



MEMO

TO: The Honorable Mayor and City Council

FROM: Kirk Abbott, P.E., Project Engineer, Engineering & CIP

THROUGH: Bert Lumbreras, City Manager
Joe Pantalione, Assistant City Manager
Laurie Moyer, P.E., Director of Engineering & CIP

DATE: April 16, 2021

RE: **Airport Master Plan and Public Health Studies**

City Council provided direction at the April 6th Council Work Session to proceed with adoption of the Airport Master Plan; however, there were questions about whether the Airport Master Plan looked at public health conditions for residents near the airport. This memo is to address Council's questions and concerns.

As discussed in the meeting, the Airport Master Plan covered environmental factors in conformance with criteria required by the Federal Aviation Administration (FAA). These criteria do not include any type of public health related study. Pages 47-52 of the master plan document summarize the process for the San Marcos Regional Airport.

Based upon the Council's questions about public health impacts associated with airports, staff conducted a brief literature search. Copies of the literature reviewed are provided. Most of the papers are prepared at a level above the expertise of City staff, but the highlights gleaned from the review are listed below.

- The studies found were conducted by federal governments, institutes of higher education or environmental health professionals. No studies were found conducted by cities.
- Papers referenced the difficulty in correlating data specifically to air traffic pollution because those pollutants are also typical in urbanized areas due to automobile emissions. Two California papers discussed how they isolated air quality measurements to better reflect air traffic impacts.
- The studies occurred at airports having significantly greater air traffic, both in the number and size of airplanes.
- Emission particulates potentially posing the greatest concern may have no regulatory limits established or did not exceed concentrations established in the National Ambient Air Quality Standards (NAAQS.)
- Proximity to and being downwind of aircraft emissions and fuel are reflected in exposure impacts.
- There was concurrence that air traffic emissions are a pollution source and there is a need for more studies to better understand health impacts.

Currently land surrounding the San Marcos Regional Airport is relatively sparsely populated within a one-mile radius (see attached exhibit); however, future development in this area is expected due to our rapid growth and the completion of FM 110. Texas Aviation Partners (TAP) and city staff have

discussed initiating zoning around the airport for height hazard and airport compatibility. This effort would provide the opportunity for additional outreach to residents and property owners surrounding the airport.

Based upon the Council discussion and our research, we have the following comments and recommendations:

- The level of expertise needed to conduct a public health study is outside the capability of City staff. Should the City Council desire to pursue a study, the County's Office of Epidemiology or some other health services organization should oversee the effort.
- Staff and Texas Aviation Partners plan to initiate the airport zoning process within the next 6 months. This effort will be conducted by City Planning, Engineering and TAP staff.
- As projects identified in the Airport Master Plan are moved forward to design, the City's Sustainability Checklist (attached) will be used to ensure that the projects are meeting the goals as approved by the Sustainability Committee (presentation attached).

Attachments

1. Map of area surrounding airport highlighting 1-mile buffer.
2. Sustainability Checklist used for CIP projects.
3. Sustainability Committee Presentation – October 26, 2020

References (not all inclusive)

Transportation Research Board (2015). Understanding Airport Air Quality and Public Health Studies Related to Airports. ACRP Report 135.

https://www.researchgate.net/publication/279848831_Understanding_Airport_Air_Quality_and_Public_Health_Studies_Related_to_Airports

- a. Katja M. Bendtsen, Elizabeth Bengtsen, Anne T. Saber and Ulla Vogel. (2021). A review of health effects associated with exposure to jet engine emissions in and around airports. *Environmental Health*. 20, Article number: 10 (2021)
- b. Wendy Gutschow (2019) Airport pollution linked to acute health effects among people with asthma in Los Angeles, article for USC Environmental Health Centers Research
- c. Wolfram Schlenker and W. Reed Walker (2015). Airports, Air Pollution, and Contemporaneous Health.
- d. David Welch, Kim N. Dirks, Daniel Shepherd, and David McBride (2018). Health-Related Quality of Life is Impacted by Proximity to an Airport in Noise-Sensitive People. *Noise Health* 2018. 20(96): 171–177.
- e. Page, Michelle L. (2017) Characterization of Jet Fuel Combustion Emissions During a C-130 Aeromedical Evacuation Engines Running Onload, Thesis, Air Force Institute of Technology
- f. Joachim D Pliel, Leslie B Smith and Sanford D Zelnick (2000) Personal Exposure to JP-8 Jet Fuel Vapors and Exhaust and Air Force Bases. *Environmental Health Perspectives* Vol 108, Number 3
- g. Léa Touri, Hélène Marchetti, Irène Sari-Minodier, Nicolas Molinari, Pascal Chanez (2013). The airport atmospheric environment: respiratory health at work. *European Respiratory Review*. 2013 22: 124-130 <https://err.ersjournals.com/content/22/128/124#F1>

