

PLANNING FUNDAMENTALS REFRESH – PRINCIPLES AND GUIDELINES CRITERIA

Patrick O'Donnell, OWPR Planner
Date: 17 August 2023



U.S. ARMY



US Army Corps
of Engineers®



PRINCIPLES AND GUIDELINES CRITERIA

What Do They Mean?

How Should They Be Used?

Why Should You Care?



The Four “P&G” Criteria (now the four PR&G Criteria)

- Completeness
- Effectiveness
- Efficiency
- Acceptability

In Place since September 1980 Principles & Standards and included in the 1983 Principles and Guidelines and 2013/2014 PR&G.

- *Not the same as the four PR&G Accounts
(NED, RED, EQ, OSE)*



Principles & Requirements, March 2013

H. Design of Alternatives. Each alternative plan, strategy or action is to be formulated *to consider* the following four criteria: completeness, effectiveness, efficiency, and acceptability.

GLOSSARY – some changes in definition from the 1983 P&G

Completeness is the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. **It does not necessarily mean that alternative actions need to be large in scope or scale.**



Principles & Requirements, March 2013

GLOSSARY – some changes in definition from the 1983 P&G

Effectiveness is the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.

Efficiency is the extent to which an alternative alleviates the specified problems and realizes the specified opportunities **at the least cost.**



Principles & Requirements, March 2013

GLOSSARY – some changes in definition from the 1983 P&G

Acceptability is the viability and appropriateness of an alternative from the perspective of the Nation's general public and consistency with existing **Federal** laws, authorities, and public policies. **It does not include local or regional preferences for particular solutions or political expediency.**



PR&G Guidelines, December 2014

7.iv. Formulating alternatives

Alternatives should comprehensively integrate multiple objectives for water resources investments. They should reflect a range of scales and management measures, and *be assessed against* the formulation criteria presented in the Principles and Requirements: completeness, effectiveness, efficiency, and acceptability.



PR&G Guidelines, December 2014

7.v. Evaluating Alternatives

Agency evaluation procedures shall incorporate methods to evaluate:

1. How public benefits of an alternative compare to its costs;
2. How alternatives perform with respect to the Guiding Principles; and
3. How alternatives perform *against* the four formulation criteria: completeness, effectiveness, efficiency, and acceptability.

Is “in consideration of” in P&G and P&R different than “assessed against”?



PR&G Criteria will be part of...

ER 1105-2-103 – currently the “EC_TBD Policy for Planning Studies, March 2023” that will soon officially be published as an Engineer Regulation.



Completeness

- Applying this Criterion: Which alternatives can stand on their own?
- Is full life-cycle considered?
- Is action needed from others for the plan to work?
- Did we include all costs for the benefits to be realized including OMRR&R costs, mitigation costs, LERRD costs?
- New EC_TBD includes “Completeness does not mean that all planning objectives are fully realized, only that the required resources and actions are included to achieve the estimated benefits. “



Effectiveness

Effectiveness is the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.

New EC_TBD “Effectiveness does not mean that all planning objectives need to be addressed or fully realized. The degree of effectiveness will be used to illustrate the trade-offs between plans when compared. “



Effectiveness

- Applying this Criterion: Objectives are defined based on alleviating problems and achieving opportunities, so which alternatives meet *some* or all objectives, to some degree, thereby alleviating *some* or all problems and achieving the opportunities?
- Most studies have a primary objective based on why a non-Federal sponsor contacted USACE to begin with. An alternative plan can be effective if it meets the primary objective but not a secondary objective based on an opportunity, such as adding recreation.



Efficiency

- **Efficiency** is the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost. (Previously “most cost-effective” in the 1983 P&G)



- Criterion: What is the cost per unit of output, or the benefit/cost ratio, ?



