

City of Galveston
Dune Protection and Beach Access Plan

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Honorable Amy Carmen Bly	Council Member, District #1
Honorable Dr. Craig Brown	Council Member, District #2
Honorable David Collins	Council Member, District #3
Honorable Jason Hardcastle	Council Member, District #4
Honorable John Paul Listowski	Council Member, District #5
Honorable Dr. Jackie Cole	Council Member, District #6

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Progress Galveston! Exhibits are Work Products of HDR Engineering Inc. Exhibit A – Shoreline Change Zone Maps; Exhibit B – Dune Conservation Area Maps; Exhibit C - Beach Access; Exhibit D – Dune Restoration Priority 68-213

Executive Summary

This project was generously funded through the Industrial Development Corporation of the City of Galveston and is an effort to consolidate the various documents governing building activities, permitting, access, mitigation practices, exemptions, and establishes a common terminology through a consistent set of definitions.

Previously, the City of Galveston has adopted and revised regulations for the "Development, Preservation and Protection of Sand Dunes" known locally as Section 29-90. Additionally, the City of Galveston has adopted and revised "Sand Dune Area Definitions" known locally as Section 29-54. Subsequently, Galveston City Council adopted an ordinance in 2015 with the purpose of re-locating 29-54 and 29-90 and the adopted ERP as three Articles of Chapter 29 of the municipal code, which was renamed to "Planning – Beach Access Dune Protection & Beachfront Construction." Though each of these three articles were well written, together they were inconsistent, and their application has often resulted in confusion for residents and the State agencies charged with reviewing and commenting on potential permit applications.

During the first half of 2015, Coastal Strategies Group LLC, was contracted to conduct a review of the City of Galveston's Erosion Response Plan and present recommendations on possible implementation strategies that included possible short, mid, and long range implementation strategies; as well as an assessment of existing ERP's from other coastal jurisdictions, beachfront construction and building permit volumes, documentation of previous state funded grant awards, and a breakdown of potential impacts and costs to citizens. During this process it became evident there were inconsistencies between the documents, and as a result Coastal Strategies Group recommended a two phase approach to complete the unification process. This present effort to reconcile and consolidate the governing documents into a single "City of Galveston Dune Protection and Beach Access Plan" is the first phase of that two-step process. It is anticipated the second phase would examine among other topics beach access locations, number of access points and the issue of on-beach and off-beach parking.

For ease of use by all parties involved the intent of this document is to work within the framework of the former Section 29-90 document since it is easily the most familiar of the three documents. Provisions, terminology, and corresponding definitions have been "lifted" from the Erosion Response Plan and incorporated into the Section 29-90 format. Corresponding changes to the Erosion Response Plan to reflect text changes regarding the Building Setback Area has also been included in this document. However, the HDR developed ERP exhibits have not been revised as a part of this document consolidation. It was understood the mapping changes would be accomplished in the secondary Phase 2 amendment that addresses access, parking and the more controversial aspects of the overall Plan. The Definitions section found on pages 28-34 incorporates the former Section 29-54 and adds new terminology from the Erosion Response Plan. Similarly, the ERP has been modified to reflect revisions to the other sections of the overall plan.

An important factor in the development of this project is the understanding that a consistent document is vital to the efficient management of Galveston's beach and dune system.

In General, Statement of Purpose and Intention

Being located on an island in the Gulf of Mexico, Galveston is commonly subjected to such natural hazards as storm, flood and shoreline erosion. These hazards disrupt commerce and governmental services, impact the tax base and threaten public health, safety, and general welfare. It is to combat these hazards that development, preservation and protection of sand dunes is encouraged. However, many land uses reduce sand dunes' effectiveness in protecting against these hazards and are for this reason alone considered to be contrary to the public interest.

The Open Beaches Act and the Dune Protection Act require the Texas General Land Office to promulgate rules for the protection of critical dune areas and public beach use and access. The General Land Office is required to protect the public beach from erosion or reduction and adverse effects on public access and critical dune areas by regulating beachfront construction and other activities occurring along the shoreline of the Gulf of Mexico. The purpose of these Standards is to augment General Land Office rules and to protect the public health, safety and welfare by minimizing losses due to flood, storm, waves and shoreline erosion. These standards are in compliance with those minimum standards established by the General Land Office and formulated to be consistent with all Federal mandates. This Section provides standards for managing the public beach and human activities occurring on the property fronting the Gulf of Mexico, consistent with the Texas Natural Resources Code, Sec. 61.001 (Open Beaches Act), et seq, a copy of which is attached, and the Texas Natural Resources Code, Sec. 63.001, et seq, (Dune Protection Act), a copy of which is also attached, and the National Flood Insurance Act.

In the event of a conflict between the Open Beaches Act; Dune Protection Act; Texas Administrative Code Title 31, Natural Resources and Conservation, Part I, Chapter 15, Subchapter A, Sections 15.1-15.10 (hereinafter 31 TAC §§15.1 - 15.10); and the City of Galveston Zoning Standards, State law and regulations shall prevail over this ordinance.

A. Requirement for a Dune Protection Permit and/or a Beachfront Construction Certificate

Authority: The City of Galveston is required to adopt dune protection and beach access plans within its jurisdiction, consistent with Title 31 Texas Administrative Code, §§15.1 - 15.10 (hereinafter 31 TAC §§15.1 - 15.10). By way of this Section the City of Galveston adopts the provisions of Title 31 Texas Administrative Code pertaining to Coastal Area Planning. The City of Galveston may choose to adopt higher standards for dune protection and beach access than those promulgated by the State. The City of Galveston may enter into interlocal cooperation contracts for the administration of this program under the Interlocal Cooperation Act, Tex. Rev. Civ. Stat. Art. 4413 (32c). The City of Galveston shall map or describe the jurisdictional boundaries of the Dune Protection Line and identify said Dune Protection Line by map. The requirement for a Beachfront Construction Certificate or Dune Protection Permit shall not extend landward from the face of the Galveston Seawall.

1. Beachfront Construction Certificate - No person shall engage in the construction of any structure or make an addition or alteration to any structure within the land adjacent to and landward of public beaches and lying in the area either up to the first public road generally parallel to the public beach or to any closer public road not parallel to the beach, or the area up to 1,000 feet of mean high tide, whichever distance is greater, or undertake any beach maintenance activities until first securing a Beachfront Construction Certificate or Dune Protection Permit as appropriate.

2. For Platted Land-All new subdivisions of land submitted for plat approval after April 12, 2012 shall contain a note on the plat advising of the location of the property within the Dune Conservation Area, and that reads substantially as follows: "The lots or parcels shown on this plat may be located within the Dune Conservation Area and will be subject to dune protection and beach access

standards more stringent building requirements or limitations under State of Texas and City of Galveston regulations.

3. For land not required to be platted, prior to the issuance of a building Beachfront Construction Certificate and Dune Protection Permit for construction activity on a property located within the Dune Conservation Area that has been platted prior to April 12, 2012, or that is otherwise not required to be platted, an affidavit in the form prescribed by the City shall be executed by the owners of the property setting forth notice language as described above.

4. To the maximum extent practicable, all structures shall be constructed landward of the Dune Conservation Area and it is the intent of this Plan to prohibit construction within or seaward of the Dune Conservation Area; and to provide for exemptions for new construction and renovations of existing structures within or seaward of the Dune Conservation Area.

B) Exemptions / Consideration of Exemptions-

Construction is prohibited within or seaward of the Dune Conservation Area. The City provides for exemptions for new construction and renovations of existing structures. To the maximum extent practicable, all structures shall be constructed landward of the Dune Conservation Area. The City will consider property owner's requests for an exemption from the prohibition on construction within or seaward of the Dune Conservation Area for one of the following existing conditions:

1. Properties for which the owner has demonstrated to the satisfaction of the City that there is no practicable alternative to construction within or seaward of the Dune Conservation Area. In determining what is practicable, the City shall consider whether an action, technology, or technique is commercially available and capable of being done after taking into consideration existing building practices, effectiveness, scientific feasibility, siting alternatives, and the footprint of the structure in relation to the area of the building portion of the lot, and considering the overall development plan for the property. The City shall also consider the cost of the technology or technique.
2. Properties with a valid Beachfront Construction Certificate approved under the City's Dune Protection and Beach Access Plan prior to the adoption of the City of Galveston ERP- Adopted on May 7, 2012. Effective into rule on December 13, 2012.
3. Structures located within or seaward of the Dune Conservation Area prior to the effective date of the ERP (adopted on May 7, 2012. Effective into rule on December 13, 2012) for which modifications are sought that do not increase the footprint further seaward of the existing structure, that have not been determined "substantially damaged" under the City's flood regulations, and that have not been abandoned for a period of more than 12 months. For the purposes of this section, "abandoned" shall mean a rebuttable determination by the City of an intention to not repair or return to the structure. Structures within or seaward of the Dune Conservation Area that have been substantially damaged or abandoned for a period of more than 12 months shall be subject to conditions of this Plan.

C) Dune Protection Permit –

No person shall engage in the construction of any structure or make an addition or alteration to any structure, sand dune, or dune vegetation in the area seaward of the Dune Protection Line until first securing a Dune Protection Permit for such addition, alteration, or construction.

1. The requirement for a Dune Protection Permit and/or a Beachfront Construction Certificate shall not apply to routine repairs, maintenance and upkeep of existing structures which do not enlarge, expand or redesign the existing structure except as prohibited in this Section.

D) Permitting Authorities

1. Final determination of whether repairs, maintenance or upkeep constitutes enlargement, expansion or redesign pursuant to Section (C) above shall be the responsibility of the Department of Development Services.
2. Beachfront Construction Certificates and Dune Protection Permits for construction within, and seaward of the Dune Conservation Area and Dune Protection Line, and Beachfront Construction Certificates for construction up to 50 feet landward of the Dune Protection Line (75' landward of the north toe of the critical dune area) are subject to review by the Department of Development Services and are issued by the Planning Commission.
3. Beachfront Construction Certificates for the area more than 50' feet landward of the Dune Protection Line (75' landward of the north toe of the critical dune area) are issued by the Department of Development Services.
4. Dune Protection Permits for dune enhancement and revegetation activities only, are reviewed and issued by the Department of Development Services.
5. Beachfront Construction Certificates and Dune Protection Permits for the construction of new driveways, slabs, ground level enclosures beneath the existing footprint of the structure dune walkovers, sand fences, beach maintenance activities, perimeter fencing, fill projects, restored (man-made) dune projects located within and seaward of the Dune Conservation Area and the Dune Protection Line, and Beachfront Construction Certificates for construction up to 50 feet landward of the Dune Protection Line (75' landward of the north toe of the critical dune area) are subject to review, and are only issued by the Department of Development Services.
6. No building permit shall be issued for any activity for which a Dune Protection Permit and/or Beachfront Construction Certificate is required until such permit and/or certificate has been issued by the Galveston Planning Commission, or, when appropriate, the of Development Services.
7. No person shall engage in any business or occupy any structure for which a Dune Protection Permit and/or Beachfront Construction Certificate is required until first securing a Certificate of Occupancy from the Building Official. Such Certificate of Occupancy shall be approved by the Department of Development Services as being in compliance with these Zoning Standards.
8. The City of Galveston, Department of Development Services, shall review the Dune Protection Line every five years to determine whether the line is adequately located to achieve the purpose of preserving critical dune areas. In addition to the five-year review, the City of Galveston Department of Development Services shall review the adequacy of the location of the Dune Protection Line within 90 days after a tropical storm or hurricane affects the portion of the coast. No Beachfront Construction Certificates or Dune Protection Permits for new construction will be approved until a review of the Dune Protection Line has been completed after a tropical storm or hurricane. Requirements for Permits as stated in Item (#4) of this Section will be followed.

E) Building Requirements

Structures required to have a Dune Protection Permit and/or a Beachfront Construction Certificate shall comply with FEMA standards for construction in flood hazard areas. Structures built seaward of the dune protection line within the Dune Conservation Area and Enhanced Construction Area shall comply with the following additional requirements:

1. Piers, if required, shall be set and the structure shall be constructed with minimum destruction of the existing terrain and vegetation;

2. Enclosures- No ground-level enclosures below base flood elevation (BFE) shall be allowed in the Dune Conservation Area.

3. The structure and lot design shall provide for the gradual and dispersed drainage of storm water runoff, such that runoff within the lot approximates natural rates, volumes, and direction of flow to avoid erosion and dune damage. Drain spouts, if any, shall be located, so as to collect rainwater and distribute same evenly under the structure if no slab; porches, patios and balconies shall be constructed to allow rainwater to pass through. All drainage from the lot shall flow away from the beach and primary dune area.

4. All permittees building structures seaward of the dune protection line must utilize the mitigation sequence defined in subsection (1) of this Section and subsection 15.4(f) of the General Land Office regulations if dunes and dune vegetation will be adversely effected.

F) Vegetation and Topography Seaward of the Dune Protection Line

As provided in this Section unless otherwise unavoidable during construction, removal or destruction of vegetation, or alteration of topography within the area seaward of the Dune Protection Line is prohibited. If dunes or dune vegetation will be damaged, a Beachfront Construction Certificate and Dune Protection Permit must be obtained prior to initiating construction. Where impacts are unavoidable, areas where vegetation was removed or destroyed shall be revegetated and topography shall be restored consistent with the mitigation sequence provisions of this Plan.

The proposed construction shall be designed to minimize impacts to natural hydrology and provide for the gradual and dispersed drainage of storm water runoff, such that runoff within the lot approximates natural rates, volumes, and direction of flow to avoid erosion and dune damage.

Prior to the commencement of proposed construction, a dune enhancement or restoration project consistent with the definition for restored (man-made) dunes shall be completed. In cases where completion of an enhancement or restoration project is deemed infeasible due to site constraints as determined by the Department of Development Services, payment of a fee-in-lieu of satisfying the requirement shall be made to the City. Such payment is applicable to locations within the Dune Conservation Area. Funds collected will be used to support dune restoration, beach nourishment, or beach access improvements

Any unavoidable alteration of the contour because of construction activities shall be restored and revegetated, and any breach in the dune area, whether caused by man or nature shall be restored and revegetated before the issuance of a Certificate of Occupancy. Restoration and revegetation shall occur as follows:

1. All areas shall be restored to their original elevation. Breaches shall be restored to the contour of the adjacent dunes;
2. If the area is located in the critical dune area, then it shall be revegetated with Bitter Panicum (Panicum amarum) planted on two-foot (2') centers with one hundred percent (100%) coverage of the area and a mixture of Bitter Panicum (Panicum amarum) and Marshay Cordgrass (Spartina patens) planted on one foot (1') centers with one hundred percent (100%) coverage of the area;
3. Sand fencing shall be required;
4. Revegetation shall not be considered complete until the area has been returned to its original condition prior to the time of destruction, at a ratio of 1:1, as determined by the Department of Development Services; and,
5. Removing or altering dune vegetation is prohibited unless the permittee has first obtained the applicable Beachfront Construction and/or Dune Protection Permit.

G) Pre-existing Uses: Destruction

Not withstanding that a structure was in existence prior to adoption of this Section such structure or use shall comply with the provisions hereof including all other applicable provisions of the Zoning Standards where such use or structure is expanded by any degree, moved to a new location, or destroyed in excess of fifty percent (50%) of its market value by fire or other catastrophe at the time of such destruction. When a structure which has been damaged less than fifty percent (50%), but is seaward of the Dune Protection Line, and by determination by the Department of Development Services, the planned development will cause material damage to dunes or dune vegetation in the Critical Dune Area, such reconstruction of the development shall require a Beachfront Construction Certificate and Dune Protection Permit. The Department of Development Services shall use standards as identified in (k) of this Section in determining whether the planned development will cause material damage to dunes or dune vegetation in the critical dune area.

H) Dune Walkovers (Ord. 05-027)

Construction of dune walkovers shall meet the following standards:

1. A dune walkover shall not exceed six feet (6') in width, the deck or floor of which shall be constructed at a height above the highest dune of not less than the width of said walkover, and maintain this height over the entire dune area. Walkovers in excess of four feet (4') in width shall only be considered for individual lots that require access for disabled persons, shared walkovers amongst three (3) or more individual lots or for high traffic areas such as public access points or multi-family properties;
2. Except with respect to paired posts constructed on each side of the walkover, posts shall be placed at intervals no closer than six feet (6') and in such a manner that new posts are not needed if walkway needs elevating;
3. Any vegetation or contours disturbed during construction shall be restored as provided herein;
4. Only one dune walkover shall be permitted per residential lot;
5. Dune walkovers must be constructed to maintain ½" spacing between the slats to allow rain and sand to pass through the decking. Additionally, walkovers shall be designed to allow for necessary modifications while minimizing disruption of the dune system;
6. The walkover must start at the northern boundary of the Critical Dune Area and shall end on the beach beyond any coppice mounds, no further than ten feet (10') seaward of the vegetation line. Dune walkovers may not impede or restrict access to, and use of, the public beach at normal high tide;
7. All walkovers built in public areas be constructed with two (2) handrails;
8. All walkovers be constructed according to the International Building Code Standards;
9. It shall be the duty of the property owner, pursuant to the requirements of this Section to keep and maintain said dune walkover in a good condition of repair and maintenance;
10. Permittees must relocate walkovers to follow any landward migration of the public beach or seaward migration of the dunes and maintain the walkover height to approved levels. The Department of Development Services may inspect and require dune walkover compliance within a reasonable period of time. Not withstanding this, compliance should not cause renewed damage to existing post locations within dunes or swales from construction or construction equipment;
11. All dune walkover construction, improvement or repair must be permitted through the Department of Development Services, City of Galveston; and includes the acquisition of a Building Permit issued by the Building Department following a determination of conforming to all Building Permit requirements.

12. Applicants for public dune walkovers may request approval for alternative design standards from the Department of Development Services.

I) Beachfront Construction Certificate and Dune Protection Permit Application Requirements

Authority: Title 31 TAC, § 15.3(s)(5), requires the City of Galveston to obtain the following items and information from applicants for Beachfront Construction Certificates and Dune Protection Permits.

1. For all proposed construction (large- and small-scale), required to obtain a Beachfront Construction Certificate and/or a Dune Protection Permit, applicants shall submit the following items and information to the Department of Development Services. (No application will be accepted until all required materials are deemed to have been provided to the Department of Development Services):
    a. A complete application according to standards set by the Department of Development Services for a Dune Protection Permit and/or a Beachfront Construction Certificate, including the name, address, phone number, email address, and if applicable fax number of the applicant, and the name of the property owner, if different from the applicant;
    b. An accurate map or plat of the site identifying:
        1. The site by its legal description, including, where applicable, the subdivision, block, and lot and the size in acres or square feet;
        2. The landward and seaward limits of the Dune Conservation Area and Enhanced Construction Zone, the location of the proposed construction and the distance between the proposed construction and mean high tide, the line of vegetation, the dune protection line, proposed and existing structures, the project area of the proposed construction on the tract and the landward limit of the beachfront construction area;
        3. The location of the property lines and a notation of the legal description of adjoining tracts;
        4. The location of the structures, the footprint or perimeter of the proposed construction on the tract, and whether the structures are amenities or habitable structures;
        5. Proposed or existing roadways and driveways, parking, dune walkovers and proposed landscaping activities on the tract; and
        6. The location of any seawalls or any other erosion response structures on the tract and on the properties immediately adjacent to the tract;
        7. If known, the location and extent of any man-made vegetated mounds, restored dunes, fill activities, or any other pre-existing human modifications on the tract;
        8. The approximate duration of construction; and,
        9. A survey by a licensed surveyor; and if the Beachfront Construction Certificate is for an area defined in (D) Permitting Authorities of these Standards, a topographic survey is also required.
2. For all proposed construction (large- and small-scale), located seaward of the Dune Protection Line, the applicant shall submit the following additional items and information to the Department of Development Services:
    a. A comprehensive mitigation plan which includes a detailed description of the methods which will be used to avoid, minimize, mitigate and/or compensate for any adverse effects on dunes or dune vegetation shall be required for all alterations and development activity seaward of the

Dune Protection Line, including effects on the proposed activity on the beach/dune system which cannot be avoided should the proposed activity be permitted, including, but not limited to, damage to dune vegetation, alteration of dune size and shape, and changes to dune hydrology;

b. Where a mitigation plan is required, the contact information for all landowners immediately adjacent to the tract and affirmation by the applicant that the adjacent landowners will be provided with notice of the hearing at least 10 days prior to the hearing on the application.
c. Proof of financial capability to mitigate or compensate for adverse effects on dunes and dune vegetation (e.g., an irrevocable letter of credit or a performance bond) or, if required for Special Requirements for Eroding Areas, to fund eventual relocation or demolition of structures (e.g., Upton-Jones coverage in the National Flood Insurance Program);
d. A copy of the FEMA elevation requirements;
e. A current topographic map, provided by a licensed surveyor, depicting any and all proposed changes to the terrain; indicate on topographic map any and all changes to the natural or man-made environment within the Critical Dune Area in order to build;
f. The approximate percentage of existing and finished open spaces (those areas completely free of structures);
g. The floor plan and elevation view of the structure proposed to be constructed or expanded and showing all plumbing plans;
h. A grading and layout plan identifying all elevations (in reference to the National Oceanic and Atmospheric Administration datum), existing contours of the project area (including the location of dunes and swales), wetlands, and proposed contours for the final grade;
i. Dated photographs of the site which clearly show the current location of the vegetation line and the existing dunes on the tract and the adjacent property from directions south, north, east and west;
j. The most recent local erosion rate data (based on published data from the Bureau of Economic Geology, University of Texas, Austin), and the activity's potential impact on coastal erosion.

3. For all proposed large-scale construction (construction required to have a Dune Protection Permit and/or a Beachfront Construction Certificate), applicants shall submit the following additional items and information:

   a. In the case of multiple-unit dwellings, the number of units proposed;
   b. Alternatives to the proposed location of construction on the tract or to the proposed methods of construction which would cause fewer or no adverse effects on dunes and dune vegetation or less impairment of beach access; and the proposed activity's impact on the natural drainage pattern on the site and the adjacent lots; and,
   c. If the tract is located in a subdivision and the applicant is the owner or developer of the subdivision, a certified copy of the recorded plat of the subdivision, or, if not a recorded subdivision, a plat of the subdivision certified by a licensed surveyor, and a statement of the total area of the subdivision in acres or square feet.

4. Upon completion of the development, and prior to the issuance of a "Certificate of Occupancy," for those structures requiring Planning Commission approval, the permittee shall provide the Department of Development Services with a final survey indicating finished elevations, surfaces, drainage patterns, fences, dune walkovers and landscape detail, or certification by a registered professional engineer that all Permit conditions have been met. No "Certificate of Occupancy" shall be approved until the Department of Development Services approves a "Certificate of Completion," verifying that all Permit conditions have been satisfied.

J) Texas General Land Office

A person proposing to conduct an activity for which a Beachfront Construction Certificate and Dune Protection Permit is required shall submit a complete application to the Department of Development Services. This Department shall forward the complete application, including all items and information as set forth in 31, TAC §15.3(s)(5)(D) most recent erosion rate data as determined by the University of Texas, Bureau of Economic Geology; the activity's impact on coastal erosion and a copy of the FEMA "Elevation Certificate") to the General Land Office (GLO), and other regulatory agencies if necessary.

The application, any documents associated with the application, and information as to when the decision will be made must be received by the GLO no later than 20 days from the date the Department of Development Services and Planning Commission, if required, is first scheduled to act on the Beachfront Construction Certificate and Dune Protection Permit. A preliminary determination as to whether the proposed construction complies with all aspects of the local government's dune protection and beach access plan will be provided by the Department of Development Services.

K) Termination of Permit and/or Certificate of Permit and/or Certificate

1. The Planning Commission or the Department of Development Services may void a Beachfront Construction Certificate and/or Dune Protection Permit, for their respective responsibilities as outlined in Section (D) "Permitting Authorities" if:
   a. The permit is inconsistent with this Plan at the time the permit was issued;
   b. A material change occurs after the permit or certificate is issued or a permittee fails to disclose any material fact in the application; or,
   c. If the construction comes to lie within the boundaries of the public beach.
2. "Material Change" includes human or natural conditions which have adversely affected dunes, dune vegetation, or beach access and use that either did not exist at the time of the original application, or were not considered by the Department of Development Services or Planning Commission in making the permitting decision because the permittee did not provide information regarding the site condition in the original application.
3. Unless conditions under Section (K) of these Standards apply, work approved under this Permit shall be completed as described below:
   a. One family dwelling (detached), or Two family dwelling:
      Within one (1) year from the date of the permit.
   b. One family dwelling (attached), Multiple-family dwelling, or Non-residential project:
      Within three (3) years from the date of the permit.

   For projects described in this subsection, the applicant shall submit an annual written report to the Department of Development Services on the progress of the construction project and compliance with the approved permit. This report shall be submitted no later than one (1) year from the date of the permit, and subsequent annual reports submitted thereafter.

   If work is not completed in this time period, it will be necessary for the applicant to reapply for a Beachfront Construction Certificate and/or Dune Protection Permit, unless a renewal of the permit, prior to its expiration approved by the City of Galveston in compliance with the requirements outlined in 31 TAC §15.3(t).

L) Beachfront Construction Certificate and Dune Protection Permit Standards

1. **Beachfront Construction Certificate Authority:** 31 TAC §15.5 requires the City of Galveston to comply with the following standards in issuing, denying or conditioning a Beachfront Construction Certificate.

   The request for a Beachfront Construction Certificate will be considered inconsistent with this Section and therefore, will not be approved, if the request:

   a. Reduces the size of the public beach or encroaches on the public beach in any manner, except for man-made vegetated mounds and dune walkovers constructed in compliance with the requirements of this ordinance;

   b. Functionally supports, depends on or is otherwise related to proposed or existing structures that encroach on the public beach, regardless of whether the encroaching structure is on land that was previously landward of the public beach, unless otherwise permitted by law, including, but not limited to, the authority granted under 31 TAC §15.5; (Ord 00-022)

   c. Closes any existing public beach access or parking area, unless equivalent or better dedicated public access or parking is established;

   d. Cumulatively or indirectly impairs or adversely affects public use of or access to and from a public beach, including failure to comply with any requirements in Management of the Public Beach unless equivalent or better access or parking is established; or,

   e. Fails to comply with any requirements of Requirements for Beachfront Construction Certificates and Dune Protection Permits.

2. **Dune Protection Permit Authority**: 31 TAC, §15.4, requires the City of Galveston to comply with the following standards in issuing, denying or conditioning a Dune Protection Permit for those areas within the Critical Dune Area.

   Before issuing a Dune Protection Permit the Department of Development Services and the Planning Commission, for their respective responsibilities as outlined in §(D) Permitting Authorities, must find that:

   a. The proposed activity is not a prohibited activity as defined in these Standards;

   b. The proposed activity will not materially weaken dunes or materially damage dune vegetation seaward of the Dune Protection Line based on substantive findings as defined in "Technical

      Standards" of this Section;

   c. There are no practicable alternatives to the proposed activity that is located seaward of the Dune Protection Line and adverse effects cannot be avoided as provided in the mitigation sequence as outlined in this section;

   d. The applicant's mitigation plan, for an activity seaward of the Dune Protection Line, if required, will adequately minimize, mitigate, and/or compensate for any unavoidable adverse effects;

   e. The proposed activity complies with any applicable requirements of: Requirements for Beachfront Construction Certificate and Dune Protection Permits and Management of the Public Beach of this Section; and,

   f. The structure is located as far landward as practicable.

M) Prohibitions

1. **Prohibited Activities seaward of the dune protection line**: The Planning Commission and the Department of Development Services shall not issue a Beachfront Construction Certificate or a Dune Protection Permit authorizing the following acts seaward of the Dune Protection Line:

   a. Activities that are likely to result in the temporary or permanent removal of sand from the portion of the beach/dune system located on or adjacent to the construction site, including:

      1. Relocating sand; and,

      2. Temporarily or permanently moving sand off the site, except for purposes of permitted mitigation, compensation, or an approved dune restoration or beach nourishment project and then only from areas where the historical accretion rate is greater than one foot per year, and the project does not cause any adverse effects on the sediment budget;

   b. Depositing sand, soil, sediment, or dredged spoil which contains any of the toxic materials listed in Volume 40 of the Code of Federal Regulations, Part 302.4, in concentrations which are harmful to people, flora, and fauna as determined by applicable, relevant, and appropriate requirements for toxicity standards established by the local, state, or federal governments;

   c. Depositing sand, soil, sediment, or dredged spoil seaward of the Dune Protection Line, which is of an unacceptable mineralogy or grain size when compared to the sediments found on the site (this prohibition does not apply to materials related to the installation or maintenance of public beach access roads running generally perpendicular to the public beach or for approved beach nourishment projects as described in (Q)(3) of these Zoning Standards);

   d. Creating dredged spoil disposal sites, such as levees and weirs, without the appropriate local, state, and federal permits;

   e. Constructing or operating industrial facilities not in full compliance with all relevant laws and permitting requirements prior to the effective date of this ordinance;

   f. No ground-level enclosures below base flood elevation (BFE) shall be allowed in the Dune Conservation Area.

   g. Operating recreational vehicles; dune buggy, marsh buggy, mini-bike, trail bike, jeep, or any other mechanized vehicle that is being used for recreational purposes, but does not include any vehicle not being used for recreational purposes (Chapter 63. §63.002(4), Texas Natural Resource Code);

   h. Mining dunes;

   i. Constructing concrete slabs or other impervious surfaces landward of the line of vegetation, except as exempted herein.

      1. For large-scale construction, impervious surfaces shall be limited to 40% of the area landward of the Dune Conservation Area. The determination of the percentage of impervious surfaces and pervious surfaces allowed must include the area beneath the habitable structure, whether or not the area or any portion of the area beneath the habitable structure is left in a natural state.

      2. Paving or altering the ground below the lowest habitable floor is prohibited in the area between the line of vegetation and 25-feet landward of the north toe of the dune within the Dune Conservation Area;

      3. Paving used under the habitable structure and for any driveway(s) connecting the habitable structure and the street is limited to the use of unreinforced fibercrete in 4 foot x 4 foot

sections, which shall be a maximum of four inches thick with sections separated by expansion joists, or pervious materials approved by the Department of Development Services, in that area 25-feet landward of the north toe of the dune to 200-feet landward of the line of vegetation, measured to the southernmost point of the structure, including decks, stairs, etc. The City shall assess a "Fibercrete Maintenance Fee" of $200.00 to be used to pay for the clean-up of fibercrete from the public beaches should the need arise;

4. Reinforced concrete may be used under the habitable structure and for any driveways connecting the habitable structure and the street for property located landward of 200-feet from the line of vegetation, measured to the southernmost point of the structure, including decks, stairs, etc.; (Ord 97-80, Ord. 05-027)

5. Exemption. An exemption to the prohibition of using reinforced concrete under a structure located within 200 feet of the line of vegetation may be granted when the following conditions are present:

   a. When the proposed or existing use of the structure is multiple-family or commercial, that will be constructed with, or have, an elevated, reinforced concrete deck at or above Base Flood Elevation (BFE).
      i. For proposed or existing structures that are:
         1. Designed, built, rented, or leased to be occupied, or any portion thereof, as an attached, multiple-family residential living unit, at least five (5) stories in height;
         2. Multiple-family residential living units constructed at least in part behind the seawall, and;
         3. Utilizes a storm water detention system which mitigates peak water runoff on the development site which reduces impacts to dunes and the public beach.
   b. The request for exemption shall be submitted to the Development Services Department for review. The request shall include:
      i. stamped engineer drawings, dated within 12 months of submittal date;
      ii. a statement of explanation for the request, and;
      iii. the basis and documentation requiring reinforced concrete.
   c. The Development Services Department may grant an exemption upon final review.
   d. The City shall assess a "concrete maintenance fee" of $1/square foot of concrete to be used to pay for the clean-up of concrete from the public beach should the need arise and as amended by City Council. (Ord. 23-038)

j. Depositing trash, waste, or debris including inert materials such as concrete, stone, and bricks that are not part of the permitted on-site construction;

k. Constructing cisterns, septic tanks, and septic fields seaward of any structure serviced by the cisterns, septic tanks, and septic fields, with the exception of subdivisions platted before the enactment of this Section; or,

l. Detonating bombs or explosives.

2. The City of Galveston Planning Commission and the Department of Development Services shall not issue a Beachfront Construction Certificate and Dune Protection Permit that does not comply with FEMA minimum requirements or with this Section.

3. **Prohibited Erosion Response Structures**:

Erosion response structures as set forth in 31 TAC §15.6 are as follows:

a. Construction of retaining walls is prohibited within 200-feet landward of the natural line of vegetation;

b. Repairing, or maintaining existing erosion response structures is prohibited within 200-feet landward of the vegetation line or within the Critical Dune Area, except in the following circumstances:

1. Where the failure to repair the structure will cause unreasonable flood hazard to a public building, public road, public water supply, public sewer system, or other public facility immediately landward of the structure; and,

2. Where the failure to repair the structure will cause unreasonable flood hazard to habitable structures because adjacent erosion response structures will channel floodwaters to the habitable structure;

c. A determination as to whether (L)(2)(a) and (L)(2)(b) above will occur, will be made by the Planning Commission.

4. Activities prohibited within the area seaward of the Dune Protection Line without a Beachfront Construction Certificate and Dune Protection Permit:

a. Removal, relocation, or movement of sand or dunes except for the clearing of sand off of dune walkover steps;

b. Construction of dunes;

c. Removal of vegetation (killing, destroying or removing in any manner any vegetation growing on a sand dune seaward of the Dune Protection Line or within a critical dune area); or,

d. Placement of fill within the critical dune area.

5. Prohibited activities under a Dune Protection Permit or a Beachfront Construction Certificate where it is shown that a loss of sand, silt, shell, sediment, vegetation or any other geologic or biological component of the Critical Dune Area will result are as follows:

a. Parking of any motor vehicle except in an area approved by the Planning Commission for parking of a motor vehicle;

b. Exposed storage of goods, equipment, building materials, junk, household items, boats, furniture, wares or merchandise of any kind;

c. Any type of construction work, other than that on the main structure or on a main building;

d. Construction of substructures under the main building;

e. Use or placement of playground equipment, volleyball nets, showers, barbecues, stables, utilities, or other apparatus;

f. Grazing of any animal which is prohibited by the City of Galveston in accordance with §29-90, Galveston Zoning Standards;

g. Horse riding except as permitted in §8-8, Galveston City Code;

h. Operation of any motor vehicle except for necessary maintenance and clean up and for transportation to and from permitted habitable structures;

i. Mowing;

j. Paving of any type; or,

k. Creation of roads, trails, or paths and the use of trails or paths, except those access roads approved by the City of Galveston as part of its access plan.

N. Technical Standards

Authority: Title 31 TAC. Natural Resources and Conservation, Part I, Chapter 15, Subchapter A, Section 15.4, requires the City of Galveston to comply with the following technical standards when issuing, denying or conditioning a Beachfront Construction Certificate and/or Dune Protection Permit seaward of

the Dune Protection Line.

1. The following standards will be used to determine material weakening and material damage of dune vegetation within a critical dune area or seaward of the Dune Protection Line. (Failure to meet any one of these standards will result in a finding of material weakening or material damage and the Planning Commission shall not approve the application for the construction as proposed):
    a. The activity shall not result in the potential for increased flood damage to the proposed construction site or adjacent property;
    b. The activity shall not result in runoff or drainage patterns that aggravate erosion on or off the site;
    c. The activity shall not result in significant changes to dune hydrology;
    d. The activity shall not result in adverse affects on dune complexes or dune vegetation;
    e. The activity shall not significantly increase the potential for washovers or blowouts to occur; or
    f. The Commission shall not issue a Beachfront Construction Certificate and Dune Protection Permit authorizing construction unless the construction and property design is designed so as to minimize impacts on natural hydrology. Such projects shall not cause erosion to adjacent properties, critical dune areas, or the public beach.
2. Other considerations when determining whether to grant a Beachfront Construction Certificate and Dune Protection Permit seaward of the Dune Protection Line are as follows:
    a. Cumulative and indirect effects of the proposed construction on all dunes and dune vegetation within the Critical Dune Area or seaward of the Dune Protection Line;
    b. Cumulative and indirect effects of other activities on dunes and dune vegetation located on the proposed construction site;
    c. The pre-construction type, height, width, slope, volume, and continuity of the dunes, the pre-construction condition of the dunes, the type of dune vegetation, and percent of vegetation cover on the site;
    d. Whether the proposed construction may alter dunes and dune vegetation in a manner that may aggravate erosion;
    e. The local historical erosion rate;
    f. The impacts on the natural drainage patterns of the site and adjacent property;
    g. Any significant environmental features of the potentially affected dunes and dune vegetation such as their value and function as flora or fauna habitat or any other benefits the dunes and dune vegetation provide to other natural resources;
    h. Wind and storm patterns including a history of washover patterns;
    i. Location of the site on the flood insurance rate map;
    j. Success rates of dune stabilization projects in the area;
    k. All comments submitted to the local government by the General Land Office;
    l. The Beachfront Construction Certificate and Dune Protection Permit Application;
    m. The proposed activity's consistency with TAC Title 31, the City of Galveston's Dune Protection and Beach Access Plan, including the Dune Protection and Beachfront Construction Standards

contained in both;

n. Any other law relevant to dune protection and beach use and access which affects the activity under review;

o. The adequacy of elevated building foundations and the proper placement, compaction, and protection of fill when used as construction for all newly constructed, substantially damaged, and substantially improved buildings elevated on pilings, posts, piers, or columns in accordance with the latest edition of specifications outlined in American Society of Civil Engineers, Structural Engineering Institute, Flood Resistant Design and Construction, ASCE 24-05.

p. Any other relevant information the City of Galveston may consider useful to determine consistency with its dune protection and beach access plans including resource information made available to them by Federal and State natural resource entities. The City of Galveston Planning Commission shall not issue a Beachfront Construction Certificate or a Dune Protection Permit that is inconsistent with its Plan, Title 31 of the Texas Administration Code, and any other State, Federal and local laws related to the requirements of the Dune Protection Act and Open Beaches Act.

O) **The Mitigation Sequence** shall be used by local governments in determining whether to issue a Permit for an activity seaward of the Dune Protection Line, after the determination that no material weakening of dunes or material damage to dunes will occur within critical dune areas or seaward of the Dune Protection Line. The mitigation sequence provided below (O)(1-4) shall be followed as set forth in guidelines promulgated in 31 TAC, § 15.4. Dune Protection Standards. The permittee shall be deemed to have failed to achieve compensation if a 1:1 ratio has not been achieved within three years after beginning compensation efforts. If, for any reason, an applicant cannot demonstrate the ability to mitigate adverse effects on dunes and dune vegetation, the Planning Commission is not authorized to issue the Permit. The Department of Development Services shall provide applicants with the mitigation sequence and standards to be followed. The mitigation sequence is as follows:

1. Avoid the impact altogether by not taking a certain action or parts of an action;

2. Minimize impacts by limiting the degree or magnitude of the action and its implementation;

3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment; and,

4. Compensate for the impact by replacing resources lost or damaged.

Mitigation Notification Requirements- When a mitigation plan is required, the applicant must provide landowners immediately adjacent to the tract with notice of the hearing on the permit at least 10 days prior to the hearing. Such notice to adjacent landowners may be made by sending a copy of the hearing notice by certified mail to the adjacent property owner's address listed in the county central appraisal district records.

P) **Special Standards for Eroding Areas**

Authority: 31 TAC, § 15.6, requires the City of Galveston to comply with the following standards for eroding areas, when issuing, denying or conditioning a Beachfront Construction Certificate and Dune Protection Permit.

Eroding areas on Galveston Island are defined as: A portion of the shoreline which is experiencing a historical erosion rate of greater than one foot (1') per year, that is, all of the Galveston Island west of the

westernmost end of the Seawall. The special standards are as follows:

1. That structures located on property adjacent to the public beach be designed for feasible relocation (i.e. on piers);
2. Constructing concrete slabs or other impervious surfaces landward of the line of vegetation, except as exempted herein, is prohibited;

    a. Paving or altering the ground below the lowest habitable floor is prohibited in the area between the line of vegetation and 25 feet landward of the north toe of the dune;

    b. Paving used under the habitable structure and for any driveway(s) connecting the habitable structure and the street is limited to the use of unreinforced fibercrete in 4-foot x 4-foot sections, which shall be a maximum of four inches thick with sections separated by expansion joists, or pervious materials approved by the Department of Development Services, in that area 25 feet landward of the north toe of the dune to 200 feet landward of the line of vegetation, measured to the southernmost point of the structure, including decks, stairs, etc. The City shall assess a "Fibercrete Maintenance Fee" of $200.00 to be used to pay for the clean-up of fibercrete from the public beaches should the need arise;

    c. Reinforced concrete may be under the habitable structure and for any driveways connecting the habitable structure and the street for property located landward of 200 feet from the line of vegetation, measured to the southernmost point of the structure, including decks, stairs, etc.

    d. Driveways are limited to the linear width of the primary structure, along the main street, and a minimum of 15% of the front yard must be maintained as open/unimproved area. The area for measurement of the open/unimproved space will be from the front building façade, where the driveway begins, to the platted property line. (Ord 97-80, Ord. 05-027).

    e. Exemptions to the prohibition of using reinforced concrete under a structure located within 200 feet of the line of vegetation may be granted when the following conditions are present:
        a. When the proposed or existing use of the structure is multiple-family or commercial, that will be constructed with, or have, an elevated, reinforced concrete deck at or above Base Flood Elevation (BFE).
            i. For proposed or existing structures that are:
                1. Designed, built, rented, or leased to be occupied, or any portion thereof, as an attached, multiple-family residential living unit, at least five (5) stories in height;
                2. Multiple-family residential living units constructed at least in part behind the seawall, and;
                3. Utilizes a storm water detention system which mitigates peak water runoff on the development site which reduces impacts to dunes and the public beach.
        b. The request for exemption shall be submitted to the Development Services Department for review. The request shall include:
            i. stamped engineer drawings, dated within 12 months of submittal date;
            ii. a statement of explanation for the request, and;
            iii. the basis and documentation requiring reinforced concrete.
        c. The Development Services Department may grant an exemption upon final review.

d. The City shall assess a "concrete maintenance fee" of $1/square foot of concrete to be used to pay for the clean-up of concrete from the public beach should the need arise and as amended by City Council. (Ord. 23-038)

3. In-ground swimming pools outside the footprint of a habitable structure may not be constructed in the area seaward of the first public road generally parallel to the public beach or to any closer public road not parallel to the beach, or the area within 1,000 feet from mean high tide, whichever distance is greater. Notwithstanding this section, in-ground swimming pools are limited to the following requirements:

   a. Must be located landward of a large-scale, concrete, multi-family condominium that had an existing in-ground swimming pool and concrete parking lot and existed prior to January 1, 1991, and;

   b. Must demonstrate that the total amount of existing impervious cover on the site will not be increased by the construction of a pool that meets the above conditions.

4. Financial assurance is required to fund eventual relocation or demolition of the proposed structure (e.g. through proof of Upton-Jones coverage in the National Flood Insurance Program); and,

5. Structures built in eroding areas must be elevated in accordance with FEMA minimum standards or above the natural elevation.

Q) Management of the Public Beach

Authority: 31 TAC, §15.7, requires the City of Galveston to apply the following standards in issuing, denying or conditioning Beachfront Construction Certificate and/or Dune Protection Permits relating to management of the public beach:

1. The City shall encourage carefully planned beach nourishment for erosion response and prohibit erosion response structures within the public beach and 200-feet landward of the natural vegetation line;

2. Permittees are required to notify the General Land Office and the City of any discernible change in the erosion rate on their property. The City of Galveston or the State of Texas may require a permittee to conduct or pay for a monitoring program to study the effects of a coastal and shore protection project on the public beach;

3. Permittees must adhere to the following requirements for dune enhancement projects:

   a. An approved Beachfront Construction Certificate and Dune Protection Permit from the City of Galveston Department of Development Services;

   b. The project must be consistent with the City's dune and beach policies;

   c. The sediment to be used must be of effective grain size, mineralogy, and quality or the same as the existing beach material subject to availability. If beach quality sand is not available on Galveston Island, and in the judgment of the Department of Development Services is prohibitively expensive from mainland sources, a sub-base not of effective grain size, mineralogy, and quality, sufficient to provide a foundation for beach quality sand enhancement, may be used subject to the approval of the Department of Development Services and the Texas General Land Office;

   d. The material must be free of hazardous substances (as defined in Volume 40 of the Code of Federal Regulations, Part 302.4) in concentrations which are harmful to people, flora, or fauna as determined by applicable, relevant, and appropriate requirements for toxicity standards

established by the local, state, and federal governments;

e. There will be no adverse environmental effects on the property surrounding the area from which the sediment will be taken or to the site of the proposed nourishment;

f. The removal of sediment will not have adverse impacts on flora and fauna;

g. There will be no adverse effects caused from transporting the nourishment material; and,

h. The City may allow restoration of dunes on the public beach up to 20-feet, if it is determined that the seaward migration of the dunes would occur naturally. Dune restoration seaward of the 20-foot limit must receive GLO approval. Interference with public use of the beach is prohibited. Dune reconstruction must approximate the natural formation of dunes and indigenous vegetation must be used. The following methods and materials shall not be permitted:

1. Hard or engineered structures;

2. Non-biodegradable items;

3. Fine clay or silty sediments;

4. Toxic materials as previously defined in this Section; or,

5. Scraping or grading the beach, unless approved by the City of Galveston, approved by the Texas General Land Office, and monitored by the Department of Development Services to determine any changes that may increase erosion of the public beach. Local governments shall not allow a permittee to construct or maintain a private structure on the restored dunes within critical dune areas or seaward of a dune protection line except for specifically permitted dune walkovers or similar access ways.

