

# NIST FACILITIES OVERVIEW

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# Facilities Overview



Overall, NIST has over 1,200 cress across its 4 sites. Consisting of 97 buildings and structures over 4.5 million gross square feet (GSF).

The Gaithersburg site is comprised of 579 acres with 61 buildings and structures totaling 3.6 million GSF.

The Boulder site covers 206 acres with 30 buildings and structures totaling 896,000 GSF.



# Facilities Overview



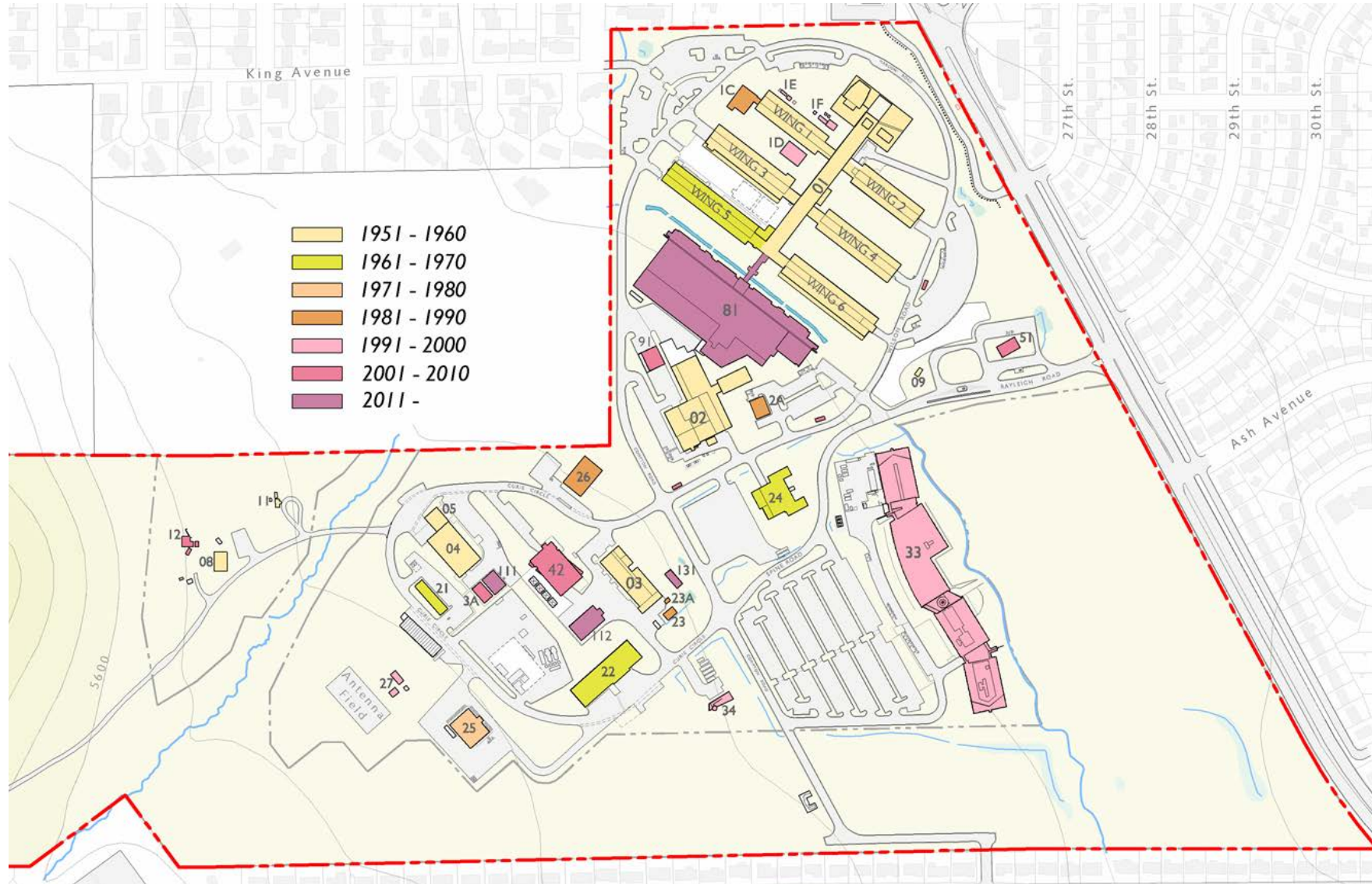
Fort Collins, CO field site covers 390 acres with 5 buildings and structures totaling 19,000 GSF.