Acceptable

- PR&G definition: **Acceptability** is the viability and appropriateness of an alternative from the perspective of the Nation's general public and consistency with existing *Federal* laws, authorities, and public policies. **It does not include local or regional preferences for particular solutions or political expediency.**
- Criterion: minimally it is compatibility with ***Federal*** law, regulation, and policy. Determining acceptance by the public, stakeholders, and State and local entities is a qualitative judgment and can be difficult. (*ER 1105-2-100 does not specify Federal law*)



Acceptable

- Acceptability to sponsor, state and local governments helps determine if the recommended plan will be a Locally Preferred Plan (LPP) instead of a NED or NER plan.
- Acceptability also can be used to describe the issues and concerns provided from the public, stakeholders, sponsors, state and local governments, and therefore the *degree* of support or lack thereof to help display the level of acceptability of an alternative plan to decision makers.



Screening

Jeff Lin says: EVALUATE and COMPARE *in consideration* of 4 P&G criteria but you don't screen just because of public views or local ordinances for acceptability.

BE CAREFUL about screening too soon



Examples - Completeness



Is this deep draft navigation alternative plan complete?



Examples - Completeness



Deep Draft Navigation

The project consists of a 500-foot-long channel segment 43 feet deep and 400 feet wide, with a bend to a 900-foot-long channel segment 43 deep and 400 feet wide.

Is this recommended alternative plan complete?

Not yet. There are no Local Service Facilities (berthing areas, docks, cranes, or other equipment on the shore for receiving, storing, and transferring cargo, and no access roads) so it has not included “all necessary investments or other actions to ensure the realization of the planning objectives”



Examples - Completeness



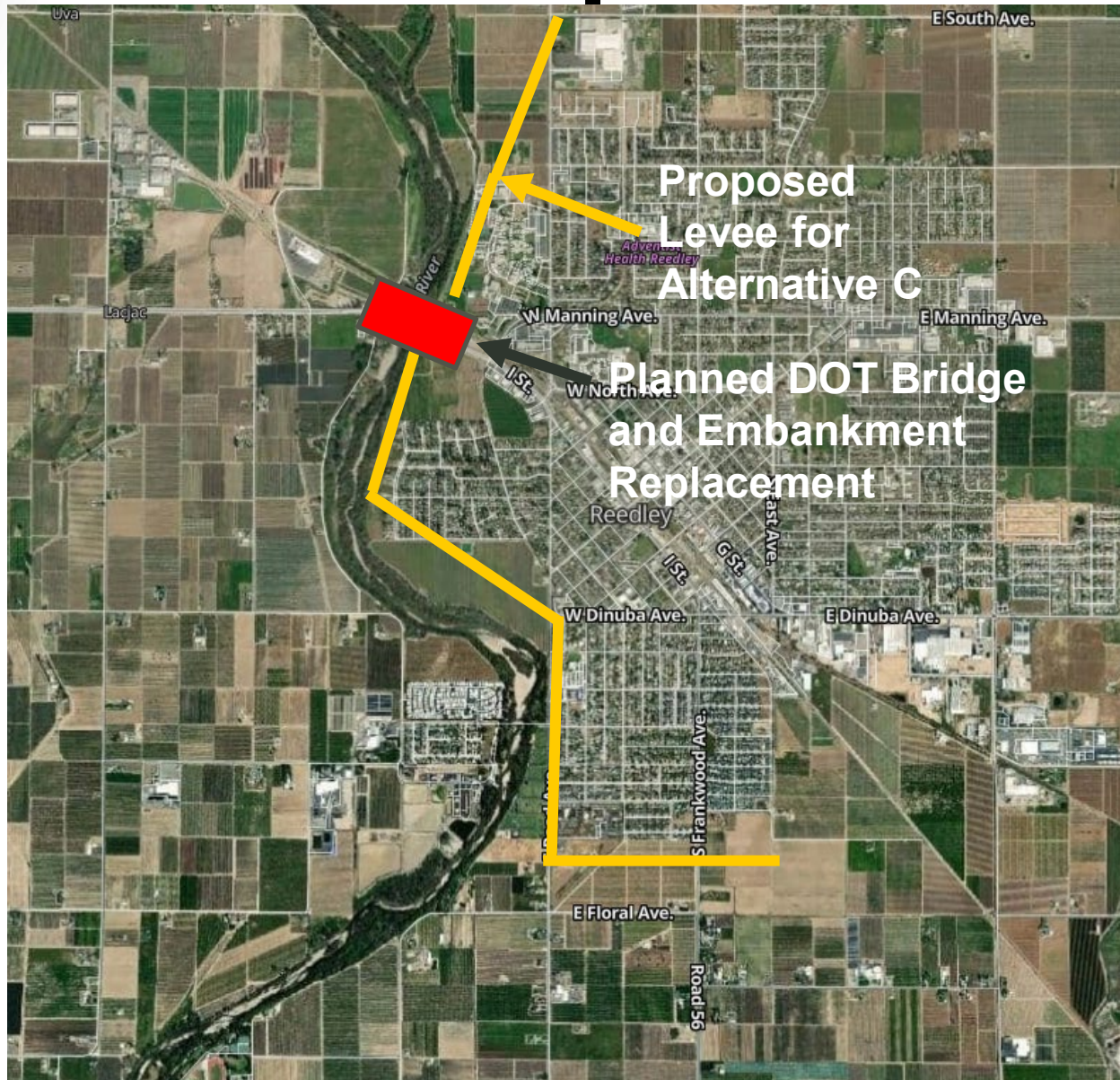
Do we screen out this alternative plan because it is not complete?