   Restored or man-made dunes will be protected under the same standards as natural dunes. Areas designated for stock piling of beach scrapings will not be considered as man-made dunes.

R) Public Beach Use and Access

Authority: 31 TAC, §15.7, requires that the City of Galveston's regulation of the pedestrian and vehicular access, traffic and parking on the beach in a manner that preserves or enhances existing public right to use and have access to and from the beach.

The City of Galveston shall presume that any beach fronting the Gulf of Mexico within its jurisdiction is a public beach unless the owner of the adjacent land obtains a declaratory judgment finding otherwise under the Open Beaches Act, Sec. 61.019. The Texas General Land Office shall make the determination on issues relating to the location of the boundary of the public beach and encroachments on the public beach pursuant to the requirements of the Open Beaches Act.

The City of Galveston shall regulate pedestrian and vehicular beach access, traffic and parking on the public beach only in a manner that preserves or enhances existing public access and use. The following standards will be observed when regulating access and parking on the public beach:

1. Parking requirements for all new or replatted developments, on or adjacent to the beach, where there is no existing public parking, will be calculated at one (1) space for each 15 linear feet of beach frontage, calculated to meet Galveston Zoning Standards for space requirements. Off-beach parking boundaries will be identified with signage and maintained on a continuous basis. Furthermore, at the

election of the Planning Commission and in accordance with Subdivision Regulations, the Galveston Zoning Standards, and state law, the Commission may request all parking consolidated and so dedicated;

2. All access ways to the beach will be constructed so as to avoid breaches in the dune system and maintain the dune integrity;

3. Signs shall be displayed in a conspicuous location identifying access and parking for the public beach;

4. All parking and access plans must be consistent with General Land Office regulations as promulgated in state law. The City of Galveston therefore, adopts Beach Access and Parking Plan, as it appears in Appendix A of this Section.

5. Beach Traffic Orders

   All beach traffic orders, including but not limited to, parking, access, signage, obstructions, and speed limits shall be in conformance with Galveston City Code.

6. Beach Maintenance Activities

   a. The City of Galveston shall prohibit beach maintenance activities which will result in the significant redistribution of sand which will significantly alter the beach profile.
   b. All sand moved or redistributed due to beach maintenance activities shall be returned to a location within the Critical Dune Areas.
   c. It is prohibited to display on or adjacent to any public beach any sign, marker, or warning, or make or allow to be made any written or oral communication which states that the public beach is private property or represent in any other manner that the public does not have the right of access to and from the public beach or the right to use the public beach as guaranteed by the Open Beaches Act and the common law right of the public.
   d. The following methods are approved beach maintenance measures following receipt of a Beachfront Construction Certificate or Dune Protection Permit:

      1. Raking of any or all beach areas at any or all times of the year with tractor drawn rakes with rake height adjusted so as to allow rake teeth to draw man made and naturally occurring debris into piles or windrows, while at the same time minimizing the amount of sand moved from the beach into the stockpiles. Piles or windrows may then be relocated using a tractor-mounted front-end loader. Stockpiles or windrows of raked debris may be placed at the seaward toe of the primary dune seaward of the vegetation line and within 20-feet of the vegetation line. All sand/debris collected with debris as a part of this maintenance process shall remain in the stockpile or windrow. A dune protection permit shall be required from the Department of Development Services;

      2. Maintenance of beach parking areas at Stewart Beach Park shall be allowed if scraped sand is placed seaward of the mean high tide line and a dune protection permit is obtained from the Department of Development Services. In addition, sand collected from beach parking areas at Apffel Park may be stockpiled and used for dune enhancement projects within the critical dune areas if the sand is obtained from accreting beaches and with proper Texas Parks and Wildlife permits, notwithstanding (R)(6)(c) above;

      3. During periods of heavy seaweed influx, as identified by the Park Board of Trustees of the City of Galveston, maintainers, bulldozers, boxblades, loaders, dumptrucks and other

equipment designed for moving large quantities of material may be employed on a short-term basis to remove seaweed and other debris collected with the seaweed from the tide line into stockpiles or windrows as described above. Blade height for all equipment shall be set only low enough to remove the majority of the seaweed and other debris and to minimize the movement of sand from the beach to the windrows or stockpiles.

All sand/seaweed collected with seaweed and other debris as a part of this maintenance process shall remain in the stockpile or windrow until such time as the sand/seaweed may be used for dune enhancement projects within critical dune areas with the proper Texas Parks and Wildlife permits. These activities will be monitored by the City of Galveston Department of Development Services to identify any potential adverse impacts that may aggravate erosion and said activities shall be modified to preclude such adverse impacts.

A dune protection permit from the Department of Development Services shall be required;

4. On the beach, seaward of the vegetation line, and landward of the high tide mark, a check-mark trench, 30-inches at the deepest point may be opened up by a maintainer or bull dozer and seaweed and any other debris accumulated within the seaweed windrow or stockpile, may be pushed into the trench and covered with beach sand from the trench cut. The trench method may only be used during emergency situations, where it will not remain open unsupervised or at any time after dusk, where no vehicular or pedestrian traffic will be endangered and where access to the beach will not be prohibited by this action. These activities will be monitored by the City of Galveston Department of Development Services to identify any potential adverse impacts that may aggravate erosion and said activities shall be modified to preclude such adverse impacts. A dune protection permit from the Department of Development Services shall be required; and,
5. Solid waste containers may be mounted on posts at necessary intervals to encourage beach users to deposit waste and debris in the containers provided.

S) Beach User Fees

1. The City of Galveston, or the Park Board of Trustees of the City of Galveston if designated by City Council, may charge beach users a fee in exchange for providing services to beach users in general. (Authority: Sec. 26-54, Galveston City Code). The most recent Beach User Fee modifications became effective on June 24, 2016.
2. The City of Galveston, or the City of Galveston Park Board of Trustees if designated by City Council, may only impose a beach user fee if the fee is reasonable, based on the cost of providing public services and facilities directly to the public beach, which may include administrative, accounting and planning activities necessary for the implementation of such public services and facilities, parking, public health and safety, environmental protection and other matters directly related to the public beach.
3. A new or amended beach user fee shall be preceded by a State approved beach user fee plan submitted by the City. Administrative costs cannot exceed 10% of beach user fee revenues.
4. Revenues from beach user fees may be used only for beach-related services as defined by state law.
5. Accounting and administration of all beach user fees shall be in conformance with those policies promulgated in state law.
6. In order to establish and maintain beach related services and facilities for the preservation and enhancement of access to and from and safe and healthy use of public beaches by the public, vehicles

may be charged in the following beach areas:

a. **Stewart Beach:** A recreational and amusement park located in the city on the East Beach:

The boundaries of Stewart Beach shall be defined as follows:

Eastern Boundary:	Michael Menard Grant
Western Boundary:	Fence on the eastern boundary of the children's playground established by Galveston County on Block No. 66
Northern Boundary:	Southerly right-of-way line of Seawall Boulevard
Southern Boundary:	Line of ordinary high tide of the Gulf of Mexico

1. Fee: Up to $15.00 maximum per vehicle

   Restricted Use Area to the east of the Park, extending 2,640 linear feet.

2. A maximum $50.00 season pass available.

b. **R.A. Apffel Park:**

The boundaries of R. A. Apffel Park shall be defined as follows:

All that property comprising 390.629 acres, more or less, more particularly described in Deed to City of Galveston from the United States of America, dated April 9, 1975, recorded in the Deed Records of Galveston County in Book 2567, page 606 et seq. All that property, comprising 64.5 acres, more or less, described in Deed to City of Galveston from the United States of America, dated April 15, 1976, recorded in the Deed Records of Galveston County, Texas, in Book 2687 at page 11 et seq. All of that property, comprising 211 acres of land, more or less, described in that certain instrument of July 30, 1976, by and between the City of Galveston and the United States Coast Guard, Eighth District.

1. Fee: Up to $15.00maximum for entry, per vehicle.
2. A maximum $50.00 season pass available.

c. **Dellanera Park.** 10901 FM 3005 (7 Mile Road at FM 3005) Provides space for approximately 84 overnight vehicles and 300 day use camp sites. The fee schedule for Dellanera Park is up to $15.00 per each vehicle, with the charge for the overnight vehicle spaces based upon services provided.

Please note, existing beach access parking shall remain, until modifications regarding the pedestrian walkway at AP 4 and improvements to AP5 are completed.

d. **Seawall Beach Urban Park:** A recreational beach urban park with beach-related services and amenities.

The boundaries of the Seawall Beach Urban Park shall be defined as follows:

Eastern Boundary:	1st Street
Western Boundary:	103rd Street

Northern Boundary: Northerly right-of-way line of Seawall Boulevard

Southern Boundary: The Gulf of Mexico

1. Fee: Up to a maximum of $16.00 per-vehicle per-day, through a paid parking system, permit system or a combination. (A maximum $45.00 annual pass available.)
2. Parking Rates:
   a. South side of the Urban Park (adjacent to the seawall structure) shall not exceed $2.00 per hour, with a minimum purchase of two (2) hours.
   b. North side of Urban Park (northerly right-of-way of Seawall Boulevard) shall not exceed $2.00 per hour, with a minimum purchase of two (2) hours.

e. **East and West areas of the island, as described in Appendix A:** A maximum daily fee of up to $15.00. A maximum $50.00 annual pass available.

f. The City of Galveston and the Park Board of Trustees of the City of Galveston shall work towards establishing a state-approved system for reciprocity of fees and fee privileges with Galveston County.

T) Beach Access (Ord 02-035)

Per the Texas General Land Office (GLO), preservation and enhancement of public beach use and access is site specific and best addressed by local governments. The City has authority and responsibility for providing public safety and emergency services within its corporate limits.

The City has adopted, pursuant to state law, a beach access plan for the public beaches within its corporate limits. Changes to the City's beach access plan require the approval and adoption by rule of the GLO. For special events, federal, state, and local law enforcement agencies have determined the need for traffic control plans in the interest of public safety.

1. Special Events – For any planned event that will eliminate public beach parking, along the southern right-of-way adjacent to a public beach, for ½ mile or greater and will continue for more than six (6) consecutive hours, the City of Galveston shall provide beach access in accordance with the following provisions: (Ord 02-035)
   a. The City Manager or designee, is authorized to take whatever measures are reasonably necessary to implement a public safety and traffic control plan, for an event that affects public beach access. The plan may include provisions that temporarily eliminate, rededicate, or use for other purposes, parking spaces normally available for public beach access, to the extent such spaces do not occupy the public beach easement. "Other purposes" may include a fee-for-entry area.
   b. Not less than sixty (60) days prior to the event, the City of Galveston shall provide the following, to the GLO:
      1. the number of parking spaces needed to replace the parking spaces being removed by the respective event;
      2. the location of the alternative parking areas where the public would be required or able to park their cars to gain access to the beach;
      3. information depicting how the public will be informed of the alternative parking

arrangements during the events. The public must be notified that normally available parking has been eliminated and directed to the alternative parking locations;

4. the method of transportation that will be provided for the public to and from the public beach. If shuttle buses are used to transport beach-goers from alternative parking locations, the schedule for the buses will be specified;

5. a statement by the City containing an affirmative finding that the alternative parking plan preserves the public's right to access the beach. The City should evaluate the alternative parking plan based on its current access plan, the impacts to public beach access, and methods for mitigating those impacts and make the affirmative finding; and,

6. The implementation dates of the traffic control plan, public safety plan, and alternate parking plan.

c. Not less than thirty (30) days prior to the event, the GLO shall provide comments, written objections or not comment on the alternative parking plan. The City of Galveston shall review and consider all comments received from the GLO, for requested revisions to the alternative parking plan**.** However, the City of Galveston reserves the right to amend the alternative parking plan based upon public safety needs as determined by the Chief of Police or designee.

d. In the event the respective special event continues outside of planned implementation dates, the City of Galveston will provide the necessary traffic control with regard to public safety, and will provide notice of such measures to the GLO. In such an event, the City of Galveston will implement and maintain the guidelines of Section 29-90 (T) during special events that alter public beach access and parking as described in subsection (1).

U) Penalties

31 TAC 15.9, establishes the following penalties:

1. Any violation of any provision of this Chapter (Chapter 29 of the City Code) shall be unlawful and a misdemeanor offense punishable by a fine not exceeding Five Hundred ($500.00) Dollars. Each day a violation of this Chapter continues shall constitute a separate offense.

2. Any person who violates the Dune Protection Act, the Open Beaches Act or a City of Galveston Permit condition established by this regulation is liable to the General Land Office for a civil penalty of not less than Fifty ($50.00) Dollars nor more than Two Thousand ($2,000.00) Dollars per violation per day. Each day the violation occurs or continues is considered a separate violation.

3. Any violation of a Permit requirement, dune protection and beach access plans, the Dune Protection Act, the Open Beaches Act, Title 31 TAC, §§15.1 - 15.10, Management of the Beach/Dune System, shall be reported by the City of Galveston to the General Land Office within 24 hours.

V) Master Planned Developments

The City of Galveston may adopt a separate ordinance for Master Planned Developments as defined in 31 TAC, §15.32. All requirements of Subchapter A, The Dune Protection Act, The Open Beaches Act and the City of Galveston Zoning Standards shall be followed.

W) Repeal of Conflicting Ordinances - Severability

If any section, subsection, paragraph, sentence, clause, phrase or work in this Section or the application thereof to any person of circumstance, be held invalid, such holding shall not affect the validity of the remaining portion of this order. In the case of a conflict between this Section and any other City Ordinances, the Ordinance containing higher standards for dune protection will prevail. In addition, the requirement to obtain a Beachfront Construction Certificate and/or a Dune Protection Permit supersedes the previous requirement for a Specific Use Permit for regulated activities in accordance with this Section.

APPENDIX A: BEACH ACCESS AND PARKING PLAN

1) Beach Access Points (Described From East To West)

AP 1: Apffel Park

On-beach: parking within Park boundaries for beach user fee
free parking outside of Park boundaries
Off-beach: n/a
Amenities: currently provided

AP 1(A): Beachtown Development

On-beach: parking via Apffel Park Road, minimum width of 480 feet, minimum of 101 parking spaces
Off-beach: minimum of 2 parking lots containing a minimum of 161 spaces
street parking, minimum of 46 parking spaces throughout subdivision
2 dedicated pedestrian pathways for public use
Amenities: n/a

AP 1(B): Palisade Palms

On-beach: n/a
Off-beach: parking lot, minimum of 116 spaces
1 dedicated pedestrian pathways for public use
Amenities:

AP 1(C): Area west of the Islander East to eastern boundary of Stewart Beach Park

On-beach: restricted use area, minimum width of 2,640 linear feet abutting the eastern end of the park
Off-beach: one parking area providing a minimum of 143 spaces, 1 dedicated pedestrian pathway for public use
Amenities: n/a

AP 2: Stewart Beach

On-beach: parking within Park boundaries; assessed beach user fee, free parking available
Off-beach: free parking comprised of 600 spaces
Amenities: currently provided

AP 3: Seawall Beach Urban Park

On-beach: n/a
Off-beach: 1,993 street parking spaces located on the north and south sides of Seawall Boulevard, minimum of 10% free parking spaces (approximately 218 spaces total distributed throughout the Seawall Beach Urban Park). There are 300 free beach parking spaces located at Stewart Beach to accommodate the remaining 266 required parking spaces. 34 parking spaces are available in the free parking at Stewart Beach for the City to relocate additional required parking from Seawall Beach Urban Park as needed for beach access amenities and public safety.
Amenities: restrooms, pedestrian lighting and crosswalks, additional amenities to be provided in the future

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 4: End of Seawall

On-beach: n/a
Off-beach: parking lot, minimum 150 spaces
pedestrian pathway from parking area to beach
Amenities: n/a

AP 5: Dellanera RV Park

On-beach: n/a
Off-beach: overnight campsites only
wheelchair accessible dune walkover
Amenities: currently provided

AP 6: Pocket Park #1

On-beach: parking via 7 ½-Mile Road (109th Street), minimum width of 1,690 linear feet,
Off-beach: parking lot
Amenities: n/a

AP 7: Sunny Beach Subdivision

On-beach: n/a
Off-beach: parking lot, minimum 92 spaces
Amenities: on-beach bollarded cul-de-sac to allow on-beach drop-off of persons and supplies

AP 8: Beachside Village Subdivision

On-beach: n/a
Off-beach: street parking, minimum of 148 spaces distributed throughout subdivision
3 dedicated pedestrian access ways for public use
Amenities: future

AP 9: Pocket Park #2

On-beach: n/a
Off-beach: parking lot, minimum of 265 spaces. 63 of the required spaces are located at AP 8 and 24 of the required spaces are located at AP 15A. In total, 352 parking spaces are available in these three locations.
1 wheelchair accessible dune walkover for public use
1 dedicated pedestrian pathway for public use
Amenities: currently provided

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 10: 10-Mile Road/Hershey Beach Subdivision

On-beach: parking via 10-Mile Road, minimum width of 1,065 linear feet
Off-beach: parking lot, minimum 58 spaces
Amenities: n/a

AP 11: Spanish Grant Subdivision

On-beach: n/a
Off-beach: street parking, minimum of 46 spaces on Spanish Grant Boulevard median
3 dedicated pedestrian pathways for public use
Amenities: n/a

AP 12: Bermuda Beach Subdivision

On-beach: parking via Pabst Road, minimum width of 564.2 linear feet, minimum 124 parking spaces
Off-beach: street parking, minimum of 87 parking spaces distributed throughout subdivision on John Reynolds Road, John Reynolds Circle, and Jane Road
2 dedicated pedestrian pathways for public use
Amenities: n/a

AP 13: Pocket Park #3

On-beach: parking via 11-Mile Road, minimum of 350 linear feet
Off-beach: parking lot, minimum of 273 parking spaces wheelchair accessible dune walkover for public use
Amenities:

**Please note, on-beach parking will be provided while substantial physical improvements to the off-beach parking lot and pedestrian pathway occur.*

AP 14: 11-Mile Road

On-beach: parking via 11-Mile Road, minimum width of 300 linear feet
Off-beach: n/a
Amenities: n/a

AP 15: Palm Beach Subdivision/Pirates Beach West Subdivision

On-beach: n/a
Off-beach: street parking throughout subdivisions
3 dedicated pedestrian pathways for public use (Palm Beach)
4 dedicated pedestrian pathways for public use (Pirates Beach West)
Amenities: n/a

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 15(A): Pirates Beach Subdivision (Ord 07-051)

On-beach: n/a
Off-beach: street parking throughout subdivisions
14 dedicated pedestrian pathways for public use
Amenities: n/a

AP 15(B): Palm Beach Subdivision (Ord 07-051)

On-beach: n/a
Off-beach: street parking throughout subdivisions
3 dedicated pedestrian pathways for public use
Amenities: n/a

AP 15(C): Pirates Beach West Subdivision (Ord 07-051)

On-beach: n/a
Off-beach: street parking throughout subdivisions
4 dedicated pedestrian pathways for public use
Amenities: n/a

AP 16: 13-Mile Road

On-beach: parking via 13-Mile Road, minimum width of 640 linear feet
Off-beach: n/a
Amenities: n/a

AP 17: 15-Mile Road

On-beach: parking via 15-Mile Road, minimum width of 150 linear feet
Off-beach: n/a
Amenities: n/a

AP 18: 16-Mile Road

On-beach: parking via 16-Mile Road, minimum width of 1,000 linear feet
Off-beach: n/a
Amenities: n/a

AP 19: Karankawa Beach

On-beach: n/a
Off-beach: street parking, minimum of 27 spaces on Habla and Glei Streets
2 dedicated pedestrian pathways for public use
Amenities: n/a

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 20: Indian Beach

On-beach: n/a
Off-beach: street parking, minimum of 200 spaces on East and West Devaca
4 dedicated pedestrian pathways for public use
Amenities: n/a

AP 21: Kahala Beach Estates, Addition #1

On-beach: n/a
Off-beach: street parking, minimum of 59 spaces on Kahala Drive East
2 dedicated pedestrian pathways for public use
Amenities: n/a

AP 22: Silverleaf Resorts

On-beach: n/a
Off-beach: parking lot, minimum of 43 spaces
1 dedicated pedestrian pathway for public use
Amenities: n/a

AP 23: The Dunes of West Beach

On-beach: n/a
Off-beach: street parking, minimum of 172 spaces on Shores Drive
2 dedicated pedestrian pathways for public use
Amenities: n/a

AP 24: Sandhill Shores Subdivision (Map Sheet W-3)

On-beach: n/a
Off-beach: street parking, minimum of 208 spaces on Sandhill Drive
2 dedicated pedestrian pathways for public use
Amenities: n/a

AP 25: Gateway Boulevard – Sea Isle Subdivision

On-beach: parking via Gateway Boulevard, minimum width of 330 linear feet
Off-beach: n/a
Amenities: n/a

AP 26: San Jacinto Street – Sea Isle Subdivision

On-beach: parking via San Jacinto Street, minimum width of 150 linear feet
Off-beach: n/a
Amenities: n/a

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 27: "Sea Isle" parking area

On-beach: n/a
Off-beach: parking lot, minimum of 88 spaces
1 dedicated pedestrian pathway for public use
Amenities: n/a

AP 28: Sea Isle Subdivision and Terramar Beach Subdivision

On-beach: n/a
Off-beach: street parking, minimum of 610 spaces on Kennedy/Gulf Drive
dedicated pedestrian pathways for public use throughout subdivisions
Amenities: n/a

AP 29: Isla Del Sol Subdivision

On-beach: n/a
Off-beach: parking lot, minimum 25 spaces (located north of FM 3005, via Isla Del Sol Drive)
Amenities: n/a

AP 30: Gulf Boulevard, Isla Del Sol Subdivision

On-beach: parking via Gulf Boulevard, minimum width of 150 linear feet
Off-beach: n/a
Amenities: n/a

AP 31: Terramar Drive, Terramar Beach Subdivision

On-beach: parking via Terramar Drive Boulevard, minimum width of 300 linear feet
Off-beach: n/a
Amenities: n/a

AP 32: Pocket Park #4

On-beach: n/a
Off-beach: parking lot
1 dedicated pedestrian pathway for public use
Amenities: n/a

AP 33: 2nd Street, Bay Harbor Subdivision

On-beach: parking via 2nd Street, minimum width of 300 linear feet
seasonal access to the west (one-way driving west to east)
Off-beach: n/a
Amenities: n/a

AP 34: Miramar Subdivision

On-beach: seasonal access via AP 35 at Half Moon Beach (one-way driving, west to east)
Off-beach: parking lot, minimum of 60 spaces via FM 3005
1 dedicated pedestrian pathway for public spaces
Amenities: n/a

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 35: Half Moon Beach Subdivision and Stavanger Beach Subdivision

On-beach: seasonal access to the east
unrestricted, vehicular access to the west to AP 36: Salt Cedar Avenue
Off-beach: n/a
Amenities: n/a

AP 36: Salt Cedar Avenue

On-beach: unrestricted, vehicular access to the east to AP 35: Half Moon Beach
Off-beach: n/a
Amenities: n/a

AP 37: Playa San Luis Subdivision

On-beach: n/a
Off-beach: street parking, minimum of 88 spaces throughout subdivision
4 dedicated pedestrian pathways for public use
Amenities: n/a

AP 38: Pointe San Luis 1 (western boundary of Playa San Luis subdivision)

On-beach: n/a
Off-beach: parking lot, minimum of 100 spaces*
25 reserve parking spaces dedicated in the event of erosion*
1 dedicated pedestrian pathway for public use*
Amenities: n/a

** Please note, beach access modifications will not occur until substantial physical improvements occur.*

AP 39: Pointe San Luis 2

On-beach: n/a
Off-beach: parking lot, minimum of 100 spaces*
1 wheelchair accessible dune walkover for public use*
Amenities: future, as part of planned development

** Please note, beach access improvements will not occur until substantial physical improvements occur.*

AP 40: Pointe San Luis 3

On-beach: n/a
Off-beach: parking lot, minimum of 100 spaces*
25 reserve parking spaces dedicated in the event of erosion*
1 dedicated pedestrian pathway for public use*
Amenities: n/a

** Please note, beach access modifications will not occur until substantial physical improvements occur.*

APPENDIX A: BEACH ACCESS AND PARKING PLAN

AP 41: Pointe San Luis 4 (toll bridge area)

On-beach: seasonal access provided, minimum width of 1,200 linear feet*
unrestricted, vehicular access, minimum width of 3,230 linear feet*
Off-beach: n/a
Amenities: pedestrian area designated by bollard placement to the north of vehicular access areas

** Please note, beach access modifications will not occur until substantial physical improvements occur.*

Please note, the names of developments found within the City of Galveston's Beach Access Plan reflect the current project name at the time of the Ordinance adoption. It should be noted that developments and/or projects may change ownership and name at a future date, but such changes will not alter beach access required in accordance with the City's adopted plan.

2) Regulated beach areas:

Except as otherwise permitted herein, it shall be unlawful for any person to drive, operate or park any motor vehicle in, on or upon any part of the following described public beaches bordering on the Gulf of Mexico and situated within the corporate limits of the City of Galveston with the exception of emergency vehicles, beach cleaning and maintenance and safety patrolling:

(1) Upon East Beach, being that area extending from the western boundary of Apffel Park to the eastern boundary of Stewart Beach Park, at all times;

(2) Within the boundaries of Stewart Beach Park, with the exception of those areas designated for parking, restricted use access, and/or as described within Section A of Appendix A:

(3) Upon the beach extending from Stewart Beach to the western end of the seawall structure at all times; and,

(4) Upon any area of the beach, unless otherwise provided for by traffic control measures, such as, but not limited to bollards and signage, and as described in Section A of Appendix A:

APPENDIX B. Definitions

The following words and terms, when used in this ordinance, shall have the following meanings, unless the context clearly indicates otherwise:

Accreting Zone- A beach area experiencing an average annual shoreline advance in excess of +1 feet per year.

Affect- As used in this section regarding dunes, dune vegetation, and the public beach, "affect" means to produce an effect upon dunes, dune vegetation, or public beach use and access.

Amenities- Any inhabitable major structures including swimming pools, bathhouses, detached garages, cabanas, pipelines, piers, canals, lakes, ditches, artificial runoff channels and other water retention structures, roads, streets, highways, parking areas and other paved areas (exceeding 144 square feet in area), underground storage tanks, and similar structures.

Backdunes- The dunes located landward of the foredune ridge which are usually well vegetated but may also be unvegetated and migratory. These dunes supply sediment to the beach after the foredunes and the foredune ridge have been destroyed by natural or human activities.

Beach Access- The right to use and enjoy the public beach, including the right of free and unrestricted ingress and egress to and from the public beach.

Beach Area- The beach area is that portion of the public beach North of the mean low tide line of the Gulf of Mexico and South of the Line of Vegetation as protected by V.A.T.C.S. Natural Resources Code, Chapter 61.

Beach/Dune System - The land from the line of mean low tide of the Gulf of Mexico to the landward limit of dune formation.

Beach Profile- The shape and elevation of the beach as determined by surveying a cross section of the beach.

Beachfront Construction Certificate- A permit issued by the City of Galveston Department of Development Services and subject to approval by the Galveston Planning Commission in areas specified in subsection (a), authorizing the permittee to engage in beachfront activities as stipulated in the Certificate and in accordance with all conditions and restrictions contained therein.

Blowout- A breach in the dunes caused by wind erosion.

Breach- A break or gap in the continuity of a dune caused by wind or water.

Bulkhead- A structure or partition built to retain or prevent the sliding of land. A secondary purpose is to protect the upland against damage from wave action.

Coastal and Shore Protection Project- A project designed to slow shoreline erosion or enhance shoreline stabilization, including, but not limited to, erosion response structures, beach nourishment, sediment bypassing, construction of man-made vegetated mounds, and dune revegetation.

Commercial Facility - Any structure used for providing, distributing, and selling goods or services in commerce including, but not limited to, hotels, restaurants, bars, rental operations, and rental properties, except single family dwellings.

APPENDIX B. Definitions

Coastal and Shore Protection Project- A project designed to slow shoreline erosion or enhance shoreline stabilization, including, but not limited to, erosion response structures, beach nourishment, sediment bypassing, construction of man-made vegetated mounds, and dune revegetation.

Commercial Facility - Any structure used for providing, distributing, and selling goods or services in commerce including, but not limited to, hotels, restaurants, bars, rental operations, and rental properties, except single family dwellings.

Construction - Causing or carrying out any building, bulkheading, filling, clearing, excavation, or substantial improvement to land or the size of any structure. "Building" includes, but is not limited to, all related site work and placement of construction materials on the site. "Filling" includes, but is not limited to, disposal of dredged materials. "Excavation" includes, but is not limited to, removal or alteration of dunes and dune vegetation and scraping, grading, or dredging a site. "Substantial improvements to land or the size of any structure" include, but are not limited to, creation of vehicular or pedestrian trails, landscape work that adversely affects dunes or dune vegetation, and increasing the size of any structure.

Coppice Mounds- The initial stages of dune growth formed as sand accumulates on the downwind side of plants and other obstructions on or immediately adjacent to the beach seaward of the foredunes. Coppice mounds may be unvegetated.

Cumulative Impact- The effect on beach use and access, on a critical dune area, or an area seaward of the dune protection line which results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Dedication- Includes, but is not limited to, a restrictive covenant, permanent easement, and fee simple donation.

Dune- An emergent mound, hill, or ridge of sand, either bare or vegetated, located on land bordering the waters of the Gulf of Mexico. Dunes are naturally formed by the windward transport of sediment, but can also be created via man-made vegetated mounds. Natural dunes are usually found adjacent to the uppermost limit of wave action and are usually marked by an abrupt change in slope landward of the dry beach. The term includes coppice mounds, foredunes, dunes comprising the foredune ridge, backdunes, and man-made vegetated mounds. (Ord. 06-009, Ord. 11-056)

Dune, Restored (man-made)- For the purposes of determining construction setbacks and the location of the Dune Protection Line, a restored dune shall be defined as having more than 50% vegetative cover, a 3:1 slope, an average height of 75% of the island's mean base flood elevation as measured from mean sea level, a naturally established connection to the dune contour and elevation of the adjacent property, and shall not extend further seaward than 4.1' elevation from mean sea level. (Ord. 11-056)

Dune Area- A dynamic hill(s) or mound(s), man made or natural, vegetated or bare, composed of beach sand, landward of the mean high tide and adjacent to the Gulf of Mexico. The dune area may contain a coppice mound, foredune, backdune, aeolian sandflat and swale.

APPENDIX B. Definitions

Dune Area (Critical) - That portion of the dune area, either vegetated or not, comprised of the coppice mound, foredune ridge, primary dune area and areas extending landward, from mean high tide to a point within 1,000 feet, that includes all dune structures, swales, sandflats and marshes within a dune complex that are essential to the protection of public beaches submerged land, and state owned land, such as public roads, and coastal public lands, from nuisance, erosion, storm surge, and high wind and waves. Critical dune areas include, but are not limited to, the dunes that store sand in the beach/dune system to replenish eroding public beaches. Typically, this area is composed of areas of bare sand or sparse vegetation consisting of more bitter panicum, sea oats, or seashore dropseed than other species of vegetation. It is intended that the dune area (critical) is identical to the "critical dune area" defined by the regulations of the General Land Office at 31 T.A.C. Sec.15.2. The two terms are used interchangeably in this code.

Dune Complex- Any emergent area adjacent to the waters of the Gulf of Mexico in which several types of dunes are found or in which dunes have been established by proper management of the area. In some portions of the Texas coast, dune complexes may contain depressions known as swales.

Dune Conservation Area- Areas along Galveston's Gulf Coast where beachfront dunes naturally occur and where restored (man-made) dunes may be located. The Dune Conservation Area shall also include lands within 25' of the north toe of existing or restored (man-made) dunes

Dune Conservation Area Limits- The seaward limit of the Dune Conservation Area (DCA) shall be the most seaward contour line corresponding to elevation +4.00 foot NAVD, or the line of vegetation, whichever is farther landward as established by a topographic survey. Where proposed beach nourishment, dune restoration, or other activity has the potential to influence a property's natural topography and/or move beach or dune contours seaward, the seaward limit shall be established by determining the +4.00 foot NAVD elevation, and the line of vegetation prior to construction. Where beach contour lines have been affected by beach maintenance or construction projects, the seaward limit shall be established by a line connecting the nearest naturally-occurring +4.00 foot NAVD contour or the line of vegetation to the west and the east of the property. The landward limit of the Dune Conservation Area shall be defined as the north toe of an existing dune or restored (man-made) dune plus a 25-foot landward offset.

Dune Protection Line- A line located at the north toe 25 feet landward of the north toe of the critical dune area. Where no dunes exist on beaches west of the western most terminus of the Galveston Seawall the line shall be located 200 feet landward of the vegetation line. For all areas, the Dune Protection Line is depicted on the attached maps. In no case shall the Dune Protection Line be seaward of a straight line connecting the nearest Dune Protection Line on the East with the nearest Dune Protection Line on the West. This term is used synonymously with "Dune Protection Line" as defined by the regulations of the General Land Office at 31 T.A.C. Sec.15.2.

Dune Protection Permit- A permit issued by the City of Galveston Department of Development Services and approved by the Galveston Planning Commission, in accordance with all conditions of this section, authorizing the permittee to engage in activities stipulated in the Permit and in accordance with all conditions and restrictions contained therein.

APPENDIX B. Definitions

Dune Protection Permit and/or Beachfront Construction Certificate Form- A form for issuance of dune protection permit and/or beachfront construction certificates pursuant to terms of this Section.

Dune Vegetation- Flora indigenous to natural dune complexes on the Texas coast and can include coastal grasses and herbaceous and woody plants.

Enhanced Construction Zone- Areas immediately landward of the Dune Conservation Area with the potential to be effected by the long-term effects of erosion. The Enhanced Constructed Zone shall be established for areas with Aggregate Shoreline Change Rates between -2 and -8 feet per year. Construction activities in the Enhanced Construction Zone will be required to meet higher standards than activities in areas further landward.

Enhanced Construction Zone Limits- The landward limit of the Enhanced Construction Zone shall be shown for areas along Galveston's Gulf Coast with Aggregate Shoreline Change Rates of between -2 and -8 feet per year. The landward limits shall be 125 feet from the landward limit of the Dune Conservation Area.

Effect or Effects- "Effects" include: direct effects - those impacts on public beach use and access, on critical dune areas, or on dunes and dune vegetation seaward of a Dune Protection Line which are caused by the action and occur at the same time and place; and indirect effects - those impacts on beach use and access, on critical dune areas, or on dunes and dune vegetation seaward of a Dune Protection Line which are caused by an action and are later in time or farther removed in distance than a direct effect, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. "Effects" and "impacts" as used in this ordinance are synonymous. "Effects" may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.

Eroding Zone (-2 ft/yr.)- A beach area experiencing an average annual shoreline retreat of -1 to -3 feet per year;

Eroding Zone (-4 ft/yr.)- A beach area experiencing an average annual shoreline retreat of -3 to -5 feet per year;

Eroding Zone (-6 ft/yr.)- A beach area experiencing an annual average annual shoreline retreat of -5 to -7 feet per year;

Eroding Zone (-7+ ft/yr.)-A beach area experiencing an annual average annual shoreline retreat in excess of -7 feet per year.

Erosion- The wearing away of land or the removal of beach and/or dune sediments by wave action, tidal currents, wave currents, drainage, or wind. Erosion includes, but is not limited to, horizontal recession and scour and can be induced or aggravated by human activities.

Erosion Response Structure- A hard or rigid structure built for shoreline stabilization, which includes, but is not limited to, a jetty, retaining wall, groin, breakwater, bulkhead, seawall, riprap, rubble mound, revetment, or the foundation of a structure which is the functional equivalent of these specified structures.

FEMA- The United States Federal Emergency Management Agency.

APPENDIX B. Definitions

Foredunes- The first clearly distinguishable, usually vegetated, stabilized large dunes encountered landward of the Gulf of Mexico. On some portions of the Texas Gulf Coast, foredunes may also be large, unvegetated, and unstabilized. Although they may be large and continuous, foredunes are typically hummocky and discontinuous and may be interrupted by breaks and washover areas. Foredunes offer the first significant means of dissipating storm-generated wave and current energy issuing from the Gulf of Mexico. Because various heights and configurations of dunes may perform this function, no standardized physical description applies. Foredunes are distinguishable from surrounding dune types by their relative location and physical appearance.

Foredune Ridge- The high continuous line of dunes which are usually well vegetated and rise sharply landward of the foredune area but may also rise directly from a flat, wave-cut beach immediately after a storm.

GLO - As used in this Plan this acronym refers to the Texas General Land Office.

Groin - Short walls built perpendicular to straight stretches of beach and designed to trap sand flowing in the longshore current. The groins along with the Galveston seawall protect the toe of the seawall from erosion.

Habitable Structures- Structures suitable for human habitation including, but not limited to, single or multi-family residences, hotels, condominium buildings, and buildings for commercial purposes. Each building of a condominium regime is considered a separate habitable structure, but if a building is divided into apartments, then the entire building, not the individual apartments, is considered a single habitable structure. Additionally, a habitable structure includes porches, gazebos, and other attached improvements and amenities.

Industrial Facilities- Include, but are not limited to, those establishments listed in Part 1, Division D, Major Groups 20-39 and Part 1, Division E, Major Group 49 of the Standard Industrial Classification Manual as adopted by the Executive Office of the President, Office of Management and Budget (1987 ed.). However, for the purposes of this ordinance, the establishments listed in Part 1, Division D, Major Group 20, Industry Group Number 209, Industry Numbers 2091 and 2092 are not considered "industrial facilities." A list of these facilities may be found in 31 TAC, Sec. 15.2, attached to this Section.

Jetty - Long walls built perpendicular or nearly perpendicular to the shoreline to keep sand from flowing into a pass or ship channel.

Large-Scale Construction- Construction activity greater than 5,000 square feet in area and habitable structures greater than two stories in height. Multiple-family habitable structures are typical of this type of construction.

Line of Vegetation- The extreme seaward boundary of natural vegetation which spreads continuously inland typically used to determine the landward extent of the public beach. Where there is no natural vegetation line, the landward extent of the public beach may be determined as provided by Sec. 61.016 and Sec. 61.017, Texas Natural Resources Code.

Man-Made Vegetated Mound- A mound, hill, or ridge of sand created by the deliberate placement of sand or sand trapping devices including sand fences, trees, or brush and planted with dune vegetation.

Motor Vehicle or Vehicle- A vehicle as defined by the Texas Uniform Traffic Act, Art. 6701d, Texas Revised Civil Statutes Annotated.

APPENDIX B. Definitions

National Flood Insurance Act- 42 United States Code, Sec. 4001, et seq.

Natural Resources- Land, fish, wildlife, insects, biota, air, surface water, groundwater, plants, trees, habitat of flora and fauna, and other such resources.

Off-Beach Parking/Pedestrian Access- The beach is closed to all vehicles for parking and driving throughout the year. Vehicular parking is available on adjacent public streets and parking lots. The beach is accessible to pedestrians by way of public footpaths, dune walkovers or from the public beach easement. (Ord. 06-009)

On-Beach Parking/Pedestrian Access ("T-heads")- The beach is open to all vehicles for parking throughout the year. The beach is accessible to pedestrians from the public beach easement. (Ord. 06-009)

On-Beach Driving/Vehicular Access- The beach is open to all vehicles for parking and driving throughout the year. (Ord. 06-009)

Payment of a Fee-in Lieu- In cases where completion of an enhancement or restoration project is deemed infeasible due to site constraints as determined by the Department of Development Services, payment of a fee-in-lieu of satisfying the requirement shall be made to the City. Funds collected will be used to support dune restoration, beach nourishment, or beach access improvements. Consideration of payment of a fee-in-lieu will include among other considerations the value of vegetation, sand volume at the current market rate for beach quality sand, and labor costs necessary to complete a similar project of this type.

Pedestrian Only Access- The beach is accessible to pedestrians, by way of footpaths, dune walkovers or from the public beach easement. However, no public parking is available within close proximity. (Ord. 06-009)

Person - An individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, the United States Government, a state, a municipality, commission, political subdivision, or any international or interstate body or any other governmental entity.

Pipeline- A tube or system of tubes used for the transportation of oil, gas, chemicals, fuels, water, sewerage, or other liquid, semi-liquid, or gaseous substances.

Practicable- In determining what is practicable, the City shall consider whether an action, technology, or technique is commercially available and capable of being done after taking into consideration existing building practices, effectiveness, scientific feasibility, siting alternatives, and the footprint of the structure in relation to the area of the building portion of the lot, and considering the overall development plan for the property. The City shall also consider the cost of the technology or technique.

Production and Gathering Facilities- The equipment used to recover and move oil or gas from a well to a main pipeline, or other point of delivery such as a tank battery, and to place such oil or gas into marketable condition. Included are pipelines used as gathering lines, pumps, tanks, separators, compressors, and associated equipment and roads.

Public Beach- As used in this Plan, "public beach" is defined in the Texas Natural Resources Code, Sec. 61.013(c).

APPENDIX B. Definitions

Recreational Activity - Includes, but is not limited to, hiking, sunbathing, and camping for less than 21 days. For purposes of permits, recreational activities are limited to the private activities of the person owning the land and the social guests of the owner. Operation of recreational vehicles is not considered a recreational activity, whether private or public.

Restoration- The process of constructing man-made vegetated mounds, repairing damaged dunes, or vegetating existing dunes.

Restricted Access - The beach is open to vehicles throughout the year only as a special use area for persons with disabilities, saltwater fishermen and the launching of non-motorized personal watercraft. The beach is accessible to pedestrians from the public beach easement and/or adjacent parking areas. (Ord. 06-009)

Retaining Wall- A structure designed primarily to contain material and to prevent the sliding of land.

Sand Budget- The amount of all sources of sediment, sediment traps, and transport of sediment within a defined area. From the sand budget, it is possible to determine whether sediment gains and losses are in balance.

Seasonal Access- Vehicular access/driving is only permitted during designated times of the year, as follows: Vehicles are prohibited on the beach from 6:00 P.M. Friday to 6:00 P.M. Sunday during the month of March, Memorial Day through Labor Day, and all legal holidays. (Ord. 06-009)

Seawall- An erosion response structure that is specifically designed to withstand wave forces. The Galveston seawall is a man-made barrier, which extends from the east tip of the island to a point near 107th Street. It protects the City from overwash damage and shoreline erosion.

Seaward of a Dune Protection Line- The area between a dune protection line and the line of mean high tide.

Small-Scale Construction- Construction activity less than or equal to 5,000 square feet and habitable structures less than or equal to two (2) stories in height. Single-family habitable structures are typical of this type of construction.

Stable Zone- A beach area experiencing an average annual shoreline change of -1 to +1 feet per year;

Structure- Includes, without limitation, any building or combination of related components constructed in an ordered scheme that constitutes a work or improvement constructed on or affixed to land.

Substantial Physical Improvements- The Director of the Department of Development Services, or designee, will approve the determination of "substantial physical improvements", upon completion of all of the following criteria for development: 1. The filing of a final plat; 2. Installation of public and private infrastructure; 3. Installation of the associated Beach Access Point parking, signage, and walkover; and, 4. The issuance of a building permit for a private residence or public building, excluding a sales office or accessory structure. (Ord. 06-009)

Surveying- The measurement of dimensional relationships as a method of finding mean high water, mean low water, elevations, the dune structure and vegetation line, conducted by a licensed surveyor in the State of Texas.

Swales- Low areas within a dune complex located in some portions of the Texas coast which function as natural rainwater collection areas and are an integral part of the dune complex.

APPENDIX B. Definitions

Washover Areas- Low areas that are adjacent to beaches and are inundated by waves and storm tides from the Gulf of Mexico. Washovers may be found in abandoned tidal channels or where foredunes are poorly developed or breached by storm tides and wind erosion. (Ord 93-73, Ord 94-26)

City of Galveston

Erosion Response Plan

APPENDIX C of the City of Galveston

Dune Protection Beach Access Erosion Response Plan

APPENDIX C. City of Galveston Erosion Response Plan

INTRODUCTION

1.1. Purpose of ERP

The City of Galveston has prepared this Erosion Response Plan (ERP) to achieve the following broad local objectives:

- Reduce public expenditures for erosion and storm damage losses to public and private property, including public beaches;
- Ensure the health and stability of existing dune systems and dune vegetation;
- Encourage the natural recovery of dunes and beaches following storm-induced erosion;
- Provide for the establishment of new dunes through restoration projects; and
- Allow for the landward migration of beaches and dunes due to erosion.

