RUTHRAUFF BASIN MANAGEMENT PLAN

Alternatives Workgroup Meeting – June 9th, 2015

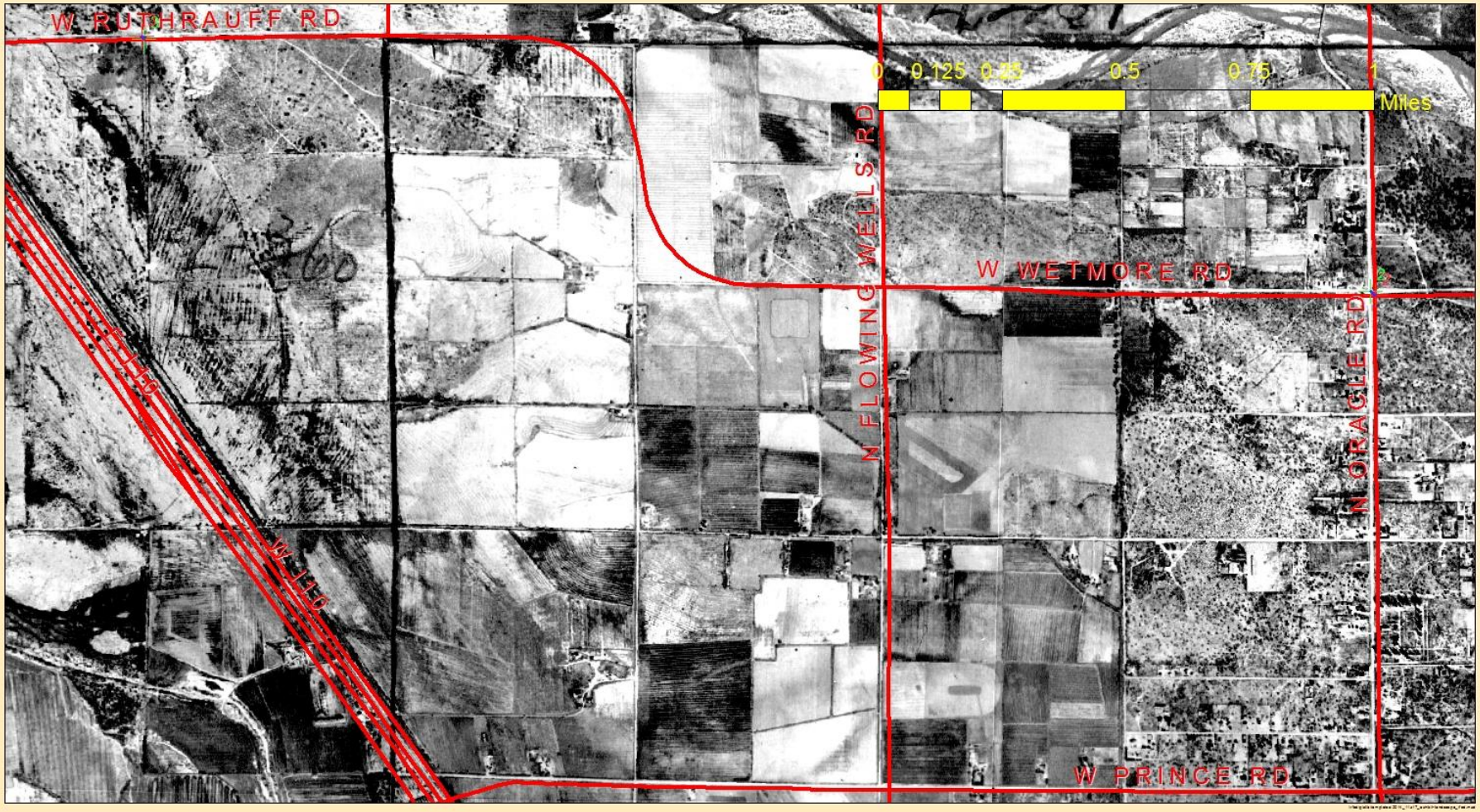
Ellie Towne Flowing Wells Community Center

CITY OF TUCSON

PIMA COUNTY FLOOD CONTROL

PROJECT PURPOSE & NEED

- *Develop a Comprehensive Flood Control Program*
- *Develop Cost Effective Drainage Alternatives*
- *Provide a Balanced Multi-Objective Approach*
- *Provide a Basis for Future Budgets to Reduce Flooding*



PIMA COUNTY
FLOOD CONTROL
Pima County Regional Flood Control District
97 E Congress - 3rd Floor
Tucson, Arizona 85701-1207
(520) 724-4600, FAX: (520) 724-4621
http://www.rfcd.pima.gov

Project Area - 1936

1 inch = 1,000 feet

0 250 500 1,000 1,500 2,000 Feet

Date:

The information depicted on this display is the result of digital analyses performed on a variety of databases provided and maintained by several governmental agencies. The accuracy of the information presented is limited to the collective accuracy of these databases on the date of the analysis. The Pima County Regional Flood Control District makes no claims regarding the accuracy of the information depicted herein.

