



Alternative Water Source Program Public Service Committee Update

July 19, 2021

ENGINEERING UPDATE

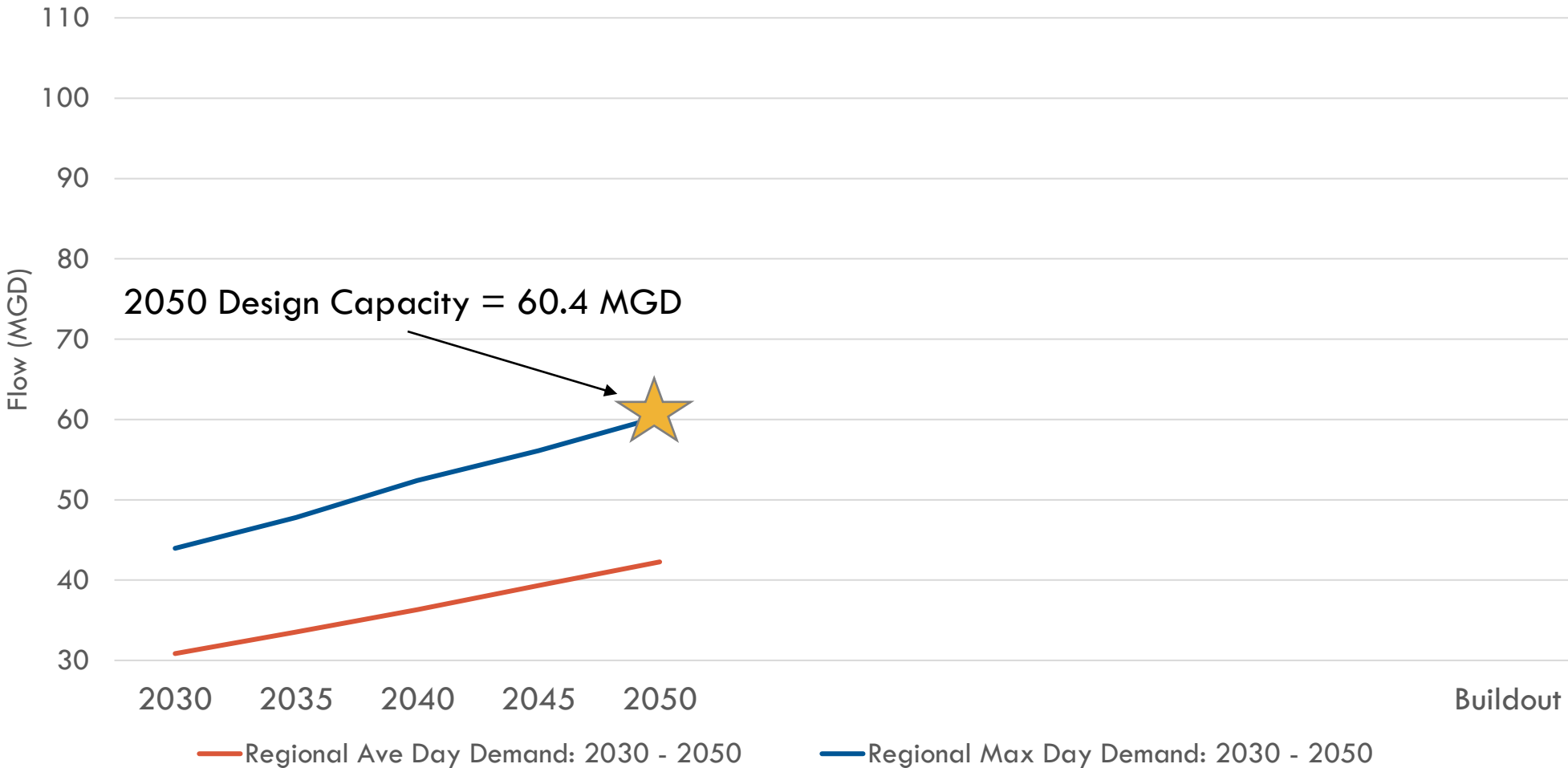


- Updated **Design Flows**
- Regional **System Configuration** Overview
- Description of Individual **Capital Improvement Projects (CIPs)**
- Preliminary Design **Schedule**

