6.0
Appendices

East Campus Design Guidelines

Objectives

These guidelines are provided to support campus master planning design principles. This set of design principles, elaborated in the Campus Master Plan, governs the long-term development of the campus. While the nature of the master plan supports ongoing decision-making, the design principles serve as the enduring tenets to structure the campus's growth.

- ENGAGE SURROUNDING COMMUNITIES
- DIVERSIFY CAMPUS NEIGHBORHOODS
- RESPECT AND REINFORCE NATURAL SYSTEMS
- CREATE STRONG PUBLIC REALM CONNECTIONS
- INTEGRATE DIVERSE OPEN SPACES
- RESPECT CAMPUS CHARACTER AND STRUCTURE
- CREATE A NETWORK OF STUDENT LIFE SPACES
- ENHANCE CAMPUS ACCESS AND WAYFINDING

How to use these guidelines

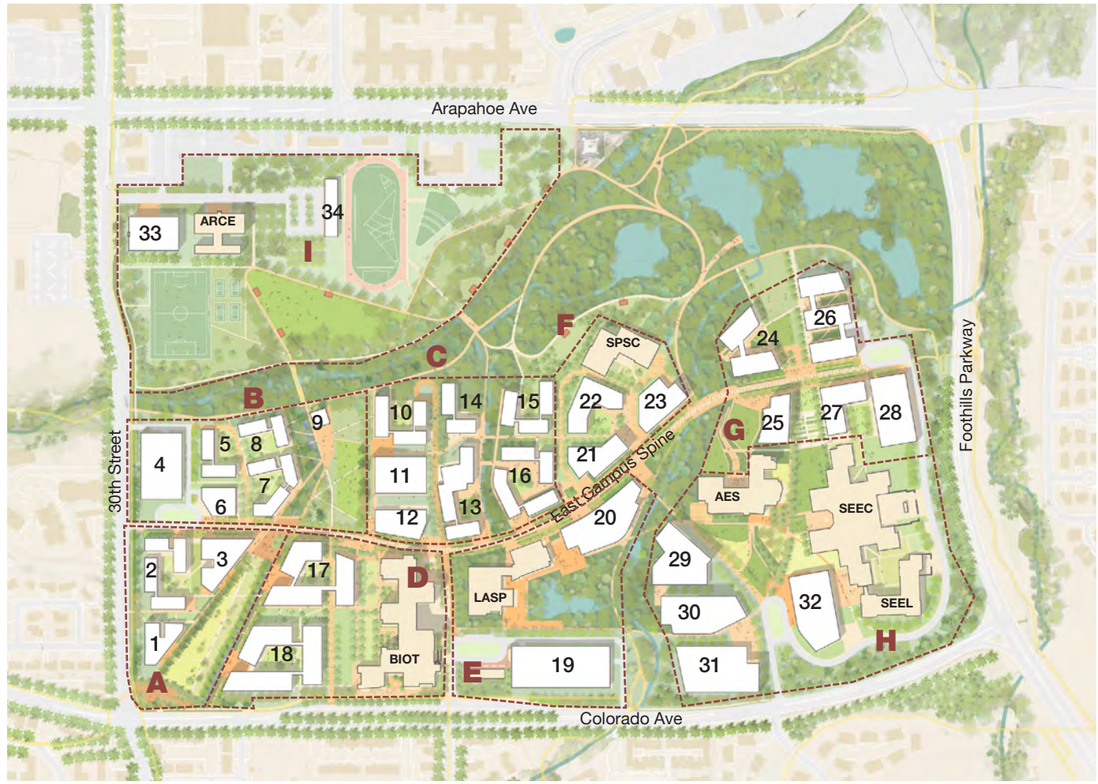
The guidelines are organized around specific districts and designated building program typologies. Within each district, zoning footprints are assigned a numerical designation (1 through 34) and existing buildings that are to remain are labeled with their building code.

Within each designated district the following criteria and organizing principles are identified:

- Zoning Footprint and Envelope
- Proposed Buildings
- Existing Building
- East Campus Spine
- Proposed Campus Open Space
- Vehicular Streets
- Key Setbacks

The guidelines for each district indicate zoning footprint designations, conceptual building siting, massing, and open space strategies, all of which reflect core tenets of the Campus Master Plan. These are intended to capture the design intent of providing integrated program, building, and open space networks within each district.

At the initiation of a **new project**, a site will be identified and will include a **zoning footprint** and a larger **parcel area**. This parcel area will incorporate landscape and site infrastructure projects that benefit the entire East Campus. The extents of the parcel area will be determined by Planning, Design & Construction and campus leadership.



Districts

- **A.** Housing and Student Life
- **B.** Housing and Student Life
- **C.** Housing and Student Life
- **D.** Academic / Research
- **E.** Academic / Research
- **F.** Academic / Research
- **G.** Academic / Research
- **H.** Partnerships / Academic / Research
- **I.** Academic / Athletics / Administration

Existing Campus Buildings

- **BIOT** Jennie Smoly Caruthers Biotechnology
- **LASP** Laboratory for Atmospheric and Space Physics
- **AES** Aerospace Engineering Sciences
- **SEEC** Sustainability, Energy and Environment Complex
- **SEEL** Sustainability, Energy and Environment Laboratory
- **ARCE** Administrative & Research Center
- **SPSC** Space Science

N

East Campus Development Summary

District SQF	Building	Zoning Footprint	Parcel Area	Building Use	Potential GSF	Potential ASF	Bed Count
A. Total: 403,649 Landscape: 331,551	1	20,530	TBD	Academic / Research	68,100	44,265	-
	2	54,800	TBD	Housing	145,835	94,793	400
	3	31,550	TBD	Student Life	105,300	68,445	-
B. Total: 545,511 Landscape: 420,490	4	52,200	TBD	Parking	156,600	156,600	-
	5	29,245	TBD	Housing	73,820	47,983	202
	6	17,092	TBD	Food	34,200	22,230	-
	7	41,625	TBD	Housing	119,000	77,350	326
	8	27,615	TBD	Housing	66,950	43,518	183
	9	8,100	TBD	Food	8,100	5,265	-
C. Total: 591,865 Landscape: 387,391	10	44,410	TBD	Housing	121,200	78,780	269
	11	36,000	TBD	Student Life	57,400	56,810	-
	12	24,290	TBD	Student Life	68,500	44,525	-
	13	61,660	TBD	Housing / Student Life	149,400	99,710	323
	14	32,580	TBD	Housing	74,700	48,555	166
	15	51,480	TBD	Housing	123,215	80,090	274
	16	81,250	TBD	Housing	179,195	116,477	398
D. Total: 594,827 Landscape: 370,302	17	92,540	TBD	Academic / Research	259,255	168,516	-
	18	105,050	TBD	Academic / Research	269,950	175,468	-
E. Total: 731,914 Landscape: 546,410	19	77,400	TBD	Parking / Mobility Hub	232,200	232,200	-
	20	63,055	TBD	Academic / Research	183,610	124,963	-
F. Total: 312,534 Landscape: 218,013	21	38,090	TBD	Academic / Research	105,920	68,848	-
	22	46,820	TBD	Academic / Research	93,250	60,613	-
	23	31,270	TBD	Academic / Research	102,945	66,914	-
G. Total: 613,793 Landscape: 432,770	24	75,000	TBD	Academic / Research	227,000	147,550	-
	25	24,540	TBD	Academic / Research	135,605	88,143	-
	26	47,740	TBD	Academic / Research	148,480	96,512	-
	27	40,640	TBD	Academic / Research	102,310	66,502	-
	28	44,760	TBD	Parking	143,280	143,280	-
H. Total: 1,247,531 Landscape: 814,863	29	52,570	TBD	Academic / Research	183,610	119,347	-
	30	56,460	TBD	Academic / Research	205,435	133,533	-
	31	68,200	TBD	Academic / Research	222,420	144,573	-
	32	54,270	TBD	Academic / Research	170,860	111,059	-
I. Total: 1,795,966 Landscape: 1,737,001	33	30,281	TBD	Administration	121,124	78,730	-
	34	14,105	TBD	Athletics	14,105	9,168	-
District Total: 7,137,590 Landscape Total: 5,258,791		**1,577,218**			**4,472,874**	**3,121,315**	**2,541**

Typical Floorplate Dimensions

Building Use	Floorplate Dimensions
Academic	240’ x 85’
Academic / Research	300’ x 125’
Administration	240’ x 75’
Housing	180’ x 60’
Parking	180’ x 300’

Typical ASF/GSF Ratios*

Building Use	Typical GSF/ ASF Ratio
Academic	0.60
Academic / Research	0.55
Athletics	0.70
Administration	0.70
Housing	0.63
Parking	0.96
Student Life	0.70
Food / Dining	0.70

*An average of 0.65 as a general planning assumption was used to calculate ASF for all program uses. Specific ratios should be applied during a project’s design phase. Typical ratios used by CU Boulder are provided in the table to the left.

Districts

- **A.** Housing and Student Life
- **B.** Housing and Student Life
- **C.** Housing and Student Life
- **D.** Academic / Research
- **E.** Academic / Research
- **F.** Academic / Research
- **G.** Academic / Research
- **H.** Partnerships / Academic / Research
- **I.** Academic / Athletics / Administration

Existing Campus Buildings

- **BIOT** Jennie Smoly Caruthers Biotechnology
- **LASP** Laboratory for Atmospheric and Space Physics
- **AES** Aerospace Engineering Sciences
- **SEEC** Sustainability, Energy and Environment Complex
- **SEEL** Sustainability, Energy and Environment Laboratory
- **ARCE** Administrative & Research Center
- **SPSC** Space Science

Housing and Student Life

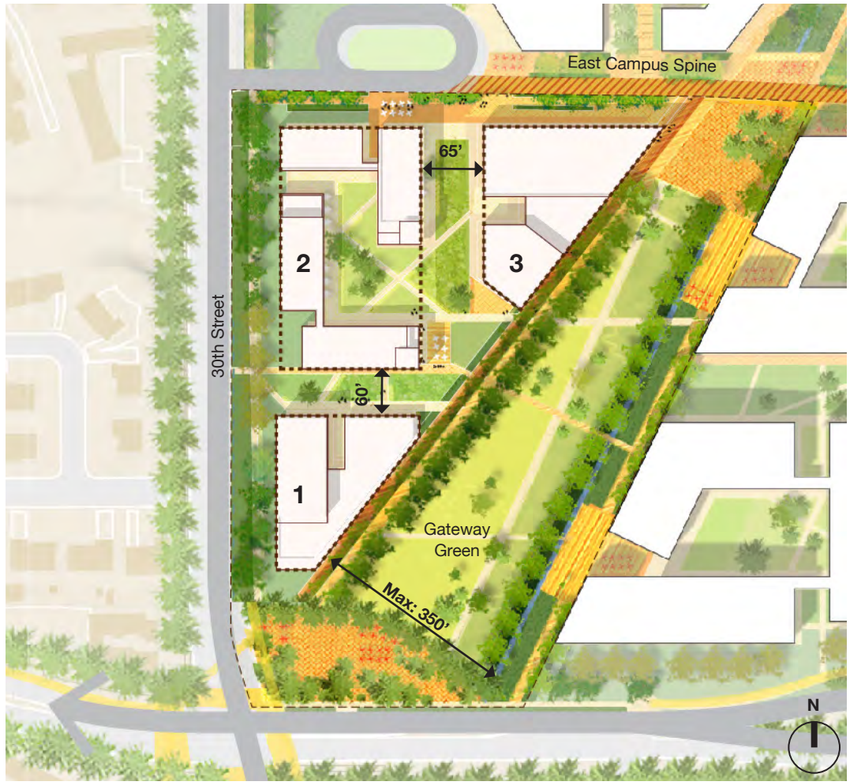
DISTRICT A.

403,649 Total SQF
331,551 Landscape SQF

Zoning Footprint 1
Footprint Area: 20,530 SQF
GSF: 68,100 SQF
ASF: 44,265 SQF
Building use: Academic/ Research

Zoning Footprint 2
Footprint Area: 54,800 SQF
GSF: 145,835 SQF
ASF: 94,793 SQF
Building use: Housing

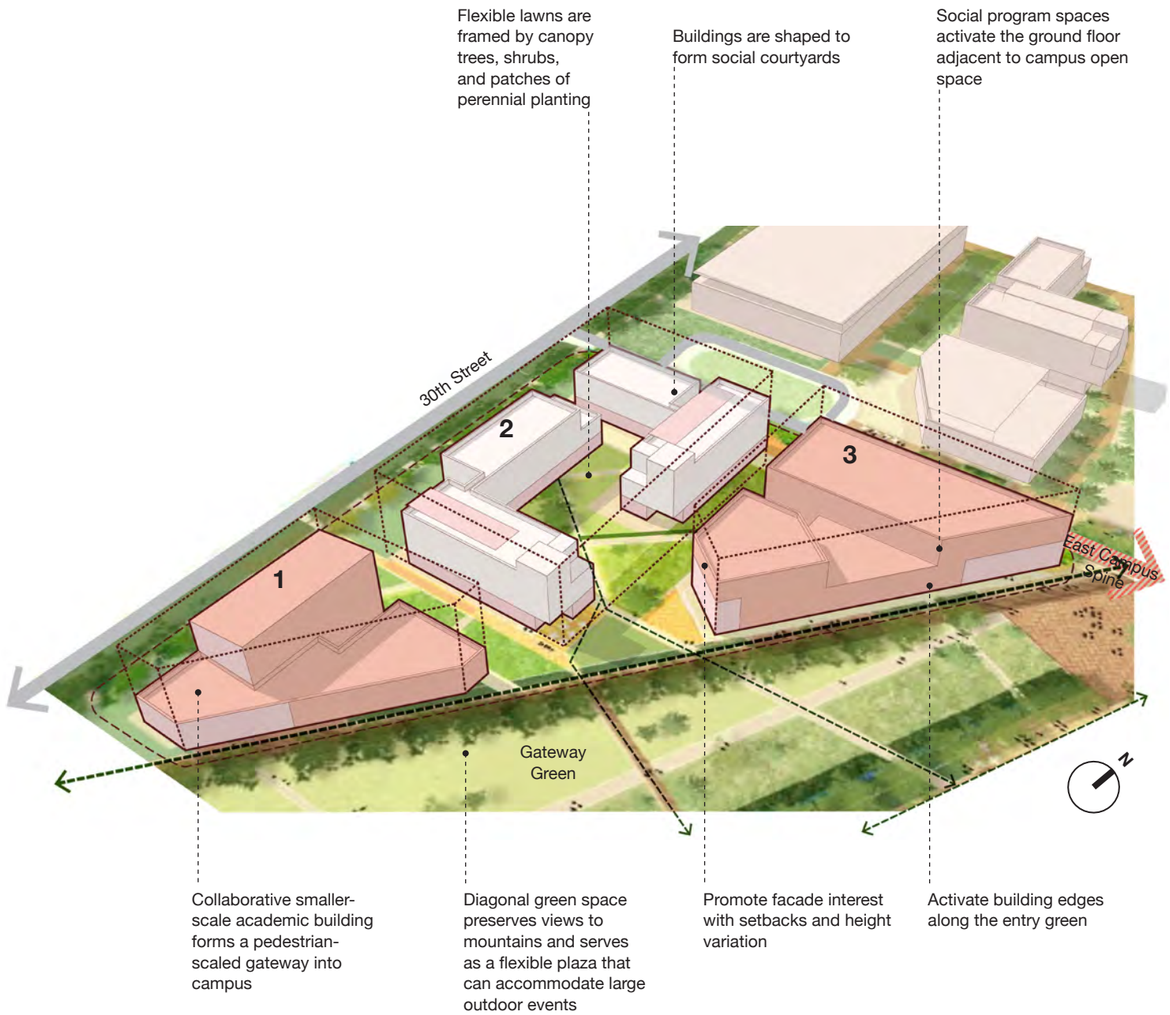
Zoning Footprint 3
Footprint Area: 31,550 SQF
GSF: 105,300 SQF
ASF: 68,445 SQF
Building use: Student Life



Minimum Distances

- Proposed Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

- Create student communities scaled to the floor, the building and the district
- Locate student life amenities in residential buildings at the ground level and link these to the campus open space network
- Include amenities on the Gateway Green that attracts pedestrians onto campus
- Locate student life facilities between residential buildings and district wide pedestrian networks
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter



- Zoning Envelope
- Proposed Buildings
- Student Life Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Housing and Student Life

DISTRICT B.

