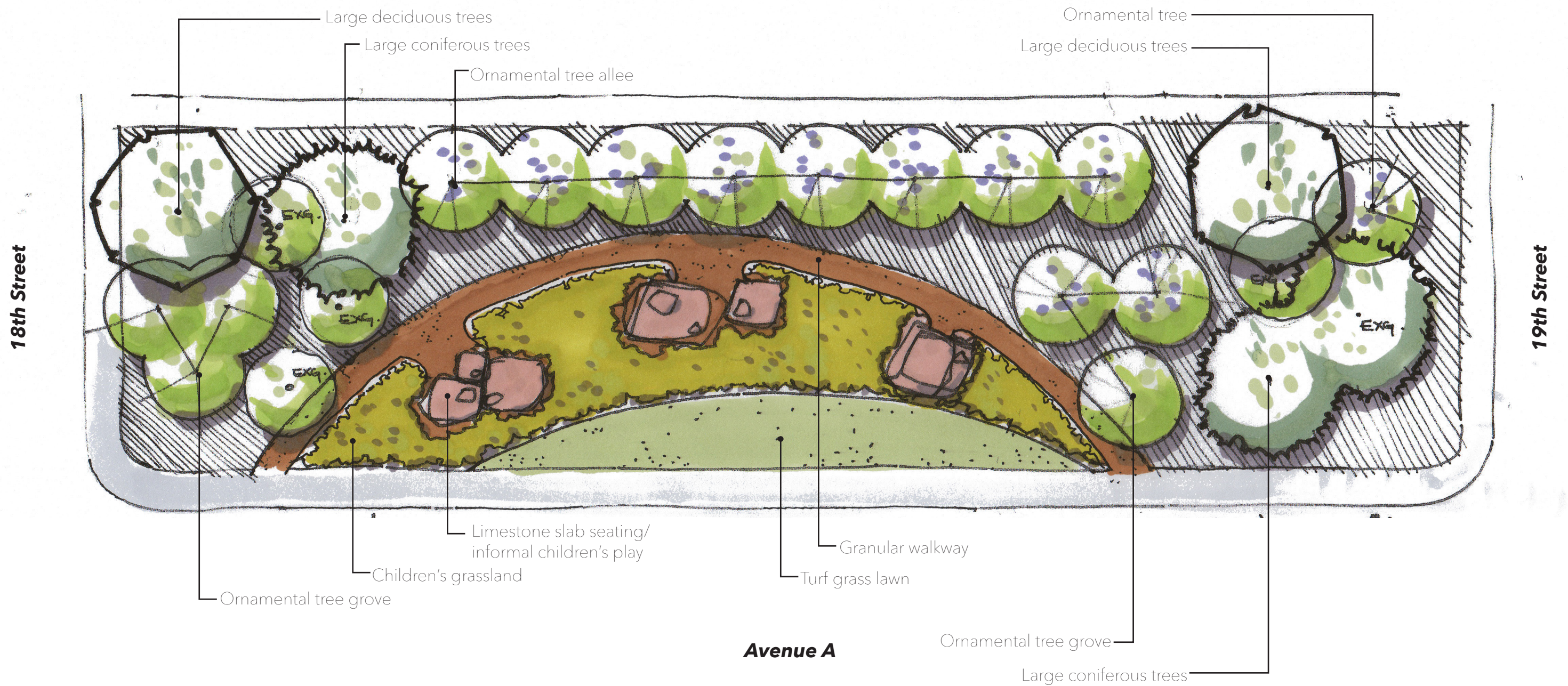


Example strolling garden



Aerial key





Rendered plan



# First Responders Park

**‘First Responders’ Pocket Park’:** Evaluation of this space includes not only a first phase arboretum and grassland opportunity, but also explores how this space can further become an intentional destination in the downtown. Being located at the Scottsbluff Public Safety Building, establishment of a memorial for service could be a very suitable use of the space. Proposed concepts associated with this amenity include:

**Construction of a hardscape plaza for congregating:** Pavement can be basic concrete or unit pavers, with consideration of permeable pavement’s water quality benefits.

**Placement of an abstract sculpture or figure statue embodying the service of all emergency responders and central focal point of the east lawn and plaza.**

**Introduction of a ‘dancing’ water feature emerging from the plaza:** While there is a cost, water consumption, and maintenance requirement for an urban water feature, this location would be a suitable location to introduce that amenity which engages a space and encourages informal play. The connotation of children engaged in the outdoors under the watch and protection of the police officer is an image of value to the community that would be an intangible beauty of the space.

**Integration of this level of further enhancement may be seen as an extension of successful programmed activities within the downtown, specifically the farmer’s market:** Being on the 18th Street corridor, this tie between the market park and this ‘First Responder’s Park’ potentially enlarges the area and increases the time spent on a weekend in the downtown.