Updated Design Flows

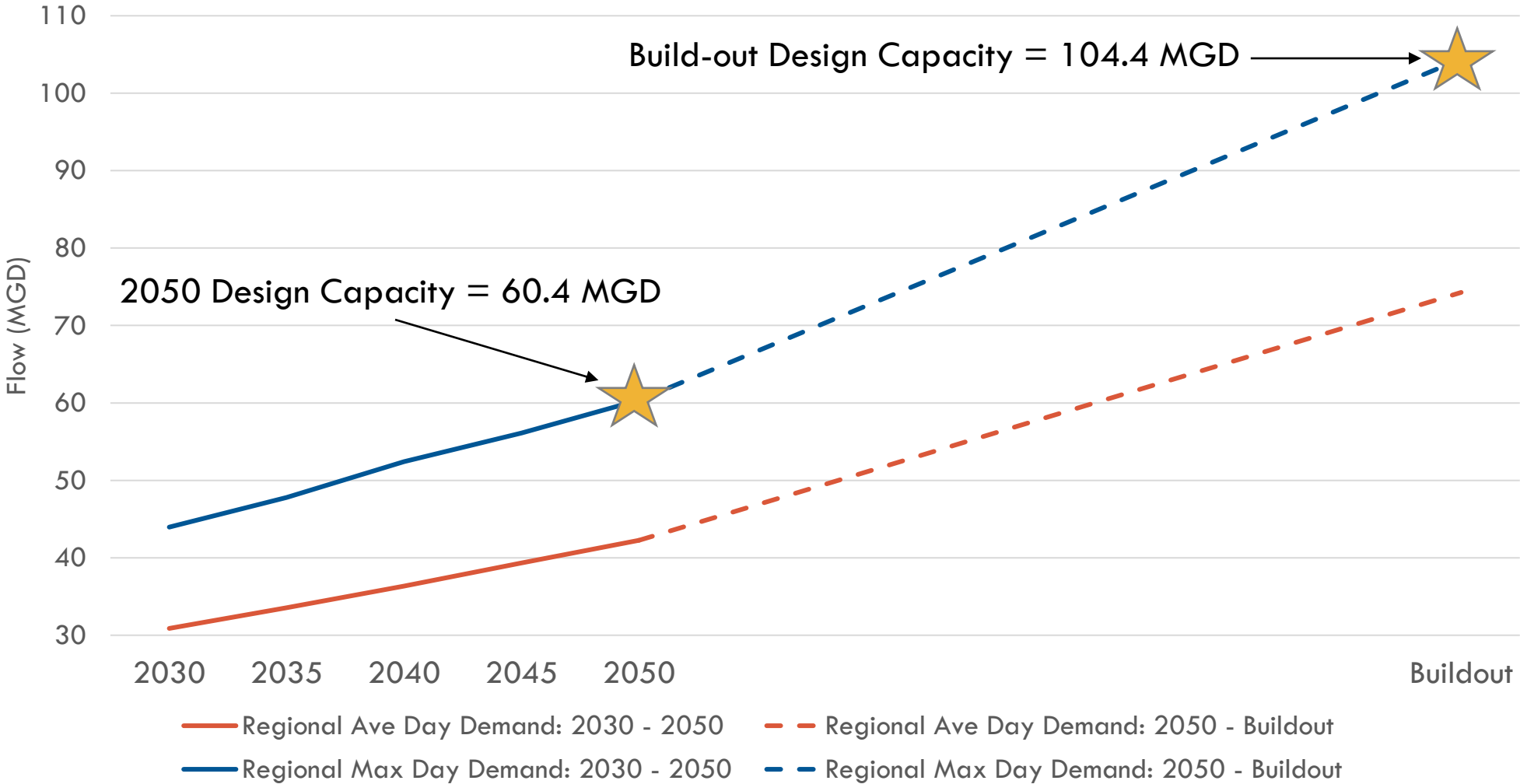
DESIGN FLOWS: 2030 – 2050

Regional System



DESIGN FLOWS: 2030 – BUILDOUT

Regional System



DESIGN CONDITIONS

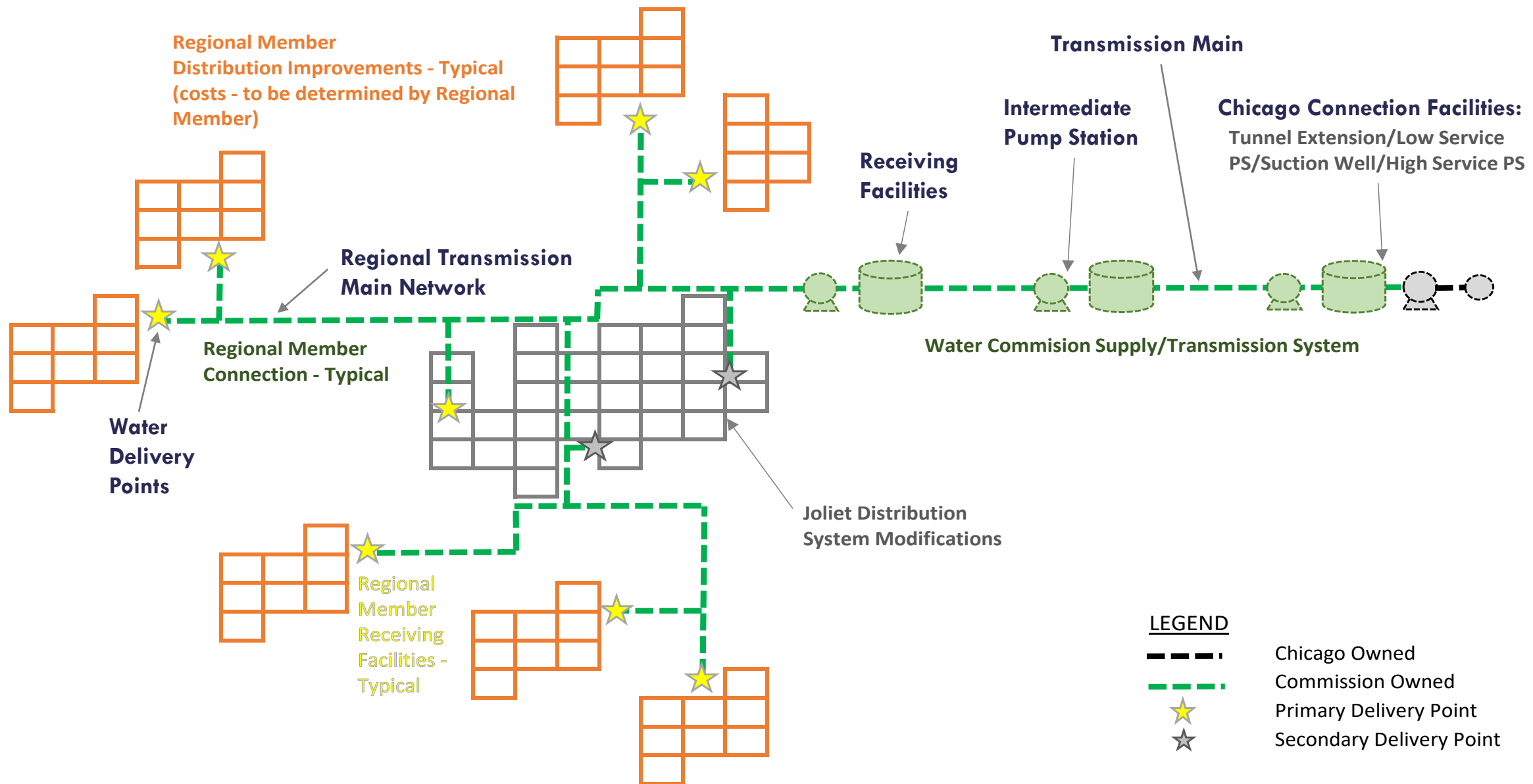


- AWSP Preliminary Design assumes **60 MGD Regional Demand Scenario** (to be adjusted based on Water Commission Members' demands during final design)