Not yet – If a nearby port facility with major infrastructure investments and operations wants to expand here and commits to making the investments, then it might still end up being a complete plan. However, the costs of the Local Service Facilities required to achieve the economic benefits must be included. There are likely also mitigation costs.

If you have a preliminary BCR of 1.2:1 before including Local Service Facility costs and mitigation costs, then the updated costs to include LSF and mitigation could make this alternative plan unjustified, and then it could be screened.



Examples - Completeness



Flood Risk Management

A proposed levee alternative ties into the embankment approaching a new bridge that is in the State Dept. of Transportation's long-range plans.

This dependency on the actions of another agency for the plan to function is a problem related to completeness. If the new bridge and embankment are approved and funded for construction by the State DOT, and is expected to be complete within 5-10 years, maybe there is no issue – that is a realistic FWOP condition. But if it is only part of the “long-range plans” then we do have an issue. The plan will need to be revised or screened. Don't screen until you know enough.



Examples - Completeness

How NOT to apply the completeness criterion.

1. For screening individual measures before creating plans.
2. Describing alternatives as “partially” complete. Keep going until it is complete, or screen it.



Examples - Completeness

How NOT to apply completeness

1. Screening a plan that does not address all reaches or the entire geographic area in a study area. Remember we must justify individual increments of our alternative plans.
2. A plan is not “incomplete” if it does not address all objectives. If you have a primary objective of FRM and a secondary objective related to the opportunity to add recreation, a plan can be complete if there is no recreation, even though that was a planning objective.



Effectiveness - Example

Dishwasher example- Objective: Clean, Dry Dishes

If you load as much as you possibly can into your dishwasher and use the “Energy Saver” setting, you are focusing on efficiency. But what if the dishes don’t come out clean? Then it is not effective. Efficiency is not important unless the plan alleviates the specified problems and achieves the specified opportunities to some degree.

If you leave plenty of space between your dishes and use “Heavy Duty/High Temp/Extra Dry” settings, you are focusing on effectiveness. But what if the dishes could still come out clean using less water, energy, or time? Now we look at efficiency.



Efficiency - Examples

Efficiency: Can you get the same plan outcomes for less cost? Can you get more or better outcomes for the same cost?

