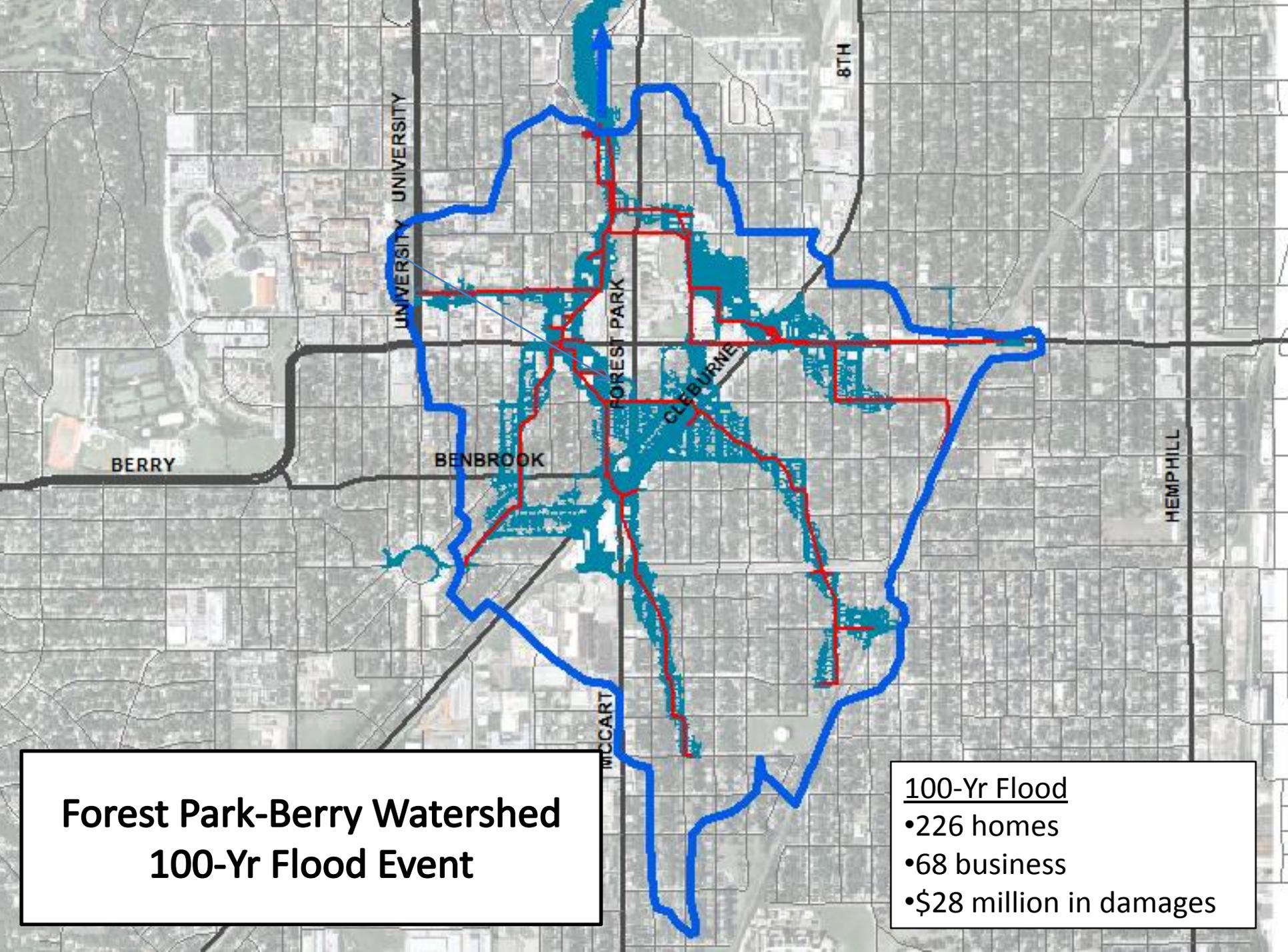


Feasible Options Study Forest Park-Berry Watershed Final Recommendations

**Public Meeting
September 29, 2011**



**Forest Park-Berry Watershed
100-Yr Flood Event**

100-Yr Flood

- 226 homes
- 68 business
- \$28 million in damages

Timeline – Before Tonight

- September 22, 2010 – Initial Public Meeting
 - Introduced study, answered questions
- March 24, 2011 – Public Meeting
 - Discussed problem in detail, requested information from public, provide first pass of potential measures
- April 28, 2011 – Stakeholder Meeting
 - Discussed key measures under consideration
 - Concern about message getting to public
- June 28, 2011 – Stakeholder Meeting
 - Presented initial results of study
 - Discussion