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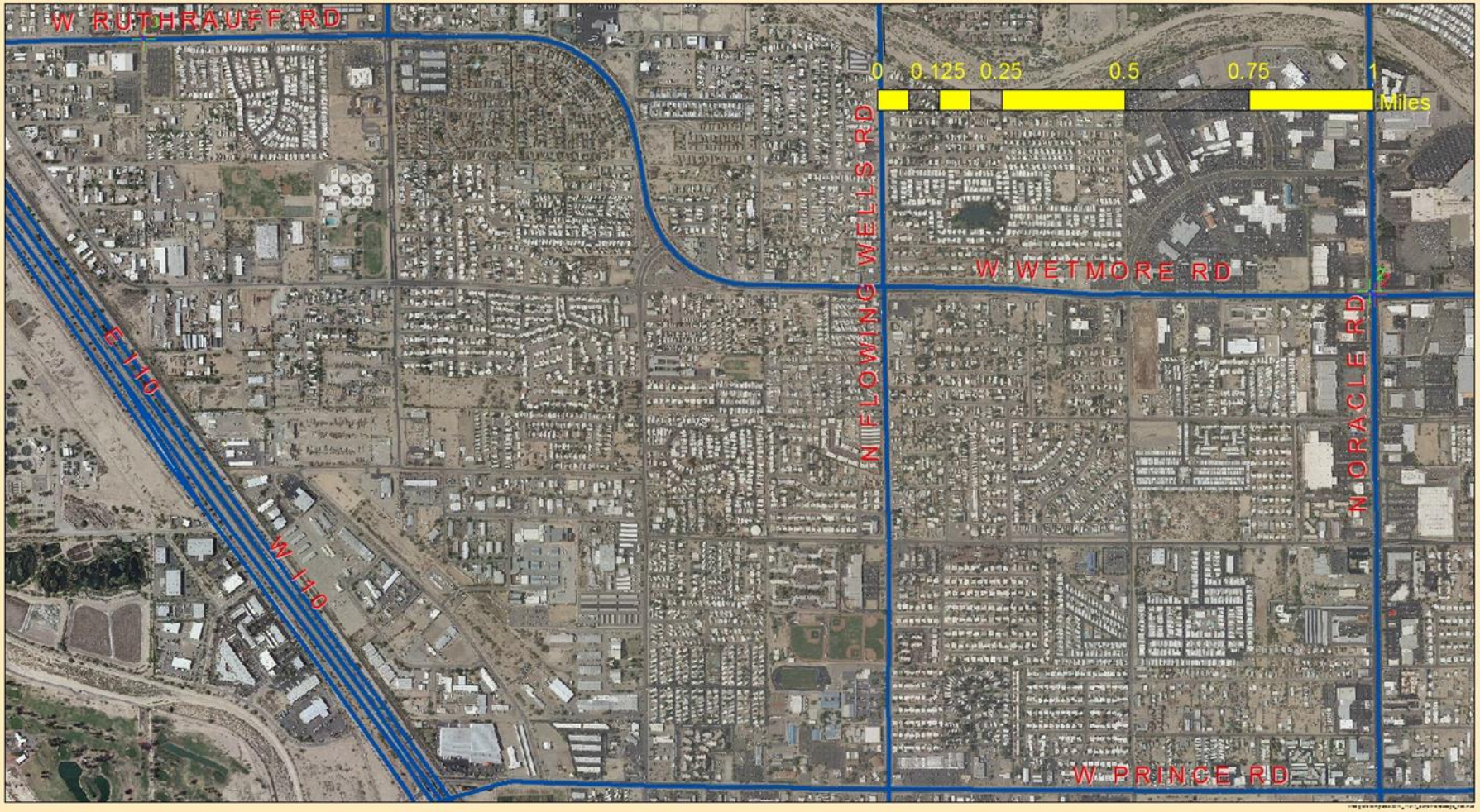