545,511 Total SQF
420,490 Landscape SQF

Zoning Footprint 4
Footprint area: 52,200 SQF
GSF: 156,600 SQF
ASF: 156,600 SQF
Building use: Parking

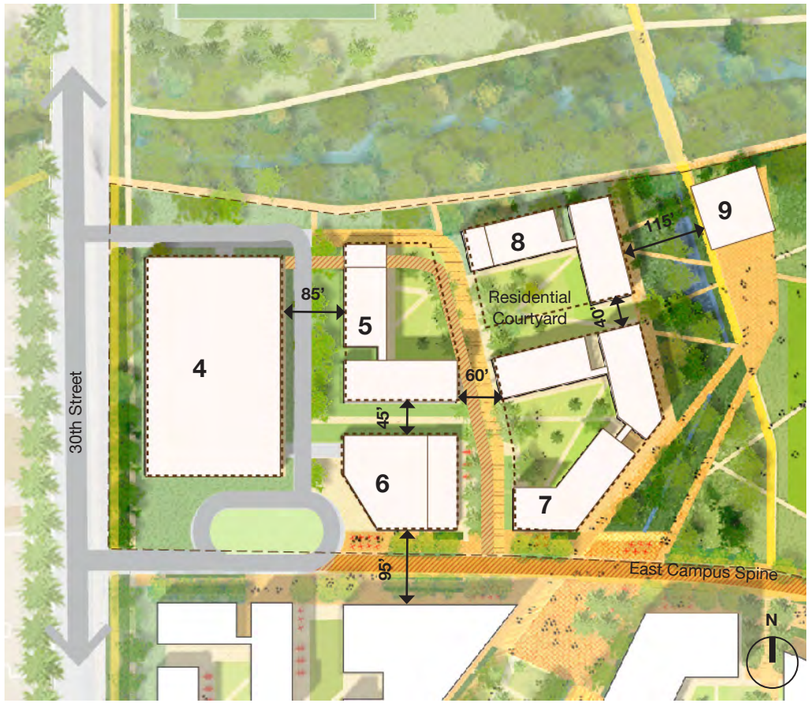
Zoning Footprint 5
Footprint area: 29,245 SQF
GSF: 73,820 SQF
ASF: 47,983 SQF
Building use: Housing

Zoning Footprint 6
Footprint area: 17,092 SQF
GSF: 34,200 SQF
ASF: 22,230 SQF
Building use: Food

Zoning Footprint 7
Footprint area: 41,625 SQF
GSF: 119,000 SQF
ASF: 77,350 SQF
Building use: Housing

Zoning Footprint 8
Footprint area: 27,615 SQF
GSF: 66,950 SQF
ASF: 43,518 SQF
Building use: Housing

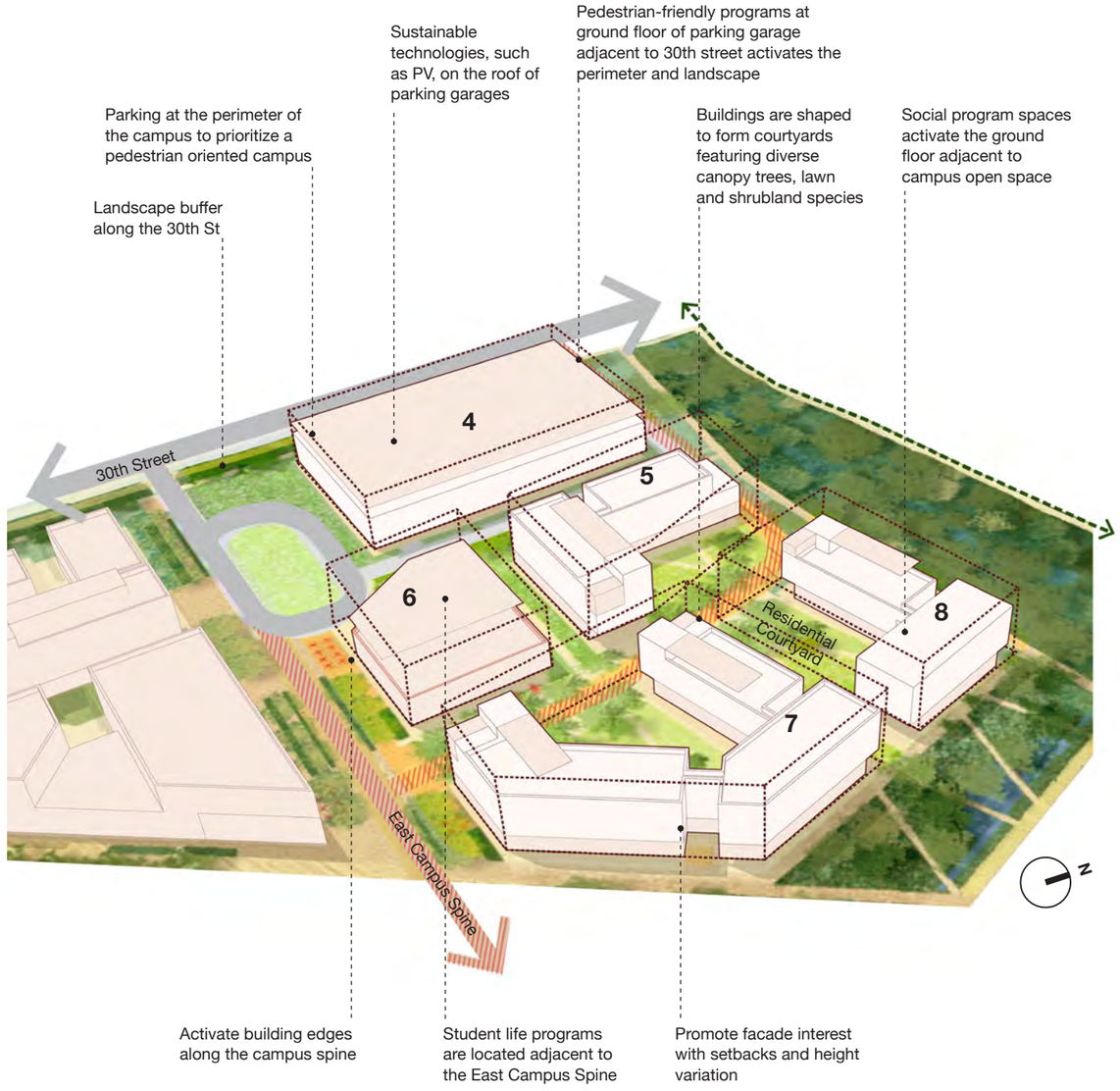
Zoning Footprint 9
Footprint area: 8,100 SQF
GSF: 8,100 SQF
ASF: 5,265 SQF
Building use: Food and Student Life



Minimum Distances

- Proposed Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

- Create student communities scaled to the floor, the building and the district
- Locate student life amenities in residential buildings at the ground level and link these to the campus open space network, such as residential courtyards
- Locate student life facilities between residential buildings and district wide pedestrian networks
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter



- Zoning Envelope
- Proposed Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Housing and Student Life

DISTRICT C.

591,865 Total SQF
387,391 Landscape SQF

Zoning Footprint 10
Footprint area: 44,410 SQF
GSF: 121,200 SQF
ASF: 78,780 SQF
Building use: Housing

Zoning Footprint 11
Footprint area: 36,000 SQF
GSF: 87,400 SQF
ASF: 56,810 SQF
Building use: Student Life

Zoning Footprint 12
Footprint area: 24,290 SQF
GSF: 68,500 SQF
ASF: 44,525 SQF
Building use: Student Life

Zoning Footprint 13
Footprint area: 61,660 SQF
GSF: 153,400 SQF
ASF: 99,710 SQF
Building use: Housing and Student Life

Zoning Footprint 14
Footprint area: 32,580 SQF
GSF: 74,700 SQF
ASF: 48,555 SQF
Building use: Housing

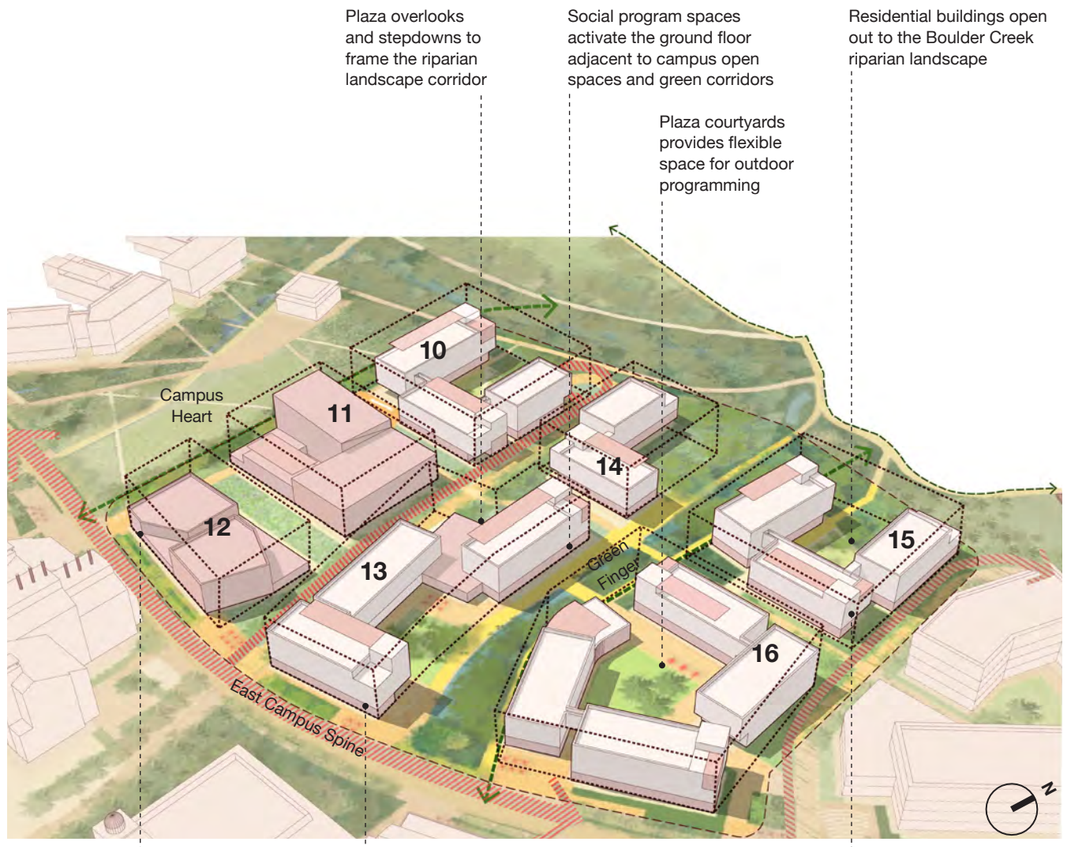
Zoning Footprint 15
Footprint area: 51,480 SQF
GSF: 123,215 SQF
ASF: 80,090 SQF
Building use: Housing

Zoning Footprint 16
Footprint area: 81,250 SQF
GSF: 179,195 SQF
ASF: 116,477 SQF
Building use: Housing

Minimum Distances

- Proposed Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

- Create student communities scaled to the floor, the building and the district
- Locate student life amenities in residential buildings at the ground level and link these to the campus open space network
- Design the Campus Heart for year-round activity, including passive recreation, collaboration, and meeting space
- Locate student life facilities between residential buildings and district wide pedestrian networks
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter



- Zoning Envelope
- Proposed Buildings
- Existing Building
- East Campus Spine
- Vehicular Street

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

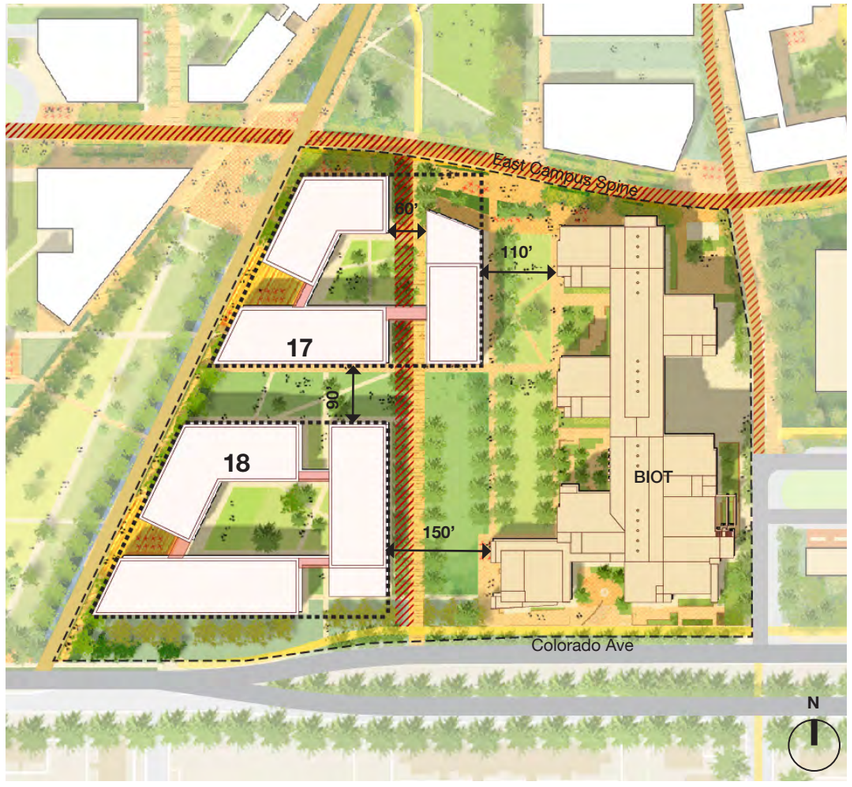
Academic / Research

DISTRICT D.

594,827 Total SQF
370,302 Landscape SQF

Zoning Footprint 17
Footprint Area: 92,540 SQF
GSF: 259,255 SQF
ASF: 168,516 SQF
Building use: Academic/ Research

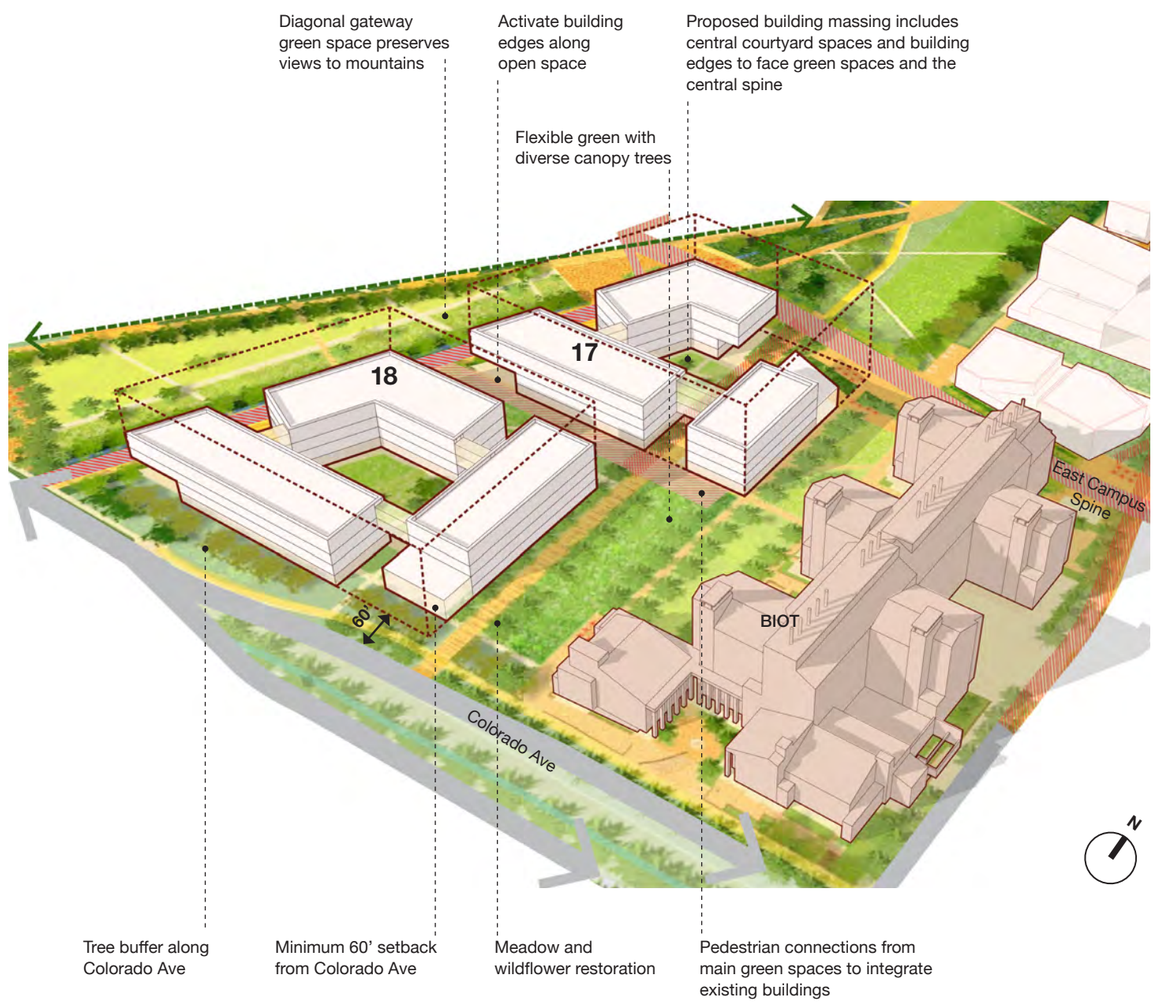
Zoning Footprint 18
Footprint Area: 105,050 SQF
GSF: 269,950 SQF
ASF: 175,468 SQF
Building use: Academic/ Research



Minimum Distances

- Create academic neighborhoods in conjunction with adjacent new and existing academic buildings
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to views of the mountains
- Consolidate service zones away from pedestrian paths
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street



Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

BIOT Jennie Smoly Caruthers Biotechnology

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

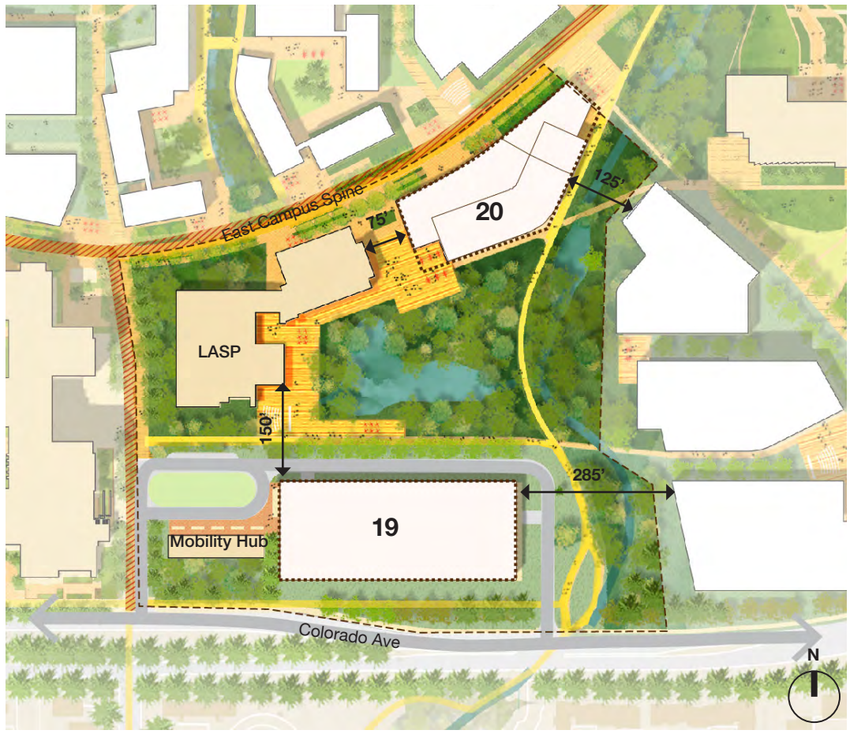
Academic / Research (Option 01)

DISTRICT E.

