The Bay Delta Tunnel Project
Sources of Water for Southern California

- Delta
- Sierra Mountains
- State Water Project Supplies
- LA Aqueduct
- Colorado River Aqueduct Supplies
- Groundwater and Recycling
- Conservation
So. Calif. Imports About Half its Water from the State Water Project (SWP) & Colorado River River (CRA)

- SWP: 29%
- CRA: 21%
- Local Supplies & LA Aqueduct: 50%
- Groundwater Recovery
  - Recycled Water
  - Surface Water
  - LA Aqueduct
  - Groundwater

Average 2006-2015
State Water Project

History
- 1931 – State Water Plan
- 1933 – CVP Act
- 1971 – First delivery
- 1994 – Bay Delta Accord
- 2000 – CALFED
- 2017 – Cal WaterFix

Facilities
- 19 Dams & Reservoirs
- 20 Pumping Plants
- 10 Power Plants
- 662 Aqueduct Miles
California WaterFix - Overall Program

- **Intakes**
- **Intermediate Forebay**
- **Clifton Court Pumping Plant**
- **Main Tunnels**
- **North Tunnels**
- **Stockton**
- **Head of Old River Gate**
Existing SWP and CVP Export Facilities are Located in the South Delta
New North Delta Diversions Provide a Flexible Intake System
Main Tunnels

- Twin bore main tunnels
- 30 miles long each
- 150 ft below grade
- 2-foot thick concrete liner
- Pressurized face tunnel boring machine
- ±45-ft excavated diameter
- 40-ft internal diameter
Metropolitan Water District of Southern California

Regional water wholesaler to 6 counties covering 5,200 square miles

Serves 19 million people

Regional economy $800+ billion

- Supplies about half of region’s water
- Includes 26 member agencies
Why a California Water “Fix”?

About 30 percent of the water that flows out of taps in Southern California comes from Northern California via the Sacramento-San Joaquin Delta. State and federal agencies want to modernize the water system by building three new intakes in the Northern Delta along with two tunnels to convey water to the existing aqueduct system in the southern Delta. Why is it needed? Here are five reasons why the Metropolitan Water District of Southern California supports the planning effort known as California WaterFix.

1. The Big One
   - The new tunnel pipelines could safely transport supplies to the 25 million people, farms, businesses that depend on this water in the event an earthquake or other disaster collapses Delta levees and disrupts the existing decades-old system.

2. Drought
   - Nearly all of the water that is stored in Southern California for drought and emergency needs comes either from Northern California or the Colorado River.

3. Groundwater
   - Groundwater is Southern California’s single largest local water source, but groundwater basin managers actually depend primarily on imported supplies from Northern California to help replenish those basins.

4. Big Storms
   - A modernized system could once again reliably capture enough water to refill reservoirs after big storms because it would have multiple locations in the Delta to divert supplies, providing flexibility and reducing conflicts with migrating fish species such as salmon.

5. The Highest Quality = More Local Supplies
   - Sierra snowmelt is pure enough to recycle again and again in Southern California, promoting more recycling projects in the region’s future. And the Northern California supply has been good enough for Metropolitan to enter into international water tasting competitions – and win.

3 new intakes, each with 3,000 cubic-feet per second (cfs) capacity. Average annual yield of 4.9 million acre-feet.

2 tunnels up to 150’ below ground designed to protect California’s water supplies.
5 More Reasons

Benefits the Ecosystem

- Improves flow patterns in the south Delta
- $800 million of direct environmental mitigation including improving habitat conditions, restored wetlands, and restored riparian habitat
- Separate 30,000 acres of habitat restoration through California EcoRestore

For Some, No Alternative

About a fourth of Metropolitan’s service area, including communities in Ventura and Los Angeles counties and the Inland Empire receive all of their imported water from Northern California.

Cheaper Than Any Alternative

The cost of water from Northern California, even after modernizing the system, is roughly half the cost of any mega-scale projects to develop new local water supplies.

