Exhibit J -- Plan Conformance Matrix

Mountain View Neighborhood Analysis of Conformance with the NAP and Plan Tucson

NAP Policy	Subdivision Performance
Residential Guidelines	
Policy 1: Preserve and enhance the integrity of the established neighborhoods. (p. 10)	The existing neighborhood is predominantly (69.47%) detached single-family residences, representing a diverse range of styles, building materials (brick, adobe, block), and construction dates (mainly from 1931 to 1978). All have perimeter yards (front, rear, sides) with fairly traditional setbacks, and most are single-story structures. The majority (64.94%) fall under the Northside Area Plan definition of low-density. The subdivision fails to preserve and enhance the existing character of the neighborhood because it: * proposes density of detached single-family units well in excess of the existing low-density character of the neighborhood * consists entirely of two-story, frame/stucco structures of a modern, boxy design with little architectural variation * includes drastically reduced interior setbacks and minimal front, rear, and side yards
a. Direct through traffic and traffic generated by more intense uses onto major streets.	The proposed subdivision is surrounded by local streets, Fremont, Holaway, Halcyon, Haven, and Kleindale. Access to any arterial street or collector street is approximately 1000 feet away as measured from the center of the proposed Subdivision. The established neighborhood is one-half mile on each side, with an area of one-quarter square mile, and the subdivision is located in the center of this square which places it at the farthest distance from an arterial or collector street of any existing property in the established neighborhood. The Subdivision proposes more single-family residences per acre than currently exists in the neighborhood and surpasses the density of many multi-family residences in the established neighborhood. The Subdivsion will more than double the number of residences possibly having direct access to Fremont Avenue and, extrapolating from the two-car garages and multi-bedroom units, will significantly increase traffic along local streets. When making improvements to Mountain Ave Phase III: Roger Road to Fort Lowell, planners and designers explicitly noted the "classic local architecture, and the rustic charm of the U of A farm and agricultural research center." Each phase of Mountain Ave. took into account the "distinctive character of each neighborhood along the route." Phase III explicitly included "a number of improvements, with no widening, so that this stretch remains a quiet, two-lane roadway." (https://www.tucsonaz.gov/projects/mountain-ave-roger-road-fort-lowell). (Continued)

NAP Policy	Subdivision Performance
Residential Guidelines	
a. Direct through traffic and traffic generated by more intense uses onto major streets. (Continued)	The Subdivision proposes to direct all traffic onto local streets (Fremont and Halcyon) in the interior of an existing low-density neighborhood. The Subdivision will also create a cut-through from the Fremont, on the north, to Halcyon, to the south, encouraging traffic to drive through the neighborhood. Furthermore, the Tentative Plat provides no improvements to any public rights of way, despite requirements of Transportation Ordinance 9828--Access Management Guidelines, page 45, Section 6.3.2.1--Site Design: Traffic Impact Analysis; Requirements: "A complete TIA should be performed if any of the following situations are proposed: 1) All new developments or additions to existing developments, which are expected to generate more than 100 new peak-hour vehicle trips (total in and out vehicular movements). The peak-hour will be determined by the City's representative." (MVNA
b. Establish improvement districts to provide and/or upgrade lighting, streets, and alleys, as desired by affected residents.	The Tentative Plat does not provide any improvements or upgrades to lighting, streets, or alleys as desired by affected residents. At two public meetings prior to submittal of the Tentative Plat, representatives of the developer stated that the development would include only what was explicitly required by the City.
c. Encourage the orientation of new residential uses to take advantage of solar energy and to integrate solar technology into the design.	The Tentative Plat does not provide a method for determining compliance with UDC Section 7.3 "Solar Considerations." When modeled to scale and correctly geolocated, the NE side of development has an adverse solar effect on adjacent single-story residences.
Policy 2: Promote appropriate residential infill in existing neighborhoods. (p. 10)	The Subdivision proposes two-story, detached single-family residences at a density that is only present in small, multi-family residences and greatly exceeds the density of single-family residences in the existing neighborhood. Per the Intent Statement of the NAP (p. 9-10): "The residential policies are intended to guide future development and to ensure the harmony of new residential development with existing neighborhoods. By substantially increasing the housing stock within a small area, the proposed Subdivision will erode the integrity of the established neighborhood and, given the high density and closely packed two-story structures, disrupt the harmony of the existing neighborhood. The Subdivision does not fit within the density or character of the existing neighborhood according to the intent of the NAP.

Exhibit J -- Plan Conformance Matrix

Mountain View Neighborhood Analysis of Conformance with the NAP and Plan Tucson

NAP Policy	Subdivision Performance
Residential Guidelines	
a. Low-density residential developments are generally appropriate within the interior of established low-density neighborhoods and along local streets.	The proposed Subdivision is situated in the geographic center of the well-established, low-density Mountain View Neighborhood and will be developed solely along local streets. The Subdivision proposes a density that falls at the high-end of the NAP definition of medium density, well in excess of the density of single-family residences within the existing neighborhood. Single-family residence density within the existing neighborhood predominantly falls within the NAP definition for low-density ("average density up through six units per acre, primarily single-family, detached residences"). This definition of low-density and guidelines for its appropriateness along local streets and in the interior of established neighborhoods is reiterated in Plan Tucson (see Chapter 3; p. 3.154; Guidelines for Development Review that Apply to Existing Neighborhoods, Neighborhoods with Greater Infill Potential & Neighborhood Building Blocks) The Subdivision is surrounded by development that was platted between 1931-1978 and/or constructed prior to the adoption of the NAP. Beyond small parcel improvements (within UDC Table 6.3-2.A for R2 single-family or Multi-Family development), there has been minimal development in MVN since the adoption of the NAP and no development of detached, single-family residences above 12 RAC.
b. Low- or medium-density residential uses are generally appropriate along designated collector streets.	The Subdivision proposes a density at the high end of medium density, based on NAP definitions. The Subdivision is distant from collector streets and arterial streets, will be developed solely on local streets and, furthermore, creates a thruway for traffic between Fremont and Halcyon that is currently inaccessible. Plan Tucson reiterates this NAP policy that calls for low- or medium density development along designated collector streets. The developer compares the density of the proposed Subdivisionto dissimilar attached and multi-family developments, an unrealistic comparison. Relative to the same type of development (i.e., detached single-family units), the proposed Subdivision is generally double the existing density condition for single-family residences. Based on its design elements and a density at the high-end of medium density, the proposed Subdivision would be appropriate along a designated collector street. However, the Subdivisionis not appropriate for its current proposed location (i.e., along local streets in the interior of an established low-density neighborhood).

NAP Policy	Subdivision Performance
Residential Guidelines	
c. Medium- and high-density residential developments are generally suitable along designated arterial streets.	The Subdivision proposes a density at the high end of medium density and design elements in keeping with multi-family developments. These aspects make the Subdivision suitable for development along designated arterial streets. However, the Subdivision is **not** appropriate for its current proposed location (i.e., along local streets in the interior of an established low-density neighborhood).
Policy 3: Ensure new residential development is sensitive to existing land uses. (p. 11).	The Tentative Plat contrasts with the surrounding existing development. It exceeds underlying zoning allotments for density while being surrounded by properties developed at a lower density than existing underlying zoning that occurred prior to the adoptionof the NAP. Minimal small-scale parcel improvements have occurred since the adoption of the NAP, all of which comply with underlying zoning and many below underlying zoning allotments.
a. Require appropriate design elements and buffering techniques during the rezoning and associated development review processes to ensure the sensitive design of new development on established neighborhoods. These elements must be shown on rezoning concept plans and development plans (see General Design and Buffering Policies).	The Tentative Plat proposes 76 two-story structures in a modern design, which contrasts from the existing architectural character of the neighborhood. The proposed Privacy Mitigation Plan submitted with the Tentative Plat includes a masonry wall that is not continuous along Haven and Kleindale, privacy restrictions that are not continuous adjacent to existing residences and buffers meeting only the absolute minimum requirements of the FLD and not of the NAP (p. 25-28).
b. Require pedestrian pathways and bikeways to provide linkages to all neighborhood facilities, such as schools, parks, and commercial areas (see Parks and Recreation policies).	The Tentative Plat does not propose any of the parks and recreation policies of the Northside Area Plan. Only one park is within a one-mile radius of the site. This single park requires crossing a major arterial street (First Avenue) and lies immediately adjacent to a homeless shelter, and is frequently inhabited by transient adults. The developer has not only failed to provide pedestrian and bicycle access to the neighborhood but has also requested Modifications to Technical Standards to narrow the standard width of sidewalks within the development.
c. Require all parking and vehicle maneuvering areas to be located off-street.	The Tentative Plat will likely result in overflow/visitor parking in ROW's especially along the breaks in the masonry wall along Kleindale and Haven. Halcyon and Fremont will also become overflow parking areas. Parking in the right-of-way is not restricted on local streets, which surround this subdivision.

NAP Policy	Subdivision Performance
Residential Guidelines	
d. Promote the consolidation of parcels with common property lines when developing higher density residential uses to provide sufficient space for adequate buffering of adjacent, less intense development.	The Tentative Plat provides the minimum setbacks, landscape and buffering required by the FLD section and is not compliant with the NAP General Design and Buffering Guidelines (p. 25-28). The proposed design has resulted in a lack of space to accommodate canopy trees along the entire northern and southern boundaries. In some instances, the development has not been required to provide privacy mitigation along existing adjacent residences. The half-acre of open space described in the Tentative Plat is predominantly comprised of remnant space and a rip-rapped drainage basin that is surrounded by security fencing and vegetated 2.8 feet below grade. It is unlikely that vegetation will thrive in the proposed basin of this type. A tree canopy situated below grade does not provide adequate canopy to shade the site and offset the heat island effect. Temperatures in the existing neighborhood are remarkably low; however, based on the lack of tree canopy and the density of large, two-story structures, temperatures in the area are likely to increase significantly with this development.
Public/Semi Public Uses: Drainage Policies (p.13-14)	
General Statement: The Northside Plan area, which lies within the watershed of the Rillito Creek, is poorly drained and susceptible to frequent nuisance flooding. About 80 percent of the streets in the Northside area convey runoff water, and during intensive storms, sheet flows from three to six inches deep occur. In addition, there is flood damage and erosion potential from high flood flows in Rillito Creek.	The MVN has known drainage issues. The majority of the neighborhood is part of the Ruthrauff Wash, which has a critical basin status (MVNA NAP Matrix - Attachment 2). Approximately one-third of the MVN is located within the Ruthrauff Basin Management Study Area (RBMSA) (MVNA NAP Matrix - Attachment 3 and 4). The proposed subdivision is located approximately 325 feet to the south of the RBMSA. It is unclear how sheetflow from proposed pavement and roofs will impact existing drainage issues due to location within a critical basin and soil conditions. If soil is raised or lowered to accommodate soil conditions, the impact of excess drainage onto adjacent sites through wall openings is not addressed in the Tentative Plat, nor does it address the special drainage polices stated in the NAP.
Intent Statement: The following policies are intended to address drainage issues in the Northside area and to encourage measures to minimize the possible impacts of sheet flooding and erosion on existing and new development. These policies will be used, when applicable, during the rezoning process and CDRC review.	
Drainage Subgoal: Encourage a comprehensive approach to floodplain management on the Northside area.	