Chicago Police Memorial Sculpture



Chicago Police Memorial paving detail

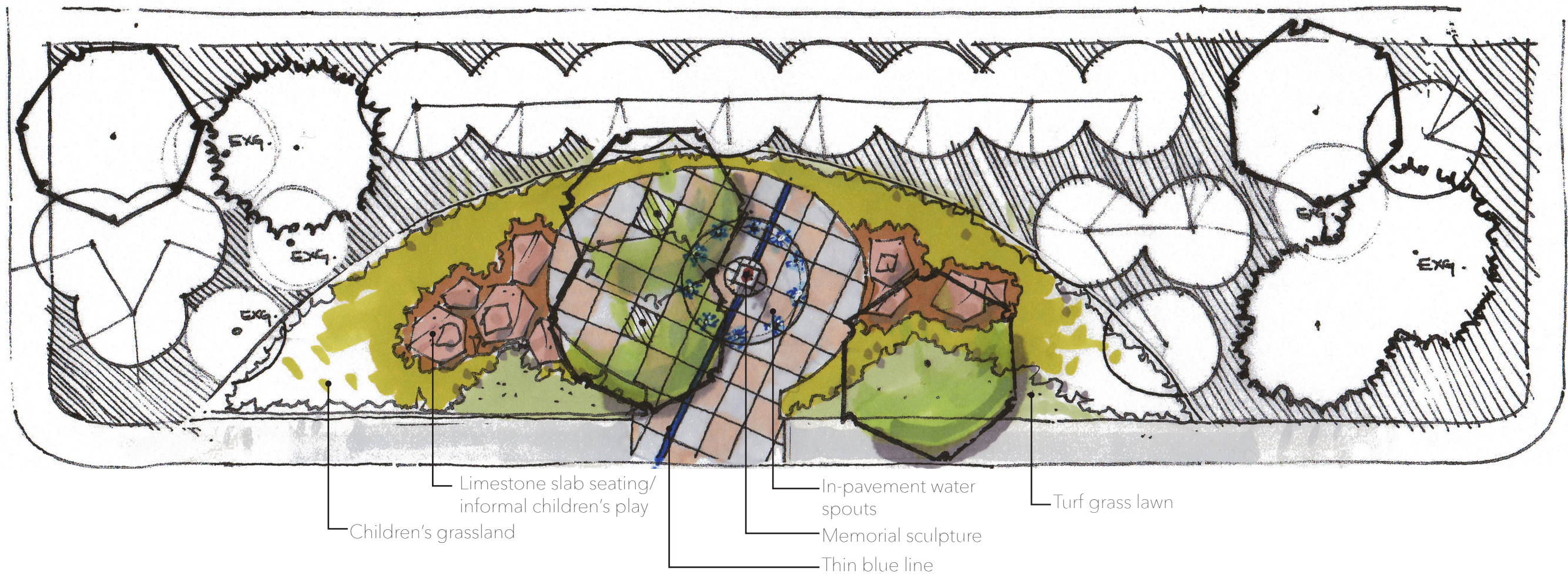


Public Safety building and grounds



18th Street

19th Street



Avenue A

## First Responders Park

Rendered plan

city of scottsbluff, nebraska - downtown streetscape master plan | 27



# 18th and Broadway Public Park

A destination location within the urban core of a community often aids as a catalyst for activity and community interaction. A place that provides the ability to meet a friend or family member, to take in a lunch on a pleasant day, or host any number of programmed public activities.

The existing dedication to the northeast corner of 18th Street and Broadway Avenue is clearly identified as the current location for this identifiable public gathering space. The continuing success of the Farmers Market through the growing season and the fiscal investment of shade structures to facilitate, a recommendation is proposed to expand this area to further accommodate activity.

During the public engagement activities of this project, the concept to evaluate the closure of the first half block of East 18th Street from Broadway Avenue to the alley was shared and received feedback from consideration to positive support. A City decision to implement this street closure would increase the daily public use space by 3 times and provide a greater permanence for programmed activities (Farmers Market, etc.) without temporary barricades or closures. Further opportunities in this park expansion include a potential for pervious surface decreases and urban landscape increases – both positive strides towards the stormwater and air quality improvement objectives of this project effort.

The existing park space is indeed a known public space in the downtown and this recommendation is to take that established identity and push it towards its full potential.

The recommendation to decommission part of 18th Street for this public space, approval and action is ultimately a city determination. If closure of the street is declined, it is recommended that the street adhere to the east/west numbered streets tree planter and stormwater basin recommendations within this document.

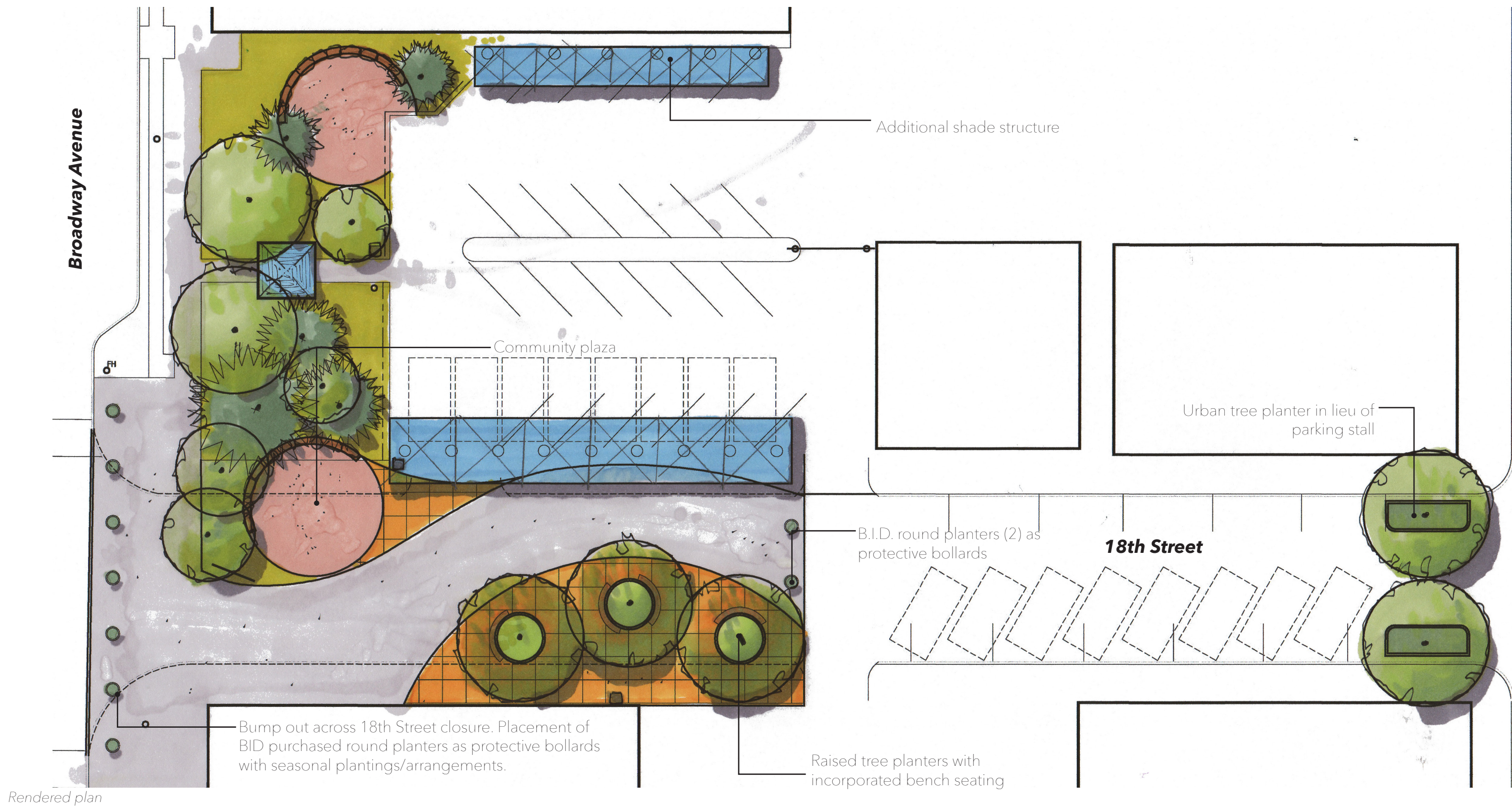


Current shade structure on 18th Street and Broadway Avenue



Aerial key





Rendered plan



# Appendix A - Horticultural considerations

Designing and selecting plant material for the downtown Scottsbluff project area has a number of significant influences that will directly influence the success of the landscape performance. Plant species and their placement cannot be seen as arbitrary or considered universally applicable. The climatic and soil characteristics of the Scottsbluff area compounded by the stresses and influences of the urban condition require that only vegetation that can suitably respond belong. From an aesthetic perspective and achieving the overarching goal of increased activity and commerce in the downtown, selected vegetation should be ‘garden worthy’ in appearance and not detract from the experience of the corridor or display of businesses.