For Aquatic Ecosystem Restoration, we use Cost Effectiveness and Incremental Cost Analysis. Combinations of measures frequently result in hundreds of possible alternative plans. CE-ICA looks at cost-effectiveness to help us screen:

Plan A: 88 Habitat Units, \$4567 average annual cost

Plan B: 88 Habitat Units, \$2345 average annual cost

Here we screen out plans that cost more for the same benefit

Or

Plan A: 88 Habitat Units, \$4567 average annual cost

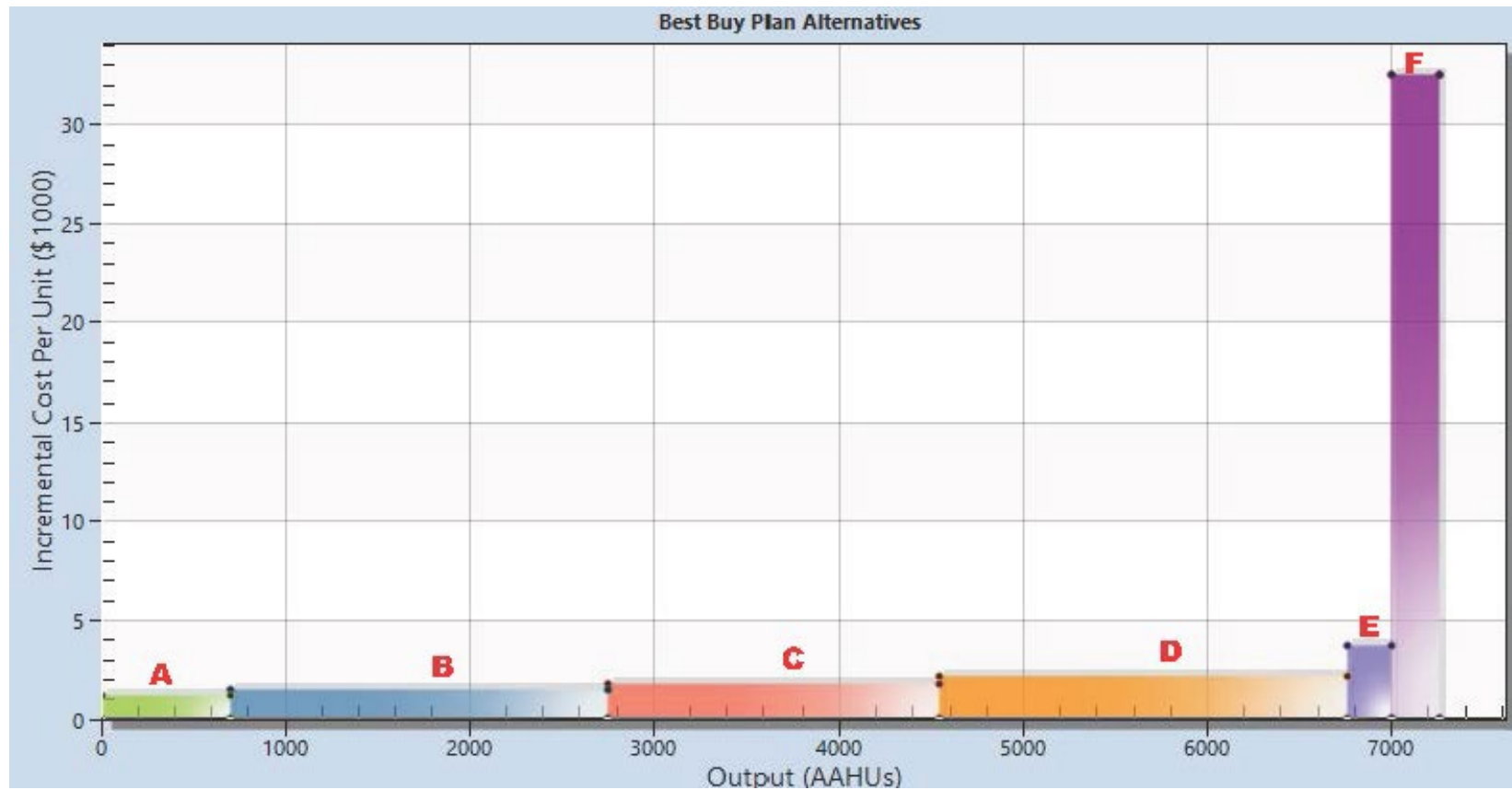
Plan B: 44 Habitat Units, \$4567 average annual cost

