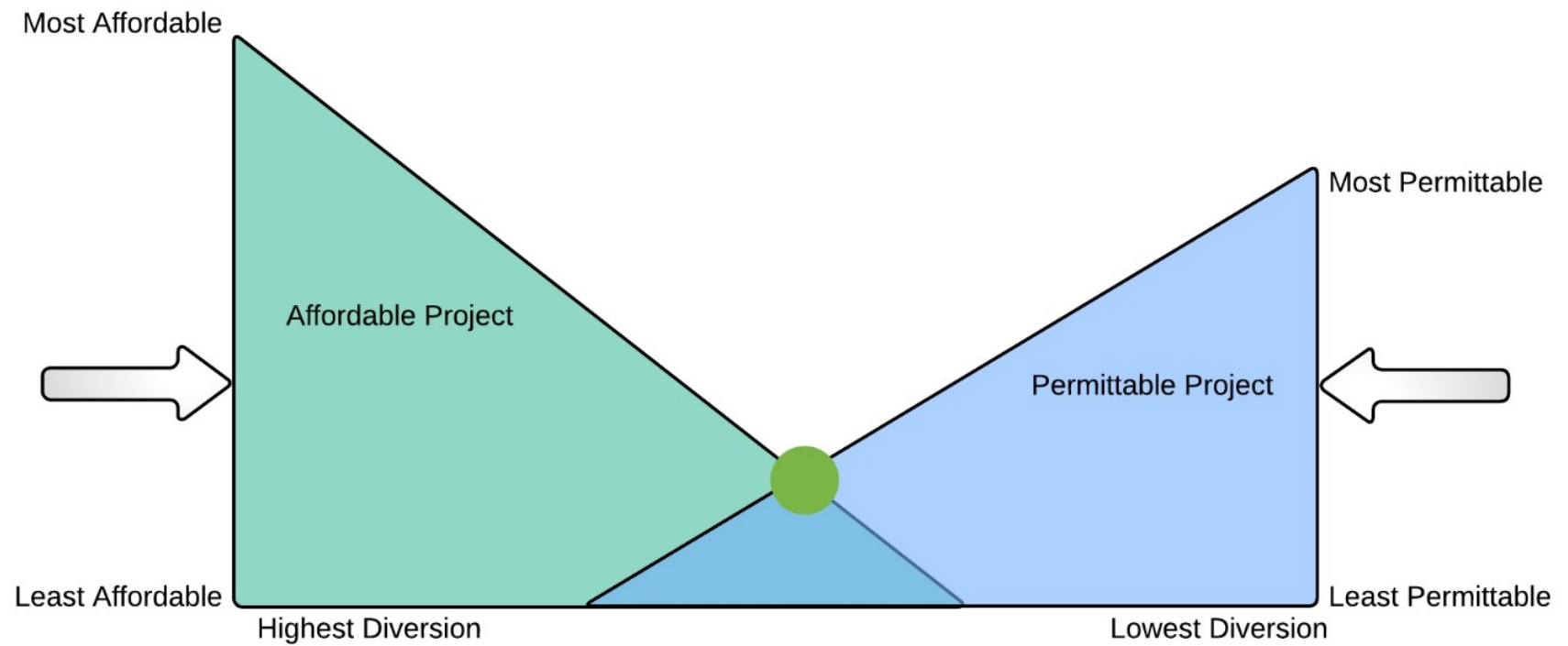


# Operations and Repayment (Affordability)

- Purpose and Background
- Changes in Water Management & Operations
- Analysis Process
- Scenarios Considered
- Preliminary Results
- Next Steps

