

City of Tucson Department of Transportation

Active Practice Guideline – Update 5/11/17

May 11, 2017

Subject: Native Plant Preservation - Protection, Salvage, and Transplanting for Roadway Projects

I. Introduction

Roadway construction and other transportation projects often have difficulty in meeting the requirements of the City of Tucson Native Plant Preservation Ordinance (Refer to City of Tucson Land Use Code Section 3.8.1.). The reasons include the linear character of roadway design, limited right-of-way, location of underground and overhead utilities, planting offset from utilities, sight-visibility restrictions, easements, and clear-zone requirements. Thus the opportunities to preserve in place and the mitigation of native plant communities within the right-of-way (ROW) are limited. This Active Practice Guideline (APG) shall establish a protocol for documenting native plant species within the construction project limits, and describe how to develop a Native Plant Preservation Plan for City of Tucson Department of Transportation (TDOT) roadway construction projects.

- A. Purpose: This APG has been developed to preserve and protect native plants within the City of Tucson ROW during all road expansions and new construction projects. It has been developed to fully meet the intent of City of Tucson Native Plant Preservation Ordinance, but is simplified and allows for an efficient approach to the unique challenges of transportation projects.
- B. Objective: To preserve native plant communities to the fullest extent possible, and enhance or restore the native Sonoran desert landscape within City of Tucson transportation corridors. This APG shall assist the Landscape Consultant in maintaining a sense of identity within the City of Tucson as well as the Sonoran Desert while meeting the intent of the City's ordinance.
- C. Scoping Considerations: The TDOT Project Manager shall provide a copy of this APG to the Engineering consultant to be reviewed and considered during project scoping. During project scoping, the scale, character, and location of the project shall determine the applicable format of the Native Plant Preservation Plan. The City shall identify project type to the consultants during the scoping phase. There are two types of Projects:

Type A Projects are characterized by primarily native vegetated areas that may include undisturbed native plant communities.

Type B Projects are characterized as denser urban areas with less vegetation.

Deliverables for Type A and B projects are discussed under Section III below.

II. Definitions and Abbreviations

- Disturbed Area – Any area of land that has been impacted by construction, off-road travel, utility impact and any other human activity.
- Construction Easements – Construction easements may be required in order gain access for construction or to constructed drainage structures.
- Limits of Disturbance – The area that will be disturbed by construction within the project limits, typically defined as a 10’ offset outside the cut/fill lines or to the edge of ROW.
- Native Plant – A plant species naturally occurring within Pima County. The most widespread plant community is Sonoran Desert Upland (Refer to Table 1.1).
- Invasive Plant – A non-native plant that spreads aggressively into native plant communities eventually displacing native plant species and altering the plant community ecology.
- Plant community- Plant communities are comprised of trees, cacti, succulents, shrubs, forbs and grasses, which form an interconnected community, i.e. upland plant community and lowland riparian community.
- ROW – Right-of-Way
- PIP- Preserve in place plant
- RFS- Remove from site
- Salvaged plant (S) – A plant removed from project limits and held in a temporary nursery for re-planting on site or other City location; this can include salvage and removal off site from Tucson Cactus Succulent Society.
- Transplanted plant (T) - A plant that is one-time moved within the project limits; typically from an area impacted by construction to an area that will not be impacted. Spading not boxing is required for all transplanted trees.

III. Native Plant Preservation Plan

The development of the Native Plant Preservation Plan shall consist of three phases:

Phase 1 is an analysis of native plants within the project limits.

Phase 2 is an inventory of native plants within the project limits.

Phase 3 is the development of a Native Plant Preservation Plan.