Kauai, HI field site is located on the Barking Sands Pacific Missile Range Facility. The site covers 31 acres and has 1 building totaling 6,000 GSF.

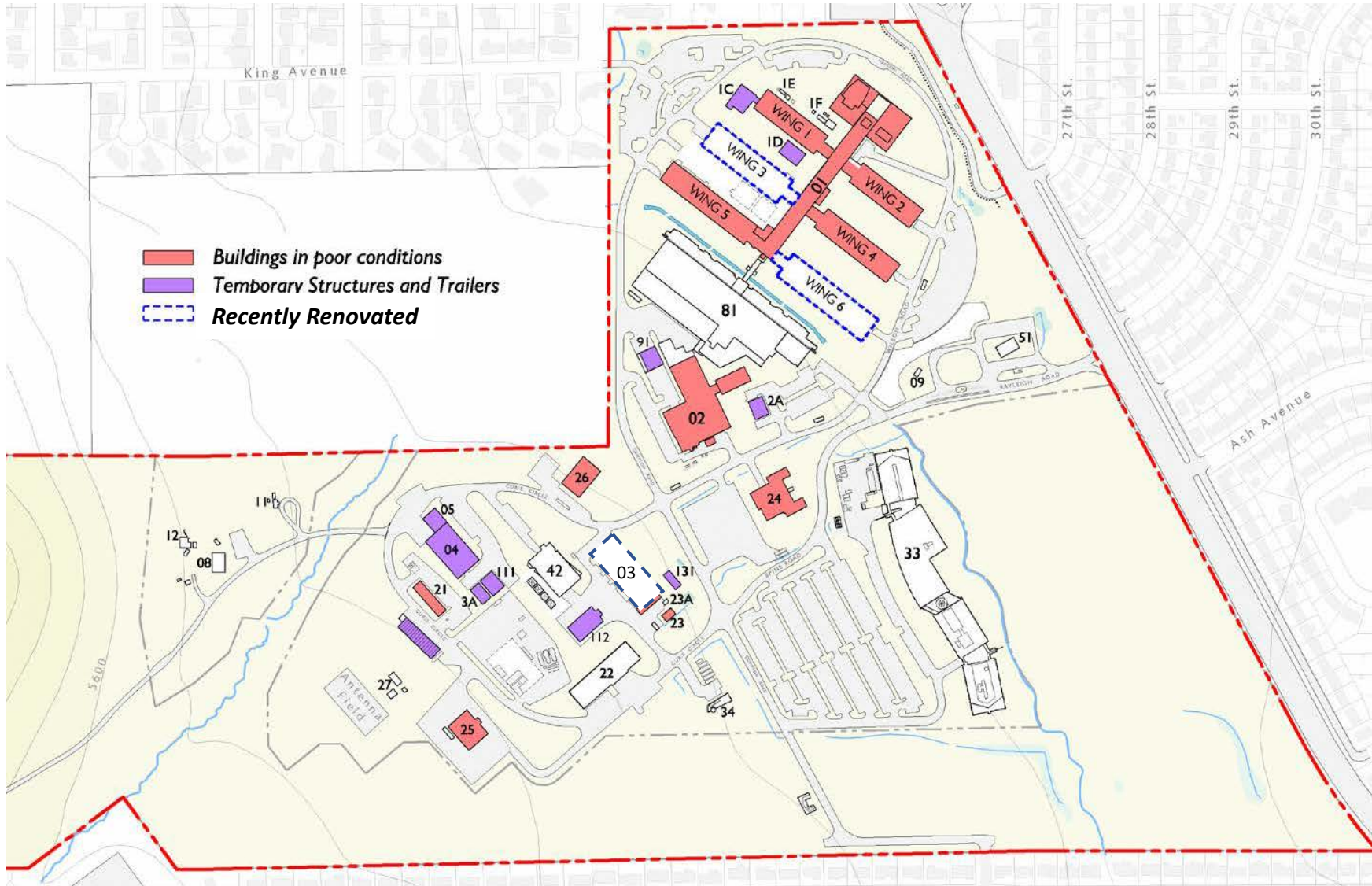


# CURRENT STATE OF NIST FACILITIES

# Facilities History - Boulder



# Facilities Conditions - Boulder



Building	Asset Name	Size	FCI
1	Radio Building	314,803	82.2
1C	Radio Building - Annex C	4,300	85.9
1D	Radio Building - Annex D	3,456	90.8
2	Cryogenic	72,348	51.5
3A	Emss Annex	2,160	89.0
21	Maintenance Garage	3,999	76.7
22	Warehouse	17,530	77.5
24	Plasma Physics	31,718	41.4
25	Maintenance Shops	8,306	7.0
26	Day Care Facility	7,776	89.2
51	Security Center	1,483	47.9
8888A	Roads, Parking Lots, Walkways, Fencing		85.1
8888B	Site Utilities		84.1