NAP Policy	Subdivision Performance
Residential Guidelines	
Policy 1: Ensure that flood control and floodplain management methods are compatible with the existing environment. (p. 17-18)	The Tentative Plat does not provide information related to or otherwise address this policy.
a. Conduct a Basin Management Study to formulate a plan for the Northside area.	A basin management study has not been completed for this Tentative Plat, and therefore, it is not compliant with this policy.
b. Pending a Basin Management Study and Plan, require submittal of hydrology/hydraulic studies that consider drainage conditions, design of proposed improvements, and impacts on uses in proximity to development site. Submittal of such studies should be made at the time of development plan and/or subdivision plat review by the Community Design Review Committee (CDRC).	A basin management study has not been completed for this Tentative Plat, and therefore, it is not compliant with this policy.
c. Pending completion of a Basin Management Study and Plan, designate all drainage areas as critical basins (see Definitions).	A basin management study has not been completed for this Tentative Plat, and therefore, it is not compliant with this policy. NAP (p. 5) Definitions Critical Drainage Basin: a drainage basin that contains natural or man-made floodwater channels and/or flood control structures that cannot contain existing runoff produced by the regulatory flood within the basin, and which has a documented history of severe flooding hazards (see City of Tucson Zoning Code Section 23-463.3 or Pima County Floodplain Management Ordinance 1985 F C 1.). COT_Stormwater Detention Manual Definition (p.9): Critical Basin: A watershed or sub-watershed which has been identified as having severe flooding problems as a result of existing watershed conditions. (Continued)

NAP Policy	Subdivision Performance
Residential Guidelines	
c. Pending completion of a Basin Management Study and Plan, designate all drainage areas as critical basins (see Definitions). (Continued)	For Critical Drainage Basin guidelines for development see Pima County Regional Flood Control District Design Standards for Stormwater Detention and Retention Manual (p. 2-3) 1.2 Ordinance Overview and Detention Requirements (2b) Within unincorporated Pima County, a watershed is considered a Balanced Basin unless it has been determined to be a Critical Basin. The District's Critical Basin Map is available through the Rules and Procedures page of the District's web page and shows basin designations regulated by the District. For watersheds regulated by other jurisdictions within Pima County, other maps may be applicable. Unless a Detention Waiver has been granted: b. New development located within a Critical Basin must provide sufficient detention to reduce the post-developed 2-, 10- and 100-year peak discharge rates to 90% of the pre-developed peak discharge rates. Other reductions may be specified by the Floodplain Administrator. See 1.3 Applicability, 1.4 Conflicting Requirements and Use of Alternative Requirements, 1.5 Low Impact Development Practices.
d. Design channelization or bank protection improvements to tributary drainages with moderate side slopes (e.g., 3:1). Ensure that improvements are constructed to their logical conclusion (i.e. the confluence with the Rillito Creek).	A basin management study has not been completed for this Tentative Plat and therefore, it is not compliant with this policy. Basins provided in the Tentative Plat have 1:1 and 4:1 slopes. Two smaller basin types propose two sides at 3:1 and 2 sides at 4:1.
Policy 2: Ensure that new development is sensitive to drainage conditions within the Northside area. (p. 17-18)	The proposed Tentative Plat is not compliant with this policy.
a. Design retention/detention facilities in a manner such that flood peaks resulting from development will be less than or equal to flood peaks generated for the 2-year, l 0-year, and l 00- year storm events.	The proposed Tentative Plat is not compliant with this policy.
b. Revegetate detention/retention areas and incorporate the basins as functional open space utilizing a multiple use concept (see General Design and Buffering policies). The Subdivision's retention area will be landscaped with canopy trees and be functional open space.	The proposed basins in the Tentative Plat are not conveniently located or visible to the majority of residents and therefore do little to provide direct visual or passive relief to MES residents. Neither does it provide for active recreation in any meaningful sense. The basins are predominantly rip rapped at 1:1, 4:1, and 3:1 slopes (MVNA NAP Matrix - Attachment 5). Exemplary water harvesting/drainage techniques are noted in the Attachment 6, where well designed water harvesting techniques are utilized in an infill project. (MVNA NAP Matrix - Attachment 6)

NAP Policy	Subdivision Performance
Residential Guidelines	
c. Preserve and/or enhance identified drainageways in their existing condition (see Campus Farm and Tucson-Prince subareas).	The Tentative Plat was not required to comply with these policies and therefore, it is not compliant with this policy.
Transportation Policies	
Policy 1: Provide for the buffering of existing residential uses along arterial streets as part of street improviement and widening projects	N/A
Policy 2: Provide safe and efficient access to all properties.	
a. Provide a connection between walkways within new development and the public sidewalk system.	The proposed Tentative Plat has not proposed any right-of-way improvements between the development and local streets with existing sidewalks.
b. Encourage the establishment of improvement districts to upgrade unimproved streets and alleys.	The proposed Tentative Plat has not proposed any right-of-way improvements between the development and local streets.
c. Require that all pedestrian facilities be accessible to the handicapped.	The proposed Tentative Plat has not proposed any accessible facilities. Technical Standard modifications were granted for sidewalk width reductions.
d. Limit the number of vehicular access points along major streets.	This Tentative Plat is proposed along local streets.
Policy 3: Encourage the use of alternative modes of transportation. (p. 20)	
a. Provide additional mass transit services, as warranted.	None proposed on the Tentative Plat.
b. Provide for bicycle uses along major streets as specified in the City of Tucson Major Streets and Routes Plan and on the Pima Association of Governments Bikeways and Selected Bikeable Streets Map.	None proposed on the Tentative Plat.
c. Encourage the incorporation of bicycle parking facilities in new development.	None proposed on the Tentative Plat.
d. Provide a continuous pedestrian path system throughout the Northside area that connects existing and proposed neighborhood and area services with residential areas (see Residential and Parks and Recreation policies).	None proposed. There are no parks located in MVN and minimal parks in the entire NPA.

NAP Policy	Subdivision Performance
Residential Guidelines	
e. Investigate concentrating alternative transportation systems on selected major streets, such as Mountain Avenue (see Campus Farm subarea). Such alternative transportation systems could emphasize mass transit, pedestrian, and bicycle uses.	Bicycle Paths are located along all the arterial and collector streets surrounding MVN. The proposed Subdivision is 1000' away from this mode of transportation. Bus stops are also located along the arterial streets, but not the collector street. No improvements are proposed for any traffic impact created by the density of the subdivision and an average 760 trips a day.
Policy 4: Investigate techniques to discourage vehicular through traffic in neighborhoods by utilizing street closures, traffic diverters, and/or other devices, where desired and consistent with Traffic Engineering and standards and approved by appropriate City and County agencies. (p. 20)	The subdivision is located within the interior of an established neighborhood and access is only available via local streets. No right-of-way improvements (such as pavement improvements or traffic calming) are proposed on any local streets. The masonry perimeter wall is not continuous along Kleindale and Haven, which will increase parking on both streets for access to the subdivision. Both roads are dirt at these locations. Removable bollards are proposed for Kleindale where the edge of the property meets the dirt road. The Haven right-of-way appears to have been reduced, and the Tentative Plat encroaches into the existing right-of-way. Haven has been closed as a thru street to Mountain Avenue since an action by Mayor and Council in the 1970's to discourage through traffic in the neighborhood. Furthermore, the Subdivision will create access between Fremont and Halcyon, where none currently exists. This addition of through streets is in direct conflict with this policy.
Buffering and Design Guidelines (p. 25-28)	
Intent Statement: The general design and buffering policies are included to help ensure that infill projects are designed in a manner that is sensitive to existing Northside development. The policies identify architectural and landscaping elements that should be addressed in development design. The sub-policies suggest methods to implement design recommendations; they are intended to be used in various combinations, depending upon the proposed development, the adjacent use, and existing site conditions.	The proposed Tentative Plat is not in conformance with the general design and visual appearance of the MVN.