In generating the recommended plant species found in this appendix, collaboration between experienced design horticulturists, Scottsbluff local horticultural practitioners, and Nebraska Forest Service experienced representation were utilized. Notation of not only plant species, but specific cultivar of that species were discussed and selected based upon observed performance in the Scottsbluff immediate area. It is strongly recommended that these selections are adhered to in the implementation of the master plan. This does not preclude future consideration of alternative cultivars; however, substitutions should only be made if observed relevant precedence is provided and evaluation by horticulturally experienced individuals is conducted.

A narrative design approach to landscaping the Scottsbluff urban corridor:

**When it comes to color:** Its usage is far more important than its frequency. The effective use of color makes all the difference in terms of both visual impact and overall maintenance inputs.

**When it comes to height:** Elements of height introduce rhythm, continuity, and extends the composition skyward. Repeated elements within the planting that function as narrow, yet firm pillars create visual ‘snapshots’ of the composition. They serve as ‘mile markers’ of pause, but allow the participant to see what is either behind or beyond the vertical extension. Such upright elements offer interest and distinction at a time of year when everything else in the planting is of similar height. The introduction of intentional height lends architectural structure to the planting design.

**Form comes first – color comes second:** A variety of shapes and textures trumps the push for color. When form and texture take precedence, color contributes at the appropriate level. Strong stems, dominant shapes, and textural interplay of the planting composition takes priority.

**‘Dreamy Grasses’:** Distinctive textural differences are pronounced with the use of ‘dreamy’ or ‘misty’ grasses. No prairie planting would be representative of its heritage without them. As the season progresses from Spring to Fall, the unique textures of the inflorescence and seed heads of the grasses celebrate the lush growth of Summer. The perennials now appear to be immersed in and amongst the grasses echoing the natural habitat of the surrounding Scottsbluff landscape.

**Seedheads – Intricate yet hazy:** Structure is then carried into the off season with all the dried flower heads from the collaboration of the shrubs, perennials, and grasses. An affirmation of the importance of structure and form carrying the design load of the composition.

## Trees

- Hackberry (Celtis occidentalis)
- Hop Hornbeam (Ostrya virginiana)
- Kentucky Coffee Tree ‘Espresso’ (Gymnocladus dioica)
- Prairie Gold (Aspen Populus tremuloides ‘Prairie Gold’)
- English Oak (Quercus robur)
- Crimson Spire Oak (Quercus robur x Quercus alba ‘Crimschmidt’)
- Chinkapin Oak (Quercus muehlenbergii)
- Hot Wings Maple (Acer tataricum ‘GarAnn’)
- State Street Maple (Acer miyabei ‘Morton’)
- Japanese Tree Lilac (Syringa reticulata)
- Northern Catalpa (Catalpa speciosa)
- Serviceberry (Amelanchier canadensis)

## Shrubs

- Pawnee Buttes Sandcherry (Prunus besseyi ‘Pawnee Buttes’)
- Potentilla Dakota Sunspot (Potentilla fruticosa ‘Fargo’)
- Autumn Ember Sumac (Rhus triloba ‘Autumn Amber’)
- Autumn Magic Black Chokeberry (Aronia melanocarpa ‘Autumn Magic’)
- St. Mary’s Broom Spruce (Picea pungens ‘St. Mary’s Broom’)
- Apache Plume (Fallugia paradoxa)
- Lead Plant (Amorpha canescens)
- Ninebark (Physocarpus sp.)
- Viburnum (Viburnum sp.)
- Blue Shag Pine (Pinus strobus ‘Blue Shag’)

## Perennials & Grasses

- ‘Silver Brocade’ Wormwood (Artemesia stelleriana ‘Silver Brocade’)
- SIdeoats Gramma (Bouteloua curtipendula)
- ‘Ballerina’ Geranium (Geranium c. ‘Ballerina’)
- Indian Rice Grass (Oryziosis hymenoides)
- Prairie Dropseed (Sporobolus heterolepis)
- Carousel Little Bluestem (Schizachyrium s. ‘Carousel’)
- Pineleaf Beardtongue (Penstemon pinifolius)
- Pikes Peak Purple Beardtongue (Penstemon x mexicalli)
- Blazing Star (Liatris spicata ‘Kobold’)
- Prairie Clover (Dalea purpurea)
- Sunray Tickseed (Coreopsis g. ‘Sunray’)
- Purple Dome Aster (Aster ‘Purple Dome’)
- Prairie Smoke (Geum triflorum)
- False Blue Indigo (Baptisia australis)
- Comanche Campfire Primrose (Oenothera m. ‘Comanche Campfire’)
- ‘Golden Baby’ Goldenrod (Solidago c. ‘Golden Baby’)
- Sedum (Sedum)
- Switchgrass (Panicum ‘Shenandoah’)
- Purple Coneflower (Echinacea purpurea)
- Black-Eyed-Susan (Rudbeckia f. ‘Goldsturm’)
- Hyssop (Agastache)
- Butterfly Milkweed (Asclepias tuberosa)
- Arizona Sun Blanket Flower (Gaillardia x g. ‘Arizona Sun’)
- ‘Paprika’ Yarrow (Achillea m. ‘Paprika’)







# Appendix B - Landscape Management Recommendations

Design and installation of the urban landscape is a process with a conclusion; however, that ending is simply the departure point for the true beginning of the landscape's life cycle. It is imperative that a landscape design meets the City at a level of care and maintenance that can sustain long term in both annual budget and manpower operations. The following narrative is a summary of recommended maintenance activities for classifications of plant types followed by potential budget allocations for the proposed solutions contained within this master plan.

Development of these recommendations was generated by horticultural practitioners within Dropseed Studio/Kinghorn Gardens based years of applied experience in the field. While these recommendations adhere to sound horticultural practices, it must be noted that every site condition, species of vegetation, and unique microclimates may display variances to plant response. These recommendations are to be considered a base line in which to apply but evaluate each landscape area within the project area for modifications necessary to care and maintain the landscape.