Provisions of the ERP are designed to implement dune protection, erosion response, and beach access policies and objectives in the City Comprehensive Plan and comply with State requirements set forth in Title 31 Texas Administrative Code, §15.17 (31 TAC 15.17). In 2009, the Texas legislature adopted Texas Natural Resources Code §33.607, which requires local governments along the Gulf Coast to develop plans for reducing public expenditures for erosion and storm damage losses. To implement the law, the Texas General Land Office (GLO) adopted rules to guide local government's preparation of erosion response plans. The rules are intended to ensure local governments enact regulations to reduce future storm damage and protect public access to beaches.

The ERP identifies recommended amendments to the City's existing Dune Protection and Beach Access Plan found in Section 29-90 (Development, Preservation and Protection of Sand Dunes) of the Zoning Standards (Chapter 29 of the Code of Ordinances of the City of Galveston). Consistent with Texas Natural Resources Code, §61.001 (Open Beaches Act) and §63.001, et seq. (Dune Protection Act), the City's Dune Protection and Beach Access Plan, with these amendments, establishes standards for managing the public beach and human activities occurring on property fronting the Gulf of Mexico within 1000 feet of mean high tide.

In accordance with Texas Natural Resources Code §33.607, the ERP will need to be reviewed, and updated as appropriate, every five (5) years or after a storm event that affects the Galveston coast, whichever occurs first. In the event of a significant storm event, the GLO will often enact temporary "emergency" rules that will take precedence over locally adopted regulations. During the timeframe of the temporary rules, the City of Galveston will review and assess any changes in shoreline conditions that may require amendments to the ERP.

APPENDIX C. City of Galveston Erosion Response Plan

1.2. Scope of the Plan

The ERP addresses conditions along the 30-mile long Gulf coastline on Galveston Island, excluding the Galveston Island State Park and the Town of Jamaica Beach. Sections of the ERP offer the following:

- A review of existing shoreline conditions, including information regarding shoreline change or erosion rates;
- A definition of a Dune Conservation Area where beachfront dunes naturally occur, where restored (man-made) dunes may be located, and where dunes may migrate landward as erosion occurs;
- Construction prohibitions, exemptions, and standards for construction activities within and seaward of the Dune Conservation Area;
- A definition of an Enhanced Construction Zone and construction standards for construction activities within the Enhanced Construction Zone.;
- Opportunities for mitigation, restoration, and preservation of dune systems;
- Strategies to improve public beach access;
- Procedures for post-storm damage assessment of beach access points; and
- Criteria for acquiring property within or seaward of the Dune Conservation Area.

1.3. Relationship to Other City Plans

The ERP is designed to be consistent with City plans and policies, including the 2011 Comprehensive Plan for the City of Galveston (Comp Plan), adopted in October 2011, and the Hazard Mitigation Plan, adopted in April 2011. The Comp Plan identifies protection of the Island's beach and dune systems as top priorities for the City, and includes the following two objectives especially relevant to the ERP.

OBJECTIVE NR-2. PROTECT THE INTEGRITY AND FUNCTION OF GALVESTON ISLAND'S BEACHES, DUNES, AND BAY WETLANDS. Galveston Island's beaches, dunes, and bay wetlands are sensitive natural resources providing a number of well-recognized benefits. Beaches and dunes are an integral part of the coastal landscape, lending beauty to the shoreline. As natural coastal barriers, the Island's dunes absorb the force of winds and high waves during major storms and help prevent or delay inland flooding and resulting property damage. Dunes also function as a source for natural beach nourishment after storms. The bay's marsh wetlands provide critical area for native and migratory land and marine species and act as natural buffers from the full force of waves, winds, and storm surges. Additionally, these wetland areas filter sediments and pollutants from the water draining from upland areas thus helping to maintain water quality. The Island's beaches, dunes, and bay wetlands play critical roles in protecting the Island from the effects of the coastal forces, and the health of these sensitive, inter-related ecosystems plays a key part in ensuring the City's long-term resiliency and sustainability.

OBJECTIVE NR-4. RESPOND PROACTIVELY TO LAND LOSS ON GALVESTON ISLAND. Land loss associated with shoreline retreat along the Island's beach and bay, resulting from a combination of regional subsidence, erosion, and relative sea level rise, has increasingly challenged government agencies and coastal communities. Over the years, man-made projects that influence the near-shore system such as the construction of dams and levees in riverine systems have reduced the sources of sediment to the Gulf Coast. Likewise, the construction of jetties and navigation channels has interrupted the littoral flow of sediments (long-shore drift) at coastal passes. Upland development also affects the natural migration of sediments. As a result, while East Beach accretes due to eddies in the long-shore current interrupted by the

jetties at Bolivar Roads, most of Galveston's beachfront shoreline from Stewart Beach westward is eroding at rates that have averaged between 5-10 feet per year for the last fifty years. Without continued intervention, land loss on Galveston Island will not be reversed in the life span of this document. The impact of global sea level rise is anticipated to be greatest on low-lying barrier islands, such as Galveston Island. The City of Galveston did not create these regional or global circumstances, but given the disproportionate impact they have on this community, it is incumbent on the City to continue to respond proactively. The City has taken important first steps toward such a response, but much remains to be done to ensure that any future development on the Island is sustainable and resilient.

Additionally, the Comp Plan provided guidance in the development of the ERP through the following strategies:

Land Use Element Strategies

- Perform Assessment of the Sensitive Environmental Areas Islandwide
- Create Matrix of Development Incentives and Regulations to Protect and Preserve Sensitive Environmental Areas
- Encourage Alternative Methods to Further Protect Dunes, Wetlands, Scenic Open Space and Community Character on the West End

Natural Resource Element Strategies

- Strengthen Regulations Designed to Protect and Restore the Island's Dune Systems
- Review and Update Zoning Standards and Subdivision Regulations to Protect the Integrity and Function of Galveston's Natural Resources
- Maintain and Implement the City's Beach Access Plan
- Develop and Implement a Dune Management and Restoration Plan
- Participate with other Governmental Agencies and Initiate Intergovernmental Coordination Efforts to Mitigate Coastal Land Loss
- Partner to Promote Beach and Bay Shoreline Stabilization
- Establish and Dedicate Local Funding for Shoreline Stabilization
- Research and Implement Innovative Projects to Promote Shoreline Stabilization

Infrastructure Element Strategies

- Continue to Explore Structural and Non-Structural Mitigation Strategies
- Maintain and Protect Existing Mitigation Features

Disaster Planning Element Strategies

- Develop a Coastal Erosion Response Plan (ERP) and Address Non-Coastal Land Loss
- Protect the Integrity of the Seawall

The Hazard Mitigation Plan identifies a variety of natural hazards and risks and the actions the City should take to reduce the effects of natural hazards on the place and its population. The Hazard Mitigation Plan identifies coastal erosion and coastal retreat as two of the hazards with the "highest potential for damaging physical assets, people and operations in Galveston." The Hazard Mitigation Plan includes an action plan that identifies citywide goals and objectives and specific actions that should be taken to mitigate against potential natural hazards, including:

- Supporting aggressive beach nourishment program to address critical erosion areas;
- Installing shoreline protection devices in areas subject to coastal erosion to reinforce dune systems
- Elevating of structures at risk from flooding.

APPENDIX C. City of Galveston Erosion Response Plan

1.4. Planning Process and Public Input

Public involvement has played a central role in the development of beachfront construction, beach access, and dune protection and restoration plans and programs in the City of Galveston. Prior to Hurricane Ike, the Planning Commission had periodically conducted workshops to discuss beachfront construction regulations specifically-related to construction setbacks and building practices. In addition, the City spent considerable time drafting comments in response to 2007 legislation regarding erosion response planning (House Bill 2819). The City's final comments regarding HB 2819 were submitted to the GLO on August 14, 2008.

An intensive process of public engagement was followed in preparing the ERP. Starting in April 2011, ERP provisions were discussed in a variety of public forums and workshops, including the following:

April 28, 2011	City Council Workshop
April 30, 2011	Progress Galveston Public Workshop
May 3, 2011	Planning Commission Regular Meeting
May 10, 2011	Planning Commission Workshop
May 24, 2011	Planning Commission Workshop with Public Comment
June 7, 2011	Planning Commission Public Hearing
June 9, 2011	City Council Public Hearing
June 23, 2011	City Council Public Hearing
July 15, 2011	Stakeholder Meeting with west end property owners
July 21, 2011	Progress Galveston Public Workshop
September 28, 2011	ERP Workshop 1
September 29, 2011	Stakeholder Meeting with west end property owners
October 12, 2011	ERP Workshop 2
October 26, 2011	ERP Workshop 3
November 3, 2011	Progress Galveston Public Workshop
November 16, 2011	ERP Workshop 4
January 31, 2012	Planning Commission Workshop
February 7, 2012	Planning Public Hearing
March 9, 2012	City Council Workshop
April 12, 2012	City Council Public Hearing (Plan Adoption)

In addition to these forums and workshops, the City posted information, updates, and draft maps and plans on City websites, including the City's home page (www.cityofgalveston.org) and the website established for post-Ike planning initiatives (www.progressgalveston.com).

EXISTING SHORELINE CONDITIONS

This section of the ERP provides a general overview of shoreline conditions on Galveston Island, including a review of shoreline change rates for segments of the City of Galveston shoreline and a general description of the existing dune system.

1.5. Overview

Coastal erosion, storm events, and coastal construction projects have strongly influenced conditions along the Galveston coastline. Significant portions of the Island's coast experience high rates of erosion, upland development has impacted the natural landward migration of dune systems and sediments, and coastal

shoreline protection projects (i.e., jetties, seawall, and navigation channels) have limited the supply and interrupted the long-shore drift of sediment. The combined effects of these phenomena have diminished the health and stability of Galveston's beach and dune systems, and thus increased the vulnerability of public and private property to damage during major storms.



Figure 1. Effects of severe storm damage and erosion sustained during Hurricane Ike.

While the eastern end of Galveston Island accretes due to a reversal in longshore transport caused by the jetties at Bolivar Roads, most of Galveston's beachfront shoreline from Stewart Beach westward is eroding. Several locations on the Island, such as at the western end of the Galveston Seawall, have experienced a high average rate of erosion of more than eight (8) feet per year. For the past century, the Seawall has protected the core of the City from major storms, but with high rates of erosion and an impaired dune system, the western end of the Island remains particularly susceptible to flooding and other impacts of major storms. The western end of the Island is largely developed, with limited unplatted parcels remaining. Over the past several decades, beach nourishment and dune restoration projects have helped address long-term erosion through introduction of sand to the beach/dune system, but for the most part, erosion along the western end of the Island has continued to make beachfront property and infrastructure vulnerable to damage in major storm events.

1.6. Shoreline Change Rates

Similar to other areas along the Texas coast, Galveston Island's shoreline is subject to considerable variability in actual shoreline change rates from year to year. A typical cycle consists of a large storm-induced retreat followed by months, and sometimes years, of recovery during relatively benign wave conditions. Shoreline locations also vary seasonally, typically exhibiting winter retreat and summer advance. Tracking shoreline change over time is an important factor to consider in developing erosion response measures.

As designated by the State of Texas, The University of Texas at Austin, Bureau of Economic Geology (BEG) is the official repository of statewide historic shoreline change data. In preparing this ERP, the City reviewed BEG historical and projected shoreline data, including the most recently reported average shoreline change rates for the period between 1882 and 2007. [1] These shoreline change rates were "calculated for the latest coast-wide aerial photography that predates Hurricane Ike, which significantly altered beach and dune

[1] Bureau of Economic Geology. http://www.beg.utexas.edu/coastal/download.php

morphology and shoreline position."[2] Due to the extent of shoreline management activity on Galveston Island over the past 15 years, the City has chosen to utilize the linear regression rate (LRR) to best reflect long-term background erosion rates.

For purposes of the ERP, the beaches within the City of Galveston were divided into the following Aggregate Shoreline Change Zones based on analysis of BEG shoreline change rates:

- ***Accreting Zone.*** Average annual shoreline advance in excess of +1 feet per year;
- ***Stable Zone.*** Average annual shoreline change of -1 to +1 feet per year;
- ***Eroding Zone.*** *(-2 ft/yr).* Average annual shoreline retreat of -1 to -3 feet per year;
- ***Eroding Zone.*** *(-4 ft/yr).* Average annual shoreline retreat of -3 to -5 feet per year;
- ***Eroding Zone.*** *(-6 ft/yr).* Average annual shoreline retreat of -5 to -7 feet per year;
- ***Eroding Zone.*** *(-8 ft/yr).* Average annual shoreline retreat in excess of -7 feet per year.
- ***Seawall Zone.*** Shoreline change affected by Seawall.

The following table and attached Exhibit A: Aggregate Shoreline Change Zone Maps identify the general location and extent of each of the Aggregate Shoreline Change Zones.

[2] Paine, J. G., Mathew, S., and Caudle, T.L. 2011. Texas Gulf shoreline change rates through 2007: The University of Texas at Austin, Bureau of Economic Geology. Final report prepared for General Land Office, under contract no. 10-041-000-3737, 38 p. + CD-ROM.

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TABLE 1: AGGREGATE SHORELINE CHANGE ZONES

Aggregate Shoreline Change Zone		Western Boundary	Eastern Boundary
1	Accreting	West end of Island	Pointe West
2	Stable (0 ft/yr)	Small segment within Pointe West	
3	Eroding (-2 ft/yr)	Pointe West	Ocean Club Villas (Grassy Point Road)
4	Eroding (-4 ft/yr)	Ocean Club Villas (Grassy Point Road)	Terramar Subdivision (Beach Access Point)
5	Eroding (-2 ft/yr)	Terramar Subdivision (Beach Access Point)	Texas Campground
6	Eroding (-4 ft/yr)	Texas Campground	City of Jamaica Beach
	n/a –City of Jamaica Beach and & Galveston Island State Park		
7	Eroding (-6 ft/yr)	Galveston Island State Park (13 Mile Road)	Marquette Property
8	Eroding (-8 ft/yr)	Marquette Property	Spanish Grant Blvd
9	Eroding (-8 ft/yr)	Spanish Grant Blvd	Sunrise Estates (Sunrise Ct)
10	Eroding (-8 ft/yr)	Sunrise Estates (Sunrise Ct)	West end of Seawall (103rd Street)
11	Seawall Zone	West end of Seawall (103rd Street)	11th Street
12	Stable (0 ft/yr)	11th Street	9th Street
13	Stable (0 ft/yr)	9th Street	Beach Drive
14	Stable (0 ft/yr)	Small segment near Beach Drive	
15	Accreting	Beach Drive	East end of Island

The City should investigate feasibility of an annual survey of erosion rates that could be used to determine Aggregate Shoreline Change Zones in future editions of ERP.

1.7. Beach and Dune System

Coastal beaches and dune systems are sensitive natural resources and provide a number of well-recognized benefits. Beaches and dunes are an integral part of the coastal landscape, lending both beauty and protection to the shoreline. As natural coastal barriers, the Island's dunes absorb the force of winds and high waves during major storms and help prevent or delay inland flooding and resulting property damage. Dunes provide protection to landward structures by blocking storm tides and waves, and by providing a sediment source for natural beach nourishment after storms. Wide beaches and high continuous dunes are the best defense against coastal storms. High, continuous dunes tend to block storm surge, while lower, discontinuous dunes can be overrun by storm surge and flood low-lying areas behind them.[3]

Due to high levels of erosion, coastal development, and destruction caused by Hurricane Ike, the dune system and line of vegetation (LOV)—the extreme seaward boundary of natural vegetation—on the western end of Galveston Island are incomplete and discontinuous. Where dune systems exist, they include both natural and restored (man-made) systems, with dune height, width, and vegetated cover varying along the shoreline.

[3] McKenna, K.K. and Paine, J.G. 2009. Texas Coastwide Erosion Response Plan. Prepared for the Texas General Land Office, Contract No. 06-076-000, 86 p. + apps.

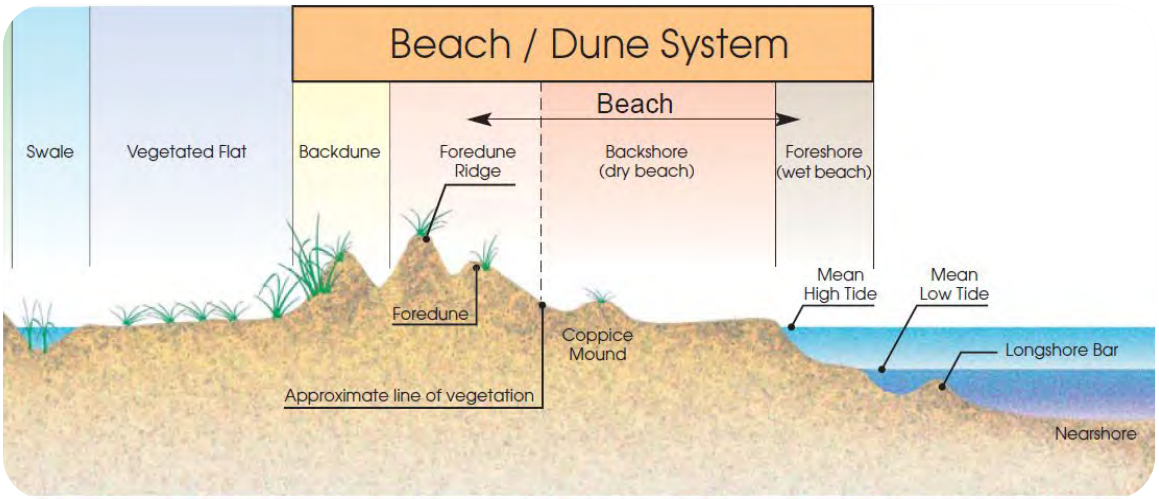


Figure 2. Illustration showing typical cross section of a Texas barrier island. (Modified from from GLO Dune Manual)



Figure 3. Restored (man-made) dune system with recently established vegetation.

Recent research, however, provides information regarding locations along the beach where dunes are most likely to naturally form and remain relatively stable. Through analysis of LIDAR surveys, Gibeaut and Caudle concluded that the elevation where dunes are most likely to form (or where the natural line of vegetation may occur) is about four (4) feet above mean sea level (MSL), or approximately 4.5 feet above the North American Vertical Datum (NAVD).[4] The seaward extent of dune systems, marked by the line of vegetation, typically forms at or above this elevation because it is sufficiently high enough on the dry beach to not be affected by normal, seasonal tidal fluctuations. Additionally, Gibeaut and Caudle determined that the typical natural foredune complex along the upper Texas coast occupies an approximate 200-foot wide corridor as measured landward from the +4.5 feet NAVD contour. Gibeaut, Gutierrez, and Hepner suggested that, along the upper Texas coast, washover and damage to beachfront construction from storms with surges of up to approximately

[4] Gibeaut, J.C., and Caudle, T.L. 2009. Defining and Mapping Foredunes, the Line of Vegetation, and Shorelines along the Texas Gulf Coast. Harte Research Institute for the Gulf of Mexico Studies and Bureau of Economic Geology, p. 10.

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five (5) feet does not typically occur where the foredunes are at least ten (10) feet high or 100 feet wide.[5]

During the design of the West Galveston Island Beach Nourishment Project for the GLO in 2010, the shape of natural dunes along west Galveston Island was analyzed. As shown in Figures 4 through 7, the width of natural foredunes at select locations along Galveston ranges from approximately 60 to 110 feet. Measurements of natural dunes at the Galveston Island State Park by Gibeaut, Gutierrez, and Hepner showed a foredune width of approximately 65 to 110 feet (Figure 4).

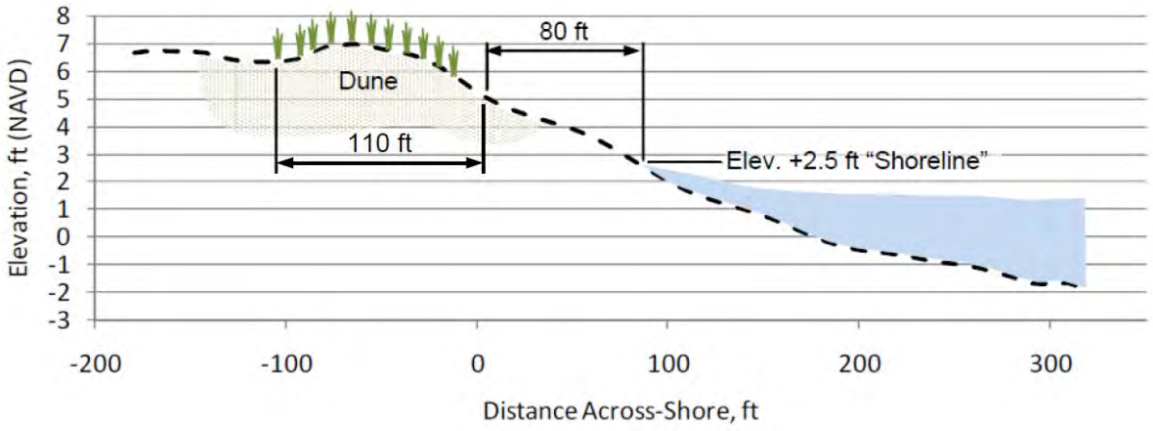


Figure 4. Average profile representing natural dune/beach system at Galveston Island State Park (modified after HDR 2009).[6]

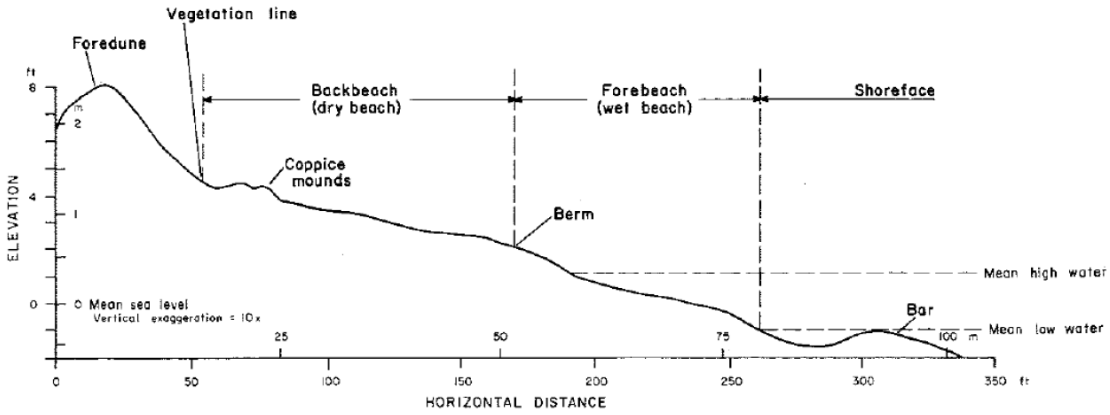


Figure 5. Natural Beach Profile at West Galveston Island.[7]

[5] GIbeaut, J.C., Gutierrez, R., and Hepner, T. 2002. Threshold conditions for episodic beach erosion along the southeast Texas coast. Gulf Coast Association of Geological Societies Transactions, v. 52, p. 323-335.
[6] HDR Engineering, Inc. 2009. Performance Analysis for the Proposed West Galveston Island End of Seawall Beach Nourishment. Prepared for the Texas General Land Office, CEPRA Project No. 1391, HDR Project No. 124626 (PW83321), 22 p. + apps.
[7] Morton, R.A. and Paine, J.G. 1985. Beach and Vegetation-Line Changes at Galveston Island, Texas: Erosion, Deposition, and Recovery from Hurricane Alicia. Geological Circular 85-5. The University of Texas at Austin, Bureau of Economic Geology.

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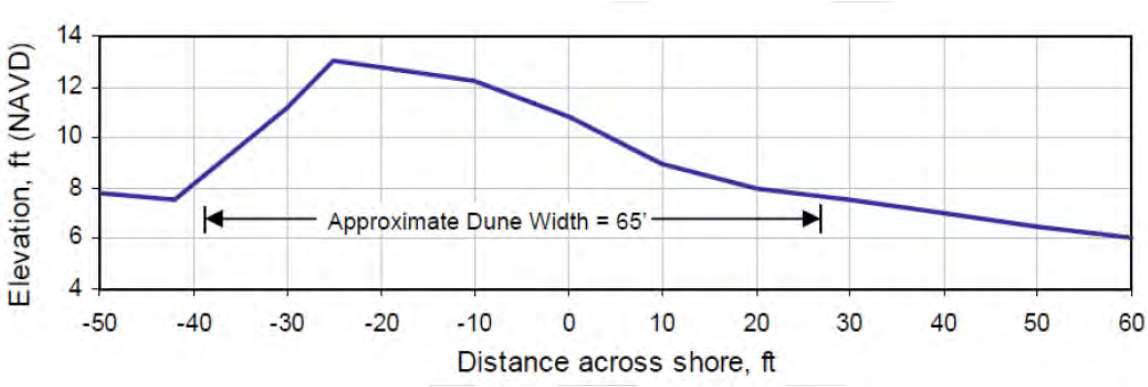


Figure 6. Natural dune profile at Silverleaf's Seaside Resort (June 2004).[8]

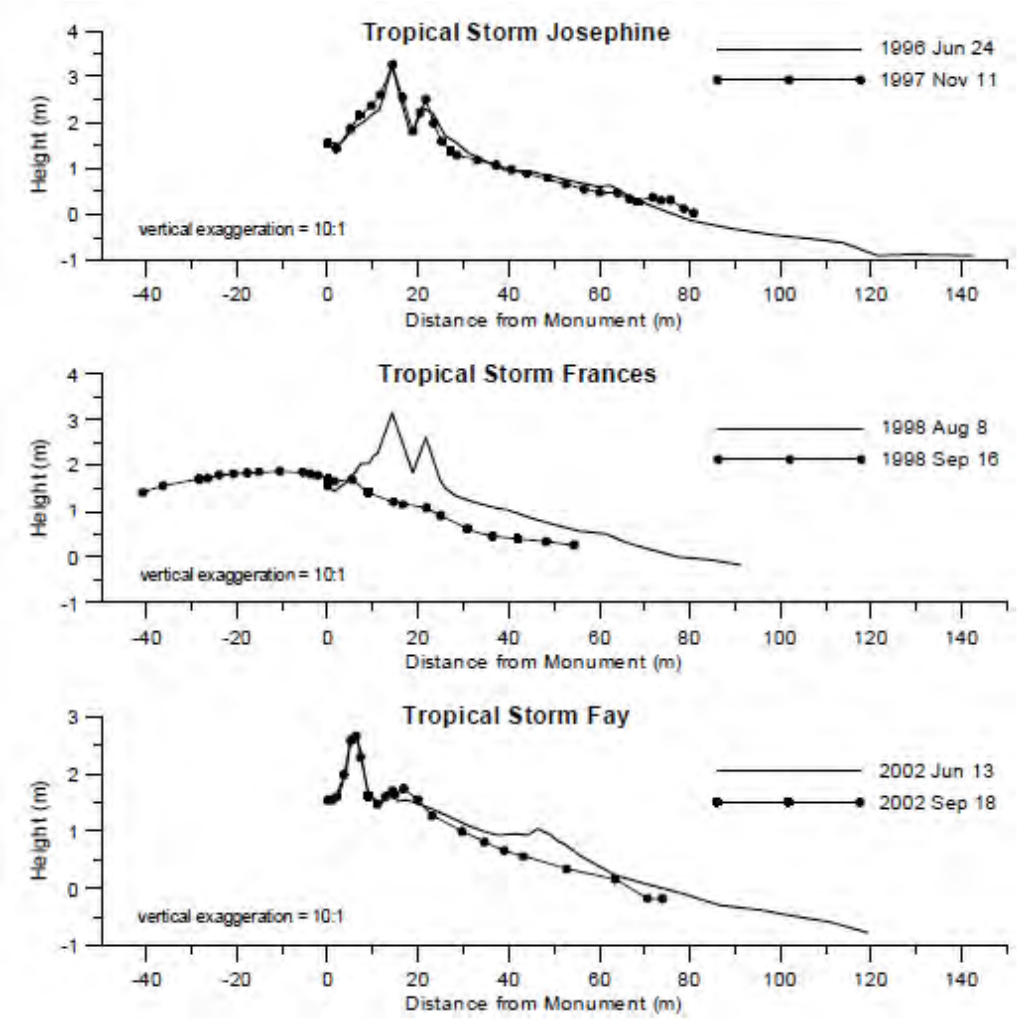


Figure 7. Natural dune profiles from Galveston Island State Park before and after major storms (modified after Gibeaut *et al.* 2003).[9]

[8] HDR Engineering, Inc. 2009. West Galveston Island End of Seawall Beach Nourishment, Design Basis Memorandum. Prepared for the Texas General Land Office, CEPRA Project No. 1391, HDR Project No. 88091 (PW83321), 72 p. + apps.
[9] Gibeaut, J. C., Hepner, T. L., Waldinger, R. L., Andrews, J. R., Smyth, R. C., and Gutierrez, R. 2003. Geotextile tubes along the upper Texas Gulf coast: May 2000 to March 2003. The University of Texas at Austin, Bureau of Economic Geology. Final

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Based on recent research regarding dune locations and profiles, the City has adopted the following definition for restored (man-made) dunes:

> For the purposes of determining construction setbacks and the location of the Dune Protection Line, a restored dune shall be defined as having more than 50% vegetative cover, a 3:1 slope, an average height of 75% of the island's base flood elevation as measured from mean sea level, a naturally established connection to the dune contour and elevation of the adjacent property, and shall not extend further seaward than 4.1' elevation from mean sea level.

These guidelines result in a dune footprint that is a minimum of 50 feet wide and has a dune height of approximately ten (10) feet.

3. DUNE CONSERVATION AREA AND ENHANCED CONSTRUCTION ZONE

3.1 Definition

The City defines a Dune Conservation Area and an Enhanced Construction Zone as follows:

Dune Conservations Area. The Dune Conservations Area shall be defined as areas along Galveston's Gulf Coast where beachfront dunes naturally occur and where restored (man-made) dunes may be located. The Dune Conservation Area shall also include lands within 25' of the north toe of existing or restored (man-made) dunes.

Dune Conservation Area Limits- The seaward limit of the Dune Conservation Area (DCA) shall be the most seaward contour line corresponding to elevation +4.00 foot NAVD or the line of vegetation, whichever is farther landward, as established by a topographic survey. Where proposed beach nourishment, dune restoration, or other activity has the potential to influence a property's natural topography and/or move beach or dune contours seaward, the seaward limit shall be established by determining the +4.00 foot NAVD elevation and line of vegetation prior to construction. Where beach contour lines have been affected by beach maintenance or construction projects, the seaward limit shall be established by a line connecting the nearest naturally-occurring +4.00 foot NAVD contour to the west and the east of the property. The landward limit of the Dune Conservation Area shall be defined as the north toe of an existing dune or restored (man-made) dune plus a 25-foot landward offset.

Enhanced Construction Zone. The Enhanced Construction Zone shall be defined as areas immediately landward of the Dune Conservation Area with the potential to be effected by the long-term effects of erosion. The Enhanced Constructed Zone shall be established for areas with Aggregate Shoreline Change Rates eroding more than -2 feet per year as defined in Section 3.2 below. Construction activities in the Enhanced Construction Zone will be required to meet higher standards than activities in areas further landward.

report prepared for Texas Coastal Coordination Council pursuant to National Oceanic and Atmospheric Administration Award No. NA07OZ0134, under GLO contract number 02-493 R, 37 p. + apps.

Development conditions and standards that apply to the Dune Conservation Area and Enhanced Construction Zone do not apply to properties within the Seawall Zone, as shown in Exhibit A within this Plan. Development within this area shall be governed by existing City and state policies and regulations.

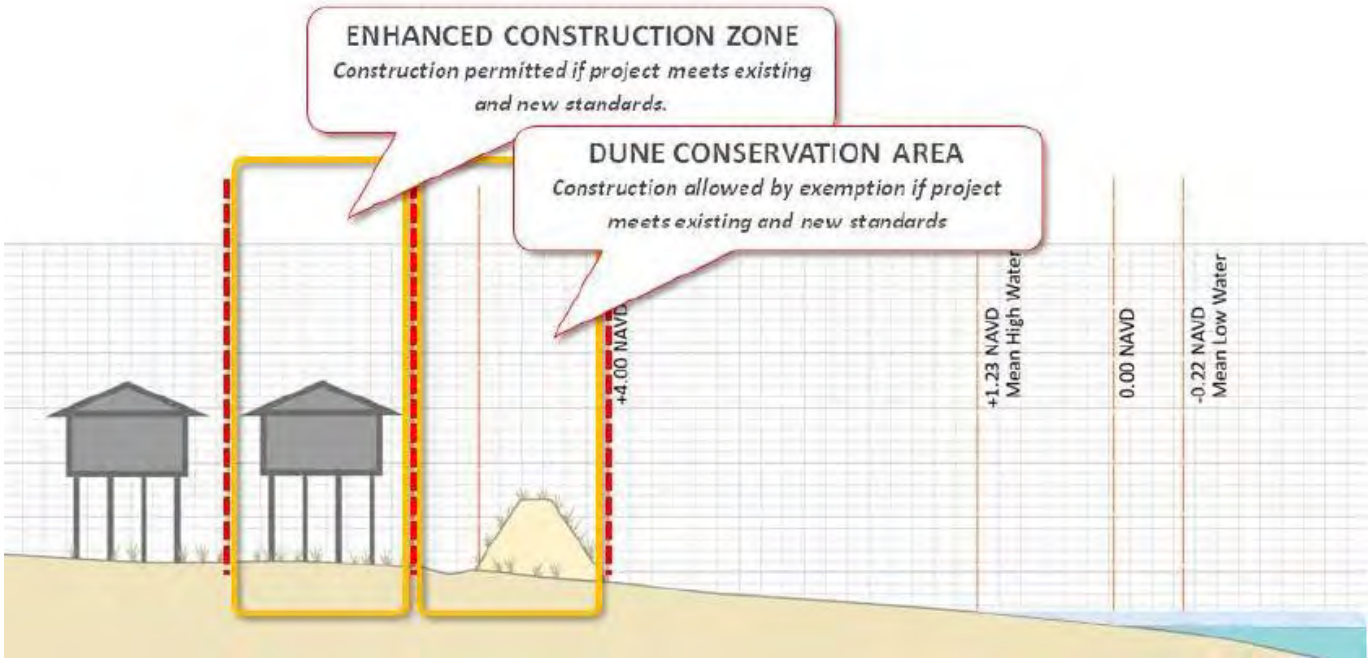


Figure 8. Graphic illustrating limits of the Dune Conservation and Enhanced Construction Zone

3.2 Mapping of the Dune Conservation Area and Enhanced Construction Zone

The City will amend existing regulations to require the following be shown on boundary and topographic surveys submitted with applications for Beachfront Construction Certificates and Dune Protection Permits:

> **Dune Conservation Area Limits**- The seaward limit of the Dune Conservation Area (DCA) shall be the most seaward contour line corresponding to elevation +4.00 foot NAVD, or the line of vegetation, whichever is farther landward as established by a topographic survey. Where proposed beach nourishment, dune restoration, or other activity has the potential to influence a property's natural topography and/or move beach or dune contours seaward, the seaward limit shall be established by determining the +4.00 foot NAVD elevation, and the line of vegetation prior to construction. Where beach contour lines have been affected by beach maintenance or construction projects, the seaward limit shall be established by a line connecting the nearest naturally-occurring +4.00 foot NAVD contour or the line of vegetation to the west and the east of the property. The landward limit of the Dune Conservation Area shall be defined as the north toe of an existing dune or restored (man-made) dune plus a 25-foot landward offset.

Enhanced Construction Zone Limits- The landward limit of the Enhanced Construction Zone shall be shown for areas along Galveston's Gulf Coast with Aggregate Shoreline Change Rates of -2 feet per year or greater. The landward limits shall be 125 feet from the landward limit of the Dune Conservation Area.

Seawall Zone Limits. Mapping of the Dune Conservation Area and Enhanced Construction Zone is not required for properties along the Seawall Zone.

The City has established procedures for applicants to follow in surveying and mapping of the seaward and landward limits of the Building Setback Area.

The approximate extent of the Dune Conservation Area and Enhanced Construction Zone are shown in Exhibit B of this Plan. These maps, indicating the approximate limits of the Dune Conservation Area and Enhanced Construction Zone, are included for illustrative purposes only—actual area limits shall be established by an individual survey of each parcel prior to submittal of an application for a Beachfront Construction Certificate or Dune Protection Permit.

The City has instituted a long-term survey program to map the limits of the Dune Conservation Area and Enhanced Construction Zone, subject to City Council goals and budget appropriations. Survey data collected through the survey program will be used to guide future planning efforts and as a tool to assess changing beachfront conditions.

4. EXEMPTIONS FOR CONSTRUCTION WITHIN THE DUNE CONSERVATION AREA

This section of the ERP describes standards for exemptions for construction in the Dune Conservation Area. The City recognizes that beach and dune systems are vital natural resources providing protection to upland properties and structures, recreation areas, and public infrastructure, and will therefore amend existing regulations to ensure new construction is sited and designed to accomplish the following general objectives of this Plan:

Avoid or minimize adverse impacts to existing dune systems;
Avoid or minimize development in areas were dunes may be located through natural formation, landward migration, or restoration; and
Allow natural dune fluctuations, migration, and recovery following coastal storm events.

4.1 Construction within or Seaward of Dune Conservation Area

The City will amend existing regulations to prohibit construction within or seaward of the Dune Conservation Area and provide for exemptions for new construction and renovations of existing structures. To the maximum extent practicable, all structures shall be constructed landward of the Dune Conservation Area. Construction of structures landward of the Dune Conservation Area establishes a rebuttable presumption that the permittee has followed the mitigation sequence requirements for avoidance and minimization of efforts on dune and dune vegetation specified in §15.4(f) of the Natural Resources and Conservation Code. However, the permittee is not exempt from compliance with compensatory mitigation requirements for unavoidable adverse effects on dunes and dune vegetation as provided within this Plan.

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4.2 Consideration of Exemptions

The City will amend existing regulations to allow property owners to request an exemption from the prohibition on construction within or seaward of the Dune Conservation Area for one of the following:

1. Properties for which the owner has demonstrated to the satisfaction of the City that there is no practicable alternative to construction within or seaward of the Dune Conservation Area. In determining what is practicable, the City shall consider whether an action, technology, or technique is commercially available and capable of being done after taking into consideration existing building practices, effectiveness, scientific feasibility, siting alternatives, and the footprint of the structure in relation to the area of the building portion of the lot, and considering the overall development plan for the property. The City shall also consider the cost of the technology or technique.
2. Properties with a valid Beachfront Construction Certificate approved under the City's Dune Protection and Beach Access Plan prior to the adoption of the City of Galveston ERP- Adopted by COG on May 7, 2012. Effective into rule on December 13, 2012.
3. Structures located within or seaward of the Dune Conservation Area prior to the effective date of the ERP (adopted by COG on May 7, 2012. Effective into rule on December 13, 2012) for which modifications are sought that do not increase the footprint further seaward of the existing structure, that have not been determined "substantially damaged" under the City's flood regulations, and that have not been abandoned for a period of more than 12 months. For the purposes of this section, "abandoned" shall mean a rebuttable determination by the City of an intention to not repair or return to the structure. Structures within or seaward of the Dune Conservation Area that have been substantially damaged or abandoned for a period of more than 12 months shall be subject to conditions of this Plan.

5. CONSTRUCTION AND CONDITIONS

The City amended existing regulations to apply the following construction standards and conditions to projects within the Enhanced Construction Zone and for projects found to be exempt from the prohibition on construction within or seaward of the Dune Conservation Area.

Existing regulations were amended to establish that Beachfront Construction Certificates for construction activity are in accordance with Item (D) Permitting Authorities as found beginning on page 3 of this Plan.

5.1 Mitigation Plan

The applicant shall prepare a comprehensive mitigation plan which includes a detailed description of the methods used to avoid, minimize, mitigate, and/or compensate for any adverse effects on dunes or dune vegetation as provided in Item (O) of this Plan.

5.2 Prohibited Activities

The proposed construction shall not involve a prohibited activity as provided in this Plan.
The proposed construction shall not materially weaken dunes or materially damage dune vegetation based on substantive findings within this Plan.

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5.3 Dune Protection and Restoration

1. The proposed construction shall be located as far landward as practicable.
2. No ground-level enclosures below base flood elevation (BFE) shall be allowed in the Dune Conservation Area.
3. The proposed construction shall be designed to minimize impacts to natural hydrology and provide for the gradual and dispersed drainage of storm water runoff, such that runoff within the lot approximates natural rates, volumes, and direction of flow to avoid erosion and dune damage as provided in this Plan.
4. The proposed construction shall not result in the removal or destruction of vegetation or alteration of existing topography unless otherwise unavoidable during construction.
5. Where impacts are unavoidable, areas where vegetation was removed or destroyed shall be revegetated and topography shall be restored consistent with provisions of this Plan.
6. Prior to the commencement of proposed construction, a dune enhancement or restoration project consistent with the definition for restored (man-made) dunes provided within this Plan shall be completed. In cases where completion of an enhancement or restoration project is deemed infeasible due to site constraints as determined by the Department of Planning and Community Development, payment of a fee-in-lieu of satisfying the requirement shall be made to the City. Funds collected will be used to support dune restoration, beach nourishment, or beach access improvements.

5.4 Site and Building Design

The proposed construction shall be designed to minimize the extent of paved areas as follows:

1. Paving or altering of sites is prohibited in the area seaward of 25 feet from the north toe of an existing or restored (man-made) dune.
2. Paving used under the habitable structure and for driveway(s) connecting the habitable structure and the street is limited to the use of 4 foot by 4 foot sections of fibrous reinforced concrete in lieu of steel reinforcement in accordance with City specifications, which shall be a maximum of four inches thick with sections separated by expansion joists, or pervious materials approved by the Department of Development Services, except as exempted herein
3. The City shall assess a “Fibrous Reinforced Concrete Maintenance Fee” of $200.00 to be used to pay for the clean-up of fibrous reinforced concrete from the public beaches should the need arise.
4. Driveways are limited to the linear width of the primary structure, along the main street, and a minimum of 15% of the front yard must be maintained as open/unimproved area. The area for measurement of the open/unimproved space will be from the front building façade, where the driveway begins, to the platted property line.
5. For large-scale construction, impervious surfaces shall be limited to 40% of the area landward of the Dune Conservation Area. The determination of the percentage of impervious surfaces and pervious surfaces allowed must include the area beneath the habitable structure, whether or not the area or any portion of the area beneath the habitable structure is left in a natural state.
6. Plans and certifications for proposed structures shall be sealed by a registered professional engineer licensed in the State of Texas, providing evidence of the following:

    1. The adequacy of elevated building foundations and the proper placement, compaction, and protection of fill when used as construction for all newly constructed, substantially damaged, and substantially improved buildings elevated on pilings, posts, piers, or columns in accordance with the latest edition of specifications outlined in American

Society of Civil Engineers, Structural Engineering Institute, Flood Resistant Design and Construction, ASCE 24-05.

2. Structures are elevated and no enclosures below BFE are located within the Dune Conservation Area.
3. Construction is designed to minimize impacts to natural hydrology.
4. For small-scale construction, structures are designed for feasible, above-site relocation.
5. For large-scale construction, financial assurance is required to fund the eventual relocation or demolition and removal of the proposed structure. Financial assurance may be provided in the form of an irrevocable letter of credit, performance bond, or other instruments acceptable to the City.

7. Exemption. An exemption to the prohibition of using reinforced concrete under a structure located within 200 feet landward of the line of vegetation may be granted when the following conditions are present:

1. When the proposed or existing structure is multiple-family or commercial, that will be constructed with, or have, an elevated, reinforced concrete deck at or above Base Flood Elevation (BFE).
    a. For proposed or existing structures that are:
    1. Designated, build, rented, or leased to be occupied, or any portion thereof, as an attached, multiple-family residential living unit, at least five (5) stories in height;
    2. Multiple-family residential living units constructed at least in part behind the seawall, and;
    3. Utilizes a storm water detention system which mitigates peak water runoff on the development site which reduces impacts dunes and the public beach

5.5 Beach Access

All developments, other than single-family habitable structures on previously platted lots, shall provide an accessible-public beach access walkover that complies with Texas Department of Licensing and Regulation Standards.

5.6 Plat Notations

1. Platted Land
   All new subdivisions of land submitted for plat approval after April 12, 2012 shall contain a note on the plat advising of the location of the property within the Dune Conservation Area, and that reads substantially as follows: “The lots or parcels shown on this plat may be located within the Dune Conservation Area and may be subject to more stringent building requirements or limitations under State of Texas or City of Galveston regulations.”
2. Unplatted Land
   For land not required to be platted, prior to the issuance of a building permit for construction of a residential structure or use on property located within the Dune Conservation Area that has been platted prior to April 12, 2012, or that is otherwise not required to be platted, an affidavit in the form prescribed by the city shall be executed by the owners of the property setting forth notice language as described above."