- Initial design must supply 2050 **Maximum Day Demand** without upgrades
- However, initial design must also consider build-out demand requirements

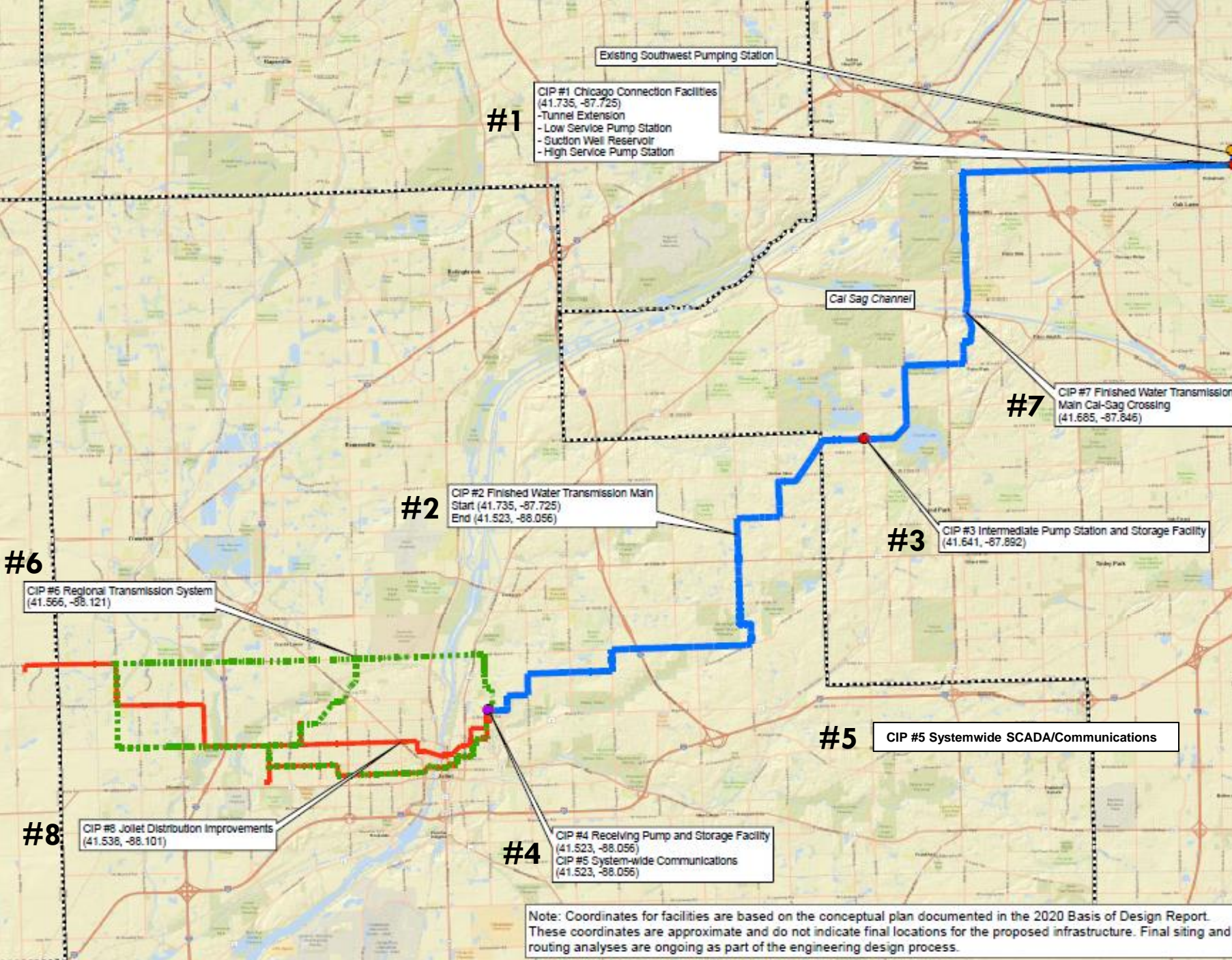
DESIGN FLOWS	2030	2050	Buildout
Minimum Day Demand (MGD)	24.7	33.8	59.4
Average Day Demand (MGD)	30.9	42.2	74.3
Maximum Day Demand (MGD)	44.0	60.4	104.4
Maximum to Average Ratio	1.42	1.43	1.41

