PUBLIC UTILITIES 2017 INFRASTRUCTURE REPORT CARD

Riverside Public Utilities

Board of Public Utilities
August 14, 2017

Importance of Infrastructure

1. Provides critical & essential services to the community
2. Investment in infrastructure should be strategic & include innovation & technology to make it more resilient & economical when possible
3. Investment in infrastructure spurs economic development, supports high customer service levels, ensures public safety, maintains or enhances property values & sustains a Community's quality of life

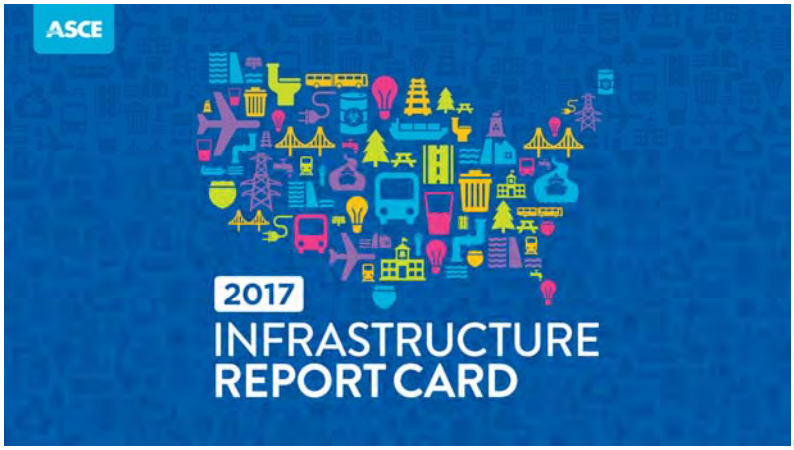
Presentation Agenda

1. Video - American Society of Civil Engineers (ASCE) 2017 Infrastructure Report card

2. Public Utilities Infrastructure Discussion

Video - American Society of Civil Engineers 2017 Infrastructure Report Card

Infrastructure Outlook
American Society of Civil Engineers (ASCE)



Infrastructure Outlook - ASCE

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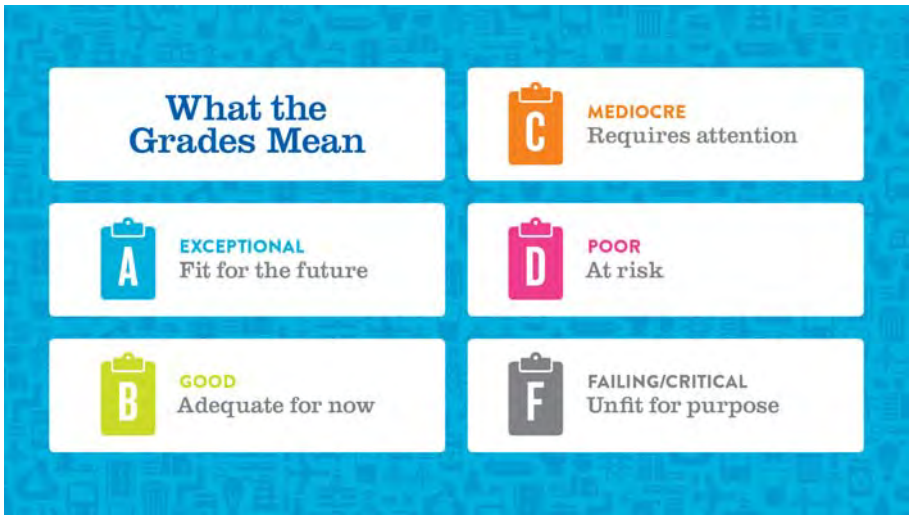
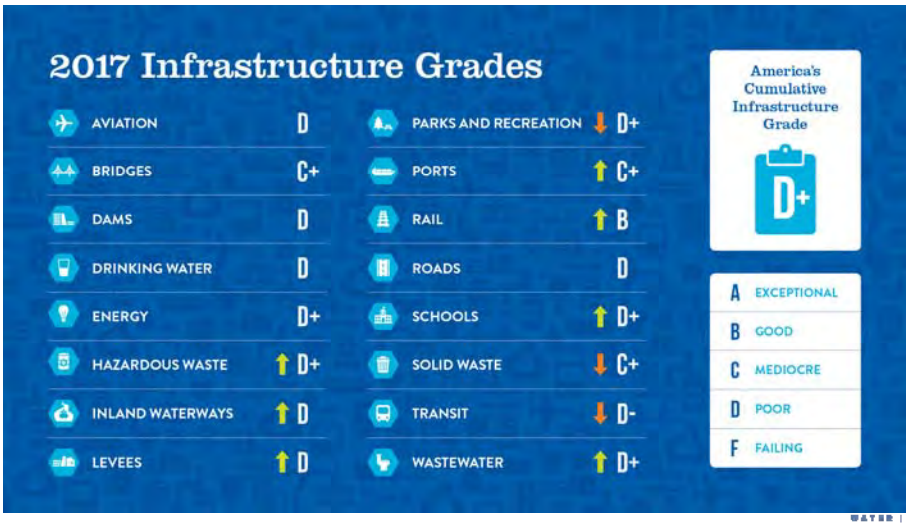