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During Land Development Regulations update process, regulations shall be created to specifically address building requirements for accreting and stable beaches, with special emphasis on managed beaches. During Land Development Regulations update process, regulations shall be created to specifically address building requirements for accreting and stable beaches, with special emphasis on managed beaches.

6. PRESERVING AND ENHANCING PUBLIC BEACH ACCESS

This section of the ERP describes actions the City will undertake to preserve and enhance the public's right of access to and use of the public beach. Following state requirements, the City has evaluated the condition of existing beach access improvements and assessed their vulnerability to damage from erosion and storm events. The City has also prepared plans to manage, maintain, and improve conditions at existing and potential access points which include the following:

- Establishment of design and construction standards to reduce post-storm repair costs;
- Establishment of goals to guide ongoing beach access maintenance and improvement activities;
- Identification of priorities and an implementation schedule for improvements; and
- Establishment of procedures for post-storm assessments to document damage and requirements for repair and rehabilitation.

6.1 Beach Access Inventory and Evaluation

As documented in Exhibit C of this Plan: Beach Access Inventory and Evaluation and detailed within Exhibit D: Beach Access Maps, the City has 46 public beach access points offering a range of amenities to residents and visitors. The inventory and evaluation, originally performed in December 2011, documents the location and extent, type, and condition of improvements at each access point, and defines measures required for protection, restoration, and enhancement. The City of Galveston is taking a phased approach to the implementation of the City Plan with a thorough examination of current beach access to be conducted following the consolidation of the City's various documents.



Figure 9. Beach access sign along FM 3005.

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As provided in Exhibit C, the following information was collected for each beach access point:

- Location (subdivision and cross-streets);
- Type, condition, and number of parking spaces provided;
- Road and access condition;
- Condition of amenities including parking, bollards, dune walkovers;
- Type and location of signage; and
- Recommended improvements including protection from erosion and storm surge, acquisition, entry and site improvements, revegetation, signage and others.

The updated inventory/evaluation will serve as the basis for the Phase II activities for improvements and determining appropriate forms of funding for projects, including qualifying for FEMA post-storm funding.

6.2 Beach Access Construction Methods and Design Improvements

To ensure beach access improvements are better able to withstand the effects of erosion and storm events, the City will adopt by reference the beach access and walkover construction standards provided in the GLO's *Dune Protection and Improvement Manual for the Gulf Coast (Dune Manual)*. The *Dune Manual* provides important guidance regarding the location and design of beach walkovers and access roads, preferred construction materials and methods, and related recommendations to improve access while protecting dunes and dune vegetation. For example, the *Dune Manual* calls for vehicle access roads through dunes to be elevated, angled to help limit direct penetration of surge and waves through or past the dunes during storms, and as narrow as practical to minimize dune destruction (Figure 11).



Figure 10. Dune walkover completed following Hurricane Ike.

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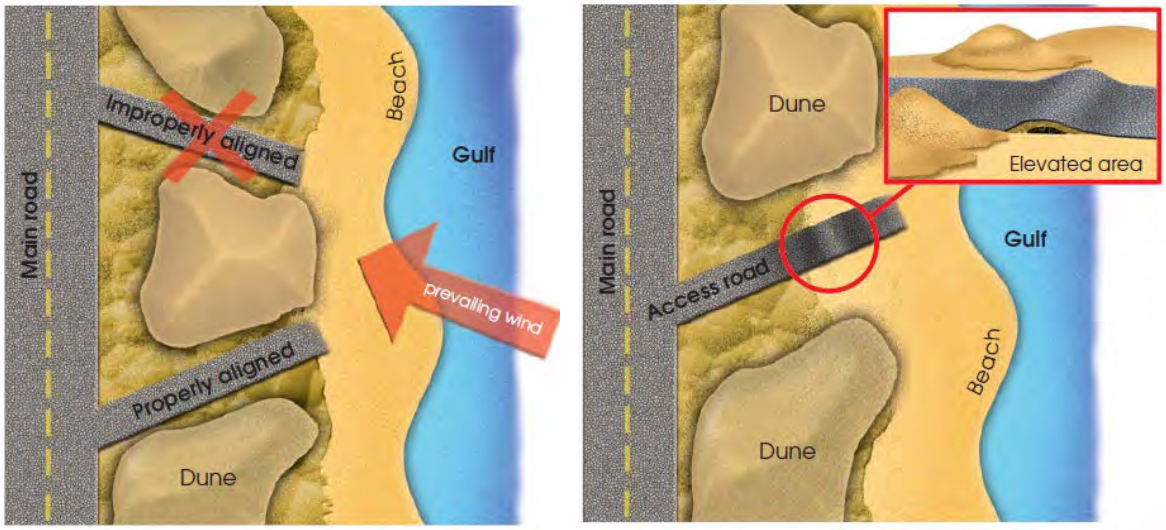


Figure 11. Recommended alignment and elevation of beach access roads. (GLO Dune Manual)

6.3 Beach Access Goals, Priorities, Implementation Schedule, and Funding Sources

Among the City's goals for beach access on the Island is the enhancement of the public's right to use and have access to beaches, balanced with the rights of private property owners and the protection of the coastal environment. This will be accomplished by providing quality access improvements and minimizing the potential for damage to such improvements by following best practices in their design, construction, maintenance, and restoration.

To achieve this broad goal over the long-term, the City seeks to provide the following for all existing and future public beach access points:

- Signage advising the public of beach access and parking locations, types of access provided, dune protection standards, applicable city/state/federal regulations, and protected habitats;
- Bollards and fencing designating beach access parking, pedestrian, and special use areas, as well as
- protection of dunes and vegetation areas;
- Improvements to roadway transition areas where roadways intersect with the beach and on-beach parking and driving access;
- Improvements to drainage features serving the beach area, adjacent properties, city and state roadways;
- Amenities, such as showers, restrooms, lighting and refreshments, and park facilities;
- Enhancements to public safety, including increased lifeguard coverage and presence of emergency personnel;
- Improved ADA access, including, but not limited to, access for beach wheelchairs, installation of access mats and accessible dune walkovers, and programming; and
- Geo-referencing of beach access points and access improvements.

The City's short-term beach access priorities include procuring funding to address post-Ike repair and improvement needs, upgrade deficient conditions at key locations, and minimize the potential for damage due to erosion and storm events. Table 2 identifies the City's short-term priorities for improvements, upgrades, and repairs by public access point. Priorities for improvements and investments were established based on levels of use, need of repair, safety and security concern, and need to reduce the potential for damage in future storm events.

APPENDIX C: City of Galveston Erosion Response Plan

The City's short-term priorities also include procuring funding to purchase equipment required to support local beach access maintenance and improvement activities. Equipment required includes front end loaders, water trucks, and street graders. The City shall make efforts to include annual budget appropriations to adequately fund beach access labor, materials. and equipment.

TABLE 2. SHORT-TERM BEACH ACCESS IMPROVEMENT IMPLEMENTATION SCHEDULE

Public Access Point	Location	Improvement
Access Points 2, 5, 6, 9, & 13	Various City and County Parks Locations	signage, drainage, parking areas, pedestrian walkways, roadways
Access Point 7	8 Mile Road	roadway transition area
Access Points 11 and 12	Spanish Grant and Bermuda Beach Subdivisions	roadway improvements, drainage
Access Point 15A	Pirates Beach and Palm Beach Subdivisions	drainage
Access Point 16	13 Mile Road/Gulf Palms Subdivision	roadway paving, drainage
Access Point 18	16 Mile Road	roadway paving, drainage
Access Point 19	Karankawa Beach	drainage
Access Point 25	Gateway Boulevard	roadway transition area
Access Point 32	County Pocket Park 32	undeveloped access
Access Point 35	Half Moon Beach West	driving area
Access Point 41	Pointe San Luis	roadway access, bollards, dune protection

The City's long-term beach access priorities include upgrading access points as required to address the following:

- Changing environmental conditions;
- Increases in localized erosion;
- The effects of recent and potential future storm activity;
- Changes in patterns of use; and
- Enhancements in the safe and convenient access to beaches.

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As the implementation of individual actions to achieve goals is contingent upon available funding, including grant funding and resources gained through partnerships with private organizations or entities, the City will evaluate the following funding sources to determine their potential to support investments in beach access improvements:

- NOAA Programs and Grants
- GLO Program and Grants
  - Coastal Erosion Planning and Response Act (CEPRA)
  - Coastal Impact Assistance Program (CIAP)
  - Coastal Management Program (CMP)
  - Beach Maintenance Reimbursement Fund
- Coastal and Estuarine Land Conservation Program (CELCP)
- Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)
  - Gulf of Mexico Energy Security Act (GOMESA) funds
- City of Galveston Capital Improvement Program
- Local Beach User Fees
- Homeowner Associations (HOAs)
- Convention Center Surplus Fund

6.4 Post-Storm Assessment Procedures

The updated Beach Access Inventory and Evaluation (Exhibit C), which documents all publicly-funded beach access improvements and amenities, will be used as the basis for conducting assessments of beach access conditions and improvements immediately following significant meteorological events. As soon as conditions allow, the City will assess compliance with the Dune Protection and Beach Access Plan and associated regulations, document non-compliance, and identify required repairs or replacements to amenities including parking, pedestrian and vehicular access ways, signage, etc. The City will develop a schedule and identify local funding, claims, and grants for each improvement.

7. PRESERVING, RESTORING, AND ENHANCING DUNE SYSTEMS

This section of the ERP presents actions and strategies the City will undertake to preserve, restore, and enhance dune systems for storm protection and conservation purposes. As provided below, the City has recently adopted a definition for restored (man-made) dunes; identified locations for potential dune restoration projects and measures to protect dune systems and dune vegetation; and identified goals, implementation schedules, and potential funding sources to accomplish dune restoration and enhancement projects.

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Figure 12. Restored (man-made) dune with fencing to protect vegetation.

7.1 Definition of and Criteria for Restored (Man-Made) Dunes

Recent City plans, policies, and ordinance revisions recognize that healthy dune systems play a central role in protecting public and private property from the effects of storm events and coastal erosion. Vital dune systems, with sufficient height, width, vegetative cover, and continuity, can serve as effective barriers against wind and wave action, thus providing a measure of protection to public and private investments along the coast.

The City's existing regulations include provisions addressing dune protection, revegetation, and restoration, and a recently adopted section provides minimum standards for the creation of restored (man-made) dunes.

Restored (man-made) dunes shall have the following characteristics:

- 50% vegetative cover;
- A minimum 3:1 slope;
- An average height of 75% of the island's base flood elevation as measured from mean sea level;
- A naturally established connection to the dune contour and elevation of the adjacent property; and
- Shall not extend further seaward than 4.1' from mean sea level.

In addition, the City will revise existing regulations to require dune restoration projects as a condition for approval of exemptions for development within the Dune Conservation Area.

To further promote the protection of dunes and dune systems, the City will continue to monitor existing regulations to reference dune vegetation best practices in the GLO's *Dune Manual*. The *Dune Manual* provides guidance regarding plant selection, planting practices, transplanting, watering, fertilization, maintenance, and survival rates. For example, the *Dune Manual* provides the following guidance regarding plant selection and the use of native hay and sand fencing as protection measures:

Seaward Face of the Dune. Bitter Panicum (grass), Sea Oats (grass), Marsh Hay Cordgrass (grass), beach morning glory (vine, and seagrapes (vine).

Landward Side of the Dune. Low-growing plants and shrubs found on the back side of the dunes include seacoast bluestem, cucumber leaf sunflower, rose ring gallardia, partridge pea, prickly pear, and lantana. Many of these are flowering

plants, an attractive alternative to dune grasses though less effective as dune stabilizers.

Native Hay. The use of a three (3) to six (6) inch thick layer native hay, with seeds of the above listed vegetation, on bare sand areas to provide immediate protection from blowing sand and encourage the natural process of re-seeding. The hay must be harvested in fall when mature seeds are present.

Sand Fencing. Encourage limited use of sand fencing to build up dunes where revegetation alone is unlikely to encourage sufficient dune width and height. Sand fencing can be used as a first step prior to revegetation.

7.2 Enhanced Dune Protection Measures for Existing Structures

The City's existing regulations include several provisions designed to protect existing dunes and dune systems. These provisions, along with new requirements called for within this Plan are designed to ensure modifications to existing structures will provide enhanced protection of dune systems.

Sections (M)(1)(I) of this Plan require protection of the dune systems for existing structures to obtain a Dune Protection Permit or Beachfront Construction Certificate. The following prohibitions are in place and will be amended to reference the potential for development within the Dune Conservation Area.

- Paving, grading, or altering the ground below the lowest habitable floor in any manner, including mowing, grading, filling, or fertilizing, is prohibited in the following areas, whichever is further landward:
- The area between the line of vegetation and 25 feet seaward from the habitable structure, or
- The area 25 feet landward of the north toe of the dune;
- Only indigenous dune vegetation described in the GLO's *Dune Manual* shall be planted seaward of the line 25 feet landward of the north toe of the dune; and
- Dune walkovers, footpaths, and irrigation systems for the dune that are approved through a Beachfront Construction Certificate may be allowed.

7.3 Dune Goals, Implementation Schedule, and Funding Sources

Promoting the formation of a continuous dune system is the City's long-term goal for beachfront areas beyond the limits of the Seawall. Although achieving the goal may be difficult given existing development patterns, damage sustained during Hurricane Ike, and the long-term effects of erosion, the City will focus resources on protecting and enhancing dune stability in locations where dunes exist, supporting dune restoration and recovery in areas affected by storm events, and establishing dune systems conditions in locations without dunes through beach nourishment and dune restoration projects.

To achieve the long-term goal, the City will align regulations and public investment strategies to accomplish the following:

- Fill in gaps and blowouts in existing dunes and promote revegetation of these areas;
- Ensure restoration projects match existing dune heights and widths or meet minimum standards for restored (man-made) dunes as defined by City regulations;
- Promote revegetation of existing and developing dunes; and
- Investigate the effectiveness of innovative dune restoration and beach nourishment methods, such as, but not limited to the use of recycled Christmas trees and sand creation using recycled glass.

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Given high levels of damage sustained by the Island's dune systems and dune vegetation during Hurricane Ike, the City's short-term priorities for dune restoration focus on completing previously planned nourishment and dune restoration projects in areas experiencing high rates of erosion. As shown in Exhibit E: Dune Restoration and Beach Nourishment Priority Area Map and Table 3, these areas include large expanses of the beachfront directly west of the Seawall, as well as an area in front of the Seawall west of 61st Street.

TABLE 3. DUNE RESTORATION, REVEGETATION & NOURISHMENT IMPLEMENTATION SCHEDULE—SHORT-TERM PRIORITIES

Priority Level	Area	Improvements
High	61st Street and end of Seawall	beach nourishment
High	End of Seawall west to 13 Mile Road	dune restoration, dune revegetation, and beach nourishment
Medium	16 Mile Road west	dune restoration, dune revegetation, and beach nourishment

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The short-term restoration areas have been prioritized based requirements to protect immediate threats to private property, public infrastructure, and publicly-owned lands. Over the long-term, priorities will be established based on evaluation of historic erosion rates and sand migration patterns, addressing breaches and blowouts, protecting wildlife habitat, and enhancing the width, height, and vegetative cover of existing dunes.

Implementation of the dune restoration or revegetation projects described previously is dependent on the availability of funding. The City will continue to pursue opportunities for restoration or revegetation including grants and other sources of funding. Potential funding sources include, but are not limited to, the following grants and programs:

- NOAA Programs and Grants
- GLO Program and Grants
- Coastal Erosion Planning and Response Act (CEPRA)
- Coastal Impact Assistance Program (CIAP)
- Coastal Management Program (CMP)
- Beach Maintenance Reimbursement Fund
- Coastal and Estuarine Land Conservation Program (CELCP)
- Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) Gulf of Mexico Energy Security Act (GOMESA) funds
- City of Galveston Capital Improvement Program
- Local Beach User Fees
- Homeowner Associations (HOAs)

In addition, the City will explore the feasibility of establishing a dune restoration fund and encouraging private participation in dune restoration and revegetation.

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The City, in conjunction with local, state, and federal partners, shall aggressively pursue beach nourishment and dune restoration projects to address long-term erosion on Galveston Island. The City's Industrial Development Corporation (IDC), which administers the 4B Sales tax, has approximately $1 million annually for beach nourishment projects. The Galveston Park Board of Trustees (Park Board) also has a multi-million dollar account from beach access fees that may be utilized for beach nourishment**,** beach park improvements and beach access. In addition, the Park Board is pursuing a model beach and dune project with the assistance of the Texas General Land Office for the area at the end of the Seawall to Dellanara Park that will utilize FEMA funds from Hurricane Ike.



Figure 13. Sign indicating location of dune revegetation project.

8. VOLUNTARY ACQUISITION OF PROPERTY

Purchase or buyout of vulnerable properties provides another option to reduce public expenditures following storms and address the long-term impacts of erosion. The City has established criteria for identifying properties for voluntary acquisition of fee simple title or a lesser interest acquisition. These properties, which may have structures located partially or entirely within or seaward of the Dune Conservation Area, experience severe damage during storms, impede the development of a natural dune system, and restrict the use of the public beach.

Prior to the City considering a property eligible for participation in a voluntary acquisition or buyout program, the following factors must be evaluated:

- The presence and extent of structures or other improvements within or seaward of the Dune Conservation Area.
- Effects on the public's access to the beach, including proximity or adjacency to public access points;
- Effects on hydrology as determined by a registered professional geologist or engineer licensed in the State of Texas;
- Effects on the health of existing dunes and dune systems;
- Effects on the potential to establish restored (man-made) dunes;
- Effects on adjacent property, including effects on localized erosion;
- Potential to acquire multiple, similarly-situated properties; and

APPENDIX C: City of Galveston Erosion Response Plan

- Other factors with the potential to affect public health and safety.

The following sequence of activities will be followed during City-initiated acquisition processes:

- Identification of potential properties;
- Negotiation of acquisition;
- Funding procurement;
- Agreement execution; and
- Removal of structures.

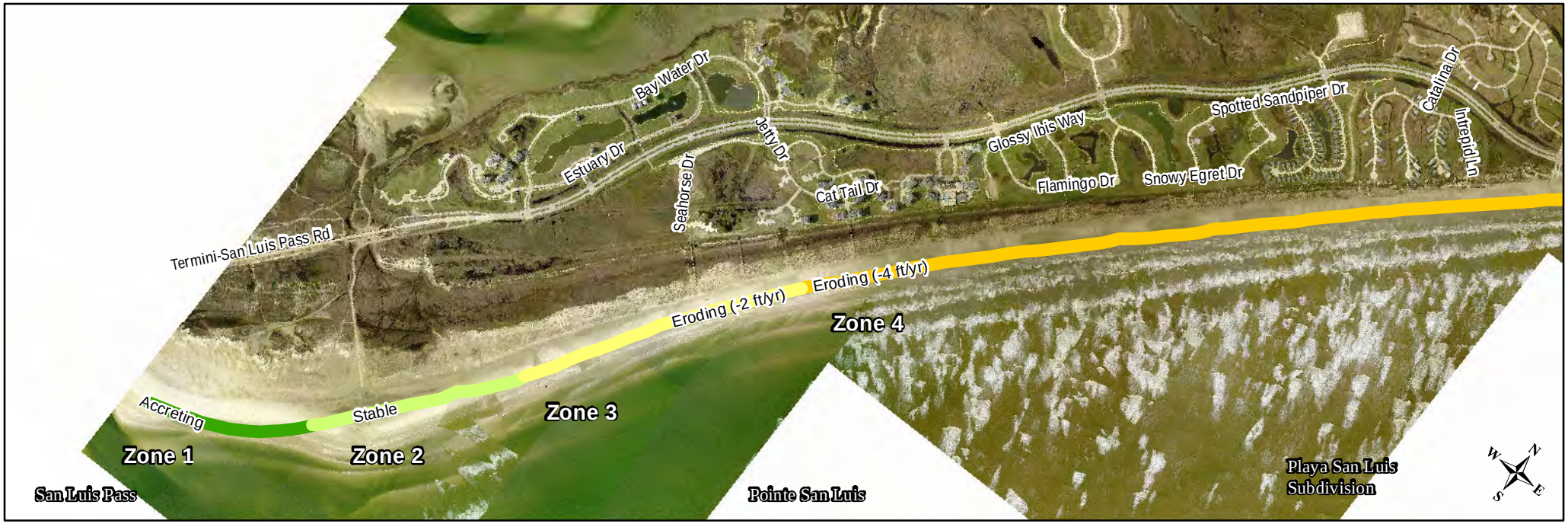
Prior to consideration of a voluntary acquisition program, the City must identify other governmental entities as partners and determine funding sources for the program.

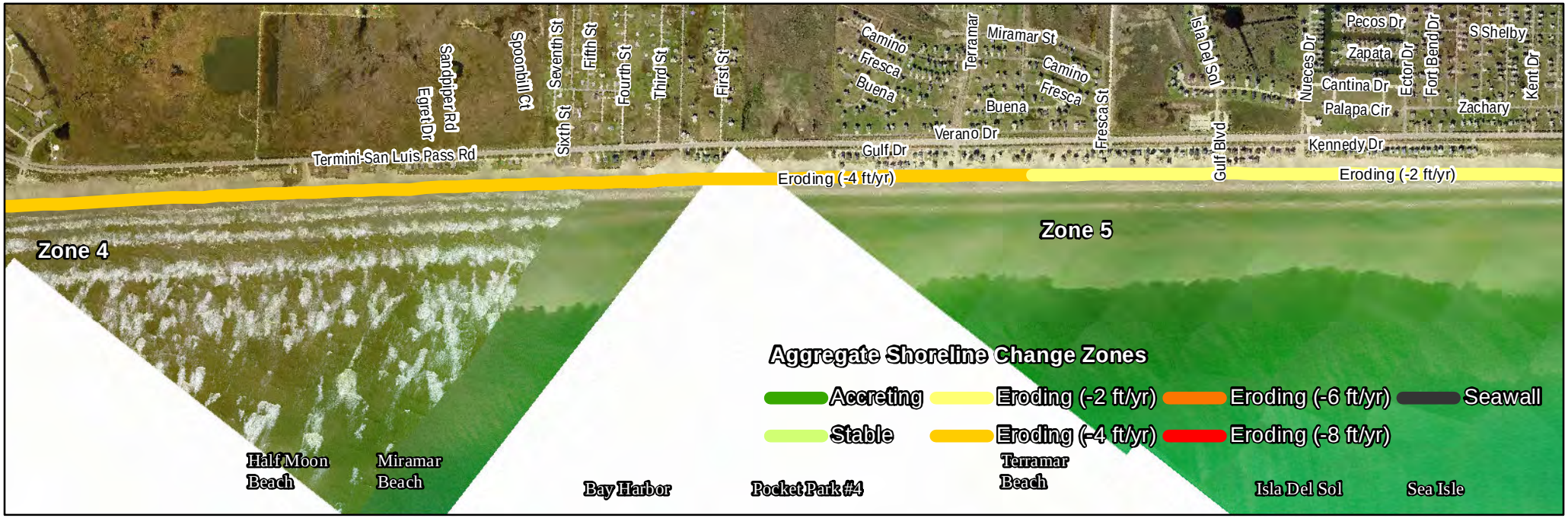
In addition to federal or state acquisition programs, the City should investigate the development of local programs for property acquisition that may utilize Beach User fees, bond funds, or general fund budget. The City shall establish standards for use of acquired properties, prior to program finalization. These standards can include uses such as, but not limited to:

- Open space creation or enhancement;
- Wetland and dune mitigation;
- Beach nourishment;
- Park facilities;
- Drainage improvements;
- Beach access and parking;
- ADA facilities; recreational uses and public infrastructure

Exhibit A

Shoreline Change Zone Maps





Department of Planning and Community Development
823 Rosenberg, Room 401
Galveston, Texas 77550
(409) 797-3660

City of Galveston
Aggregate Shoreline Change Zones
Erosion Response Plan

Aerial Imagery from Spring 2010

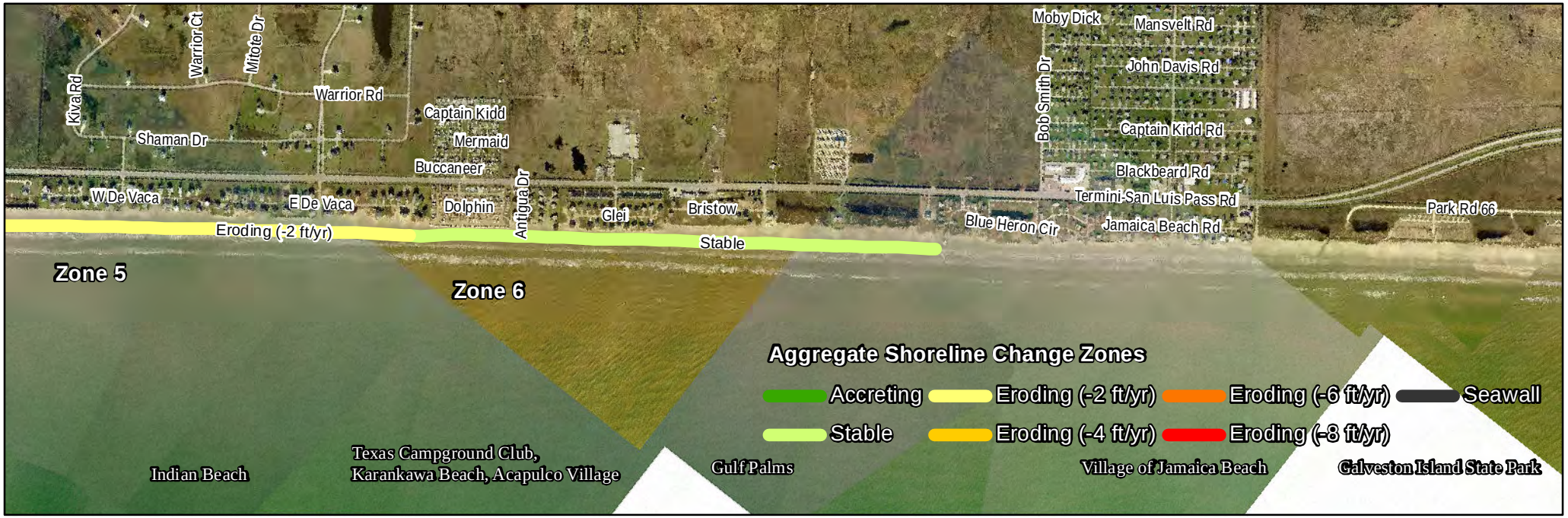
0 0.25 0.5 Miles

Sheet 1 of 5

Map Last Updated: 2/29/2012

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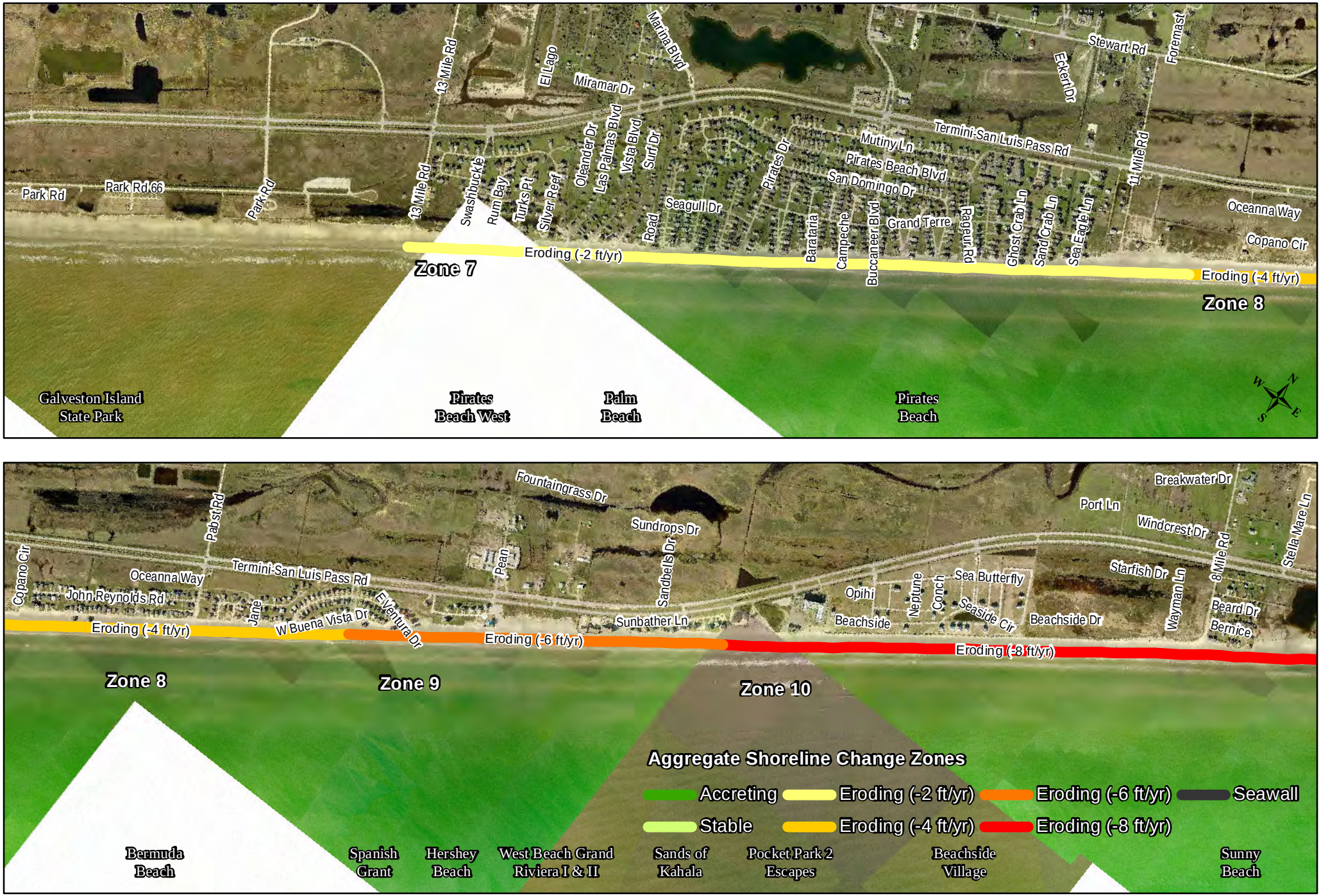
Aerial Imagery from Spring 2010

0 0.25 0.5 Miles

Sheet 2 of 5

Map Last Updated: 2/29/2012

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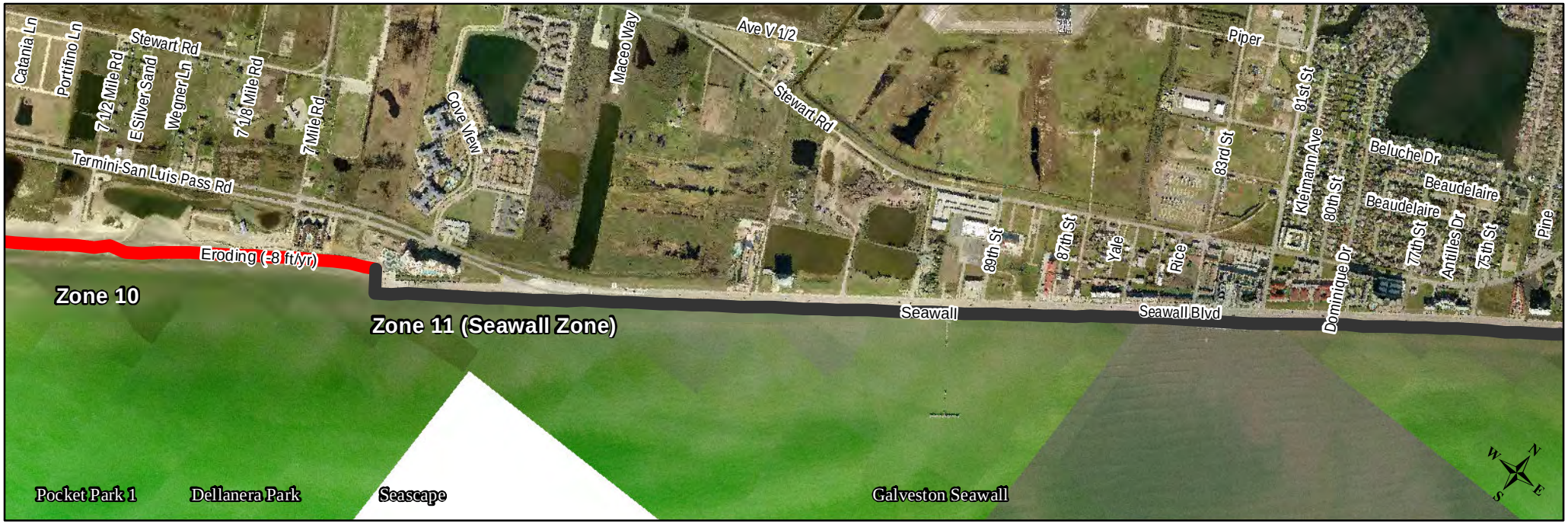
Aerial Imagery from Spring 2010

0 0.25 0.5 Miles

Sheet 3 of 5

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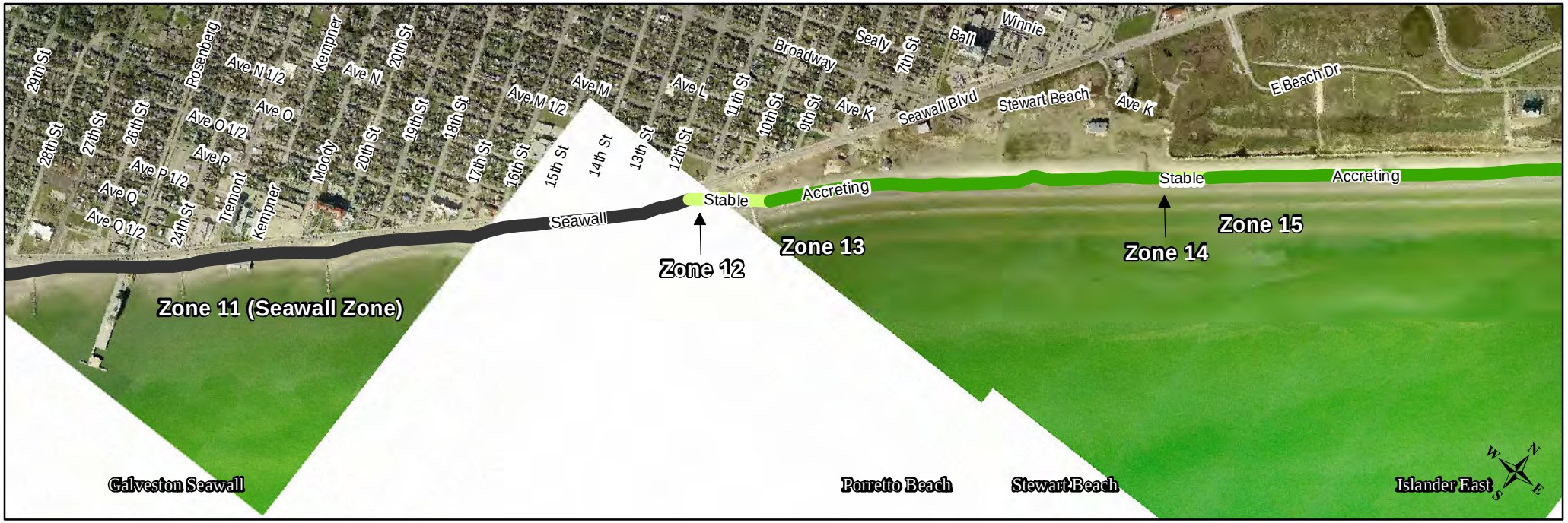
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Aggregate Shoreline Change Zones
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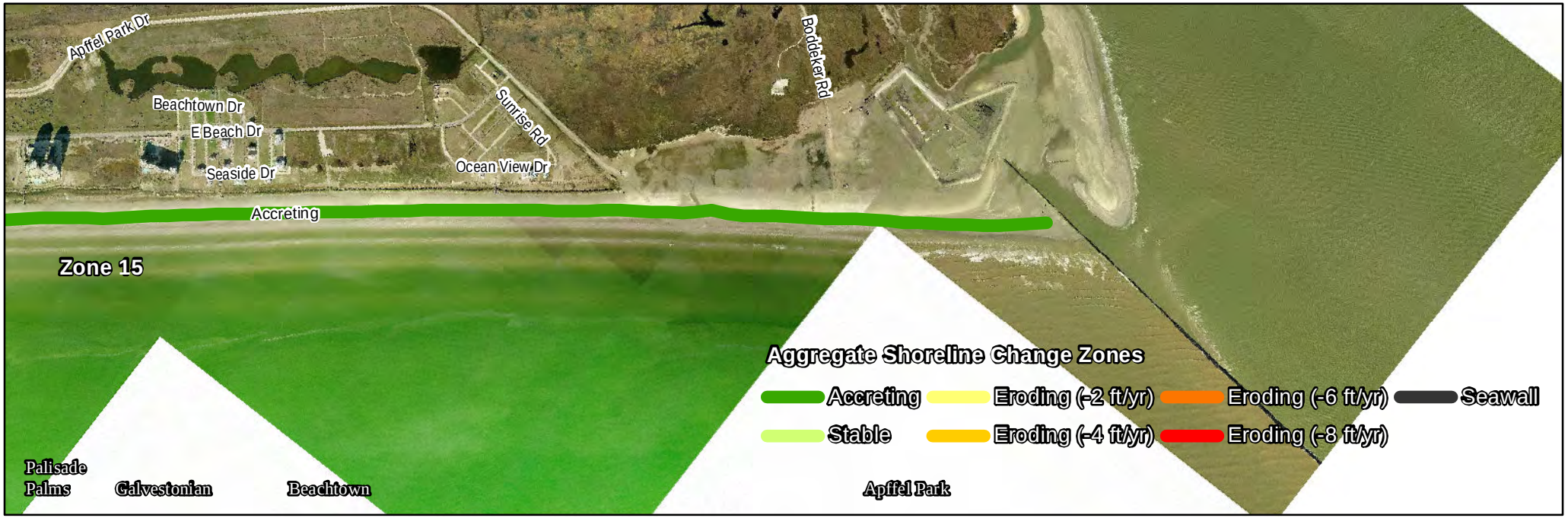
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0 0.25 0.5 Miles

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City of Galveston
Aggregate Shoreline Change Zones
Erosion Response Plan

Aerial Imagery from Spring 2010

0 0.25 0.5 Miles

Sheet 5 of 5

Map Last Updated: 2/29/2012

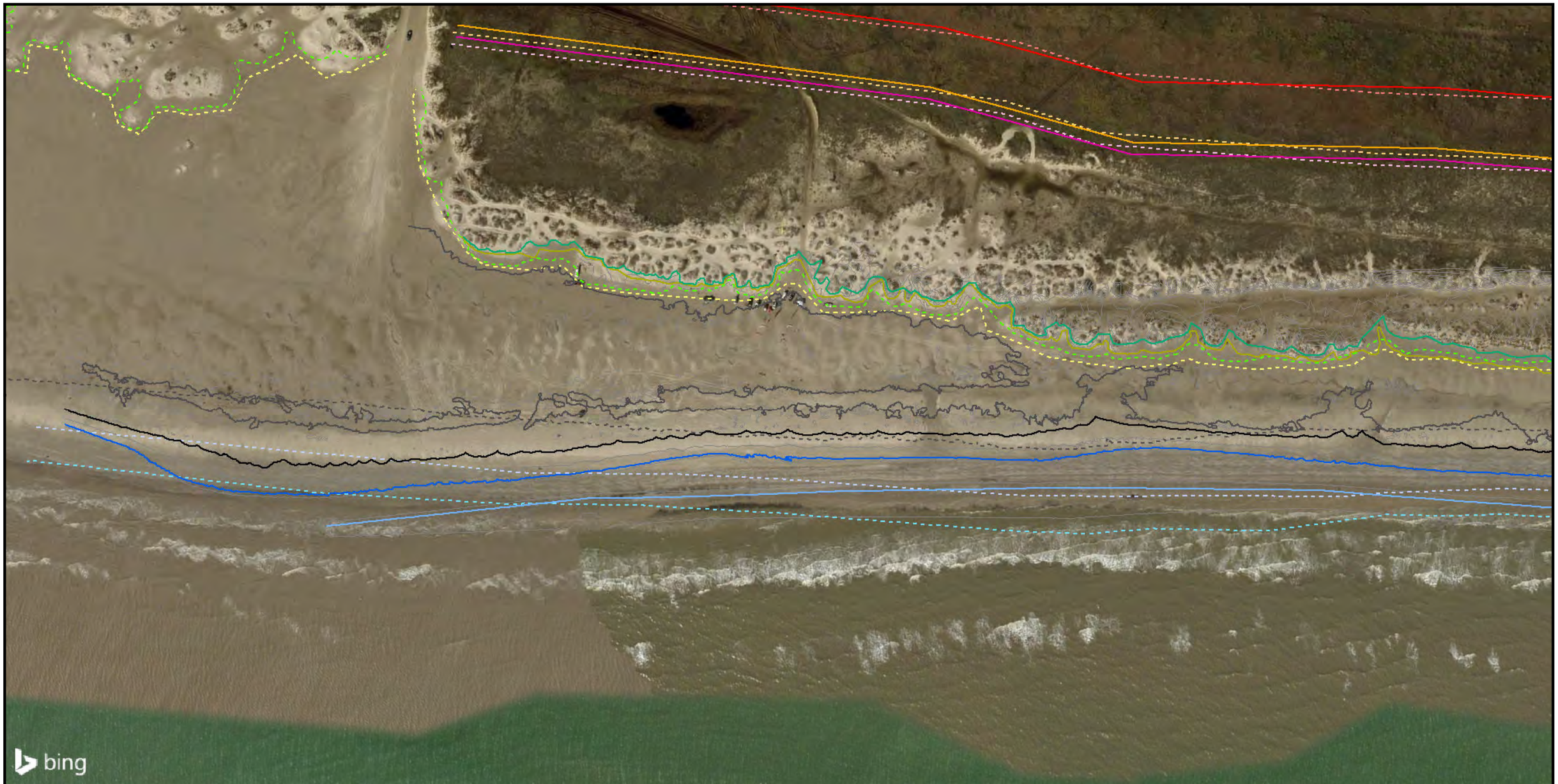
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Exhibit B

Dune Conservation Area Maps

Note: Map data for the entire City is also available on the City's website at:

http://gis.cityofgalveston.org/web_ERP/mapviewer.jsf?width+1122&height=70





- 2017 3' CONTOUR
- 2017 4' CONTOUR
- 2017 LINE OF VEGETATION
- 2017 SOUTH TOE OF DUNE
- 2017 NORTH TOE OF DUNE
- 2017 MEAN HIGH WATER
- 2017 MEAN LOW WATER
- 2017 25' OFFSET NORTH TOE OF DUNE
- 2017 ENHANCED CONSTRUCTION ZONE
- 2016 4' CONTOUR
- 2016 APPROXIMATE LINE OF VEGETATION
- 2016 SOUTH TOE OF DUNE
- 2016 NORTH TOE OF DUNE
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0 100 200 Feet

Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

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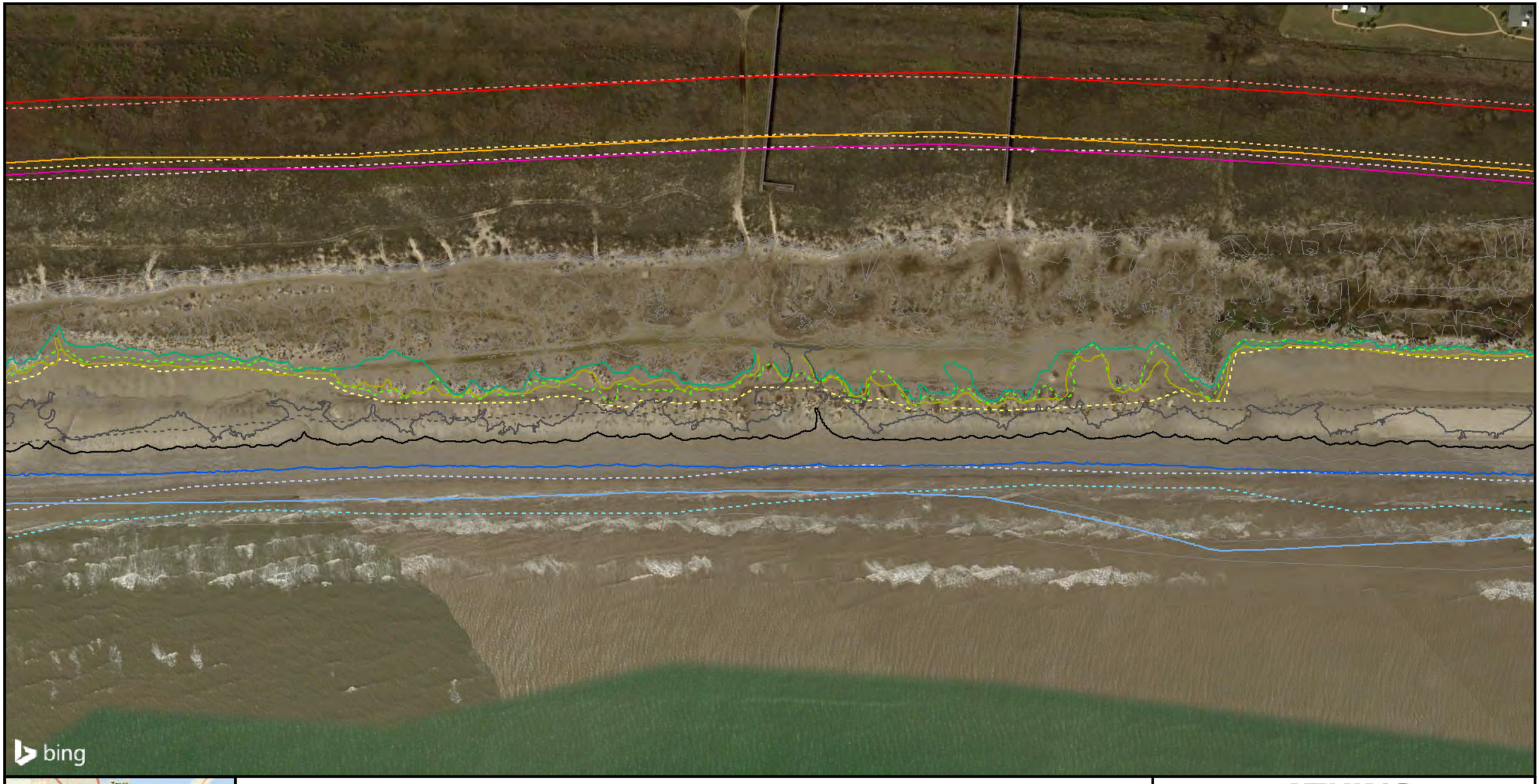
2017 Wading Depth Survey
City of Galveston

Galveston County, Texas
Page 2 of 57

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Prepared By: Atkins/WHIT6392	Date: Sep 06, 2017

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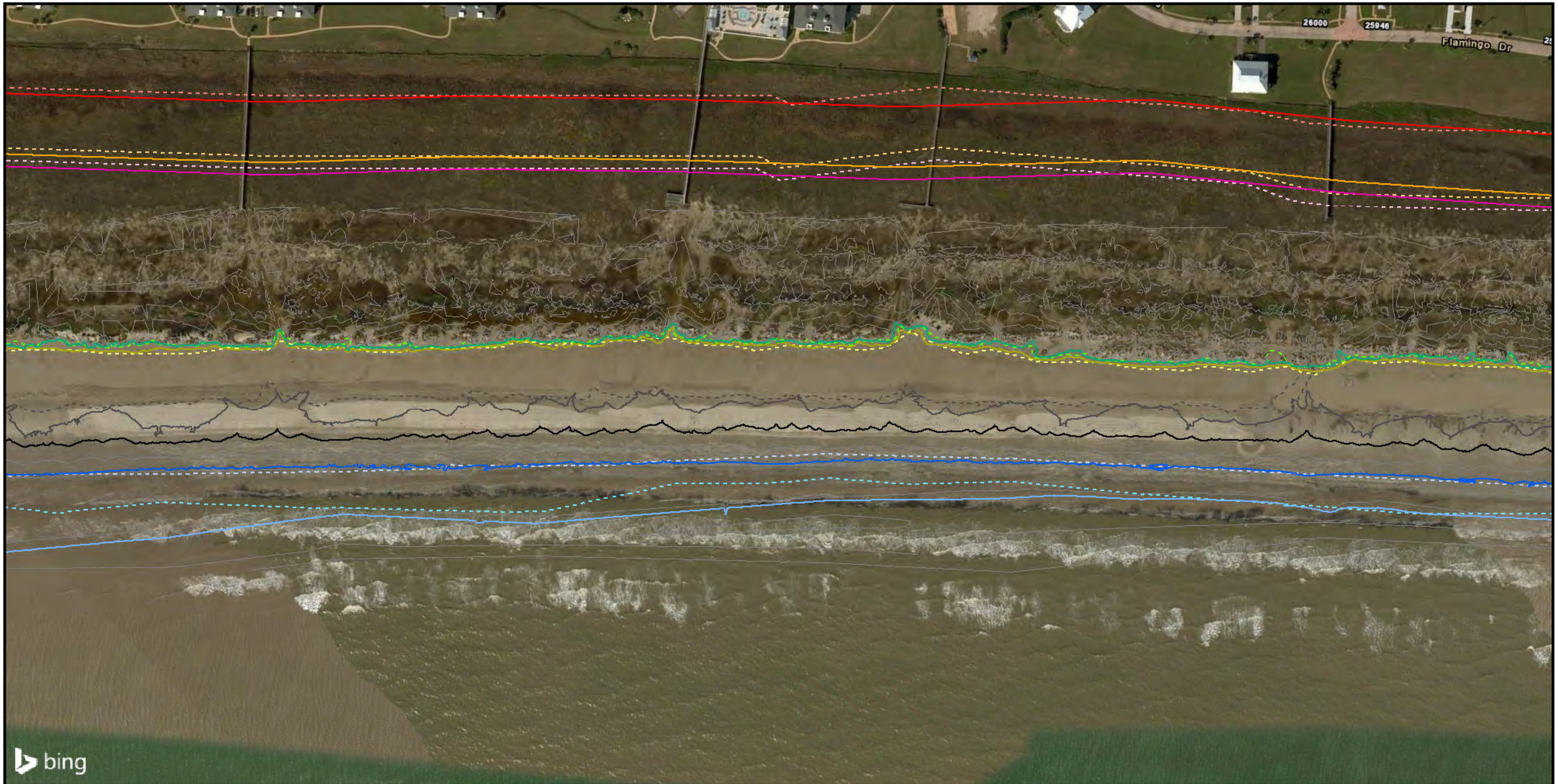
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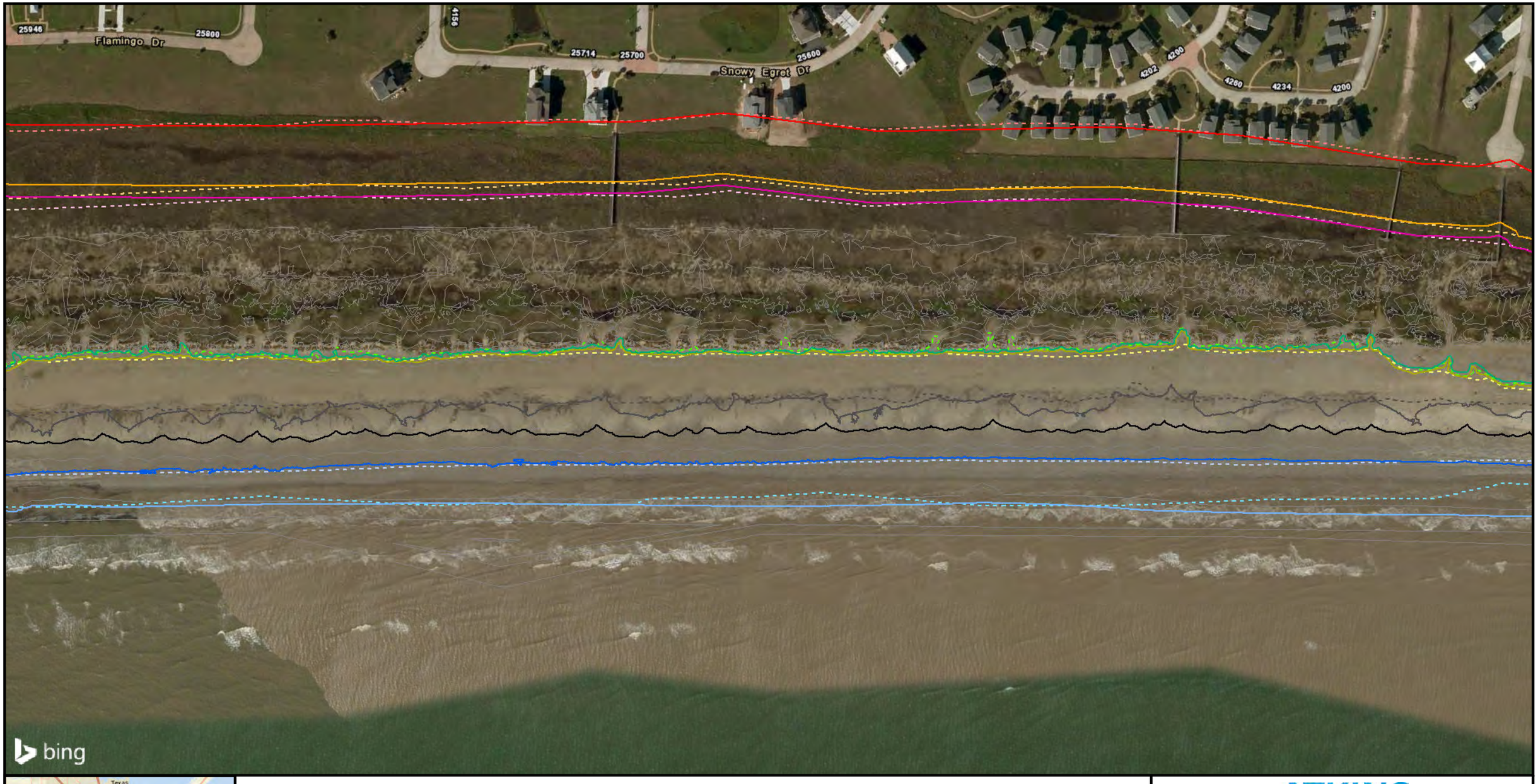
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Galveston County, Texas
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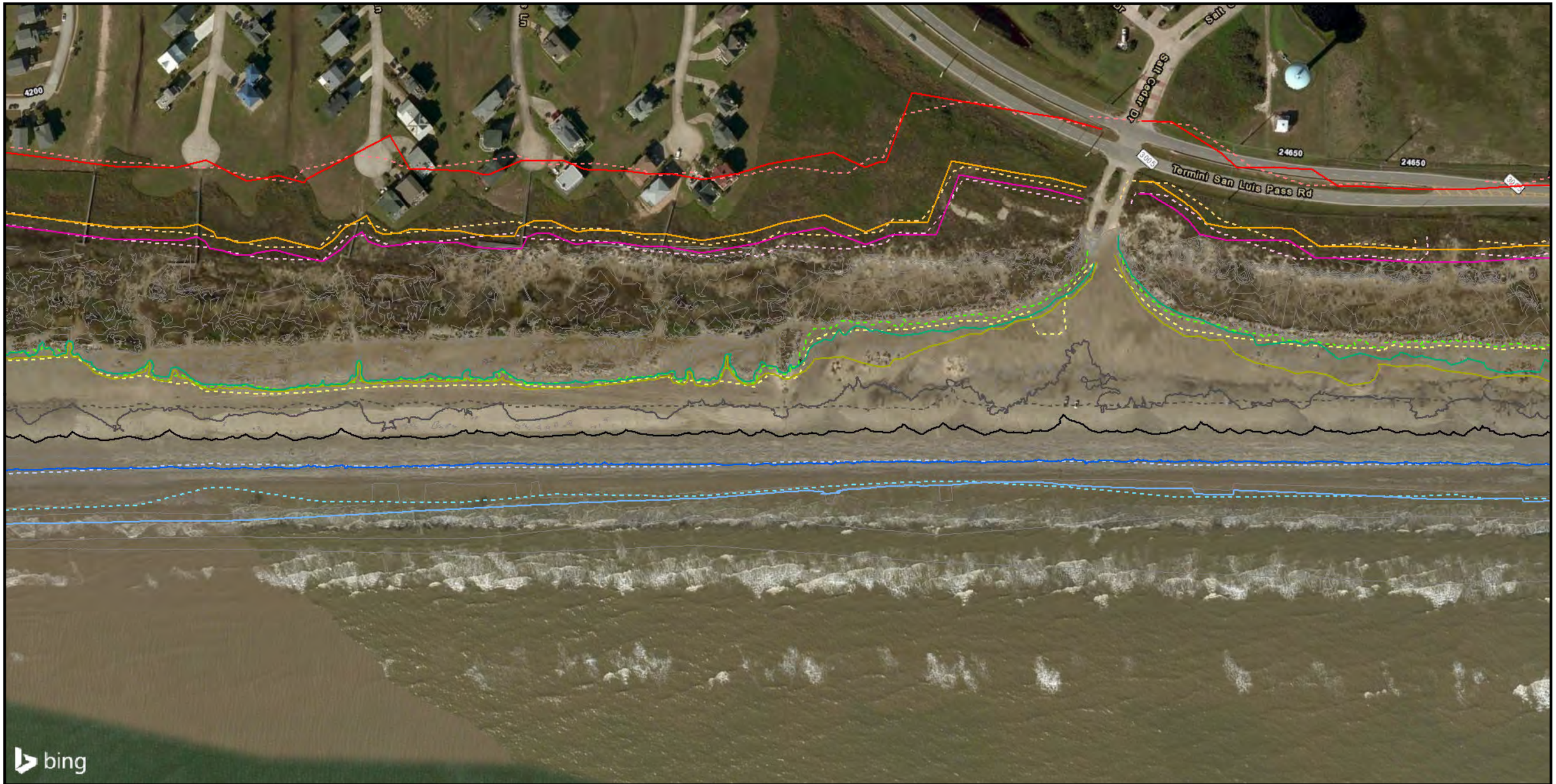
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City of Galveston

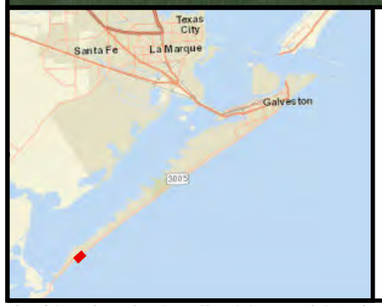
Galveston County, Texas
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City of Galveston

Galveston County, Texas
Page 8 of 57

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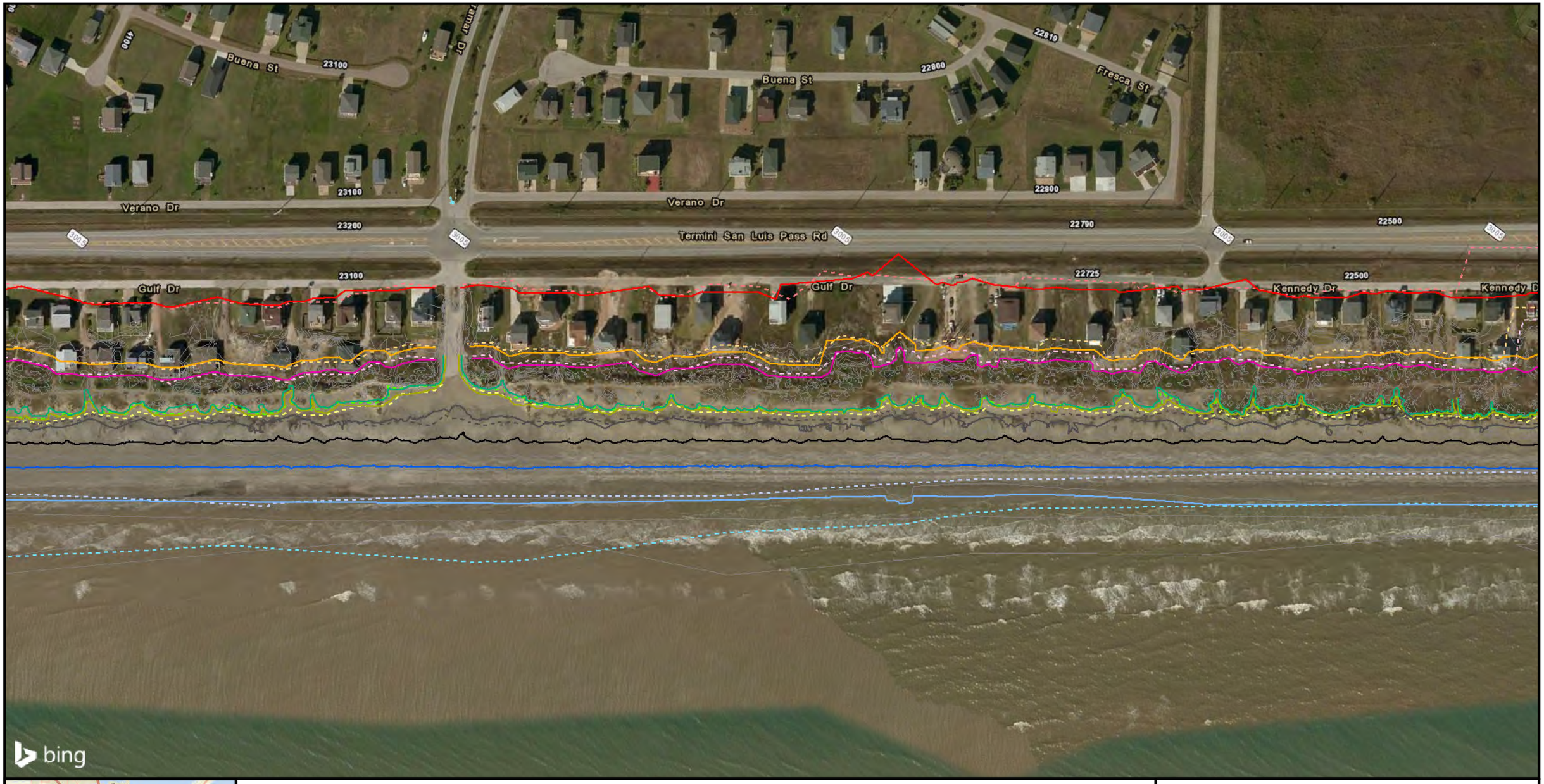
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City of Galveston

Galveston County, Texas

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City of Galveston

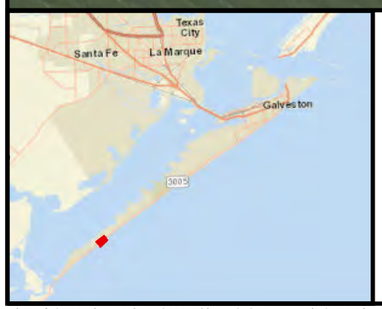
Galveston County, Texas
Page 10 of 57

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2016 MEAN LOW WATER
2016 25' OFFSET NORTH TOE OF DUNE
2016 ENHANCED CONSTRUCTION ZONE
CONTOURS

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0 100 200 Feet

Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

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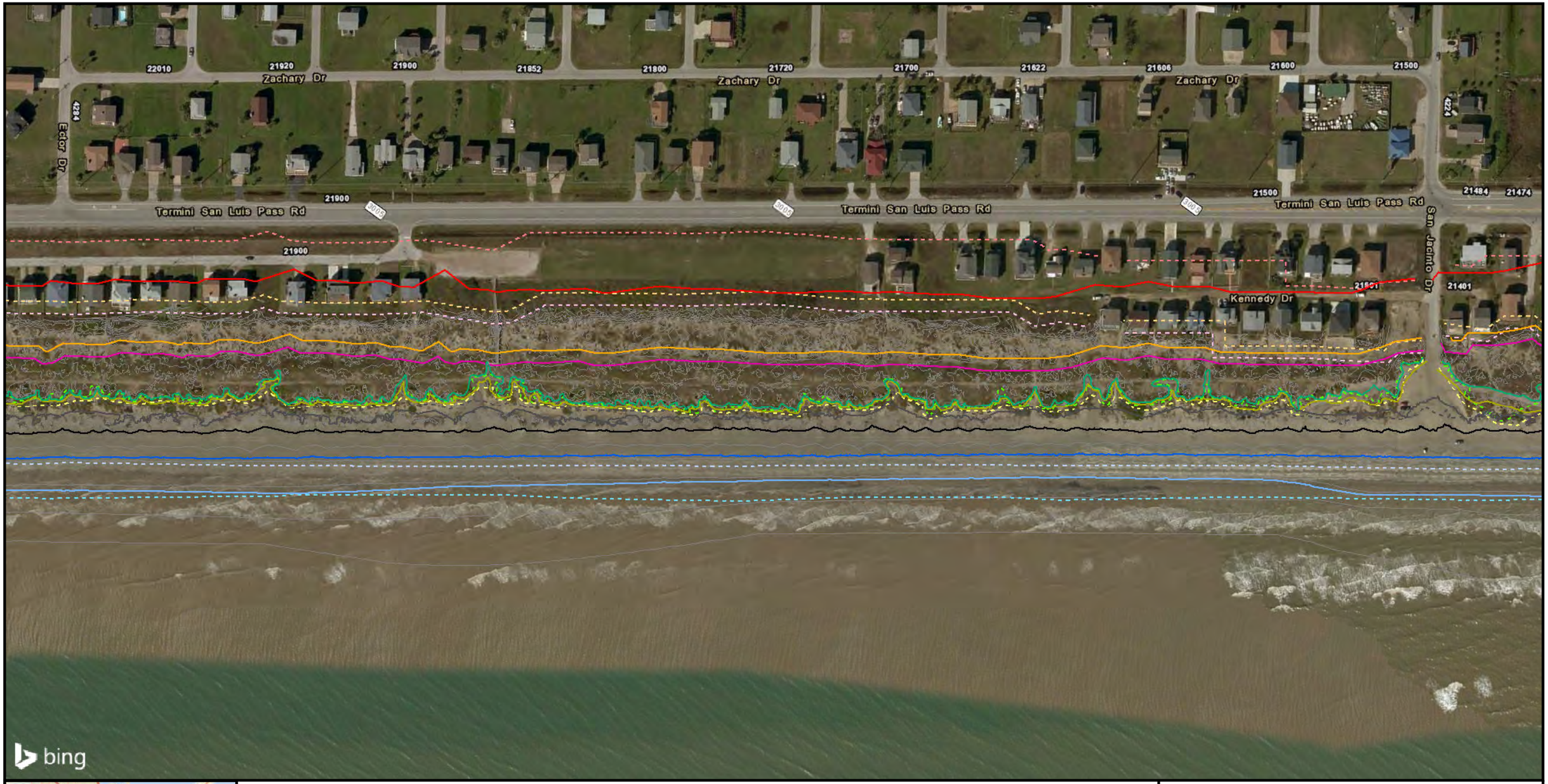
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Prepared By: Atkins/WHIT6392	Date: Sep 06, 2017

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- 2017 3' CONTOUR
- 2017 4' CONTOUR
- 2017 LINE OF VEGETATION
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Galveston County, Texas
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City of Galveston

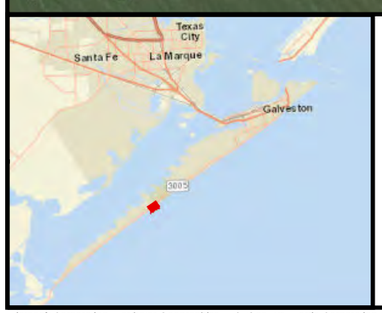
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- 2017 3' CONTOUR
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- 2017 MEAN LOW WATER
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Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

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Job No.: 100053964	Scale: 1 " = 200 '
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City of Galveston

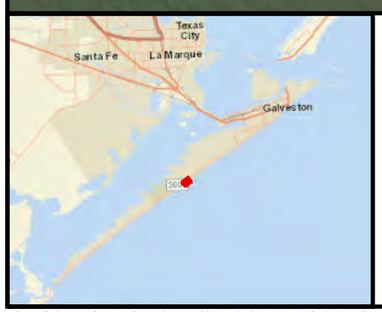
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City of Galveston

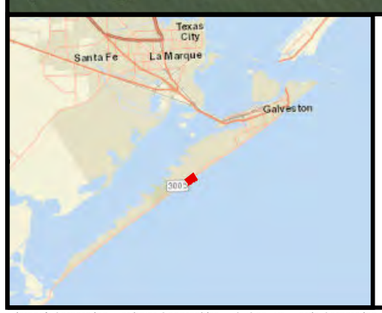
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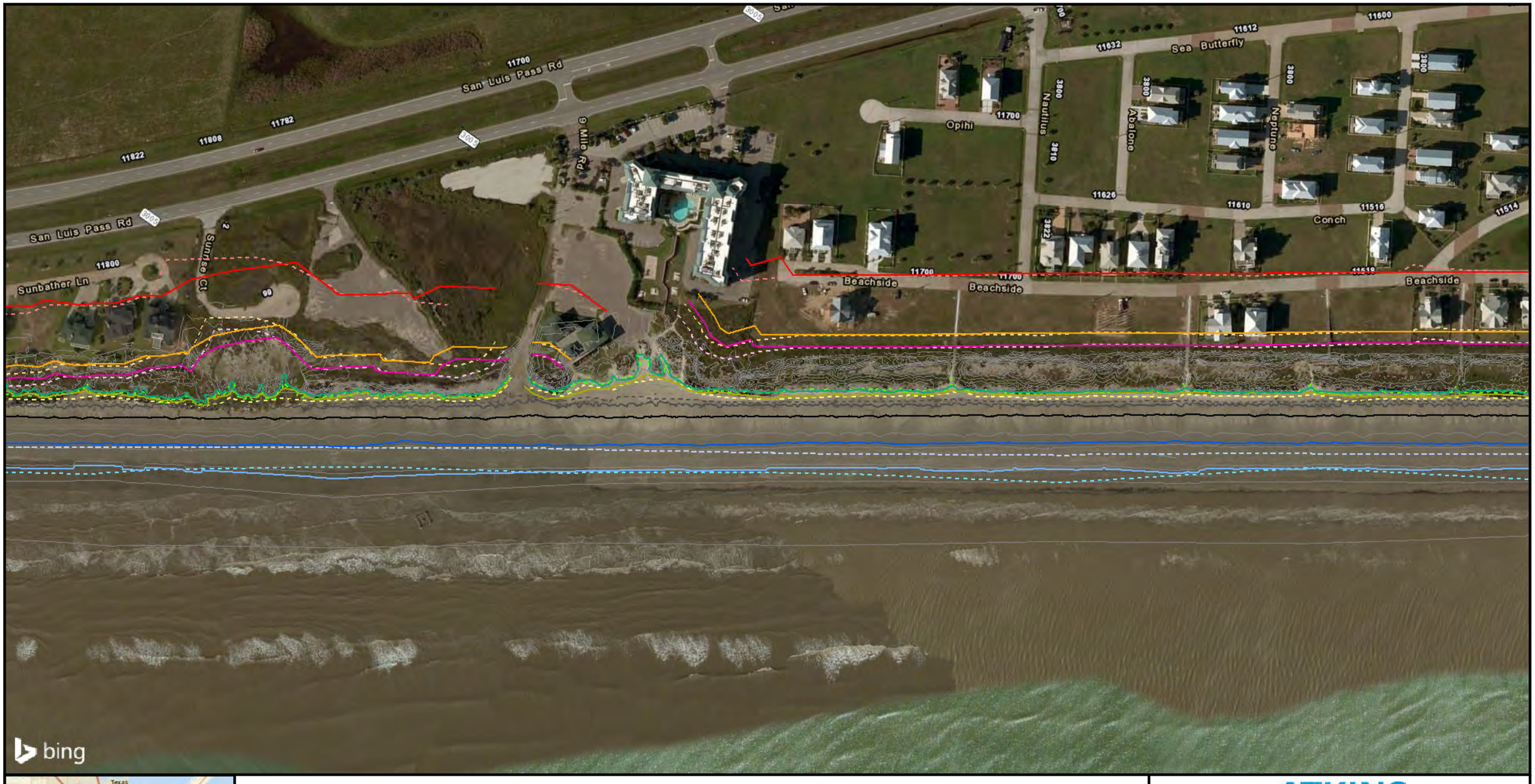
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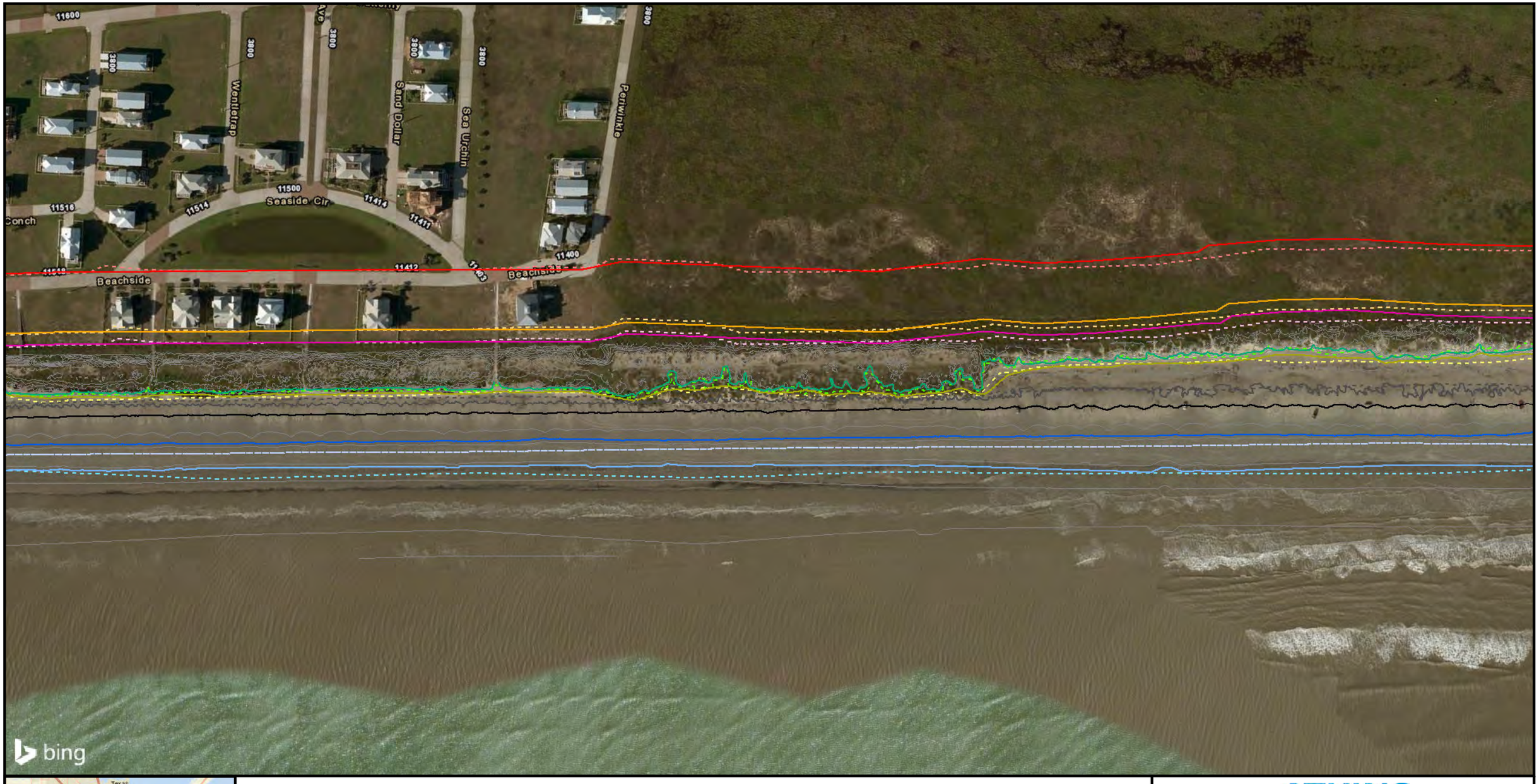
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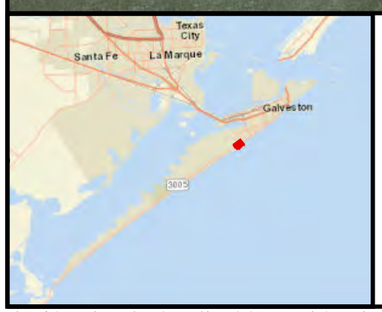
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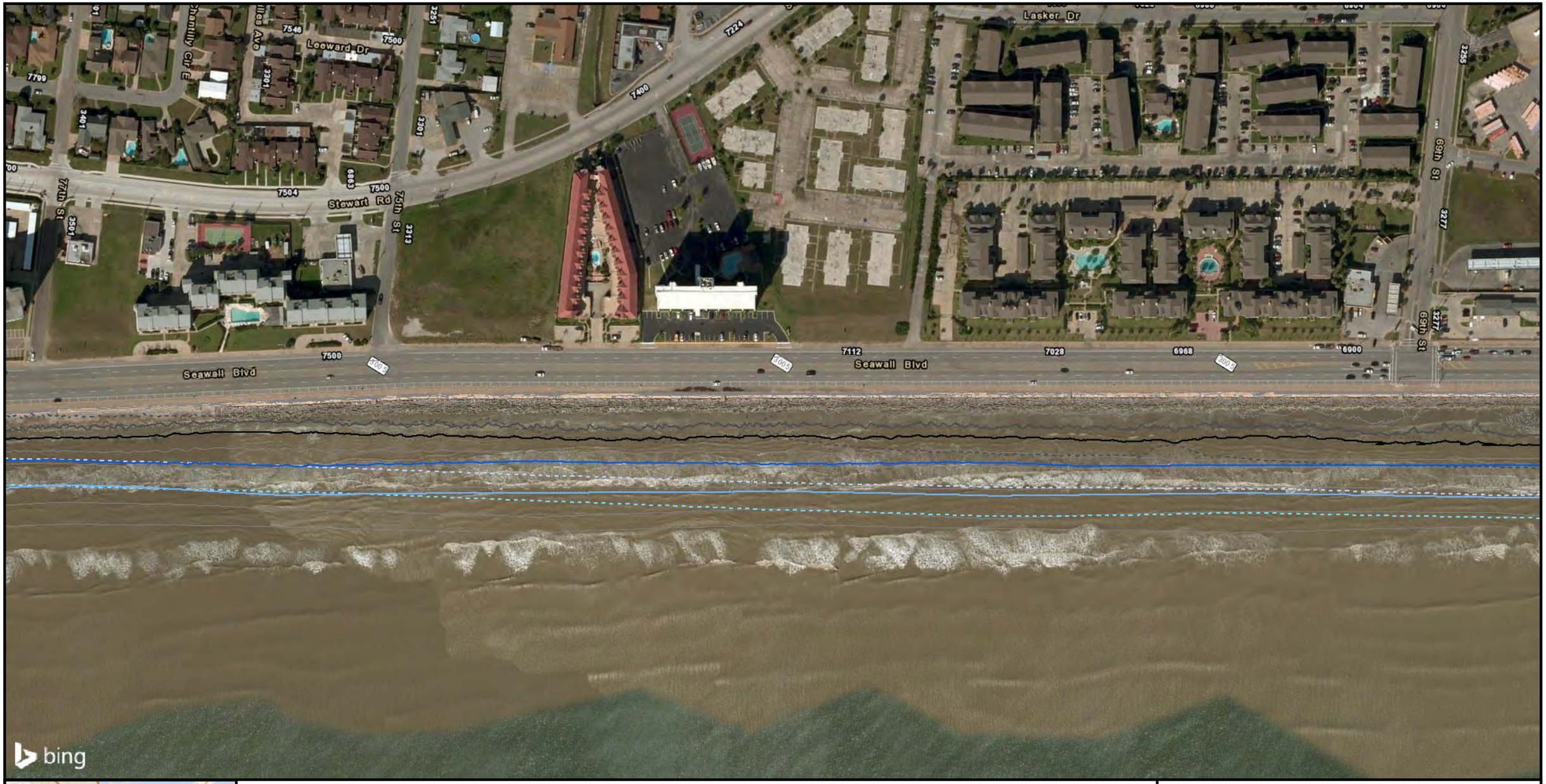
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Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

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Job No.: 100053964	Scale: 1 " = 200 '
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2017 3' CONTOUR
2017 4' CONTOUR
2017 LINE OF VEGETATION
2017 SOUTH TOE OF DUNE
2017 NORTH TOE OF DUNE
2017 MEAN HIGH WATER
2017 MEAN LOW WATER
2017 25' OFFSET NORTH TOE OF DUNE
2017 ENHANCED CONSTRUCTION ZONE
2016 4' CONTOUR
2016 APPROXIMATE LINE OF VEGETATION
2016 SOUTH TOE OF DUNE
2016 NORTH TOE OF DUNE
2016 MEAN HIGH WATER
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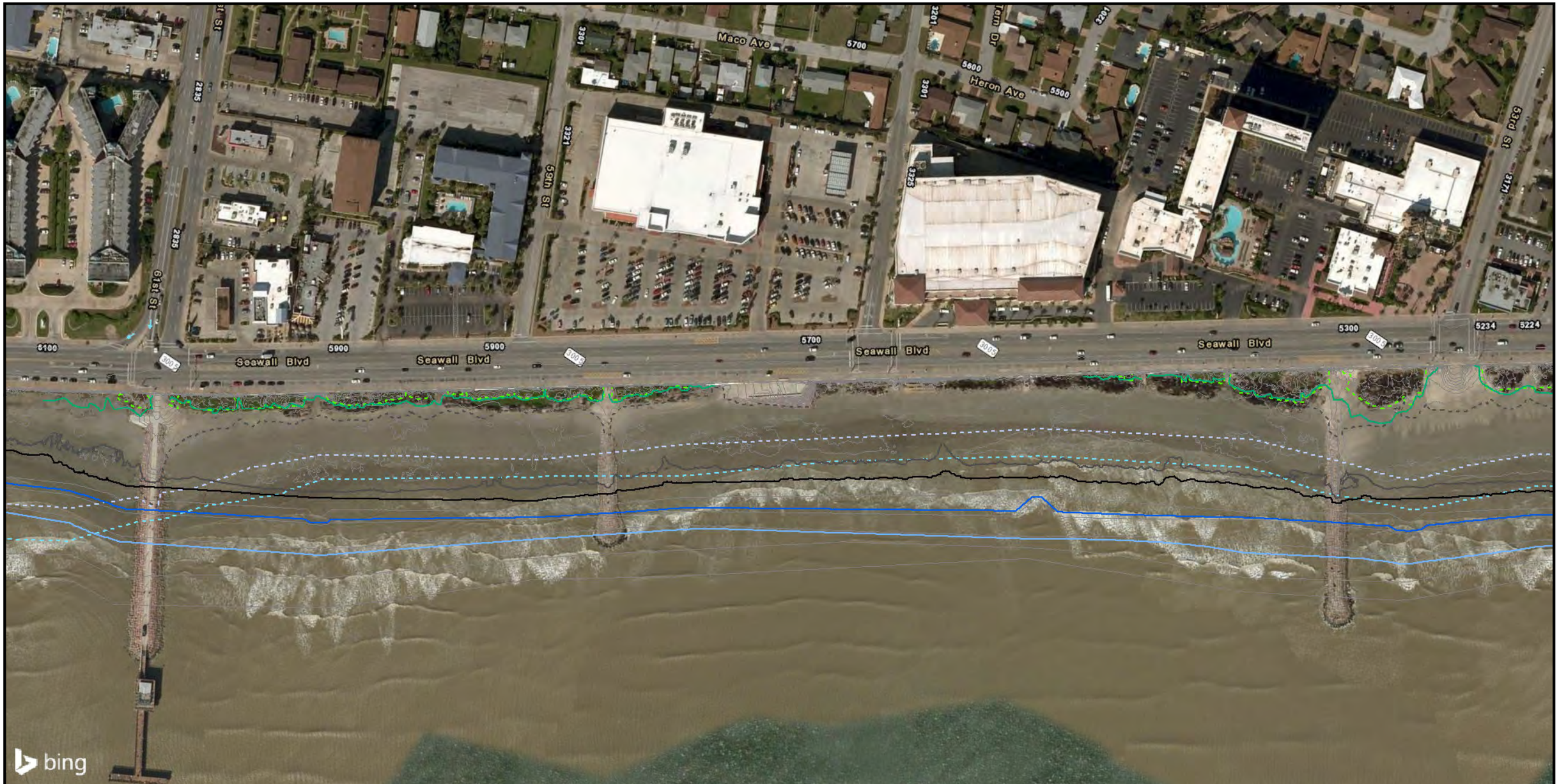
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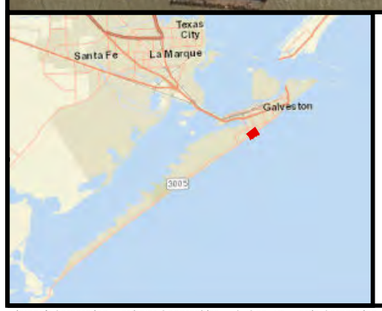
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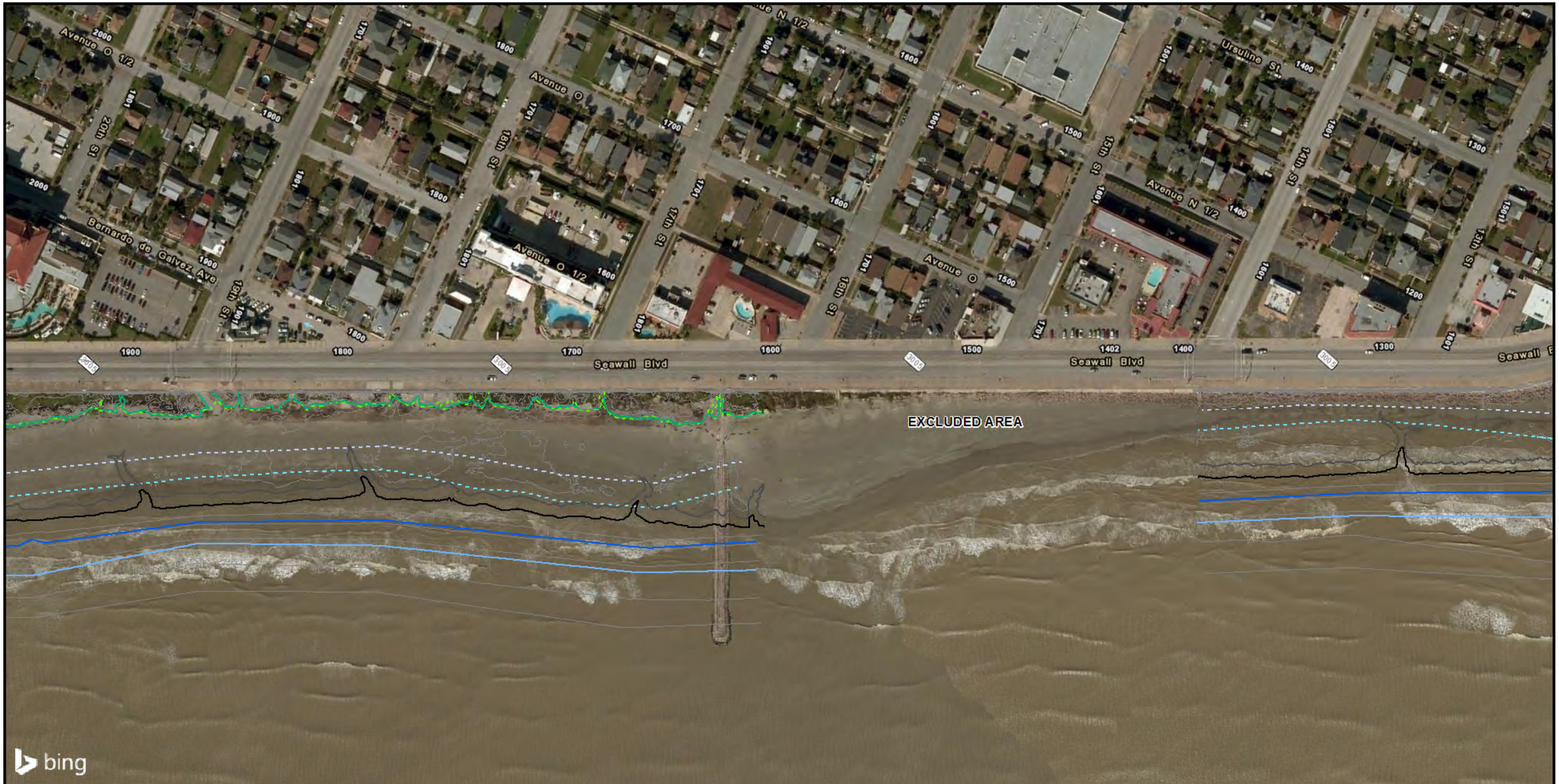
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City of Galveston