731,914 Total SQF
546,410 Landscape SQF

Zoning Footprint 19
Footprint area: 77,400 SQF
GSF: 232,200 SQF
ASF: 232,200 SQF
Building use: Parking

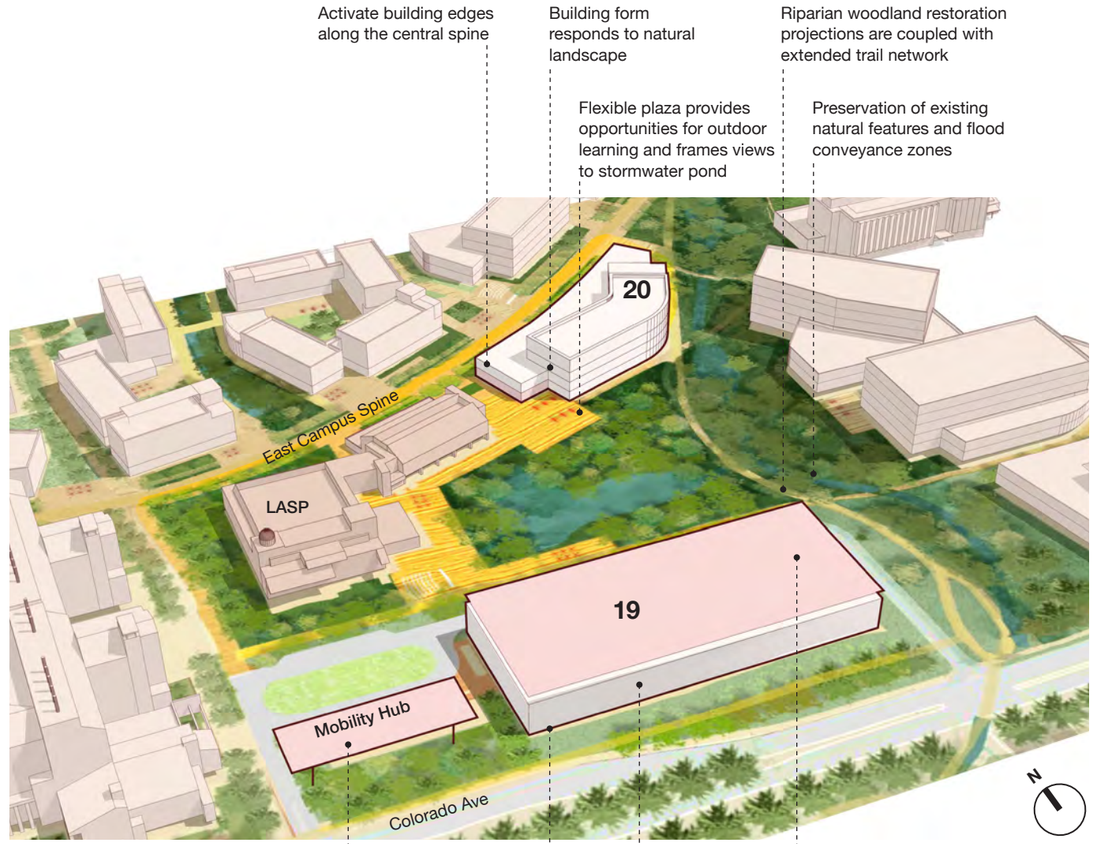
Zoning Footprint 20
Footprint area: 63,055 SQF
GSF: 183,610 SQF
ASF: 124,963 SQF
Building use: Academic/ Research



Minimum Distances

- Create academic neighborhoods in conjunction with adjacent new and existing academic buildings
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
-
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street



Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

LASP Laboratory for Atmospheric and Space Physics

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

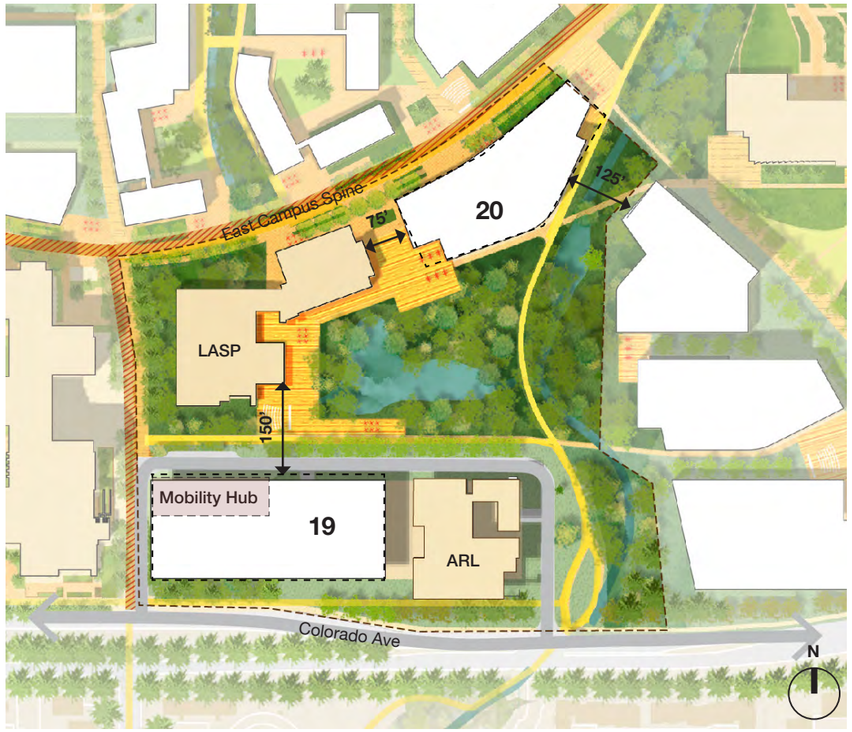
Academic / Research (Option 02)

DISTRICT E.

731,914 Total SQF
504,020 Landscape SQF

Zoning Footprint 19
Footprint area: 77,400 SQF
GSF: 232,200 SQF
ASF: 232,200 SQF
Building use: Parking

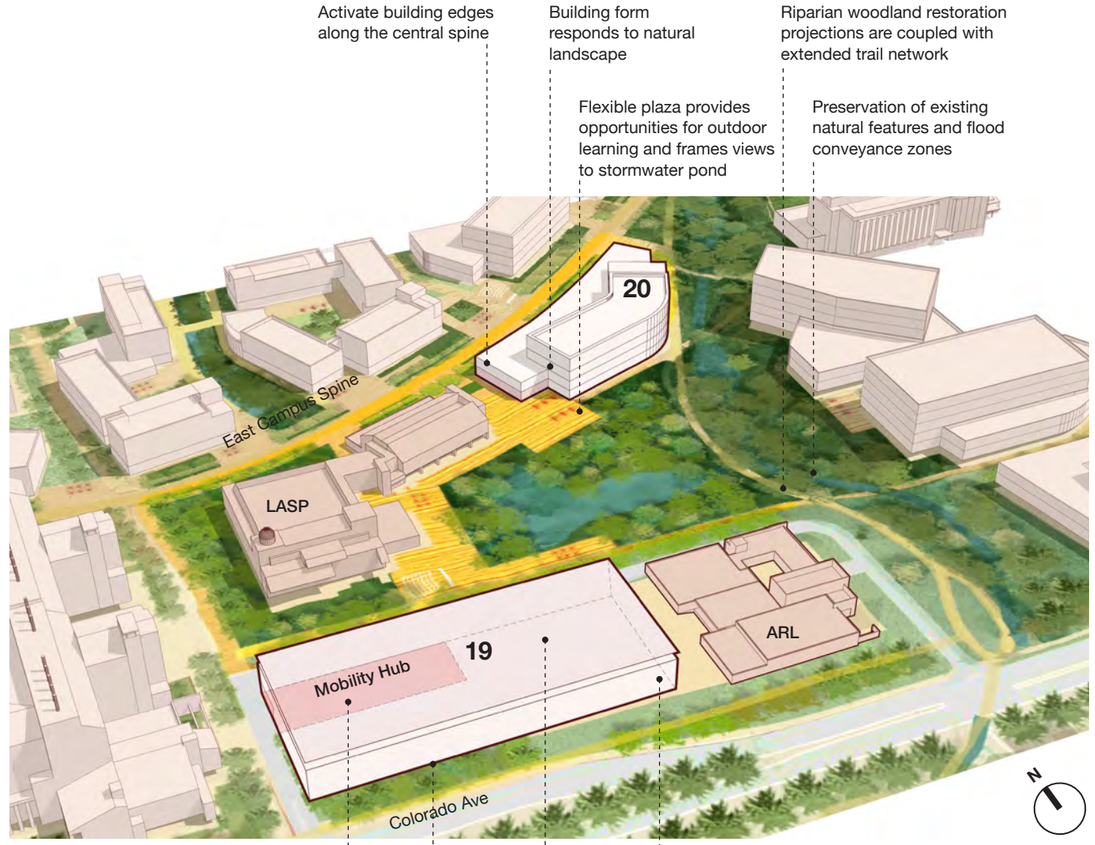
Zoning Footprint 20
Footprint area: 63,055 SQF
GSF: 183,610 SQF
ASF: 124,963 SQF
Building use: Academic/ Research



Minimum Distances

- Create academic neighborhoods in conjunction with adjacent new and existing academic buildings
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

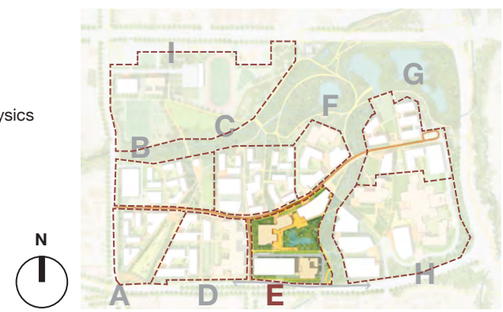


Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

LASP Laboratory for Atmospheric and Space Physics
ARL Astrophysical Research Lab

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



Academic / Research

DISTRICT F.

312,534 Total SQF
218,013 Landscape SQF

Zoning Footprint 21
Footprint area: 38,090 SQF
GSF: 105,920 SQF
ASF: 68,848 SQF
Building use: Academic/ Research

Zoning Footprint 22
Footprint area: 46,820 SQF
GSF: 93,250 SQF
ASF: 60,613 SQF
Building use: Academic/ Research

Zoning Footprint 23
Footprint area: 31,270 SQF
GSF: 102,945 SQF
ASF: 66,914 SQF
Building use: Academic/ Research

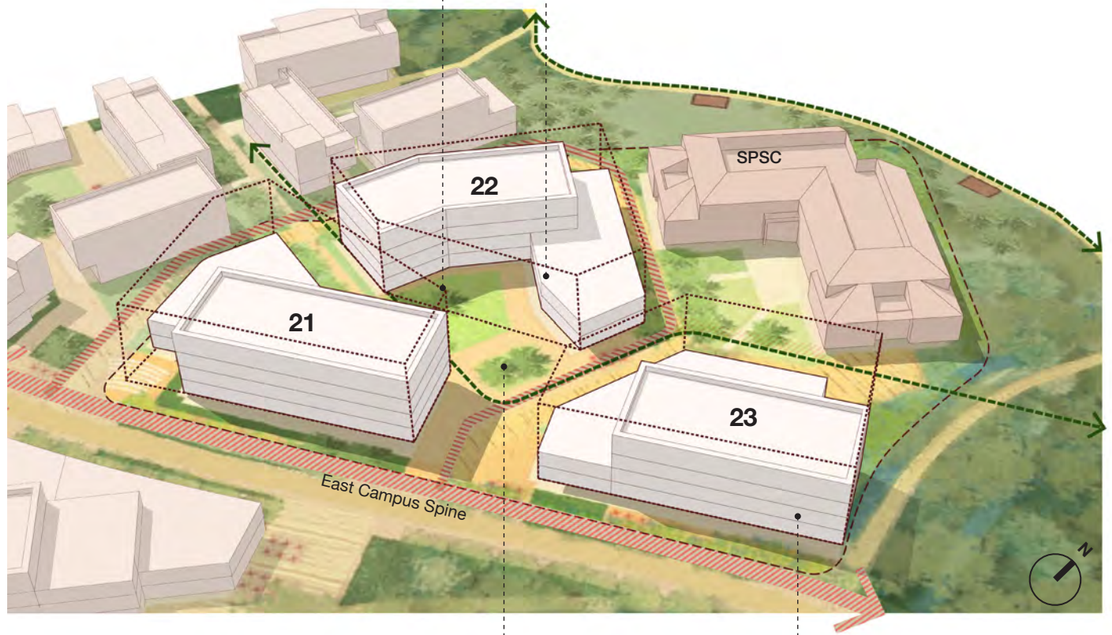
Minimum Distances

- Create academic neighborhoods in conjunction with adjacent new and existing academic buildings
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Proposed building massing includes central courtyard spaces with maximum building frontage facing green spaces

Lower building massing at the center of the district adjacent to the existing building and plaza



New plaza court features a small, flexible lawn to accommodate diverse student programming

Activate building edges along the central spine

Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

SPSC Space Science

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Academic / Research

DISTRICT G.

613,793 Total SQF
432,770 Landscape SQF

Zoning Footprint 24
Footprint area: 75,000 SQF
GSF: 227,000 SQF
ASF: 147,550 SQF
Building use: Academic/ Research

Zoning Footprint 25
Footprint area: 24,540 SQF
GSF: 135,605 SQF
ASF: 88,143 SQF
Building use: Academic/ Research

Zoning Footprint 26
Footprint area: 47,740 SQF
GSF: 148,480 SQF
ASF: 96,512 SQF
Building use: Academic/ Research

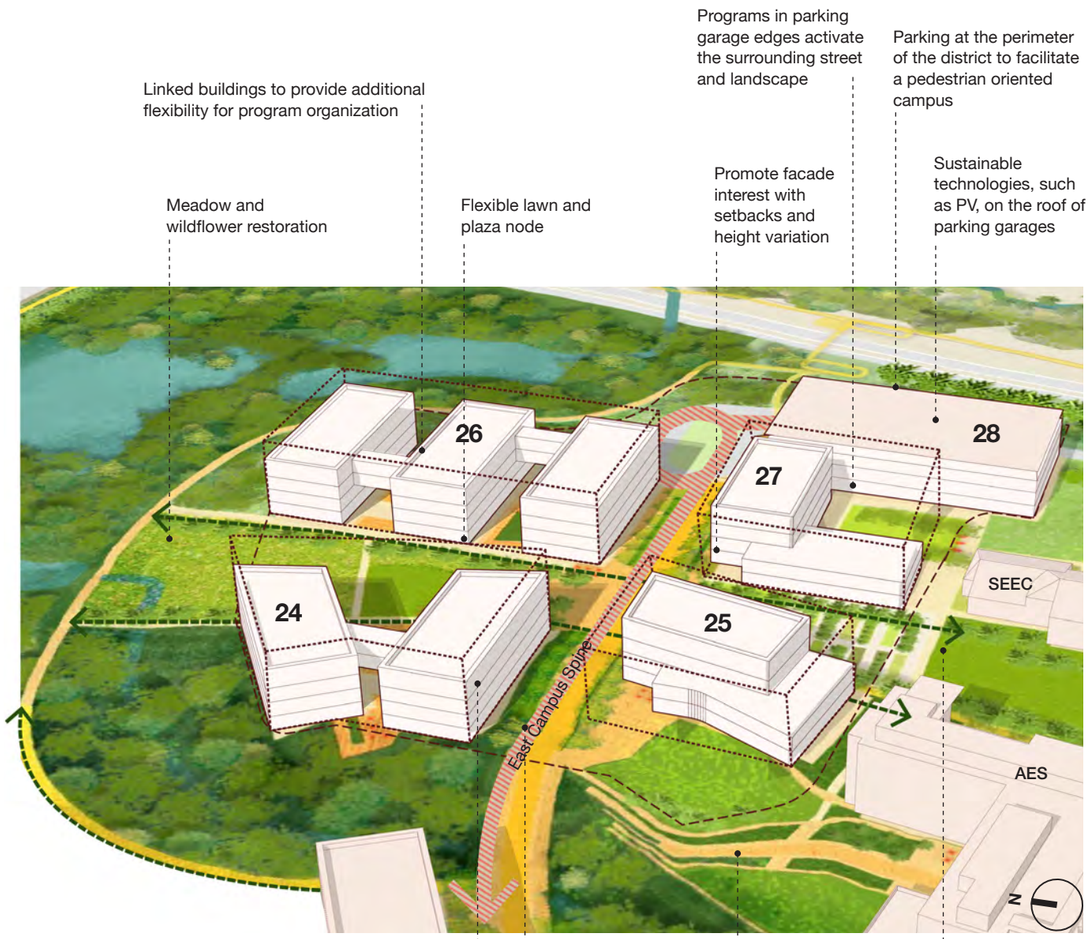
Zoning Footprint 27
Footprint area: 40,640 SQF
GSF: 102,310 SQF
ASF: 66,502 SQF
Building use: Academic/ Research

Zoning Footprint 28
Footprint area: 44,760 SQF
GSF: 143,280 SQF
ASF: 143,280 SQF
Building use: Parking

Minimum Distances

- Create academic neighborhoods in conjunction with adjacent new and existing academic and research buildings
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public spaces in the winter

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

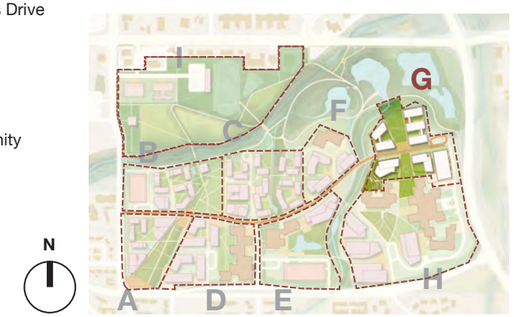


Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

AES Aerospace Engineering Sciences
SEEC Sustainable Energy Environment Community

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



Partnerships

DISTRICT H.