# Affordable and Permittable



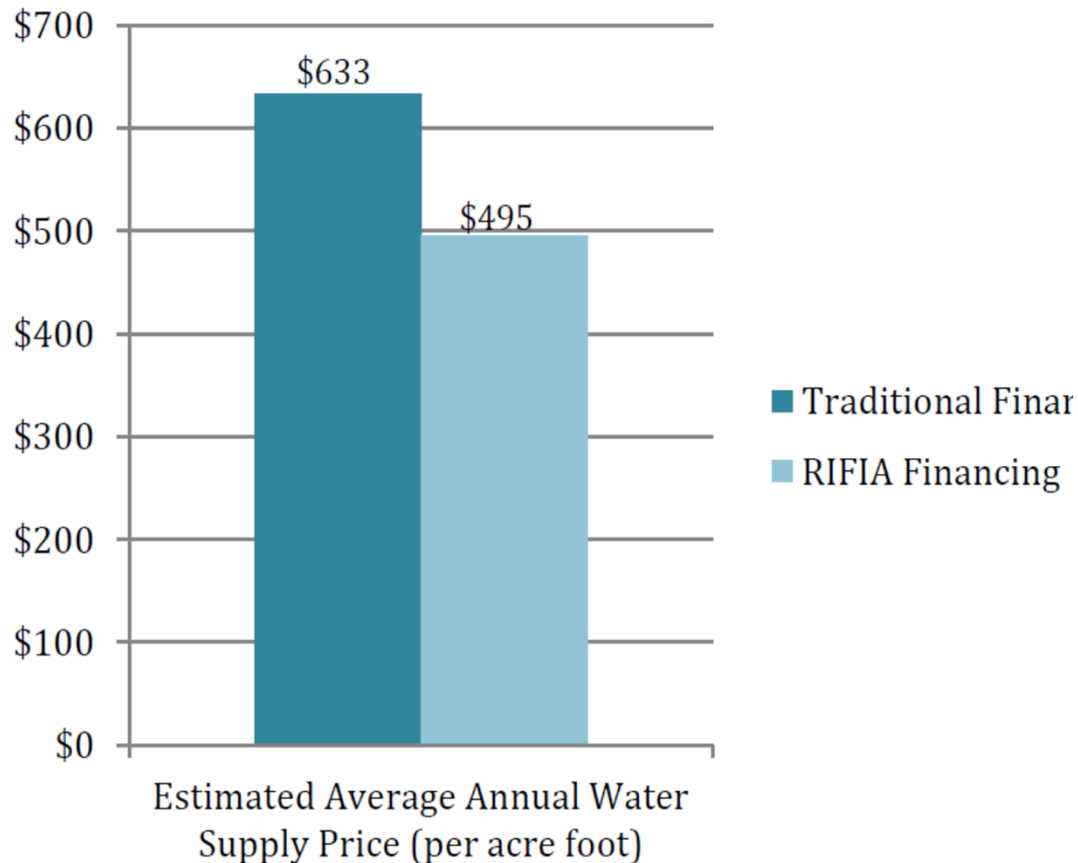
# Purpose

Estimate annual repayment and operational costs to participants associated with changes in:

- Facility sizes and costs
- Future operations – including climate change,
- Participation
  - a. Sacramento Valley
  - b. Beyond Sacramento Valley (Exports)
  - c. State of CA (Prop 1, WSIP)
  - d. Federal government (Dept. of Interior, WIIN Act)
- Future market conditions
  - a. Financial market & access to WIFIA &/or RIFIA
  - b. Construction market (competition), Supplier, and bulk material costs

# 2015 Analysis

## Average Annual Water Supply Price



### Assumptions:

- Project Cost = \$4.2 Bn (2015 dollars)
- WSIP funding = \$1.25 Bn
- Participation = 300,000 AF/Yr
- Bond funds available in year 2020
- Rate for Traditional: 4.31%
- Repayment starts in year 2026  
7 for 30-years
- No annual OM&R costs

# End of Phase 1 (Dec 2018) Analysis

## Common Assumptions

- Pay Interest only until completion, then principal and interest
- USDA loan at 3.875%
- Semi-annual interest payments in Jun/Dec, principal payment in Dec
- Level Debt Service

	<b>Assumed Future Bond Rates (5.0%)</b>	<b>Bonds if Issued at Current Rates (4.2%)</b>	<b>Bonds at Current Rates (4.2%) <u>plus</u> WIFIA loan (3.3%)</b>
	<b>(\$ millions)</b>	<b>(\$ millions)</b>	<b>(\$ millions)</b>
<b>Project Costs</b>	<b>6,464,317,786</b>	<b>6,464,317,786</b>	<b>6,464,317,786</b>
<b>Prop 1 Funds</b>	<b>816,000,000</b>	<b>816,000,000</b>	<b>816,000,000</b>
<b>WIIN Act Funds</b>	<b>1,300,000,000</b>	<b>1,300,000,000</b>	<b>1,300,000,000</b>
<b>USDA Loan Proceeds</b>	<b>438,728,982</b>	<b>438,728,982</b>	<b>438,728,982</b>
<b>WIFIA Loan Proceeds</b>	<b>-</b>	<b>-</b>	<b>1,100,000,000</b>
<b>Project Fund</b>	<b>4,275,728,982</b>	<b>4,277,728,982</b>	<b>4,239,276,206</b>
<b>CAPI Fund</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Debt Service Reserve Fund</b>	<b>139,869,790</b>	<b>128,146,735</b>	<b>119,048,643</b>
<b>Underwriters Discount</b>	<b>19,964,170</b>	<b>19,915,310</b>	<b>14,010,511</b>
<b>Cost of Issuance</b>	<b>6,500,000</b>	<b>6,500,000</b>	<b>5,500,000</b>
<b>Principal</b>	<b>4,442,062,942</b>	<b>4,432,291,028</b>	<b>4,377,835,361</b>
<b>Interest Paid</b>	<b>5,510,997,191</b>	<b>4,621,029,534</b>	<b>4,239,483,697</b>
<b>Debt Service</b>	<b>9,953,060,132</b>	<b>9,053,320,562</b>	<b>8,617,319,058</b>

# End of Phase 1 (Dec 2018) Analysis

PRELIMINARY RESULTS: CURRENT COST ESTIMATE of \$6,464 million (future \$)

	Assumed Future Bond Rates (5.0%)		Bonds Issued at Current Rates (4.2%)		Bonds at Current Rates (4.2%) plus \$1.1 Bn WIFIA loan (3.3%)		
	\$	\$/AF 250,000 AF	\$	\$/AF 250,000 AF	\$	\$/AF 250,000 AF	
<b>Annual Net Debt Service (Note 1)</b>							
in 2018 Dollars	183,978,345	736	168,787,718	675	156,998,493	628	Fixed payment
in 2032 Dollars	278,283,755	1,113	255,306,568	1,021	237,474,308	950	
<b>Annual O&amp;M (Note 2)</b>							
in 2018 Dollars	21,621,836	86	21,621,836	86	21,621,836	86	Escalates over time
in 2032 Dollars	28,529,554	114	28,529,554	114	28,529,554	114	
<b>Annual Revenue</b>							
in 2018 Dollars	(10,168,428)	(41)	(10,168,428)	(41)	(10,168,428)	(41)	Variable over time. Reduces payments
in 2032 Dollars	(13,367,172)	(53)	(13,367,172)	(53)	(13,367,172)	(53)	
<b>Total Net Cost</b>							
in 2018 Dollars	195,431,753	782	180,241,126	721	168,451,902	674	
in 2032 Dollars	293,446,136	1,174	270,468,949	1,082	252,636,690	1,011	