NAP Policy	Subdivision Performance
Residential Guidelines	
General Design and Buffering Subgoal: Ensure that the design of new developments enhance the visual appearance of the Northside area and that such developments are designed in a manner that is compatible with existing, adjacent land uses.	The proposed Tentative Plat is not in conformance with the general design and buffering subgoal of the NAP. In the entire Mountain View Neighborhood, only 12 residential parcels have been developed at or under standard R-2 zoning for single-family or multi-family residential development since the adoption of the NAP. Four of those 12 parcels had the following improvements only: single-family dwelling, laundry building, small 314 sq ft addition, commercial yard improvement and a parking lot. Based on the limited amount and type of development that has occurred in the MVN since the NAP was adopted, the developer's claim that the Subdivision is consistent with development that has occurred since adoption of the NAP is incorrect.
Policy 1: Provide a minimum 5-foot-high masonry wall along the perimeter of new development adjoining less intense development. Utilize design features such as:	Subdivision proposes a minimum 5' wall that is NOT continuous along the property. The wall is omitted along Kleindale and along Haven where it intersects with Fremont. Wall heights are measured from grade, and it is unclear how the development will deal with current soil conditions. If grade is reduced, then a 5' wall will become obsolete due to the two-story nature of the proposed units. If the soil level is raised, the 5' wall will be higher. Properties adjacent to MES will require an owner agreement to place wall on property line.
a. Decorative materials (such as tile, stone, brick, adobe, or wood), textured covering materials (such as stucco or plaster), or a combination of two or more materials.	Tentative Plat indicates a stuccoed wall.
b. Colors that are predominant in the natural desert landscape.	Tentative Plat indicates this natural desert colors.
c. Variations in wall alignment, such as jogs, curves, or notches.	The wall is aligned along the property line, which is straight, and therefore does not comply with this policy.
Policy 2: Integrate landscaping with perimeter walls to provide buffering along the edges of new development adjoining less intense development. Landscaping should include a balanced mix of canopy trees and understory plants, such as shrubs and groundcover. Canopy trees should reach 50 percent of growth within two growing seasons and should be placed at intervals that ensure that canopies will touch at maturity. (p. 26)	The Landscape Plan submitted with the Tentative Plat package only proposes canopy trees along the east and west perimeter walls and a few along the wall adjacent to the south parcels. There are shrubs and groundcover only. No landscaping is proposed along the exterior wall of the subdivision. There are no trees along pedestrian walkways on the north and south where MES homes face directly into neighboring properties, nor are there trees along the interior of the site where asphalt meets garages. (MVNA NAP Matrix - Attachment 7 and 7.1).

NAP Policy	Subdivision Performance
Residential Guidelines	
Policy 3: Landscape major street frontages of new development.	The Subdivision accesses local roads only, which based on its proposed high-medium density, is non-conforming with NAP policies that indicate low-density development is appropriate within the interior of the established neighborhood.
Policy 4: Design architectural elements to be compatible with existing land uses, with techniques such as: (p. 26)	
a. A transition of heights and/or densities for development adjacent to less intense uses.	The general architectural style is out of character with the established neighborhood. The open space provided contains basins that are steep, rip-rapped, and planted. It is unlikely any vegetation will survive in some of the narrow rip-rapped spaces provided. On the perimeters of the site, two-story homes are 8'-14' from adjacent single-story residences (except for one on the east side). On the north and south, the setback is to be 2/3 the height of the house. Architectural plans show roof plans up to 24', requiring a 16' setback; however, the Tentative Plat reflects only a 14' setback. (MVNA NAP Matrix - Attachment 8)
b. Balconies and upper story windows that are either clerestory or directed away from adjacent residential uses to protect the privacy of those uses.	The development is mainly surrounded by single-story-residences established prior to the adoption of the NAP and developed at a much lower density and scale. The Tentative Plat proposes a privacy mitigation plan that selectively omits privacy mitigation along adjacent residential uses and, therefore, is not in compliance with this policy.
c. A variety of rooflines in developments where building heights in excess of 20 feet are permitted.	The architectural plan depicts minor variation of two-story rooflines, and the architectural style is out of character for the neighborhood.
d. Setbacks for higher intensity uses that are equal to or greater than the code-required setbacks for any adjacent residential uses.	The Tentative Plat employs minimal setbacks for any adjacent use.
g. Outdoor lighting that is shielded or directed away from adjacent residential uses.	The Tentative Plat does not show a lighting plan; however, there is a lighting ordinance for this area per Map Tucson GIS.
h. Outdoor storage areas or dumpsters that are screened with masonry walls and/or landscaping and that are located away from any adjacent residential uses.	Trash will be kept in garages.
Policy 5: Provide amenities for pedestrians and bicyclists in new developments, with techniques such as: (p. 27)	

NAP Policy	Subdivision Performance
Residential Guidelines	
a. Pedestrian walkways that are designed to provide an internal pedestrian circulation system that is also connected to public facilities.	The Tentative Plat was granted Technical Standard modifications for internal streets and sidewalk width reductions. It will not connect to public sidewalks because it is located along local streets, and no improvements to affected local streets were proposed. There are several internal pedestrian routes that dead-end and fail to provide an accessible option to turn around.
b. Secure parking facilities for bicycles that are located in well-traveled, visible, and lighted locations that do not impede pedestrian movement.	The Tentative Plat was granted Technical Standard modifications for internal streets and sidewalk reductions. No bike parking was included in the Tentative Plat.
c. Landscaping with canopy trees in parking areas and along pedestrian pathways to decrease heat absorption and provide shade.	The Tentative Plat proposed 9 canopy trees to shade 76 parking spaces, and no trees are proposed for pedestrian pathways. The Tentative Plat shows 8 trees planted in a rip rapped drainage basin 2.8 feet below grade, which is not standard for vegetated basins. It is unlikely these trees will thrive; however, should they do so, they will not provide any shade for heat absorption due to their location. The proposed Subdivision is not in compliance with this policy.
Policy 6: Enhance the visual appearance of channelized or bank protected drainageways in new development. (p. 27)	The Tentative Plat proposes exposed rip-rap along multiple locations across the site, including the large drainage basin, adjacent to stabilized decomposed granite sidewalks.
a. Landscaping with drought-tolerant vegetation, to include a mix of canopy trees, shrubs, and ground cover, within a minimum 10-foot setback area from the top of bank.	The Tentative Plat proposes landscaping inside the rip-rapped, 1:1, 4:1, 3:1 basins. The largest basin, where most of the required vegetation is placed, will be fenced off with a "Danger" sign. The Tentative Plat does not propose a minimum 10-foot vegetated set back and does not comply with this policy.
b. Moderate side slope (e.g., 3:1) of channelized or bank protected washes to ensure safe ingress and egress.	Two basins specified onsite have 1:1 and 4:1 slopes, while the other three basin styles have 3:1 and 4:1 slopes. All basins are considered functional open space and comprise a significant portion of the purported "half-acre" of additional open space claimed. The rip-rapped basins contain most of the required landscaping designated for the site. The Tentative Plat proposed 8 basins. Two are unlabled and 2 have slopes of 4:1 and 3:1. Four have slopes of 4:1/1:1. All are designated functional open space, are not conveniently located or visible to the majority of residents and therefore do little to provide direct visual or passive relief to MES residents, neither will these areas provide for active recreation in any meaningful sense. The Subdivision is not in conformance with this policy.
c. Use of natural appearing materials. Where gunnite or soil cement are required, use of texture and/or color to blend with adjacent soil conditions.	Not specified on the Tentative Plat.

NAP Policy	Subdivision Performance
Residential Guidelines	
Policy 7: Limit grading of development parcels to within four months of actual construction to protect wildlife habitats and to preclude the premature grading of parcels that may cause excessive rainwater run-off from sealed soil conditions. (p. 27)	Not specified on the Tentative Plat.
Policy 8: Provide for mature vegetation in landscaping. (p. 27)	The Tentative Plat proposes mass grading the site.
a. When site conditions permit, preserve or relocate trees that have a caliper of 4 inches or greater and mature native vegetation such as saguaro, ocotillo, and barrel cacti.	The Tentative Plat does not propose to salvage or preserve any trees, regardless of their caliper.
b. When site conditions do not allow such preservation or relocation, replace with trees or mature native vegetation of comparable size and density.	The Tentative Plat included an NPPO, but there is a discrepancy in what is actually on site and what is in the plan. The NPPO was approved. It is known that the Native Plant Preservation Plan for this project intentionally did not identify certain viable plants to avoid mitigation requirements.
Policy 9: Employ defensible space concepts in new developments. (p. 27-28)	
a. Utilize curbs and sidewalks to define public, semi-public, and private areas.	The Tentative Plat has requested numerous Technical Standard Modifications to reduce this requirement.
b. Utilize screening which allows visibility and surveillance of the project and/or which creates an effective barrier around the property.	The Tentative Plat proposes a screening barrier that is not continuous and offers opportunity for unsafe activity within many small remnant spaces across the site. By design, the Subdivision creates a tunnel effect, with constrained access where a person could get trapped. This occurs throughout the project at all front door locations.
c. Utilize plant material in areas adjacent to doors and windows. Plants should be of such height (e.g. less than 30 inches or with a greater than six-foot canopy) to retain visibility of building openings from the street or from other properties. Where possible, thorny or spiny plant material should be utilized.	The Tentative Plat does not include a site plan with floor plans in order to review this policy; however, there are **NO** plants shown in public areas adjacent to front or rear of houses.
d. Define areas of influence through the use of design elements, such as walls, fences, changes in level or grade, lights, entryway design, or change in paving texture.	The Tentative Plat shows multiple remnant spaces (hiding spaces) by design throughout, which does not promote a safe environment and offers opportunity for unsafe activities, unsafe encounterments and trash accumulation.

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NAP Policy	Subdivision Performance
Residential Guidelines	
e. Locate building entryways so that they are visible from other buildings.	The Tentative Plat shows all entry ways constrained to a long, linear tunnel for entry way access. The entry ways are constrained between a wall or another building.