Tonight

- Two Strategies
- Presentation of Feasible Options
- Action Items

Possible Mitigation Measures

- **Increase storage (detention)**
- **Increase conveyance (pipes, channels)**
- Avoidance (floodproof, acquisition)
- Coping (flood insurance, flood warning)

Possible Mitigation Measures

- **Increase conveyance (pipes, channels)**
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Two alternative strategies:

- *Detention Based Strategy*

- *Conveyance Based Strategy*

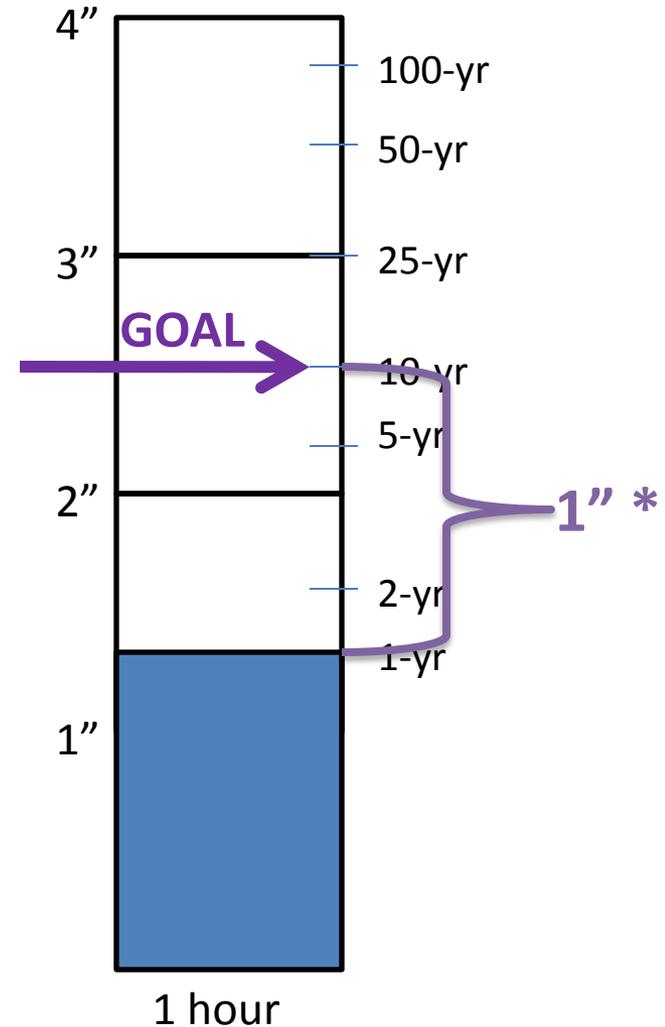
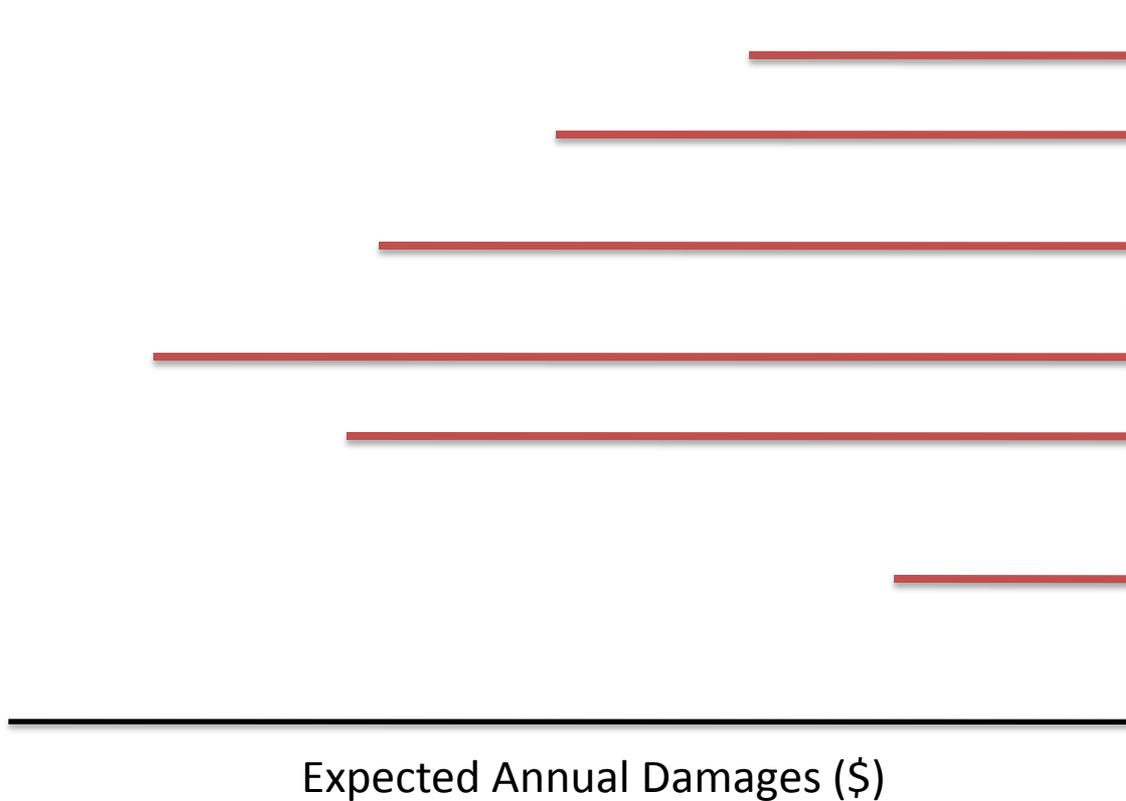
Bad News