Note 1: Net debt service is debt service less interest earned on debt service reserve fund investments

Note 2: Annual O&M is for delivery at Holthouse. Delivery to Sacramento River adds \$17/AF in 2018\$ (\$22/AF in 2032\$)

# End of Phase 1 (Dec 2018) Analysis

	2015 Analysis	2018 Analysis
<b>Project Cost</b>	Project costs for Alternative D (1.8 MAF, Delevan I/O)	Risk-adjusted Project costs for Alternative D (1.8 MAF, Delevan I/O)
<b>State</b>	\$1,250M	WSIP (\$816M)
<b>Federal</b>	Combined with State	Draft Feasibility (\$1,300M)
<b>Local (PWA)</b>	300,000 AF/yr	250,000 AF/yr
<b>Interim Finance</b>	<ul style="list-style-type: none"> <li>Not included</li> </ul>	<ul style="list-style-type: none"> <li>Based on Phase 2 Work Plan and Budget</li> <li>Bank line of credit</li> <li>Payments as either interest only or interest and principal</li> <li>Principal rolled into permanent finance</li> <li>6-months carryover into 2022 until permanent finance is in place</li> </ul>
<b>Permanent Finance</b>	<ul style="list-style-type: none"> <li>Either with or without RIFIA</li> <li>Bonds</li> </ul>	<ul style="list-style-type: none"> <li>USDA Rural Development Loan (\$ 449 m)</li> <li>Either with or without WIFIA</li> <li>Bonds</li> </ul>
<b>Operable Date</b>	2026	2032
<b>Operations Basis</b>	?	DCR-2015

# Affordability: Updated Financial Modeling

## Assumptions

- Interest rate assumptions - Stayed the same as forecasted loan  
Bond rates for 2022-2030 have not changed significantly from late 2018 forecasts.
- Federal WIIN Act funds: 25% of total cost (max \$1.6 billion)
- Construction costs Updated to 2018 basis then escalated from there.
- Risk Mitigation cost escalator reduced from 4.2% to 3.9%.

## Flexibility built in for scenario analysis by:

- Cost based on reservoir size and options
- Interest rate
- WIFIA / RIFIA funding amount
- \$/AF value based on water releases



- ✓ Responses: 4 of 21
  - 3 Dry year supplies
  - 1 Annual deliveries
- ✓ Range of price and associated quantity (assuming permittable)
  - Medium price reflects 2018 scenario
  - Quantities drop if \$/acre-ft > medium price
- ✓ Sensitivity to other water management activities
  - ROC on LTO CVP/SWP: Not currently viewed as a driver
  - Sac Valley:
    - Voluntary Agreements
    - Bureau participation
  - South: Delta Conveyance

# Changes in Water Management & Operations

## 1. Other Water Management Actions

- ✓ ROC on LTO of CVP/SWP (BiOp pending)
- ✓ Voluntary Agreements (pending)
- ✓ Priority of Fremont Weir Notch
- ✓ Delta Conveyance
  - Freeport criteria
  - Net Delta Outflow Index
- ✓ Implement RPAs for 2008/2009 BiOps (CA EcoRestore)
- ✓ Shasta raise

NOTE: These items were not included in the CalSim model provided by the Water Commission