Infrastructure Outlook - ASCE



Public Utilities Infrastructure

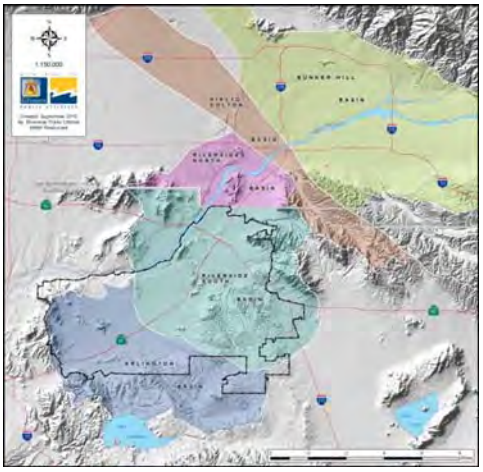
1. Used ASCE infrastructure report framework to assess City water and electricity production and distribution systems
2. Goal - to provide information on the status & future outlook
3. Anticipate completing a joint assessment with Public Works ahead of five –year planning & two-year budget cycle
4. Managed by the Water and Electric Enterprise Funds (non-general fund)

ASCE Grading Scale

- A – Exceptional – Fit for the future
- B – Good – Adequate for Now
- C – Mediocre – Requires Attention
- D – Poor – At risk
- F – Failing/Critical – Unfit for purpose

Water Supply and Treatment – Key Facts

1. Groundwater: 86,000 AFY supply
   - Seven Oaks Dam recharge
2. Six Water Treatment Plants
   - JW North WTP
   - Lockheed Martin and Shell



Water Supply and Treatment – Infrastructure Grade B

1. Water Supply – "B+"
   - $9.5M for Recycled Water, Phase 1A
2. Water Treatment Plant – "B-"
   - $1M for JW North membranes

Outlook:
Needs: $16M for recycled water, $14M for new treatment plant, $74M for storm water capture

Water Transmission Pipelines – Key Facts

1. System "Arteries" (16-72")
2. 34 miles of Supply Transmission
   - Good condition
3. 98 miles of distribution pipeline
   - 4 miles of Techite material
   - Generally undersized
4. Invested $35M (Safe W.A.T.E.R.)

Water Transmission Pipelines – Infrastructure Grade C

1. Supply Transmission – "B"
   - No projects scheduled
2. Distribution Transmission – "D"
   - $5M for next 5 years

Outlook:
Needs: $31M to replace "techite" pipe, $25M for three other projects

Water Distribution Pipelines – Key Facts

1. System "capillaries" (6-8 inches)
   - 822 Miles
2. 270 Miles of Cast Iron pipeline
   - Post WW II – short life span
3. Invested $63M (Safe W.A.T.E.R.)

Water Distribution Pipelines – Infrastructure Grade C

1. Pipeline "Tsunami"
   - Cast Iron Pipeline
2. $31M for next 10 years

Outlook:
Needs: $99M to replace 75 miles of pipeline

Water Facilities – Key Facts

1. 50 Domestic Wells
2. 60 Pressure Stations
3. 16 Reservoirs
4. Invested $110M (Safe W.A.T.E.R.)