1,247,531 Total SQF
814,863 Landscape SQF

Zoning Footprint 29
Footprint area: 52,570 SQF
GSF: 183,610 SQF
ASF: 119,347 SQF
Building use: Academic/ Research

Zoning Footprint 30
Footprint area: 56,460 SQF
GSF: 205,435 SQF
ASF: 133,533 SQF
Building use: Academic/ Research

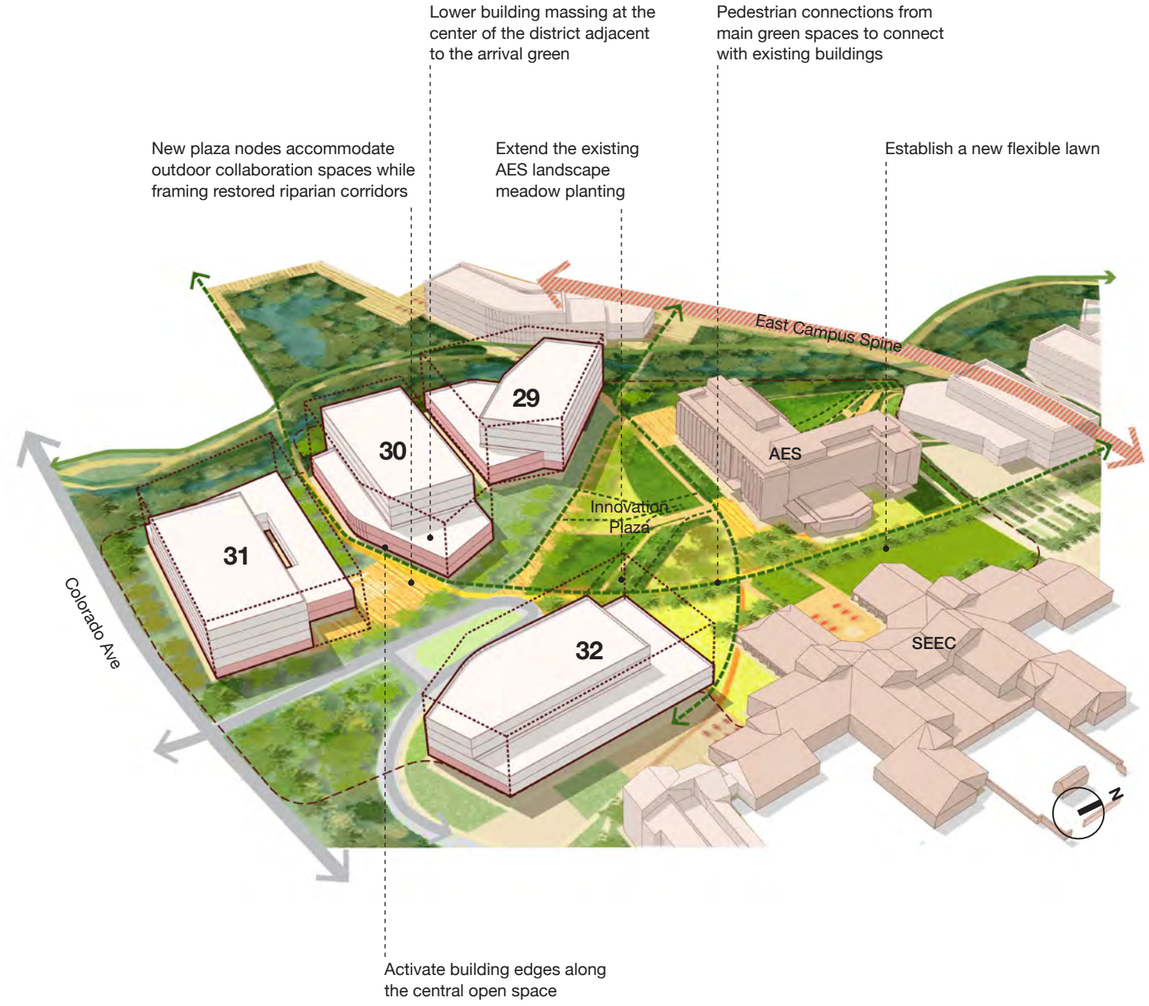
Zoning Footprint 31
Footprint area: 68,200 SQF
GSF: 222,420 SQF
ASF: 144,573 SQF
Building use: Academic/ Research

Zoning Footprint 32
Footprint area: 54,270 SQF
GSF: 170,860 SQF
ASF: 111,059 SQF
Building use: Academic/ Research

Minimum Distances

- Cluster buildings together to provide larger pockets of campus open space
- An outdoor innovation plaza pulls student life outside
- Provide a variety of massing within each project to add human scale to large volume buildings
- Create building footprints that are efficient and still provide natural light into the building interiors
- Design buildings with social spaces and transparency directly facing outdoor gathering spaces
- Orient buildings and outdoor spaces to views of the mountains
- Locate service and vehicle access to prioritize the pedestrian experience
- Orient buildings and massing to reduce solar heat gain and allow adequate solar access to public

Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street



Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

AES Aerospace Engineering Sciences
SEEC Sustainable Energy Environment Community

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

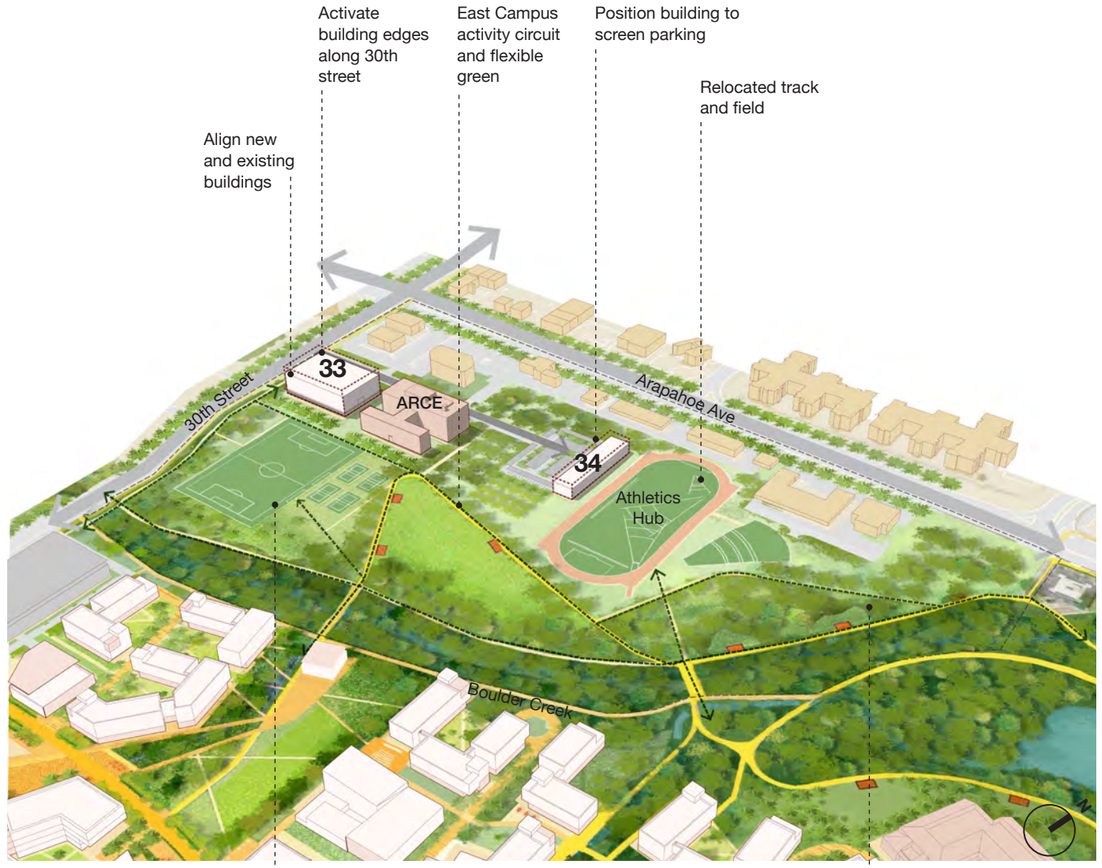
Academic / Athletics

DISTRICT I.

1,795,966 Total SQF
1,737,001 Landscape SQF

Zoning Footprint 33
Footprint area: 30,281 SQF
GSF: 121,124 SQF
ASF: 78,730 SQF
Building use: Administration

Zoning Footprint 34
Footprint area: 14,105 SQF
GSF: 14,105 SQF
ASF: 9,168 SQF
Building use: Athletics



- Maintain building setback along Marine Street
- Support definition of open space and athletic fields
- Create a pedestrian loop that connects the campus across Boulder Creek, providing access to the new Atheltics Hub featuring a new Track & Field stadium for athletes, a recreation soccer field, and recreation outdoor tennis courts
- In the future with proposed reduced building and parking densities, the university should work with the City to re-evaluate right-of-way access off of 30th Avenue onto Marine Street
- Re-locate support functions as liner elements of new parking garages or at WALN and adjacent properties

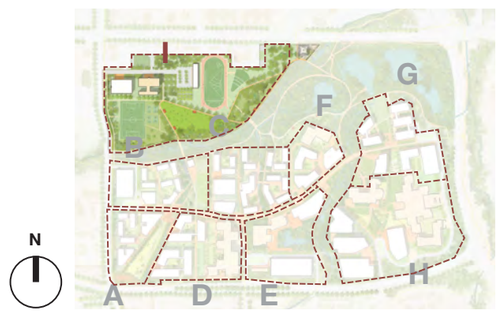
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Zoning Envelope
Proposed Buildings
Existing Building
East Campus Spine
Vehicular Street

Existing Campus Buildings

ARCE Administrative & Research Center

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



NBC Campus Design Guidelines

Objectives

These guidelines are provided to support campus master planning design principles. This set of design principles, elaborated in the Campus Master Plan, governs the long-term development of the campus. While the nature of the master plan supports ongoing decision-making, the design principles serve as the enduring tenets to structure the campus's growth.

- ENGAGE SURROUNDING COMMUNITIES
- DIVERSIFY CAMPUS NEIGHBORHOODS
- RESPECT AND REINFORCE NATURAL SYSTEMS
- CREATE STRONG PUBLIC REALM CONNECTIONS
- INTEGRATE DIVERSE OPEN SPACES
- RESPECT CAMPUS CHARACTER AND STRUCTURE
- CREATE A NETWORK OF STUDENT LIFE SPACES
- ENHANCE CAMPUS ACCESS AND WAYFINDING

How to use these guidelines

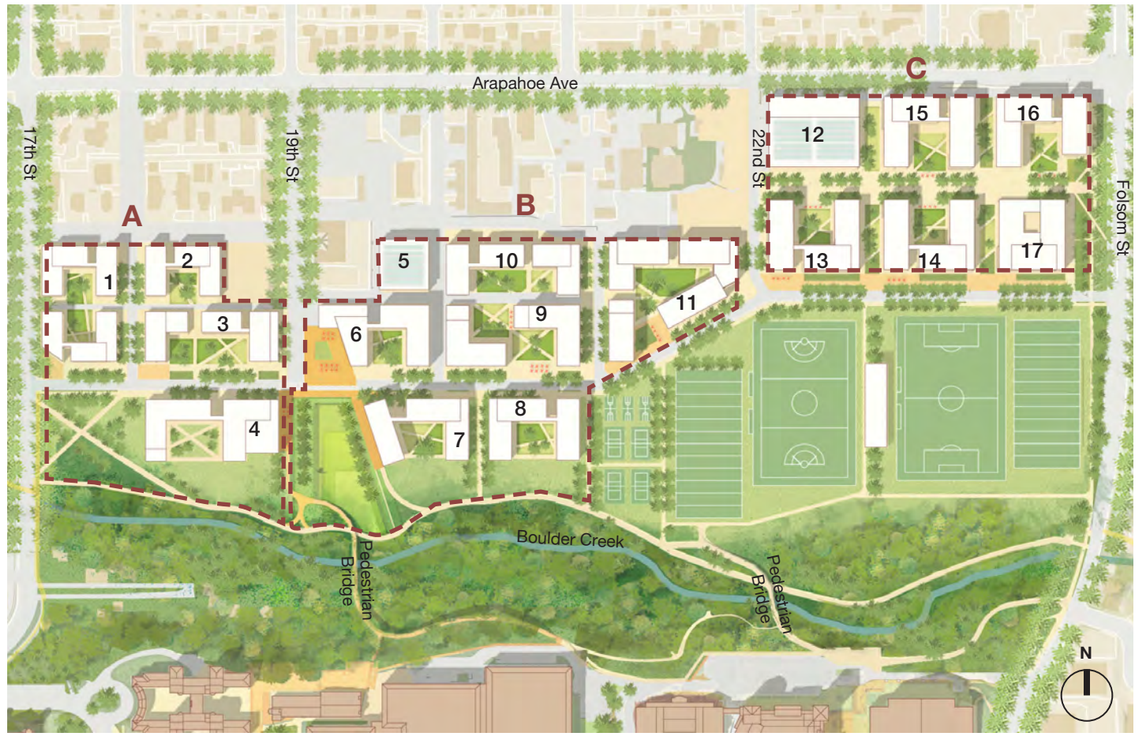
The guidelines are organized around specific districts and designated building program typologies. Within each district, zoning footprints are assigned a numerical designation (1 through 17).

Within each designated district the following criteria and organizing principles are identified:

- Zoning Footprint and Envelope
- Proposed Buildings
- NBC Campus Spine
- Proposed Campus Open Space
- Vehicular Streets
- Key Setbacks

The guidelines for each district indicate zoning footprint designations, conceptual building siting, massing, and open space strategies, all of which reflect core tenets of the Campus Master Plan. These are intended to capture the design intent of providing integrated program, building, and open space networks within each district.

At the initiation of a **new project**, a site will be identified and will include a **zoning footprint** and a larger **parcel area**. This parcel area will incorporate landscape and site infrastructure projects that benefiit the entire NBC Campus. The extents of the parcel area will be determined by Planning, Design & Construction and campus leadership.



Districts

A. Housing and Student Life
B. Housing and Student Life
C. Mixed Use

North Boulder Creek Development Summary

District SQF	Building	Zoning Footprint	Parcel Area	Building Use	Potential GSF	Potential ASF	Bed Count
A. Total: 331,442 Landscape: 232,892	1	50,830	TBD	Housing	151,581	98,527	441
	2	21,770	TBD	Housing	65,460	42,549	190
	3	38,815	TBD	Housing	83,650	54,372	226
	4	47,580	TBD	Housing/ Dining	131,366	85,387	280
B. Total: 581,968 Landscape: 415,434	5	14,640	TBD	Parking	43,920	28,548	-
	6	39,080	TBD	Housing	130,840	85,046	403
	7	32,580	TBD	Housing	98,440	63,986	303
	8	33,000	TBD	Housing	100,025	65,016	291
	9	48,050	TBD	Housing	101,617	66,051	295
	10	39,540	TBD	Housing	95,990	62,393	279
	11	67,300	TBD	Housing	169,734	110,327	494
C. Total: 404,415 Landscape: 241,096	12	37,400	TBD	Parking	149,600	97,240	-
	13	37,400	TBD	Housing	116,700	75,855	227
	14	37,400	TBD	Housing	116,700	75,855	227
	15	37,400	TBD	Housing	116,700	75,855	227
	16	37,400	TBD	Housing	107,700	70,005	209
	17	27,200	TBD	Housing	73,200	47,580	141
District Total: 1,317,825 Landscape Total: 889,422		**647,385**			**1,853,223**	**1,204,592**	**4,233**

Typical Floorplate Dimensions

Building Use	Floorplate Dimensions
Housing	180’ x 60’
Parking	180’ x 300’

Typical ASF/GSF Ratios*

Building Use	Typical GSF/ ASF Ratio
Housing	0.63
Parking	0.96
Dining	0.70

*An average of 0.65 as a general planning assumption was used to calculate ASF for all program uses. Specific ratios should be applied during a project’s design phase. Typical ratios used by CU Boulder are provided in the table above.