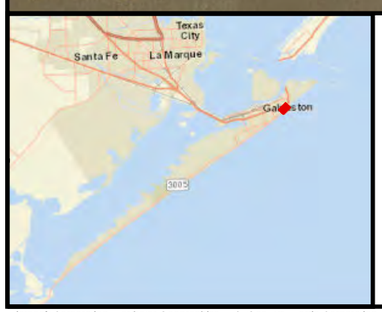
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Job No.: 100053964	Scale: 1 " = 200 '
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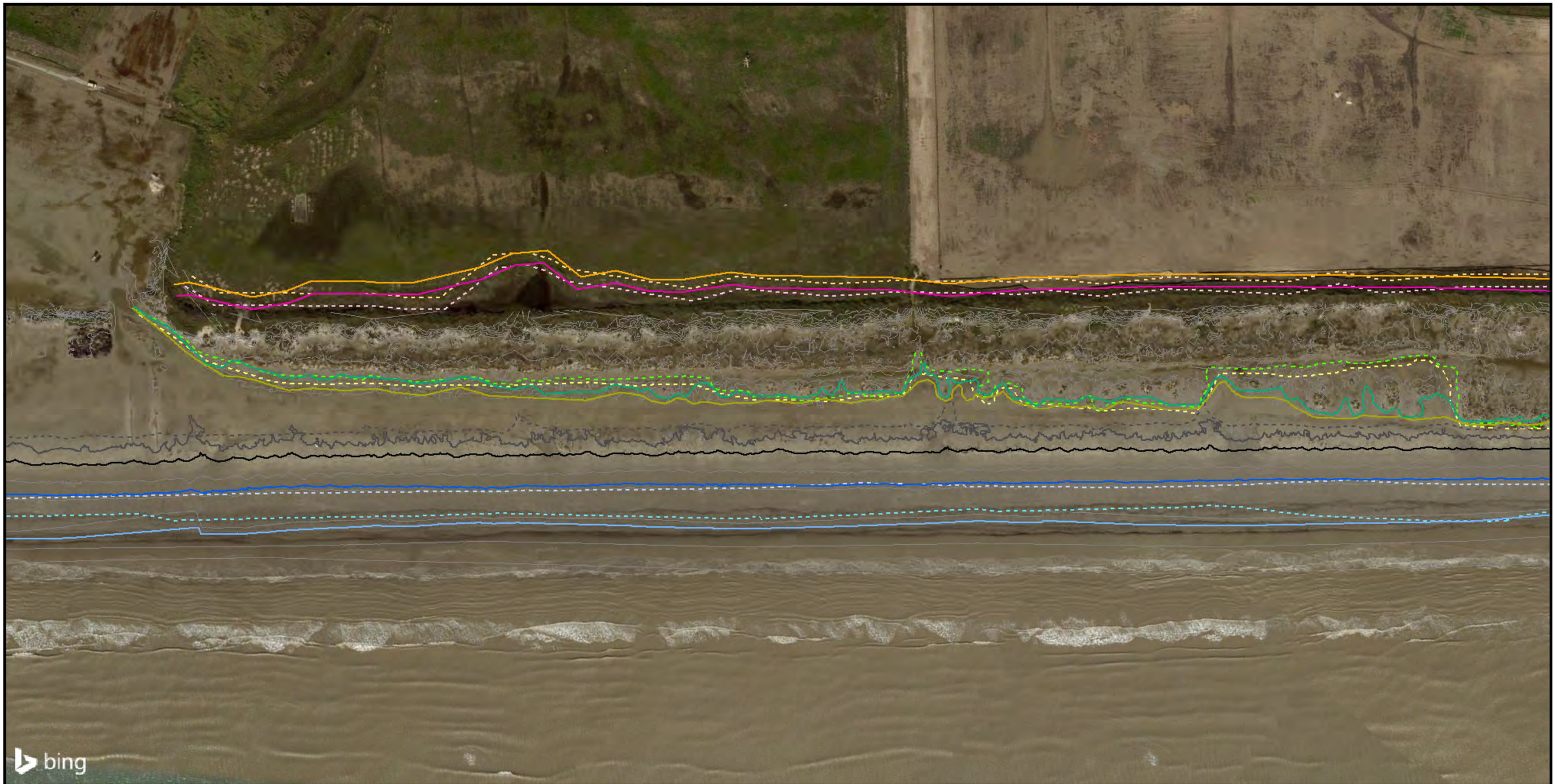
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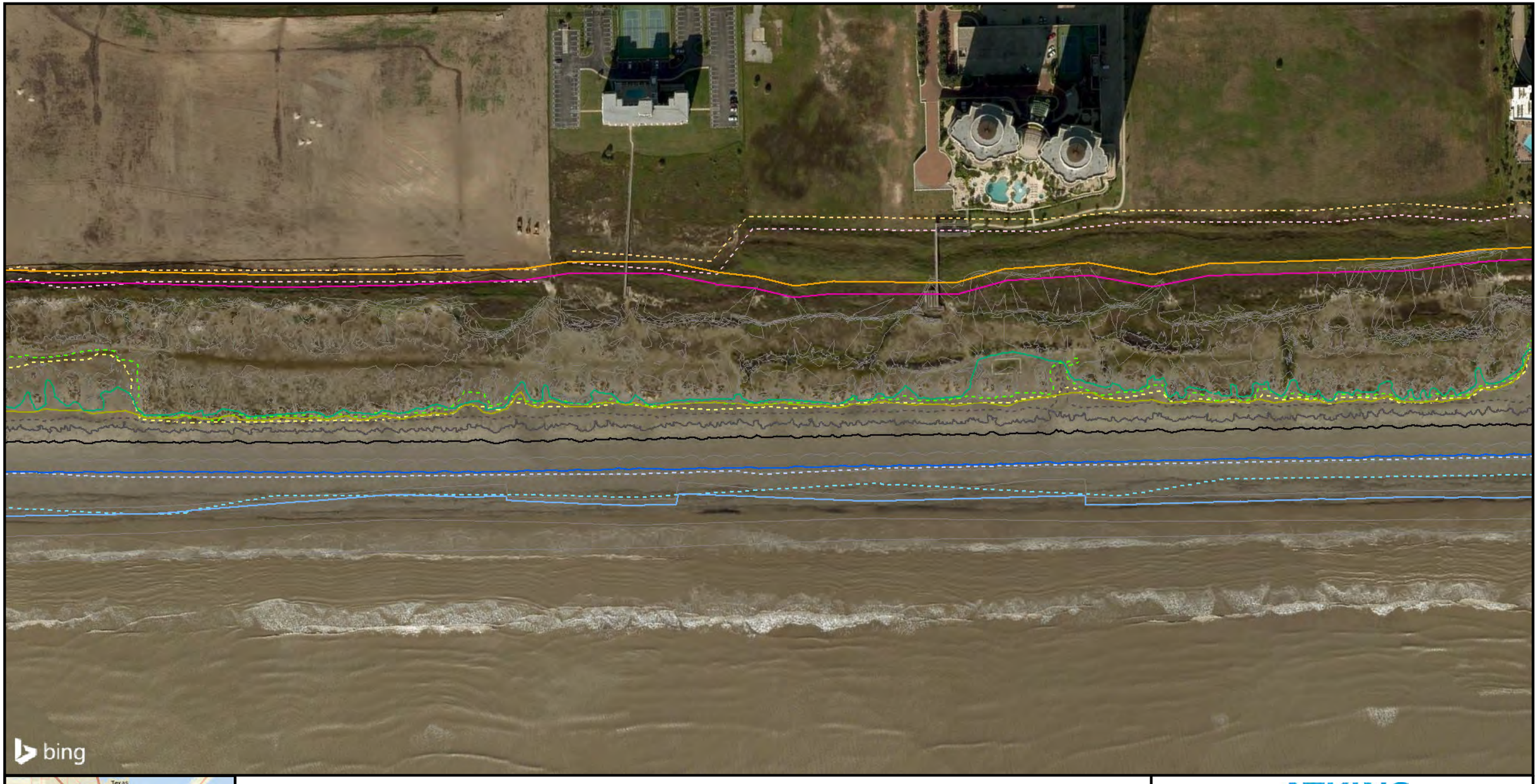
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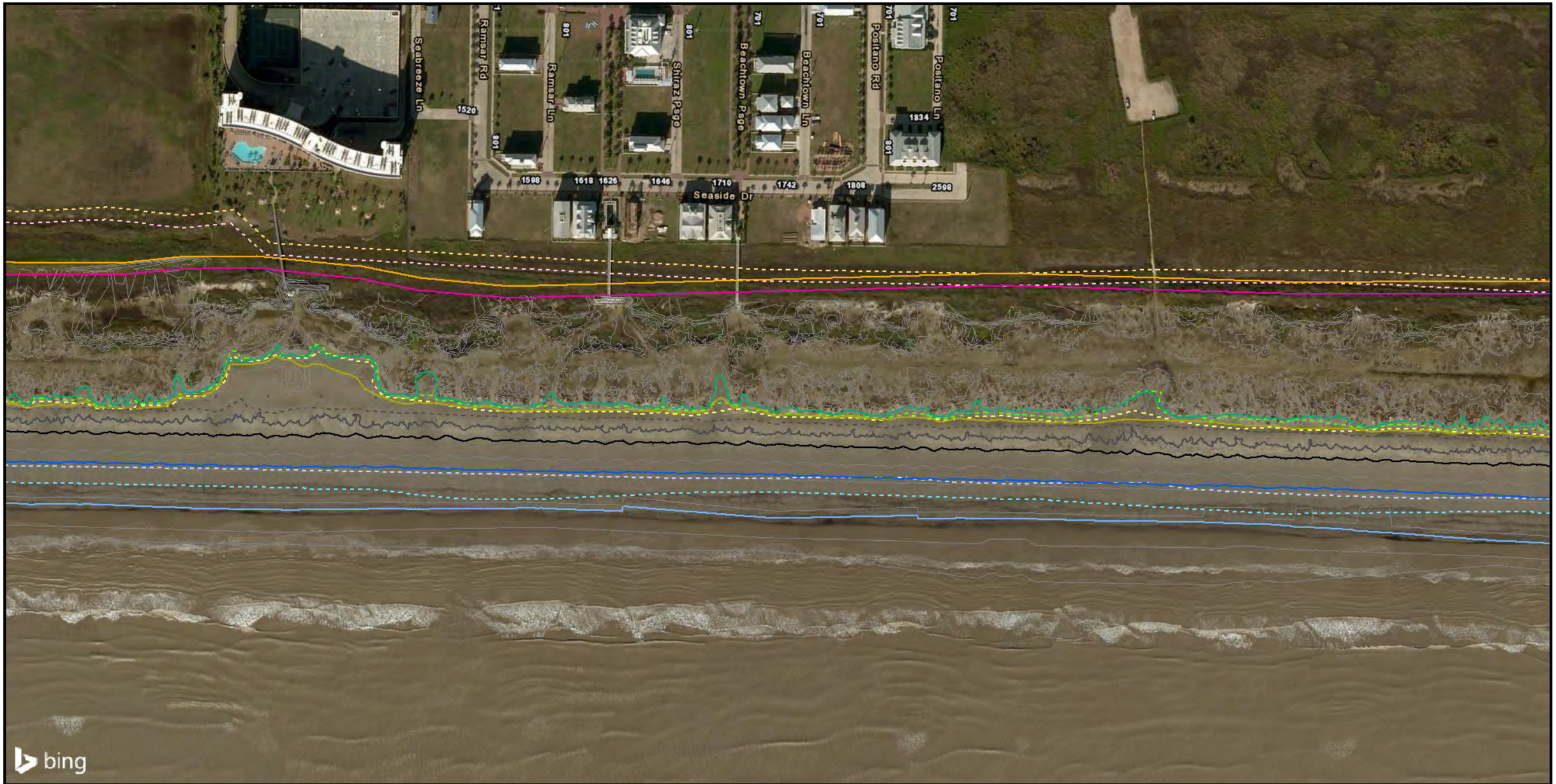
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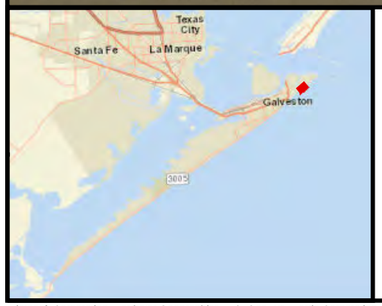
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2016 MEAN LOW WATER
2016 25' OFFSET NORTH TOE OF DUNE
2016 ENHANCED CONSTRUCTION ZONE
CONTOURS

The north toe of dune, as shown hereon, is approximate and based on a combination of survey contour lines and depiction from aerial imagery. Atkins does not certify to the location of said line.
Aerial imagery shown for informational purposes only.

Data shown hereon is for informational purposes only and does not constitute a boundary survey

0 100 200 Feet

Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

ATKINS

2017 Wading Depth Survey
City of Galveston

Galveston County, Texas
Page 55 of 57

Job No.: 100053964	Scale: 1 " = 200 '
Prepared By: Atkins/WHIT6392	Date: Sep 06, 2017

N:\Clients\G_H\Galveston\100053964\geo\figs\Wading_Depth_Survey_2017_11x17_v3.mxd

Microsoft Corporation, Earthstar Geographics LLC, GeoEye, Harris Corporation, NASA, and DigitalGlobe. Bing Maps Aerial.
2013. 1:2,400; generated by Atkins; using ArcMap. < http://www.bing.com/maps> (06 September 2017)





- 2017 3' CONTOUR
- 2017 4' CONTOUR
- 2017 LINE OF VEGETATION
- 2017 SOUTH TOE OF DUNE
- 2017 NORTH TOE OF DUNE
- 2017 MEAN HIGH WATER
- 2017 MEAN LOW WATER
- 2017 25' OFFSET NORTH TOE OF DUNE
- 2017 ENHANCED CONSTRUCTION ZONE
- 2016 4' CONTOUR
- 2016 APPROXIMATE LINE OF VEGETATION
- 2016 SOUTH TOE OF DUNE
- 2016 NORTH TOE OF DUNE
- 2016 MEAN HIGH WATER
- 2016 MEAN LOW WATER
- 2016 25' OFFSET NORTH TOE OF DUNE
- 2016 ENHANCED CONSTRUCTION ZONE
- CONTOURS

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Aerial imagery shown for informational purposes only.

Data shown hereon is for informational purposes only and does not constitute a boundary survey

0 100 200 Feet

Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

ATKINS

2017 Wading Depth Survey
City of Galveston

Galveston County, Texas
Page 56 of 57

Job No.: 100053964	Scale: 1 " = 200 '
Prepared By: Atkins/WHIT6392	Date: Sep 06, 2017

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Microsoft Corporation, Earthstar Geographics LLC, GeoEye, Harris Corporation, NASA, and DigitalGlobe. Bing Maps Aerial.
2013. 1:2,400; generated by Atkins; using ArcMap. < http://www.bing.com/maps> (06 September 2017)





2017 3' CONTOUR
2017 4' CONTOUR
2017 LINE OF VEGETATION
2017 SOUTH TOE OF DUNE
2017 NORTH TOE OF DUNE
2017 MEAN HIGH WATER
2017 MEAN LOW WATER
2017 25' OFFSET NORTH TOE OF DUNE
2017 ENHANCED CONSTRUCTION ZONE
2016 4' CONTOUR
2016 APPROXIMATE LINE OF VEGETATION
2016 SOUTH TOE OF DUNE
2016 NORTH TOE OF DUNE
2016 MEAN HIGH WATER
2016 MEAN LOW WATER
2016 25' OFFSET NORTH TOE OF DUNE
2016 ENHANCED CONSTRUCTION ZONE
CONTOURS

The north toe of dune, as shown hereon, is approximate and based on a combination of survey contour lines and depiction from aerial imagery. Atkins does not certify to the location of said line.
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0 100 200 Feet

Datum: NAD 1983
Vertical Datum: NAVD88
Projection: State Plane
Texas South Central
Units: Feet
Aerials: BING Aerial (accessed 8/22/2017)

ATKINS

2017 Wading Depth Survey
City of Galveston

Galveston County, Texas
Page 57 of 57

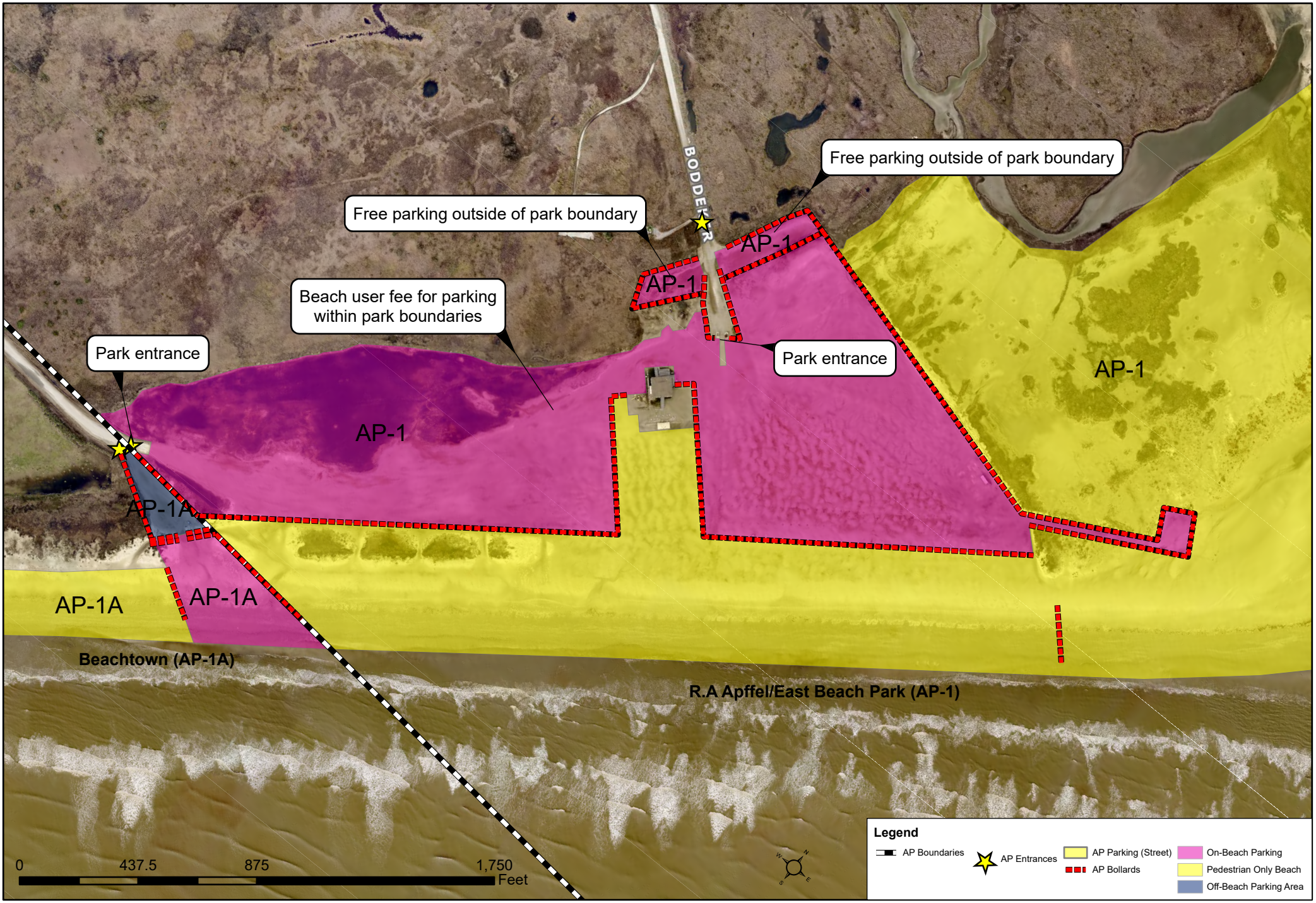
Job No.: 100053964	Scale: 1 " = 200 '
Prepared By: Atkins/WHIT6392	Date: Sep 06, 2017

N:\Clients\G_H\Galveston\100053964\geo\figs\Wading_Depth_Survey_2017_11x17_v3.mxd

Microsoft Corporation, Earthstar Geographics LLC, GeoEye, Harris Corporation, NASA, and DigitalGlobe. Bing Maps Aerial.
2013. 1:2,400; generated by Atkins; using ArcMap. < http://www.bing.com/maps> (06 September 2017)

Exhibit C

Beach Access

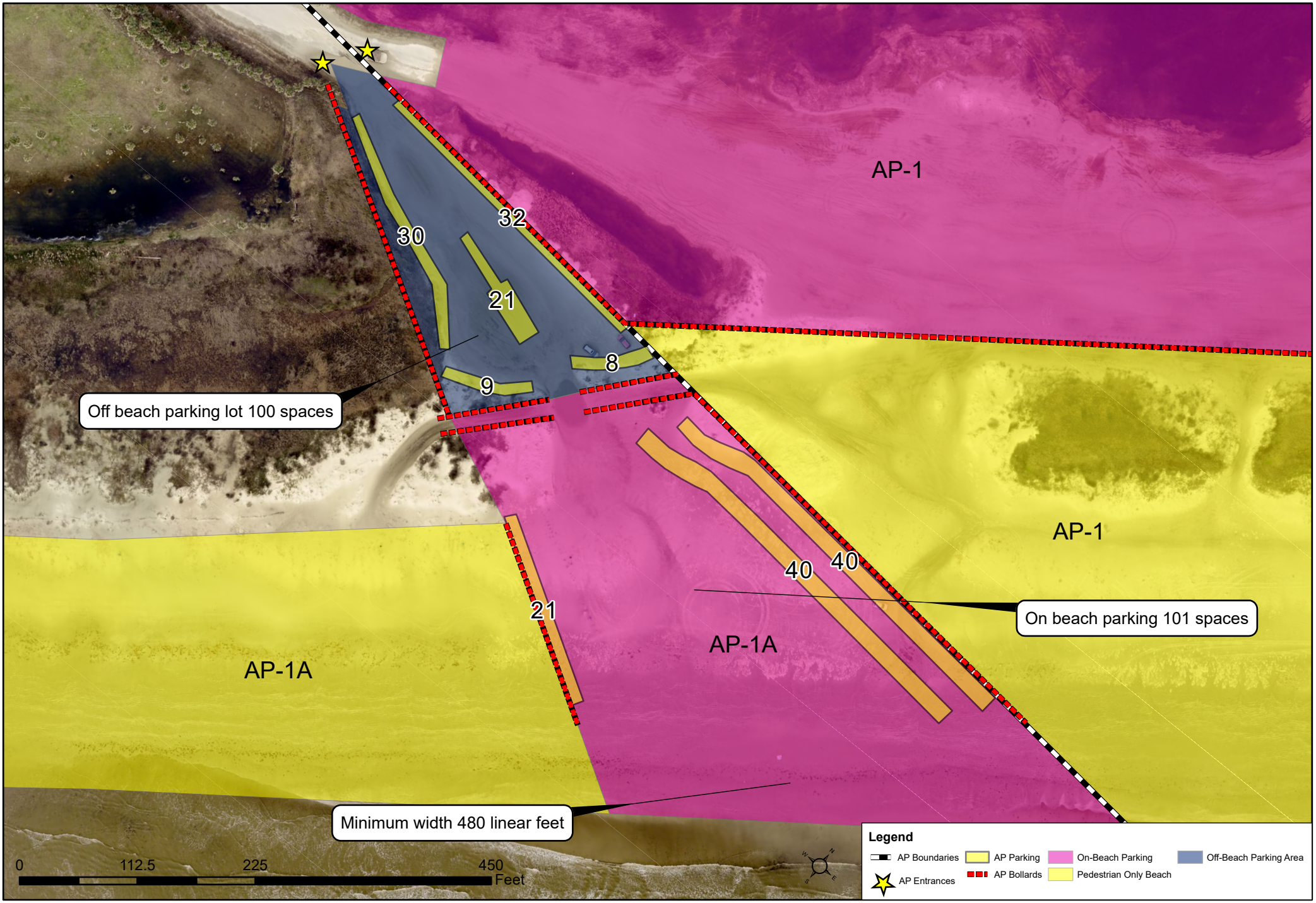


City of Galveston, Beach Access Point #01 R.A. Apffel/East Beach Park

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/6/2024
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.
Aerial imagery shown for informational purposes only.
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City of Galveston, Beach Access Point #01 (A) Beachtown Development

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/27/2024

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City of Galveston, Beach Access Point #01(A) Beachtown Development

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/6/2024

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City of Galveston, Beach Access Point #01(A) Beachtown Development

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/7/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #01(A) Beachtown Development

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/7/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #01(B) Palisade Palms

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/7/2024

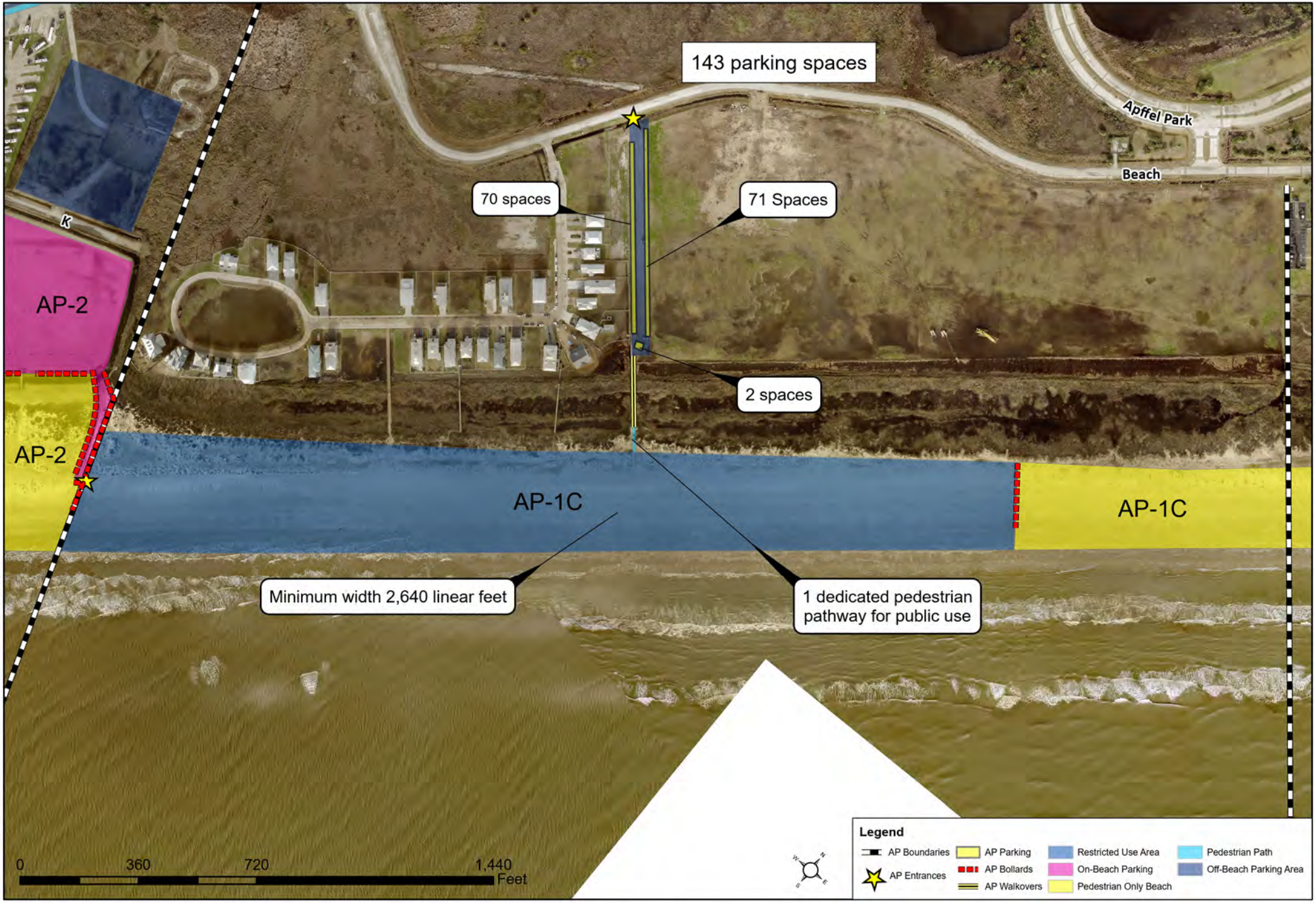
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #01(C) area west of Islander East to eastern boundary of Stewart Beach Park Map prepared by the City of Galveston Development Services Department (HCummings) - 9/25/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #02, Stewart Beach, Close up of free parking

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/7/2024

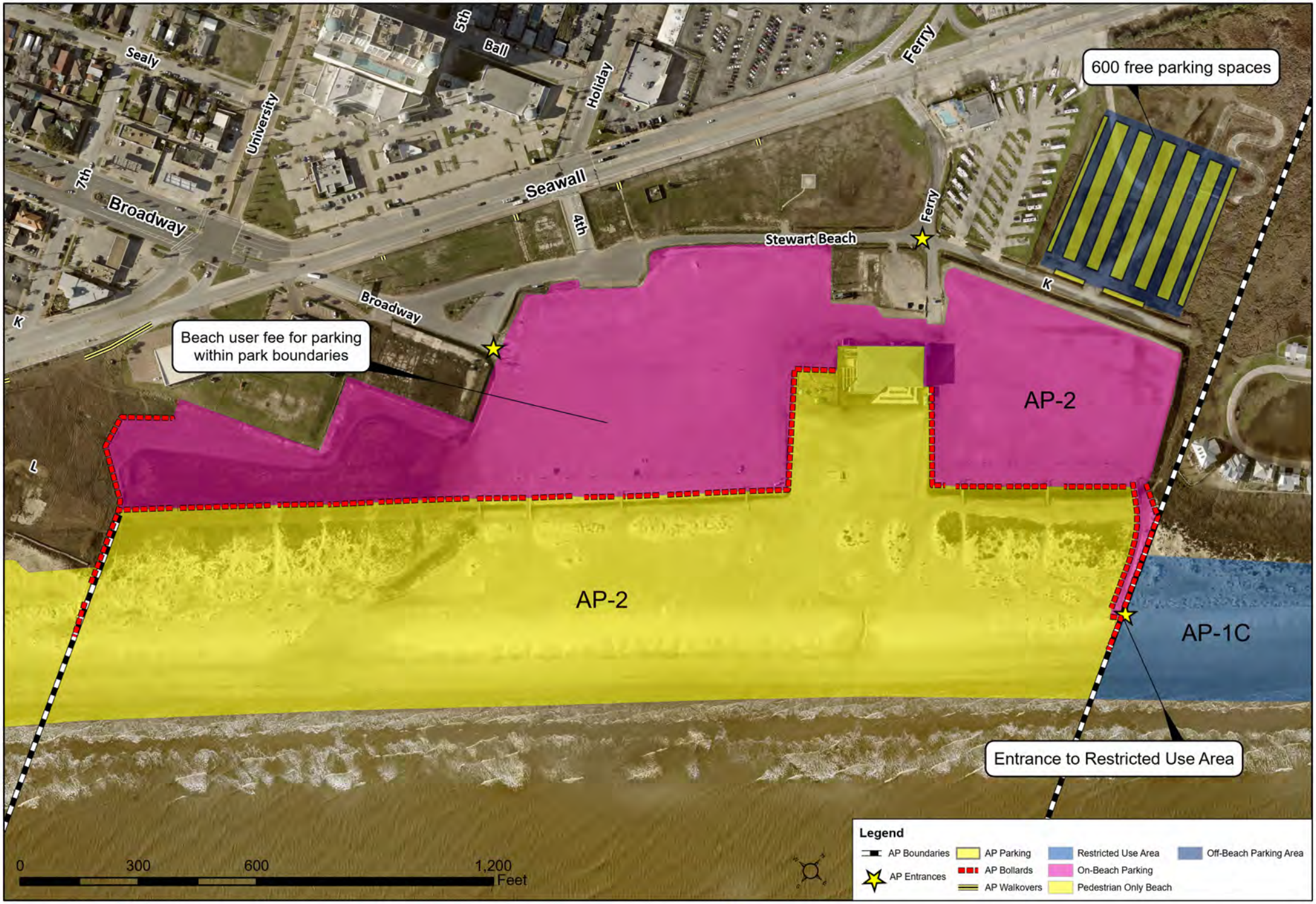
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #02, Stewart Beach

Map prepared by the City of Galveston Development Services Department (HCummings) - 9/25/2024

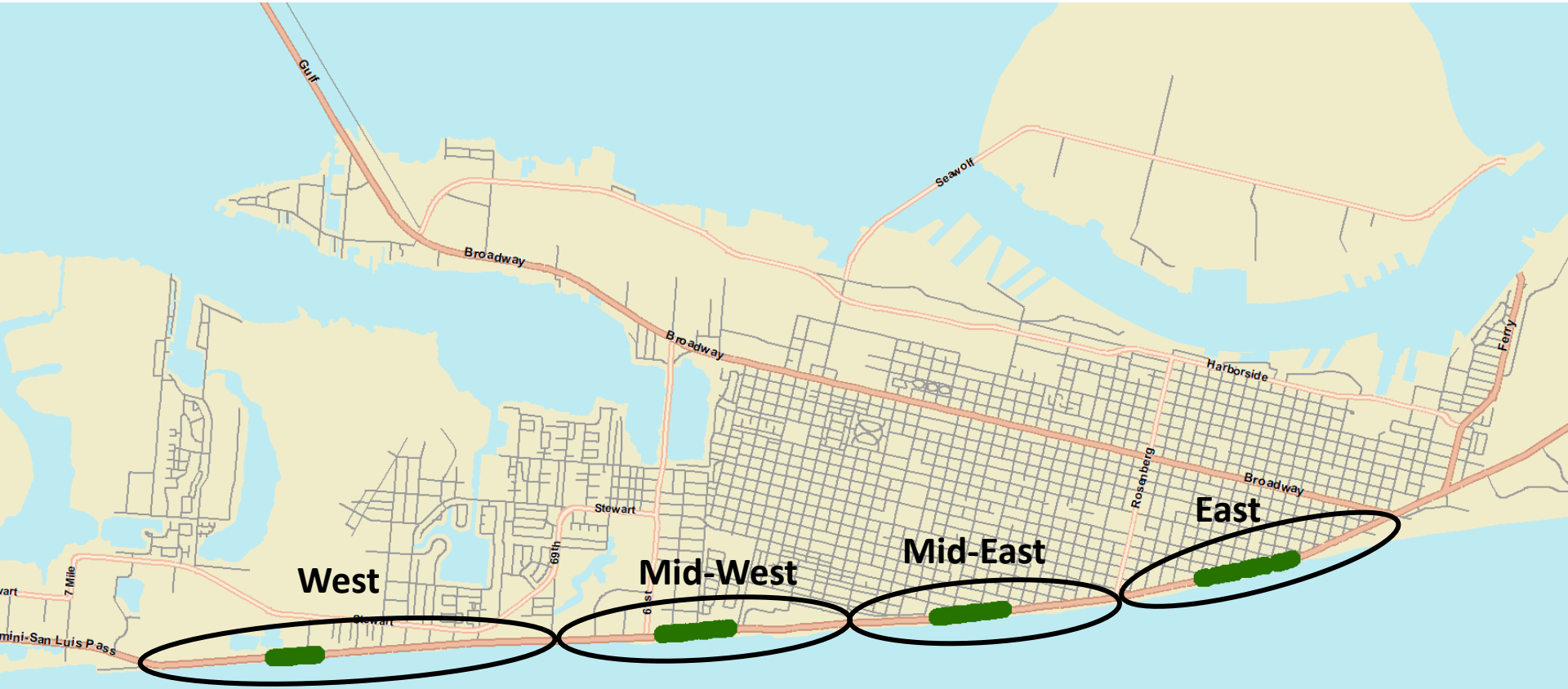
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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Seawall Beach Urban Park – Proposed Free/Paid Parking Distribution		
Area	**Total Parking Spaces**	**Free Parking Spaces (on Seawall Blvd)**
East (7th St to 25th St)	359	49
Mid-East (25th St to 45th St)	456	59
Mid-West (45th St to 69th St)	462	51
West (69th St to 103rd St)	716	59
Total	**1993**	**218**

2019-11-20 DRAFT



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 01

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 02

0 125 250 500 Feet

Free Parking
Free (ADA) Parking
Paid Parking
No Parking (Amenities)
No Parking (Emergency Access)
No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 03

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 04

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 05

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 06

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 07

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 08

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 09

0 125 250 500 Feet

Free Parking
Free (ADA) Parking
Paid Parking
No Parking (Amenities)
No Parking (Emergency Access)
No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 10

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 11

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 12

0 125 250 500 Feet

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 13

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 14

0 125 250 500 Feet

Free Parking
Free (ADA) Parking
Paid Parking
No Parking (Amenities)
No Parking (Emergency Access)
No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 15

0 125 250 500 Feet

Free Parking	No Parking (Amenities)
Free (ADA) Parking	No Parking (Emergency Access)
Paid Parking	No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 16

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 17

0 125 250 500 Feet

Free Parking
Free (ADA) Parking
Paid Parking
No Parking (Amenities)
No Parking (Emergency Access)
No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 18

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 19

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 20

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 21

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 22

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 23

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #3 - Seawall Beach Urban Park

Map prepared by the City of Galveston Development Services Department (dhenry) - 11/19/2019

Data Sources: Aerial Imagery (2018) from Galveston CAD

Sheet 24

0 125 250 500 Feet

N W E S

- Free Parking
- Free (ADA) Parking
- Paid Parking
- No Parking (Amenities)
- No Parking (Emergency Access)
- No Parking Area



City of Galveston, Beach Access Point #04, End of Seawall

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/7/2024

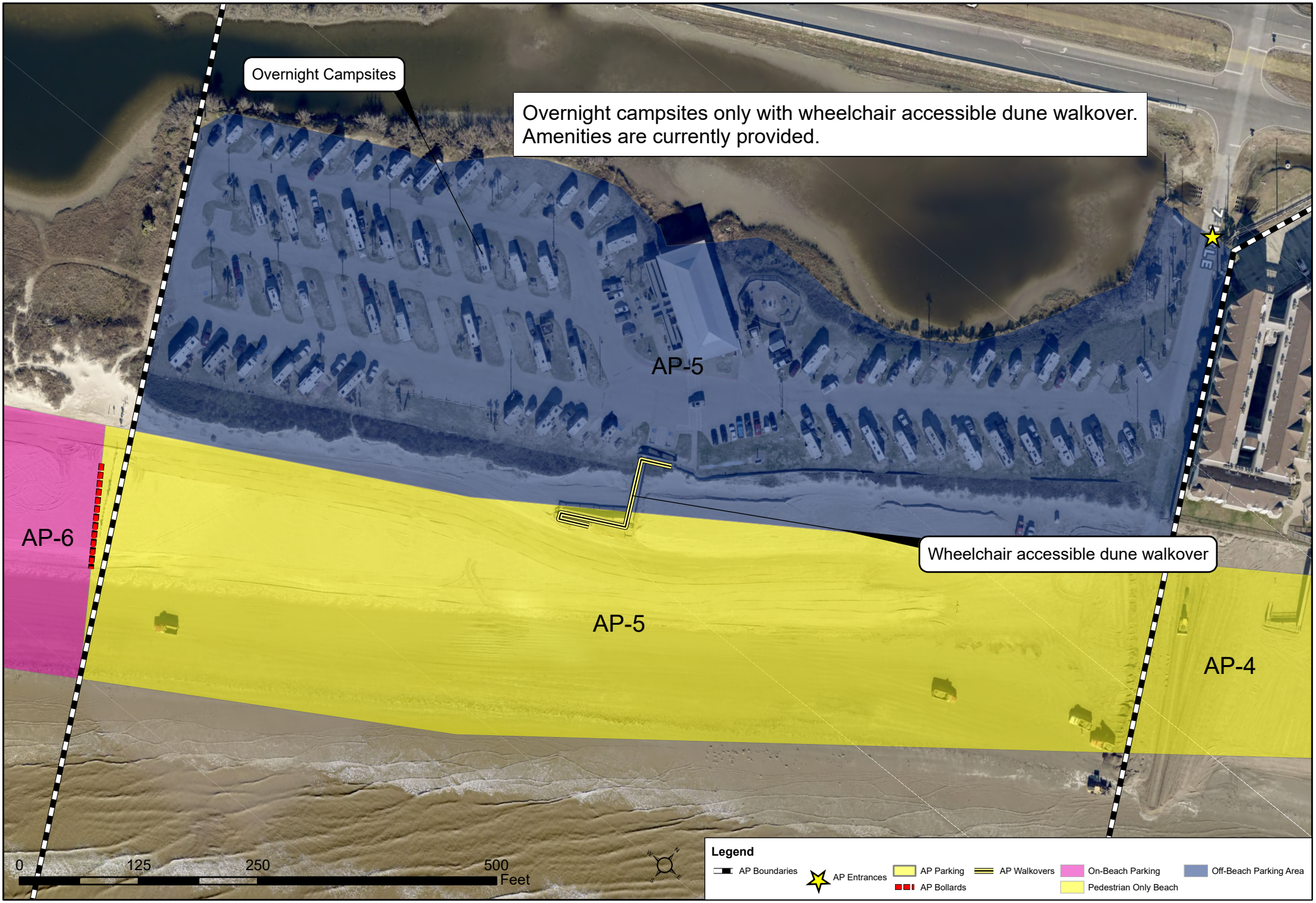
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #05, Dellanera RV Park

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/8/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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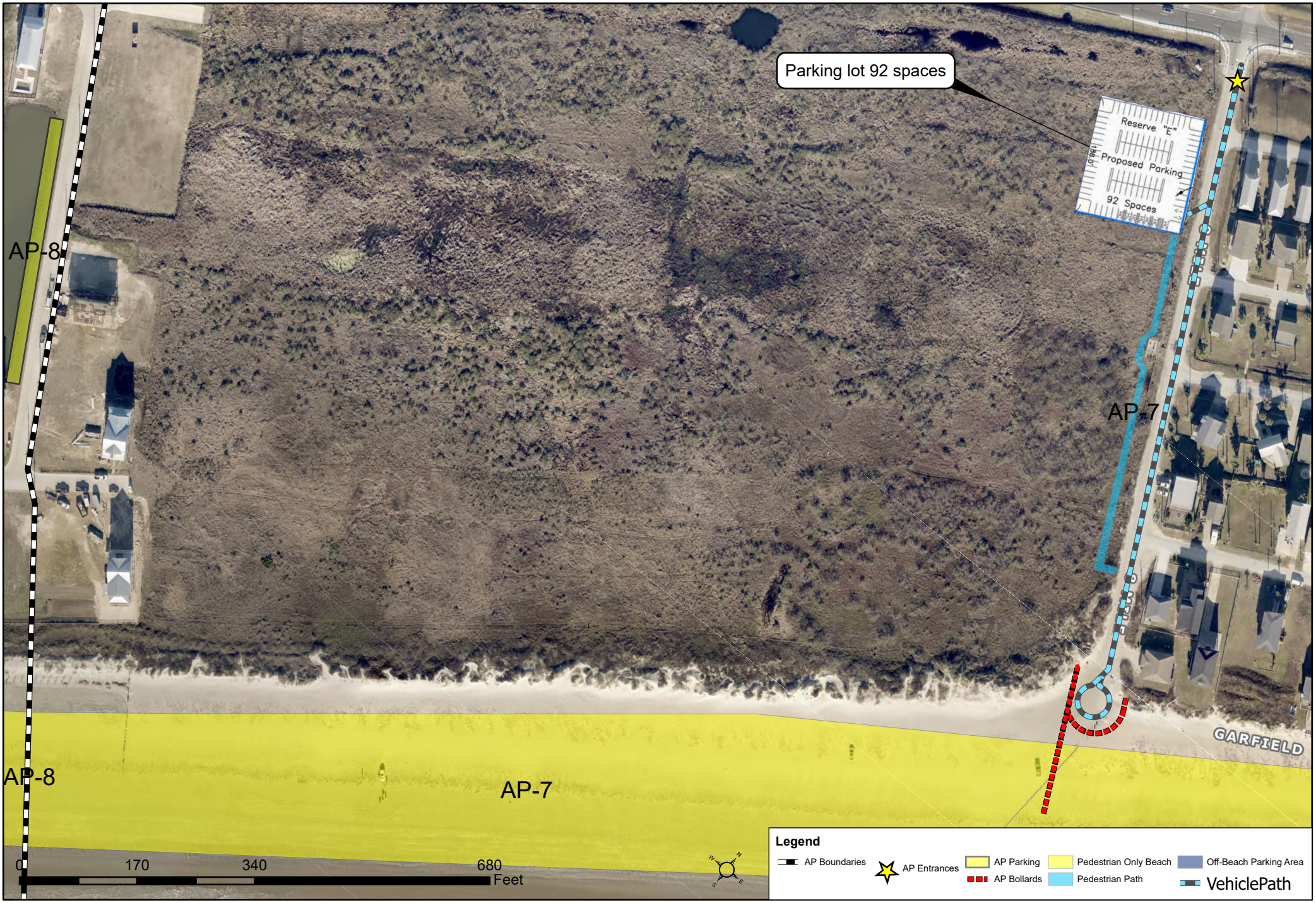


City of Galveston, Beach Access Point #06, Pocket Park #1

Map prepared by the City of Galveston Development Services Department (HCummings) - 9/25/2024
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City of Galveston, Beach Access Point #07, Sunny Beach Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/12/2024

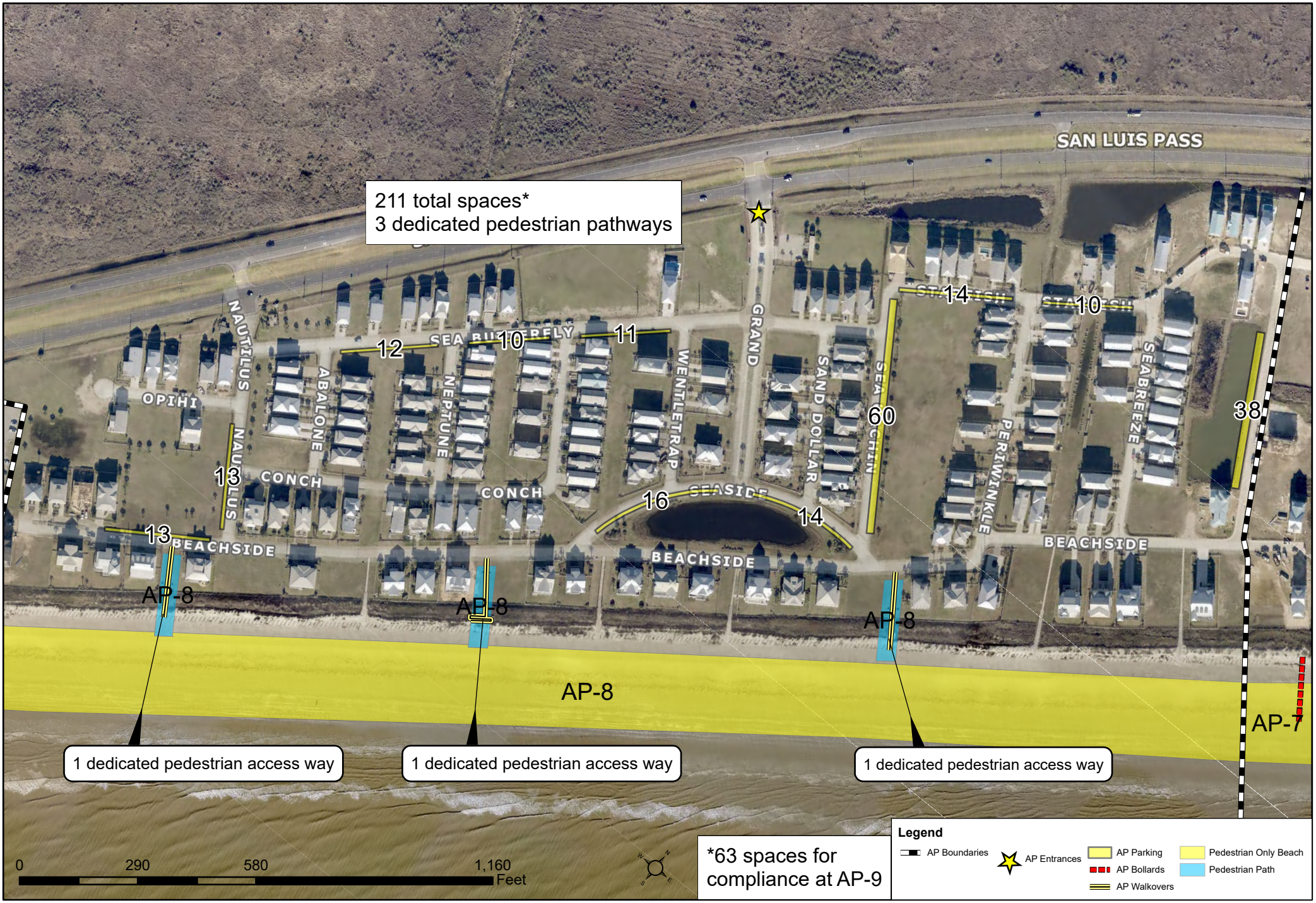
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

Data shown hereon is for information purposes only and does not constitute a boundary survey.