**Trees: Initial Post Installation Practices:** Ensure that each planted tree was of specimen quality, free of wounds or disease, and were installed to proper horticultural practices. The International Society of Arboriculture, the Nebraska Forest Service, or the University of Nebraska Extension Service are all suitable references in which to identify proper planting practices. Tree staking is appropriate where high winds are experienced. Ties should be suitable for arbor applications (no cable, wire, or hose) and uniformly staked to remain upright. Tree staking should only remain in place for one full year as the tree needs to 'learn to stand on its own' and develop a substantial root system. Remove all arbor ties so as not to scar or 'choke' the trunk and branching. Provide a 36-inch high open plastic mesh tree guard around the tree upon planting. Provide a diameter such that the tree trunk does not rub on the mesh. Air flow to the trunk is essential so as not to retain moisture against the bark which increases risk of disease or pest infestation. Removal can be a couple of few seasons after planting, pending potential of small wildlife activity in the downtown (squirrel or rabbit). It is recommended that a 48-inch high open metal fencing (flexible hog panels or similar) be installed at a diameter beyond the branching limits of the tree. While this is an urban environment and deer rubbing or other wildlife encounters are not realistic, human behavior is additionally unpredictable. Removal when tree achieves a 4 to 5-inch diameter. Do not prune trees when first planted unless it is to remove broken branches.

Return and prune trees for form where necessary the Spring following installation. Pruning should only be done by an arborist or other qualified individual who can identify double leaders, branch crossings, or other form developments that will become troublesome as the tree matures.

**Trees: Annual Care and Maintenance:** Remove weeds from tree pits through weekly checks (if possible) May through October. Irrigation as provided by in-ground programmed system. This is not to be a 'turn it on and forget it' effort. Review trees during the season for signs of over or under watering. This should be done by a trained individual who can identify signs of moisture stress in the tree. As trees mature they should rely more on feeder roots to seek moisture and supplemental irrigation should be adjusted accordingly. Provide 1 ½-inch to 2-inches a week for first several months post installation. Provide at low rate frequently. Reduce to 1-inch per week applied at a higher rate but less frequently. Monitor and adjust accordingly. Apply mulch annually in early Spring or late Winter based upon natural snow cover as insulator. At no time should mulch be a thickness greater than 3-inches. New mulch should either be 'top dressing' for appearance or old mulch should be partially removed and only enough new mulch be applied to achieve the 3-inch maximum depth. Do not place mulch against the trunk or root flare (moisture against bark increasing disease and pest risk). Excessive mulch thickness can lead to natural rainfall suspension in the mulch vs. reaching the soil and decrease of oxygenation to the soil. Wrap tree trunks to first branch flare with burlap in the Fall before Winter weather conditions begin. Burlap to serve as protection against sun scald as well as food seeking wildlife. Remove wrap in Spring (May). Discontinue after first Winter on any rough bark trees. For any smooth bark trees that lack natural sun scald defenses, seasonal protective wrapping should be a long term maintenance practice. Prune branches only as necessary by a qualified individual. Same objectives – avoid crossing limbs or double leaders as well as breakage. Prune when dormant. Provide clean cuts with sharp tools and do not apply any 'wound heal' type product – allow trees to naturally scab over.

**Shrubs – Annual Care and Maintenance:** Apply mulch annually in early Spring or late Winter based upon natural snow cover and insulator. Maintain a maximum 3-inch thickness of mulch. See tree annual care notes for other principles of mulch use. Irrigation by in-ground system and rates same as noted in tree section. Monitor for signs of moisture stress (too much or too little) and adjust

accordingly. Prune only where necessary after first year of establishment. Do not prune the year of initial planting. Allow shrub to establish without inducing undo stress on the plant. Weed weekly from May to October if possible, or at a frequency that can be expended. Apply appropriate fertilization to shrubs the initial year of planting to aid in establishment. Fertilize only per manufacturer's specifications. Subsequent season fertilization is beneficial but not mandatory.

**Native Grasses – Annual Care and Maintenance:** Apply mulch, irrigation, fertilization, and weeding activities same as shrub materials. Mulch application will greatly reduce as grasses mature to full diameter and natural weed suppression will take place to additionally reduce that maintenance activity. Cut native grasses down to 4 to 6-inches in late winter before they break bud. Leaving native grasses at full height through Fall and Winter provides visual interest.

**Perennials – Annual Care and Maintenance:** Apply mulch, irrigation, fertilization, and weeding activities same as shrub and native grass materials. Mulch application will reduce as perennials mature to full diameter and natural weed suppression will take place to additionally reduce that maintenance activity. Cut perennials back annually in the Fall. Winter interest is not as prominent in perennials as it is with native grasses. Weed control around perennials is most essential the first 3 growing seasons of the plant to achieve establishment and dominance.

Use of chemical pre-emergent: While there is an increase in cost for product, there is a savings in labor in applying chemical weed suppression. Require that all individuals applying chemicals have the proper certifications and protective cover at all times. Pre-emergent chemical application is best suited for the first and potentially second season post installation. It is recommended that pre-emergent use is discontinued beyond that initial period. The determination of use should take into consideration of chemicals sterilizing the soil vs. the opportunity for initial growth vigor in the plant.

In all maintenance activities and applications applied to the urban landscape, the single greatest benefit to the vigor and health of vegetation will be in building good soils! Opportunities to utilize organic, slow release fertilizers



and allow for decomposition of plant and mulch material to build beneficial microbes in the soil will be evident in the positive response by the vegetation.

**Maintenance Annual Budgets:** Maintaining the installed landscape will be variable based on initial vs. subsequent growing seasons and whether efforts are performed by City staffing or contracted to a private sector landscape provider. For purposes of this appendix, annual maintenance dollars are based on the level of recommendations provided herein as a baseline of consideration. Anticipate a gradual reduction in annual maintenance costs as vegetation matures, weed pressure and mulch needs decrease.



# Appendix B - Landscape Management Recommendations

Broadway Avenue Landscape Maintenance				
15th to 20th Streets Inclusive				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Landscape Maintenance				
Spring Clean Up - Labor and Equipm	54	Hours	\$60.00	\$3,240.00
Spring Clean Up - Mulch	60	CY	\$50.00	\$3,000.00
Monthly Maintenance (2x per, May-C	200	Hours	\$60.00	\$12,000.00
Fall Clean Up/Winterization	24	Hours	\$60.00	\$1,440.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$500.00	\$500.00
			Subtotal	\$20,180.00
Contingency (5%)				\$1,009.00
			Total	\$21,189.00

Public Parking Lots Landscape Maintenance				
All Plan Identified Lots Inclusive				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Landscape Maintenance				
Spring Clean Up - Labor and Equipm	64	Hours	\$60.00	\$3,840.00
Spring Clean Up - Mulch	100	CY	\$50.00	\$5,000.00
Monthly Maintenance (2x per, May-C	240	Hours	\$60.00	\$14,400.00
Fall Clean Up/Winterization	32	Hours	\$60.00	\$1,920.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$750.00	\$750.00
			Subtotal	\$25,910.00
Contingency (5%)				\$1,295.50
			Total	\$27,205.50