Proposed NBC Framework

Proposed Buildings

Existing Buildings

Housing and Student Life

DISTRICT A.

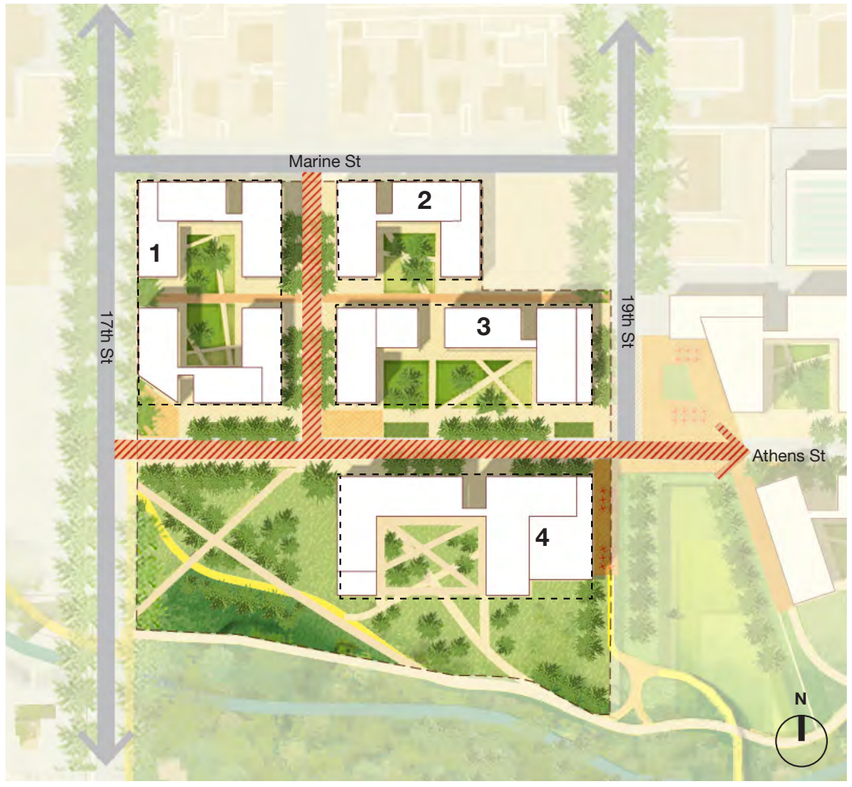
331,442 Total SQF
232,892 Landscape SQF

Zoning Footprint 1
Footprint Area: 50,830 SQF
GSF: 151,581 SQF
ASF: 98,527 SQF
Building use: Housing

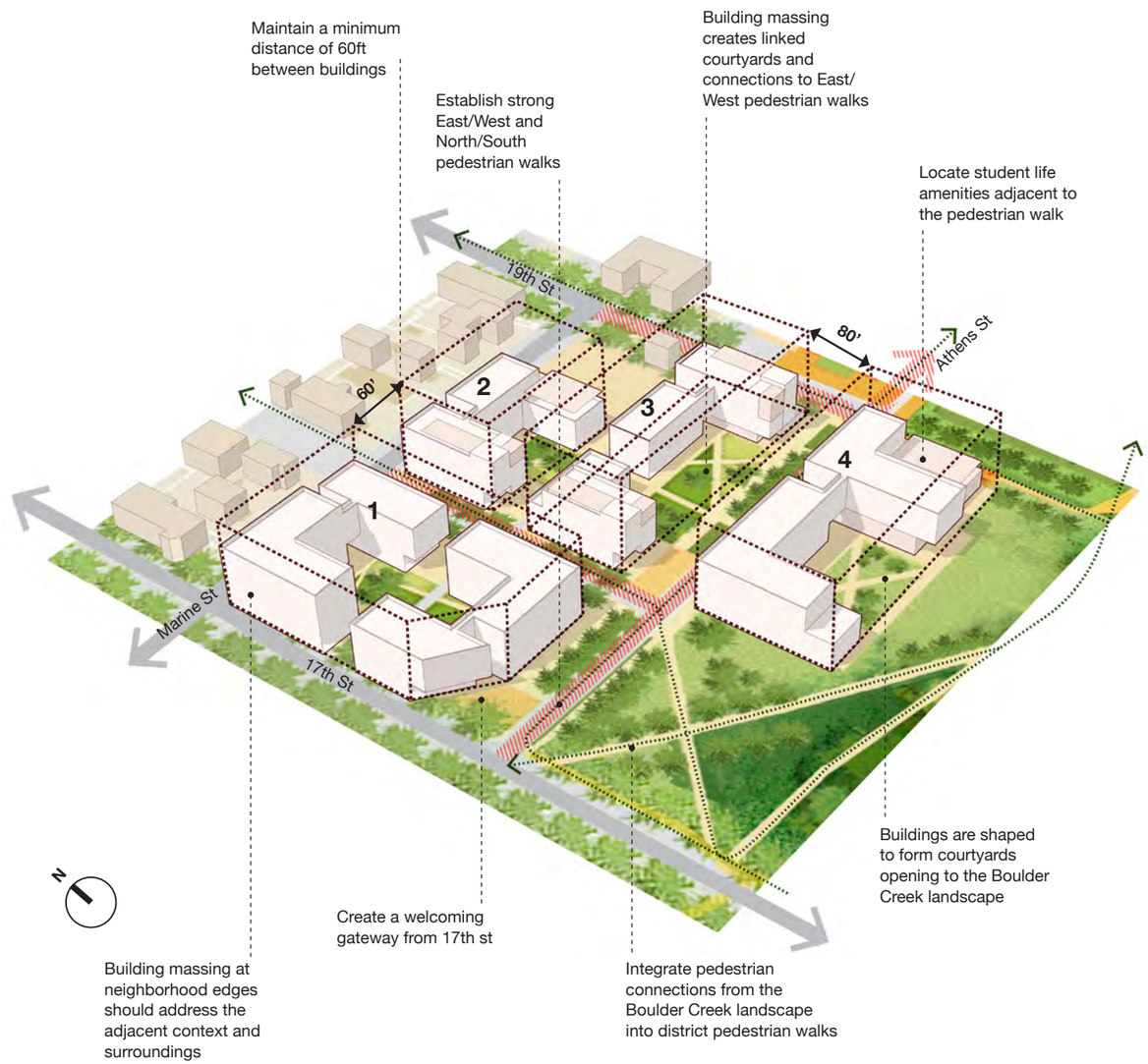
Zoning Footprint 2
Footprint Area: 21,770 SQF
GSF: 65,460 SQF
ASF: 42,549 SQF
Building use: Housing

Zoning Footprint 3
Footprint Area: 38,815 SQF
GSF: 83,650 SQF
ASF: 54,372 SQF
Building use: Housing

Zoning Footprint 4
Footprint Area: 47,580 SQF
GSF: 131,366 SQF
ASF: 85,387 SQF
Building use: Housing



- Create student communities scaled to the floor, the building and the district
- Locate student life amenities in residential buildings at the ground level and link these to the campus open space network
- Locate student life facilities to connect residential buildings with district wide pedestrian networks
- Orient buildings and outdoor spaces to maximize views of the mountains, reduce solar heat gain, and allow adequate solar access in the winter
- Locate service and vehicle access to prioritize the pedestrian experience
- Create a unified pedestrian scaled experience within the district.
- Locate parking at the perimeter of the district



Zoning Envelope
Proposed Buildings
Existing Building
District Spine
Vehicular Street

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Housing and Student Life

DISTRICT B.

581,968 Total SQF
415,434 Landscape SQF

Zoning Footprint 5
Footprint area: 14,640 SQF
GSF: 43,920 SQF
ASF: 28,548 SQF
Building use: Parking

Zoning Footprint 6
Footprint area: 39,080 SQF
GSF: 130840 SQF
ASF: 85,046 SQF
Building use: Housing

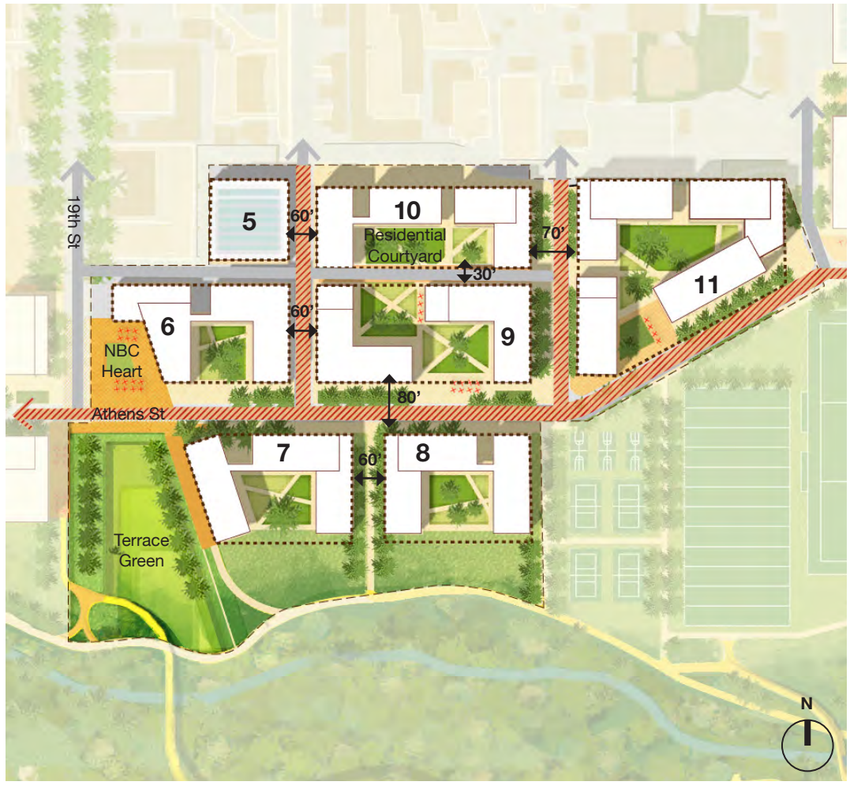
Zoning Footprint 7
Footprint area: 36,540 SQF
GSF: 98,440 SQF
ASF: 63,986 SQF
Building use: Housing

Zoning Footprint 8
Footprint area: 33,000 SQF
GSF: 100,025 SQF
ASF: 65,016 SQF
Building use: Housing

Zoning Footprint 9
Footprint area: 48,050 SQF
GSF: 101,617 SQF
ASF: 66,051 SQF
Building use: Housing

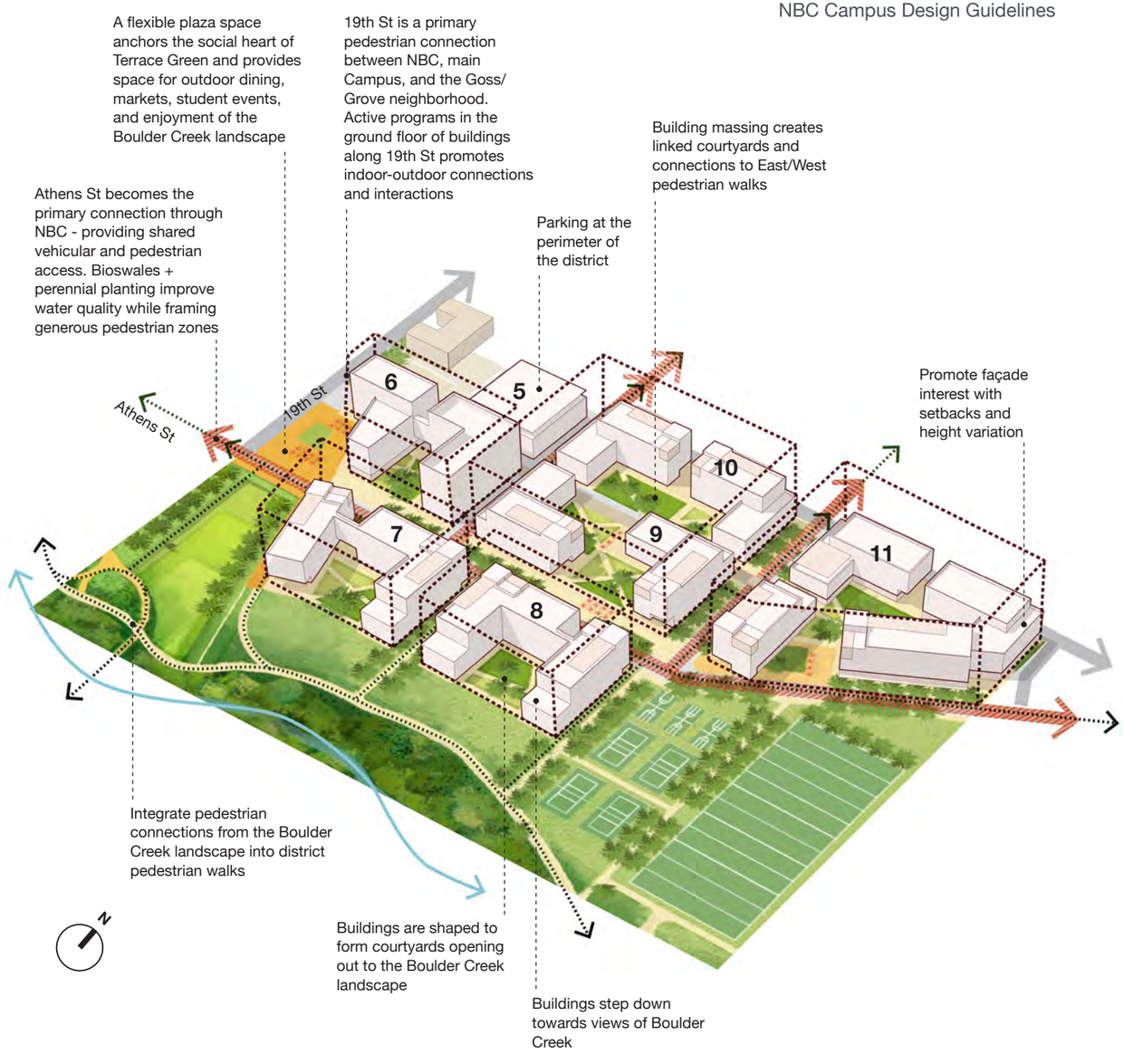
Zoning Footprint 10
Footprint area: 39,540 SQF
GSF: 95,990 SQF
ASF: 62393 SQF
Building use: Housing

Zoning Footprint 11
Footprint area: 67,300 SQF
GSF: 169,734 SQF
ASF: 110,327 SQF
Building use: Housing



Minimum Distances

- Create student communities scaled to the floor, the building and the district supported by a unified pedestrian scaled experience
- Locate student life amenities and facilities in residential buildings at the ground level and link these to the campus open space and pedestrian networks
- Build a robust network of bioswales and rain gardens to provide stormwater infiltration while providing an enhanced open space network
- Locate service and vehicle access to prioritize the pedestrian experience
- Locate parking at the perimeter of the district
- Orient buildings and outdoor spaces to maximize views of the mountains, reduce solar heat gain, and allow adequate solar access in the winter



Zoning Envelope
Proposed Buildings
Existing Building
District Spine
Vehicular Street

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Mixed Use

DISTRICT C.

