Memorandum

DATE December 30, 2011

TO Honorable Mayor and Members of the City Council

SUBJECT Mill Creek/Middle Peaks Branch/State-Thomas Drainage Relief Tunnel Briefing

On Wednesday, January 4, 2012, you will be briefed on the update of the Mill Creek/Middle Peaks Branch/State-Thomas Drainage Relief Tunnel. The briefing material is attached for your review.

If you have any questions or need any additional information, please let me know.

for

Jill A. Jordan, P.E.
Assistant City Manager

Attachment

cc: Mary K. Suhm, City Manager
    Thomas P. Perkins, Jr., City Attorney
    Craig D. Kinton, City Auditor
    C. Victor Lander, Administrative Judge
    A.C. Gonzalez, First Assistant City Manager
    Ryan S. Evans, Assistant City Manager
    Forest E. Turner, Assistant City Manager
    Joey Zapata, Assistant City Manager
    Jeanne Chipperfield, Chief Financial Officer
    Frank Librio, Public Information Office
    Rosa Rios, Acting City Secretary
    Stephanie Pegues-Cooper, Assistant to the City Manager – Council
    Kelly High, Director, Trinity Watershed Management
    Rebecca Rasor, P.E., Managing Director, Trinity River Corridor Project

"Dallas – Together, we do it better!"
Mill Creek/ Middle Peaks Branch/ State-Thomas Drainage Relief Tunnel

City Council Briefing
January 4, 2012
Briefing Outline

- Background of Mill Creek, Peaks Branch and State-Thomas Watersheds
- Background of 2006 Bond Program related to these projects
- Update of the 2008 plan for Mill Creek and Peaks Branch
- Update on State-Thomas study and new recommendations
- 2011 Proposed Plan for a Combined Mill Creek phases I&II, Peaks Branch phases I&II and State-Thomas
- 2011 Plan Funding Options
Flooding has been a problem in the Mill Creek, Peaks Branch and State-Thomas areas for years.

The 2006 bond program funded solutions for Mill Creek phase I, Middle Peaks Branch phases I & II and State-Thomas.

After updating an earlier study it was determined that a substantially more extensive solution was needed for State-Thomas.

Further study of the project determined that a combined tunnel for all three projects, with the addition of Mill Creek phase II, was more efficient and cost effective long term.

Resolving the flooding issues in these three watersheds will require additional funding in a future bond program. The combined solution could be done as one project or phased.
(1) Mill Creek, (2) Peaks Branch and (3) State-Thomas Watersheds
Mill Creek was originally a stream draining from Mockingbird Lane to the Trinity River, and Middle Peaks Branch was originally a stream from Mockingbird Lane to White Rock Creek.

From the 1920’s through the 1950’s, these streams were enclosed in underground pipes to convey approximately the 2-year to 5-year storm events.

In a 100-year event (1% annual chance):

- The streets in these areas look like rivers
- Approximately 3,800 properties are impacted by one foot or more of flooding in the Mill Creek/Peaks Branch area due to inadequate pipe systems
- Flood depths are up to 10 feet high
Map on Depths of Flooding in (1) Mill Creek / (2) Middle Peaks Branch

Note:
Cross hatched area denotes known street flooding in the State Thomas area.
Mill Creek Flooding – Baylor Area Hospital
Flooding – March 19, 2006
(1) Mill Creek Flooding – March 2006

Monticello Avenue – West of Greenville Avenue
(3) State-Thomas - Background

- Re-development over the years in the State-Thomas area has exceeded the capacity of local drainage systems and the existing Woodall Rodgers pressure sewer
  - Undersized local drainage systems result in flows that back-up along the surface streets.
  - Additional capacity is needed in the Woodall Rodgers Pressure sewer to accept additional run-off from neighborhood drainage system
(3) – State-Thomas Area

Example of typical flooding from McKinney to Field – stormwater that cannot get into the undersized system flows along the surface streets
The 2006 Bond Program included these major storm drainage relief systems ($104.3M)

1. Mill Creek, Phase I - $57.7M
2. Middle Peaks Branch, Phases I & II - $34.9M
3. State-Thomas - $11.7M
2006 Plan – Mill Creek(1) / Middle Peaks Branch(2) and State-Thomas(3)
In 2008, Council was briefed and supported a new combined Mill Creek and Middle Peaks Branch project:

- Re-design indicated a combined system, including Mill Creek Phase II, is more economical
- Mill Creek Phase II was added to protect a larger area from flooding (including Baylor Hospital and IH30 area)
  - Estimated at $94 Million in Needs Inventory
  - Provided an opportunity for TxDOT to participate due to the I-30 project
    - Potentially a $66M contribution (I-30 project is indefinitely delayed, funds not available)
The new alignment also provided the flexibility to bring full flooding relief to the Buckner Park area.

The new combined solution drains to White Rock Creek and avoids having to drain through and impacting the Trinity Levees which would require Corps of Engineers involvement.
2008 Plan – 1) Mill Creek / 2) Middle Peaks Branch Drainage Relief Tunnel
The 2006 Bond Program provided funding to update an earlier drainage system study and enlarge a portion of the existing Woodall Rodgers pressure sewer - $11.7M

In 2009, the updated study indicated more capacity was required than the previous study.