- We did not find the “magic solution” or the “silver bullet”
- Challenges and obstacles identified in past studies were validated
- Substantially solving flooding in the Forest Park/Berry Watershed will be very expensive, and will take a long time

Good News

- We identified alternative measures that will provide meaningful reductions
- They are also expensive, but they can be phased in, easing the cost burden
- Expected re-development will make it easier to implement solutions

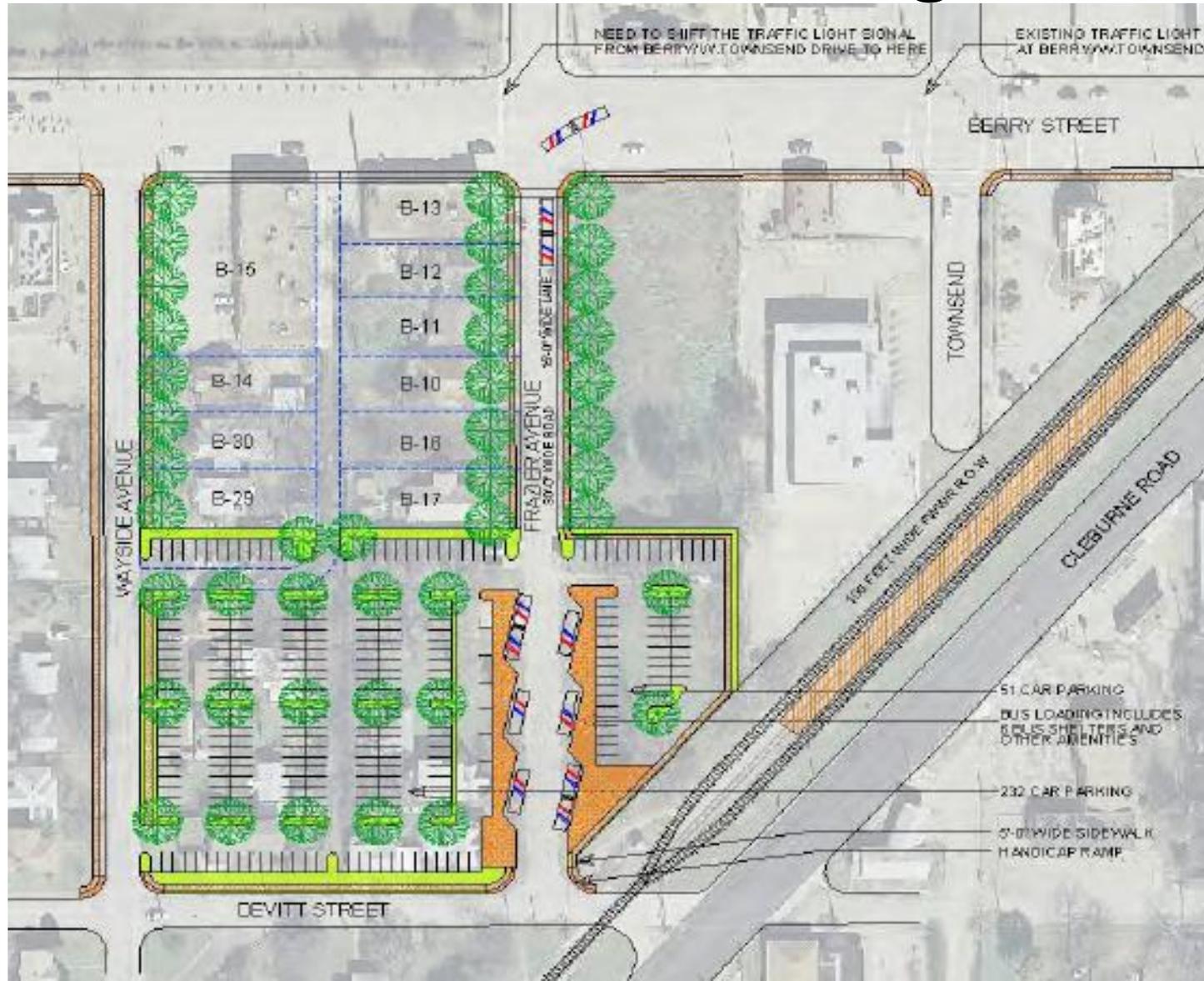
Expected Annual Damage (considers likelihood of event)



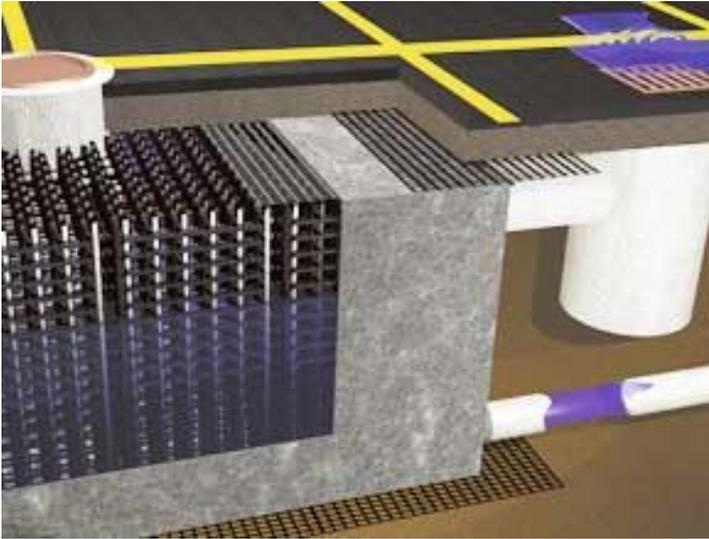
- Our goal is 68 acre-feet
- Equivalent to 11.3 acres of 6' deep storage

Detention Options

Underground Detention Below Transit Parking Lot



Underground Storage Units



1. Underground Detention in Transit Surface Parking Lot

- In conjunction with construction of surface parking lot, install underground detention below parking using underground modules
- Outfall from storage will tie into existing storm sewer
- Goal is 12 acre-feet of underground storage
- Estimated Cost: \$5.0-7.5 million

Transit Oriented Development Detention Concept



2. Transit Oriented Development

- Coordinate with City Planning Department in the development of a Transit Oriented Development plan that includes detention storage
- Land acquisition will be in conjunction with future development
- Goal is sufficient land for detention for storage of 23 acre-feet
- Estimated Cost: \$3.0-5.0 million