404,415 Total SQF
241,096 Landscape SQF

Zoning Footprint 12
Footprint Area: 37,400 SQF
GSF: 149,600 SQF
ASF: 97,240 SQF
Building use: Parking

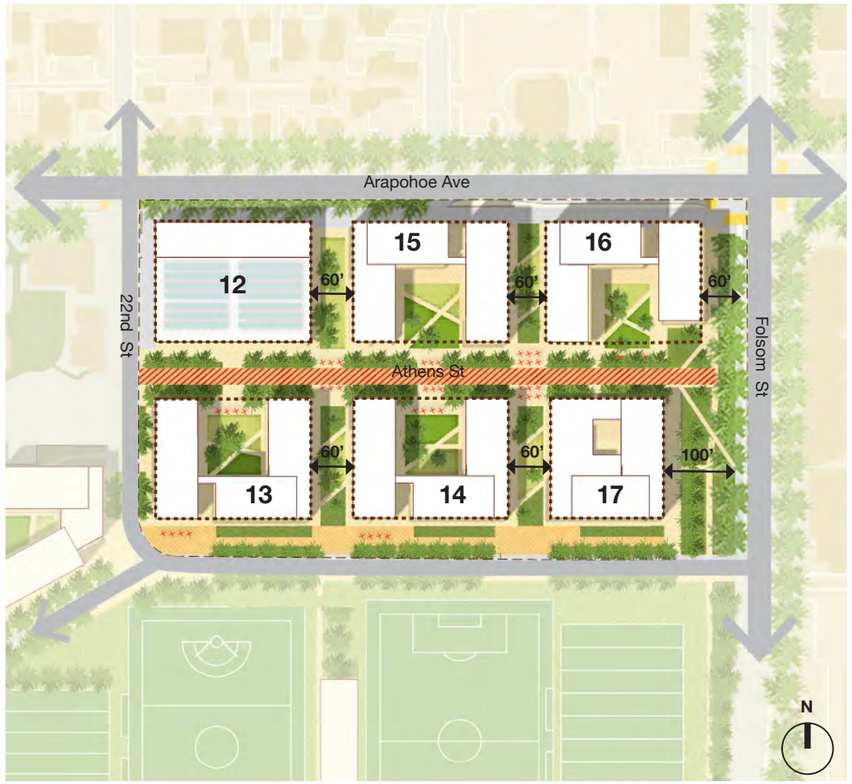
Zoning Footprint 13
Footprint Area: 37,400 SQF
GSF: 116,700 SQF
ASF: 75,855 SQF
Building use: Housing

Zoning Footprint 14
Footprint Area: 37,400 SQF
GSF: 116,700 SQF
ASF: 75,855 SQF
Building use: Housing

Zoning Footprint 15
Footprint Area: 37,400 SQF
GSF: 116,700 SQF
ASF: 75,855 SQF
Building use: Housing

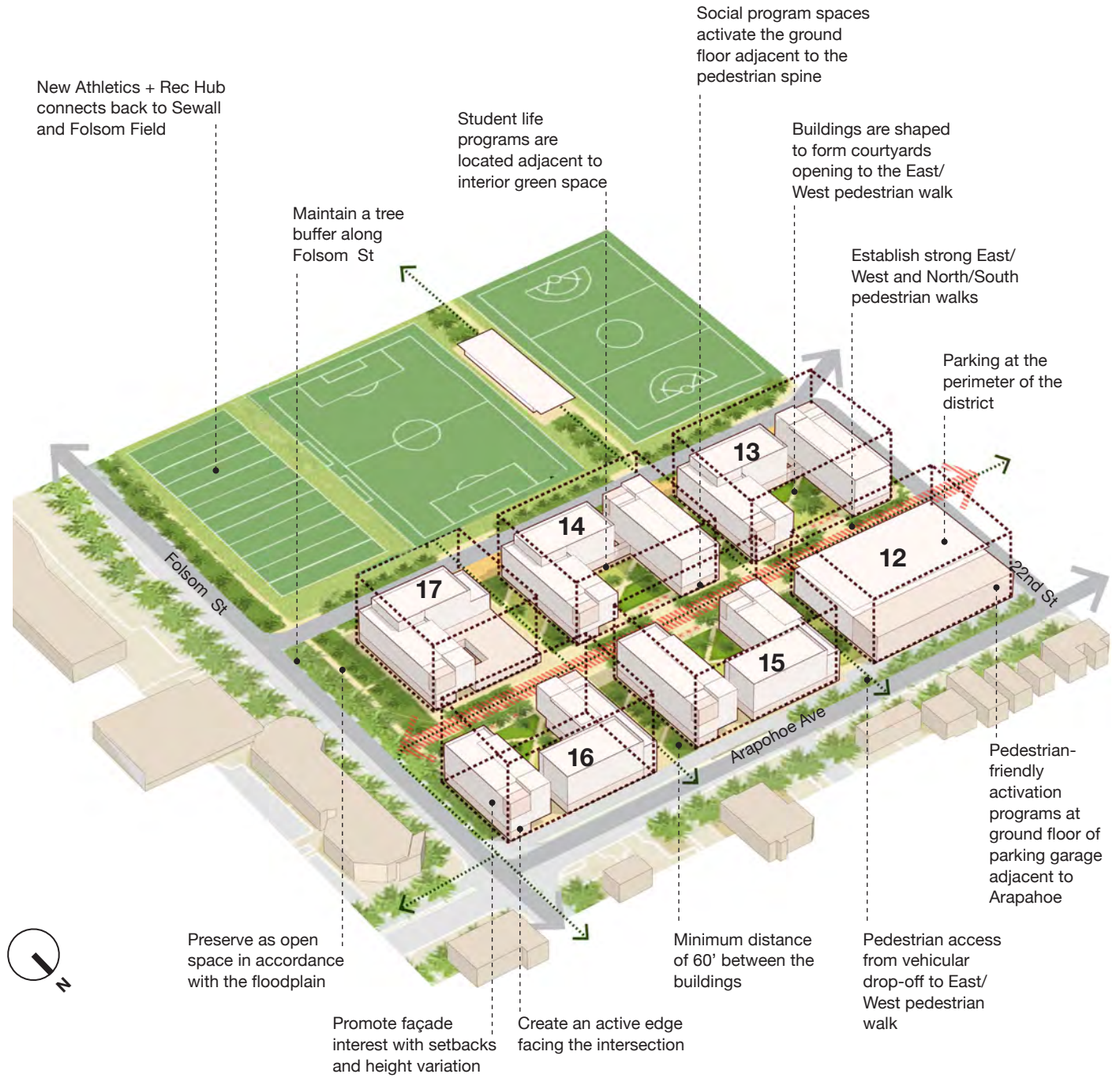
Zoning Footprint 16
Footprint Area: 37,400 SQF
GSF: 107,700 SQF
ASF: 70,005 SQF
Building use: Housing

Zoning Footprint 17
Footprint Area: 27,200 SQF
GSF: 73,200 SQF
ASF: 47,580 SQF
Building use: Housing



Minimum Distances

- Create student communities scaled to the floor, the building, and the district
- Organize massing into building wings with articulated connections
- Design buildings to create a hierarchy of open spaces that link to the district wide open space network
- Create a unified pedestrian scaled experience within the district.
- Locate social amenities at the ground level and provide visual transparency to the district open space network
- Orient buildings and outdoor spaces to maximize views of the mountains, reduce solar heat gain, and allow adequate solar access in the winter
- Consolidate service zones away from pedestrian paths



Zoning Envelope
Proposed Buildings
Existing Building
District Spine
Vehicular Street

Future development of zoning footprints 15 adn 16 will require strategic property acquisitions.

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.

Regent Drive Design Guidelines

Objectives

These guidelines are provided to support campus master planning design principles. This set of design principles, elaborated in the Campus Master Plan, governs the long-term development of the campus. While the nature of the master plan supports ongoing decision-making, the design principles serve as the enduring tenets to structure the campus's growth.

- ENGAGE SURROUNDING COMMUNITIES
- DIVERSIFY CAMPUS NEIGHBORHOODS
- RESPECT AND REINFORCE NATURAL SYSTEMS
- CREATE STRONG PUBLIC REALM CONNECTIONS
- INTEGRATE DIVERSE OPEN SPACES
- RESPECT CAMPUS CHARACTER AND STRUCTURE
- CREATE A NETWORK OF STUDENT LIFE SPACES
- ENHANCE CAMPUS ACCESS AND WAYFINDING

How to use these guidelines

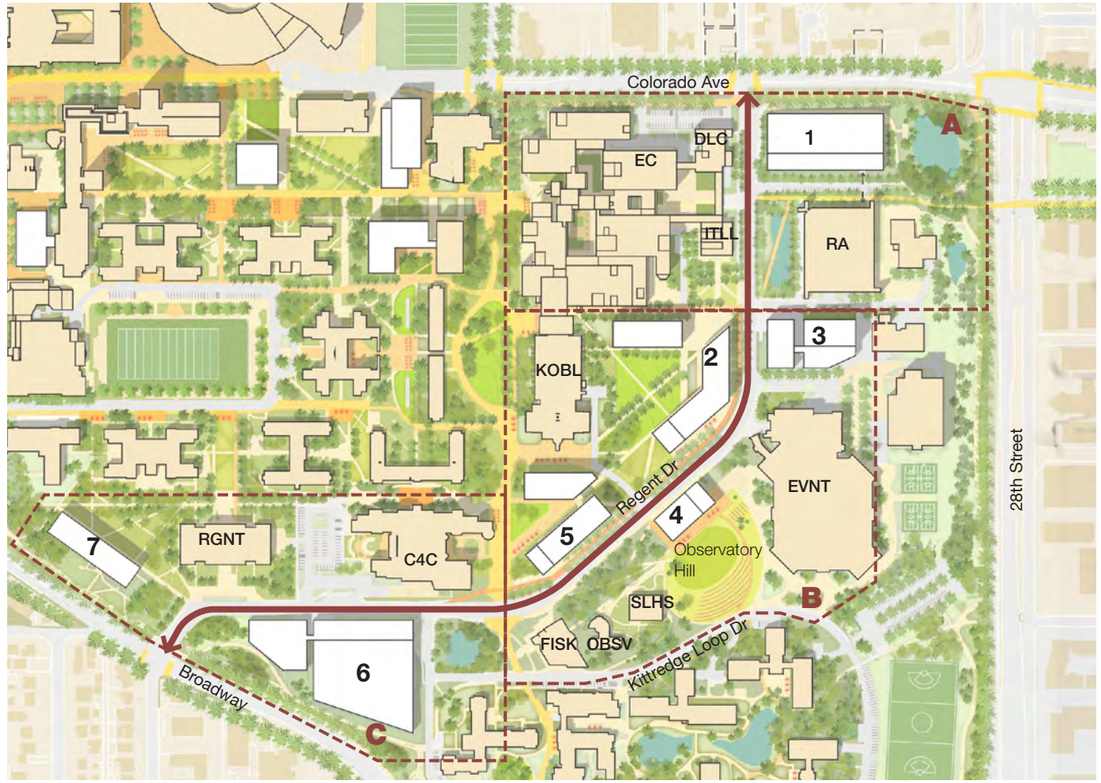
The guidelines are organized around specific districts and designated building program typologies. Within each district, zoning footprints are assigned a numerical designation (1 through 7) and existing buildings that are to remain are labeled with their building code.

Within each designated district the following criteria and organizing principles are identified:

- Zoning Footprint and Envelope
- Proposed Buildings
- Existing Building
- Regent Drive Spine
- Proposed Campus Open Space
- Vehicular Streets
- Key Setbacks

The guidelines for each district indicate zoning footprint designations, conceptual building siting, massing, and open space strategies, all of which reflect core tenets of the Campus Master Plan. These are intended to capture the design intent of providing integrated program, building, and open space networks within each district.

At the initiation of a **new project**, a site will be identified and will include a **zoning footprint** and a larger **parcel area**. This parcel area will incorporate landscape and site infrastructure projects that benefiit the entire Regent Drive. The extents of the parcel area will be determined by Planning, Design & Construction and campus leadership.



Districts

A. Administration / Parking
B. Academic / Student Life
C. Administration / Parking

N

Existing Campus Buildings

EC	Engineering Center (EC)
DLC	Gallogly Discovery Learning Center
ITLL	Drescher Engineering Lab
RA	Regent Autopark
KOBL	Koelbel (Leeds School of Business)
FISK	Fiske Planetarium and Science Center
OBSV	Sommers-Bausch Observatory
SLHS	Communication Disorders
EVNT	CU Events Center
RGNT	Regent Administrative Center
C4C	Center for Community

Regent Drive Development Summary

District SQF	Building	Zoning Footprint	Parcel Area	Building Use	Potential GSF	Potential ASF
A. Total: 952,286 Landscape: 599,436	1	59,500	TBD	Parking	238,000	238,000
B. Total: 1,160,100 Landscape: 831,874	2	114,398	TBD	Academic	191,612	124,547
	3	37,147	TBD	Academic	134,048	87,131
	4	57,532	TBD	Student Life	230,128	149,583
	5	53,875	TBD	Academic	138,136	89,788
C. Total: 818,546 Landscape: 585,586	6	116,110	TBD	Admin & Parking	436,800	380,150
	7	21,780	TBD	Administration	87,120	56,628
District Total: 2,930,932 Landscape Total: 2,016,896		**460,342**			**1,455,844**	**1,125,827**

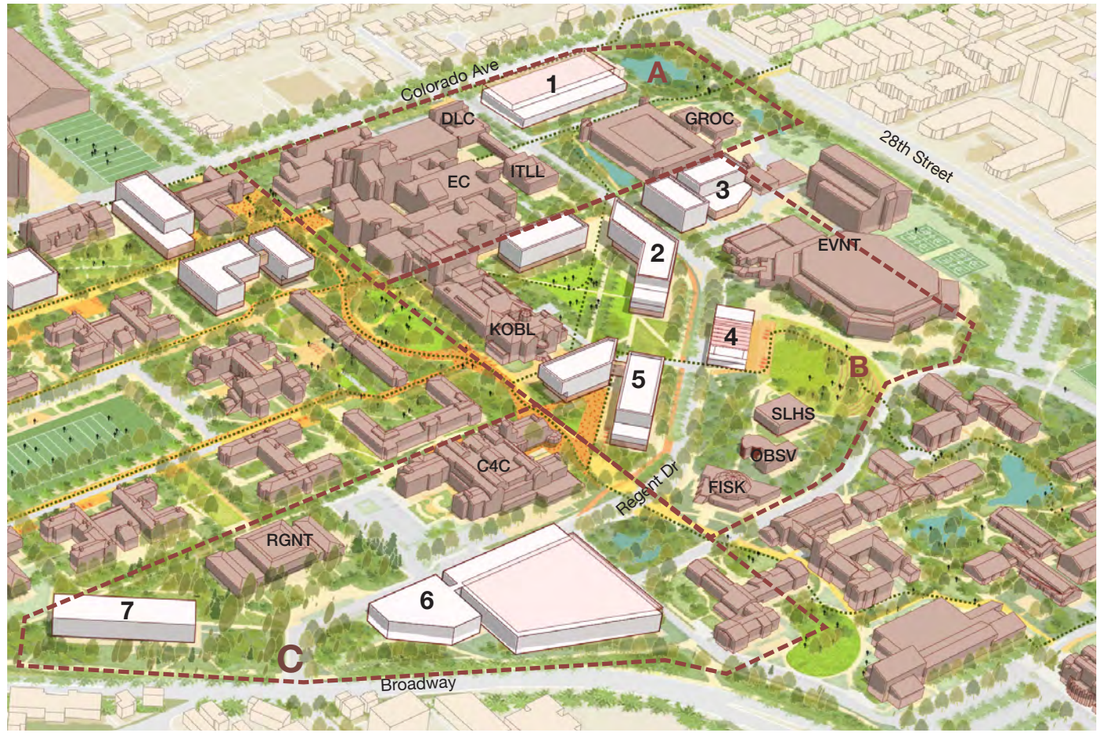
Typical Floorplate Dimensions

Building Use	Floorplate Dimensions
Academic	240’ x 85’
Administration	240’ x 75’
Parking	180’ x 300’

Typical ASF/GSF Ratios*

Building Use	Typical GSF/ ASF Ratio
Academic	0.60
Administration	0.70
Parking	0.96
Student Life	0.70

*An average of 0.65 as a general planning assumption was used to calculate ASF for all program uses. Specific ratios should be applied during a project’s design phase. Typical ratios used by CU Boulder are provided in the table above.



Districts

- **A.** Administration / Parking
- **B.** Academic / Student Life
- **C.** Administration / Parking

Existing Campus Buildings

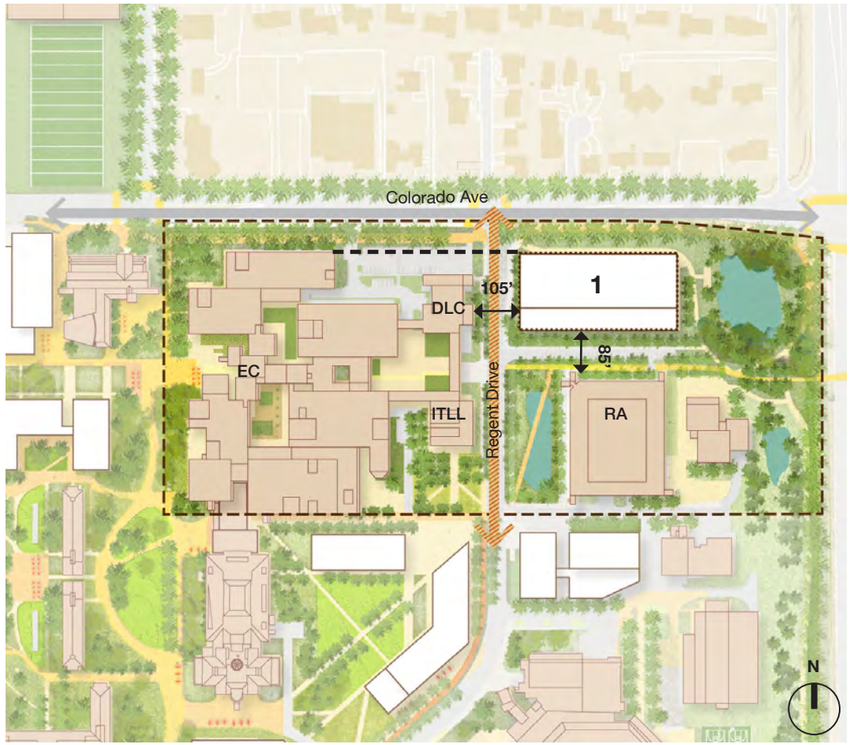
EC	Engineering Center (EC)
DLC	Gallogly Discovery Learning Center
ITLL	Drescher Engineering Lab
RA	Regent Autopark
KOBL	Koelbel (Leeds School of Business)
FISK	Fiske Planetarium and Science Center
OBSV	Sommers-Bausch Observatory
SLHS	Communication Disorders
EVNT	CU Events Center
RGNT	Regent Administrative Center
C4C	Center for Community

Administration / Parking

DISTRICT A.