Plan Tucson Policy	Subdivision Performance
EC3 - Reduce the urban heat island effect by minimizing heat generation and retention from the built environment using a range of strategies.	The proposed Tentative Plat does not show sensitivity to reducing the resulting heat island effect in an area cooler than most parts of the City. Residents voiced concerns at the first meeting, noting, in particular, the expanse of asphalt and hardscape between the garages. The developer subsequently showed a unit with a smaller footprint to break up this expanse; however, that footprint has since been abandoned.
GI 1 - Encourage green infrastructure and low impact development techniques for stormwater management in public and private new development and redevelopment, and in roadway projects.	The proposed Tentative Plat does not show use of low-impact development techniques for stormwater management in a private new development. Proposed basins are not consistent with current design guidelines.
GI 2 - Rehabilitate and enhance natural drainage systems, water detention and retention basins, and other infiltration areas for multiple benefits, such as recreation, wildlife habitat, and stormwater management.	The proposed Tentative Plat does not show use of low-impact development techniques for stormwater management in a private new development. The Ruthrauff Wash and Critical Basin status has not been addressed. Proposed basins are not consistent with current low impact development techniques.
GI 3- Create and maintain a connected urban greenway system for non-motorized mobility and to providehuman and environmentalhealth benefits.	The proposed Tentative Plat does not propose any new sidewalks or infrastructure connectivity to promote human or environmental health benefits.
GI 4- Expand and maintain a healthy, drought tolerant, low water use tree canopy and urban forest to provide ecosystem services, mitigate the urban heat island, and improve the attractiveness of neighborhoods and the city as a whole.	The proposed Tentative Plat neither expands nor maintains the existing native vegetation and low-water use tree canopy. Rather, it will eliminate existing urban forest and ecosystem services, and the Subdivision as a whole will increase the urban heat island effect and diminishthe attractiveness of the existingneighborhood.
GI 6 - Protect, restore, enhance, and manage trees for their long-term health, including providing guidance on proper planting, care, and maintenance.	Existing native tree canopy and understory will be completely eliminated by grading. Trees will be planted in areas that will neither-mitigate the urban heat island effect, where it is needed most, nor provide for the long-term health of the trees.
LT1 - Integrate land use, transportation, and urban design to achieve an urban form that supports more effective use of resources, mobility options, more aesthetically-pleasing and active public spaces, and sensitivity to historic and natural resources and neighborhood character.	The proposed Tentative Plat does not show sensitivity to neighborhood character or existing land use and increases transportation without any upgrades or improvements to local streets for public safety, bicycling, or walking.
LT3-Support development opportunities where:	

Plan Tucson Policy	Subdivision Performance
a. residential, commercial, employment, and recreational uses are located or could be located and integrated	Residential development allowed.
b. there is close proximity to transit	Public transit is 1/2 mile from the proposed development.
c. multi-modal transportation choices exist or can be accommodated	The development will greatly increase traffic without providing any mitigation in the form of local street improvements or infrastructure upgrades.
d. there is potential to develop moderate to higher density development	The established neighborhood is zoned R-2, and the majority is built out at a density lower than underlying zoning allotment. Development in the neighborhood has been minimal since the NAP was adopted.
e. existing or upgraded public facilities and infrastructure provide required levels of service	None provided.
f. parking management and pricing can encourage the use of transit, bicycling, and walking. (p. 3.148)	N/A
LT4 - Ensure urban design that	
a. is sensitive to the surrounding scale and intensities of existing development	The development is not sensitive to the existing scale and density of the established neighborhood.
b. integrates alternative transportation choices, creates safe gathering places, and fosters social interaction	Not provided. In this setting, the designed development is unsafe because it creates multiple corridors without adequate escape access, creates remnantdead end pockets that will be dark at night.
c. provides multi-modal connections between and within building blocks	None provided.
d. includes ample, usable public space and green infrastructure	No green infrastructure provided. There are two picnic tables and 6 benches. One bench is partially in a drainage basin.
e. takes into account prominent viewsheds	The view from the north side building 2nd floors will have nice views of the Mountains. Privacy Mitigation requirements have been omitted for this part of the Tentative Plat. The overall design of the subdivisions eliminates any existing viewsheds afforded to the neighborhood as a whole.
LT6 - Promote the development of dog friendly facilities within the urban environment.	None provided.

Plan Tucson Policy	Subdivision Performance
LT7- Use the Future Growth Scenario Map: a. as a general guide for determining the general location of development opportunities, development patterns, and land use and transportation concepts, while also considering area and site- specific issues b. in conjunction with the Guidelines for Development Review for discretionary rezonings, variances, special exceptions, and other land use decisions	This area is not noted for future growth on the Future Growth Scenario Map. The Tentative Plat does not show consideration to site specific issues such as current soil conditions combined with the Ruthrauff Wash and Critical Basin Status.
LT 12 - Design and retrofit streets and other rights-of-way to include green infrastructure and water harvesting, complement the surrounding context, and offer multi-modal transportation choices that are convenient, attractive, safe, and healthy.	None provided.
LT14 - Create pedestrian and bicycle networks that are continuous and provide safe and convenient alternatives within neighborhoods and for getting to school, work, parks, shopping, services, and other destinations on a regular basis.	None provided.
LT27- Using existing neighborhood, area, and other specific plans as the starting point, undertake an inclusive public process to explore the concept of developing and implementing planning and service areas to coordinate and enhance land use planning, infrastructure improvements, and public service delivery	The Tentative Plat reflects a willful disregard of the applicable Northside Area Plan. Furthermore, review of the Tentative Plat by PDSD has purposefully ignored the applicability of the NAP.

Plan Tucson Policy	Subdivision Performance
LT28 - Apply Guidelines for Development Review (Exhibit LT-11) to the appropriate Building Blocks in the Future Growth Scenario Map to evaluate and provide direction for annexations, plan amendments, rezoning requests and special exception applications, Board of Adjustment appeals and variance requests, and other development review applications that require plan compliance. The Guidelines referenced in this policy and presented in Exhibit LT-11 are integral to this policy and are the tools used to meet policy objectives. Apply specific plan and functional plan policies to these types of development applications. Refer to the Design Guidelines Manual for additional guidance.	Applicable Area Plan policies have not applied to this development.
LT28.1.7-Preserve and strengthen the distinctive physical character and identity of individual neighborhoods and commercial districts in the community.	Distinctive characteristics of the neighborhood will not be preserved. When making improvements to Mountain Ave Phase III: Roger Road to Fort Lowell planners and designers took note of "classic local architecture, and the rustic charm of the U of A farm and agricultural research center." Each phase of Mountain Ave took into account the "distinctive character of each neighborhood along the route." Phase III explicitly stated it would "involve a number of improvements, with no widening, so that this stretch remains a quiet, two-lane roadway." (https://www.tucsonaz.gov/projects/mountain-ave-roger-road-fort-lowell)
LT28.1.22 - Support an interconnected urban trail system throughout the city to meet the recreational needs of pedestrians, bicyclists, and equestrians.	The Tentative Plat proposed no pedestrian or bicycle improvements.
LT28.2.1-Note that this guideline **only applies to the Existing Neighborhoods & Neighborhoods of Greater Infill Potential Building Blocks:** Low-density (up to 6 units per acre) residential development is generally appropriate along local streets and in the interior of established single-family residential areas.	The Tentative Plat is proposed on the interior of an established low-density neighborhood surrounded by local streets.

Plan Tucson Policy	Subdivision Performance
LT28.2.2 - Medium-density (between 6 and 14 units per acre) residential, with greater densities possible in conformance with the FLD provision. Medium-density residential development is generally appropriate where primary vehicular access is provided to an arterial or collector street and is directed away from the interior of low-density residential areas. In areas already predominately zoned R2 additional medium-density residential may be appropriate. (p. 3.154	While the subject area is zoned R2-it has been developed at a much lower density, which is not uncommon in older established neighborhoods. The Subdivision is proposed on the interior of an established low-density neighborhood and surrounded by local streets.
LT28.2.12 - Support environmentally sensitive design that protects the integrity of existing neighborhoods, complements adjacent land uses, and enhances the overall function and visual quality of the street, adjacent properties, and the community.	The Tentative Plat fails to exhibit environmentally sensitive design that protects the integrity of the existingneighborhood, complements adjacent land uses, or enhances the overall function and visual quality of the street, adjacent properties, and the community.
LT28.2.13 - Support infill and redevelopment projects that reflect sensitivity to site and neighborhood conditions and adhere to relevant site and architectural design guidelines.	The proposed development consists entirely of two-story residences, which is out of character with the vast majority of existing architecture and site design in the neighborhood. Page 25 of the NAP states: The general design and buffering policies are included to help ensure that infill projects are designed in a manner that is sensitive to existing Northside development.
LT28.2.15 - Consider residential development with densities that complement the size and intensity of the center or node, while providing transitions to lower density residential uses. For example, high-and medium-density development can support and reinvigorate regional activity centers, while appropriate medium- and low-density infill can complement the scale and character of neighborhood activity nodes.	The neighborhood is established and developed at a scale and density less than urban. The proposed development would be located at the "center" of the neighborhood. Commercial development occurs along the edges of Ft. Lowell, 1st Avenue, and Prince respectively. The proposed density of this development does not complement the established neighborhood.
LT3-Support development opportunities where:	
a. residential, commercial, employment, and recreational uses are located or could be located and integrated	Residential development is allowed on this parcel. This neighborhood is not located within an economic activity area.
b. there is close proximity to transit	City bus transit is approximately 1/2 mile away. No bike or sidewalk infrastructure has been proposed to existing local streets to promote safe walking or biking.

Plan Tucson Policy	Subdivision Performance
c. multi-modal transportation choices exist or can be accommodated	N/A
d. there is potential to develop moderate to higher density development	MVN is an established neighborhood developed at lower than urban densities as recognized by the NAP and previously mentioned Phase III Mountain Avenue Improvement Project.
e. existing or upgraded public facilities and infrastructure provide required levels of service	No upgraded public facilities proposed despite significant increase in traffic due to proposed density.
f. parking management and pricing can encourage the use of transit, bicycling, and walking. (p. 3.148)	N/A
P. 3.136 Specific Plans (Subregional, Redevelopment, Area, and Neighborhood Plans): As of 2012, the City had adopted a total of 77 specific plans, with three-quarters of those twenty or more years old. Specific plans are intended to advance the systematic implementation of the General Plan through the use of detailed policy direction, often at the parcel level, for specific areas of Tucson. In addition to recommending locations for different types of land use, specific plans guide the locations of buildings and other improvements with respect to rights- of-way, floodway and floodplain treatments, and public facilities. Policies established by specific plans are used by City staff in reviewing rezoning, variance, and other development and permitting applications.	The Northside Area Plan was adopted in 1987 and all sections are still applicable to the MVN today. In fact, minimal development has occurred since it was adopted.

6.0 METHODS OF APPLICATION

6.1 Traffic Impact Analysis

The City may request that a Traffic Impact Analysis (TIA) be prepared for proposed developments consistent with its policies. A detailed description of the methodology and necessary data is presented in Section 6.3.2.

6.2 Variations

Where the City of Tucson finds extraordinary hardships or practical difficulties resulting from strict compliance with approved requirements, the City may approve variations to the requirements, provided that safety standards are met, so that the public interest is served. The City may require that a TIA or other information be submitted when reviewing a request for a variation. Variations may be necessary for exceptions to turning restrictions or spacing standards where it can be demonstrated that no other reasonable options are available.