Here we screen out plans that provide less benefit for the same cost



Efficiency - Examples

The results of CE-ICA usually gives us multiple “best buy” plans that are cost effective. Each best buy plan is the most efficient at a certain level of benefit (AAHUs). We are not screening out all plans except the one most efficient plan in terms of \$/AAHU.





Efficiency - Judgment

Are you using these criteria improperly to screen out plans that could be the recommended plan?

When to screen for efficiency?

Looking at measures for a FRM study, you screen out floodwalls because they typically cost more than levees. Later you discover that the available real estate footprint is too narrow for a levee. Now what? You need to screen but be careful about screening too early.



Acceptability – Not Easy

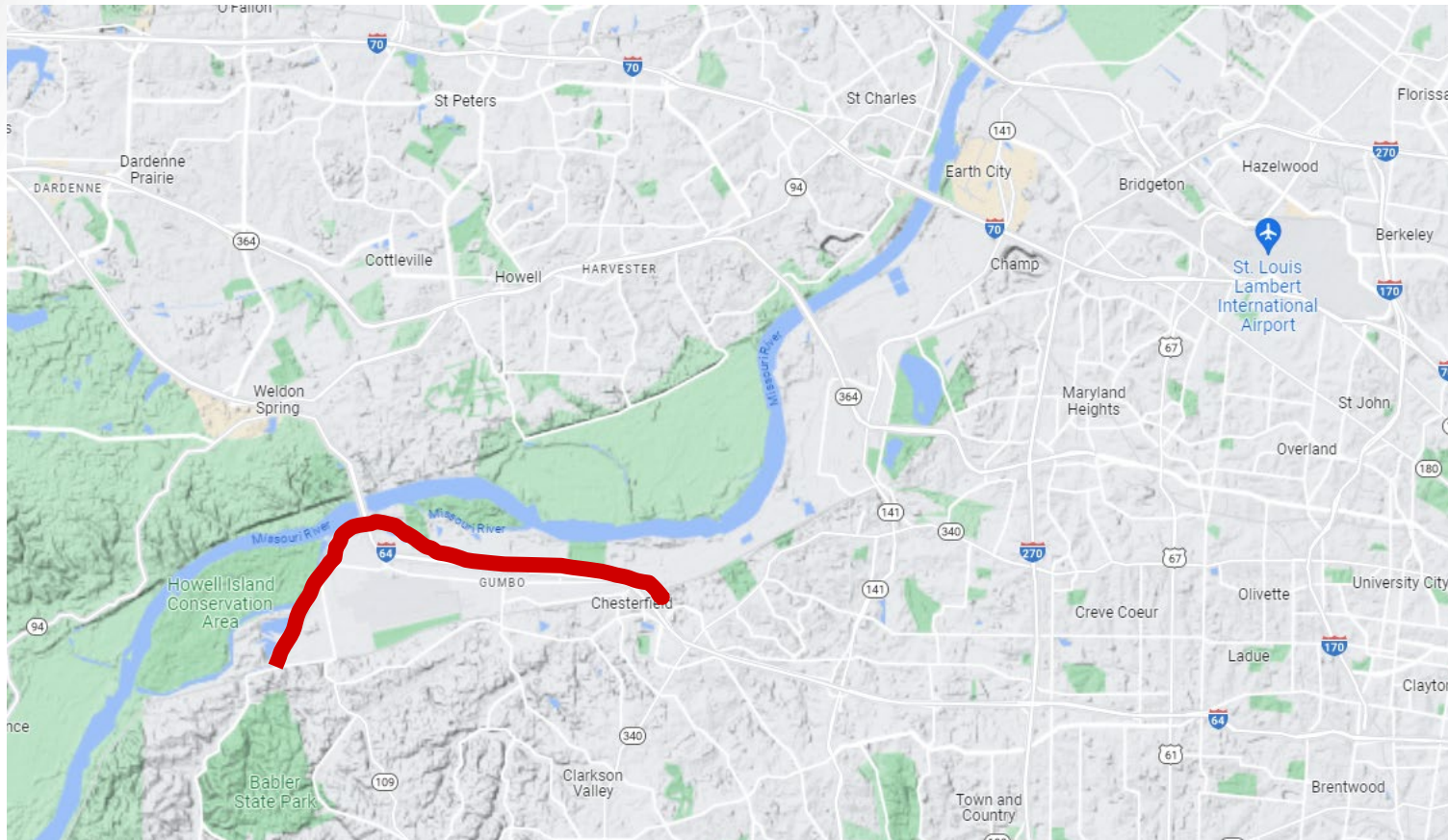
Are you using these criteria improperly to screen out plans that could be the recommended plan?