Regional System Configuration

System Components:



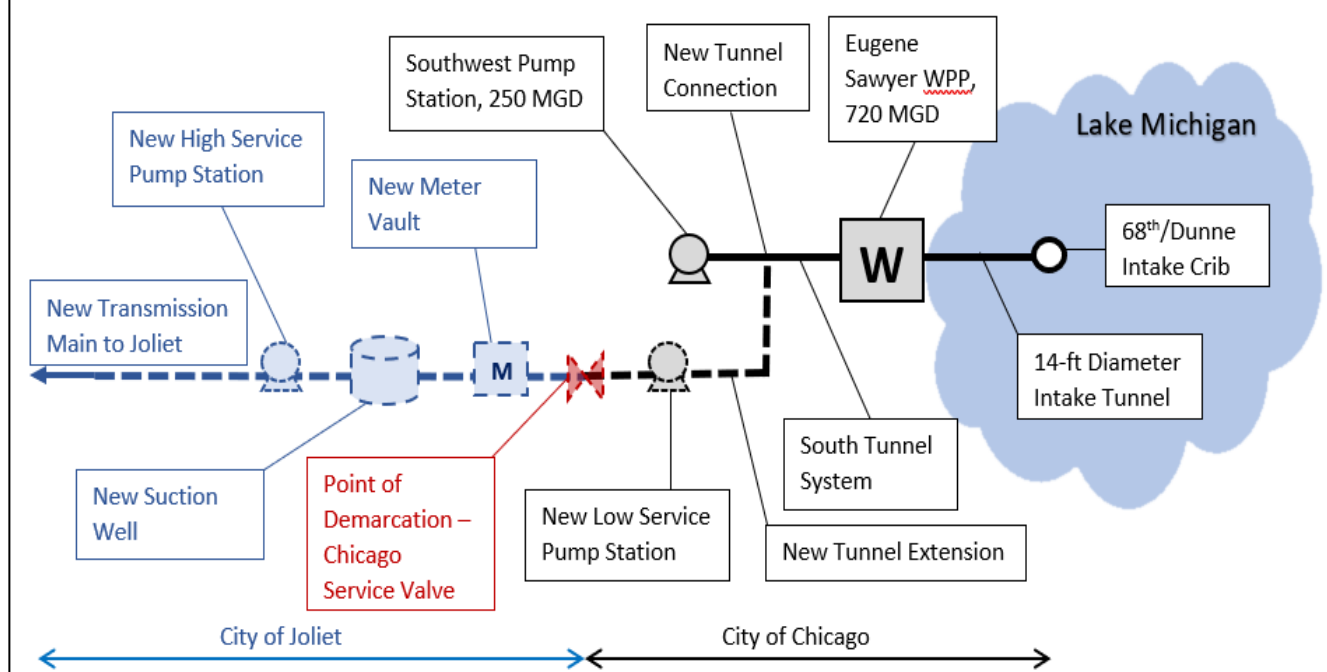
Capital Improvement Projects (CIPs)