952,286 Total SQF
599,436 Landscape SQF

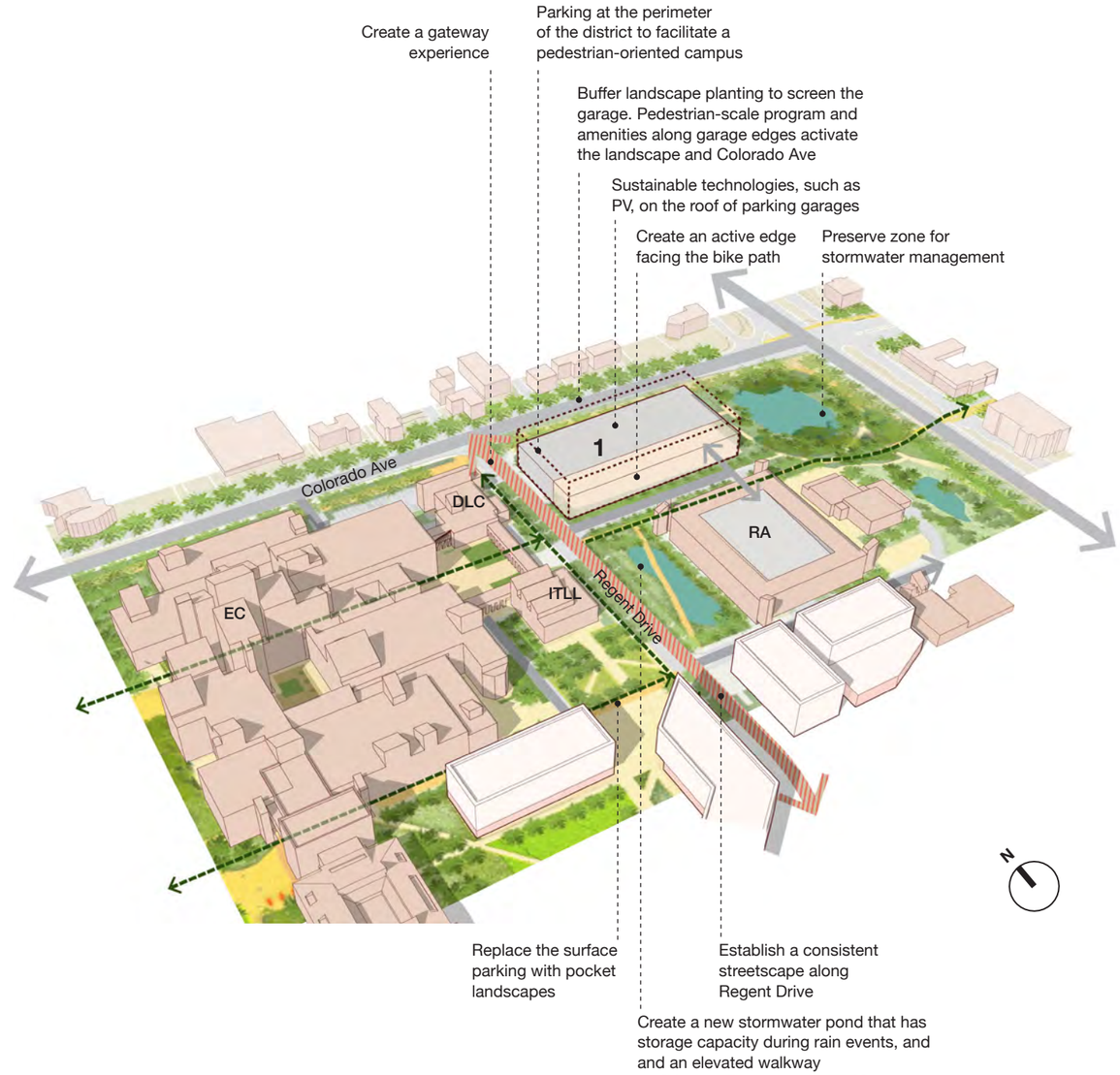
Zoning Footprint 1
Footprint area: 59,500 SQF
GSF: 238,000 SQF
ASF: 238,000 SQF
Building use: Parking



Minimum Distances

- Leverage buildings to define campus open space and streetscape
- Create a unified pedestrian scaled experience, including safe crossings, along the entire length of Regent Drive
- Utilize ground floor space with programs that activate the streetscape and campus open space
- Locate parking at the perimeter of the district
- Create an active edge of programs facing Regent Drive

Proposed Buildings
Existing Building
Regent Drive
Vehicular Street

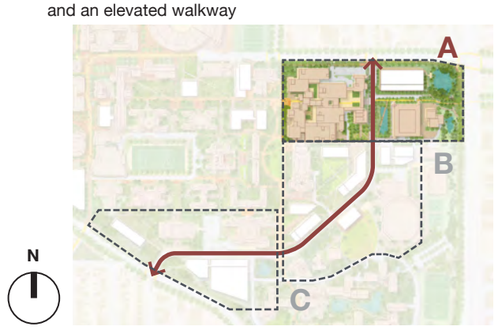


Zoning Envelope
Proposed Buildings
Existing Building
Regent Drive
Vehicular Street

Existing Campus Buildings

EC	Engineering Center (EC)
DLC	Gallogly Discovery Learning Center
ITLL	Drescher Engineering Lab
RA	Regent Autopark

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



Academic / Student Life

DISTRICT B.

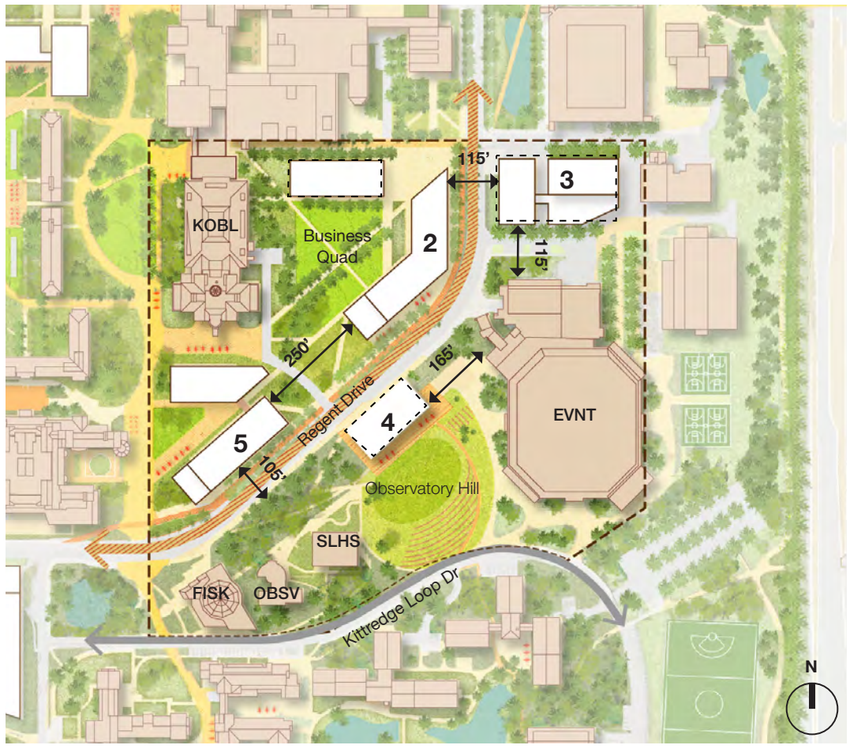
1,160,100 Total SQF
831,874 Landscape SQF

Zoning Footprint 2
Footprint area: 114,398 SQF
GSF: 191,612 SQF
ASF: 124,547 SQF
Building use: Academic

Zoning Footprint 3
Footprint area: 37,147 SQF
GSF: 134,048 SQF
ASF: 87,131 SQF
Building use: Academic

Zoning Footprint 4
Footprint area: 57,532 SQF
GSF: 230,128 SQF
ASF: 149,583 SQF
Building use: Student Life

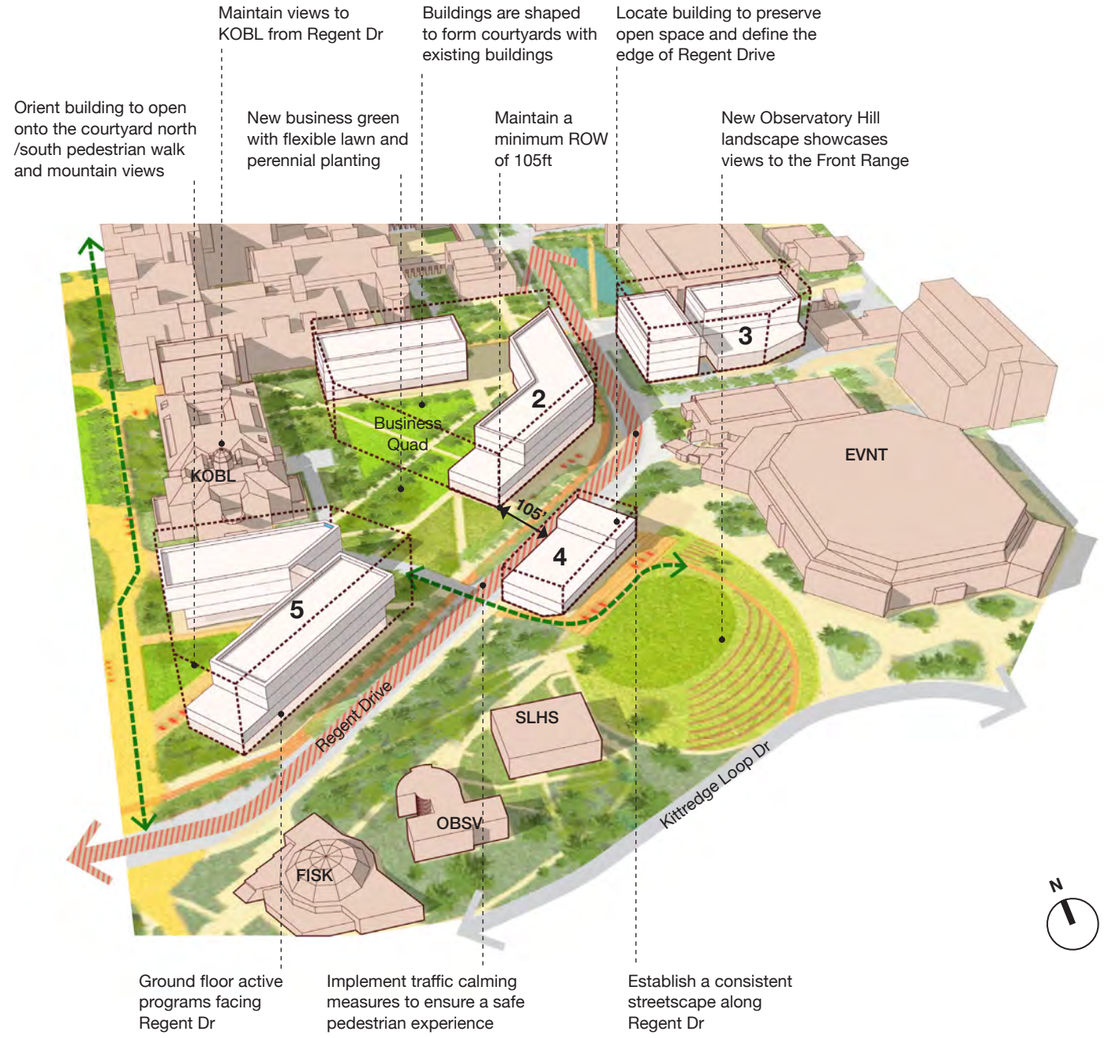
Zoning Footprint 5
Footprint area: 53,875 SQF
GSF: 138,136 SQF
ASF: 89,788 SQF
Building use: Academic



Minimum Distances

- Proposed Buildings
- Existing Building
- Regent Drive
- Vehicular Street

- Leverage buildings to define campus open space and streetscape
- Create a unified pedestrian scaled experience, including safe crossings, along the entire length of Regent Drive
- Utilize ground floor space with programs that activate the streetscape and campus open space
- Preserve views of campus open space and mountains
- Create an active edge of programs facing Regent Drive

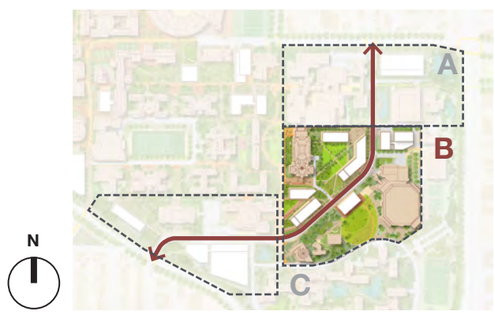


- Zoning Envelope
- Proposed Buildings
- Existing Building
- Regent Drive
- Vehicular Street

Existing Campus Buildings

KOBL	Koelbel (Leeds School of Business)
FISK	Fiske Planetarium and Science Center
OBSV	Sommers-Bausch Observatory
SLHS	Communication Disorders
EVNT	CU Events Center

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



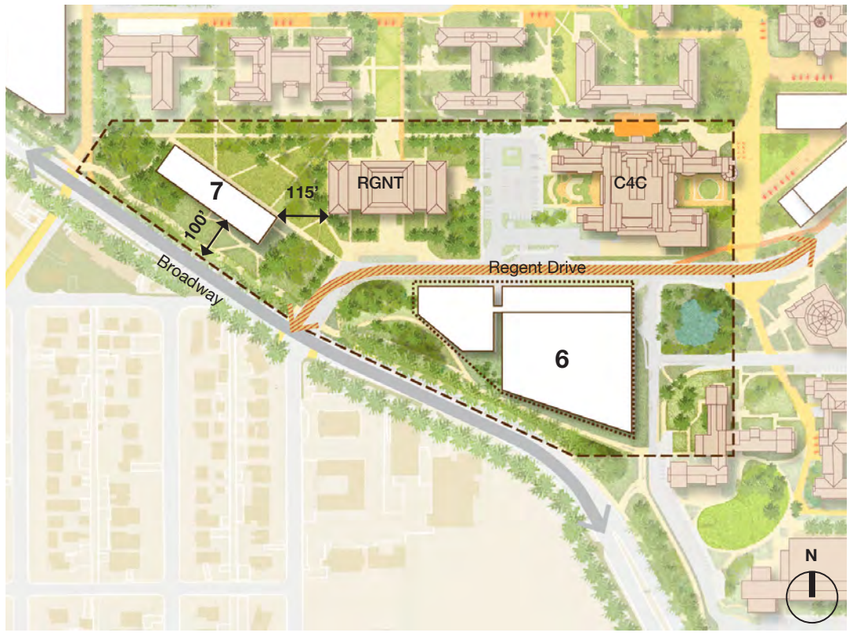
Administration / Parking

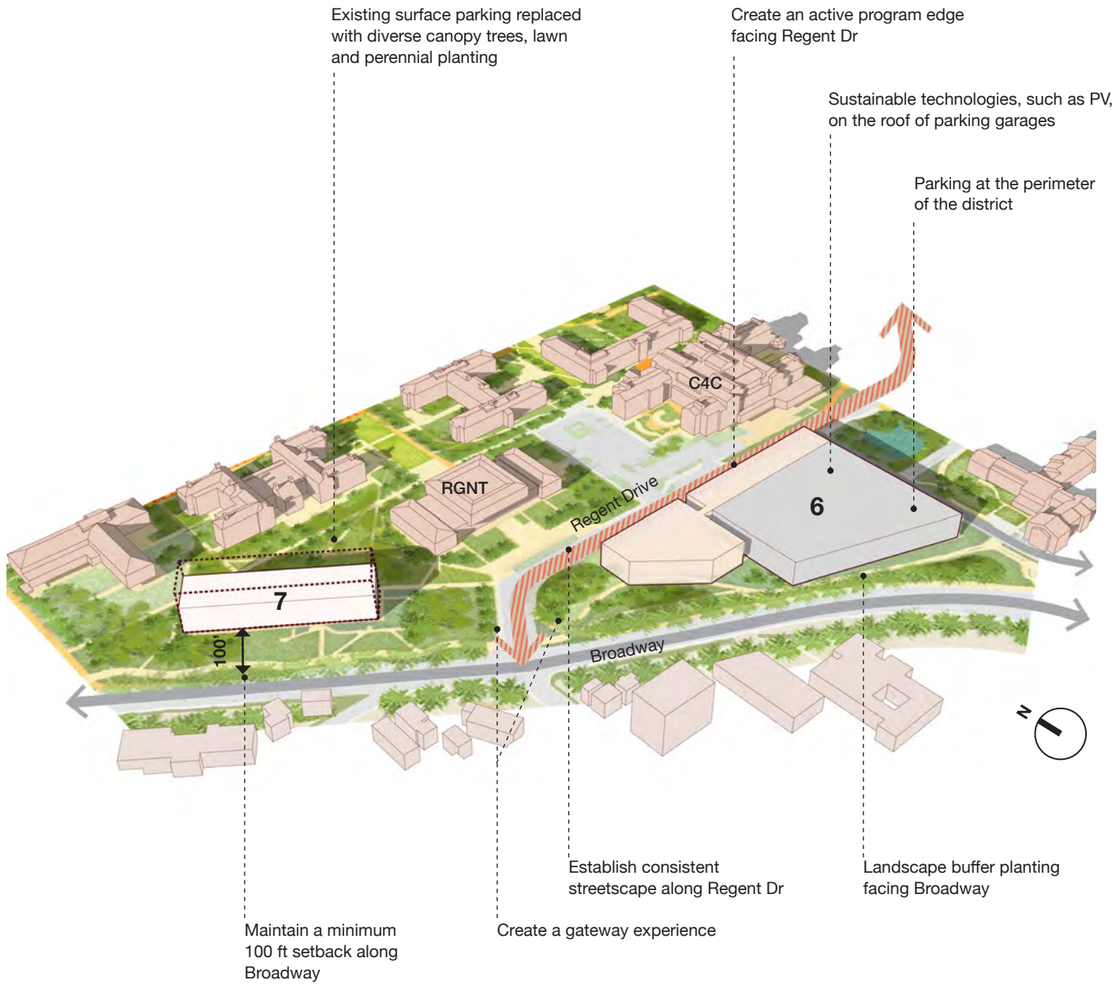
DISTRICT C.