Some details to remember – not complying with Federal law means a plan is unacceptable and the plan must be revised or screened. However, a plan not complying with local ordinances or state laws may still be acceptable from our perspective. Sponsor or stakeholder preference does not make a plan unacceptable.

Most plans are not popular with some segment of the public. Don't screen just because of public views or local ordinances for acceptability. Be CAREFUL about screening too soon.



Acceptability – Example



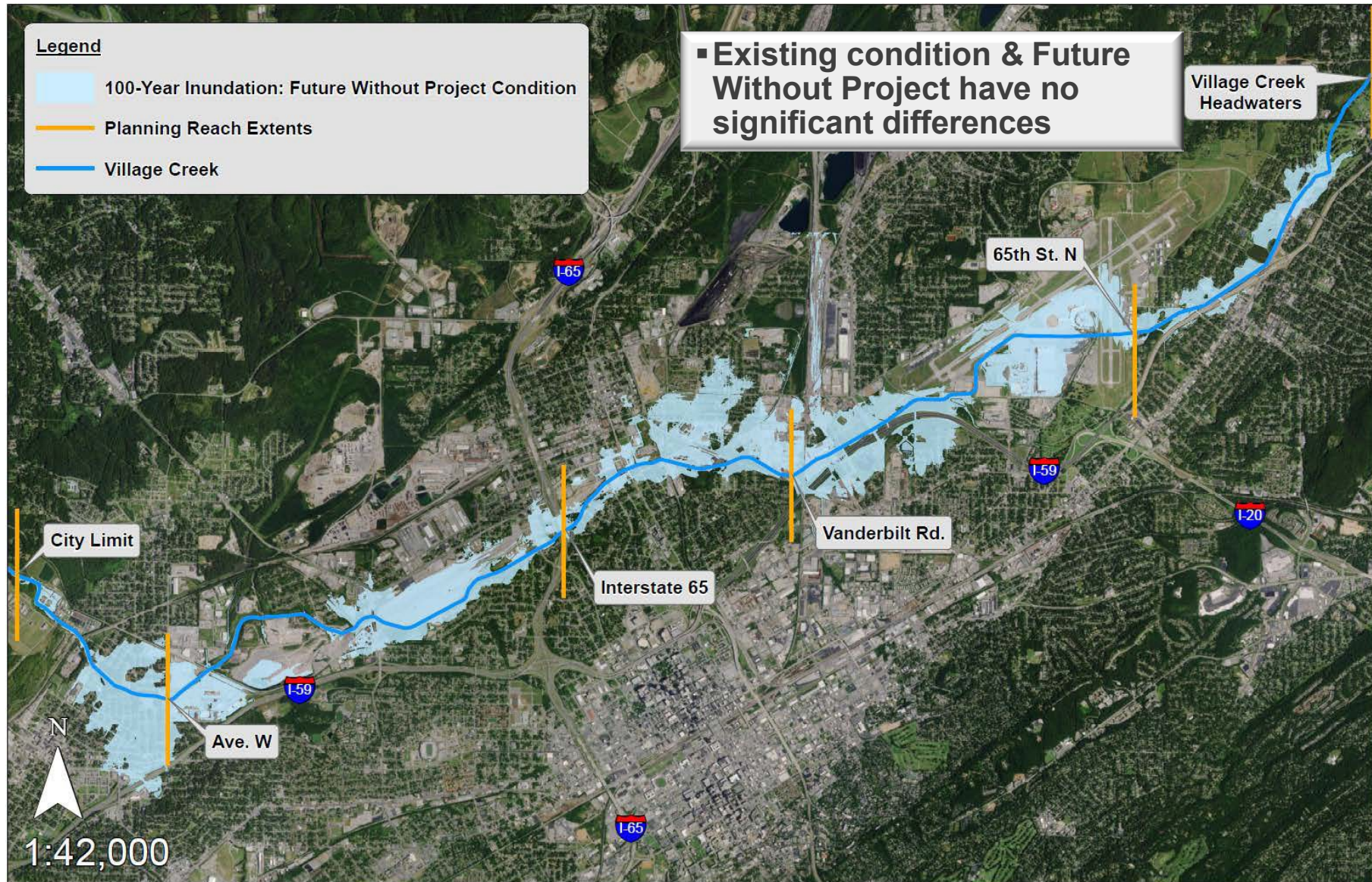
Authorized FRM study area in metro St. Louis south of Missouri River only.