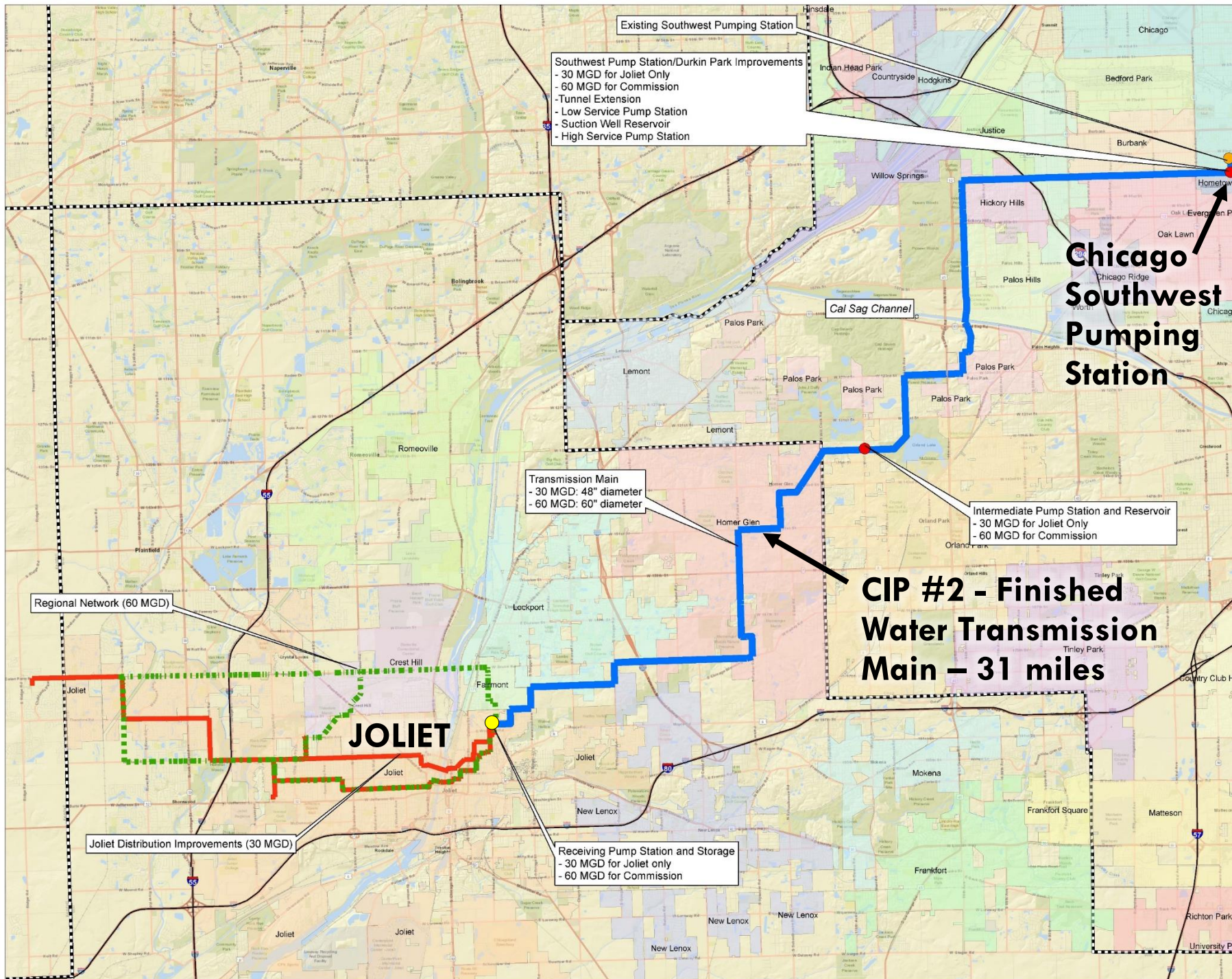


- CIP#1 – Chicago Connection Facilities
- CIP#2 – Finished Water Transmission Main
- CIP#3 – Intermediate Pump Station/Storage
- CIP#4 – Receiving Pump Station/Storage
- CIP#5 – Systemwide SCADA/Communication
- CIP#6 – Regional Transmission Main Network
- CIP #7 – Cal-Sag Crossing
- CIP #8 – Joliet Distribution Improvements

CIP#1 - CHICAGO CONNECTION FACILITIES

- Tunnel Connection
- Tunnel Extension
- Low Service Pump Station
- Chicago Service Valve
- Meter Vault
- Suction Well
- High Service Pump Station





CIP#2 – Finished Water Transmission Main



0 1.25 2.5 5 Miles

(At original document size of 22x34)
1 Inch = 6000 FT

Legend

- Finished Water Transmission Main
- Regional Network
- Water Distribution System Modifications


Facilities

- Existing Fairmount & Garvin Facilities
- Existing Southwest Pumping Station
- Proposed Facility
- County Boundaries



CIP#2 – FINISHED WATER TRANSMISSION MAIN



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- Single transmission main to meet full range of flows anticipated
 - Meet **minimum velocity** (1 to 2 feet per second) under **2030 Minimum Day Demand**
 - Meet **maximum velocity** (7 to 8 feet per second) under **Buildout Maximum Day Demand**
 - **66" diameter** transmission main anticipated for 60 MGD* Regional Demand Scenario
 - **Pipe material and Corrosion Control:**
 - Restrained or push-on joints
 - Rated for **working pressure plus surge pressure**
 - Evaluating all materials but **PCCP or steel pipe** likely (DIP possible at smaller sizes)
 - Corrosion control dependent on pipe material
 - Locate in **right-of-ways**, wherever possible

*Assumed for Preliminary Design – to be adjusted based on Water Commission Members' demands during final design



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CIP#4 - RECEIVING FACILITIES



- Storage/Standpipe, Pump Station & **Water Commission Office**
- Prior to first Water Delivery Point (Depending on location of first Customer may be combined with Intermediate Pump Station)
- **Standpipe** – volume to allow for shutdown of pumps at full design flow (anticipate 1.5 million gallons)
- **60 MGD* Maximum Day Demand** design, expandable to meet **buildout demand**
- Split case horizontal pumps with **VFDs**
- **N+1** design (meet design flow with largest pump out of service)
- Chemical feed facilities, if needed (**sodium hypochlorite**)
- 2 diesel standby **generators** combine to meet average flow
- Water Commission Office to be designed to allow for **educational opportunities and public engagement**