BNSF Railroad Corridor along Biddison



3. Detention in Biddison Railroad Corridor

- Obtain right-of-way from BNSF Railroad
- Consider abandonment of North or South Biddison
- Install detention in acquired corridor
- Goal is 5 acre-feet
- Estimated Cost: \$2.5 million to \$10.0 million (only pursue if cost is reasonable)

Paschal High School Underground Detention



Paschal High School Underground Detention



4. Underground Detention in Paschal High School Athletic Fields

- Install underground modular detention underneath athletic fields at Paschal High School
- Construct drainage improvements connected to underground detention
- Requires Agreements with FWISD
- Goal is 15 acre-feet of storage
- Cost Estimate: \$6 -10 million

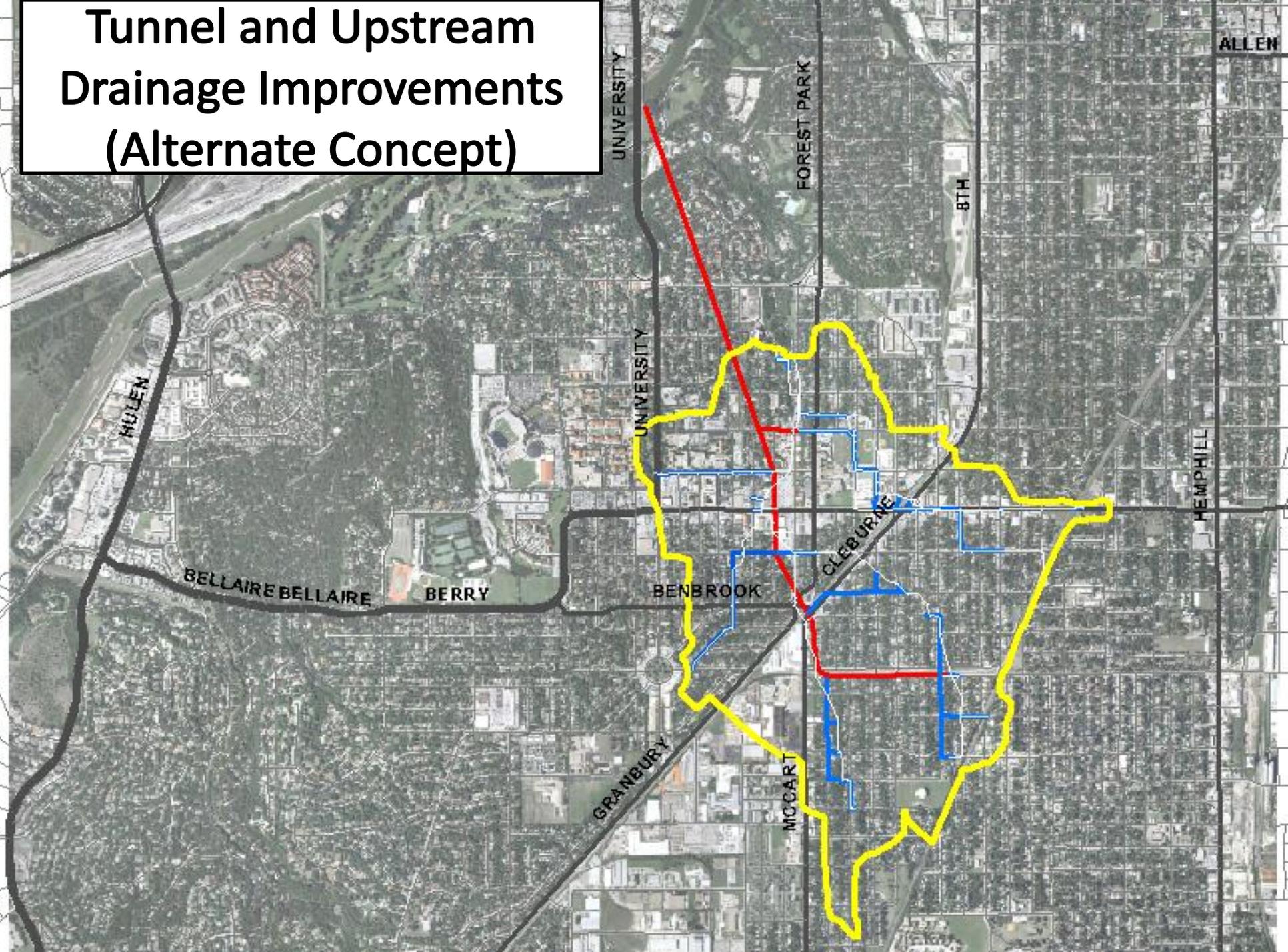
5. Watershed-wide Detention

These are unidentified opportunities that may be available, over time, in the watershed