Water Facilities – Infrastructure Grade

B–

$19M to maintain facilities

Outlook:

- Water facilities have a shorter life span and a continuous investment is necessary

Electric Grid Reliability – Key Facts

1. 91 miles of subtransmission circuits fed from single source – Southern California Edison's Vista Substation (in Grand Terrace)
2. Single source connection at Vista provides maximum 557 megawatts of energy to Riverside
3. Peak demand is more than 600 megawatts today, and it's forecasted to be higher in the future
4. Peak load (in excess of Vista capacity) is met by using internal gas generation

Electric Grid Reliability – Infrastructure Grade

F

1. Proposed RTRP Project connects second 230/69kV transmission source to Riverside
2. SCE applied for California Public Utilities Commission approval & expects final decision in late 2018
3. Portions of RTRP within Riverside city limits have been constructed & are currently being constructed to benefit internal capacity deficiencies & reduce system losses
4. Projected A Grade upon completion of RTRP project.

Electric Substations – Key Facts

1. 14 substations (or power centers)
2. 65 substation transformers
3. 92 substation high voltage breakers (69KV)
4. Systematic inspection & test schedule to determine priorities for maintenance & replacement of electric facilities
5. 24/7/365 Dispatch & Troubleshooter coverage

Electric Substations – Infrastructure Grade

C

1. On-going infrastructure replacement/rebuild/ modernization program (Utility 2.0, Option 1):
   a. $42M over next 10 years
   b. Installation/replacement of 5 substation transformers & switchgears
   c. Replacement/modernization of 45 high voltage breakers (69KV) & 375 substation relays
2. Strategic Objectives – Reliability, modernization, capacity availability
   a. O&M efficiency
   b. Technology/automation integration
   c. Substation capacity consistent with service area load densities
   a. Elimination of 69-4kV substation infrastructure

Substation 69-12kV Power Transformer

Electric Overhead System – Key Facts

1. Approximately 513 miles of overhead distribution lines
2. Around 22,000 poles, additional switches & overhead devices
3. Ongoing, systematic intrusive inspections to determine priorities for maintenance & replacement of electric facilities
4. 24/7/365 Dispatch & Troubleshooter coverage

Electric Overhead System – Infrastructure Grade

C

1. On-going infrastructure replacement/rebuild/ modernization program (Utility 2.0, Option 1):
   a. $72M over the next 10 years
   b. Conversion of remaining overhead 4kV delivery system to 12kV
   c. Replacement of 2,000 wood poles
   d. Replacement/modernization of 300 overhead switches/devices

2. Strategic Objectives – Reliability, modernization, capacity availability
   a. Efficient operation & maintenance
   b. Technology/automation integration
   c. Elimination of 4kV overhead delivery systems

Wood Pole Replacement

Electric Underground System – Key Facts

1. Approximately 817 miles of underground distribution cable
2. Approximately 13,000 underground structures, switches & devices
3. Ongoing, systematic intrusive inspections to determine priorities for maintenance & replacement of electric facilities
4. Underground electric distribution construction is standard for all new installations
5. 24/7/365 Dispatch & Troubleshooter coverage

Electric Underground System – Infrastructure Grade C+

1. On-going infrastructure replacement/ rebuild/ modernization program (Utility 2.0, Option 1):
   a. $95M over next 10 years
   b. Conversion of remaining underground 4kV delivery system to 12kV
   c. Replacement of 54 miles of old cable & 170 underground structures
   d. Replacement/modernization of 100 underground switches/devices
2. Strategic Objectives – Reliability, modernization, capacity availability
   a. Efficient operation & maintenance
   b. Technology/automation integration
   c. Elimination of remaining 4kV underground delivery systems & antiquated underground cable systems & oil insulated switches

Replacement of antiquated underground cable & devices

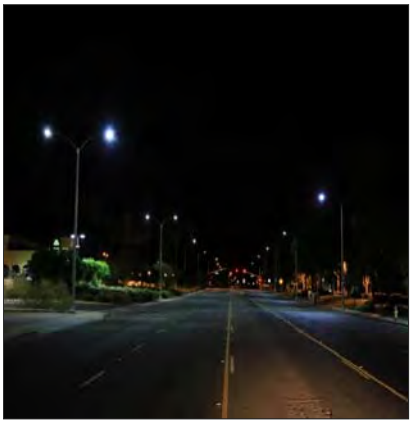
Street Lights – Key Facts

1. Street light system consists of 6,500 mast arm lights & 24,000 ornamental standards
2. Public Works Department operates safety lights at intersections throughout the city consisting of over 1,500 luminaires very similar to street lighting
3. Current type of street light lamps are predominantly high pressure sodium (HPS)