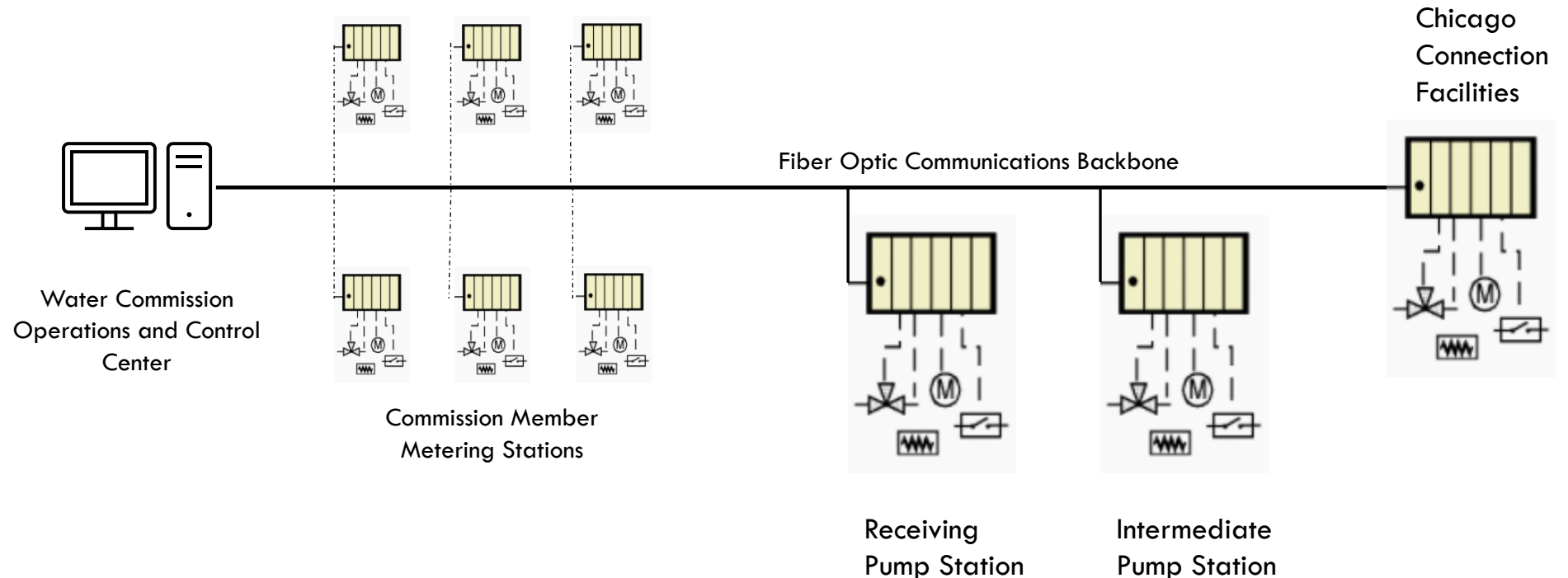
*Assumed for Preliminary Design – to be adjusted based on Water Commission Members' demands during final design

CIP#5 – SYSTEMWIDE SCADA AND COMMUNICATIONS




A Supervisory Control and Data Acquisition (SCADA) system will be constructed to allow for effective, real-time control of the new regional water transmission system.

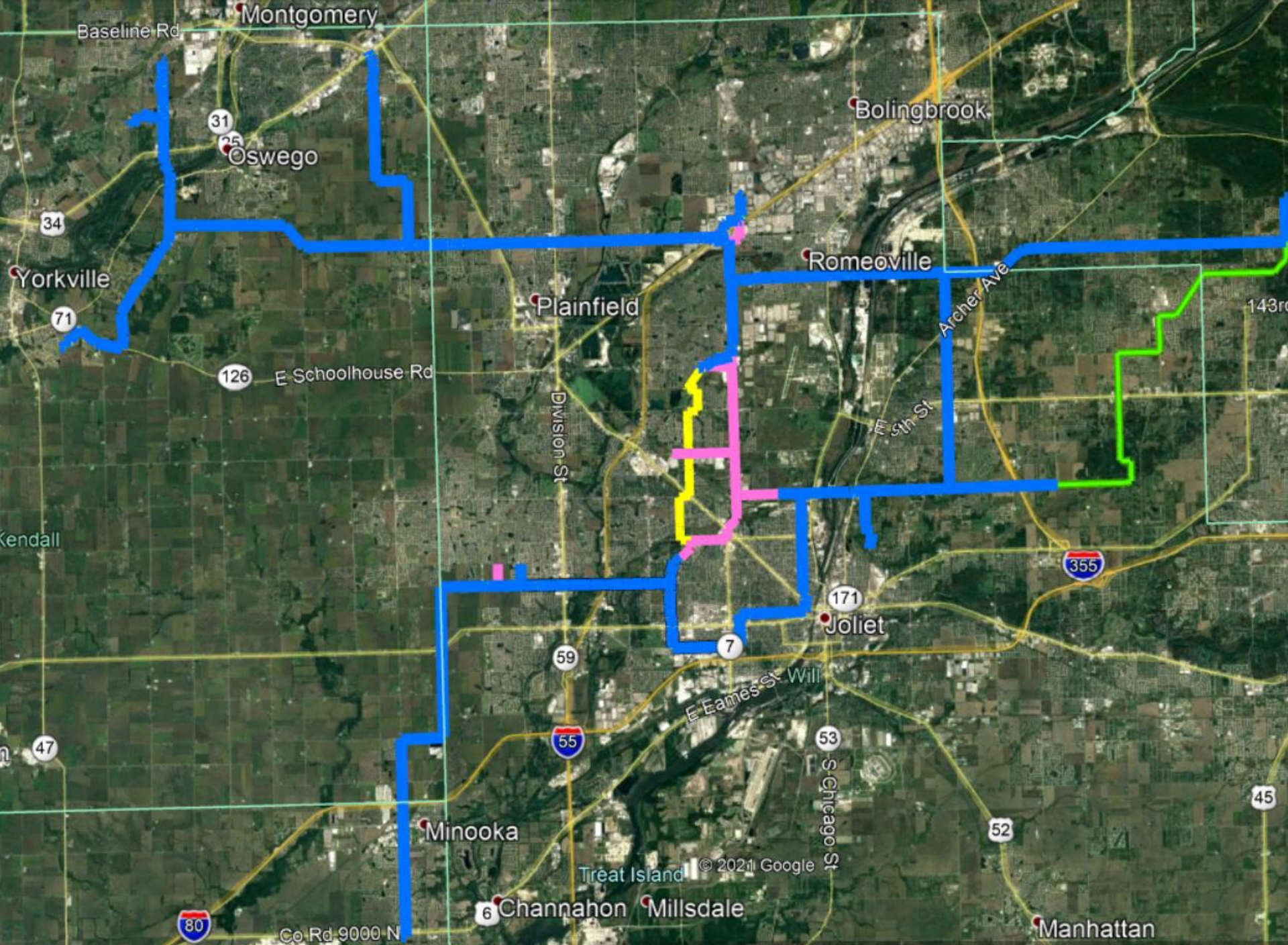
Conditions at each facility will be monitored by instruments and relayed to the Operations and Control Center via a systemwide communications network.