Draft recommended plan for Chesterfield, Missouri levee in red.

Public meeting – hundreds in attendance. Those living south of the Missouri River were mostly for the proposed FRM project. Those living north of the Missouri River were strongly against it. Was the plan unacceptable?



ACCEPTABILITY - VILLAGE CREEK, AL – FWOP





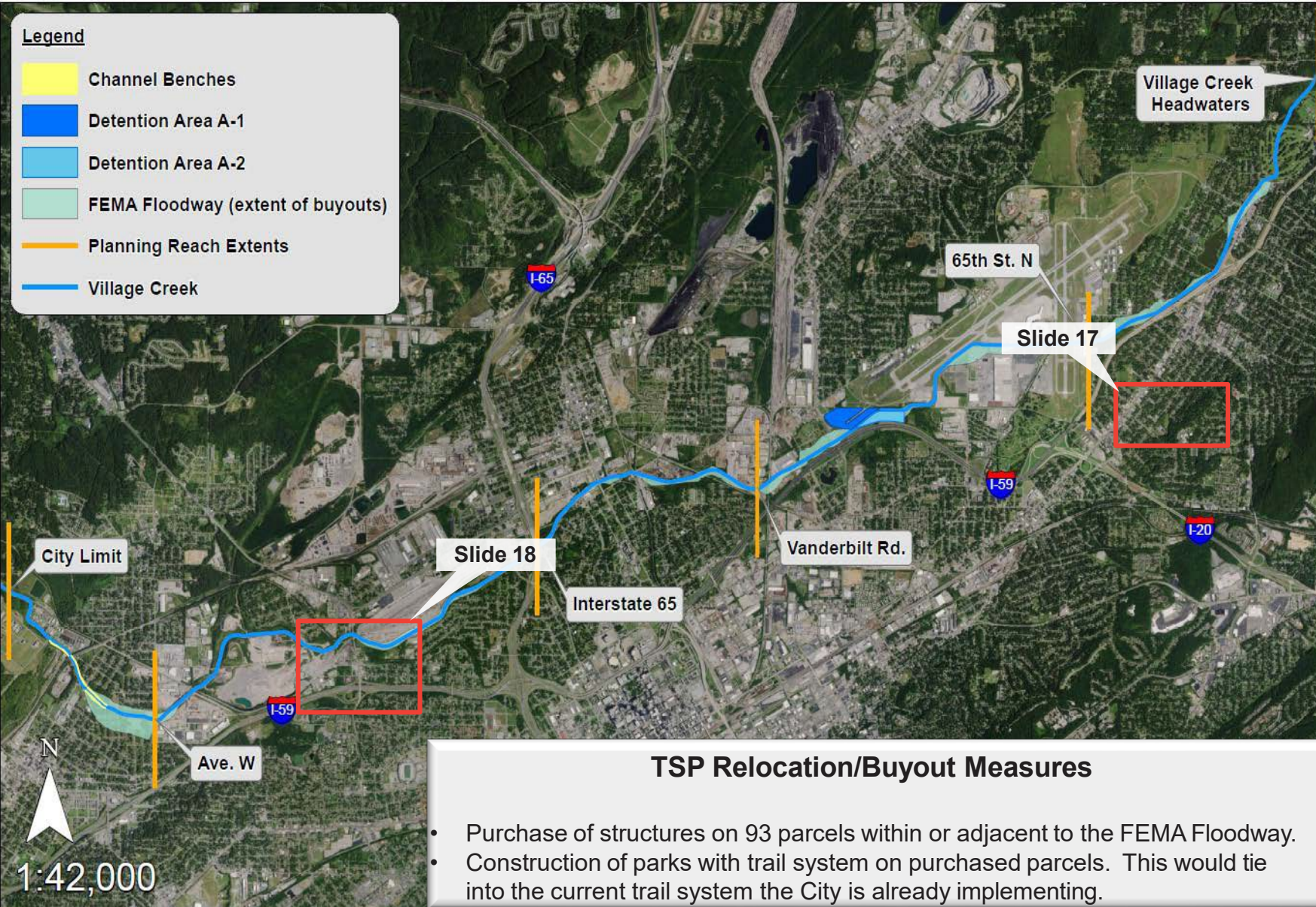
VILLAGE CREEK, BIRMINGHAM, AL EXAMPLE³

Alternative recommended for TSP:

NED plan consists of:

- Two small dry detention sites totaling 44 acres
- Benched channel widenings
- Relocation/buyouts
- Recreation (trails)
- **First Costs: \$41.1 Million**
- Average Annual Net Benefits: \$3.2 Million
- **BCR: 2.9**

VILLAGE CREEK – TENTATIVELY SELECTED PLAN ¹⁶



TSP had buyouts proposed for some pockets of the floodplain, some detention basins, and some small channel benches. Much of the study area did not benefit from this plan, but it was the NED plan. Was this plan complete? Was it acceptable?



QUESTIONS AND COMMENTS?



STEP 3: PLAN FORMULATION – WITHIN YOUR ARRAY, DOCUMENT THE PLANS THAT ARE...

Formulate plans based on the Study's purpose, and the problems, opportunities, objectives, and constraints.

REQUIRED BY LAW TO BE IDENTIFIED:

"No
Action"

Potential
NED or
NER Plan

For FRM – a
Nonstructural
Plan

LEDPA –
Least
Environmentally
Damaging
Practicable
Alternative

REQUIRED BY 2021 COMP BENEFITS POLICY:

Max Net Benefits
Consistent with
Study Purpose –
All Categories

Max Net Benefits
– All Categories

IF REQUESTED BY PARTNER:

Locally Preferred
Plan

The same alternative may meet more than one of these requirements (e.g., LEDPA, NED, and Max Benefits consistent with study purpose) AND – you should have more plans than these in your array