East/West Numbered Streets				
15th through 19th Streets Inclusive				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Landscape Maintenance				
Spring Clean Up - Labor and Equipm	54	Hours	\$60.00	\$3,240.00
Spring Clean Up - Mulch	36	CY	\$50.00	\$1,800.00
Monthly Maintenance (2x per, May-C	96	Hours	\$60.00	\$5,760.00
Fall Clean Up/Winterization	16	Hours	\$60.00	\$960.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$350.00	\$350.00
			Subtotal	\$12,110.00
Contingency (5%)				\$605.50
			Total	\$12,715.50

1st Ave and Avenue A Tree Planters				
15th to 20th Streets Inclusive				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Landscape Maintenance				
Spring Clean Up - Labor and Equipm	48	Hours	\$60.00	\$2,880.00
Spring Clean Up - Mulch	20	CY	\$50.00	\$1,000.00
Monthly Maintenance (2x per, May-C	96	Hours	\$60.00	\$5,760.00
Fall Clean Up/Winterization	16	Hours	\$60.00	\$960.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$200.00	\$200.00
			Subtotal	\$10,800.00
Contingency (5%)				\$540.00
			Total	\$11,340.00



Public Safety Building Arboretum				
(First Responders Park)				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Landscape Maintenance</b>				
Spring Clean Up - Labor and Equipm	40	Hours	\$60.00	\$2,400.00
Spring Clean Up - Mulch	24	CY	\$50.00	\$1,200.00
Monthly Maintenance (2x per, May-C	64	Hours	\$60.00	\$3,840.00
Fall Clean Up/Winterization	16	Hours	\$60.00	\$960.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$200.00	\$200.00
			<b>Subtotal</b>	<b>\$8,600.00</b>
Contingency (5%)				\$430.00
			<b>Total</b>	<b>\$9,030.00</b>

18th Street and Broadway Avenue Public Park				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Landscape Maintenance</b>				
Spring Clean Up - Labor and Equipm	12	Hours	\$60.00	\$720.00
Spring Clean Up - Mulch	8	CY	\$50.00	\$400.00
Monthly Mowing and Maint (4x, May-	64	Hours	\$60.00	\$3,840.00
Fall Clean Up/Winterization	12	Hours	\$60.00	\$720.00
Misc. Product (wrap, fertilizers, etc.)	1	Allow	\$200.00	\$200.00
			<b>Subtotal</b>	<b>\$5,880.00</b>
Contingency (5%)				\$294.00
			<b>Total</b>	<b>\$6,174.00</b>



# Appendix C - Concepts of sustainable and efficient irrigation

Turf and landscape irrigation has changed dramatically over the last ten years. The use of computers to operate, design and test new irrigation equipment coupled with the market demand for more efficient use of our most precious resource has brought irrigation into the forefront of sustainability. The use of the word sustainability in irrigation means to use the water that is necessary to support the landscape in the most efficient manner possible. To meet the needs of the present without compromising the ability of future generations to meet their own needs. To use the water that is necessary to maintain a healthy landscape and turf in the most efficient way possible through design, irrigation equipment, water management and proper maintenance.

**Irrigation Equipment and Benefits:** Control of the Irrigation System, First of two options:  
Conventional systems require that a dedicated electrical circuit, consisting of one “hot” wire and one “common” wire, activate each solenoid or valve. In a system with 25 valves, that’s a minimum of 26 wires runs from the controller to the field; 25 “hot” wires and one “common” wire. If the valves are evenly spaced along a 1,000-ft. mainline, that can mean as much as 14,000 ft. of wire is needed to run from the controller to the valves.

**Proposal/Option One; 2-Wire Decoder Controller & Valves:**  
In a two-wire system, a decoder with a unique electrical signature or serial number is wired into each solenoid. A wire path consisting of (you guessed it) two wires is installed from the controller to each decoder in the field. To operate a solenoid, the controller sends a message along the wire path to a specific decoder, much like making a phone call. The decoder receives the signal meant for it alone, interprets the data, and then completes the electrical current to operate the solenoid.

For a system of 25 valves with a 1,000-foot mainline, installation would require only 1,000 ft. of wire and 25 decoders.

From an installation standpoint, this can significantly reduce your labor and materials cost for new irrigation systems. As the costs of copper and labor increases, most systems that are upward of 25 valves, or even less, are more easily and effectively installed as a two-wire system. Installation of phased projects is vastly simplified, as no additional wires are required to expand the system: Simply extend the two-wire path into the new project phase to connect any new devices.

Two-wire systems can provide a host of benefits not only in the installation

of a system, but also in the design and maintenance. The system can be expanded with ease, through modular design, and works well in liner irrigation systems such as streetscapes.

- Water Savings; Effective Evapotranspiration (ET) based system management, when used in a 2-wire system, can ultimately result in water savings of 30 – 50% per year, depending on current or manual management practices. (ET) adjusts run times based on water loss from the soil through evaporation and water loss through plant transpiration ensuring that the right amount of water is applied without over watering or under watering. Automatic adjustment to watering schedules based on evapotranspiration (ET) will ensure the most efficient irrigation program possible.
- A Healthier Landscape — A two-wire controller system helps ensure your landscape receives the right amount of water. Good irrigation management, through (ET) management, can reduce leaching and run-off and will reduce fertilizer, pest infestations and disease.
- Reduced Labor Costs — By regulating all irrigation schedules from a single controller or personal computer, the user no longer needs to make schedule adjustments at each controller. System shut-downs for maintenance occur quickly, allowing more effective use of time.
- Damage Prevention — The system monitors current hydraulic conditions through a flow sensor and takes action to prevent washout in the event of pipeline or sprinkler head breaks. Detection and isolation of breaks occur in minutes instead of hours.
- Gas and Vehicle Wear Savings — The user no longer has to drive around to all the controllers to make programming changes or look for problems, the controller will locate and notify.



**Proposal/Option Two; Battery-Operated Controller & Valves:**  
BOS-II™ Series Battery-Operated Irrigation Controllers  
Commercial Level Control for Battery-Operated Systems

The TBOS-II battery-operated line of buriable irrigation controllers allows the use of automatic irrigation in challenging areas where AC power is not available. Its water saving programming features maximize water efficiency by letting you build highly-customized programs.

With seven advanced programming features, the TBOS-II™ cuts setup time and eliminates repeat trips to the controller, resulting in water-efficient programs and lower operating expenses.