CIP#6 - REGIONAL TRANSMISSION MAIN NETWORK



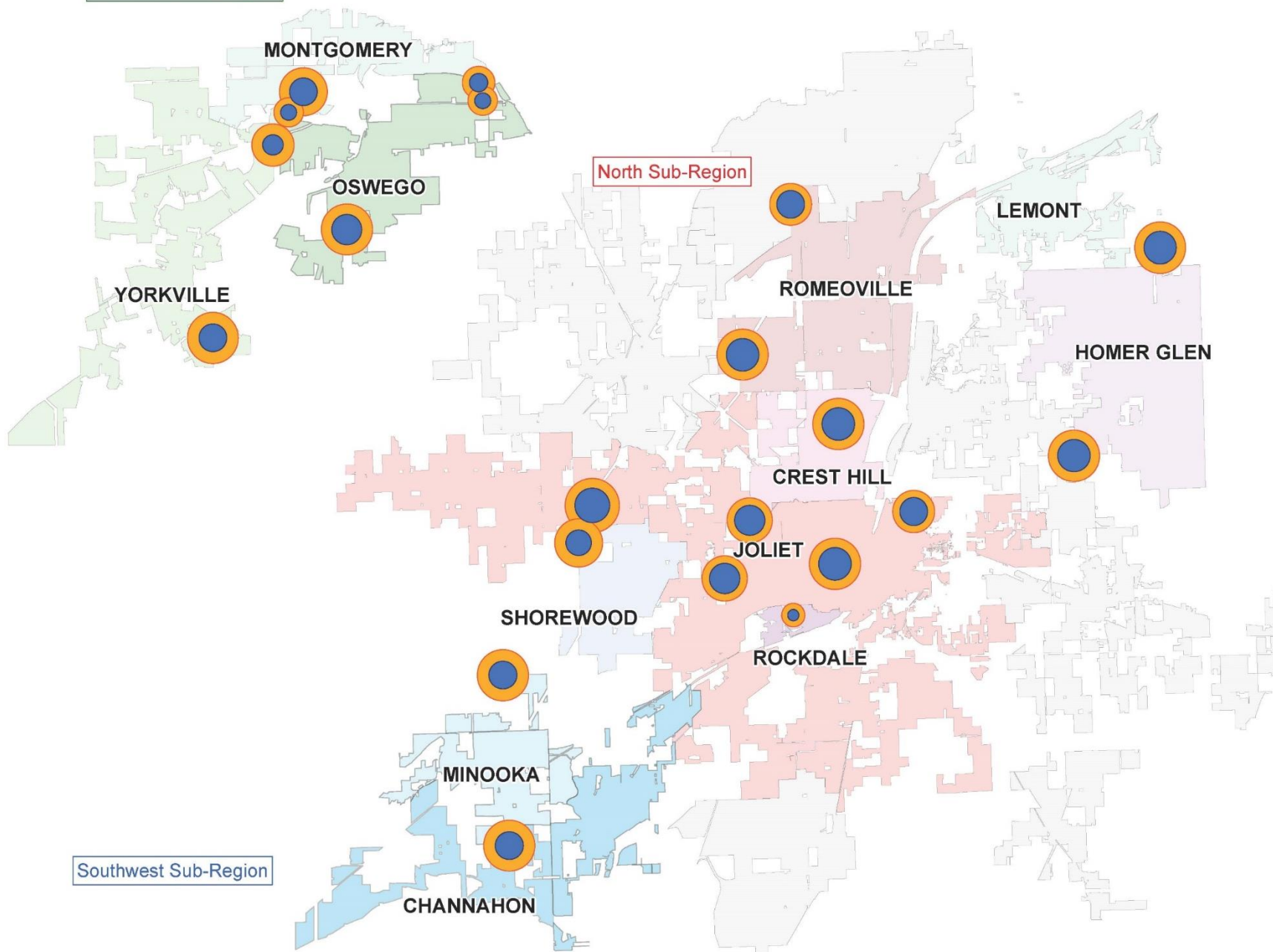
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- Routing and sizing **optimized based on hydraulic analysis**
 - Meet **2050 Maximum Day Demand** flows initially (looking at minimum velocities at 2030 Minimum day Demand)
 - Meet **buildout demand flows at maximum velocities**, add looping if necessary, to meet buildout demands
 - **Elevated storage** on transmission main network downstream of Receiving Facilities
 - **Same assumptions** for pipe material, construction & appurtenances as transmission main