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Project Area - 2011

1 inch = 1,000 feet

0 250 500 1,000 1,500 2,000 Feet

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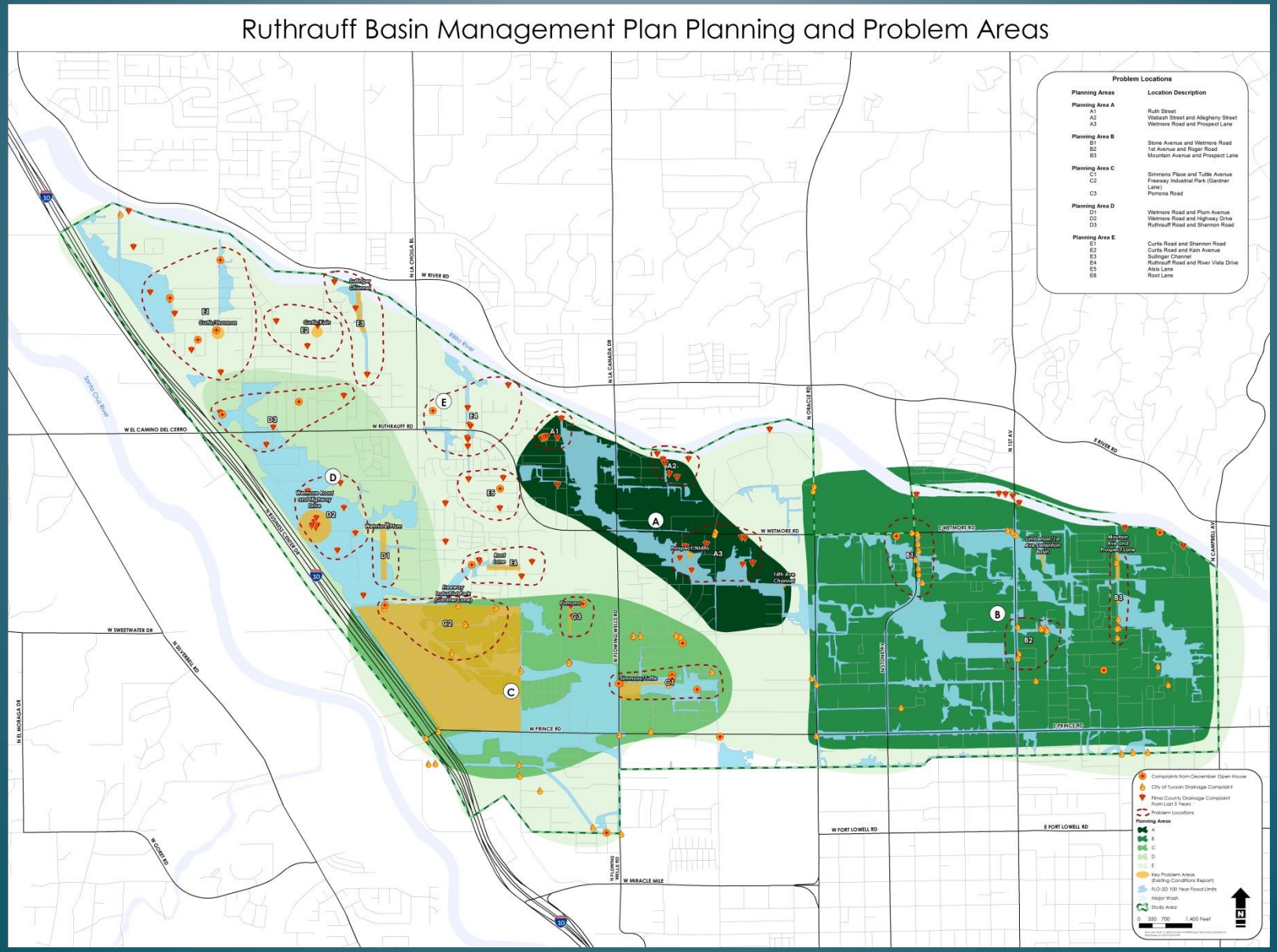
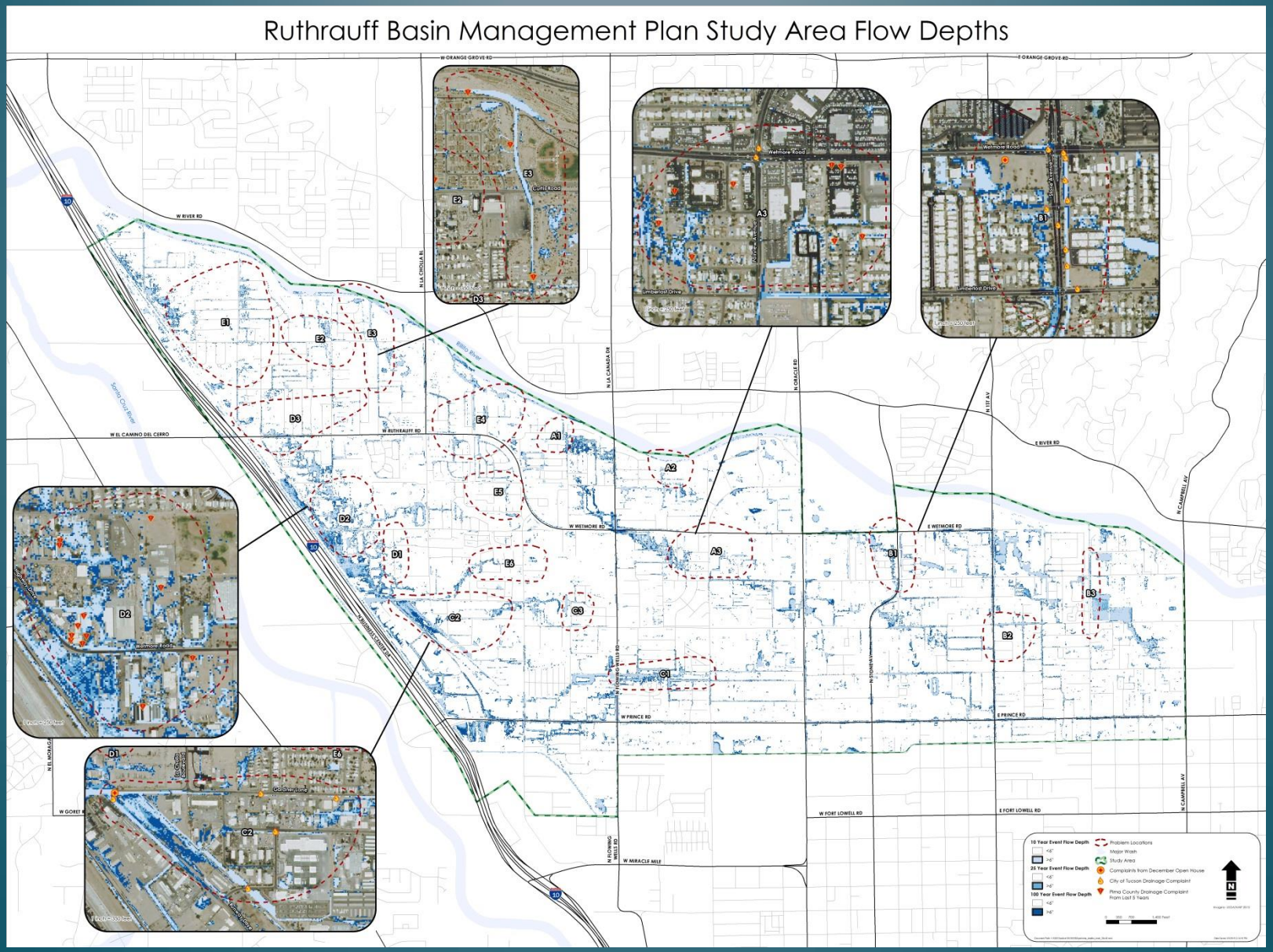
PLANNING AND PROBLEM AREAS