# Changes in Water Management & Operations

## 2. Administration/Policy Change (EO-10-19)

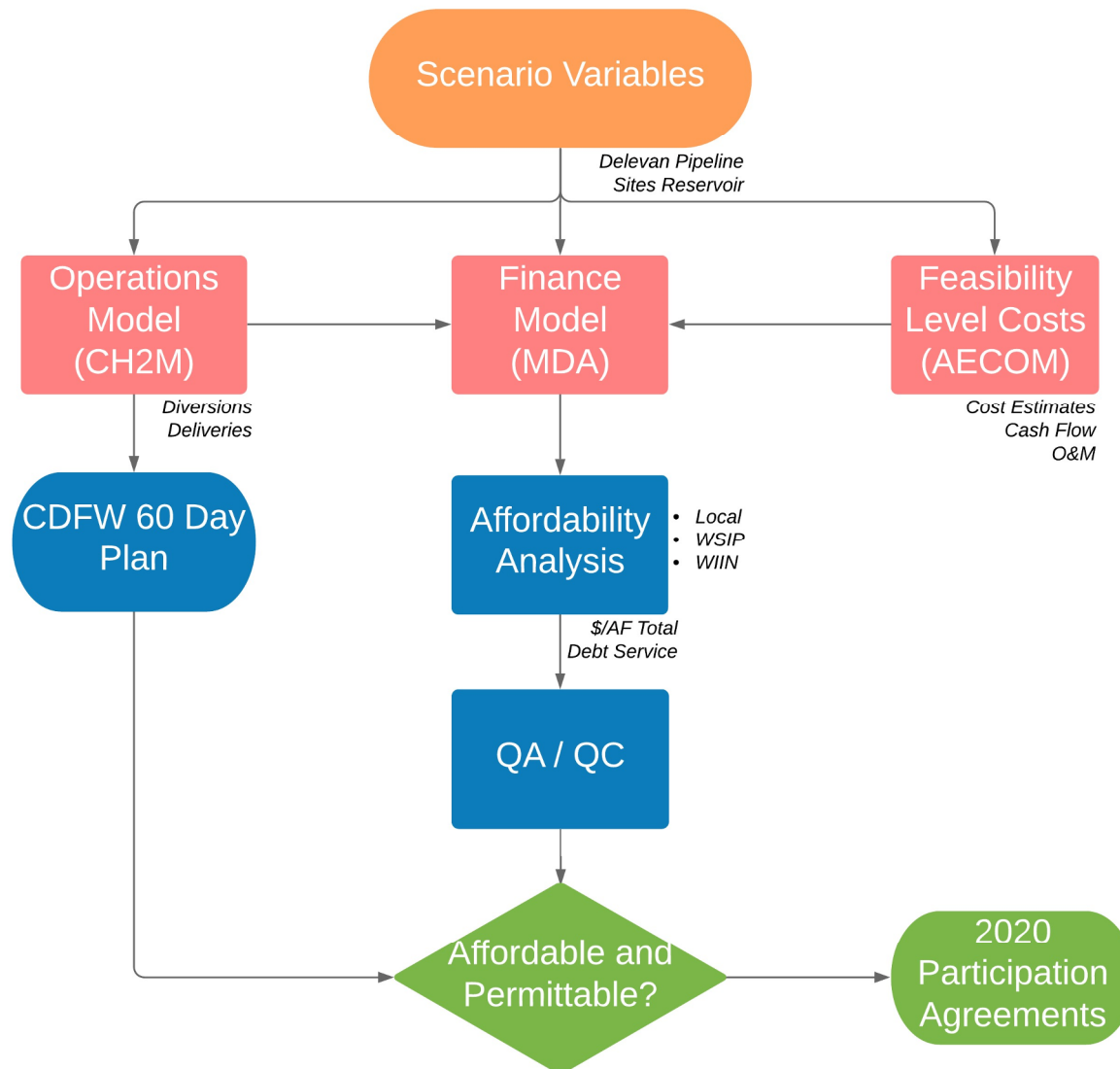
### Priorities:

1. Develop a water resilience portfolio
  - Pursue collaborative strategies
  - Reassess the 2016 Water Action Plan
  - Assess water reliability
  - Pursue Voluntary Agreements
  - Single-tunnel WaterFix
  - Provide access to clean, safe, & affordable water
2. Integrate State's Resources (funding, talent, personnel, & policy)
3. Breakdown the Binary

### Principles:

- a. **Prioritize multi-benefit approaches**
- b. Utilize natural infrastructure (forests & floodplains)
- c. Embrace innovation & new technologies
- d. **Encourage regional approaches**
- e. Adopt approaches (benchmark)
- f. Integrate state's investments, policies, and programs
- g. **Strengthen partnerships**

# Process



# Process

- Based on beneficiary pays – both capital and OM&R
- Use current participation (long-term annualized deliveries)
- Operations used to convert deliveries into 4 storage accounts
  - Sacramento Valley
  - Beyond Sacramento Valley (Exports)
  - State and Federal (water for the environment).
- Facilities and operations determines size of storage accounts
  - Range of facilities needed to match operations (deliveries)
- Size of storage accounts determines financial obligation (based on Cost of Production)

# Range of Facility Sizes & Costs

- Range of facility sizes
  - a. Reservoir: 1.8 MAF - 0.8 MAF
  - b. Delevan facility: Inlet/Outlet or Outlet only
  - c. Pipelines: 2 vs 1
  - d. Construction schedule's effect on Interest During Construction (IDC)
- Range of construction costs
  - a. Cost estimate: Appraisal level (dollars in 2018)
  - b. Construction schedule's effect on Interest During Construction (IDC)
  - c. Mitigation for construction effects is scaled by footprint size
  - d. Mitigation for operations does not decrease proportionately with smaller project (i.e. not linear)
- Range of operating costs (OM&R)
  - a. Includes seasonal hydropower (releases)
  - b. Excludes pumped-storage hydropower

# Range of Participation, State of California

- Current Prop 1, WSIP
  - a. Current MCED = \$816 million
  - b. Dollars in 2015 (Amount does not escalate)
  - c. Capital Only. Can't be converted to cover OM&R costs
  - d. Deduct recreation benefits (50% cost-share with federal)
  - e. Deduct flood risk reduction benefits (35% cost-share, 65% federal)
  - f. Convert remaining dollars into a storage account (Cost of Production)
  - g. Reserve a fraction to sell water to cover OM&R costs
- Release water to comply with Water Commission's current priorities
  - a. Augment water for wildlife refuges (Incremental Level 4)
  - b. Release water to flow into Cache Slough for Delta smelt
  - c. Water flowing through Cache Slough is eventually counted towards Delta outflow
  - d. Current working assumption is annual deliveries

# Range of Participation, Federal (interior)

- Storage Investment through WIIN Act < 25%
  - a. Dollars escalate, but can't be converted to cover OM&R costs
  - b. Deduct recreation & flood risk reduction (cost-share with State)
  - c. Convert remaining dollars to storage account (Cost of Production)
  - d. Water to augment wildlife refuges (Incremental Level 4)  
OM&R: Requires annual appropriations or use existing source (e.g. CVPIA)
  - e. Water to provide "Operational Flexibility"  
For flow stabilization & coldwater pool: OM&R is *not* reimbursable to CVP Contractors. Requires annual appropriations or other funding mechanism  
For Export: OM&R is reimbursable to CVP Contractors receiving water benefits