A. Phase 1: Landscape Analysis

Both Type A and B projects shall complete the following:

1. The Landscape Consultant will perform a Landscape Analysis of the project site (defined as the entire width and length of ROW within the project limits). The Analysis shall be performed as early as possible to allow for incorporation of the findings into the final roadway design. The project deliverable is a written narrative (Refer to the COT Landscape Design Guidelines item B for additional information regarding narrative

- requirements). Notes on an aerial with proposed roadway alignment and ROW may be useful for communication purposes.
2. The landscape consultant will require ROW and proposed roadway alignment in CADD to proceed with the Analysis.
 3. The Analysis shall provide a full representation of the plant communities present in the project area. The landscape consultant shall document the plant communities present, and the density and relative location patterns of the vegetation on site. If the project area has been previously disturbed, the site will be compared to similar healthy plant communities in close proximity to the project area.
 4. The Landscape Analysis shall note all native species of trees, shrubs, succulents, cacti, grasses, and forbs observed within the project limits. The documentation of plant species found in the project ROW will guide the planting design and seed mix specification.
 5. The visual character of the project site, including significant non-native and/or invasive plants, is also documented as part of the Landscape Analysis.
 6. Document the occurrence of riparian zones and washes.
 5. Large vegetative stands should be documented.
 6. Potential preserve-in-place (PIP) plant materials and plant groups shall be noted, i.e. stands of creosote.
 7. The riparian zones and washes require an additional inventory process using the WASH and ERZ ordinances. Document these areas where they occur within the project limits.
 8. Significant vegetative findings to be relayed to the project Engineer in writing for consideration.
 9. As part of the Landscape Analysis, all plant documentation needs to be in compliance with federal and state laws regarding protected species. A complete list of Protected Arizona Plants is located on the Arizona Department of Agriculture website.
 10. Analysis will note any documentation of potentially impacted existing irrigation systems/components.
 11. The Analysis will be included in the 30% or 60% project submittal (depending on the project schedule).
 12. Utility companies should be presented with the Landscape Analysis.

B. Phase 2: Native Plant Inventory

1. The Landscape Consultant will perform a native plant inventory of the project site.
2. Trees identified as possible transplant candidates shall meet the following criteria:
 - (a) 3"-6" caliper
 - (b) Upright form
 - (c) Viable
 - (d) On stable ground in accessible locations by salvage equipment
 - (e) Not under low hanging power or cable lines

4. All native cacti, agave, yucca and ocotillo shall be evaluated for salvage. Large, old ocotillo over 10' and barrels over 18" high may be too large to salvage successfully.
5. The inventory will be included in the 60% or 90% project submittal (depending on the project schedule).

C. Phase 3: Native Plant Preservation Plan (NPPP)

1. Type A Projects shall develop the following for the 60% or 90% submittal (depending on the project schedule):
 - a. The consulting Landscape Architect shall schedule a field meeting with the City Representatives (Project Manager and/or TDOT Landscape Architect) to review the Landscape Analysis and the Native Plant Inventory. All significant native plants within the ROW shall be reviewed during the field meeting. The field meetings shall identify viable plant material that should be transplanted, salvaged or should be protected-in-place.
 - b. All data from the field meeting will be documented and included in the 60% or 90% project submittal and ultimately becoming part of the NPPP construction documents.
 - c. The consulting Landscape Architect shall prepare Native Plant Preservation Plans (NPPP). The plans will consist of the Plan Sheets, Inventory Schedules, and applicable Notes and Details. The NPPP Sheets shall include a current aerial photo, proposed roadway alignment, existing and proposed ROW, cut/fill limits, and construction easements. The Plan Sheets scale should be determined by project size and density of plant material, with a minimum scale of 1" = 40'.
 - d. The purpose of the NPPP is to convey to the contractor the locations of plants to be Preserved in place (PIP), Removed from Site (RFS), Salvaged (S), and Transplanted (T). All native cacti, agave, yucca and ocotillo shall be moved to a temporary nursery or to a final location depending on the site conditions. Trees will not be salvaged to a temporary Nursery. Trees will only be transplanted once, either to a final location within the project limits or to another City project. The PIP plants can be grouped together and identified by preservation fencing. The RFS plants will not be identified.
 - e. The Plan Sheets will identify the (T) and (S) plants approximate location within the limits of disturbance and their ID number. All identified plants will have a disposition location shown on the landscape planting plan. Only plants with a disposition of salvage and transplant will be physically tagged in the field. Those native plants that are outside the limits of disturbance, but within the project limits, shall be clearly noted on the aerial as PIP. These PIP plants (beyond the limits of disturbance) do not need to be individually identified on the plans or inventory, but will be identified and preserved with preservation fencing.