FLOW DEPTHS



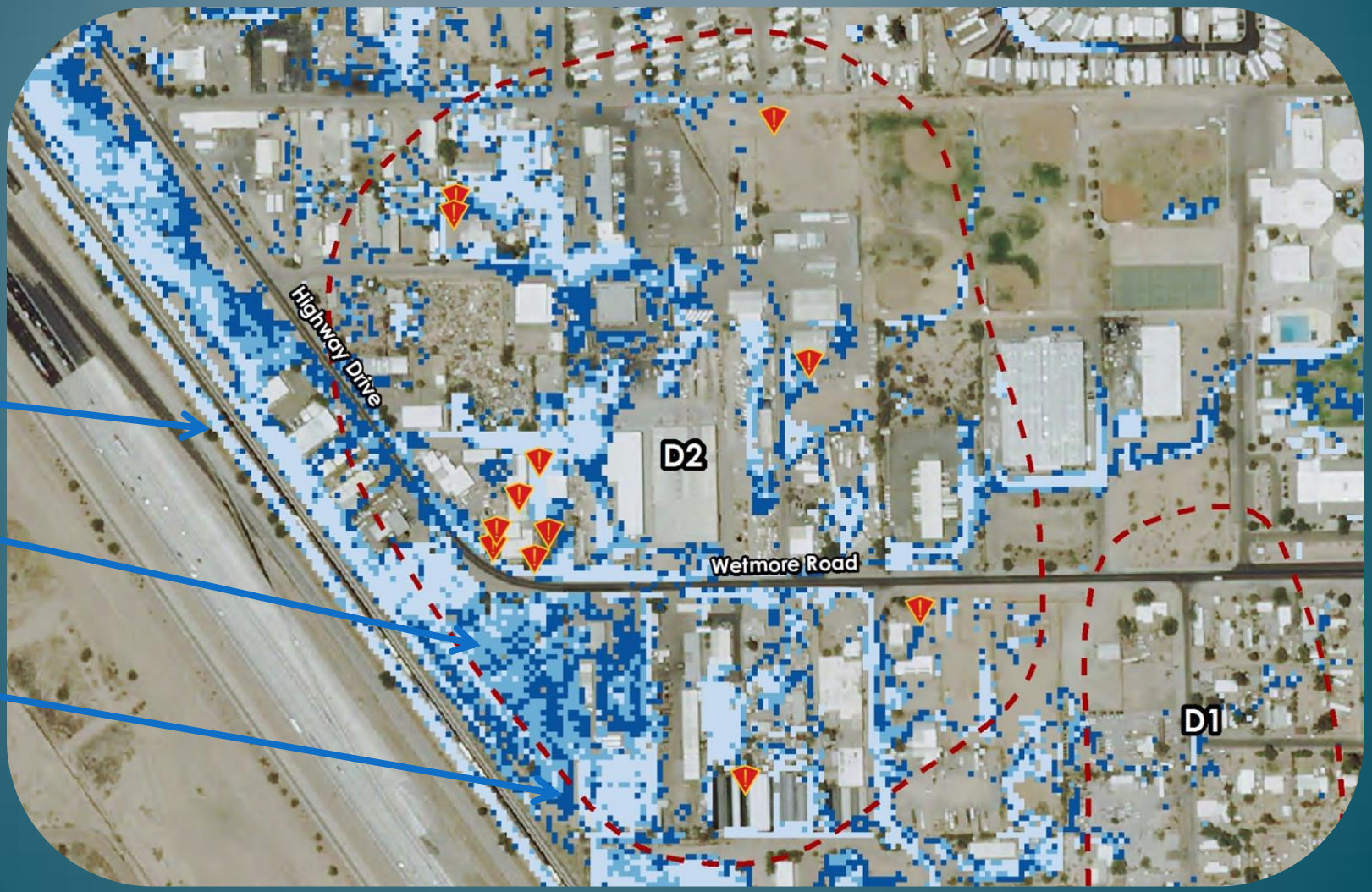
Ruthrauff Basin Management Plan Study Area Flow Depths
W ORANGE GROVE RD
E ORANGE GROVE RD
W RIVER RD
W EL CAMINO DEL CERRO
W RUTHRAUFF RD
W WETMORE RD
E WETMORE RD
E RIVER RD
W PRINCE RD
E PRINCE RD
W FORT LOWELL RD
E FORT LOWELL RD
W MIRACLE MILE
N LA CANADA DR
N ORACLE RD
N 1ST AV
N CAMPBELL AV
N FLOWING WELLS RD
N STONE AV
N MORAGA
Santa Cruz River
Rillito River
Wetmore Road
Limberlost Drive
Golden Lane
10 Year Event Flow Depth
<6"
>6"
25 Year Event Flow Depth
<6"
>6"
100 Year Event Flow Depth
<6"
>6"
Problem Locations
Major Wash
Study Area
Complaints from December Open House
City of Tucson Drainage Complaint
Pima County Drainage Complaint From Last 5 Years
N