Or, reserve a fraction to sell water to cover OM&R costs
- Cooperative Operations (No storage investment)
  - a. Annual exchange of "Local" water with Shasta (and potentially Folsom) and no carryover
  - b. "Local" water takes risk of spill
  - c. Limitations on fall release flows and maximum exchange volume



# Range of Participation, Local / Public WA

- Common
  - a. Convert deliveries into storage volumes using pro-rata share of the Cost of Production
  - b. Apply current participation first
  - c. When needed, estimate additional participation needed to be fully subscribed
  - d. Apply conditional USDA Loan
  - e. Evaluate combination of WIFIA &/or RIFIA up to 49% of total non-federal costs
- Releases for use in Sacramento Valley (CVP)
  - a. Ag Service Contractors
  - b. Settlement contractors
- Releases for use beyond Sacramento Valley (SWP)
  - a. Southern CA
  - b. Bay Area
  - c. North Bay
  - d. San Joaquin Valley

# Range of Diversions and Releases

## Operations:

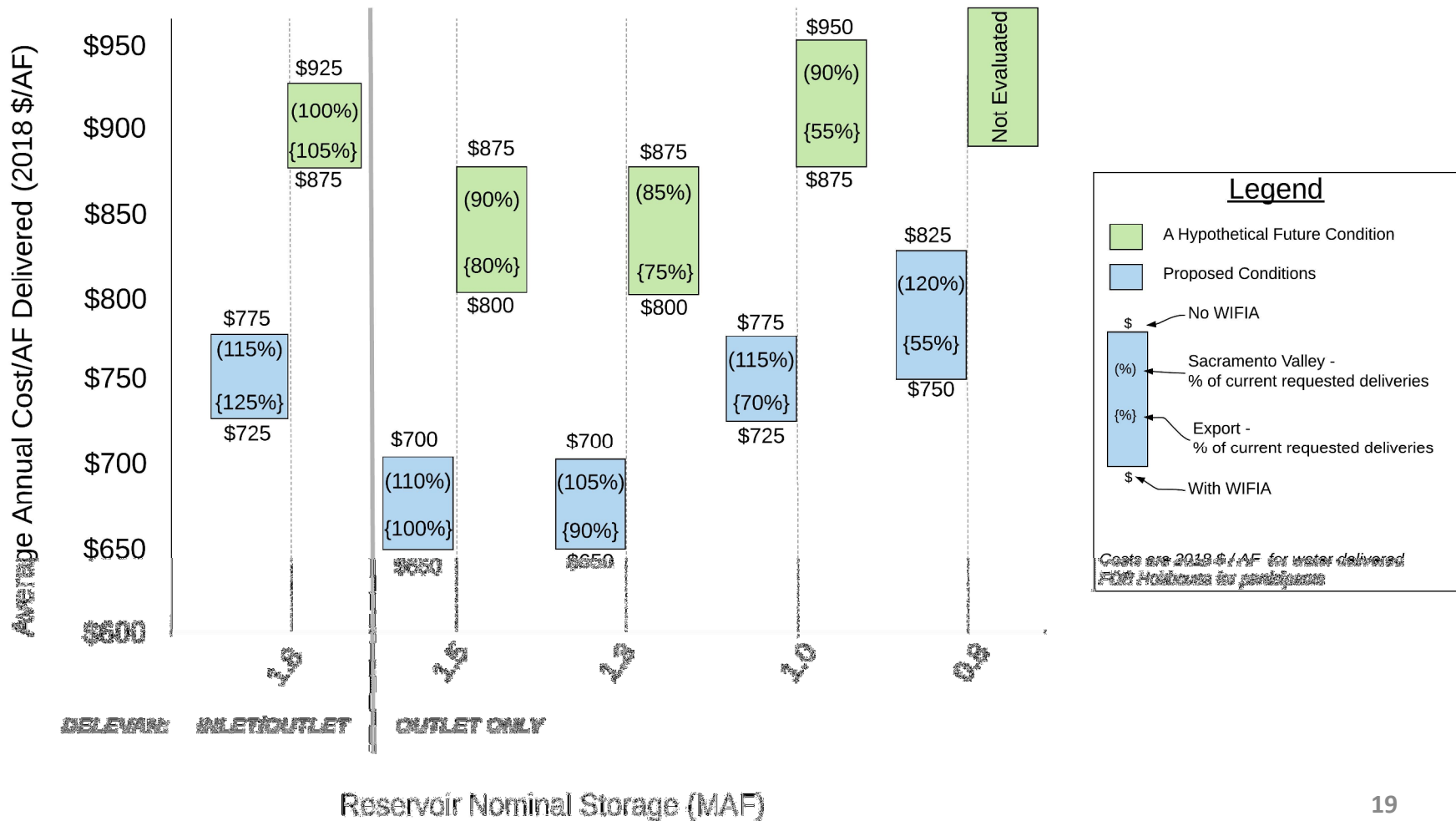
- DWR's DCR2015 (same as WSIP and Alt D in DEIR/S)
  
- One hypothetical future operations

## Next Steps:

- a. Additional hypothetical future operations
  
- b. Include climate change (ELT)