It was determined a new system, parallel to the existing Woodall Rodgers pressure sewer, would be needed to address the 100-year flooding in the State Thomas and Field Street areas.
Based on the updated study two options were considered:

A.) A new tunnel system outfalling into the Trinity River estimated to cost $84M**, or

B.) A shorter tunnel connecting to the Mill Creek / Middle Peaks Branch tunnel estimated to cost $47M**

**2010 dollars
2009 State Thomas Design Options

LEGEND:
- Red: State-Thomas to Trinity River
- Green: State-Thomas to Mill Creek
- Orange: Mill-Peaks Tunnel
- Purple: Existing storm sewer

Option A

Option B
2011 Recommended Plan – Combine (1) Mill / (2) Peaks Tunnel with (3) State-Thomas

- Recommend State Thomas relief drainage system connect to the combined Mill Creek and Middle Peaks Branch tunnel
  - Connecting to Mill/Peaks shortens the tunnel length from 9,000 feet to 5,500 feet
  - Connecting to the Mill/Peaks tunnel avoids the Trinity River Levees
  - Connecting to Mill/Peaks provides better geology for tunneling, which provides cost savings
  - Connecting to Mill/Peaks tunnel saves approximately $37M relative to tunnel to the Trinity River
Recommended (1) Mill Creek, (2) Peaks Branch and (3) State-Thomas Relief System
Areas Currently Subject to 100-Year Flooding in (1) Mill Creek, (2) Peaks Branch and (3) State-Thomas Watersheds

Note: Cross hatched area denotes known street flooding in the State Thomas area
60% of the Areas Removed from 100-Year Flooding After (1) Mill Creek, (2) Peaks Branch and (3) State-Thomas Tunnel is Constructed

Note: Additional lateral/inlets will be needed to capture the water from the streets.

Note: Areas in blue are to be addressed in future bond projects

-Mill Creek Ph. III
-Upper Peaks Branch
2011 Combined (1) Mill/(2) Peaks Branch/(3) State-Thomas Plan Cost

- Total cost of combined system - $302M*
- Mill Creek I & II, and Peaks Branch I & II - $243M*
- State Thomas added to relief tunnel - $59M*
  - Connects to Mill Creek I & II, and Peaks Br. I & II
  - Combining State-Thomas and Mill/Peaks saves approximately $37M as opposed to a separate State-Thomas and Mill/Peaks drainage relief systems

* Cost inflated to the mid-point of construction and includes a 10% contingency due to uncertainties associated with tunnel construction
## Comparative Cost of Various Approaches
(cost inflated to the midpoint of construction, with 10% contingency)

<table>
<thead>
<tr>
<th>Plan Components</th>
<th>2006</th>
<th>2008</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>$396 M*</td>
<td>$350 M*</td>
<td>$302 M*</td>
</tr>
<tr>
<td><strong>Funding (06 Bond)</strong></td>
<td>$104 M</td>
<td>$104 M</td>
<td>$104 M</td>
</tr>
<tr>
<td><strong>Obligated/Spent ($19 M)</strong></td>
<td>$(19 M)</td>
<td>$(19 M)</td>
<td>$(19 M)</td>
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<tr>
<td><strong>Available Funds</strong></td>
<td>$85 M</td>
<td>$85 M</td>
<td>$85 M</td>
</tr>
<tr>
<td><strong>Future Bond</strong></td>
<td>$311 M</td>
<td>$265M</td>
<td>$217 M</td>
</tr>
<tr>
<td><strong>Cost if phased over two bond programs</strong></td>
<td>$427M</td>
<td>$417M</td>
<td>$372M</td>
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Note: The 2006 bond program provided funding for three separate projects and did not include cost for Mill Creek phase II, a new State-Thomas tunnel and Buckner Park.
Potential Funding and Construction Strategies

Alternative 1:

- Project can be built all at one time in a single construction phase
  - The total project cost of a single phase is $302M*
  - A future bond program would need to include $217M* to fund this alternative (assuming $85M available from 2006 funds)

*cost inflated to midpoint of construction
Potential Funding and Construction Strategies

- Alternative 2:
  
  Project can phased over two bond programs

  - The cost premium for Phasing - approx. 15%
  
  - For example, the project can be divided into two phases for a total cost of $372M * :
    
    State Thomas to IH30 (limited flood storage only until full project build out) - $163M
    
    Assuming $85M available for 2006 funds, $78M would be needed in a future bond program
    
    IH30 to White Rock Creek - $209M (future bond program)
Two Phase Construction
Estimated Schedule for a Single Project

- Complete Design – Fall 2013
- Continue Property Acquisition
- Construction Award – No earlier than January 2014 (if funded in a 2012 bond program)
- Construction duration – 3 to 5 years
- Complete between 2017 and 2019
Estimated Schedule for a Phased Project

- Construction Award for 1st Phase – No earlier than January 2014
  - Construction duration – 3 to 5 years (if funded in the 2012 bond program)
- Construction Award for 2nd Phase – No earlier than January 2017
  - Construction duration – 3 to 5 years (if funded in a 2016 bond program)
  - Complete between 2020 and 2024
Project Recommendation

- Fund the project in the upcoming bond program as one project:
  - One project allows the City to protect lives and property quicker
  - Project cost savings is approximately $70M versus a phased approach
  - Addresses approximately 60% of the flooding in Mill Creek, Middle Peaks and State-Thomas areas
Next Steps

With the 2006 bond funds the following can continue:

- Continue the design of the entire tunnel project
- Continue to purchase right-of-way needed for the tunnel project
- Recommend council authorize Supplemental Agreement No. 2 to the contract with Halff Associates for the design of the extension of the proposed drainage relief tunnel to State Thomas by Council action on January 11, 2012 ($2.6M)

Additional bond funds required:

- Choose a funding plan for Mill/Peaks/State Thomas Project:
  - Fund completely in one bond program
  - Phase over multiple bond programs
Additional Critical Flood/Drainage Projects to Consider in the 2012 Bond Program

- Able Pump Station - $91M
- Erosion Control projects - $15M