- Underground detention tied to street repaving projects (concrete vault detention)
- Underground detention in alleys (modular detention)
- TCU Redevelopment Opportunities
- Greenway Detention
- Goal is 10 acre-feet of storage
- Cost Estimate: \$5.0 to 7.5 million

Conveyance Options

Tunnel and Upstream Drainage Improvements (Alternate Concept)



6. Tunnel to Trinity River

- Construct a tunnel upstream from the Trinity River
- Avoid Zoo Creek Impacts
- 16-Foot Diameter
- Cost: \$20-40 million

7. Local Storm Drain Improvements

- New storm drains to pick up water in floodprone areas
- Convey to detention storage or tunnel
- Must be included in tandem with all strategies
- Cost Estimate: \$5-20 million

Conveyance Based Strategy

Conveyance-Based Strategy

- Tunnel
- Local Storm Drain Improvements
- T.O.D. Detention
- Paschal Detention

Conveyance Strategy- Summary

- 100-year protection
- Very expensive
 - \$35 million minimum, likely higher
 - Costs could be as high as \$50-75 million
 - Plan has value, but is not affordable given current financial resources
- Tunnel component must be constructed as one project
- Funding assistance will be needed

Detention Based Strategy

Detention Based Strategy

- Underground Detention – Transit Parking
- T.O.D. Detention
- Paschal Underground Detention
- Watershed-wide Detention
- Biddison Railroad Corridor Detention
- Local Storm Drain Improvements

Detention Based Strategy - Summary

- 10-year protection – almost
- 54 acre-feet (short of 68 acre-feet goal)
- Moderately expensive
 - \$24-35 million
 - Cost effective but not affordable as a single project
- Project elements can be phased in over time, with incremental benefits
- Requires maintenance commitment

Recommended Strategy

- Pursue phased implementation of the **detention-based strategy** and pursue cost-sharing partnership for **tunnel strategy**
- Promote Avoidance and Coping measures
 - Voluntary Property Acquisitions
 - Flood Insurance
 - Education

Action Items

1. Property Acquisition Program

- City (TPW) implement a program to acquire, on a voluntary basis, homes subject to chronic flooding (citywide)
- Establish and adopt evaluation criteria
- Develop secondary use/property management plan
- Set aside funds for program

Begin Now...

1. Initiate/continue coordination and communication with potential partners
 - Fort Worth ISD (Paschal High School)
 - The T (Parking)
 - BNSF Railroad (Biddison)
 - Berry Street Initiative (TOD)
 - City of Fort Worth Planning (TOD)
 - TCU (Master Plan/Redevelopment)

Begin Now...

2. Develop flood-prone property acquisition program
 - Voluntary basis
 - Emphasis – chronic/frequent flooding
 - Secondary use (rain garden, community garden, open space, etc...)
 - Allocate Funding
 - Strong maintenance guidelines

Over Next Two Years

3. Prove-up Feasibility of Detention Options and Tunnel/Conveyance Option
 - Engineering analysis
 - Schematics
 - Verify/refine costs and benefits
 - Pursue funding partnerships
4. Develop Form-Based Code for Transit Oriented Development (Planning) to include detention

Over Next Two Years

5. Coordinate within City to identify and implement detention opportunities with other City projects

Next 3-10 years

6. Construction of “available” detention measures
7. Rough grading of TOD detention

Ongoing

- Continue stakeholder/community engagement
- Commitment to maintenance
- Remain forward looking and opportunistic – pursue opportunities and partnerships as they become available

Questions



Feasibility

- Effective – measures must reduce flood risk
- Affordable –
 - Within funding ability of City of Fort Worth
 - Must have appropriate value
- Acceptable – must be accepted by a general consensus of stakeholders