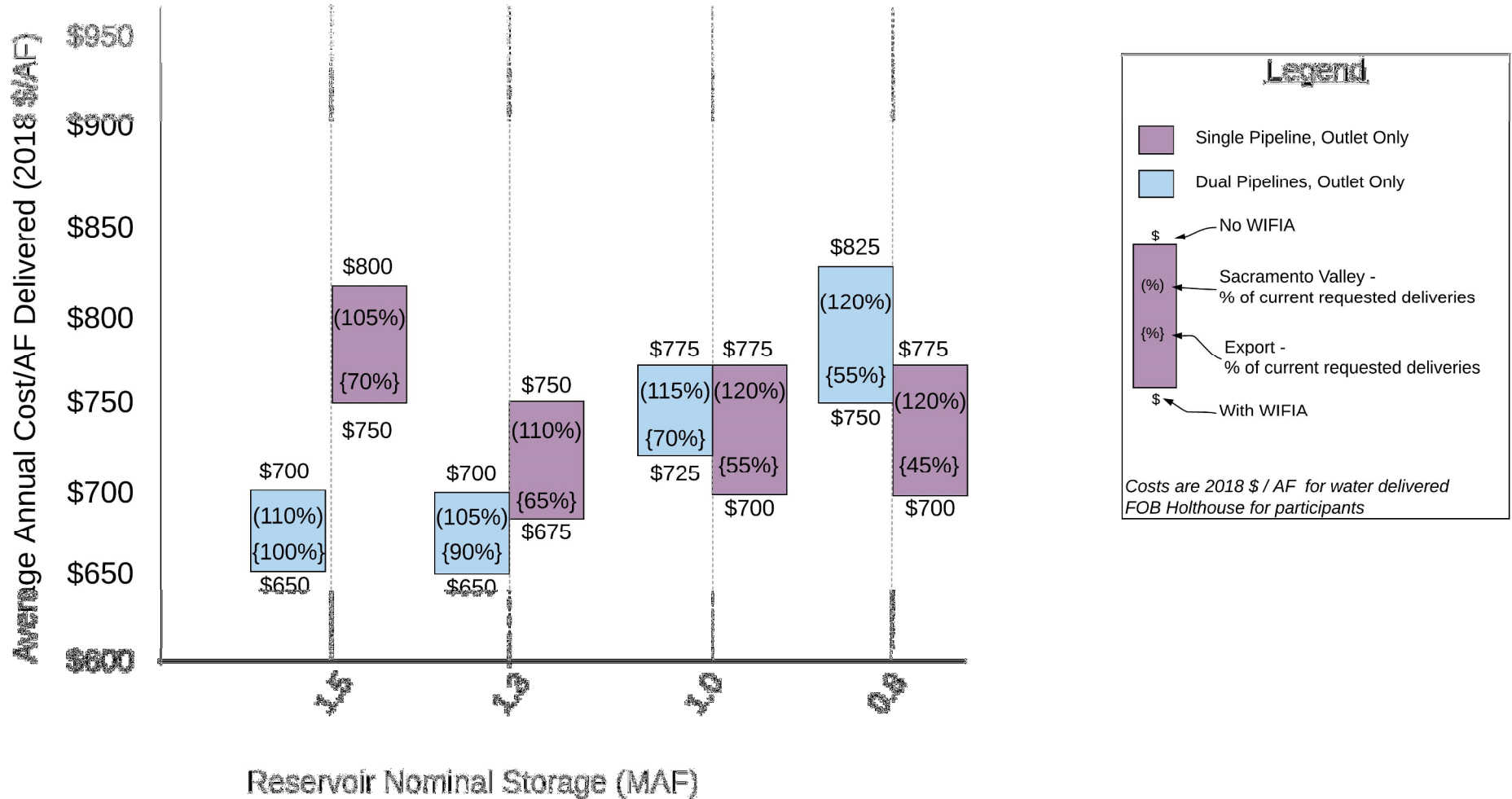
# Results: Average Year Affordability Scenarios

Participating Water Agencies Long Term Average \$/AF Deliveries (not drier year)



# Results: Sensitivity Analysis: 2 vs 1 Pipeline

Sensitivity Analysis: Dual vs Single Pipeline (not drier year), Proposed Conditions



Costs are 2018 \$ / AF for water delivered FOB Holthouse for participants

# Results: Storage based on Cost of Production

		Inlet/Outlet	Outlet Only			
Reservoir Nominal Storage	MAF	1.8	1.5	1.3	1.0	0.8
Project Cost, 2018\$	\$million	5,235	4,219	3,967	3,832	3,578
Project Cost, Nominal \$ (includes risk adjustment)	\$million	6,448	5,196	4,886	4,748	4,406
Active Storage	TAF	1,690	1,380	1,150	880	680
<b>State</b>						
Storage Account Size	AF	235,854	243,968	218,139	172,785	142,625
\$/AF storage "installed"	\$2018/AF	2,902	2,803	3,133	3,955	4,789
\$/AF storage/30yrs	\$2018/AF/yr	97	93	104	132	160
<b>Sacramento Valley</b>						
Storage Account Size	AF	250,000	230,000	230,000	230,000	195,000
\$/AF storage "installed"	\$2018/AF	3,673	3,067	2,836	2,708	2,988
\$/AF storage/30yrs	\$2018/AF/yr	122	102	95	90	100
<b>Export</b>						
Storage Account Size	AF	814,403	590,794	438,359	273,450	184,352
\$/AF storage "installed"	\$2018/AF	3,049	3,228	4,024	6,158	8,546
\$/AF storage/30yrs	\$2018/AF/yr	102	108	134	205	285
<b>Federal</b>						
Storage Account Size	AF	389,743	315,238	263,502	203,766	158,022
\$/AF storage "installed"	\$2018/AF	3,457	3,448	3,879	4,839	5,930
\$/AF storage/30yrs	\$2018/AF/yr	115	115	129	161	198