Mitigates the Impacts of Climate Change

- Enhances water supply in the face of reduced snow pack
- Protects against increasing salinity with sea level rise

Crucial to Long-Term Plan

Water from Northern California helps to prepare the Southland for future droughts, while Metropolitan plans for a greater portion of day-to-day, ongoing needs to be met by increasing local supplies and lowering demand through conservation.
2015 IRP Update

RELIABILITY TARGETS

The 2015 IRP Update is a plan to provide water supplies under a wide range of potential future conditions and risks

Meeting 2040 Demands

- CRA: 900,000 AF
- State Water Project: 1,213,000 AF
- Conservation: 1,519,000 AF
- Local Resources: 2,426,000 AF
Colorado River Aqueduct Deliveries to Metropolitan Service Area*

*Net deliveries to Metropolitan’s service area.
*Deliveries include transfer, exchange, and storage.
Lake Mead on the Colorado River will narrowly miss a Shortage Declaration.
Lake Mead
Metropolitan’s Storage Capacity

13x Increase in Capacity
MWD Storage Reserves
End of Year Balances*

*Estimated storage balances.
SWP-CVP Export Capability Has Declined Due to Regulations

- 1980's
- 1991 NMFS BiOp
- 1992 CVPIA
- 1994 Accord
- 2000 Trinity River Flows
- 2006 San Joaquin Flows
- 2008-9 Smelt/Salmon BiOps
- Future

Annual Average Export Capability (MAF)
North Delta Bypass Criteria Protect Flows, Water Quality, and Fish

Sacramento River Flow

- No Diversions
- 9,000 cfs
- 1,600 to 7,000 cfs
- 900 to 3,000 cfs
- 0 to 540 cfs
- > 35,000 cfs
**Metropolitan Analysis of Excess Storm Flow**

**Winter 2012-2013**

**Storm Event #2**
(14 days – 1,100,000 af)

**Storm Event #1**
(14 days – 880,000 af)

- **Delta Outflow to Ocean**
- **Actual SWP/CVP Exports**
- **Potential SWP/CVP Exports with 9,000 cfs Facility**

*Increased export with California WaterFix ~ 781,000 acre-feet (thru Feb 17)*

*SWP/CVP export losses due to BioOp ~ 800,000 AF (larger amount of SWP loss)*

*Analysis by State Water Contractors – Feb 2013*
Total Average Delivery Capability With and Without CA WaterFix

<table>
<thead>
<tr>
<th>SWP-CVP Capability (MAF)</th>
<th>Existing Conditions</th>
<th>Future without CA WaterFix</th>
<th>Future with CA WaterFix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.7(^1)</td>
<td>3.5(^2) to 3.9(^3)</td>
<td>4.7(^4) to 5.3(^5)</td>
</tr>
</tbody>
</table>

1. California WaterFix EIR/EIS No Action Alternative, existing conditions with 2025 climate change impacts
2. 2015 Delivery Capability Report Existing Conveyance High Outflow scenario
3. 2015 Delivery Capability Report Existing Conveyance Low Outflow scenario
4. California WaterFix EIR/EIS Alternative 4A-H4, initial operating criteria lower range
5. California WaterFix EIR/EIS Alternative 4A-H3, initial operating criteria upper range
## California WaterFix

### Capital Cost

<table>
<thead>
<tr>
<th>ITEM</th>
<th>2014 ($ Billions)</th>
<th>2017 ($ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conveyance Facility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Construction</td>
<td>9.5</td>
<td>10.4</td>
</tr>
<tr>
<td>• Contingency for construction (~36%)</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>• Program Mgmt.</td>
<td>Construction Mgmt.</td>
<td>Engineering</td>
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<tr>
<td>• Land acquisition (includes 20% contingency)</td>
<td>.15</td>
<td>.16</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>14.9</strong></td>
<td><strong>16.3</strong></td>
</tr>
<tr>
<td><strong>Mitigation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mitigation</td>
<td>.37</td>
<td>.40</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$15.3</strong></td>
<td><strong>$16.7</strong></td>
</tr>
<tr>
<td>ITEM</td>
<td>2014 ($ M/yr.)</td>
<td>2017 ($ M/yr.)</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Conveyance Facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Facility Operations &amp; Maintenance(^1)</td>
<td>20.0</td>
<td>21.9</td>
</tr>
<tr>
<td>• Power(^1)</td>
<td>6.6</td>
<td>7.2</td>
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<tr>
<td>• Capital Replacement(^1)</td>
<td>13.7</td>
<td>15.0</td>
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<tr>
<td>Subtotal</td>
<td>40.3</td>
<td>44.1</td>
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<tr>
<td>Mitigation</td>
<td>18.6</td>
<td>20.3</td>
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<tr>
<td>Total</td>
<td>$58.9 M/yr.</td>
<td>$64.4 M/yr.</td>
</tr>
</tbody>
</table>

1. When project is fully operational
California WaterFix
Capital Cost Share

Central Valley Project
$7.5 billion
(45% share)

State Water Project
$9.2 billion
(55% share)