**54% of facilities area is in poor to critical condition per DOC standards.**

**\$166M Backlog (w/o B1R)**  
**Primary Component: \$132.5M**  
**Major Utility Infrastructure**

# Boulder – Dangers of Water

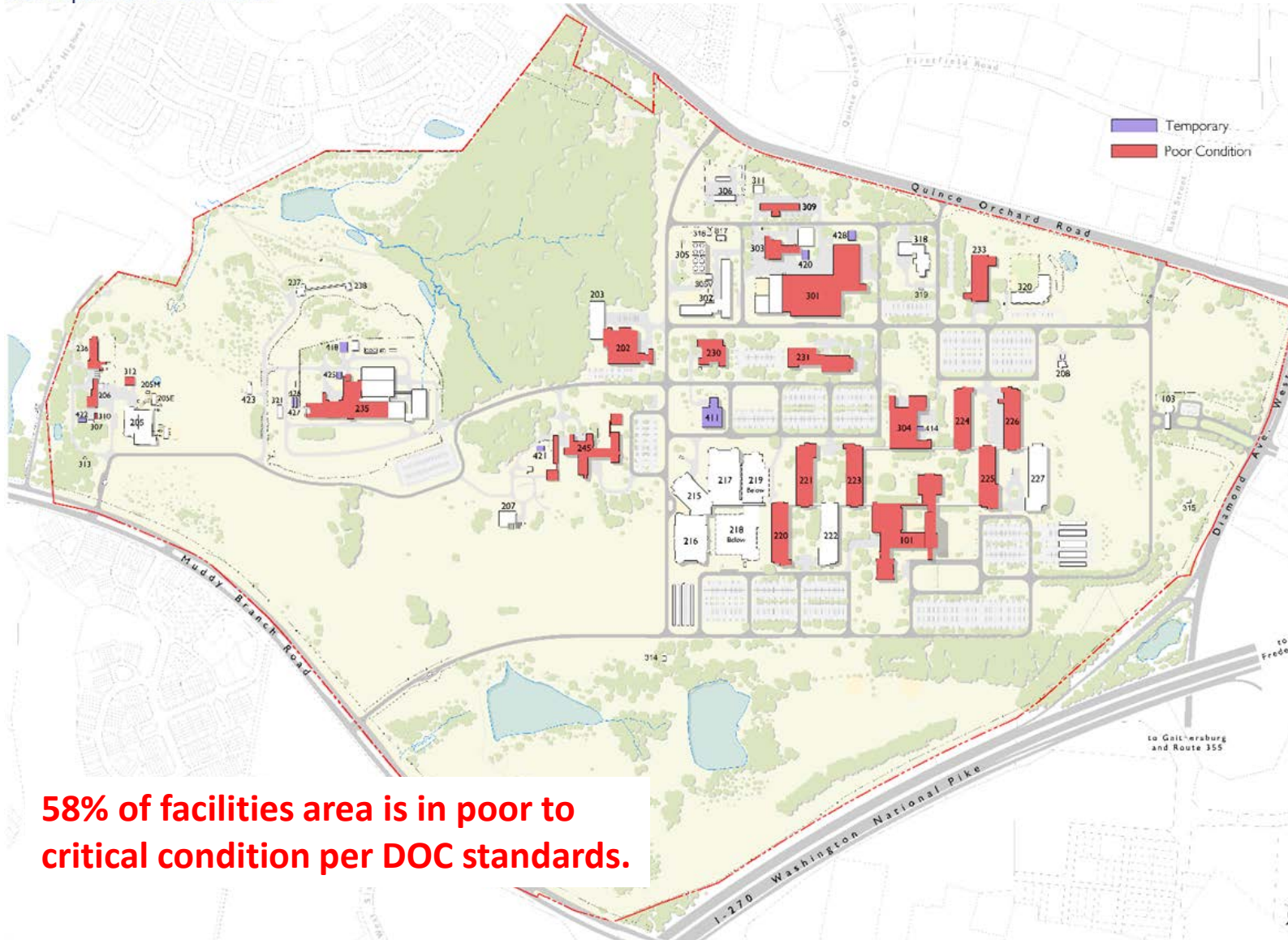


# Facilities History - Gaithersburg





# Facilities Conditions - Gaithersburg



**58% of facilities area is in poor to critical condition per DOC standards.**

101	Administration	345,785	68.0
202	Engineering Mechanics	78,577	81.3
205	Large Fire Facility	48,750	92.2
220	Metrology	216,068	84.5
221	Physics	219,654	78.2
223	Materials	164,659	75.6
224	Polymer	164,028	76.3
225	Technology	204,332	83.4
226	Building Research	142,805	76.6
230	Fluid Mechanics	38,367	86.3
231	Industrial	75,121	79.4
233	Sound	42,888	79.0
235	Nist Center For Neutron Research	229,849	93.0
236	Special Projects	13,217	70.0
237	Non-Magnetic A	3,099	93.2
301	Supply And Plant	163,762	92.2
303	Service	14,573	81.4
304	Shops	75,588	75.2
307	Materials Processing Storage	373	70.1
309	Grounds Maintenance	11,702	34.2
310	Plant Storage Building	505	50.1
311	Grounds Storage Shed	2,511	94.7
312	Materials Processing Storage	3,877	26.5
314	Backflow Preventer Building - East	663	58.2
315	Backflow Preventer Building - North	663	58.2
414	Janitorial Storage	803	80.6
421	Radiation Physics Storage	1,499	82.2
422	Concrete Materials Storage	1,200	90.7
9999B	Roads, Parking Lots, Walkways		15.1
9999C	Site Utilities		-37.2
9999D	Corridors		19.4

**\$199M Backlog (w/o B245)**  
**Primary Component: \$180M**  
**Major Utility Infrastructure**

# B245 Steam Leak



Building occupants relocated for 1 week due to lack of heat from failed steam valve.