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City of Galveston, Beach Access Point #08, Beachside Village Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/12/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #09, Pocket Park #2

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/8/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #10, 10-Mile Road/Hershey Beach Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/27/2024

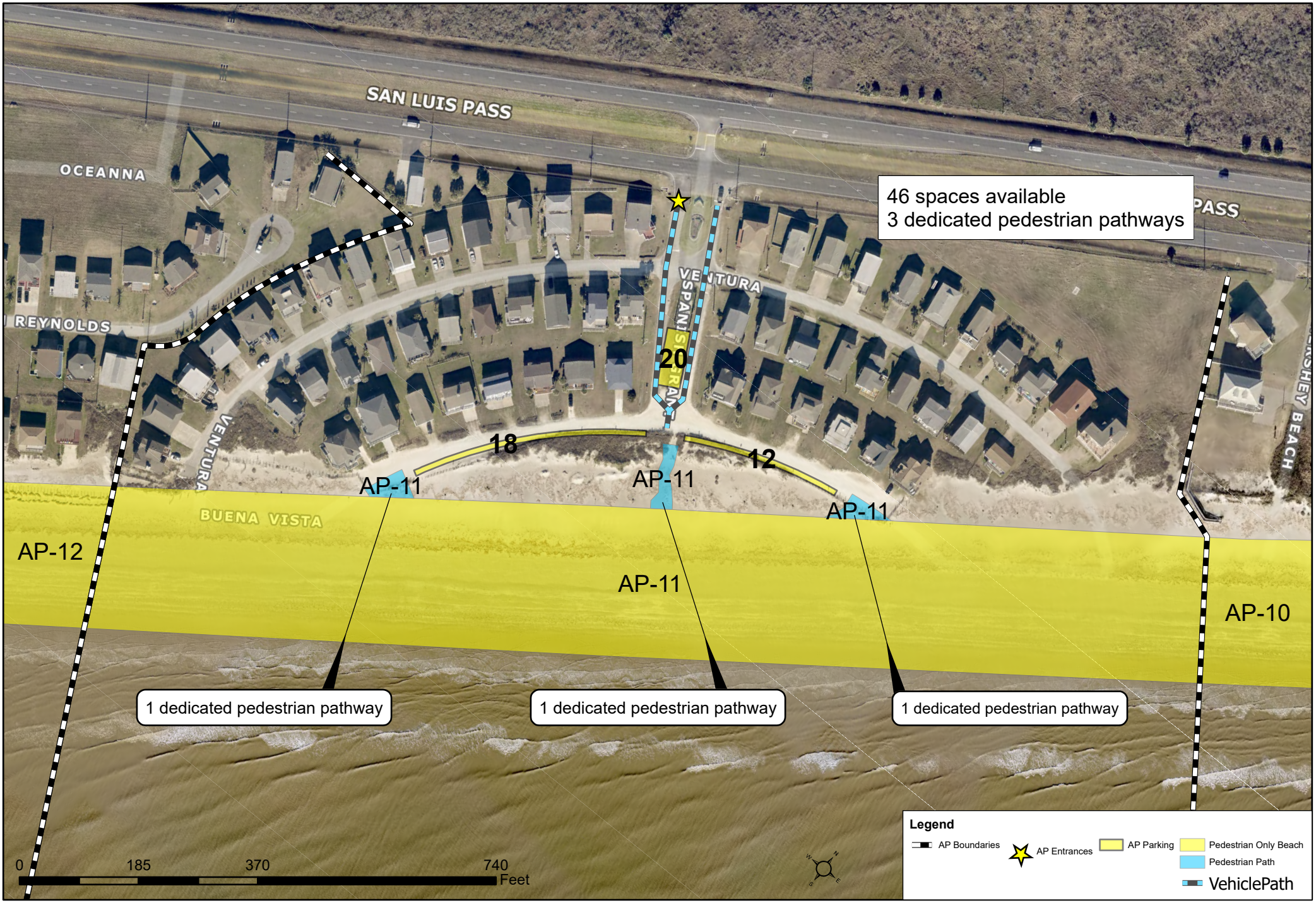
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

Data shown hereon is for information purposes only and does not constitute a boundary survey.

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City of Galveston, Beach Access Point #11, Spanish Grant Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/12/2024

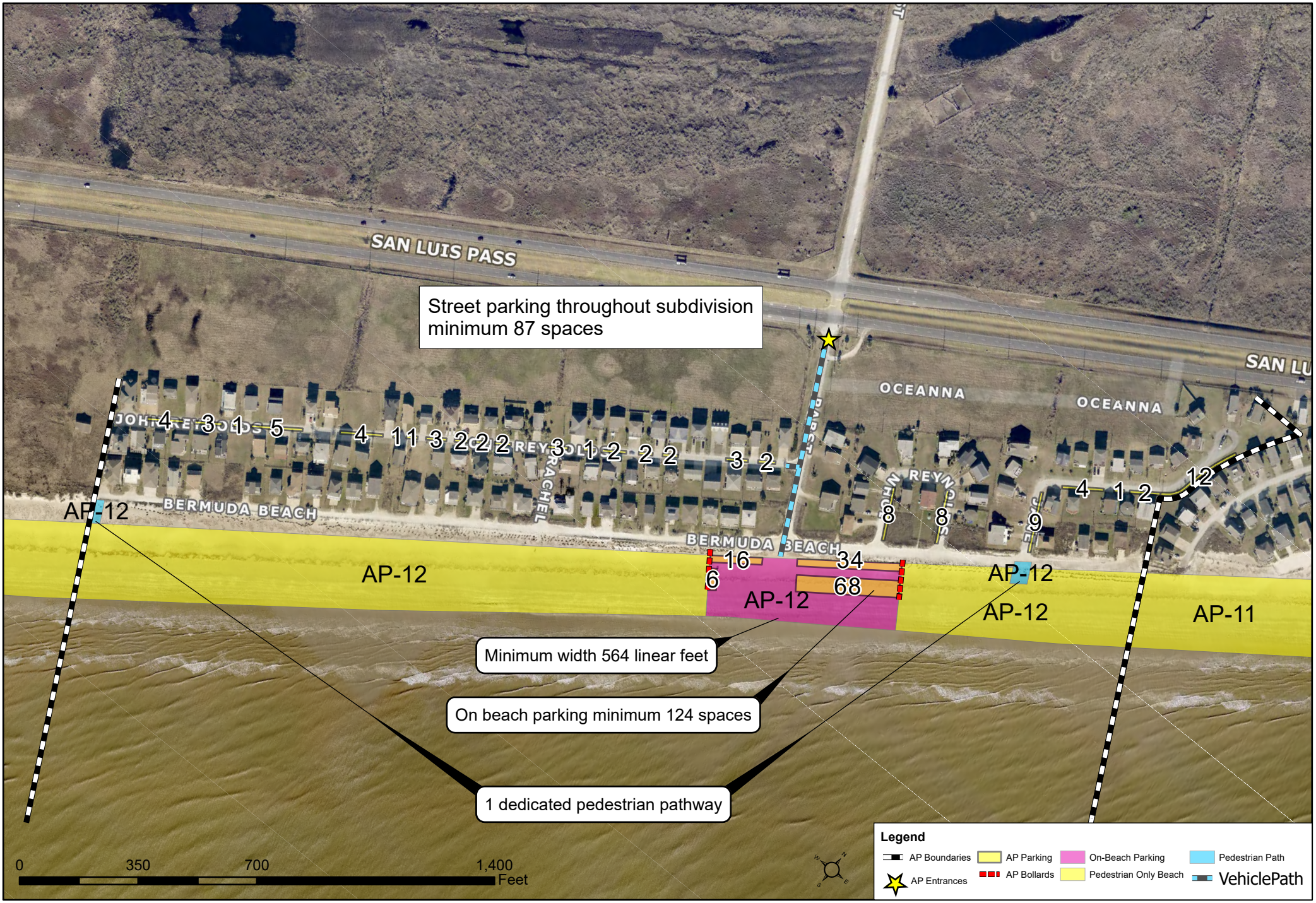
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #12, Bermuda Beach Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/27/2024

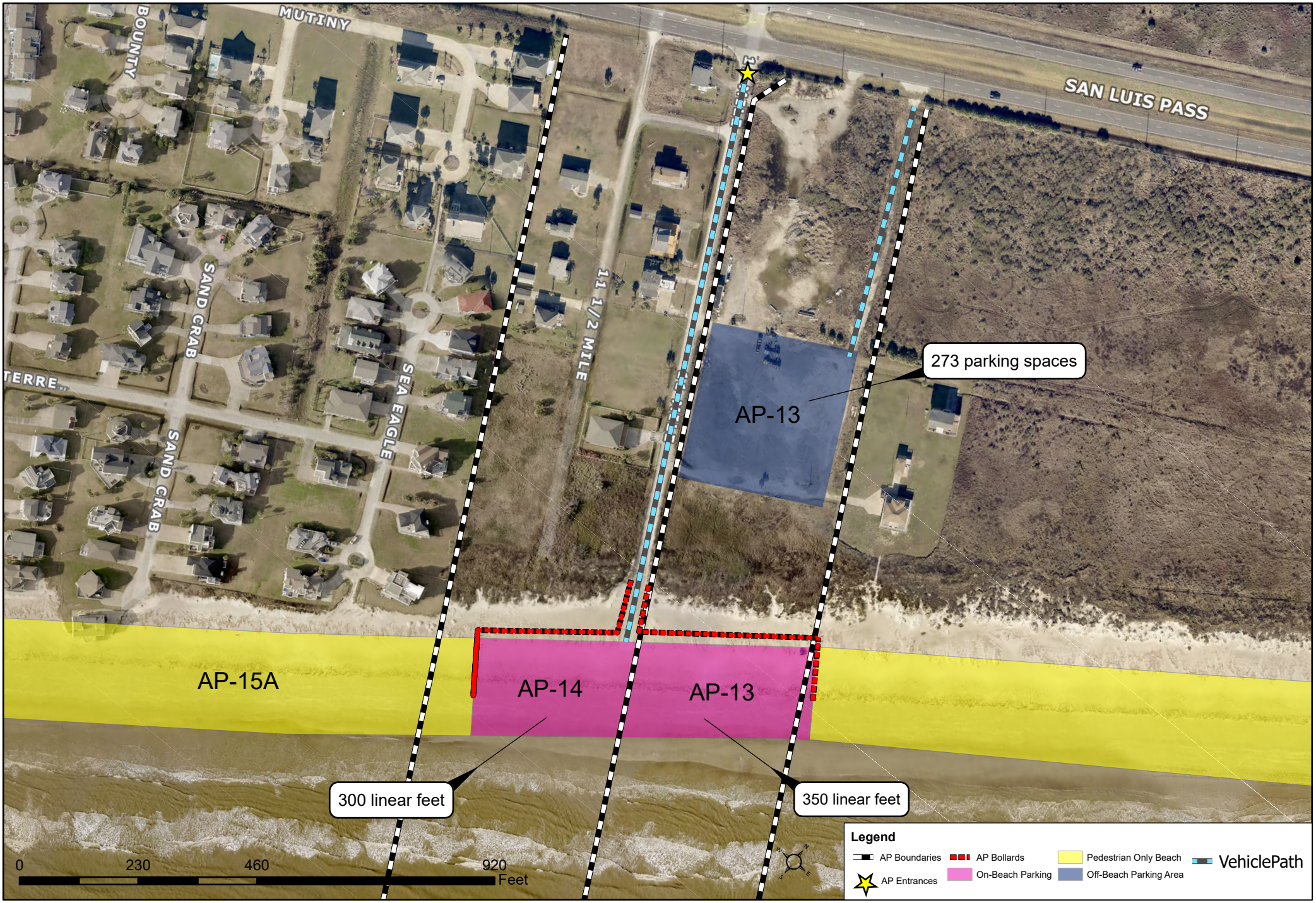
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

Data shown hereon is for information purposes only and does not constitute a boundary survey.

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City of Galveston, Beach Access Point #13, Pocket Park #3 & Access Point #14, 11-Mile Road

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

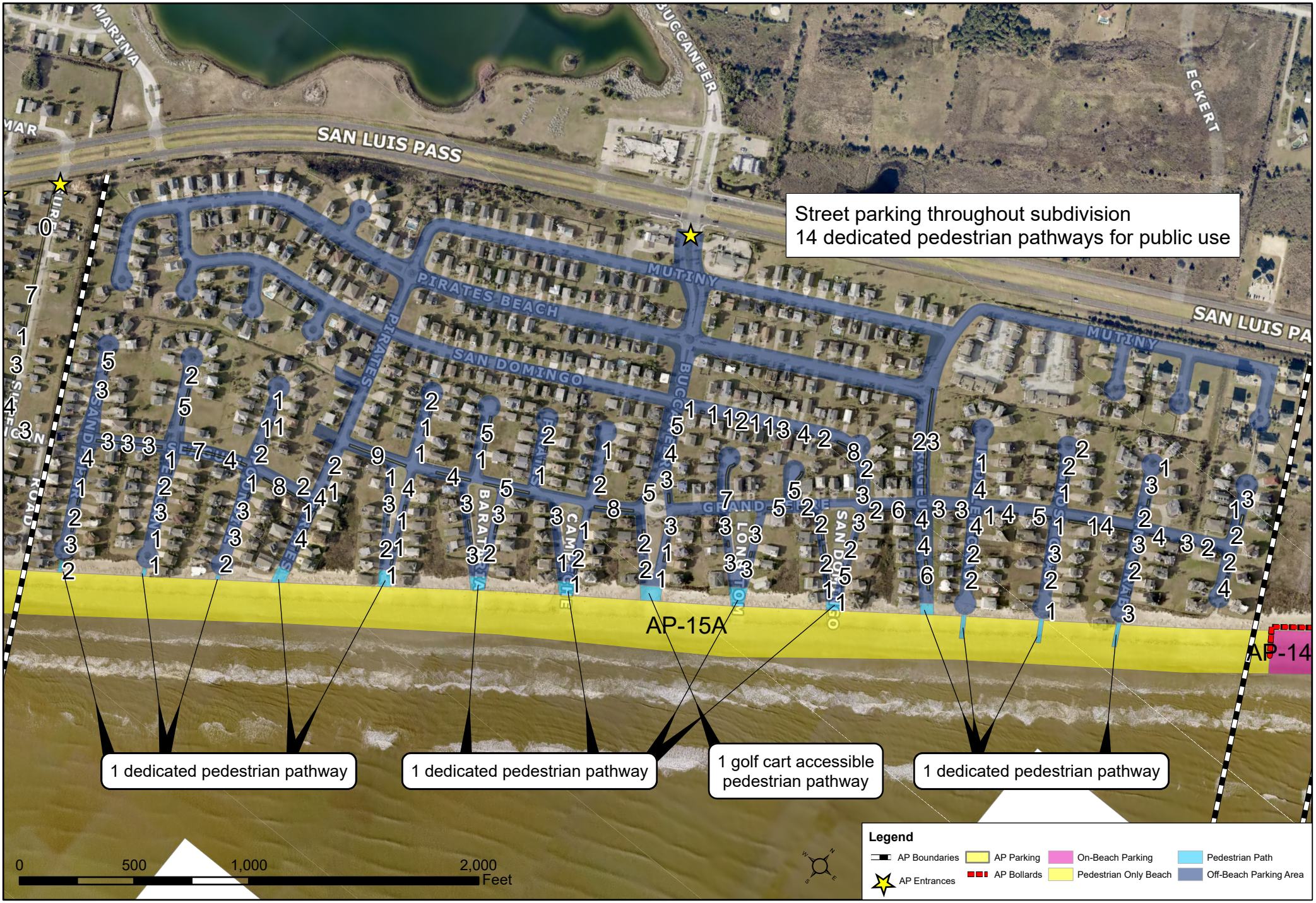
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #15A, Pirates Beach Subdivision, (wide view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

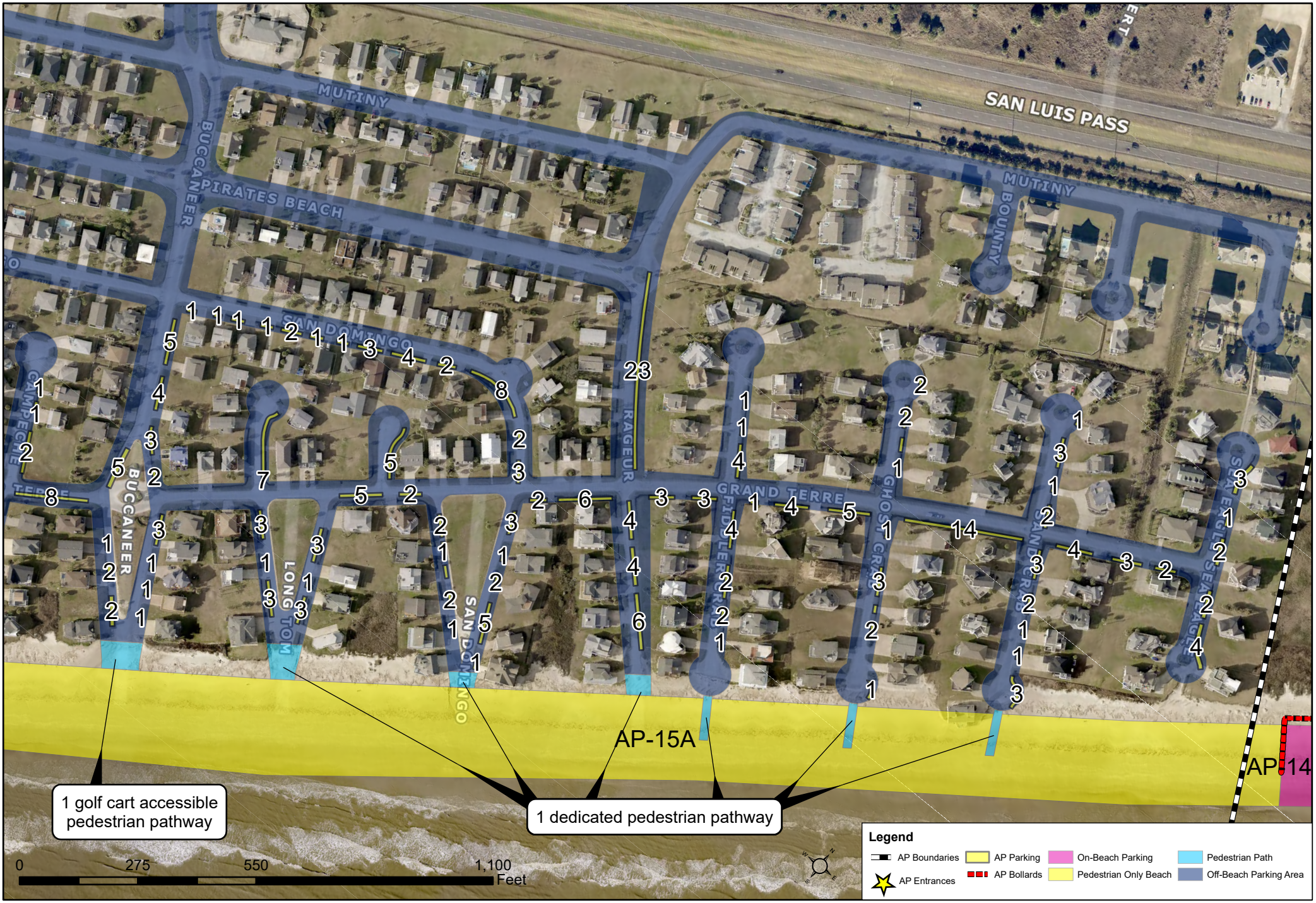
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

Data shown hereon is for information purposes only and does not constitute a boundary survey.

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City of Galveston, Beach Access Point #15A, Pirates Beach Subdivision, (east view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

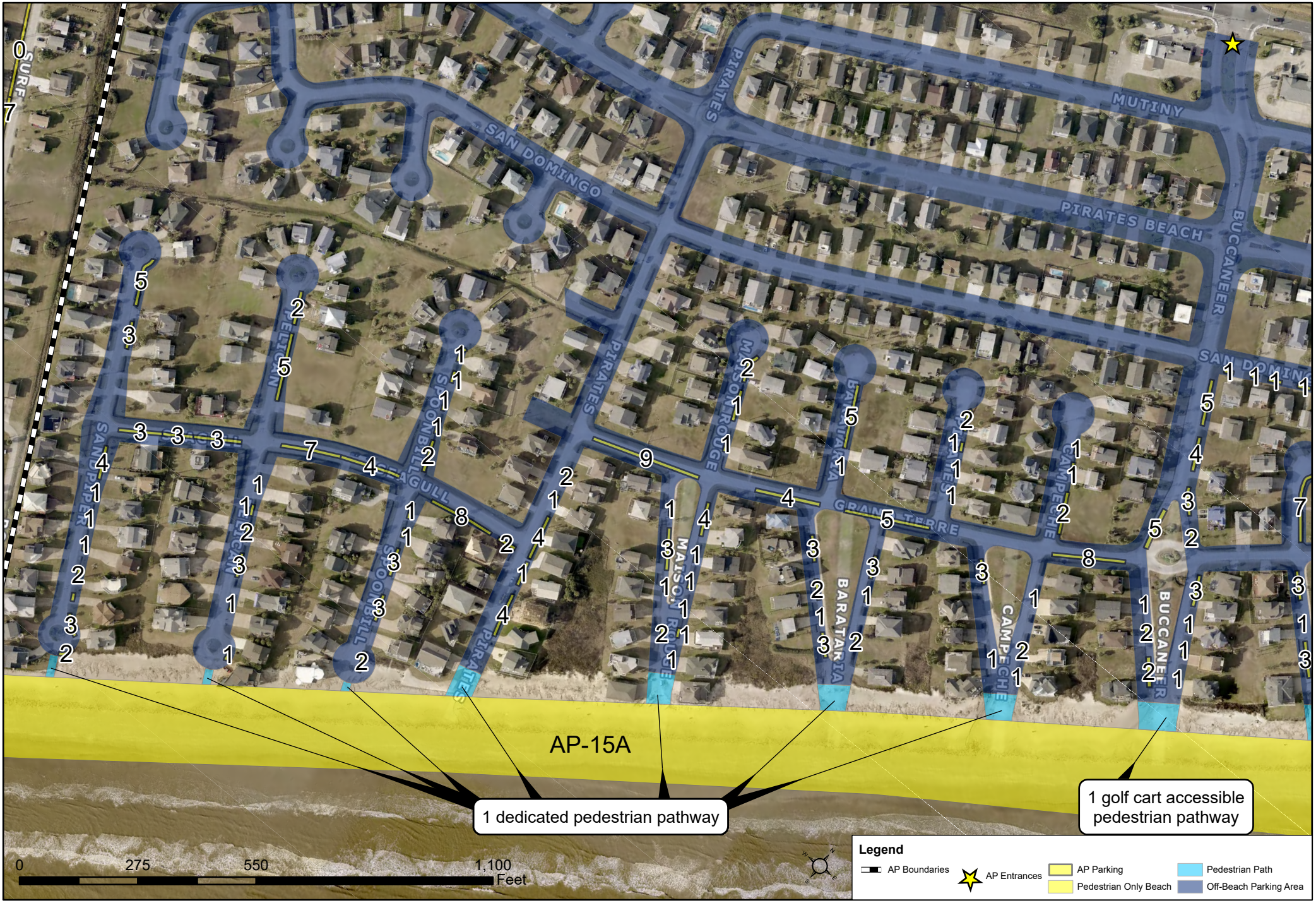
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #15A, Pirates Beach Subdivision, (west view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

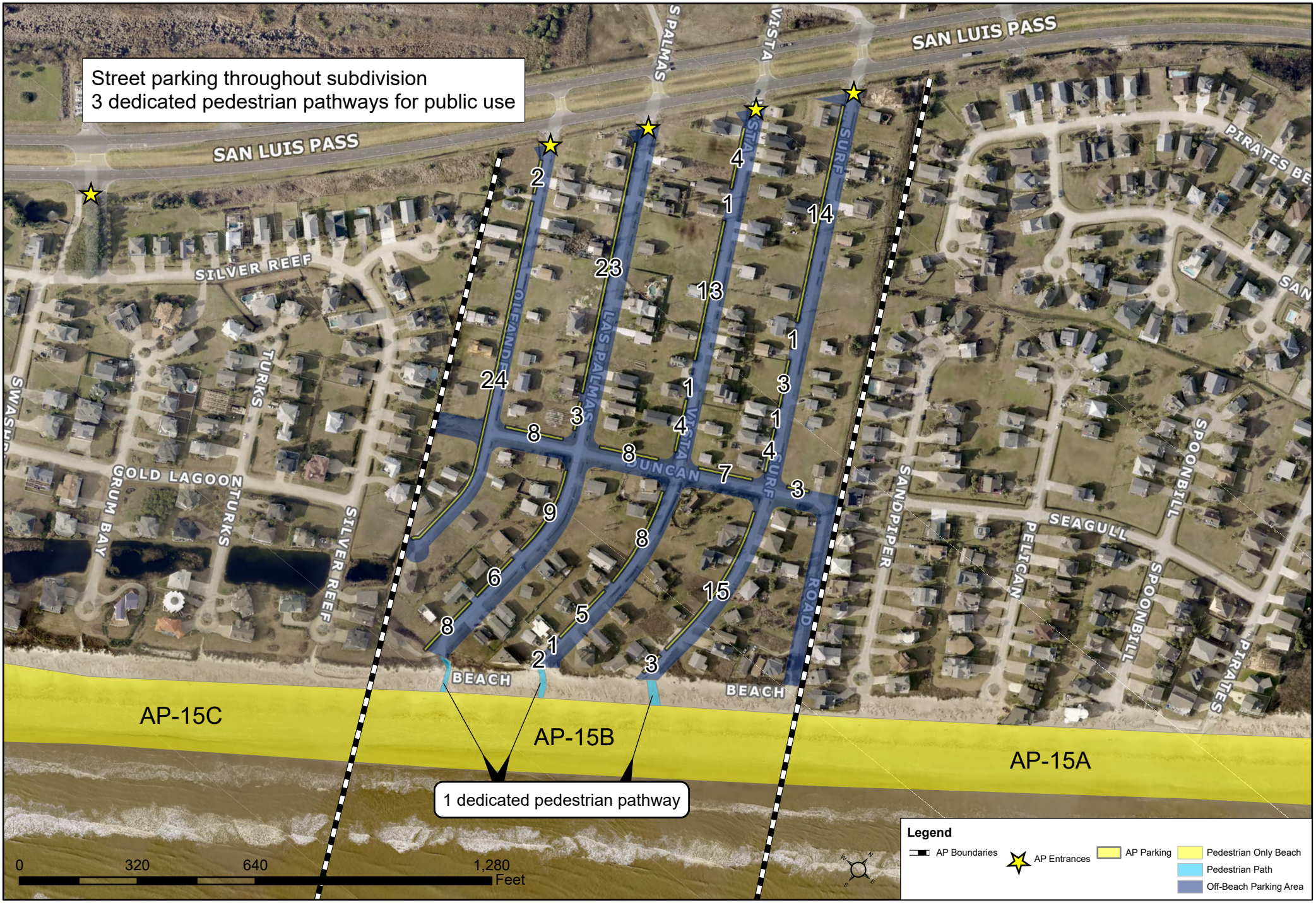
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #15B, Palm Beach Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

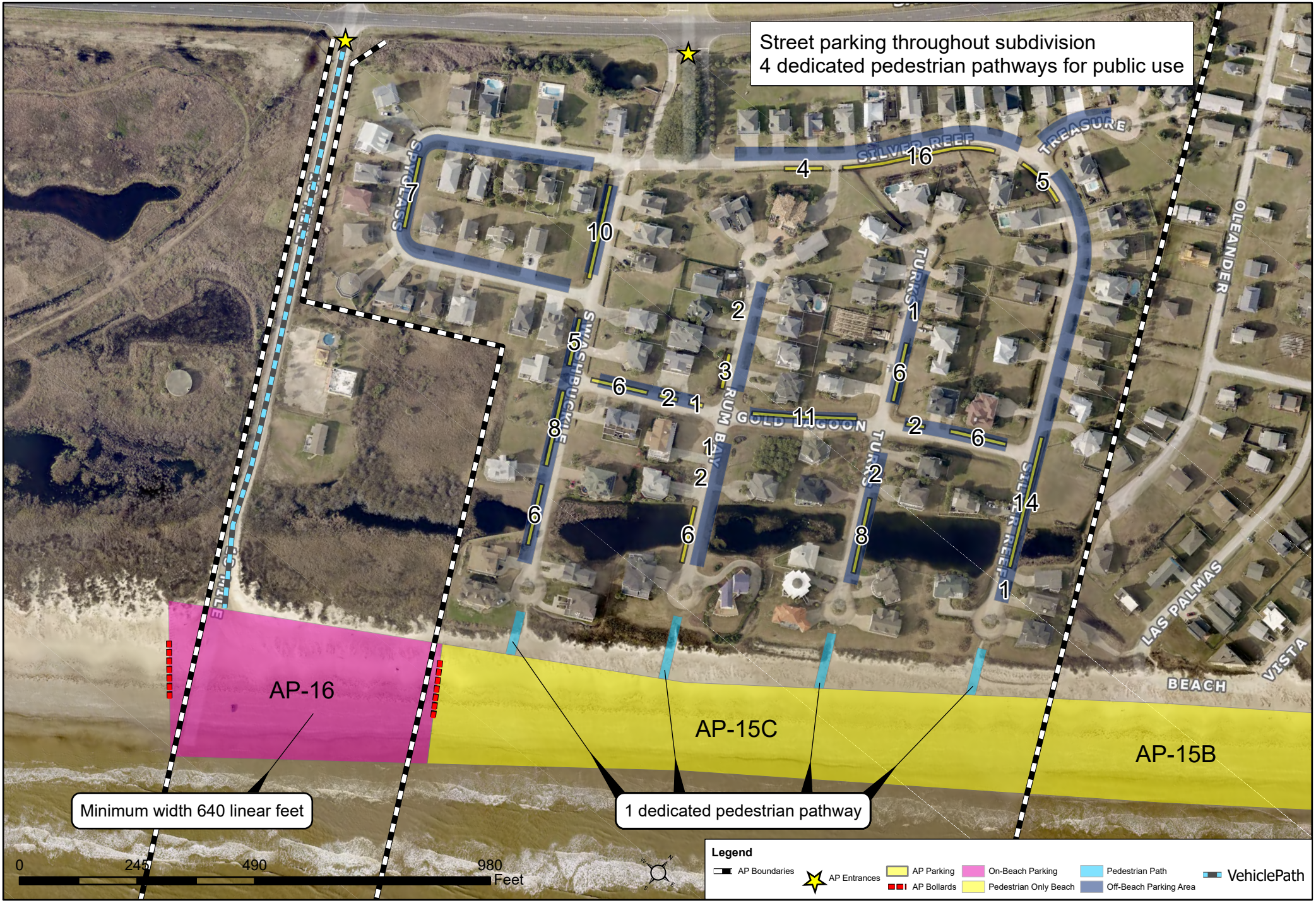
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #15C, Pirates Beach West Subdivision & Access Point #16, 13-Mile Road Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #17, 15-Mile Road

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

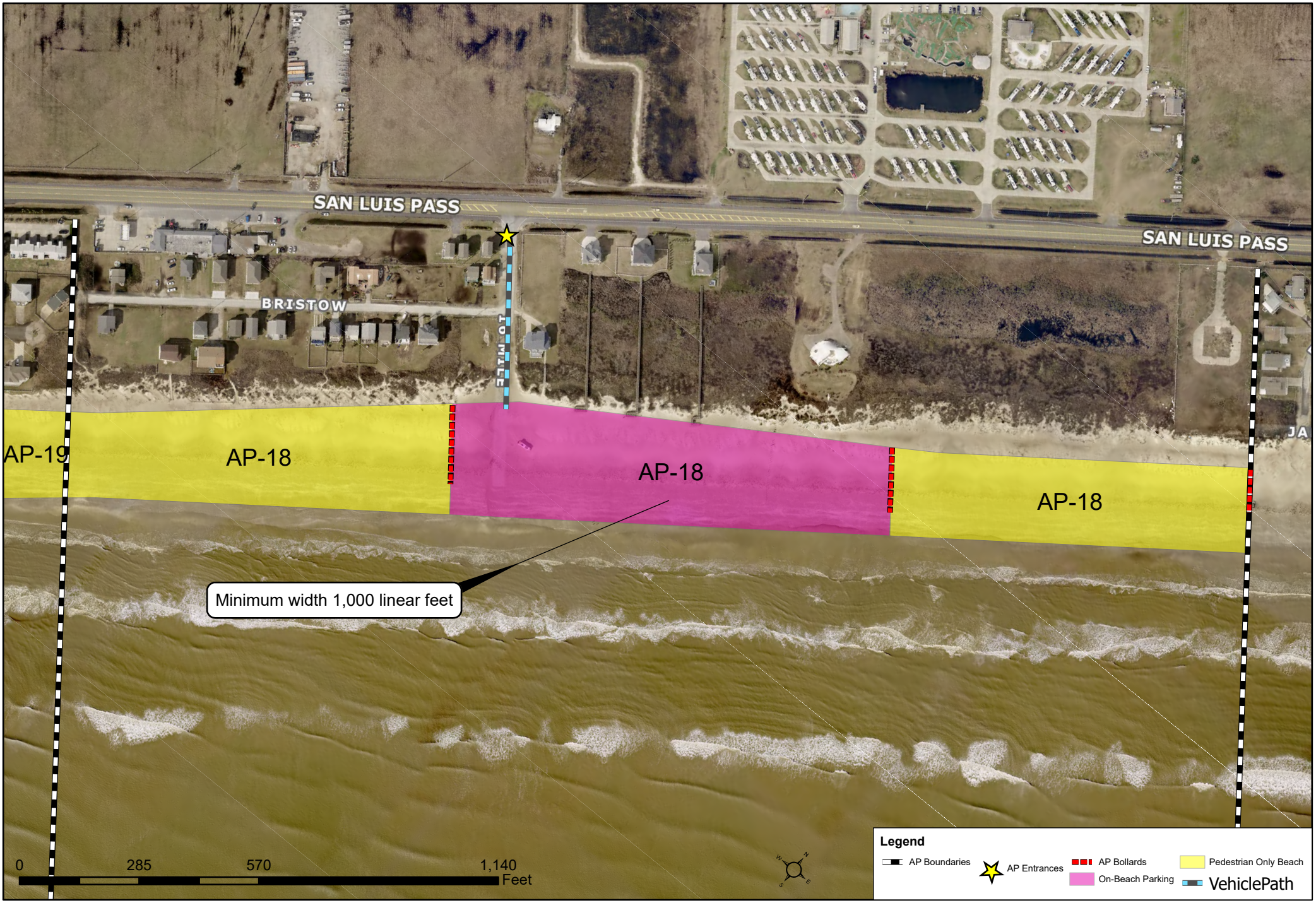
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

Data shown hereon is for information purposes only and does not constitute a boundary survey.