- Advanced Water Management**
- Seasonal Adjust: Automatically adjusts station run times for each month
  - Master Valve: Extra support for stations that require a back-up to minimize water leaks or need extra water pressure



- Time-Saving Programming**
- Review Programs: Automatically verifies if the system is correctly programmed
  - Programming Templates: Save commonly-used programs as a template that can be transferred to other controllers
  - Test All Valves: Automatically tests if the system is correctly programmed and wired
  - Contractor Default Program: Save a customized default program that can be automatically restored at a later date
  - Naming Stations: Identify valves and their function without turning on the system programs

- Flexible Programming**
- Run-time from 1 minute to 12 hours in 1-minute increments
  - Basic programming includes 3 independent programs with flexible days cycles including custom even, odd, odd-31 and 1-6 day program cycles for maximum flexibility
  - 8 start times per program per day
  - Independent station operation allows simultaneous start times or sequential start times based on system hydraulic capacity

- Easy to Use Interface**
- Battery indicator reports battery status in the TBOS Field Transmitter
  - The TBOS field transmitter has a large Liquid Crystal Display (LCD) with self-explanatory function icons. Each function is indicated by an easy-to-understand symbol
  - The 7-key keypad is equipped with a “beep” sound to confirm that a key has been pressed for fast and sure programming
  - One TBOS field transmitter programs an unlimited number of TBOS Control Modules
  - Field transmitter and control module have external infrared connectors for easy plug-in



- It is possible to transmit information even if the module is under water

Irrigation Heads: If needed or used the following principles will be employed;

All irrigation sprinkler heads will have in-stem pressure regulation to maintain optimal water pressure. Every 5 psi reduction in pressure reduces water usage by 6-8%. A 70 psi system reduced to a recommended 30 psi can provide more than 50% in water savings. All irrigation sprinkler heads will be high efficiency with a distribution uniformity, DU, efficiency of at least 75% as determined by the Center for Irrigation Technology and the Irrigation Association.



#### Subsurface Drip Irrigation, SDI:

Subsurface Drip irrigation, also called micro-irrigation or Xerigation®, uses tubing and emitters to apply a slow, steady trickle of water directly to the soil at the plant's root structure. Through gravity and capillary action, water spreads slowly down to plant roots, reducing water loss to surface evaporation. Drip can often be a more efficient way to water trees, shrubs, flower beds, ground cover or borders. A drip system can be 30% to 50% more efficient than traditional sprinkler irrigation on landscapes for which drip is appropriate. Drip can also reduce runoff and plant disease, which can result from over-watering.

#### Netafim Techline® CV (17mm Dripline)



Netafim continues to be the leader in innovation in the Landscape & Turf dripline market by introducing Techline CV manufactured with post-consumer recycled polyethylene. Techline CV Dripline has the most technologically advanced dripper available. Techline CV's Check Valve feature keeps water from draining out of the dripline after zone shut-down.

#### Features & Benefits:

- 2 psi Check Valve in Each Emitter: All emitters turn on and off at the same time, maximizing balance of application. Holds back up to 4.6' of water (elevation change). No low emitter drainage, great on slopes. Delivers more precise watering.
- Unique Patented Emitter Design with Physical Root Barrier: Offset flow path, extra large bath area and raised outlet prevent root intrusion without chemical reliance.
- Pressure Compensating: Precise and equal amounts of water are delivered over a broad pressure range.
- Continuous Self-Flushing Emitter Design: Flushes debris as it is detected, throughout operation, not just at the beginning or end of a cycle, ensuring uninterrupted emitter operation.
- Emitter With Anti-Siphon Feature: Prevents ingestion of debris into tubing caused by vacuum.
- Self-Contained, One-Piece Dripline Construction: Assures reliable, easy installation.
- Flexible UV Resistant Tubing: Adapts to any planting area shape - tubing curves at a 7" radius. For on-surface installations withstands heat and direct sun.
- Qualifies for use on LEED Projects: Contains the required quantity of post-consumer and post-industrial recycled material.
- Makes Installation Quicker : Does not require air/vacuum relief vent or automatic flush valve for subsurface installations.

#### Sensors:

Additional system and environmental monitoring can also be incorporated, many different sensors such as weather stations, flow meters/sensors, as mentioned previously, rain sensors, wind and soil moisture sensors. These sensors monitor site conditions and report to the central computer or controller. The system automatically responds if any field conditions are outside the pre-defined limits set by the system operator

#### Wireless Rain & Rain/Freeze Sensors:

Rain and rain/freeze sensors are a "must have" component for irrigation systems these days. Rain Bird designed the new WR2 wireless sensor to exceed the standard. With revolutionary features, this sensor saves time, improves system performance and enhances your reputation as a water management expert. Reliable signal transmission and other innovations deliver superior responsiveness to rainfall and cold temperatures, while user-friendly features cut installation and programming time in half. Choose your own rainfall set points and save up to 35% on water usage while promoting lush, beautiful landscapes.

#### Summary for water conserving irrigation equipment; Six Key Equipment Technologies to Conserve Water:

1. Operates Based on Weather and Evapotranspiration
2. Flow Sensing and Leak Detection
3. Pressure Regulation
4. High-Efficiency Nozzles
5. Low Volume and Direct to Root Landscape Irrigation, SDI.
6. Durability/Low Maintenance to Perform as Specified

#### The Irrigation System Design:

The most water-efficient products alone cannot solve our water shortages or produce an efficient irrigation system. However, these products in the hands of people who recognize water as a precious resource and who know how to use them properly can certainly provide a meaningful solution.

The irrigation system will incorporate the latest in irrigation equipment in a design that will utilize their features in the most efficient irrigation system possible. The irrigation consultant is a Certified Irrigation Designer, (CID) and Certified Landscape Irrigation Auditor, (CLIA) through the Irrigation Association. He is also a LEED AP, United States Green Building Association. He holds certificates in Advance Irrigation Design and has received the 2011 & 2013 National Excellence in Irrigation Honor Award by the American Society of Irrigation Consultants. He will provide the design, specifications and installation details that will include all of the information necessary to provide an efficient water conserving irrigation system. The irrigation details will show installation of each component of the system and construction observation will insure that the design intent is met. This will insure that the irrigation system will serve the needs of the turf and landscape in Scottsbluff for many years.