CIP#6 Regional Transmission Main Network Options

- Multiple configurations are currently being evaluated
- Final configuration will depend on Water Commission members

Northwest Sub-Region



North Sub-Region


Southwest Sub-Region



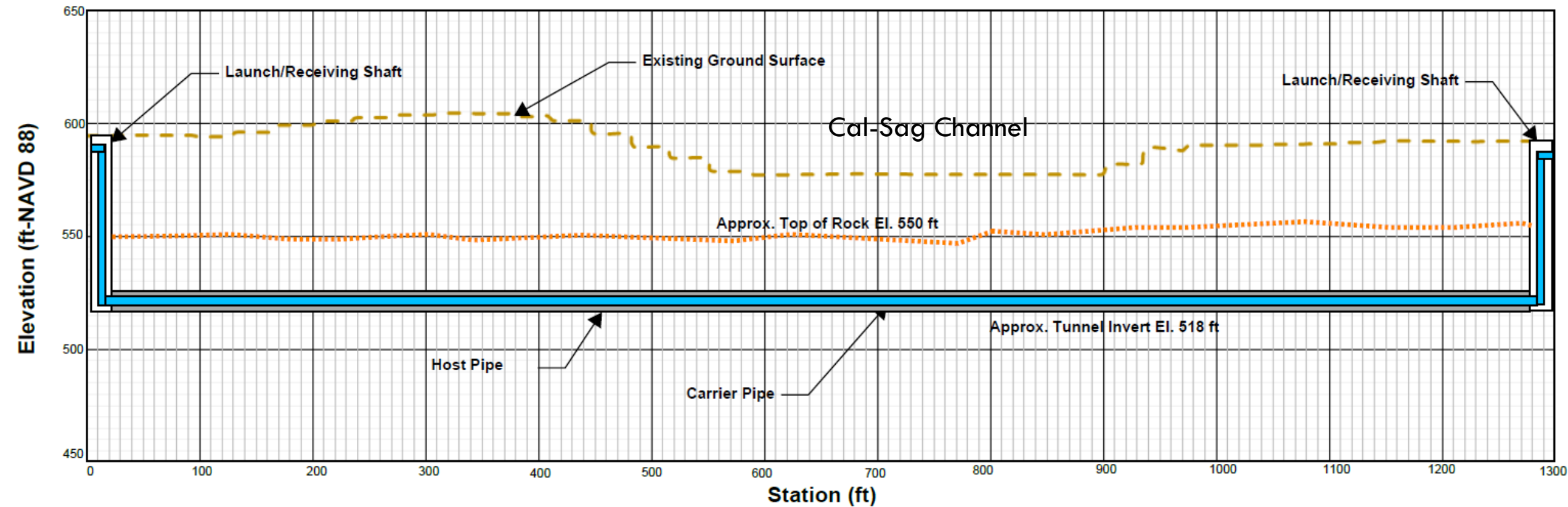
WATER DELIVERY POINTS

WATER DELIVERY POINTS



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- **Location** established by each Water Commission Member
 - Detailed requirements still to be established this year
 - At a minimum - **meter** owned, operated and maintained by **Water Commission**
 - After meter, **point of demarcation** between Water Commission and Water Commission Member
 - Water Commission **Member to provide storage, pumping** as necessary to meet their system requirements

CIP#7 – CAL-SAG CHANNEL CROSSING



Conceptual Profile

CIP#8 – JOLIET DISTRIBUTION IMPROVEMENTS









Improvements are required within Joliet to distribute water from the new regional transmission system to customers throughout the service area



- Five (5) new water delivery points
- Additional pumping and water storage capacity (2 x allocation required)
- Local water main improvements coordinated with the City's Water Main Replacement Program



Water and Sewer Service Center/Washington Street Water Facility

Preliminary Design Schedule

 Sizing/Capacity Analysis
  Siting/Routing Analysis
  1 Siting/Routing Analysis (Level 1)
  2 Siting/Routing Analysis (Level 2)
  Prelim Eng Field Investigations
  Preliminary Design

 Lead Solubility Screening
  Flow Through Pipe Tests