A petition for any variation should be submitted in writing to the City by the developer or by the developer's traffic engineer. The developer must prove that the variation will not be contrary to the public interest and that unavoidable practical difficulty or unnecessary hardship will result if not granted. The developer should establish and substantiate that the variation conforms to the City's requirements and standards.

Care should be taken in issuing variations. No variation should be granted unless it is found that the following relevant requirements and conditions are satisfied. The City may grant variations whenever it is determined that all of the following criteria have been met:

1) The granting of the variation should be in harmony with the general purpose and intent of the regulations and should not result in undue delay or congestion or be detrimental to the safety of the public using the roadway.
2) There should be proof of unique or existing special circumstances or conditions where strict application of the provisions would deprive the developer of reasonable access. Circumstances that would allow reasonable access to a road or street other than a primary roadway, circumstances where indirect or restricted access can be obtained, or circumstances where engineering or construction solutions can be applied to mitigate the condition should not be considered unique or special.
3) There should be proof of the need for the access and a clear documentation of the practical difficulty or unnecessary hardship. The difficulty or hardship must result from strict application of the provision, and it should be suffered directly and solely by the owner or developer of the property in question.

The City shall render a decision in writing to the developer. Materials documenting the variation are maintained in the City's permit files.

6.3 Site Design

This sub-section sets forth criteria for access control and traffic impact analyses, as they apply to individual developments.

6.3.1 Access Control

Typical access control requirements for arterials and collectors are provided as follows:

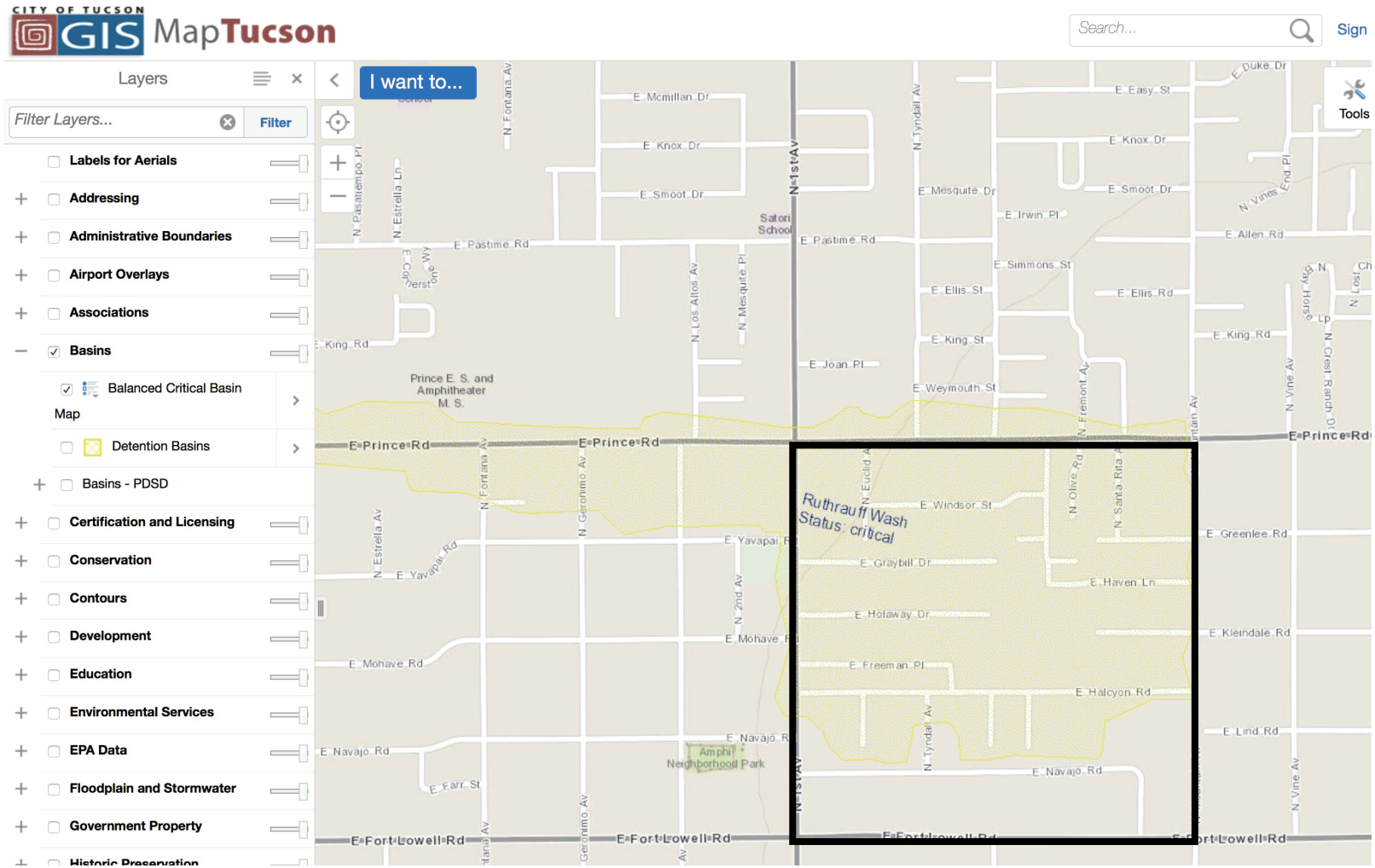
1) No driveway access to an arterial street should be allowed for any residential lot. Driveway access to collectors from residential lots should be discouraged and approved on a case-by-case evaluation.
2) No driveway access should be allowed within 150 feet of the nearest curb line of a signalized or major intersection. See Section for 5.0 for specific design criteria.
3) Driveways giving direct access may be denied if alternate access is available.
4) When necessary for the safe and efficient movement of traffic, access points may be required to be designed for right turns in and out only.
5) In most cases driveways will be treated with curb returns along arterial and collector roadways (see Table 5-2).

6.3.2 Traffic Impact Analysis

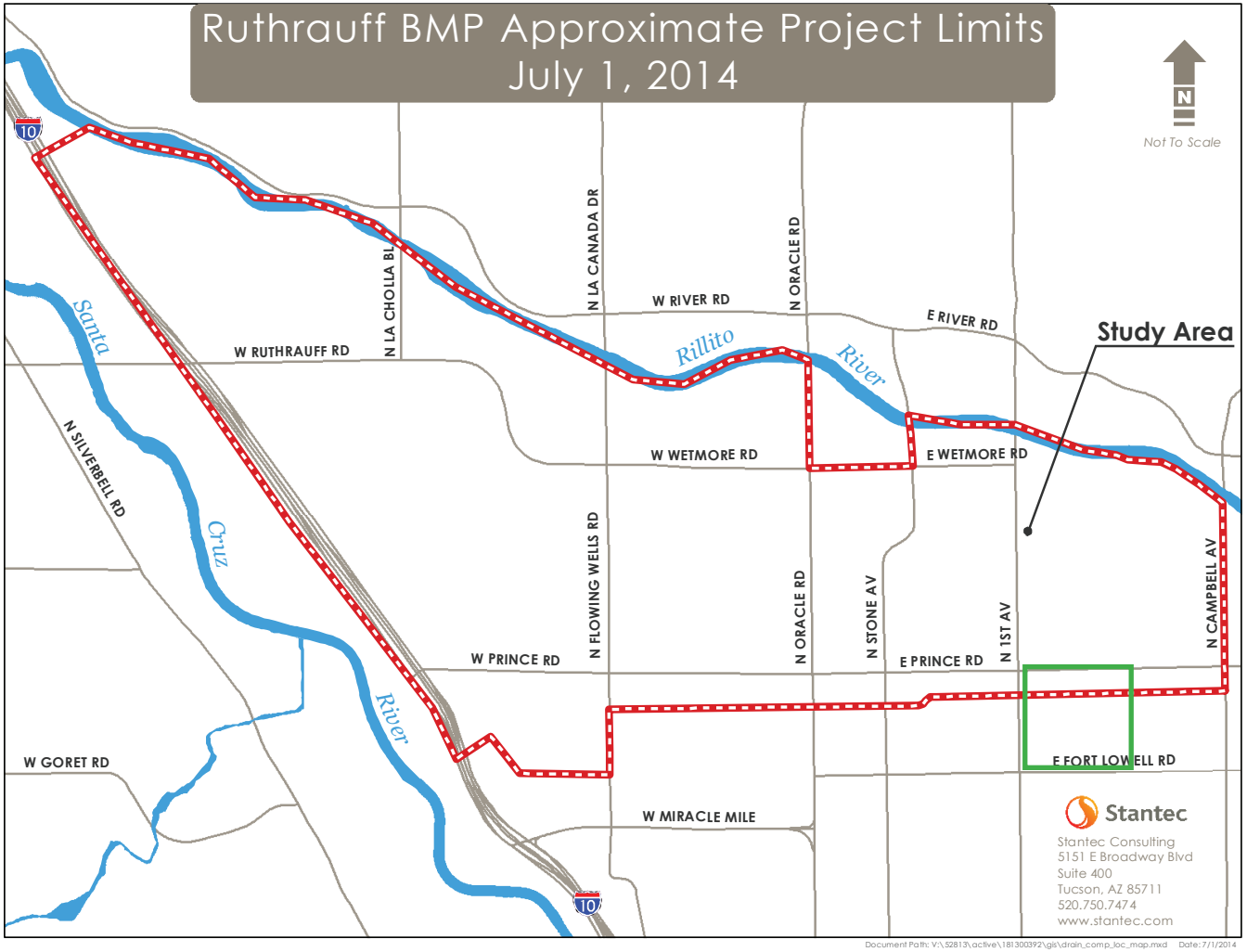
A TIA is a specialized study of the impacts that a certain type and size of development will have on the surrounding transportation system. A TIA is essential for many access management decisions, such as spacing of driveways, traffic control devices, and traffic safety issues. It is specifically concerned with the generation, distribution, and assignment of traffic to and from new development. A TIA should also be used as part of the site planning process, not merely justification of the site plan. The purpose of this sub-section is to establish uniform guidelines for when a TIA is required and how the study is to be conducted.