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City of Galveston, Beach Access Point #18, 16-Mile Road

Map prepared by the City of Galveston Development Services Department (hcummings) - 4/1/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #19, Karankawa Beach

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #20, Indian Beach (wide view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #20, Indian Beach (east view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

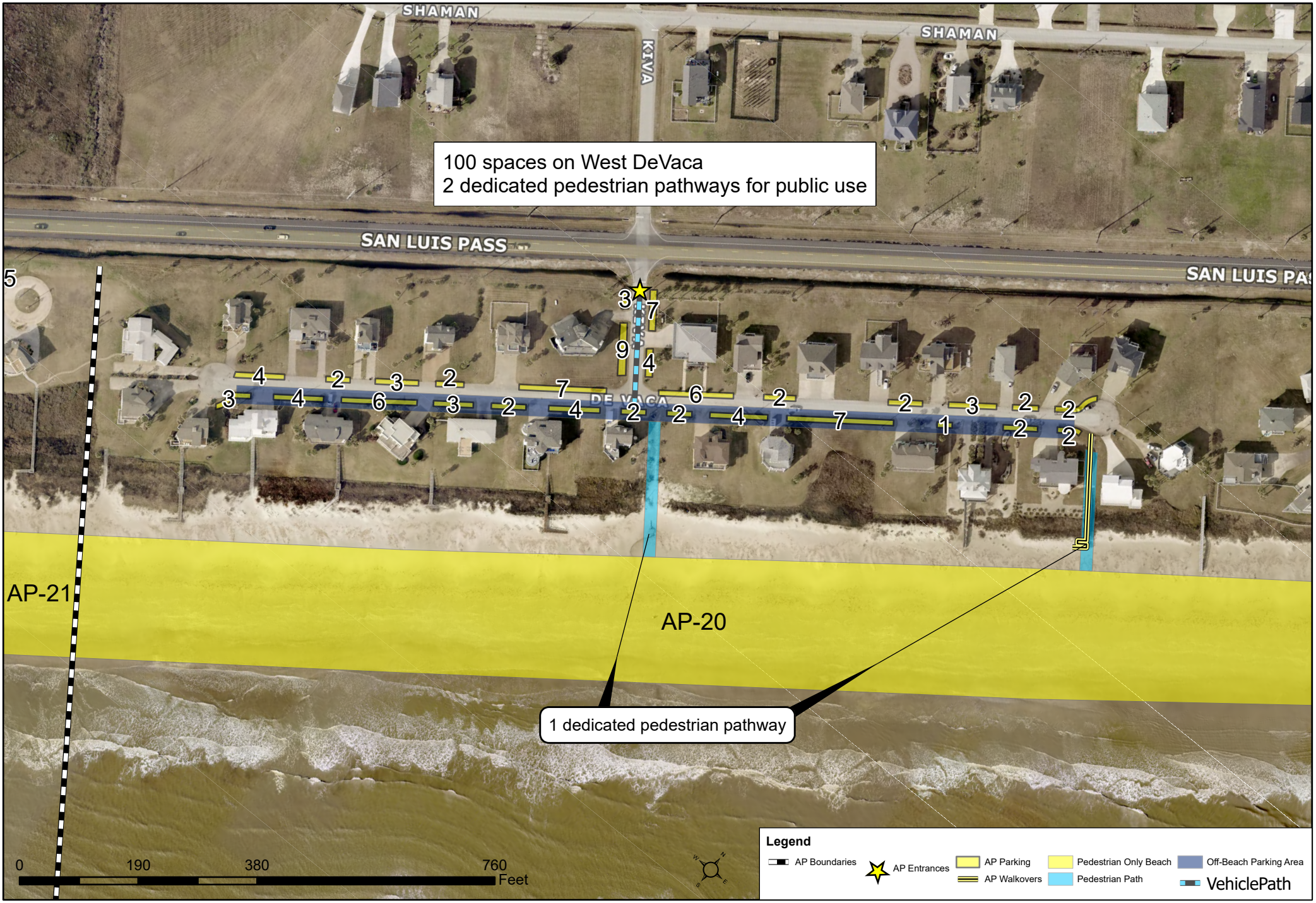
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #20, Indian Beach (west view)

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/13/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #21, Kahala Beach Estates, Addition #1

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

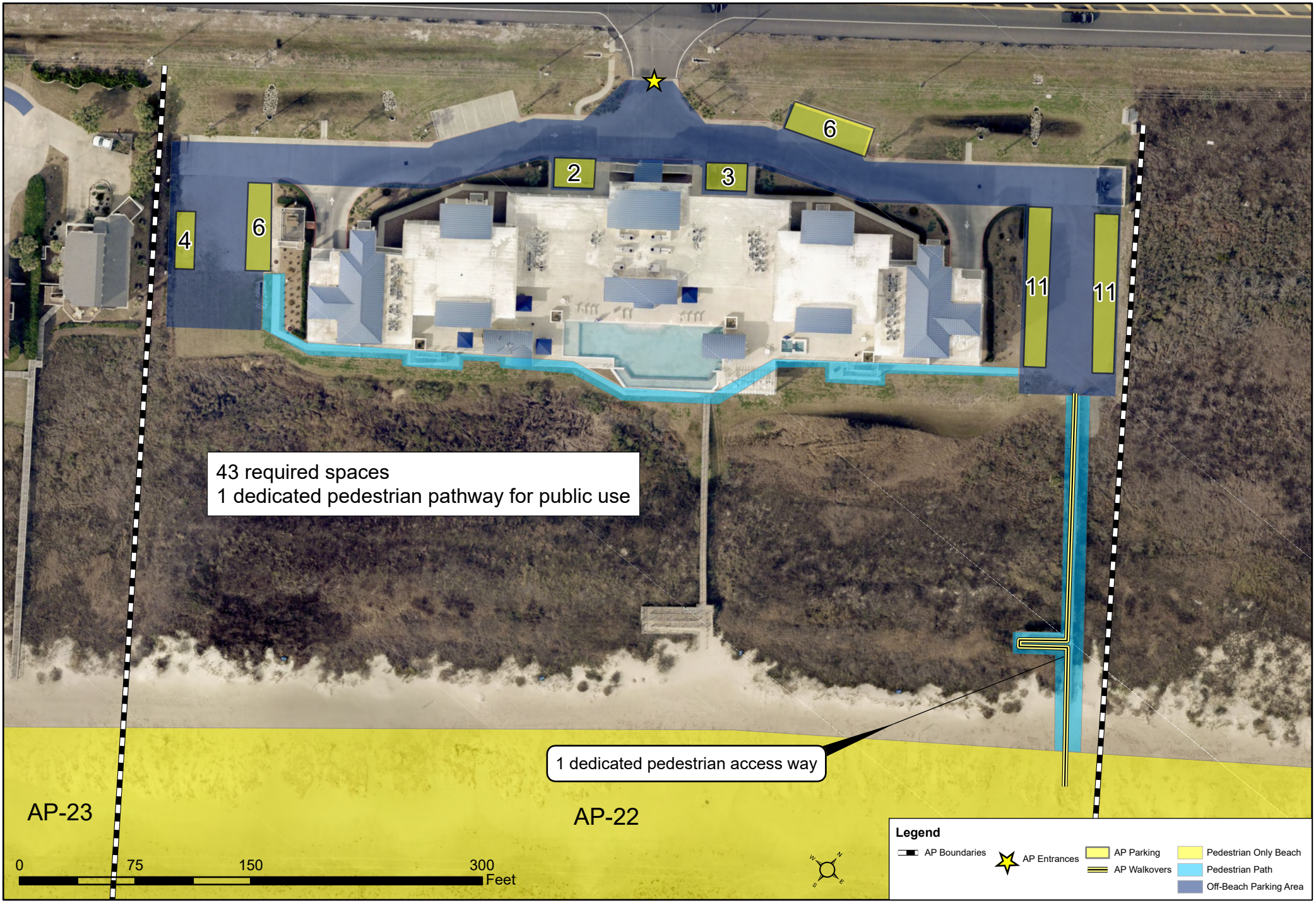
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #22, Silverleaf Resorts

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

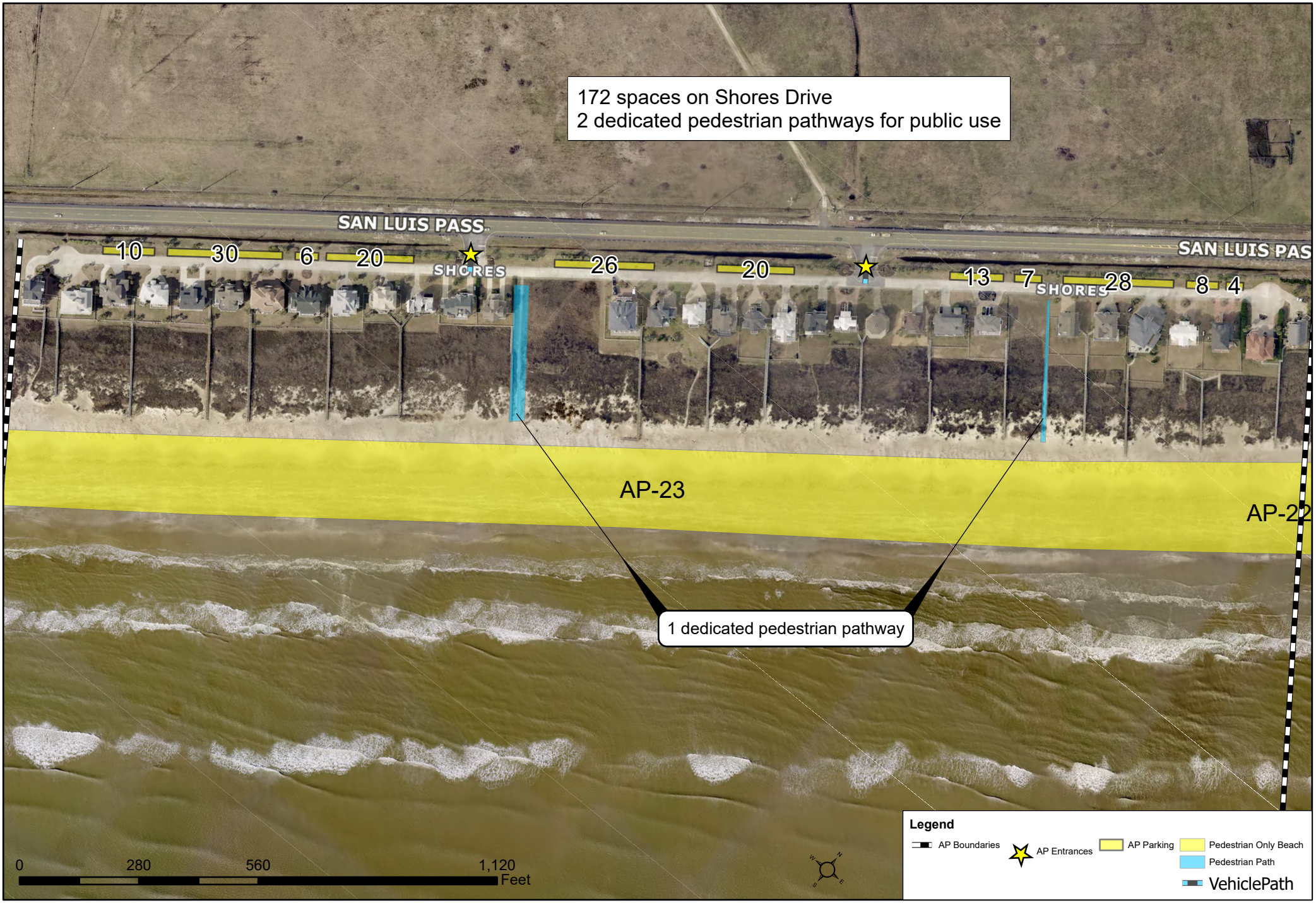
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #23, The Dunes of West Beach

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #24, Sandhill Shores Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #25, Gateway Boulevard - Sea Isle Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #26, San Jacinto Street - Sea Isle Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

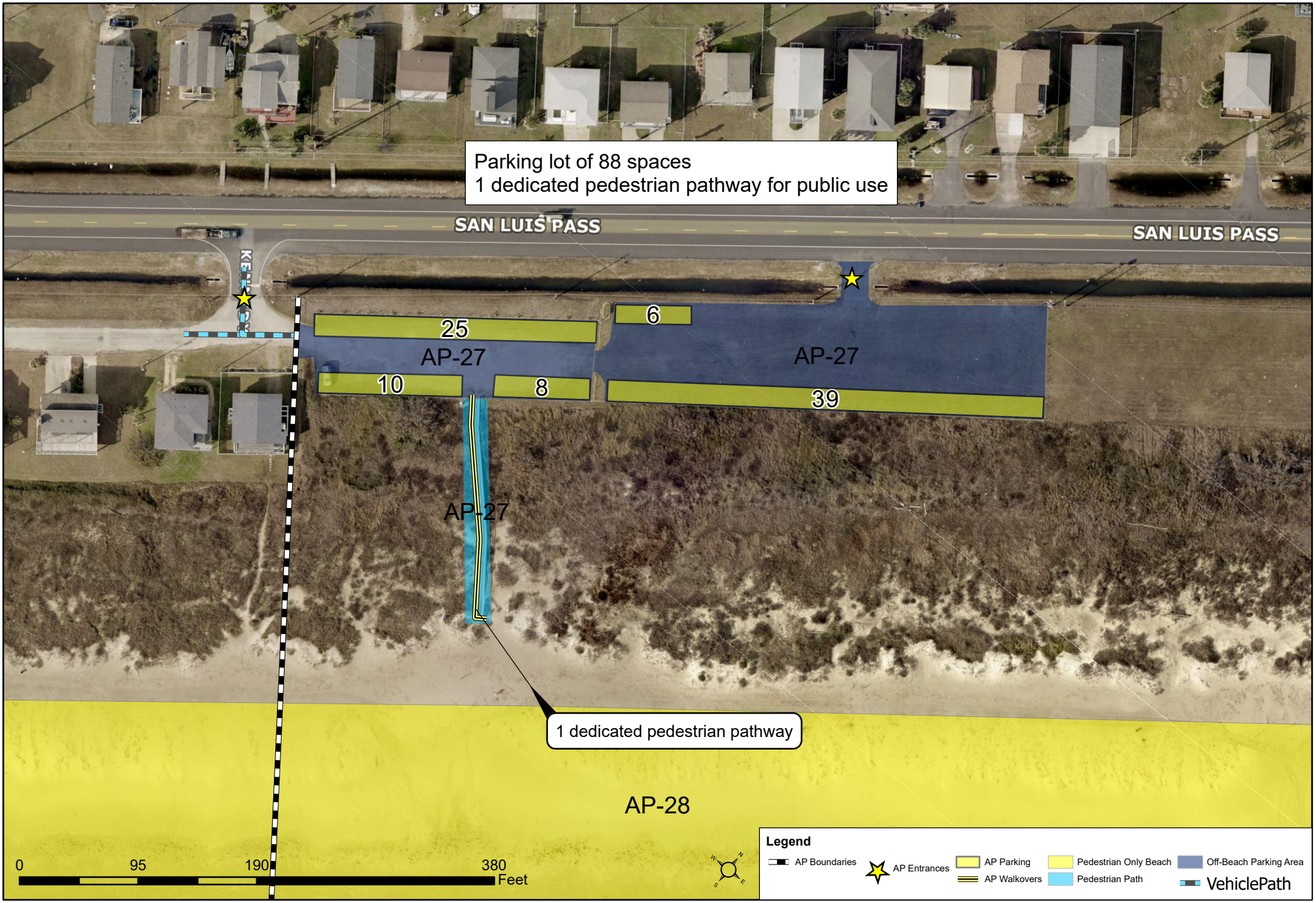
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #27, Sea Isle Parking Area

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #28, Sea Isle & Terramar Beach Subdivision, Gulf Drive East

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/28/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #28, Sea Isle & Terramar Beach Subdivision, Kennedy Drive

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

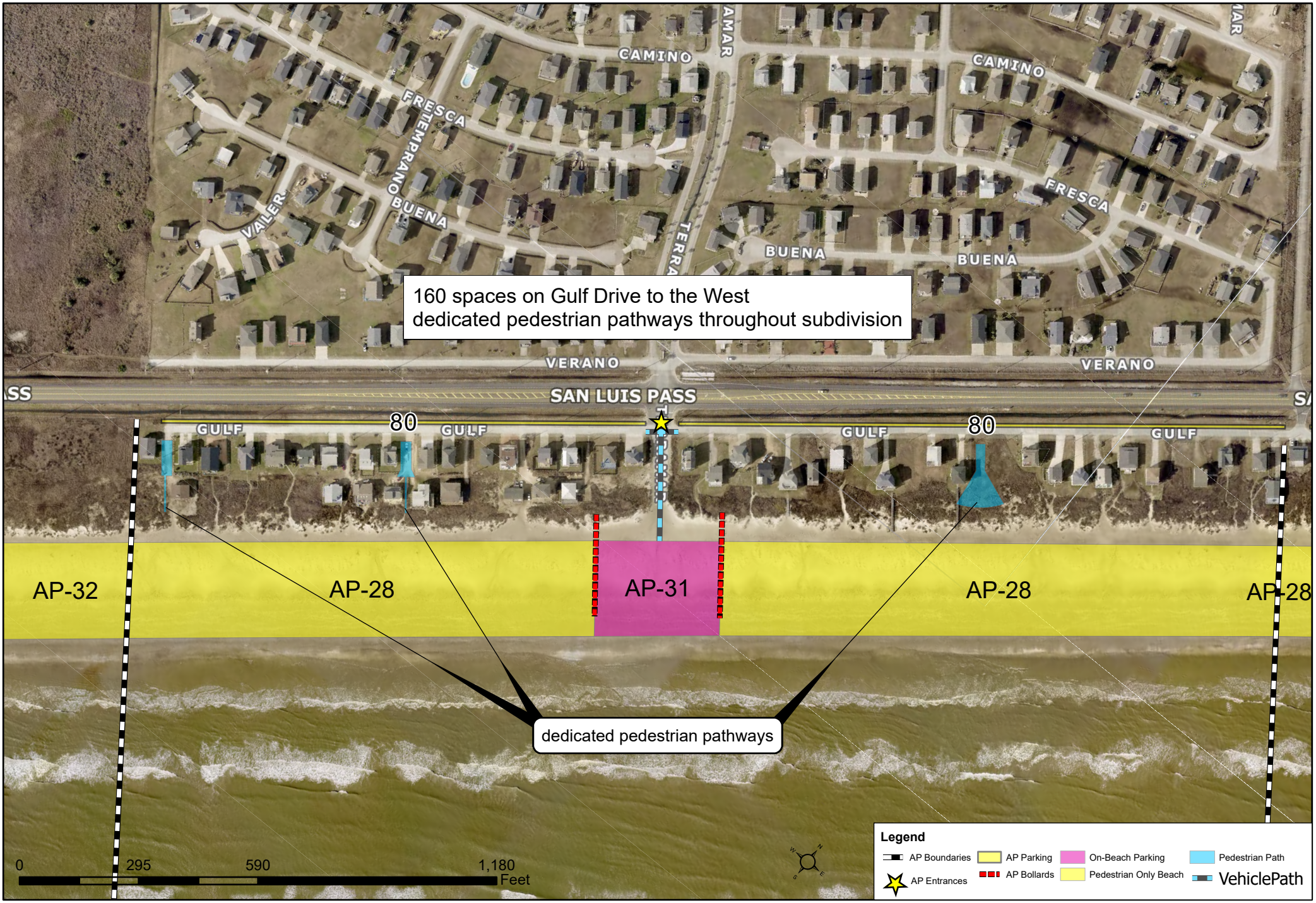
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #28, Sea Isle & Terramar Beach Subdivision, Gulf Drive West

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/26/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #29, Isla Del Sol Subdivision & Access Point #30, Gulf Boulevard Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

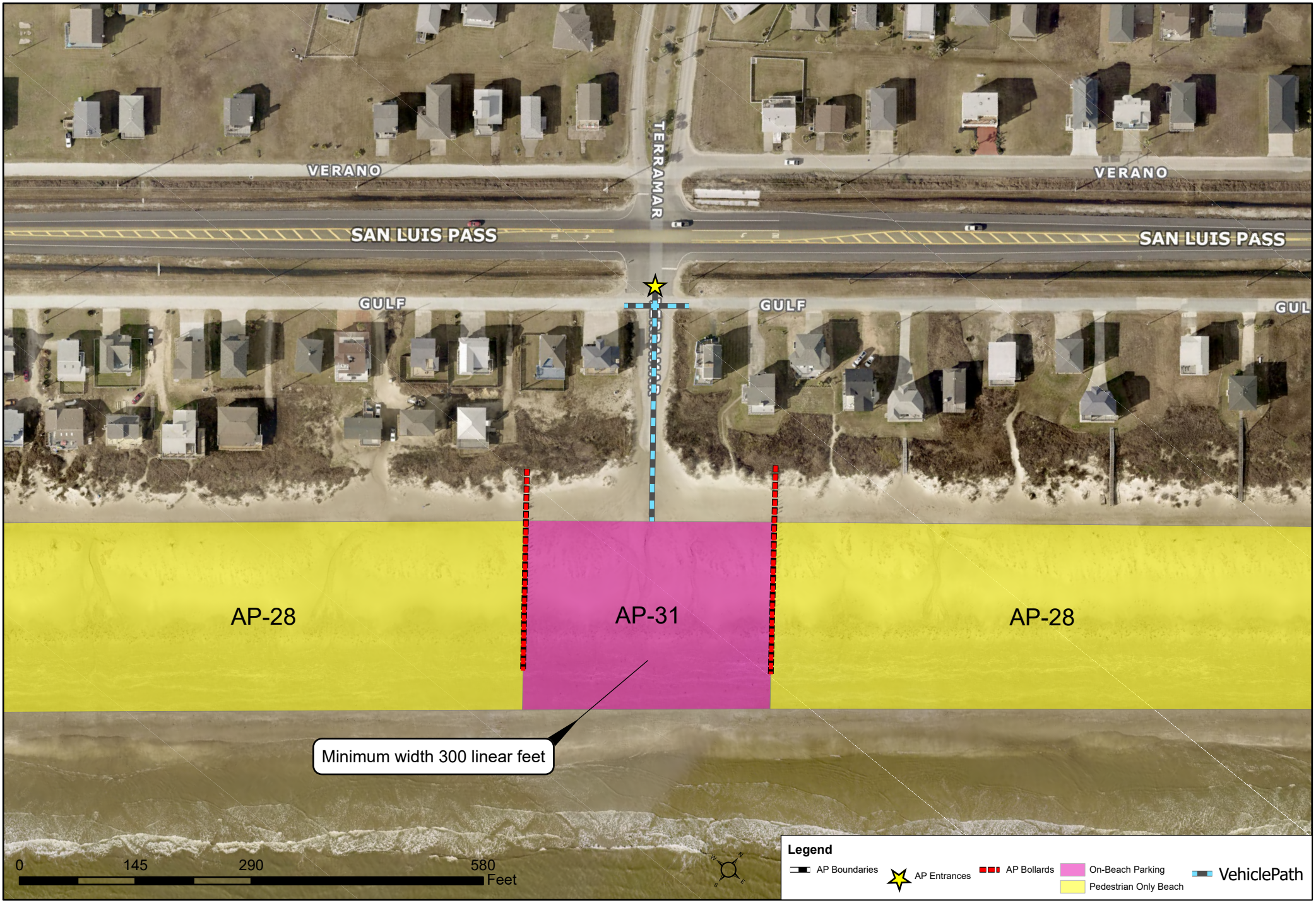
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #31, Terramar Drive, Terramar Beach Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #32, Pocket Park #4

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

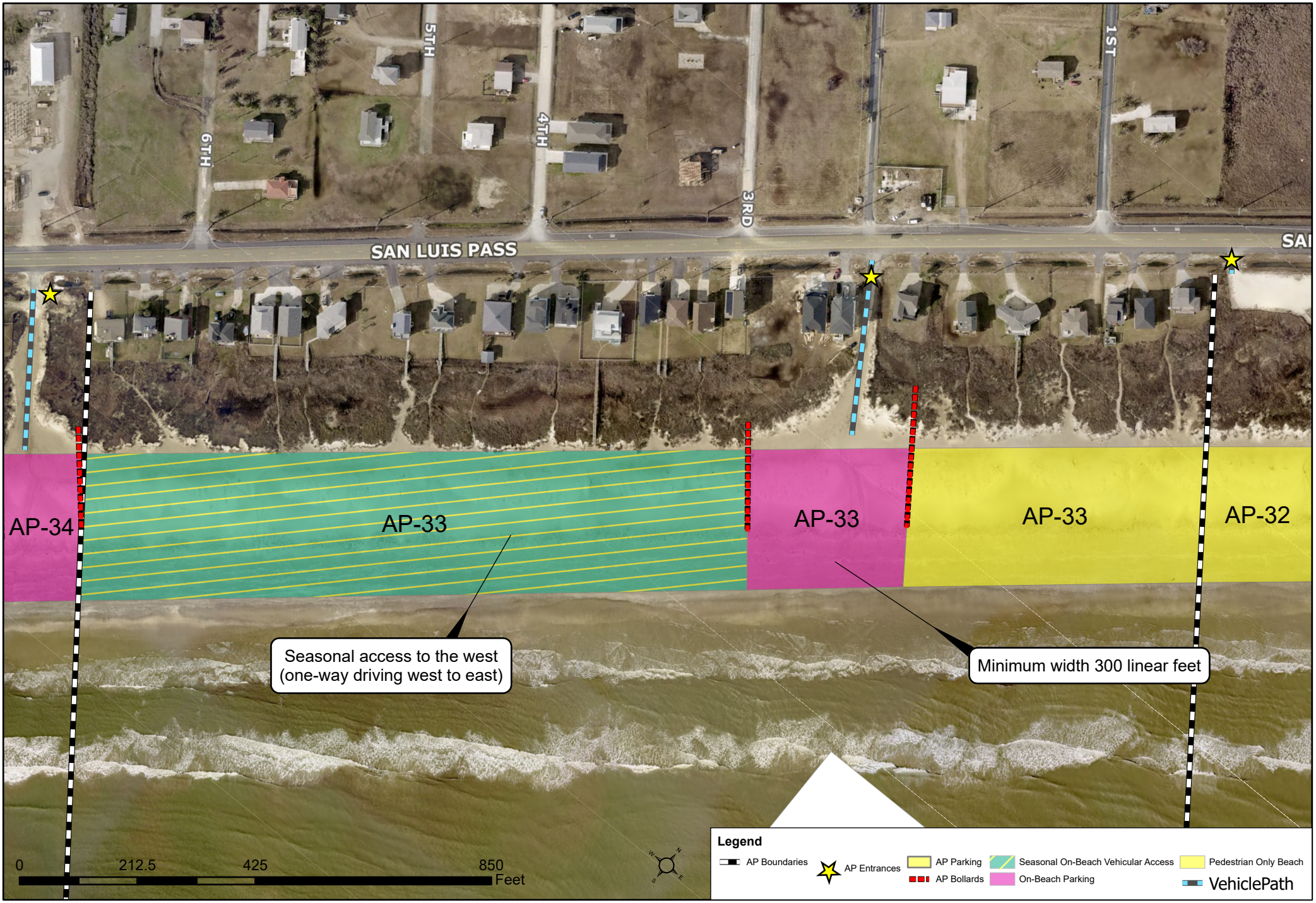
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #33, 2nd Street, Bay Harbor Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/14/2024

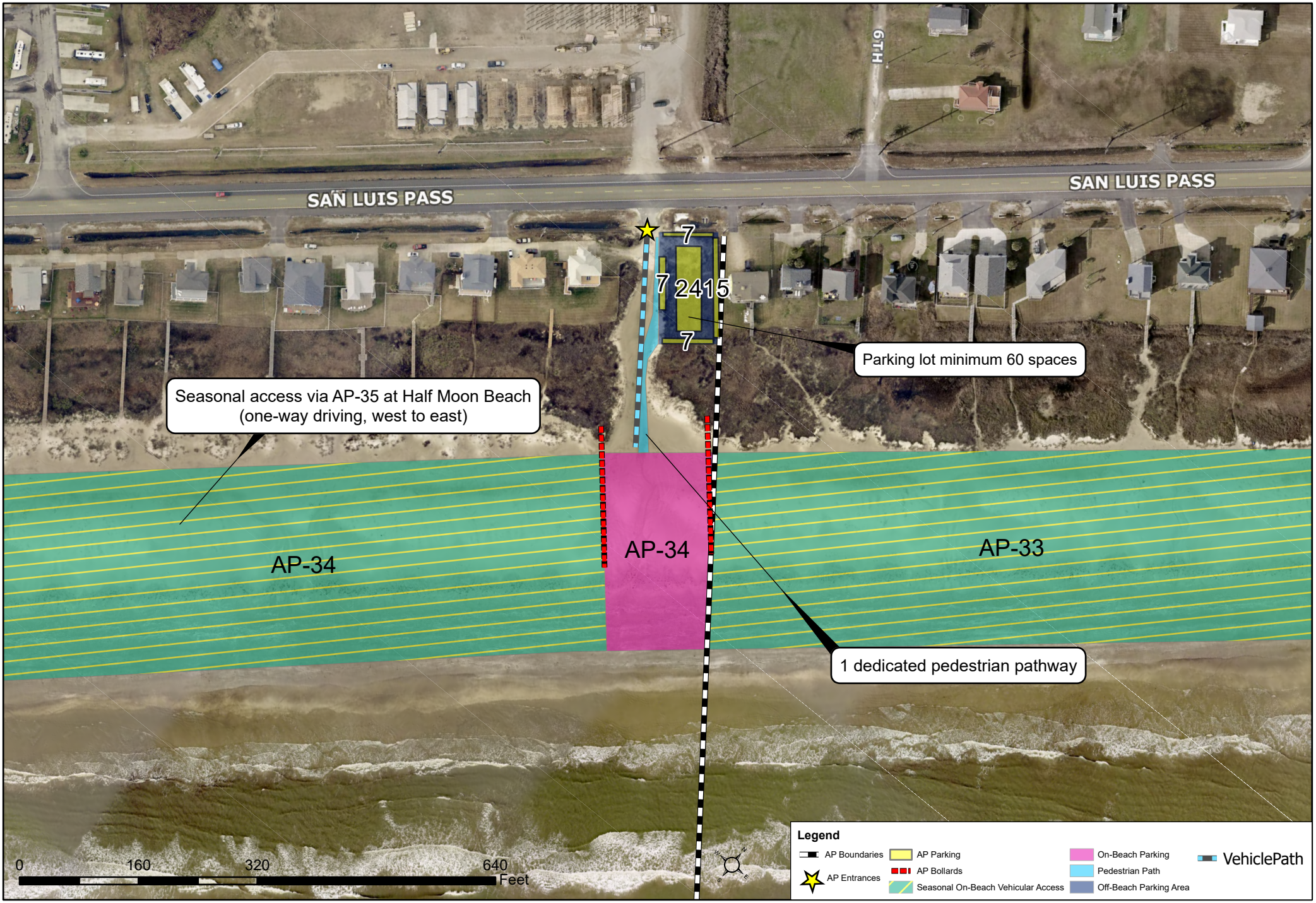
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #34, Miramar Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/19/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #35, Half Moon Beach Subdivision and Stavanger Beach

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/18/2024

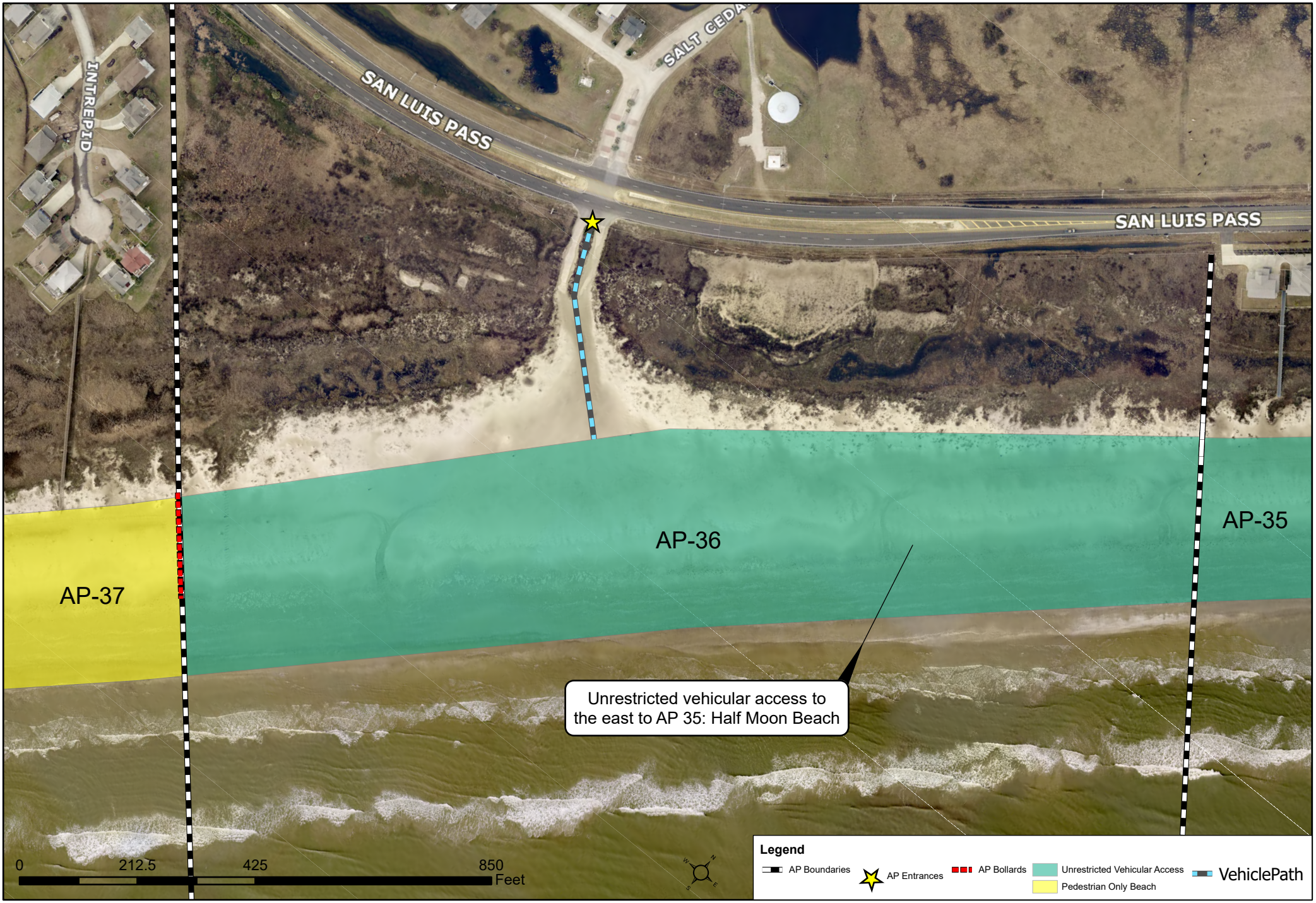
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #36, Salt Cedar Avenue

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/18/2024

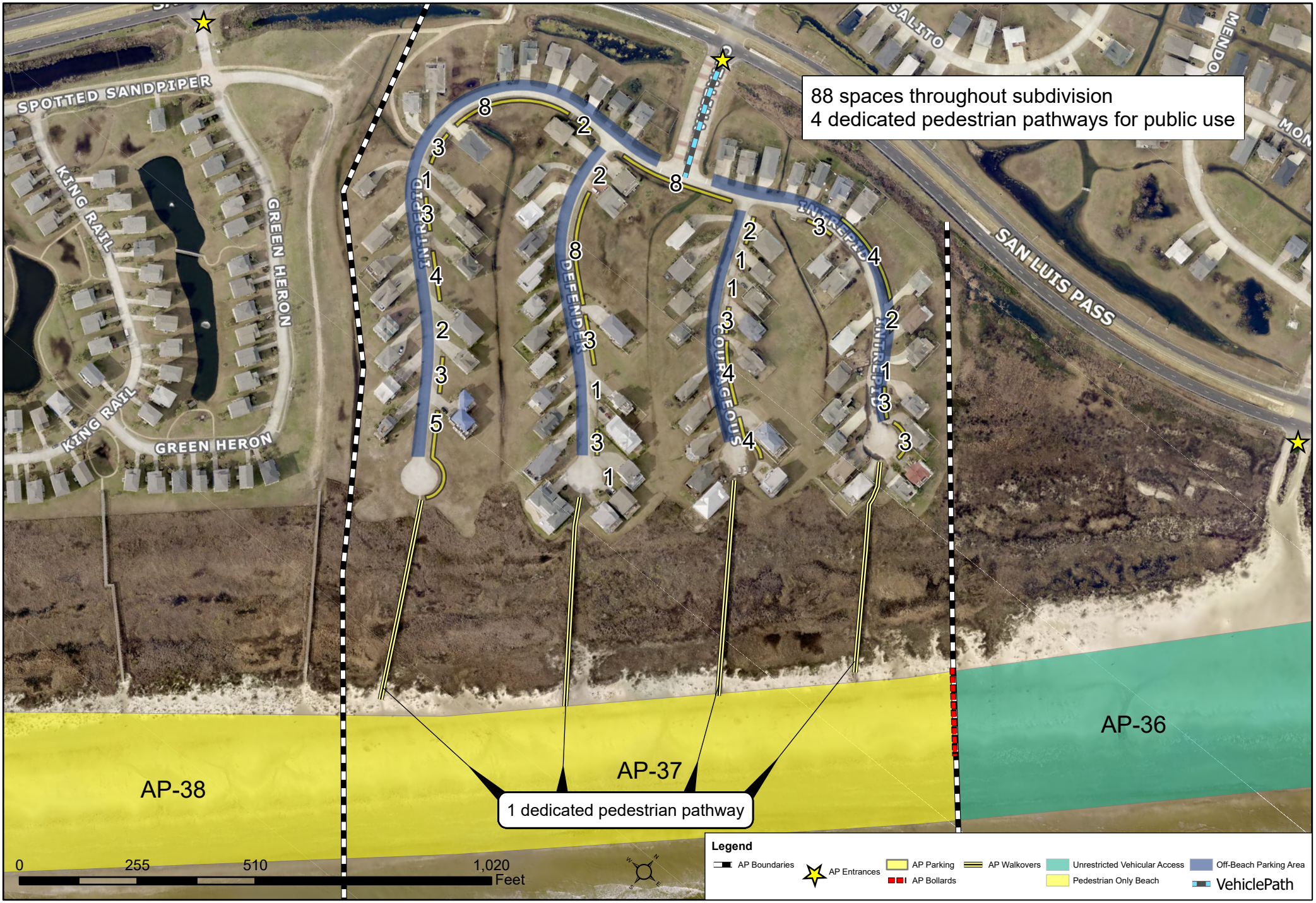
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #37, Playa San Luis Subdivision

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/18/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #38, Pointe San Luis 1

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/18/2024

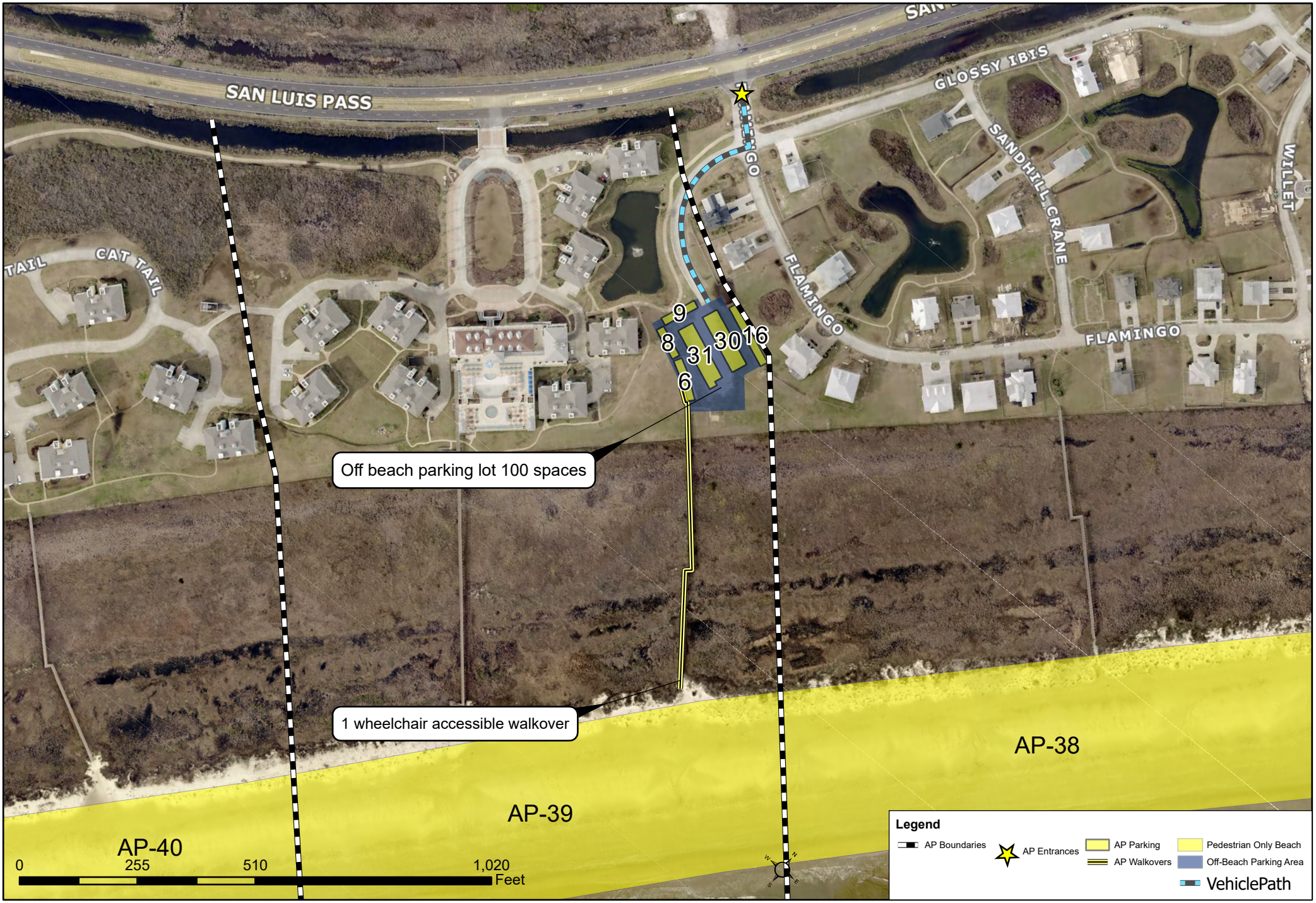
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

Aerial imagery shown for informational purposes only.

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City of Galveston, Beach Access Point #39, Pointe San Luis 2

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/18/2024

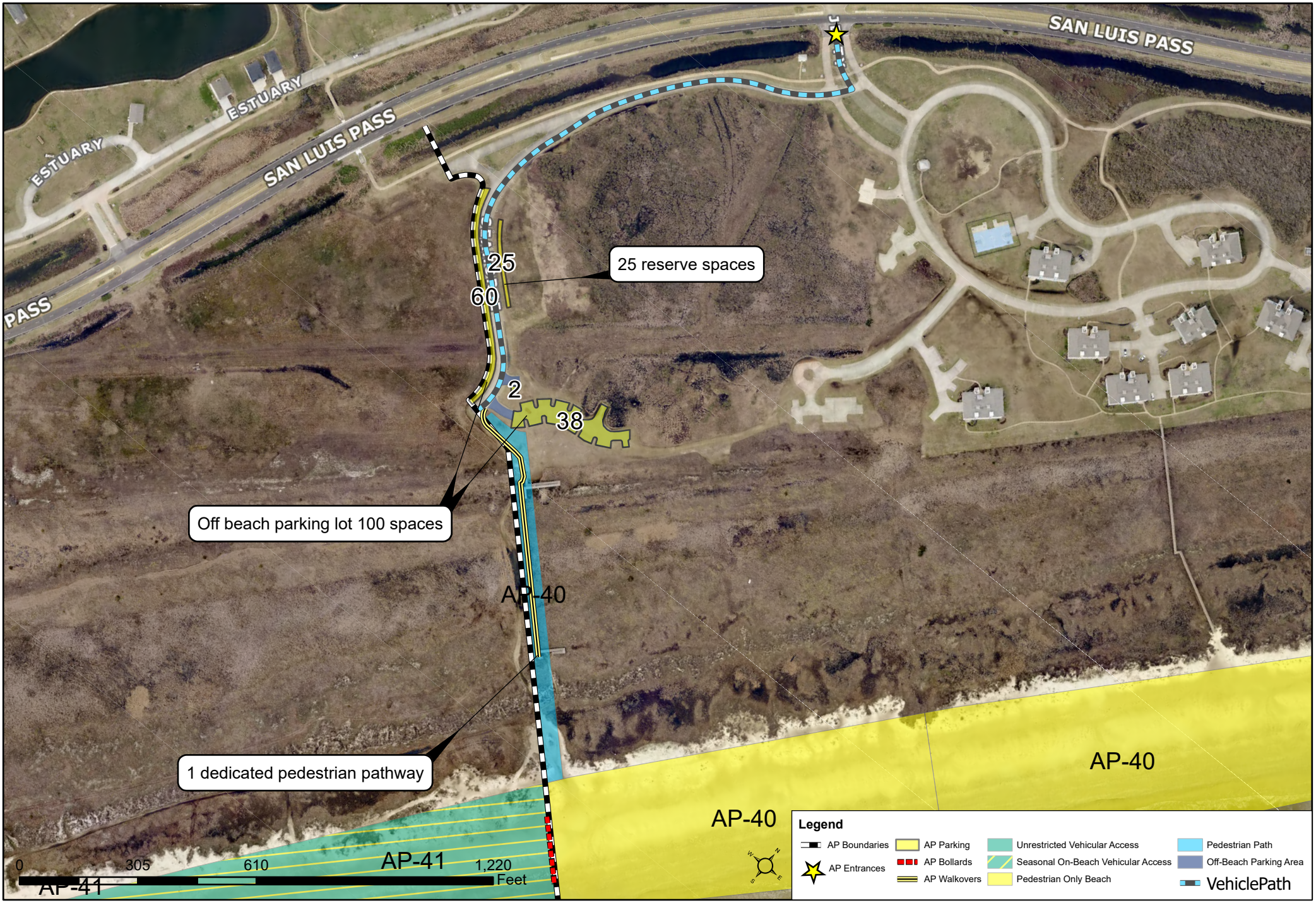
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #40, Pointe San Luis 3

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/27/2024

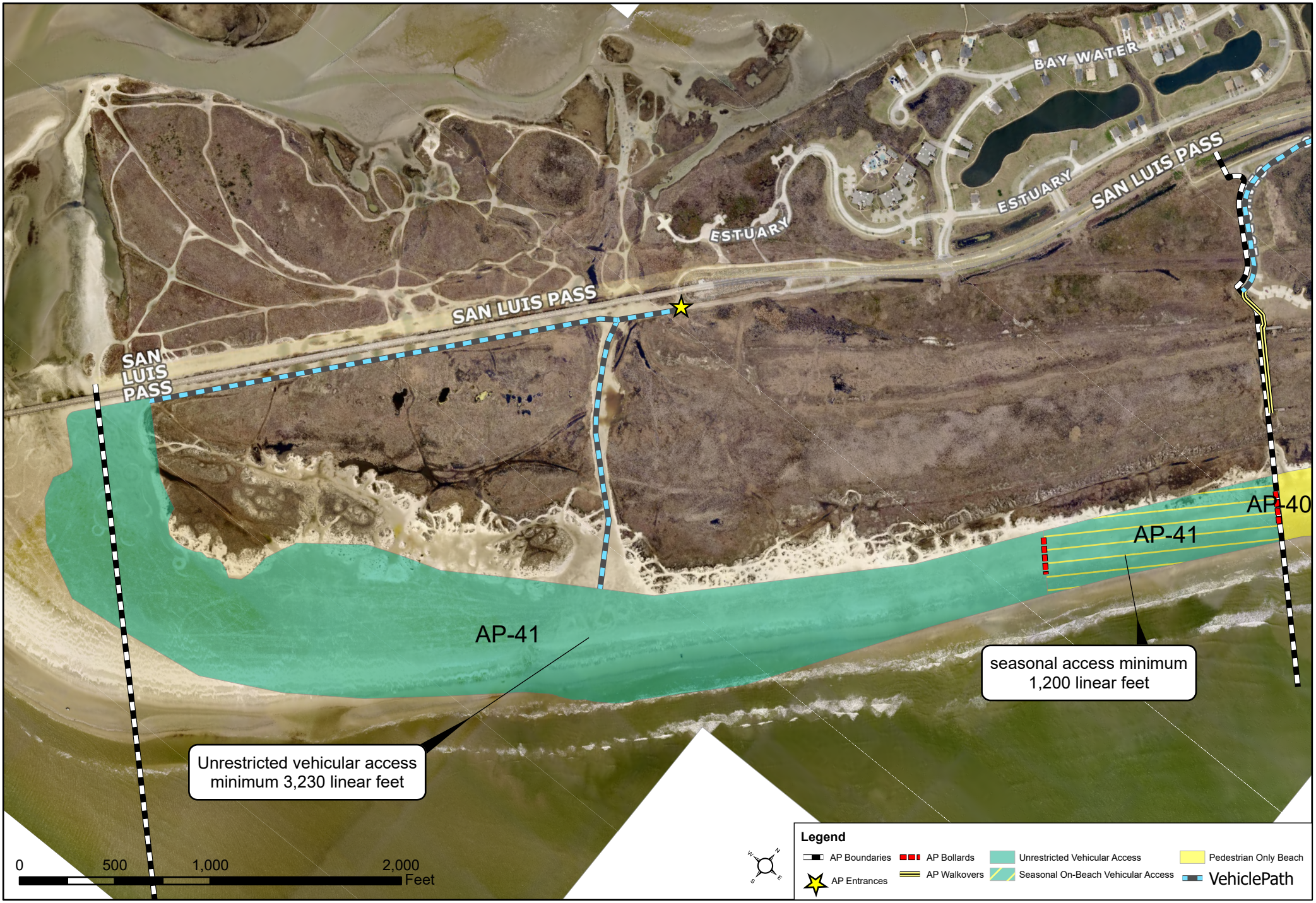
Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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City of Galveston, Beach Access Point #41, Pointe San Luis 4

Map prepared by the City of Galveston Development Services Department (hcummings) - 3/27/2024

Data Sources: Aerial Imagery from ESRI, and Parcel Data from Galveston CAD.

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Exhibit D

Dune Restoration Priority





Department of Planning and Community Development
823 Rosenberg, Room 401
Galveston, Texas 77550
(409) 797-3660

City of Galveston
Dune Restoration & Beach Nourishment
Priority Areas - Erosion Response Plan

0 1.5 3
Miles

Map Last Updated: 1/13/2012

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