# B306: Electrical Failures, May 20, 2018

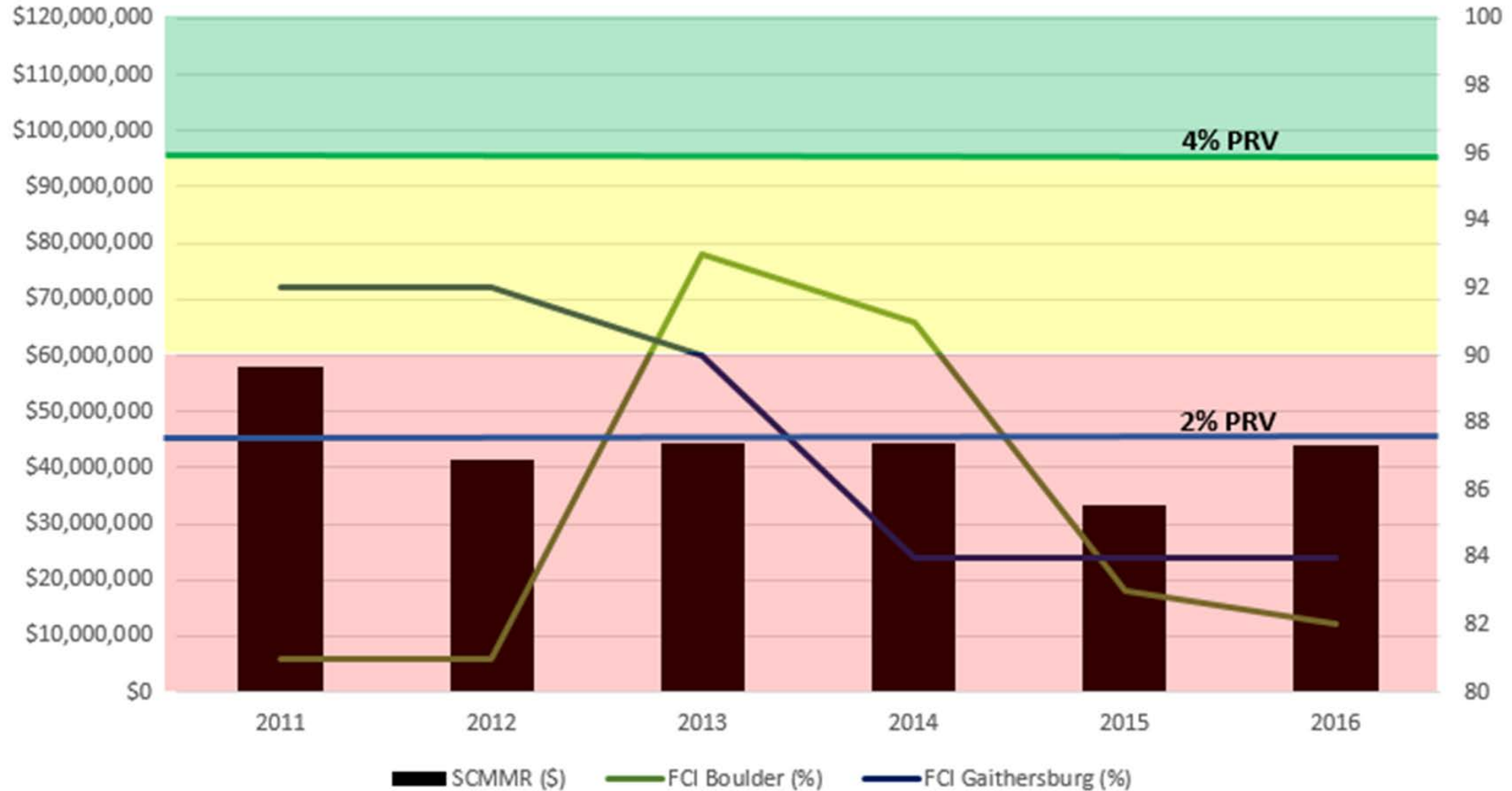


**Note:** Scorch marks from electrical explosion in unit.



# How did we get here?

**Funding vs. FCI**



# How did we get here?

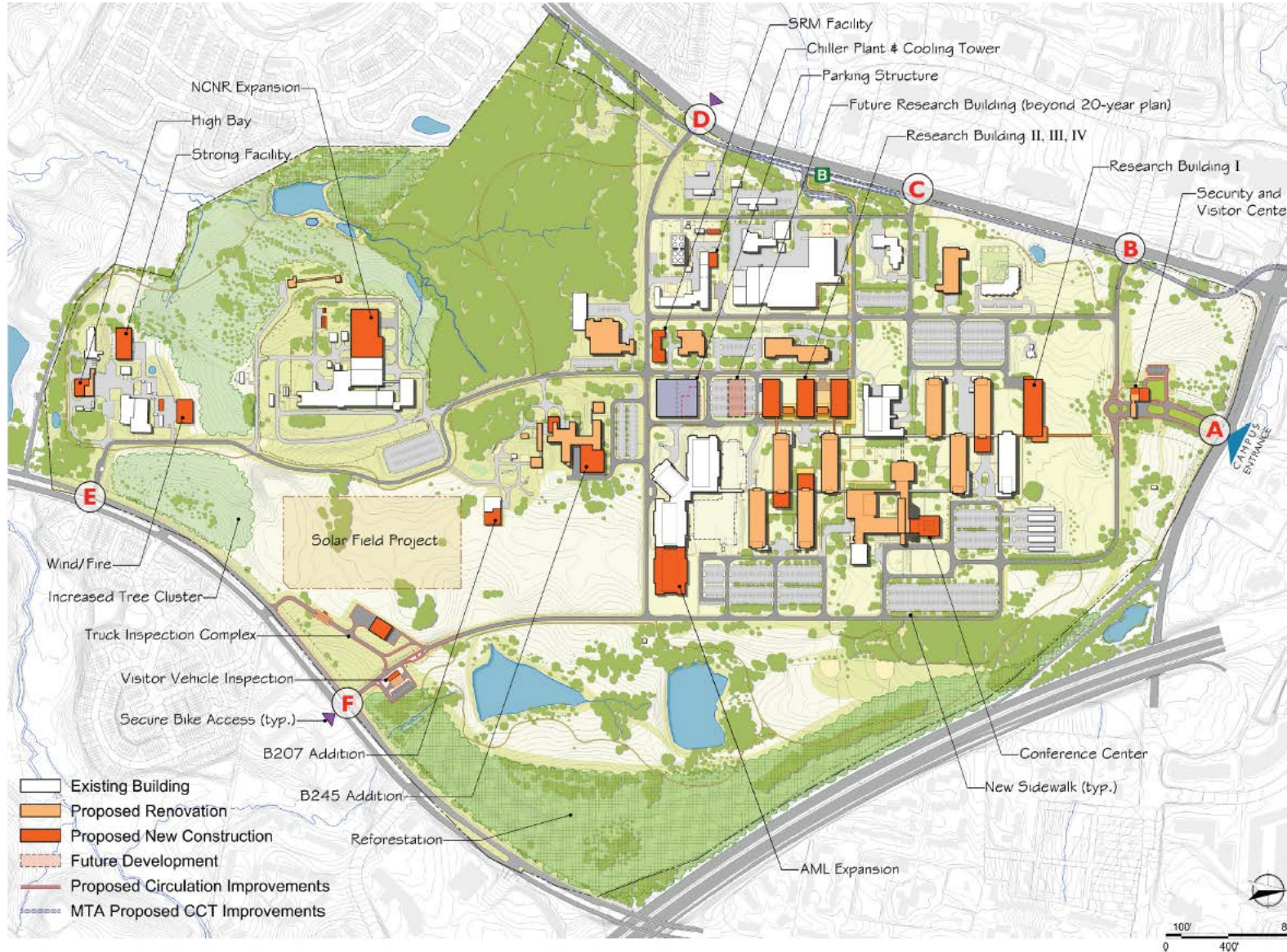
- 1.) For facilities in good condition: 2% of current replacement value (CRV) should be spent annually on repair/maintenance.
- 2.) For facilities in poor or declining state, 4% + of CRV should be spent annually on repair/maintenance. **Based on the updated CRV in 2017, this equates to a minimum of \$121M annually. (President's Budget for FY19 & FY20: \$40M)**
- 3.) NIST has received roughly 2% of CRV or less each of the last 6 years.
- 4.) Between 2011 & 2016 the average FCI of facilities not built or renovated in the last 20 years declined an average of 13-15%! Without significant investments this decline will continue.
- 5.) Competing priorities provided limited ability to perform larger value repair/upgrade projects. (\$2M+)
- 6.) A perpetual annual band-aid exercise.