Capital & Mitigation
$16.7 billion

1. In 2017 dollars

Metropolitan Water District
$4.3 billion (26% share of total)
### Cost Impact Summary in 2017 Dollars

<table>
<thead>
<tr>
<th>State Water Project Share</th>
<th>Base Case 4% Interest</th>
<th>6% Interest Scenario</th>
<th>8% Interest Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$438 M</td>
<td>$567 M</td>
<td>$709 M</td>
</tr>
<tr>
<td>Metropolitan's Share Annual Project Cost</td>
<td>$207 M</td>
<td>$267 M</td>
<td>$334 M</td>
</tr>
<tr>
<td>Total Costs (47.13%)</td>
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<td></td>
</tr>
</tbody>
</table>

### Metropolitan's Cost Impact

- Metropolitan's Overall Cost Increase \(^1\)
  - 13%
- Annual Cost Increase (spread over 15-yrs)
  - 0.9%
- Average Cost Increase per AF \(^2\)
  - $122/AF

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(1) Based on Metropolitan's 2017/18 Revenue Requirement of $1,574 M
(2) Based on Metropolitan's 2017/18 sales budget of 1.70 million acre-feet
WaterFix Marginal Cost at South Delta Pumps

Calculation Method and Assumptions

- Estimated Incremental Supply from WaterFix = 1.3 MAF
- Metropolitan Incremental Supply @ 26% = 337 TAF
- Annual Cost to Metropolitan = $207 Million
- Marginal Cost = (Annual Cost / 337 TAF)

$613 per AF = ($207M / 337 TAF)
WaterFix Marginal Cost
Delivered & Treated to MWD Service Area

Calculation Method and Assumptions
- Marginal Cost of WaterFix at Delta Pumps = $613/AF
- Marginal Cost to convey and treat SWP supply = $227/AF
  - O&M = $17/AF
  - Power for transportation = $197/AF
  - Treatment of SWP supplies = $30/AF
- Marginal Cost in MWD Service Area = $613 + $227

$840 per AF = $613 + $227
California WaterFix
- Delivered & Treated\(^1\) $840/AF

Recycled Water
- Edward C. Little Water Recycling Facility\(^2\) $1,739/AF
- Local Resources Program (avg. of projects)\(^3\) $2,240/AF
- San Diego Pure Water Project\(^4\) $1,975 – $2,375/AF

Seawater Desalination
- Carlsbad Desalination Project\(^5\) $2,412/AF

Groundwater Recovery
- Local Resources Program (avg. of projects)\(^3\) $1,157/AF

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1. WaterFix in 2017 dollars; includes costs to deliver and treat water to MWD’s Service Areas (Power=$197/AF; O&M=$17/AF; Treatment=$30)
2. Unit cost from LRP FY13/14 reconciliation with grants
3. Project unit cost from the Local Resources Program FY13/14 reconciliation; grants included in cost; in 2013 dollars
4. Unit costs in 2011 dollars and before grants or netting out avoided costs (from the June 14, 2012, SDCWA Board presentation); in 2011 dollars
5. Estimated unit cost from the June 2017 SDCWA Board presentation; in 2017 dollars
**Household Impacts**

**WaterFix**

**Calculation Method and Assumptions**
- Residential water use = ~70% of total regional water use
- Metropolitan’s service area = ~6.2 million occupied households
- Household impact calculation:
  - Monthly Impact = (Annual Cost x .70) / 6.2 million / 12 months

**Household Impacts**

- **Base Case**
  - $1.95 = ($207M x .70) / 6.2 Million / 12
- **6% Interest Case**
  - $2.52 = ($268M x .70) / 6.2 Million / 12
- **8% Interest Case**
  - $3.14 = ($334M x .70) / 6.2 Million / 12
## Water Supply Alternatives

### Cost Impact

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Cost Impact</th>
<th>Metropolitan</th>
</tr>
</thead>
<tbody>
<tr>
<td>California WaterFix</td>
<td>$2 / month</td>
<td>13% increase</td>
</tr>
<tr>
<td>Recycling Focus</td>
<td>$4.50 / month</td>
<td>19% increase</td>
</tr>
<tr>
<td>Desalination Focus</td>
<td>$7 / month</td>
<td>30% increase</td>
</tr>
</tbody>
</table>

1. Household impact based on 6.2 million occupied residential households in MWD Service area, 70% residential / 30% industrial split
2. Based on impact to MWD’s 2017 Full Service Treated Tier 1 water rate