6.3.2.1 Requirements A complete TIA should be performed if any of the following situations are proposed:

1) All new developments or additions to existing developments, which are expected to generate more than 100 new peak-hour vehicle trips (total in and out vehicular movements). The peak-hour will be determined by the City's representative.
2) In some cases, a development that generates less than 100 new peak hour trips may require a TIA or a Traffic Statement, if it affects local "problem" areas. These would include high-crash locations, currently congested areas, or areas of critical local concern. These cases will be based on the City representative's judgment.
3) All applications for rezoning or special exception (e.g. big box).
4) All applications for annexation.



MVNA Boundary



MVNA Boundary

July 28, 2017

City of Tucson Benefits from the Ruthrauff Basin Management Study

This plan assists City of Tucson development community and floodplain management staff understand current flood risks and potential types and locations of flood mitigation projects within the Ruthrauff Watershed. Regional benefits include better hydrologic mapping and flood data to clarify current conditions and flood risks within the study area of this watershed. The proposed LOMR, which is in final stages of FEMA review, is proposed to remove over a hundred structures from the high-risk floodplain, thereby lowering flood insurance costs. Additional specific benefits are listed below:

Future Development Benefits

The Ruthrauff Basin Management Plan and associated data may be used by consultants and developers and City of Tucson floodplain management review staff for the following beneficial purposes:

- ✓ This study provides current up-to-date hydrologic flood data including current flood limits, flowrates, and water surface information for the jurisdictional flood event.
- ✓ The availability of new flood data alleviates some time and cost burden for developers and consultants when preparing the hydrology portion of the drainage reports for a proposed project within this watershed. There will be less drainage documentation required for project submittals, as some of the work has been done with this study.
- ✓ New flood mapping provides updated areas of flood risk to prospective projects are designed accordingly.

City of Tucson Floodplain Management Benefits

- ✓ Future flood mitigation project alternatives have been scoped out using the flood study and analyzed for potential future regional or CIP projects.
- ✓ Report and map data will be available at the PDSD and TDOT Engineering Review offices.
- ✓ The Ruthrauff Watershed currently has no ALERT rain gauges within the City limits. Locations are being considered by the Pima County Regional Flood

Control District with cooperation with the City Stormwater Engineering staff to determine feasible locations. Providing additional rain gauges within the watershed helps to determine precipitation rates for specific locations within the watershed and adds valuable data to the ALERT Flood Warning system that the Pima County Regional Flood Control District maintains for the Pima County communities including the City of Tucson. Pima County ALERT system map: https://alertmap.rfcd.pima.gov/Gmap/Gmap.html

- ✓ This study provides more accurate and current information to address property owners' inquiries concerning the updated areas of flood risk.
- ✓ This plan provides avenues for reduced flood hazard risks and associated costs (repair, mitigation, insurance, etc.).

Resources

City staff can clarify the drainage documentation required for project submittals on case-by-case basis, taking into consideration the study data. Ruthrauff Basin Management Study data will be available after adoption at 201 N Stone Av, Tucson Arizona 85701:

- City of Tucson Transportation Engineering Division Engineering Counter (4th floor)
- City of Tucson Planning & Development Services Department (1st floor)

MVNA NAP Matrix - Installed Basins and FOS similar to proposed Tentative Plat
Attachment 5

Interview with Grant McCormick

Sonora Cohousing Founding Member, Resident, and Landscape Architect

Terrain.org: As a founding member of Sonora Cohousing, what were your goals when you entered the group? Are they the same now, and if not, how have they evolved?

Grant McCormick:

Goals Then

In addition to the appeal of community living, I became involved as someone who had skills to offer in the development process, and I was interested in eventually owning a home. I did not own a home and did not have the resources to do so at the time, so for me it was less about creating a home in the short term and more about supporting something I felt would be good for Tucson. Having studied community planning in school, with an emphasis on social factors in design, cohousing seemed to me to embody solutions to many issues. It seemed to have the prospect of providing a desirable physical and social environment that might compete with factors behind the residential decisions which underpin suburban sprawl. Foremost to me it seemed were concerns, founded or not, that suburban locations provide better environments for children. Another is the idea that far flung locations provide better access to nature and open space. A goal of mine was to choose an urban infill site so as to not destroy untouched desert and not create infrastructure burdens associated with new suburban development. And I desired a location close to downtown, commercial services, and public transit.

The social basis of cohousing—such as community, collaboration, and consensus—were personally appealing and something I not only wanted to promote but to learn more about and integrate within both my personal and professional life. Many of the "textbook" cohousing ideas about being connected to a community, casual social opportunities, a pedestrian orientation, participatory design and management, shared open space, knowing neighbors, etc., were appealing as well.

Sunset on the Santa Catalinas frames the tops of Sonora's homes.
Photo courtesy Sonora Cohousing.

The prospect of collaborating in the creation of an entire neighborhood from the start was of interest because of contributions I could make on both urban planning and landscape design issues, plus I was intrigued by the possibilities of a highly participatory planning/design process, producing results more responsive to future residents than occurs in typical developments.

Aside from opportunities to demonstrate discrete sustainable development techniques (e.g., material selections), cohousing seemed to have potential to demonstrate sustainability due to the collaborative and "shared resources" nature of the community.

Goals Realized and Goals Now

Most of these goals have been realized to some degree. I have a home in Sonora Cohousing. The site is not as urban as I would prefer but is within several miles of the city core and is built on an infill site. I believe it to be a great environment for kids (and their parents) and it has a lot of very appealing open spaces. I've learned much about community, collaboration, and consensus although I think we have a ways to go in terms of reaching our potential. My full work life, combined with the time demands of being a primary steward of the community's landscape, combined with some community conflicts, have made the social results not as fulfilling as I had hoped.

I was very involved in the project development process and had a key role in the design and installation of the community landscape. This had its rewards but took a large toll as well due to challenges with the development team we worked with.

In terms of our use of a participatory development model, I believe the results speak for themselves—there are countless areas where value was added as a direct result of resident input. In some cases these were things the design professionals, the builder/developer, or the City had little experience with and thus was met with resistance. This ability to promote innovation was a direct result of the participatory process, and in my mind debunked the common negative dismissal of participatory processes as being "design by committee." Many sustainable goals have been advanced, and the sharing/collaborative aspect of the community does seem to have resulted in environmental benefits.

My goals now revolve around my family, fostering a more effective community decision-making process, developing stronger personal relationships with other community members, finishing some projects around my house, and nurturing the Sonora Cohousing landscape.

Grant speaks with visitors on one of Sonora's many internal paths.
Photo by Simmons Buntin.

Terrain.org: What was the most surprising part of creating Sonora Cohousing? The largest challenge?

Grant McCormick: It took a long time. Perhaps seven years from the first meeting to move-in. Still, the more developer-driven and streamlined forms of cohousing development can take many years, as can conventional development projects. Despite characterizations of government regulations being a large drag on the development process, in our case the City was very supportive, predictable, and presented little overall impediment. There were some limitations associated with codes and approval processes, but by far a more limiting factor in terms of time delay and innovation was what might be called "design by inertia" on the part of the professional development community. The inertia of conventional practices presented challenges in implementing a more participatory process that distributed decision-making control. Despite these challenges, the key stumbling block related to financing. Finding a partner that could arrange financing was the "watershed event" that eventually made the project happen.

Terrain.org: What is your role today in enhancing Sonora Cohousing's "sense of place"—its identity not only as a cohousing community, but as a permanent part of the Sonoran desert?

Grant McCormick: I'm involved in the ongoing evolution and care of our common landscape, which I believe is key to the community's sense of place within the Sonoran desert. The landscape was designed to be a diverse and beautiful place centered on people, while also demonstrating appropriate ecological choices for the Sonoran desert. Other outstanding projects demonstrate sustainable practices appropriate to the region, such as re-vegetation with native plants, water harvesting, and landscaping with edible plants. While Sonora Cohousing incorporates such techniques, what I believe distinguishes its landscape is the integration of such things within shared spaces people actually live in and care for. We don't know what will evolve, but it will likely be a compelling symbiosis—between the natural world and resident stewards who care for it—that is rather uncommon beyond the scale of the single-family home.

An intricately tiled mural provides a backdrop for Sonora's community garden.
Photo by Simmons Buntin.

Terrain.org: How are community conflicts resolved at Sonora Cohousing? Does consensus ever break down, and if so, what does the community do?

Grant McCormick: Community meetings using consensus, mediations, informal discussions, and special workshops have been used to address conflicts. A Process Manual and various guidelines exist which are of some benefit and are generally used in place of the official CC&Rs/Bylaws. Consensus decision making has been effective for various topics, but I believe we have yet to develop a shared understanding of consensus that might allow us to operate in a fully collaborative and satisfying way. When consensus

breaks down there is struggle and conflict and meetings and withdrawl. We are holding a workshop with a skilled community/consensus facilitator later this month who I hope will help lay the groundwork for a more effective consensus process.

Terrain.org: What have Tucson's newer cohousing developments learned from Sonora Cohousing?

Grant McCormick: I can't say for sure, and you'd probably get a clearer idea from asking Milagro or Stone Curves, so the following is just speculation. Although Milagro was completed after Sonora, the development timelines were generally the same, so there probably were no real "hindsight" lessons, although I believe some mutual support occurred along the way. Stone Curves used our common house for many of their meetings, and I believe used our physical environment as a marketing tool. There surely were things learned by Stone Curves, but to my knowledge they did not request a lot of advice from Sonora members. Since much of the formative planning and design was by a developer there may have simply been less perceived need. I suspect after Stone Curves is complete many opportunities will emerge for sharing experiences and knowledge among residents. I believe the Stone Curves developers organized their development process in part as a response to what they perceived as challenges encountered with the highly participation-based process used by Sonora. They may well have taken a proactive approach to developing some operational policies, such as relating to pets, in response to some difficulties experienced at Sonora. While speculation, I believe Sonora's landscape may have "raised the bar," thus encouraging above average (for cohousing) budget and consideration given to the Stone Curves landscape.

Terrain.org: What is the process for someone interested in living in Sonora Cohousing to get involved?

A strawbale wall separates Sonora's pool area from residences.
Photo by Simmons Buntin.