FLOW DEPTHS EXAMPLE

10 -yr

25 -yr

100 -yr



WHAT HAVE WE LEARNED ABOUT DRAINAGE AND FLOODING?

To date…

- Low velocity
- Lots of Ponding (~1/3 of area in 100-yr, 1/5 in 10 yr)
- Ponding is relatively shallow (less than 0 – 3 feet)
- Problems occur on roads and on private property

AGENDA

- **10:00 – Introductions and Opening Comments**
- **10:10 Meeting Purpose**
- **10:20 – Project Status**
- **10:30 – Alternatives Workgroup Involvement**
  - Develop Performance Criteria Weighting Values (by whole workgroup)
  - Review of Specific Criteria Spreadsheet (by whole workgroup)
- **11:00 – Develop Specific Criteria and Specific Weighting Values** (by subgroup)
- **1:30 – Review and Augment Seedlist of Alternatives** (by whole workgroup)
- **2:20 – Summary and Next Steps**
- **2:30 – Adjourn**

MEETING PURPOSE

1. Brief Status Update
2. Initiate Alternatives Workgroup Process
3. Review and Augment Alternatives Seedlist (time permitting)

PROJECT STATUS

- Background and Overview
- Project Area
- Schedule

EXISTING CONDITIONS REPORT

Ruthrauff Basin
Management Plan
Existing Conditions Analyses
Final Report

Appendix A to the DRAFT TSDN

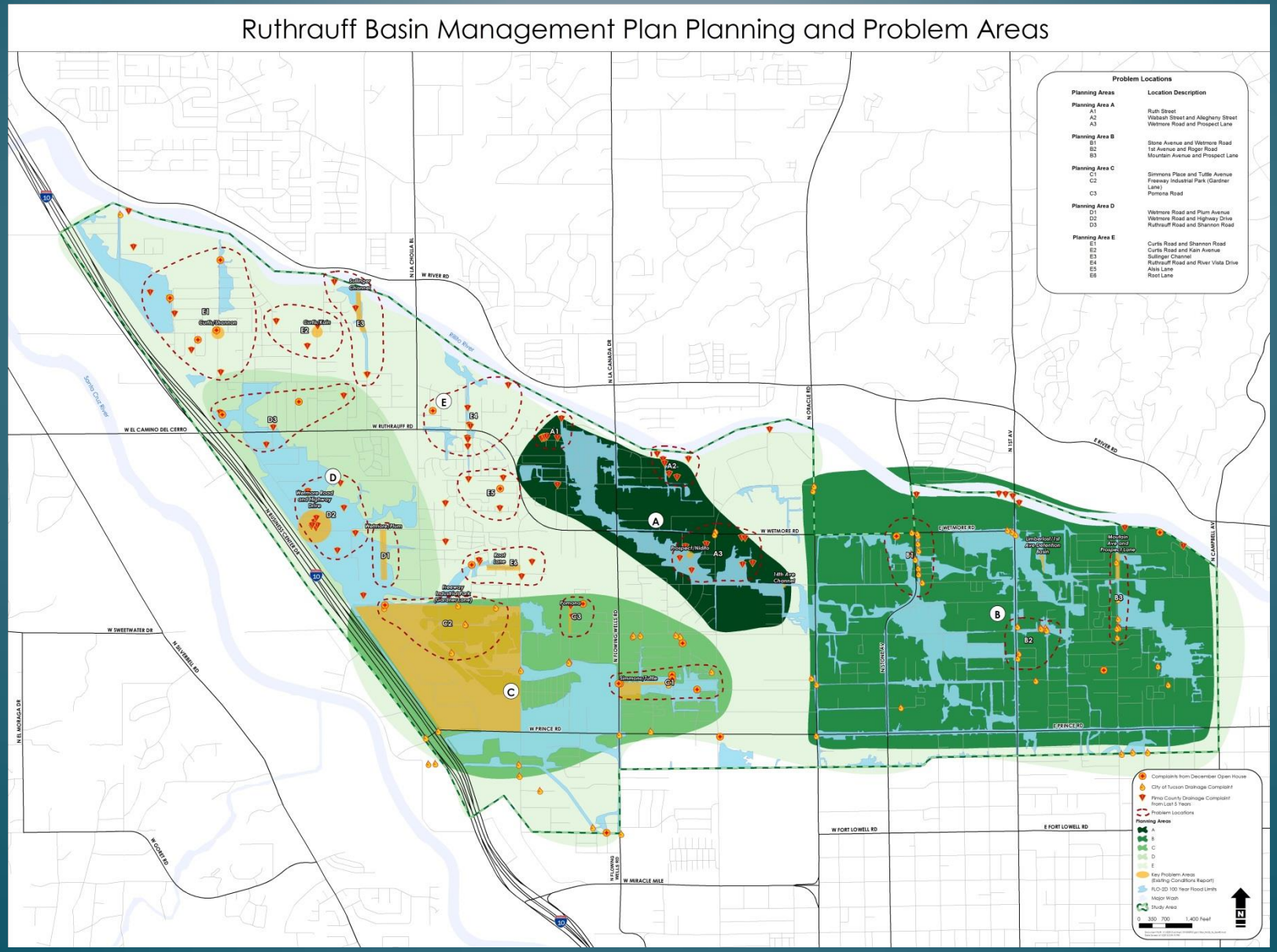
Stantec

Prepared for:
Pima County Regional Flood
Control District

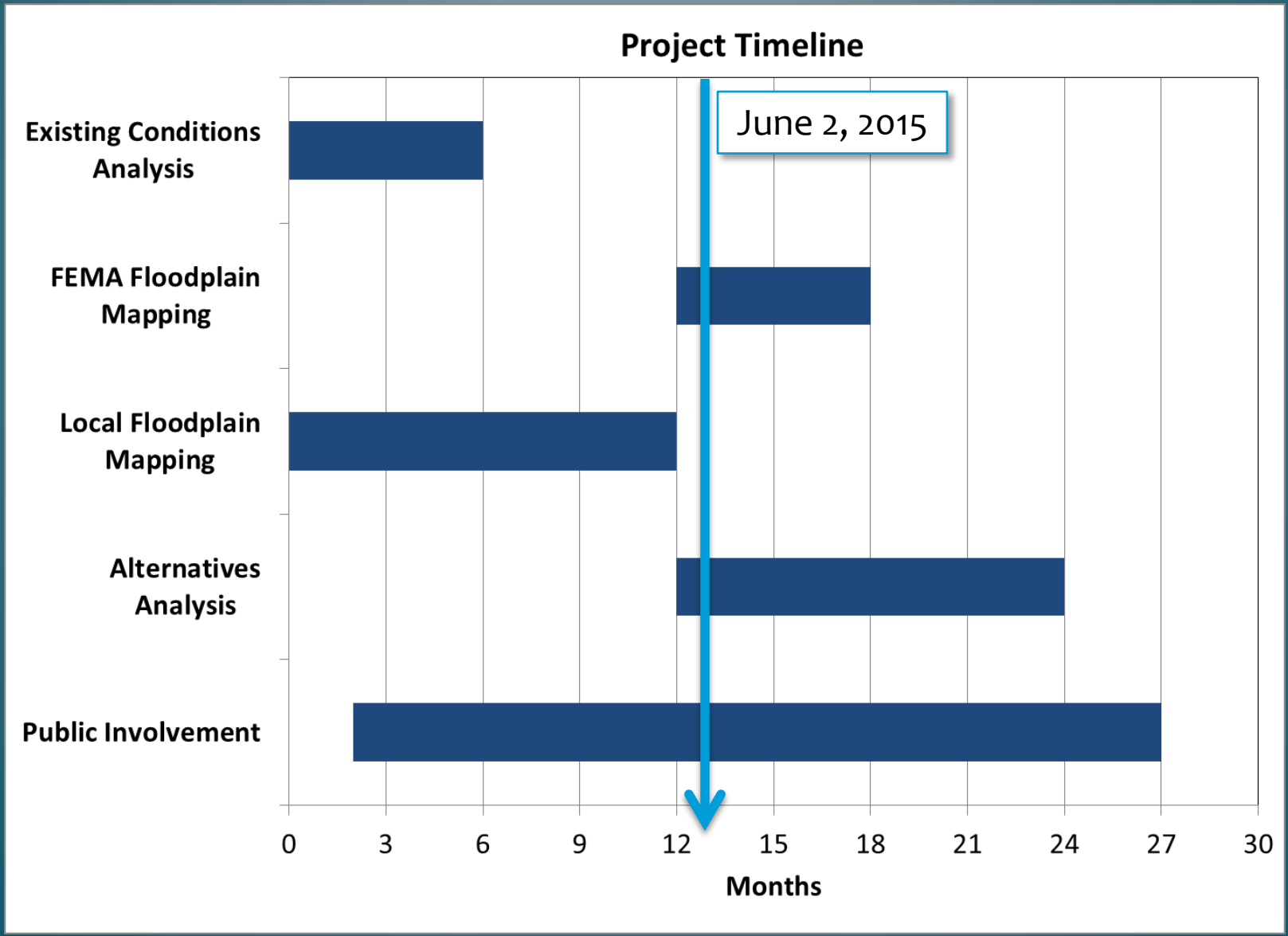
Prepared by:
Stantec Consulting
5151 E. Broadway, Suite 400
Tucson, Arizona 85711