- h. Bulletin of the World Health Organization, Improving the health aspects of airports
www.who.int/bulletin/volumes/96/8/18-020818
- i. Lin S, Munsie JP, Herdt-Losavio M, Hwang SA, Civerolo K, McGarry K, Gentile T. Residential proximity to large airports and potential health impacts in New York State. *Int Arch Occup Environ Health*. 2008 Jul;81(7):797-804. doi: 10.1007/s00420-007-0265-1. Epub 2007 Oct 16. PMID: 17938951.
- j. W Passchier 1, A Knottnerus, H Albering, I Walda (2000). Public health impact of large airports. *National Library of Medicine Jan-Jul 2000*. 15(1-2):83-96.

Existing residential
development within 1
mile radius of runway
ends

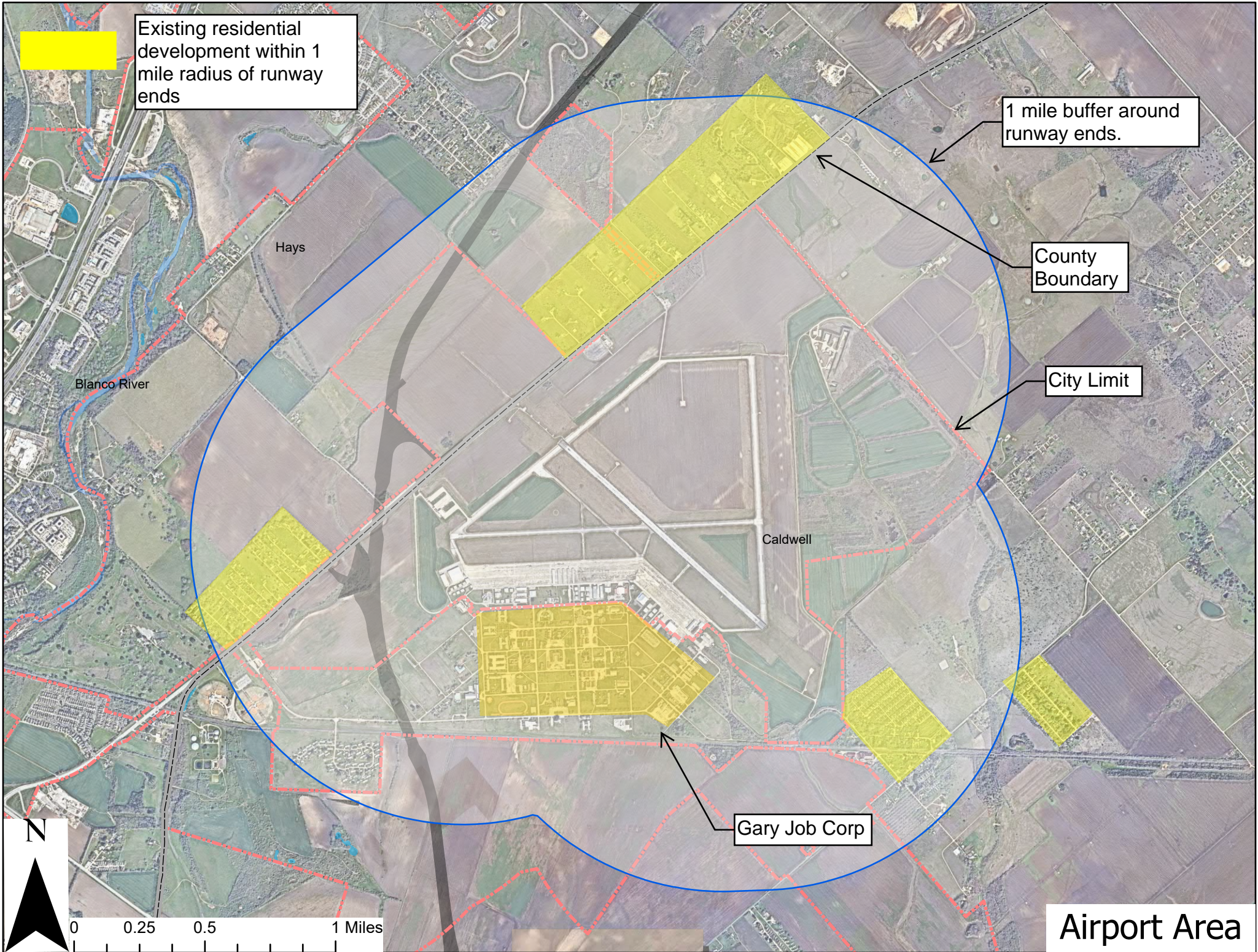
1 mile buffer around
runway ends.