Grant McCormick: Home sales are not restricted by the community in any way—it is up to the seller to accept or reject an offer for purchase. At the same time, there is an informal self-selection that happens, resulting in buyers who value the benefits of community. New residents often get an initial view of the community through our website (www.SonoraCohousing.com). Much is learned about the specific home for sale from the seller, or from other community members who provide community/home tours. Potential residents are encouraged to attend several meetings, common meals, or other activities to get a feel for the community prior to purchasing. A number of homes are available for rent, which is another way to make an incremental step into the community. A process for "new resident orientation" is evolving but is still rather informal at the moment and has included orientation meetings, welcoming parties and meals, and so on. Normally a "buddy" is assigned to help new residents learn about the community.

Case Studies
Low Impact Development
Green Infrastructure

LID Working Group
September 2018

WHY DO WE NEED CASE STUDIES?

The Pima County Regional Flood Control District (RFCD) is compiling Case Studies reflecting design solutions embracing the evolving mandate for sustainable design: Low Impact Development (LID) and Green Infrastructure (GI) practices.

The Case Studies will be available to help groups, professionals or individuals learn more about the value of LID/ GI development, what worked, lessons learned, etc. Inclusion of relevant company logos in the top title block is strongly encouraged. We must rely on the Tucson professional community to provide data on as many relevant projects as possible. If you have a project that can contribute to the education of Tucson designers, homebuilders and homeowners, please contact us:

- Evan Canfield, Chief Hydrologist, REFCD Evan.Canfield@pima.gov
- Sandra Bolduc, Registered Landscape Architect, RFCD Sandy.Bolduc@pima .gov

We have an outline to guide the gathering of information. Projects can be New or Retro-fit. We will be happy to help you create the Case Study spreadsheet, or you can create it yourself. We have spreadsheet templates for every category as follows:

- Commercial- Office-Retail / Small, Medium or Large
- Industrial/ Distribution, Manufacturing
- Institutional/ Education K-12, Non-Profit, Medical, Municipal or Utility
- Recreational/ Linear Park, Neighborhood Park, Regional Park, Retention Basin
- Residential/ Single Family, Multi-dwelling, Subdivision, Master Planned Community
- Transportation/ Local, Collector or Major, Terminal (bus, airport)

Photos that illustrate the LID principals and goals described in the text are very useful- *please label the principals used*. Dated photos, especially Before and After of the same location, are very helpful to see the progress of vegetation growth. Arrows indicating changes to drainage flow (redirection to natural areas, landscaping, harvesting swales, etc.) further explain the principals in the photos.

We appreciate any efforts to provide updates to these Case Study spreadsheets once completed. It is especially easy to show LID benefits on projects that are retrofit. Be sure to retain photographs, water and energy bills, and property value for the “Before” condition. The value of LID is the transformation it generates upon a site for both new construction and retro-fit; 3 to 5 years can show incredible improvements! This data will be of great interest and possibly motivation to someone just learning about LID/ GI. Lessons continually learned are invaluable.

If you have any projects you would like to have included, just let us know the category and the appropriate template(s) will be provided.

Thank-you!

FIRMS AND OWNERS WHO HAVE PARTICIPATED TO DATE

Certificate of Appreciation
Awarded to the 18 original Case Studies
At the
2015 LID/ GI Workshop

LID Categories

	COMMERCIAL- OFFICE- RETAIL- MEDICAL
	Small NEW
	Small RETRO
	Medium or Grouped Use NEW
	Medium or Grouped Use RETRO
	Large NEW
	Large RETRO
	INDUSTRIAL
	Distribution NEW
	Distribution RETRO
	Manufacturing- Fabrication NEW
	Manufacturing- Fabrication RETRO
	INSTITUTION
	Education- K12- College NEW
	Education- K12- College RETRO
	Non-Profit NEW
	Non-Profit RETRO
	Medical NEW
	Medical RETRO
	Municipal Facilities NEW
	Municipal Facilities RETRO
	RECREATION
	Linear Park NEW
	Linear Park RETRO
	Neighborhood Park NEW
	Neighborhood Park RETRO
	Regional Park NEW
	Regional Park RETRO
	Basin NEW
	Basin RETRO
	RESIDENTIAL
	Single Family NEW
	Single Family RETRO
	Multi-Dwelling NEW
	Multi-Dwelling RETRO
	Subdivision NEW
	Subdivision RETRO
	Master Planned Community NEW
	Master Planned Community RETRO
	TRANSPORTATION
	Local Neighborhood NEW
	Local Neighborhood RETRO
	Collector NEW
	Collector RETRO
	Terminal NEW
	Terminal RETRO

I

ICONS FOR LID PRACTICES

SYM	PRACTICE
	Berms and vegetated or rock swales direct stormwater runoff to plants
	Curb openings to allow street or parking lot runoff to access landscaped areas
	Roof Runoff is directed to Landscape
	Native or low-water use vegetation is planted
	Pathways are raised allowing runoff into the landscape
	Impervious surfaces have been disconnected to slow runoff and allow percolation
	Rainwater is stored in a cistern or underground storage cells for future use- especially April, May and June in Tucson
	Pervious pavement allows stormwater infiltration
	Infiltration trenches intercept larger stormwater volumes
	Condensate is collected and used for landscape

PROJECT NAME: NATURE CONSERVANCY

PROJECT TYPE: ■ Non-Profit ■ Retrofit

Tucson, AZ

Low Impact/ Green Infrastructure

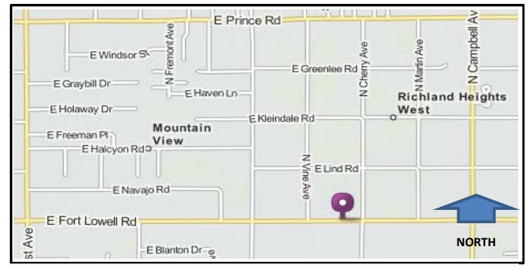
LID/ GI DEVELOPMENT

DATA

LOCATION	1510 E. Ft. Lowell Road
ACRES	2.29 acre
CLIENT	Nature Conservancy, Tucson Office Dorothy Boone Dboone@pnc.org
CONTACT	Water Harvesting Solutions 304 South Lincoln St., Suite 100 Hinsdale, IL 60521
DESIGNED BY	Water Harvesting Solutions
COMPLETED	2009 with upgrades through 2012

COST

ESTIMATED COST	Donation
FUNDING SOURCE	Donation
ACTUAL COST	DESIGN COST: CONSTRUCTION COST:
MAINTENANCE	Volunteer
COMPARE TO CONVENTIONAL	N/A
TIME TO BUILD	N/A



LOCATION MAP

GOALS

REGULATORY: City of Tucson

STAKEHOLDERS: Tucson Nature Conservancy and its partner

PROJECT RECOGNITION: N/A

PERFORMANCE MEASURES: The Tucson Nature Conservancy has a long history of sustainable practices that have been used to demonstrate sustainable landscaping, vegetated swales and rainwater harvesting. The updated system is expected to save 60-70,000 gallons per year with updated drip irrigation system and expanded cistern.

SUMMARY

FINISHED PROJECT DESCRIPTION: ■ The Tucson Nature Conservancy has a long history of sustainable practices that demonstrate sustainable landscaping, water harvesting and solar power. ■ The site includes both active and passive rainwater harvesting techniques: three above-ground cisterns, vegetated swales, basins, curb cuts, dirt berms and permeable paving. ■ In 2012, an underground cistern (30,000 gallons capacity) was added to the project site, because the existing above-grade cistern (3,800 gallons capacity) was not large enough to store the rainwater needed for irrigation, and there was no room on the property for a larger tank. ■ The updated system's passive water quality management uses natural thermal and capillary action to keep water in the cistern moving with a circulation pump, and a natural bio-film on the plates and in the sand layer improves the quality of the water in storage. ■ The system is expected to save 60-70,000 gallons per year while providing a demonstration project to the visiting public on rainwater harvesting storage and treatment methods.

DESIGN FEATURES: ■ The new underground cistern was constructed on-site out of 85% recycled polypropylene crates (Atlantis Underground Tank System from Wahaso). Rainwater is collected from both the building rooftop and off the solar car shade surfaces. ■ A dual filtration step with U.V. sanitation filters the water to 5 microns and essentially sterilizes the water exiting to the irrigation system to minimize any risk to public health. ■ The long dry season required a system that could store the water for months without the risk of it going anaerobic with the associated issues of bad odors and color.

LESSONS LEARNED

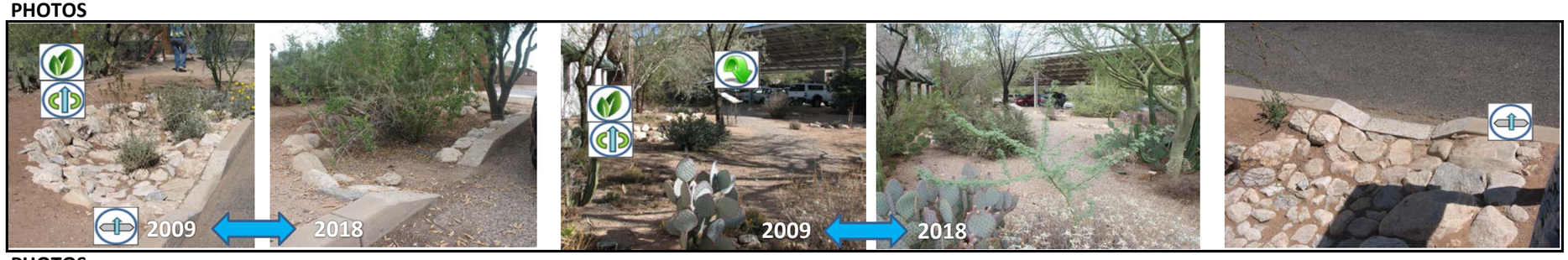
SOMETHING TO BE PROUD OF:

■ The rainwater harvesting project helps to promote appropriate rainwater harvesting and demonstrate beneficial effects of designing with nature, while it also contributes to reducing potable water use and soil erosion. ■ The Nature Conservancy sees the grounds as a community asset where one can learn about sustainability and common sense approaches to sustainable design and practices.