January 12, 2014

PLANNING AND PROBLEM AREAS



PROJECT SCHEDULE



ALTERNATIVES WORKGROUP INVOLVEMENT

- Select Stakeholders Included in Developing & Scoring Alternatives
- Alternatives Process
  - Performance Criteria Established Already (RBMP Team)
    1. Community
    2. Economic Vitality
    3. Implementation
    4. Public Safety
    5. Sustainability
  - Develop Performance Criteria Weighting Values (By Whole Workgroup)
  - Review of Specific Criteria Spreadsheet (By Whole Workgroup)

ALTERNATIVES EVALUATION CRITERIA AND SCORING FLOW CHART

1. Establish 5 performance criteria.
2. Determine relative weighting valves for performance criteria.
3. Develop specific scoring criteria.
4. Determine relative weighting valves for special criteria.
5. Refine seedlist of alternative solutions for the Ruthrauff drainage problems.
6. Select potential alternatives for each problem type and/or location.
7. Score each problem alternative using performance and specific criteria valves.
8. Add costs to top ranked alternatives.
9. Evaluate for fatal flaws.
10. Determine recommended alternative.

SCORING CRITERIA

PUBLIC SAFETY CRITERIA

No.	Performance Criteria	Specific Criteria Weighting		Specific Criteria Scoring Descriptions
1	**Remove or protect existing structures from floodprone areas and/or from hazards due to lateral migration, bank erosion, sediment deposition and/or scour.** This criteria measures the basic capacity of the alternative to protect existing structures from flood and erosion hazards.	2.2	10	Significant number of structures removed or protected.
			6	Moderate number of structures removed or protected.
			2	Minimal number of structures removed or protected.
			0	No structures removed or protected.
2	**Provide all-weather access to existing structures.** This criteria measures the degree to which all-weather access (depth of flow less than one foot across the roadway during the 100-year flood) to existing development.	1	10	Significant improvement in access
			6	Moderate improvement in access
			2	Minimal improvement in access
			0	No improvement in access
3	**Avoids potential for an attractive nuisance and associated risk to public safety.** This criteria measures the degree to which the alternative minimizes the potential for creation of structures or facilities which may entice children or juveniles to recreate in an unplanned or unacceptable manner at the structure or facility	0.3	10	Complete avoidance
			6	Moderate avoidance
			2	Low avoidance
			0	No avoidance
4	**Maps new floodway, erosion hazard zones or other no-build corridors.** This criteria measures the capacity of an alternative to identify areas of high hazard where new construction should not take place. It increases flood safety by minimizing the potential for creation of new development subject to flood and erosion	1.2	10	Significant increase in mapped areas.
			6	Moderate increase in mapped areas.
			2	Minimal increase in mapped areas.
			0	No increase in mapped areas.
5	**Promotes public awareness of flood and/or erosion hazards.** This criteria measures the degree to which an alternative promotes awareness of flood and erosion hazards, which in turn discourages unwise use and occupation of those areas.	1	10	Significant increase in awareness.
			6	Moderate increase in awareness.
			2	Minimal increase in awareness.
			0	No increase in awareness.
	Total Specific Criteria Weighting	5.7		

PERFORMANCE CRITERIA EXAMPLE

Public Safety:

- Public Safety
- Remove or protect existing structures from flood prone areas.
  - This criteria measures the basic capacity of the alternative to protect existing structures from flood and erosion hazards.
- Maps new floodway, floodplain, erosion hazard zones or other no-build corridors.
  - This criteria measures the capacity of an alternative to identify areas of high hazard where new construction should not take place. It increases flood safety by minimizing the potential for creation of new development subject to flood and erosion hazards. Promotes public awareness of flood and/or erosion hazards.
- Promotes public awareness of flood and/or erosion hazards.
  - This criteria measures the degree to which an alternative promotes awareness of flood and erosion hazards, which in turn discourages unwise use and occupation of those areas.