# Results: General Take Aways

1. Finance: WIFIA loan reduces cost per acre foot on average by ~\$60 / AF
2. Changing Operations: Hypothetical future conditions increases repayment cost per by ~\$130 / AF
3. Value Engineering: Reducing project cost has biggest impact on reducing repayment (up to \$110 / AF)
4. Delevan Pipeline: Is key to maximize deliveries south of Delta
5. Participation: For a given project size, reduced State or Federal funding creates an opportunity for additional participation, but the shift in capital cost to participants increases IDC and repayment on \$/acre-ft.

# Next Steps

1. Evaluate additional hypothetical future conditions
  - ✓ With and without Climate Change
  - ✓ Attempt to estimate minimum Shasta and Folsom exchange quantities to create flow stabilization and coldwater pool benefits
2. Evaluate alternative Federal (Dept of Interior) participation
  - ✓ No WIIN Act Investment, but cooperative operations
  - ✓ Reduced WIIN Act Investment
  - ✓ Reduce federal priority to increase water available to meet current south of Delta participants first

# Next Steps (Continued)

## 3. Cost reduction Strategies

- ✓ Optimize project facilities to reduce costs (In 2020-2021 Work Plan)
- ✓ Implement key findings from 2018 risk assessment
- ✓ Allocate some facility costs to Hydropower - if 3<sup>rd</sup> party developer

## 4. Further evaluate effects of future market changes

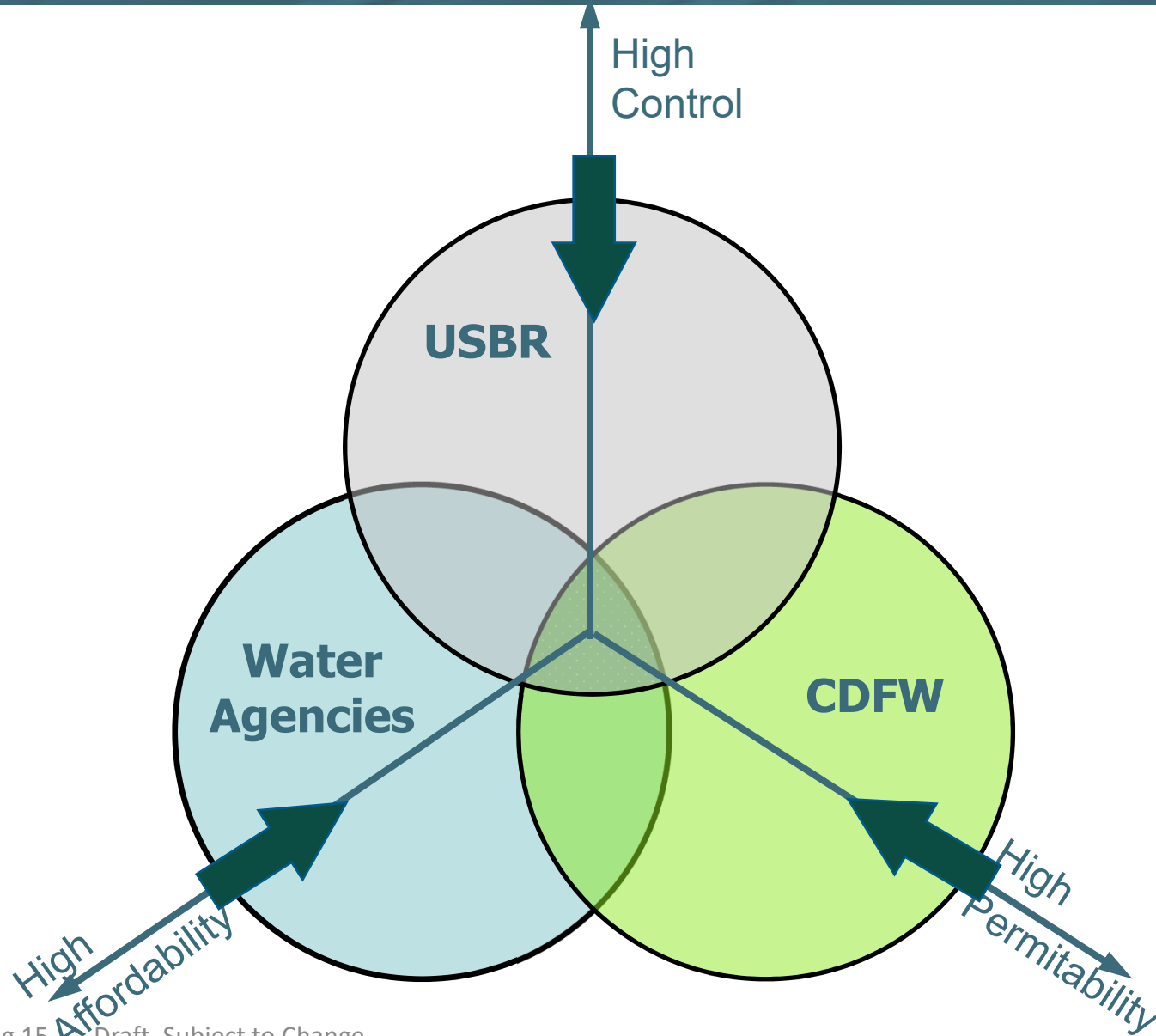
- ✓ Financial market
- ✓ Construction, supplier, and bulk material markets