County
Boundary

City Limit

Gary Job Corp

Airport Area



Hays

Blanco River

Caldwell



0 0.25 0.5 1 Miles

City of San Marcos

Engineering Sustainability Checklist

The 5 following sustainable infrastructure qualities will be considered during the design and construction of City CIP projects. Each project should incorporate and document the inclusion of items listed or others beginning in the initial project phase.

Benefit Sharing

- Project uses current infrastructure design standards
- Outreach methods appropriate with demographics of project area
- Connect with area “leaders” during design and construction
- Transit and social services coordination to determine any project impacts
- Real Estate transactions must consider potential title issues & language barriers
- Design uses Complete Streets policy
- Consider customer-side cost implications

Environmental Resilience

- Atlas 14 for stormwater design
- Natural channel design
- Green vs. Gray evaluation
- Water quality treatment consistent with LDC
- Urban Arborist and Habitat Conservation Manager consultation during design
- Early state and federal agency coordination
- Tree mitigation required
- Native & xeriscape plantings
- Stormwater runoff during construction
- Post construction re-vegetation

Social Acceptability

- Project web page
- Engage public in sustainable design options
- Public meeting during preliminary engineering phase
- Public meeting at design phase initiation
- Public meeting prior to construction
- Identify key stakeholders and engage at appropriate milestones
- Project permitting with Texas Historical Commission
- Context sensitive design elements

Economic & Institutional Effectiveness

- Use standard products.
- Demonstrate project benefit to budget, costs and citizens.
- Buy-in from operations on future maintenance responsibilities.
- Research during design from previous project issues
- Feed back loop after construction
- Annual update to standard products and specifications.
- Projects design incorporates master planning
- City provides current master plans

Future Proofing & Strategic Planning

- Project developed within City budget
- Master plan/strategic initiative based
- Project prioritizes leveraging funds, public health & safety
- Asset management based
- Connection to on-going maintenance funding