PERFORMANCE CRITERIA WEIGHTING VALUES SCORING MATRIX

Performance Criteria:		Preference	Preference	Preference	Preference	**Total points**
		A or B	A or C	A or D	A or E	
A.	Community					
		B or C	B or D	B or E		
B.	Economic Vitality					
		C or D	C or E			
C.	Implementation					
		D or E				
D.	Public Safety					
E.	Sustainability					

Now let's try it…

DEVELOP SPECIFIC CRITERIA AND SPECIFIC WEIGHTING VALUES

- Develop Specific Criteria (by subgroup)
- Develop Specific Criteria Weighting Values (by subgroup)

CRITERIA WEIGHTING AND DEVELOPMENT

RUTHRAUFF BMP SPECIFIC CRITERIA WEIGHTING EVALUATION

8-Jun-15
Master List

PUBLIC SAFETY CRITERIA

No.	Performance Criteria	Specific Criteria Weighting		Specific Criteria Scoring Descriptions
1	**Remove or protect existing structures from floodprone areas.** This criteria measures the basic capacity of the alternative to protect existing structures from flood and flood related hazards.	2.2	10	Significant number of structures removed or protected.
			6	Moderate number of structures removed or protected.
			2	Minimal number of structures removed or protected.
			0	No structures removed or protected.
2	**Provide all-weather access to existing structures.** This criteria measures the degree to which all-weather access (depth of flow less than one foot across the roadway during the 100-year flood) to existing development.	1.0	10	Significant improvement in access
			6	Moderate improvement in access
			2	Minimal improvement in access
			0	No improvement in access
3	**Reduces maintenance due to sediment and erosion.** This criteria measures the degree to which maintenance operations are reduced following runoff events.	1.8	10	Significantly maintains maintenance needs
			6	Moderately maintains maintenance needs
			2	Minimally maintains maintenance needs
			0	Does not maintain maintenance needs
4	**Avoids potential for an attractive nuisance and associated risk to public safety.** This criteria measures the degree to which the alternative minimizes the potential for creation of structures or facilities which may entice children or juveniles to recreate in an unplanned or unacceptable manner at the structure or facility (e.g., skateboarding on the concrete slopes of a channel or detention basin).	0.3	10	Complete avoidance
			6	Moderate avoidance
			2	Low avoidance
			0	No avoidance

REVIEW AND AUGMENT SEEDLIST OF ALTERNATIVES

- Review of Typical Problems
- Review of Existing Seedlist of Alternatives and Discussion of Augmentation of the List of Alternatives

RUTHRAUFF BMP ALTERNATIVES BRAINSTORMING "SEEDLIST"

- **A. Structural Alternatives**
  - Retention and/or detention basins - online or offline (per Detention/Retention Manual)
  - Bank Stabilization
  - Conveyance channels/Channelization
  - Flood Walls
  - Levees
  - Flood proofing
  - Culverts
  - Road Improvements
    - Curbs
    - Inverted Crown
    - Others
  - Storm drains
  - Diversion channels/structures
  - Low flow channels
  - Restore Disturbed Areas
  - On-site individual lot retention/detention (per Detention/Retention Manual)
  - Stormwater Harvesting Basin (LID Guidance manual)
  - Vegetated or Rock Swale (LID Guidance manual)
  - Bioretention Systems (LID Guidance manual)
  - Infiltration Trenches (LID Guidance manual)
  - Permeable Pavements (LID Guidance manual)
  - Drywells (LID Guidance manual)
  - Cisterns (LID Guidance manual)
  - Soil amendments (LID Guidance manual)
  - Tree Vaults
  - Other

RUTHRAUFF BMP ALTERNATIVES BRAINSTORMING "SEEDLIST"

- **B. Non-Structural Alternatives**
  - Delineate additional floodplains
  - Delineate/preserve flow corridors
  - Utilize floodplain regulations
  - Floodplain Land Acquisition Program (FLAP)
  - Infill Development Criteria
    - Disconnect and Minimize Impervious (LID Guidance Manual)
    - Conserve and Protect Natural Flow Paths (LID Guidance Manual)
    - Minimize Disturbance and Soil Compaction (LID Guidance Manual)
    - Alternative Site Layouts (LID Guidance manual)
    - Others
  - Open space regulations/preservation/purchase
  - Flood warning systems
  - Public Education & Outreach
  - Flood Insurance
  - LID Practices
  - Stacked/multi-functional uses
  - Educates and involves the public
  - Qualitative value to property; gives a "sense of place"
  - Other
- **C. No Action**

THANK YOU