## 5. Other actions

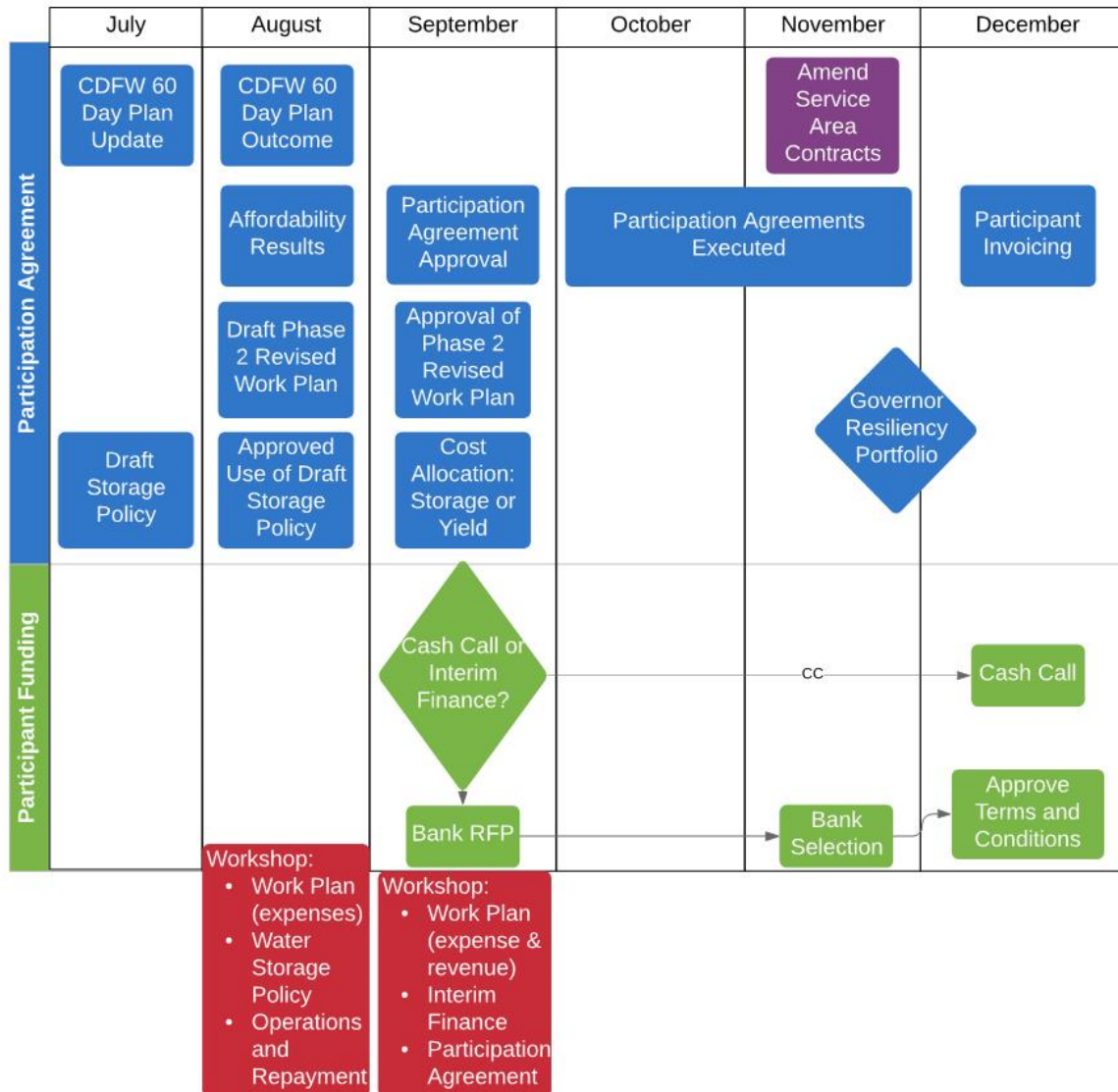
- ✓ Seek to have Water Commission fully fund eligible public benefits
- ✓ Seek other funding sources (e.g. future water bond)



# Next Steps (Continued)



# 2019 Participation Agreement Schedule



# Next Steps: Schedule

- ✓ August 15: Draft 2020-2021 Work Plan,  
(Workshop) Affordability analysis, & draft Storage Policy
- ☐ August 22/26: Develop positions  
(Res Comm/Board)
- ☐ August 28: Tentative agreement & define next steps
- ☐ Sept 12 2020-2021 Work Plan,  
(Workshop) Funding: Cash call vs. Interim finance,  
Draft Participation Agreement
- ☐ Sept 20/23 Discussions with CDFW Director (proposed)  
(Res Comm/Board) Approve Work Plan, Agreement, and Funding Method
- ☐ October Distribute packages to existing participants  
Potential Bank Facility Line of Credit RFP
- ☐ December 19/20 Participation decisions & release invoice  
(Res Comm/Board)
- ☐ January 1 Phase 2 (2020-2021) starts