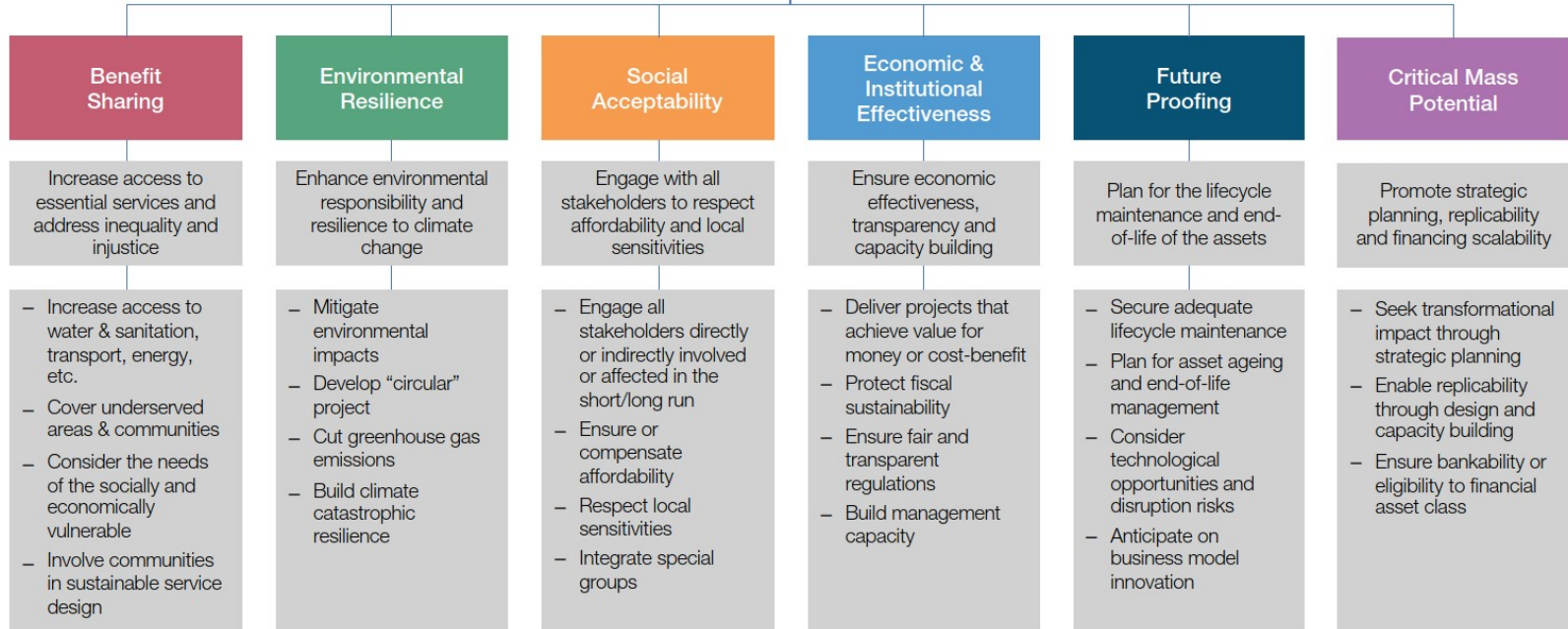


Implement sustainable infrastructure solutions in the City's capital improvement program effort.

- a) Develop design guidelines/checklist for use in evaluation of project scopes**
- b) Develop pattern book of sustainable solutions**



GFC-6 Sustainable Infrastructure Qualities





Sustainable Infrastructure Qualities

Benefit Sharing

GFC-6

Increase access to essential services and address inequality and injustice

San Marcos

CIP projects will be consistent within the community and seek to remove impediments within vulnerable or underserved areas

Checklist:

- ✓ Use current infrastructure design standards
- ✓ Use outreach methods appropriate with demographics of project area
- ✓ Connect with area “leaders” during design and construction
- ✓ Transit and social services coordination
- ✓ Real Estate transactions must consider potential title issues & language barriers
- ✓ Complete Streets
- ✓ Consider customer-side cost implications



Sustainable Infrastructure Qualities

Environmental Resilience

GFC-6
Enhance
environmental
responsibility and
resilience to climate
change

San Marcos
CIP projects will be
designed to protect our
environment and for
resiliency to climate
change.

Checklist:

- ✓ Atlas 14 for stormwater design
- ✓ Natural channel design
 - Green vs. Gray evaluation
- ✓ Water quality treatment consistent with LDC
- ✓ City Arborist and Habitat Conservation Manager consultation during design
- ✓ Early state and federal agency coordination
- ✓ Tree mitigation required
- ✓ Native & xeriscape plantings
- ✓ Stormwater runoff during construction
- ✓ Post construction re-vegetation



Sustainable Infrastructure Qualities

Social Acceptability

GFC-6

Engage with all stakeholders to respect affordability and local sensitivities

San Marcos

CIP projects will engage stakeholders during design and construction to listen, to inform, and to develop project consent.

Checklist:

- ✓ Maintain project web page
- Engage public in sustainable design
- ✓ Public meeting during preliminary engineering phase
- ✓ Public meeting at design phase initiation
- ✓ Public meeting prior to construction
- ✓ Identify key stakeholders and engage at appropriate milestones
- ✓ Project permitting with Texas Historical Commission
- ✓ Context sensitive design elements



Sustainable Infrastructure Qualities

Economic & Institutional Effectiveness

GFC-6

Ensure economic effectiveness, transparency, and capacity building

San Marcos

CIP projects will provide value for the current and long-term investment.

Checklist:

- ✓ Use of standard products.
- ✓ Demonstrate benefit to budget, costs and citizens.
- ✓ Buy-in from operations with future maintenance responsibilities.
- ✓ Research during design
- ✓ Feed back loop after construction
- ✓ Annual update to standard products and specifications.
- ✓ Review and incorporate master planning
- ✓ Maintain master plans



Sustainable Infrastructure Qualities

Future Proofing & Strategic Planning

GFC-6

Plan for the lifecycle maintenance and end-of-life of the assets.