#### Resources:

- The Irrigation Association: Turf and Landscape Irrigation Best Management Practices (<http://www.irrigation.org>)
- American Society of Landscape Architects (ASLA): Code of Environmental Ethics (<http://www.asla.org>)
- American Society of Irrigation Consultants (ASIC): Smart Water Solutions (<http://www.asic.org>)
- U.S. Green Building Council: (LEED) <http://www.usgbc.org>



Appendix D - Opinions of cost

Scottbluff Downtown - Broadway Intersection Bump Outs				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Site Preparation				
Sawcut Pavement	680	LF	\$3.50	\$2,380.00
Remove Pavement	500	SY	\$15.00	\$7,500.00
Remove Vegetation and Amenities	1	Allow	\$850.00	\$850.00
Site Improvements				
Soil Excavation and Replacement	240	CY	\$25.00	\$6,000.00
Compost Amendments	10	CY	\$75.00	\$750.00
Infill Street Pavement Restoration	90	SY	\$48.00	\$4,320.00
Poured Concrete Curb	430	LF	\$40.00	\$17,200.00
4" Sidewalk Pavement	2,900	SF	\$4.00	\$11,600.00
Limestone Slab Seat Walls	16	Ton	\$450.00	\$7,200.00
Crosswalk Re-Striping	1	Allow	\$2,400.00	\$2,400.00
ADA Parking Signage	1	Allow	\$1,600.00	\$1,600.00
Landscaping				
Street Trees	7	EA	\$475.00	\$3,325.00
Groundcover/Grasses/Sedges/Perennials	320	EA	\$20.00	\$6,400.00
Mulch	25	CY	\$50.00	\$1,250.00
Irrigation	2,600	SF	\$3.00	\$7,800.00
Directional Boring (Irrigation Sleeves)	105	LF	\$9.00	\$945.00
Subtotal				\$81,520.00
General Conditions, O&P (20%)				\$16,304.00
Contingency (20%)				\$16,304.00
Total				\$114,128.00
Survey, Design, Soft Costs (one time)				
				\$17,119.20
15th to 19th Streets, 4 1/2 intersections total = \$530,700 full build out.*				
(Assumes 2 bump outs at 15th and 4 bump outs 16th-19th Streets)				

Scottbluff Downtown - Broadway Ave Single Block Face				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Site Preparation				
Sawcut Pavement	226	LF	\$3.50	\$791.00
Remove Concrete Pavement	75	SY	\$15.00	\$1,125.00
Remove Brick Pavement	65	SY	\$15.00	\$975.00
Remove Vegetation and Amenities	1	Allow	\$2,000.00	\$2,000.00
Site Improvements				
Soil Excavation and Replacement	50	CY	\$25.00	\$1,250.00
Compost Amendments	5	CY	\$75.00	\$375.00
2x2 Unit Pavers on 4" Conc +Bituminous	112	4 SF	\$50.00	\$5,600.00
Amenities (bench, litter, bike - 2 ea)	1	Allow	\$5,800.00	\$5,800.00
Landscaping				
Groundcover/Grasses/Sedges/Perennials	250	EA	\$20.00	\$5,000.00
Mulch	9	CY	\$50.00	\$450.00
Irrigation	850	SF	\$3.00	\$2,550.00
Subtotal				\$25,916.00
General Conditions, O&P (20%)				\$5,183.20
Contingency (20%)				\$5,183.20
Total				\$36,282.40
Survey, Design, Soft Costs (15%)(one time)				
				\$6,219.84
Assumes approximate 220' block face between bump out improvements.				
Assumes an average block face comprised of 65% landscape / 35% hardscape in 6' wide zone.				
14th to 20th Streets,11 block faces total = \$405,300 full build out.*				



Scottbluff Downtown - 17th and 1st Ave Demonstration Basin				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Site Preparation</b>				
Sawcut Pavement	125	LF	\$3.50	\$437.50
Remove Pavement	74	SY	\$15.00	\$1,110.00
<b>Site Improvements</b>				
Soil Excavation and Replacement	50	CY	\$15.00	\$750.00
Compost Amendments	4	CY	\$40.00	\$160.00
FormedConcrete Curb Wall	5	CY	\$450.00	\$2,250.00
Pre-Treatment Basin	4	Each	\$500.00	\$2,000.00
Limestone Slab Overlook Path	8	Ton	\$450.00	\$3,600.00
Sewer Inlet Modification	1	LS	\$850.00	\$850.00
Interpretive Panel	1	LS	\$900.00	\$900.00
<b>Landscaping</b>				
Perennials/Grasses/Sedges	50	EA	\$15.00	\$750.00
Shrubs	12	EA	\$50.00	\$600.00
Irrigation	550	SF	\$3.00	\$1,650.00
Directional Boring (Irrigation Sleeves)	40	LF	\$9.00	\$360.00
			<b>Subtotal</b>	<b>\$15,417.50</b>
General Conditions, O&P (20%)				\$3,083.50
Contingency (20%)				\$3,700.20
Survey, Design, Soft Costs				\$5,550.30
			<b>Total</b>	<b>\$27,751.50</b>

Scottbluff Downtown - Ave A 1800 Block Narrow Parking Lot				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Site Preparation</b>				
Sawcut Pavement	155	LF	\$3.50	\$542.50
Remove Pavement	39	SY	\$15.00	\$585.00
<b>Site Improvements</b>				
Soil Excavation and Replacement	23	CY	\$25.00	\$575.00
Compost Amendments	4	CY	\$75.00	\$300.00
FormedConcrete Curb Wall	4	CY	\$450.00	\$1,575.00
Poured Concrete Curb	22	LF	\$40.00	\$880.00
Pre-Treatment Basin	2	Each	\$500.00	\$1,000.00
Re-striping and HC signage resetting	1	Allow	\$1,500.00	\$1,500.00
<b>Landscaping</b>				
Perennials/Grasses/Sedges	50	EA	\$20.00	\$1,000.00
Street Tree	1	EA	\$475.00	\$475.00
Mulch	4	CY	\$50.00	\$200.00
Netting (hold mulch in raingardens)	1	Allow	\$150.00	\$150.00
Irrigation	300	Allow	\$3.00	\$900.00
Directional Boring (Irrigation Sleeves)	110	LF	\$9.00	\$990.00
			<b>Subtotal</b>	<b>\$10,672.50</b>
General Conditions, O&P (20%)				\$2,134.50
Contingency (20%)				\$2,561.40
Survey, Design, Soft Costs				\$3,842.10
			<b>Total</b>	<b>\$19,210.50</b>



# Appendix D - Opinions of cost

Scottbluff Downtown - East/West Streets				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Site Preparation				
Sawcut Pavement	430	LF	\$3.50	\$1,505.00
Remove Pavement	130	SY	\$15.00	\$1,950.00
Remove sidewalk plantings and brick	600	SF	\$3.00	\$1,800.00
Site Improvements				
Soil Excavation and Replacement	108	CY	\$25.00	\$2,700.00
Compost Amendments	8	CY	\$75.00	\$600.00
Formed Concrete Curb Wall - Basins	9	CY	\$450.00	\$4,050.00
Poured Concrete Curb - Planters	200	LF	\$40.00	\$8,000.00
Pre-Treatment Basin	4	Each	\$750.00	\$3,000.00
Underdrain and Sewer Tap	4	Each	\$2,400.00	\$9,600.00
Sidewalk infill (allow 600 s.f. per block)	600	SF	\$4.00	\$2,400.00
Landscaping				
Perennials/Grasses/Sedges	120	EA	\$20.00	\$2,400.00
Street Trees	4	EA	\$475.00	\$1,900.00
Mulch	12	CY	\$50.00	\$600.00
Netting (hold mulch in raingardens)	1	Allow	\$250.00	\$250.00
Irrigation	690	SF	\$3.00	\$2,070.00
Directional Boring (Irrigation Sleeves)	350	LF	\$9.00	\$3,150.00
			Subtotal	\$45,975.00
General Conditions, O&P (20%)				\$9,195.00
Contingency (20%)				\$11,034.00
			Total	\$66,204.00
Survey, Design, Soft Costs (one time)				\$9,930.60
15th to 19th Streets, 9 blocks total = \$632,000 full build out.				