# MASTER PLANS

# Master Plan - Boulder



# Master Plan - Gaithersburg





# FY18 BUDGET

# FY18 Budget

<u>Description</u>	<u>Anticipated</u>	<u>Actual Budget</u>
B245 Modernization Project	\$60M	\$205M
B1R: Wing 5 Renovation	\$10M	\$ 50M
Utility Infrastructure Projects	\$ -	\$ 20M
FY18 Original SCMMR List	\$10M	\$ 10M
B101 Complex Projects	\$ -	\$ 5M
Roofing/Life-Safety Projects	\$ -	\$ 5M
Salaries/Recurring Contracts	\$24M	\$ 24M
	<b>\$104M</b>	<b>\$319M</b>

# WHAT'S OUR FOCUS & WHY?

# Major Utility Infrastructure

- 1.) High Speed Switch (Boulder): 3 unplanned power outages in last year. Manufacturer stops supporting at the end of 2019.
  
- 2.) Steam System (Gaithersburg): Currently at 80% capacity for make-up water due to leaks, losing 50,000 gallons per day of water!
  
- 3.) Electrical Ductbank System (Gaithersburg): 1 major failure discovered, lines past useful life, steam system leaks may be accelerating problems.
  
- 4.) Major Electrical Equipment (Gaithersburg): Switchgear, transformers, MCC's and panels beyond useful life.
  
- 5.) Water Systems (Boulder): Numerous issues found in hot water, chilled water, domestic and sanitary systems.

# Competing Interests

**Major Renovations Programs:** Which takes priority after FY19?

**Boulder:** Building 3 finished January 2018. Anticipate FY19 funding to fully fund B1R: Wing 5 Renovation.

**What's next?:**

- 1.) Finishing B1R (Wing 4 & associated spine),
- 2.) Renovating the rest of Building 1 (Wings 1, 2, headhouse & associated spine), or
- 3.) Building 2 replacement?

**Gaithersburg:** FY18 fully funded B245 Modernization Project.

**What's next?:**

- 1.) Building 228 (New Building) to begin GPL Modernization Program
- 2.) Building 101 Complex Renovation and Lower Level Study Buildout
- 3.) Gate A & F Renovations per the Master Plan

**Both:** IT Network Infrastructure

# CHALLENGES

# Challenges

- 1.) Execute the expanded FY18 funded program in the most expeditious manner possible.
- 2.) Develop 5 year plan to address competing interests questions.
- 3.) Develop OFPM organization (staffing, tools, procedures) to execute a large scale design and construction program (moving from \$40M-\$50M/year to potentially \$250M+/year). Evolve and execute the draft strategic plan in developing OFPM in light of a pending retirement cliff.
- 4.) Develop a 20 year buildout plan, coordinated between campuses, per the 2 Master Plans.
- 5.) Have fun while flying 1,000 MPH and building the plane while flying it! 😊

# QUESTIONS



**THE END**