- f. The Inventory Schedule shall be included on the NPPP sheets and include the Plant Identification Number, Scientific Name, Common Name, Size, and Disposition. There shall be no calculations for mitigation requirements.
 - g. The Plan Sheets will identify the approximate location of plants with a disposition.
 - Trees designated as (T) will be a “Once-move transplant” within the project limits. No tree nursery will be maintained on site. Tree will be moved by spade only, not boxed. Trees may be moved to another site or COT project per the discretion of the TDOT LA. Transplanted trees must be hand watered or have a temporary irrigation system until the final irrigation system is in place.
 - Cacti may be stored on site for future transplanting. Cacti will be covered with shade cloth and irrigated as required to maintain viability.
 - Cacti may also be salvaged by other government agencies and non-profit native plant organizations if not utilized by the project. All plant material protected by the Arizona Native Plant Law that will be moved off COT property will require permits from the Arizona Department of Agriculture.
 - h. The NPPP will provide preliminary information for developing a project cost estimate for transplanting, salvage, temporary irrigation, and maintenance.
 - i. The NPP information will be shared with all utility companies, to assist in relocating utilities to optimize available ROW for protection of native plants and optimizing usable landscape areas.
2. Type B Projects shall develop the following for the 60% submittal:
 - a. The consulting Landscape Architect shall schedule a field meeting with the City Representatives (Project Manager and/or TDOT Landscape Architect) to review the Landscape Analysis and Native Plant Inventory. The City shall approve or request changes to the disposition of the plant materials. The consultant shall make appropriate changes to the inventory.
 - b. The consultant shall identify the existing plant materials to be Removed from Site (RFS), Salvaged (S), and Transplanted (T).
 - c. Preserve in place (PIP) plants do not need to be identified individually, but will be shown to be protected by preservation fencing on the landscape plans.
 3. Utility Adjustment and Coordination: (Both A and B Type Projects)
 - a. Once the 60% plan review by TDOT has been completed, the proposed utility relocation shall be reviewed for impacts to both the proposed PIP areas and new transplant locations by the consulting Landscape Architect. The impacts may require additional field meetings with the TDOT Representative to identify the conflicts and develop a revised protection strategy.
 - b. If existing plants are impacted by utility relocations, refer to Table 1.2 for Mitigation Requirements for utility companies.

- c. After the utility review is completed, an updated inventory may be required of all plants impacted by utility relocation.
4. General Information for both Type A and B Projects:
 - a. There will be no mitigation calculations for plants removed from site.
 - b. The consulting Landscape Architect shall meet with the Project Manager to determine a budget for the Native Plant Preservation Plan. This budget shall include protective fencing for preserve-in-place plants, all salvaging, temporary nursery, and tree transplanting operations, and hand watering or a temporary irrigation system to maintain the plants until construction can provide a permanent irrigation system.
5. Final Construction Documents for 100% Submittal
 - a. For Type A Projects, a separate NPPP sheet, Inventory Schedules, Notes and Details shall be incorporated into the final roadway construction documents.
 - b. For Type B Projects, the Plant Inventory Chart shall be incorporated into the final Landscape Plans as part of the roadway construction documents as well as preservation fencing for PIP on the Engineer's Demolition plans.
 - c. Type A projects with a final Native Plant Preservation Plan, which identifies transplant and preserve-in-place plants, may not be completed until after all the utility conflicts have been identified and utility relocation impacts have been submitted and approved by the City project manager. This may take place after the 100% drawings are submitted. The consultant shall be available to alter the NPPP if required.
 - d. The utility companies shall be asked to provide mitigation funding if their relocation requires removal of the preserve-in-place plant materials. Refer to Table 1.2.
 - e. The Landscape Plans shall function as the mitigation plans in both Type A and B project. The Landscape Plans shall incorporate the plant species identified in the Landscape Analysis. If seed mix is used on the project, the seed mix shall also incorporate native annual forbs and grasses that will germinate and provide cover, with both cool and warm weather species present.
 - f. The Pre-Construction phase of the project may include flagging of transplant and salvaged material, and additional utility coordination.