Scottbluff Downtown - 1st Ave and Ave A Tree Planters				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
Site Preparation				
Sawcut Pavement	48	LF	\$3.50	\$168.00
Remove Pavement	12	SY	\$15.00	\$180.00
Site Improvements				
Soil Excavation and Replacement	10	CY	\$25.00	\$250.00
Compost Amendments	1	CY	\$75.00	\$75.00
Poured Concrete Sloped Curb	48	LF	\$12.00	\$576.00
Landscaping				
Street Tree	1	EA	\$475.00	\$475.00
Mulch	1	CY	\$50.00	\$50.00
Irrigation	85	SF	\$3.00	\$255.00
			Subtotal	\$2,029.00
General Conditions, O&P (20%)				\$405.80
Contingency (20%)				\$486.96
			Total	\$2,921.76
Quantity of 8 planters per block = \$24,400 per block street tree planter full build out.				
Allow estimated 550 linear feet of directional boring per block @ \$9 per foot = \$4500 add per block.				
1st Avenue (14th to 19th, five blocks total) = \$144,500 full build out.				
Avenue A (Railway Street to 20th , five blocks total) = \$144,500 full build out.				



Scottbluff Downtown - 17th Street Drop Off				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Site Preparation</b>				
Sawcut Pavement	300	LF	\$3.50	\$1,050.00
Remove Pavement	150	SY	\$15.00	\$2,250.00
<b>Site Improvements</b>				
Soil Excavation and Removal	85	CY	\$10.00	\$850.00
Formed Concrete Curb Wall Perimeter	17	CY	\$450.00	\$7,650.00
Concrete Walk Infil	400	SF	\$5.00	\$2,000.00
ADA Ramps	2	EA	\$2,200.00	\$4,400.00
Permeable Pavement Profile	125	SY	\$130.00	\$16,250.00
Underdrain and Sewer Tap	1	Allow	\$3,000.00	\$3,000.00
Re-striping and HC signage	1	Allow	\$2,500.00	\$2,500.00
			<b>Subtotal</b>	<b>\$39,950.00</b>
General Conditions, O&P (20%)				\$7,990.00
Contingency (20%)				\$9,588.00
Survey, Design, Soft Costs				\$8,629.20
			<b>Total</b>	<b>\$66,157.20</b>

Scottbluff Downtown - Ave. A Police Lawn Arboretum				
Opinion of Cost - 31 March 2014				
Item	Approx. Quantity	Unit	Unit Price	Estimated Total
<b>Site Preparation</b>				
Remove Turf	6,000	SF	\$0.25	\$1,500.00
<b>Site Improvements</b>				
Soil Prep	3,000	SF	\$1.00	\$3,000.00
Compost Amendments	12	CY	\$75.00	\$900.00
Limestone Slabs	12	Ton	\$450.00	\$5,400.00
Decomposted Granite Walk	1,000	SF	\$4.00	\$4,000.00
<b>Landscaping</b>				
Native Grassland Plugs	1,500	EA	\$5.00	\$7,500.00
Deciduous Overstory Trees	2	EA	\$475.00	\$950.00
Deciduous Ornamental Trees	15	EA	\$400.00	\$6,000.00
Conifer Trees	2	EA	\$450.00	\$900.00
Mulch	60	CY	\$50.00	\$3,000.00
Irrigation	14,750	SF	\$1.00	\$14,750.00
			<b>Subtotal</b>	<b>\$47,900.00</b>
General Conditions, O&P (20%)				\$9,580.00
Contingency (20%)				\$9,580.00
			<b>Total</b>	<b>\$67,060.00</b>



# Appendix E - Recommended Prioritization and Phasing

The following recommendations for prioritizations and phasing the implementation of the various design areas has been initially determined by consultant and City staff through preliminary design discussions on February 26, 2014. It is to be understood that completion of proposed design areas is variable and subject to the pace and magnitude which can be expended. Additionally, there is the potential for individual projects to receive grant funding, private sector investment, or philanthropic support which in turn should raise the priority of that item to make best use of any supplemental dollars.

It is highly recommended however, that the Broadway Avenue Intersection Nodes be the first item to prioritize for implementation as the recent traffic and parking modifications have initiated the importance of this provision.

The following is a summary of full build out probable cost opinions and potential phases.

- Broadway Avenue Intersection Nodes (15th – 19th): \$530,700
- Broadway Avenue Block Faces (15th – 19th): \$405,300
- East West Numbered Streets (15th – 19th): \$632,000
- 1st Avenue and Avenue A Tree Planters (15th- 20th): \$221,600
- 17th Avenue Drop Off Lane: \$66,200
- Public Safety Building Arboretum: \$67,000
- PSB ‘First Responders’ Park: \*\$150,000
- ‘First Responders’ Park’ Splash Pad: \*\$50,000
- 18th Street Park (Farmer’s Market): \*\$250,000
- City Public Parking Lot Conversion: \*\*by City

\*First Responders’Park at the Public Safety Building and the 18th Street Park are presented as conceptual ideas in this master plan. Both areas are subject to further defining the program elements to place within those areas. Budget numbers noted in this summary are placeholders of a suitable budget to target in order to implement those areas.

\*\* City Public Parking Lot Conversions’ budget summary is not included. With completion of the 17th Street and 1st Avenue completed parking lot, it is recommended that actual construction costs are reviewed and interpolate to square foot area of each subsequent parking lot.

## Phase 1

Broadway Avenue Intersection Nodes and Block Faces: \$936,000  
(Additionally, City to paint stripe 17th Street drop off and decommission parking)

## Phase 2

18th Street Park (Farmer’s Market), 1st and Avenue A Tree planters, and East/West Numbered Streets: \$1,103,600

## Phase 3

Public Safety Building Arboretum/First Responders’ Park, 17th Street Drop Off Lane \$333,200

## Phase 4

City public parking lot conversions are noted as ‘final phase’; however, could be implemented inclusive with other phases if grant funding or other variables create opportunity.