Street Lights – Infrastructure Grade

D

1. Current LED street light conversion project will convert all HPS lamps to more efficient light emitting diode (LED) lamps
2. Service life following LED conversion will increase from 7 years to 20 years
3. $15M LED conversion project projected to be completed in 2019
4. Projected Grade of C upon completion of LED conversion project
5. Additional areas require wholesale replacement & rebuilding of aged streetlight system



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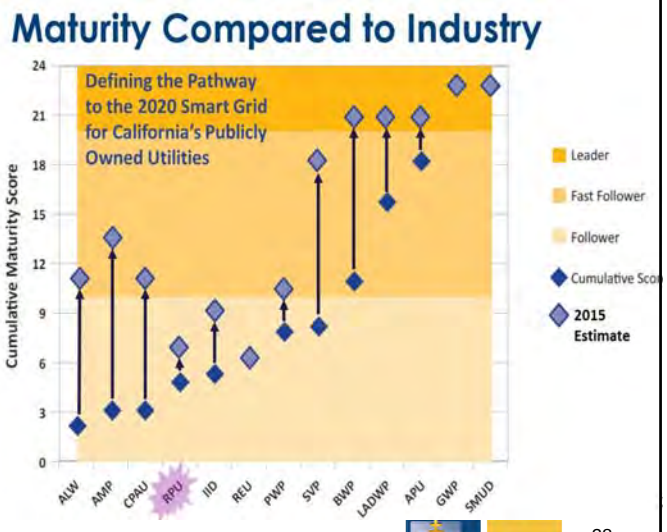
Advanced Technology – Key Facts

1. Riverside Public Utilities has historically been a "technology follower"
2. Electric & water utilities have had to become more flexible & agile due to constantly changing regulatory requirements, state and federal energy policies, economic conditions, & RPU is no exception
3. The strategic technology roadmap is structured to provide a flexible approach to achieving RPU's technology vision



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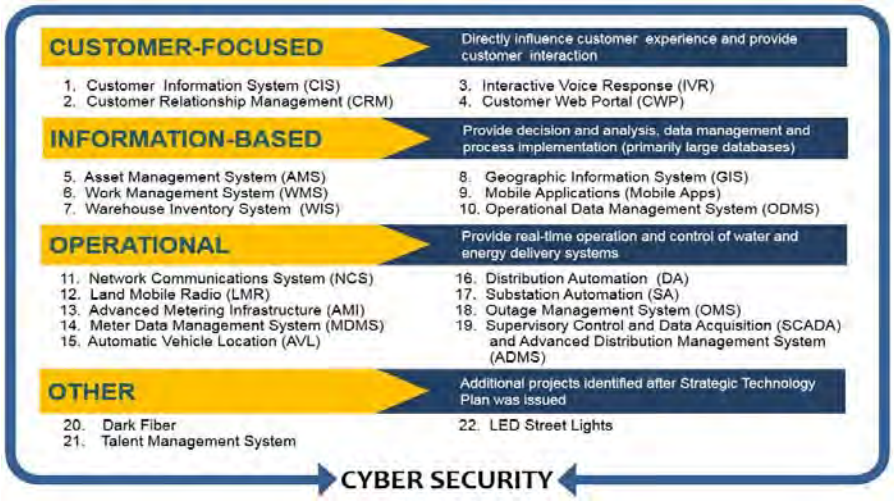
Advanced Technology – Infrastructure

D



Projected Grade of B upon completion of identified projects.

Infrastructure Summary

1. Infrastructure provides critical & essential services to Riverside

2. Investment in Riverside's infrastructure should be strategic & include innovation & technology to make infrastructure more resilient & economical when possible

3. Investment in Riverside's infrastructure spurs economic development, supports high customer service levels, ensures public safety, maintains or enhances property values & sustains a Community's quality of life

Infrastructure Summary Cont.

4. Riverside's infrastructure condition ranges from grade of B to F

5. Financial & strategic goal is to raise infrastructure grades to a B across the board

6. Challenge is to balance infrastructure investment requirements & customer service rates (Water and Electric Enterprise Funds)

Recommendations

That the Board of Public Utilities receive and file the Public Utilities 2017 Infrastructure Report Card.