City of Tucson Protected Native Plant List - Table 1.1

CACTI	
<i>Scientific Name</i>	Common Name
<i>Carnegiea gigantea</i>	Saguaro note crested
<i>Peniocereus greggi</i>	Desert Night-blooming Cereus
* <i>Coryphantha scheeri</i> var. <i>robustipina</i>	*Pima Pineapple Cactus
<i>Echinocereus engelmannii</i>	Engelmann's hedgehog cactus
<i>Echinomastus erectocentrus</i> var. <i>erectocentrus</i>	Needle-spined Pineapple Cactus
<i>Ferocactus acanthodes</i>	Compass Barrel
<i>Ferocactus wislizenii</i>	Fishhook Barrel
TREES	
<i>Scientific Name</i>	Common Name
<i>Acacia constricta</i>	Whitethorn Acacia
<i>Acacia greggii</i> var. <i>arizonica</i>	Catclaw Acacia
<i>Celtis pallida</i>	Desert Hackberry
<i>Celtis reticulata</i>	Net Leaf Hackberry
<i>Cercidium floridum</i>	Blue Palo Verde
<i>Chilopsis linearis</i>	Desert Willow
<i>Fraxinus velutina</i> var. <i>velutina</i> or <i>Fraxinus pennsylvanica</i> spp. <i>Velutina</i>	Arizona Ash
<i>Juglans major</i>	Arizona Black Walnut
<i>Salix gooddingii</i>	Goodding Willow
<i>Sambucus Mexicana</i>	Desert Elderberry
<i>Sapindus saponaria</i> var. <i>drummondii</i>	Western Soapberry
<i>Olneya tesota</i>	Ironwood
<i>Parkinsonia microphyllum</i>	
<i>Platanus racemosa</i> Nutt. var. <i>wrightii</i>	Arizona Sycamore
<i>Populus fremontii</i> sp. <i>Fremontii</i>	Fremont Cottonwood
<i>Prosopis pubescens</i>	Screwbean Mesquite
<i>Prosopis velutina</i>	Velvet Mesquite
* Denotes plants listed as Endangered or Threatened under the Federal Endangered Species Act (ESA) as of March 24, 1997. Any plants designated by the ESA, as amended, shall be subject to the applicability of this ordinance.	
SHRUBS	
<i>Scientific Name</i>	Common Name
<i>Acacia constricta</i>	Whitethorn Acacia
<i>Acacia greggii</i> var. <i>arizonica</i>	Catclaw Acacia

<i>Atriplex canescens</i>	Saltbush
<i>Celtis pallida</i>	Desert Hackberry
<i>Chilopsis linearis</i>	Desert Willow
<i>Condalia warnockii var. kearneyana</i>	Kearney Condalia
<i>Lycium species</i>	Wolfberry
<i>Zizyphus obtusifolia var. canescens</i>	Greythorn
SUCCULENTS OF A MINIMUM SIZE OF TWO (2) FEET IN HEIGHT	
<i>Scientific Name</i>	Common Name
Agave palmeri	Palmer's Agave
Fouquieria splendens	Ocotillo
Yucca elata	Soaptree Yucca

Table 1.2 Utility Mitigation Costs Paid to the City

Mitigation Shall be as Follows:	
Removing	The cost per plant X 2.5 (irrigation and maintenance cost)
Trees 2"-4" Caliper	The cost of 2 - 15 gal Tree of same species
Trees 4"-8" Caliper	The cost of 3 - 15 gal Trees of same species
Trees 8" and larger	The cost of 5 - 15 gal Trees of same species
Ocotillo under 6'	The cost of 1 - 15 gal Ocotillo
Ocotillo over 6'	The cost of 2 - 15 gal Ocotillo
Agaves & Yuccas	The cost of 2 – 5 gal plants same species
Barrels	The cost of 2- 12" mini. Same species

Resources:

- <https://agriculture.az.gov/protected-arizona-native-plants>
- <http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=52688>
- City of Tucson Native Plant Preservation Ordinance
- Pima County Native Plant Preservation Manual, Adopted June 2, 1998
- Pima County Environmentally Sensitive Roadway Design Guidelines, Chapter 4, Appendix4D