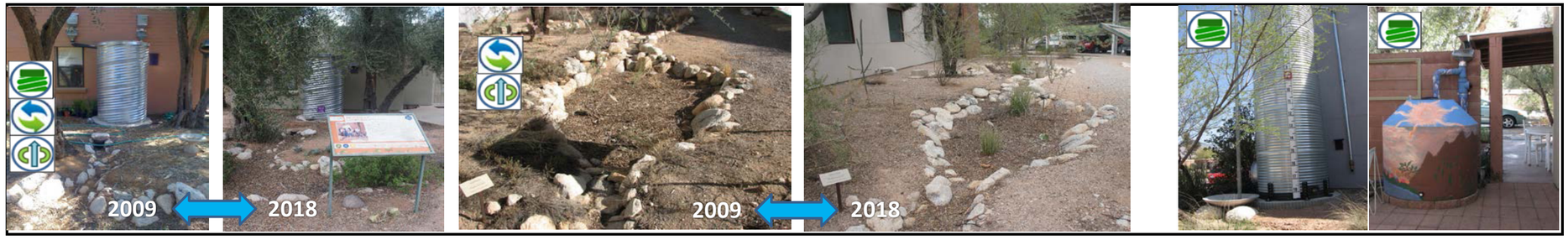
SOMETHING TO BE DONE DIFFERENTLY:

N/A

PHOTOS



PHOTOS



PROJECT TYPE: INSTITUTIONAL

■ Non-Profit

■ Retrofit

PROJECT NAME:

TUCSON NATURE CONSERVANCY

PROJECT NAME: STONE CURVES COHOUSING

PROJECT TYPE: RESIDENTIAL ■ Master-Planned Multi-Dwelling ■ New

Tucson, AZ

LID / GI DEVELOPMENT

Low Impact / Green Infrastructure

KEY

- Berms
- Curb Cuts
- Roof Runoff
- Arid Plants
- Raised Paths
- Separated Impervious Surfaces
- Cisterns
- Pervious Paving
- Infiltration Trenches
- Condensate Used

DATA

LOCATION	4133 N. Stone Ave (SE corner of Stone Ave and LimberLost)
ACRES	5.10 Acres
CLIENT	Stone Curves Cohousing, 5 "villages" with 48 cohousing unit individual owners
CONTACT	Kat Jimenez katlinx@gmail.com Pen Sand jimpen1@gmail.com
DESIGNED BY	Jim Leach, James Hamilton; Wonderland Hill Development; Greg Shinn, GRS Landscape Architect; Entranco; Technicians for Sustainability (cistern); Shawn Mulligan (Green Team Member); Brad Lancaster; SBBA
COMPLETED	Apr-05

COST

ESTIMATED COST	N/A
FUNDING SOURCE	Construction: Wonderland Hill Development, Cistern system: 4 public workshops funded in part, by two, $20,000 Urban and Community Forestry Challenge grants
ACTUAL COST	LANDSCAPE DESIGN COST: $8,000 LANDSCAPE CONSTRUCTION COST: $140,000
MAINTENANCE	The residents are assigned 5 hours of work each month based on need and individual interests. The Green Team holds responsibility for landscaping, while the Infrastructure Team addresses repair and maintenance of shared amenities.
COMPARE TO CONVENTIONAL	Homeowners make the decisions about managing and maintaining the community on a community-wide, consensus basis.
TIME TO BUILD	5 months

GOALS

REGULATORY: ■ City of Tucson ■ Stone Curves was one of first developments to utilize community-wide passive water harvesting

STAKEHOLDERS: Stone Curves community residents

PROJECT RECOGNITION: N/A

PERFORMANCE MEASURES: ■ Passive and active rainwater harvesting from basins, parking structures and roof tops have sustained vegetation which camouflages the perimeter wall and provides native habitat. ■ Rainwater harvesting uses both roofs and covered parking structures to collect the maximum amount of water for the landscape.

SUMMARY

FINISHED PROJECT DESCRIPTION: ■ Stone Curves utilizes passive water harvesting capable of retaining the total volume of a 10yr storm event and most of a 100yr event. ■ The streetscape along Stone Ave. accentuates the spectacular growth and habitat created by native plantings using micro basins and water infiltration areas. ■ Infiltration areas were planned and designed for landscape and gardening use, and these have become an example for community permaculture and urban forestry. ■ Housing units range in size from 680-1,800 sq ft to accommodate a variety of users. ■ Community atmosphere is generated by placing buildings near one another and limiting parking to the perimeter of the community. The community center has a shared kitchen, activity space and guest quarters, which allows residents to live comfortably in smaller residential units. ■ Parking provided for the community is 2/3 of what is required by the building code because of the community's proximity to the bus system. The reduction in parking allows for more open space in the community.

DESIGN FEATURES: ■ A network of micro-basins use passive water harvesting to support the community's landscape. ■ Greywater is reused from the community laundromat which uses biodegradable soap. ■ Parking is limited to the community perimeter to maximize pedestrian walkways and intra-community common areas. ■ 8 cisterns are located on-site capable of holding 39,000 gallons of water. ■ Native vegetation is used to cool the community, provide native habitat, and screen views of surrounding traffic. ■ Solar energy is used to heat the community's water. ■ Hose bibs from cisterns are sleeved under walkways to irrigate basins using flood irrigation.

LOCATION MAP

LESSONS LEARNED

SOMETHING TO BE PROUD OF:

Over time, residents of Stone Curves have remained vigilant with their water usage and have continued to reduce their use. The community installed residential and landscape water meters which are helpful in monitoring the amount of irrigation the landscape requires. The community has also benefitted from water "monitors", individuals who help teach the community how to use water appropriately discouraging residential water for use in the landscape.

SOMETHING TO BE DONE DIFFERENTLY:

All ground level units with access to yards were supposed to have greywater-harvesting stubouts enabling the diversion of household greywater to the landscape. However, challenges during the construction phase stopped the stubouts from being installed.

PHOTOS

PROJECT TYPE: **RESIDENTIAL**

- Multi-dwelling
- New

PROJECT NAME:

STONE CURVES COHOUSING

PROJECT NAME: HABITAT FOR HUMANITY OFFICE

PROJECT TYPE: INSTITUTIONAL ■ Non-Profit ■ Retrofit

Tucson, AZ

Low Impact/ Green Infrastructure

LID/ GI DEVELOPMENT

KEY

Berms, Curb Cuts, Roof Runoff, Arid Plants, Raised Paths, Separated Impervious Surfaces, Cisterns, Pervious Paving, Infiltration Trenches, Condensate Used

DATA

LOCATION	3501 N. Mountain Ave, Tucson, AZ 85719
ACRES	40,000 SF 0.9 Acres
CLIENT	Habitat for Humanity
CONTACT	Jason Isenberg admin@realmenvironments.com
DESIGNED BY	Realm
COMPLETED	2013

COST

ESTIMATED COST	N/A
FUNDING SOURCE	Capital campaign fund with an additional reserve fund for maintenance
ACTUAL COST	DESIGN COST: N/A CONSTRUCTION COST: N/A
MAINTENANCE	In-house
COMPARE TO CONVENTIONAL	The initial investment was higher because the client wanted construction that would last. Over time, this project will be more cost effective due to savings on maintenance and upkeep.
TIME TO BUILD	3 weeks before low voltage lighting was installed

LOCATION MAP

GOALS

REGULATORY: N/A

STAKEHOLDERS: N/A

PROJECT RECOGNITION: N/A

PERFORMANCE MEASURES: The office has become a community asset; neighbors use the landscaped areas for daily walks. Trees were strategically placed in front of windows to shade the building and reduce additional heat absorbtion. An irrigation water meter has made it possilbe to track water use and reduce the amout given to the landscape as plants mature.

SUMMARY

FINISHED PROJECT DESCRIPTION: ■ The goal for Habitat for Humanity's Tucson office was to be both sustainable and create an asset to the surrounding community. ■ The site contains five, 800 gallon cisterns capable of holding 4,000 gallons of rainwater on site. This water is then used to irrigate the surrounding vegetation. ■ Any roof runoff that is not collected is directed through gutters to surrounding vegetation. ■ Curbs we not installed on the perimeter of the parking lot to allow water to flow into stormwater harvesting swales filled with native vegetation along the perimeter of the site. ■ The South side of the building along E Greenlee Road is planted with desert trees and low-voltage lighting was installed to invite residents to walk through the landscape.

DESIGN FEATURES: ■ Multiple stormwater harvesting basins throughout the site collect and infiltrate rainwater after storm events. ■ Areas under gutters and along pathways are reinforced with rock to direct water, reduce erosion, and facilitate infiltration. ■ The building footprint and the size of the parking lot covered the majority of the site with impervious surfaces, therefore the landscape used decomposed granite as a ground cover to minimize soil loss and promote infiltration.

LESSONS LEARNED

SOMETHING TO BE PROUD OF: ■ A separate water meter was installed to service the irrigation system. This allows the system to be monitored for leaks and will help compare the amount of water used when the project was installed to reduce irrigation in the future. ■ The renovation of the existing grocery store has beautified the neighborhood. Graffiti that was once prevalent on site has not been a problem since construction was completed.

SOMETHING TO BE DONE DIFFERENTLY: The cisterns installed on site are capable of holding an immense amount of rainwater after storms. This water is currently delivered using hose bibs from each tank. An automated irrigation system could reduce the time and money used to distribute this rainwater making the cisterns an even greater asset to the project.

PHOTOS

PROJECT TYPE: **INSTITUTIONAL**

■ Non-Profit
■ Retrofit

PROJECT NAME:
HABITAT FOR HUMANITY OFFICE

MVNA NAP Matrix - Attachment 7

Pedestrian walkways

No plant material along central corridor in front of houses.*

Perimeters do not have trees along the majority of walkways.

FLD LANDSCAPING REQUIREMNETS
8.7.3.H.2.
One canopy tree shall be provided every 40 feet of pedestrian circulation systems, excluding crossings with streets, alleys, and driveways. If providing canopy trees every 40 feet is not achievable, the applicant shall:

a. Provide the equivalent number of trees that would be obtained using the 40-foot increment measure; and,
b. Distribute the trees within the FLD project site along pedestrian circulation systems and within functional open space areas.

J.40

* Only 1 home type shown

MVNA NAP Matrix - MVN Architectural Styles
Attachment 8 (1 of 2)

MVNA NAP Matrix - MVN Architectural Styles
Attachment 8 (2 of 2)