Promote strategic planning, replicability, and financing scalability

San Marcos

The Capital

Improvement Program will be developed based upon financial responsibility, strategic planning and stewardship of City assets.

Checklist:

- ✓ Developed within a financial framework
- ✓ Master plan/strategic initiative based
- ✓ Prioritizes leveraging funds, public health & safety
- Asset management based
- Connection to on-going maintenance funding



Pattern Book of Sustainable Solutions

- Technical Design Manuals for:
 - Stormwater
 - Water
 - Wastewater
 - Transportation
- Standard Details & Specifications
- Standard Product List

B.1: LOW IMPACT DEVELOPMENT STORMWATER CONTROL MEASURES

In order for Low Impact Development (LID) to be effective, basic guidelines need to be established for design, construction, and maintenance. This guide provides professionals through the LID process. The LID process is provided for the three appropriate for the San Marcos region: pavement, and rainwater harvesting. Several other structural controls, wetlands, and proprietary systems for more information if project implement these practices.

LID practices use natural features off. Project characteristics will determine which LID Measures (SCMs) are applicable. LID requirements, project management, such as site location, existing site elements. These characteristics are important because LID SCMs are other project elements; therefore site assessments to avoid the need for LID early in the site design stage cost of traditional drainage infrastructure to be conveyed off-site.

Though the LID toolbox is unlimited, the LID toolbox is limited by above structural tools as they are not applicable in the San Marcos region. Further, many of the LID practices are designed to reduce both runoff volume and peak flow.

B.1.1: INTRODUCTION

LID features employ principles of natural landscape features, minimizing and employing processes of infiltration and detention of stormwater. LID can be structural or non-structural. By using LID practices, water can be managed on-site and promotes the health of an ecosystem or watershed. Appropriate LID practices should be selected based on site characteristics and project requirements.

maintain or restore a watershed's hydrologic and ecological functions. These principles, and the strategies described below can be of the most benefit when used together, often in a linked series of measures.

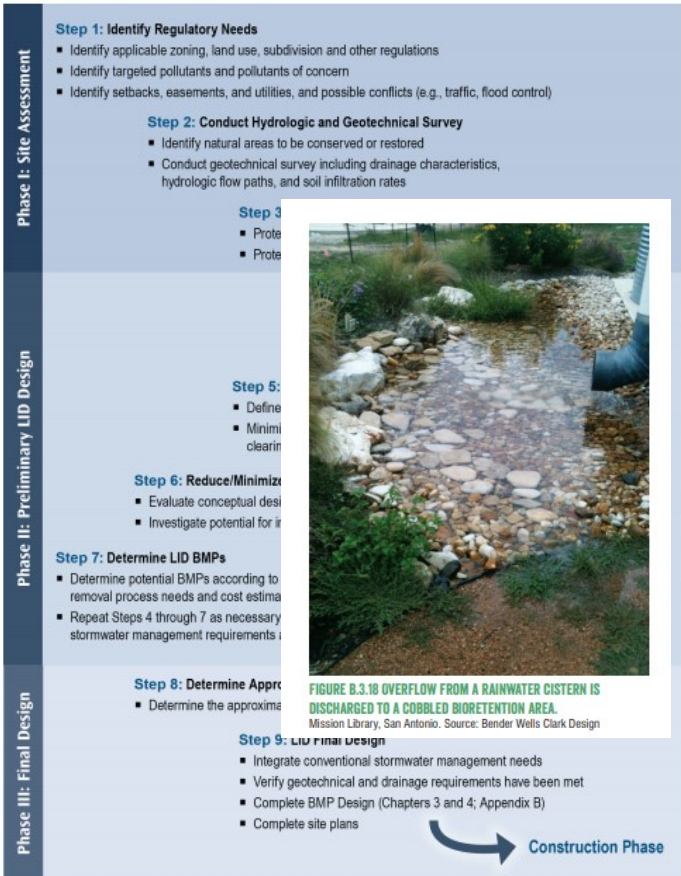


FIGURE B.2.1 STEPS TO DEVELOP A SITE PLAN WITH INTEGRATED STORMWATER MANAGEMENT.