818,546 Total SQF
585,586 Landscape SQF

Zoning Footprint 6
Footprint area: 116,110 SQF
GSF: 436,800 SQF
ASF: 380,510 SQF
Building use: Admin & Parking

Zoning Footprint 7
Footprint area: 21,780 SQF
GSF: 87,120 SQF
ASF: 56,628 SQF
Building use: Administration





- Leverage buildings to define campus open space and streetscape
- Create a unified pedestrian scaled experience along the entire length of Regent Drive
- Utilize ground floor space with programs that activate the streetscape and campus open space
- Locate parking at the perimeter of the district
- Buffer landscape planting to screen the garage
- Creative an active program edge along garage facing Regent Dr

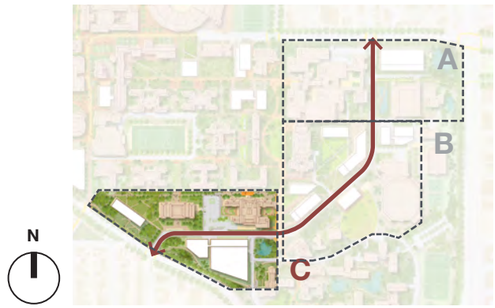
Proposed Buildings
Existing Building
Regent Drive
Vehicular Street

Zoning Envelope
Proposed Buildings
Existing Building
Regent Drive
Vehicular Street

Existing Campus Buildings

RGNT Regent Administrative Center
C4C Center for Community

The massing shown for individual buildings is indicative of the building potential. Building footprints and zoning envelopes show flexibility to increase the height and size, if required, as detailed building designs are prepared.



Other Proposed Buildings

Development Summary

Building	Building Use	Potential GSF	Potential ASF	Bed Count
1	Alumni Center	40,200	26,130	-
2	Housing	96,360	62,634	214
3	Housing	85,500	55,575	190
4	Academic / Research	133,000	86,450	-
5	Parking / Mobility Hub	247,165	247,165	-
6	Academic / Research	16,277	10,580	-
7	Academic / Research	61,795	40,167	-
8	Academic / Research	95,990	65,394	-
9	Academic / Research	130,410	84,767	-
10	Parking	113,400	113,400	-
11	Academic	51,000	33,150	-
12	Academic	102,275	66,479	-
13	Student Life	78,065	50,742	-
14	Parking	82,800	82,800	-
		1,334,237	**1,025433**	**404**

Main Campus

Williams Village

Existing Campus Buildings

C4C	Center for Community
CASE	Center for Academic Success & Engagement
CHEM	Cristol Chemistry & Biochemistry
EC	Engineering Center
ENVT	Coors Events/Conference Center
FA	Visual Arts Center
FLMG	Fleming
LIBR	Norlin Library
MAIN	Old Main
MCKY	Macky Auditorium
MUS	Imig Music
REC	Student Recreation Center
STAD	Folsom Field
UMC	University Memorial Center
CONF/ HOTEL	Conference Center and Hotel

Landscape Guidelines

Landscape Typologies

These landscape guidelines are organized by landscape typology and are intended as a reference for designing new campus open spaces.

Each landscape typology includes information regarding key dimensions, materiality, and recommended planting palettes. These new typologies borrow from the historic core of Main Campus and were created to ensure that new open spaces with modern material choices still feel integrated with the existing campus character.

Guidelines for the following typologies are included:

- Shared Transit Streets
- Primary Paths
- Campus Buffer Trails
- Secondary Paths
- Tertiary Paths
- Quads
- Riparian Landscapes
- Storm water Ponds
- Green Courts
- Plaza Courts
- Bike Corrals
- Tree Bank

NBC Floodplain

Additionally, an appendix is included that focuses on the floodplain at NBC. This appendix describes the assumptions that this masterplan took in the conceptual grading and suggested alterations of the Conveyance Zone.

The First Floor Elevations (FFE) in this appendix are approximate and were interpolated from the FFE included in the 2020 NBC Design Guidelines and Master Site Development Plan. The FFE elevations of the proposed footprints of the 30-year Masterplan will need to be finalized by a flood engineer. Any modification to the Conveyance and High Hazard Zones will need to be done in collaboration with FEMA and the City of Boulder.

Athletic & Rec Fields

Also Included in the guidelines is the proposed organization & programming of Athletic & Rec fields for each campus.

Canopy Analysis

Further information regarding tree canopy diversity and considerations for future plantings is also included. This analysis is designed to highlight districts likely to experience stress due to climate change and recommendations for maintaining a healthy canopy into the future.

Sustainability

Care was taken in the landscape guidelines to emphasize a palette of locally sourced materials to lower the embodied carbon of the campus. A native and adaptive planting palette helps to reduce campus irrigation needs during typical years and improves the likelihood of plant survival during periods of drought and stress. As climate change will increase the likelihood of both drought and severe flooding, this master plan is designed to respect existing waterways and expand the stormwater management network. New development within the floodplain will be elevated in alignment with FEMA and City of Boulder requirements.

The maintenance of campus landscapes plays an important role in the case of drought and subsequent fire risk.

Clearing overgrown shrubs, implementing a maintenance regime to reduce flammable plant matter in meadows, and spacing trees to include a 10-12’ buffer between tree crowns will help prevent and slow the spread of wildfires.

Additionally, a canopy analysis was conducted to identify at-risk tree species, areas requiring more diverse tree planting, and pockets of campus with trees likely to experience stress due to climate change. Managing pests that threaten CU’s canopy, like the Emerald Ash Borer, and strategic succession planting around at-risk trees are two strategies that CU Boulder is already implementing. Continuing these efforts will improve the resilience of the campus landscape in coming years.

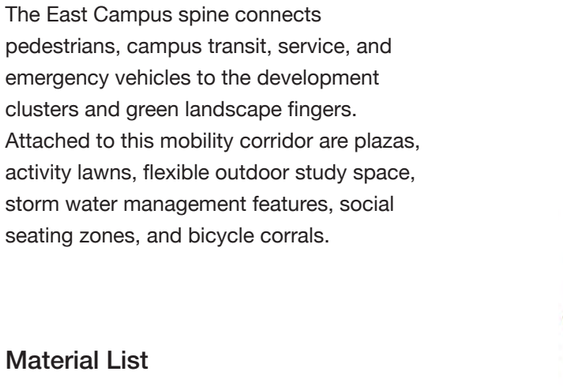
Shared Transit Street

Example: East Campus Spine

The East Campus spine connects pedestrians, campus transit, service, and emergency vehicles to the development clusters and green landscape fingers. Attached to this mobility corridor are plazas, activity lawns, flexible outdoor study space, storm water management features, social seating zones, and bicycle corrals.

Material List

- *Cast in place concrete paths + scoring detail*
- *Herringbone pervious brick central spine*
- *Aluminum, LED light fixtures*
- *Outdoor furnishings*



Meadow Restoration

Bioswale

Mature Canopy

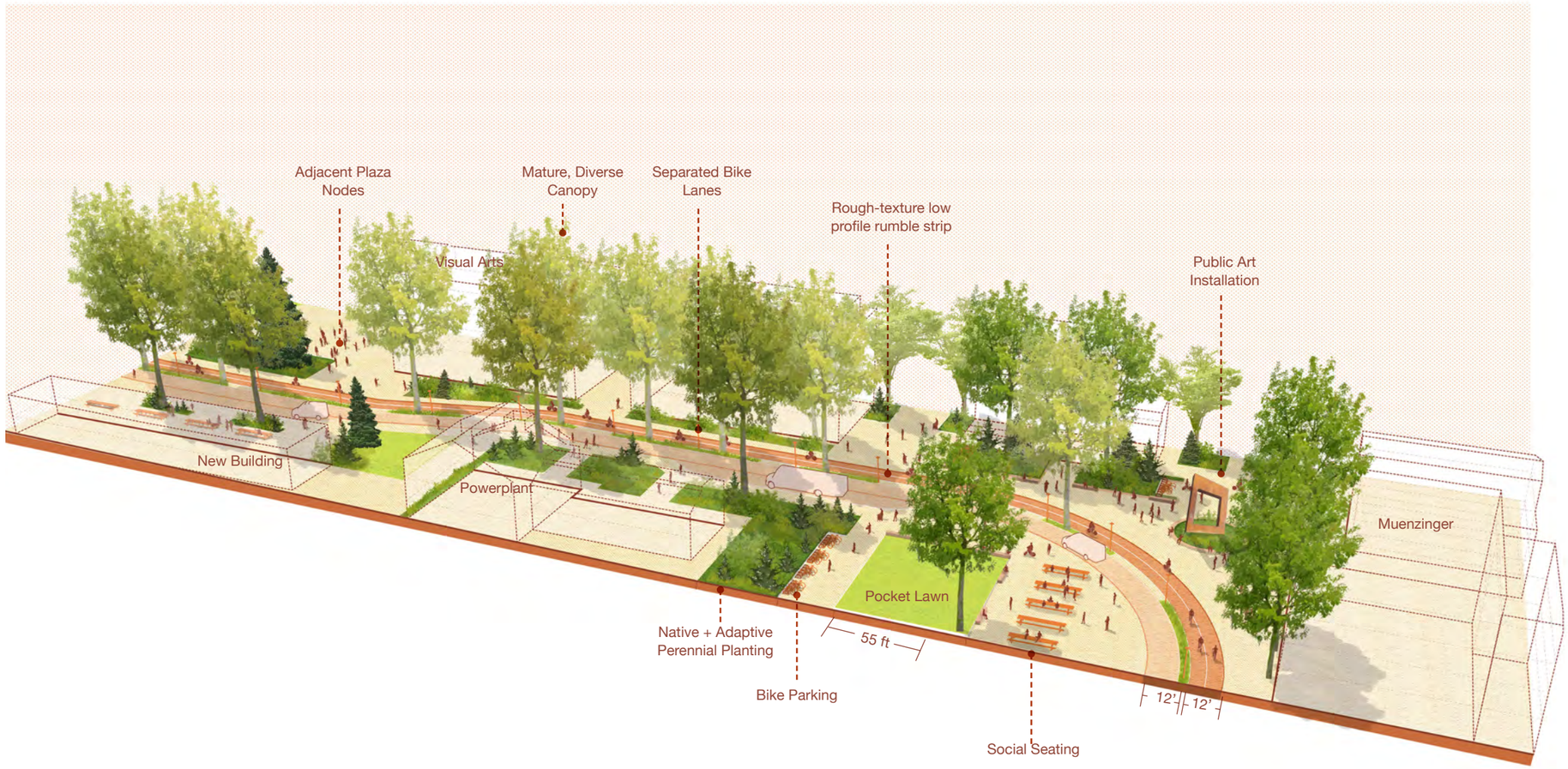
Shared Transit Street

Example: The Walk

The Walk connects pedestrians, campus transit, service, and emergency vehicles to the core of Main Campus. The Walk is designed to be pedestrian and bicycle friendly, offering separated bike lanes, generous paved pedestrian zones, and planted areas that frame seating and bicycle parking. Attached to this mobility corridor are plazas, small pocket lawns, and flexible outdoor study spaces.

Material List

- *Cast in place concrete paths*
- *Herringbone pervious brick central spine*
- *Aluminum, LED light fixtures*
- *Outdoor furnishings*

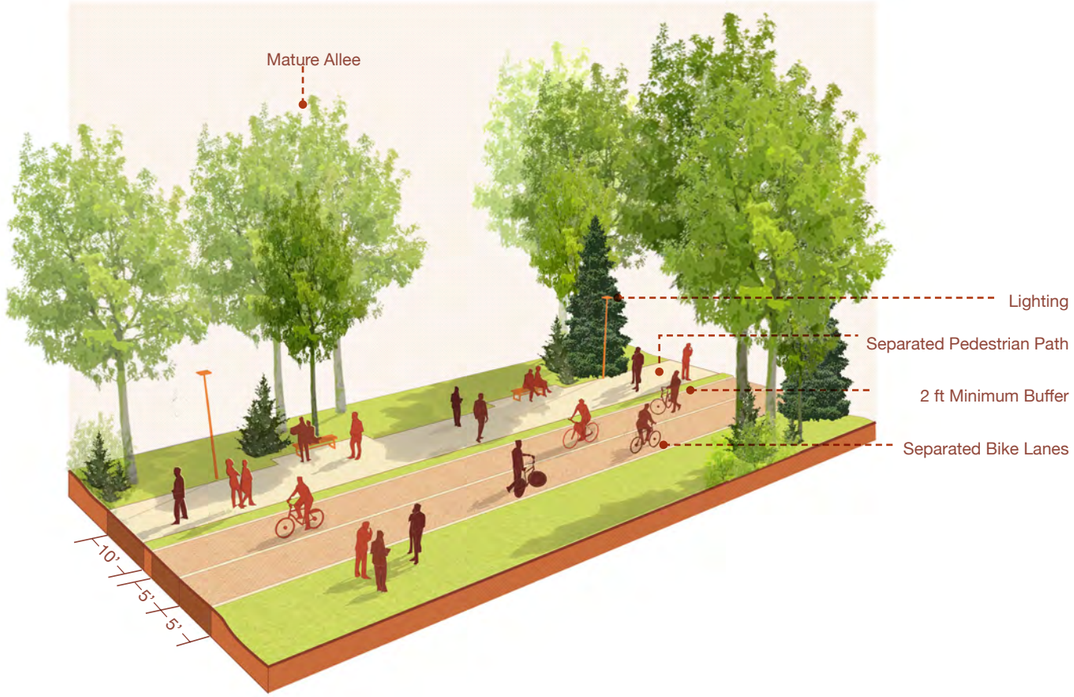


Mesic Mixed Conifer Woodland Sp.

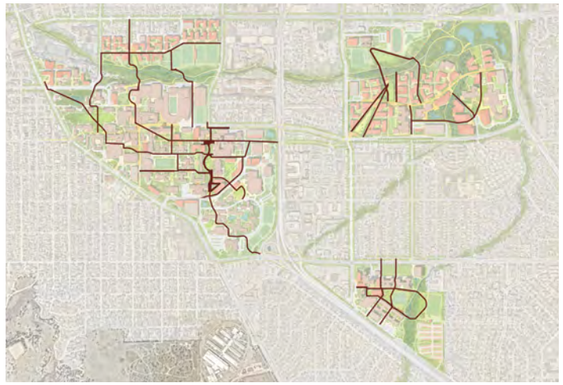
Shrubland Sp.

Mature Canopy

Primary Path



New primary paths through campus should be wide enough to accommodate a generous pedestrian path and dedicated bike lanes. Seating, lighting, trash receptacles, and bike racks should be placed throughout these corridors for resting, safety, and convenience. A diverse canopy of native and adaptive trees should line these paths for shade and comfort.



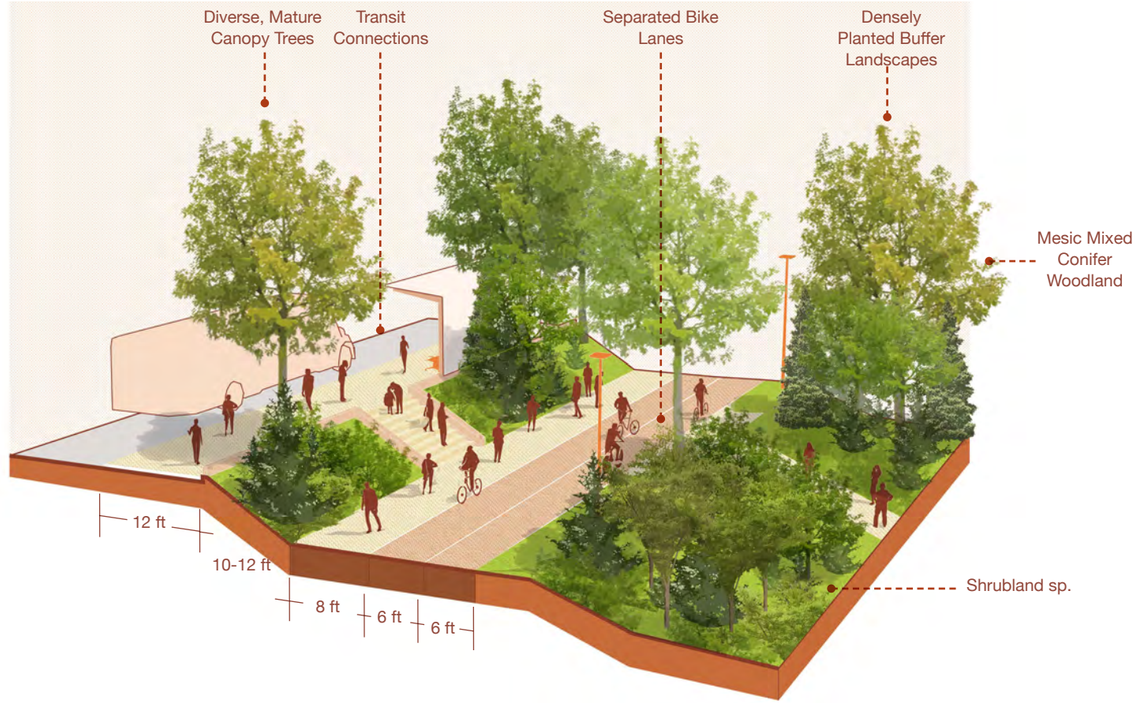
Material List

- *Cast in place concrete paths*
- *Aluminum, LED light fixtures*
- *Outdoor furnishings including benches, trash & recycling cans*

Shrubland Sp.

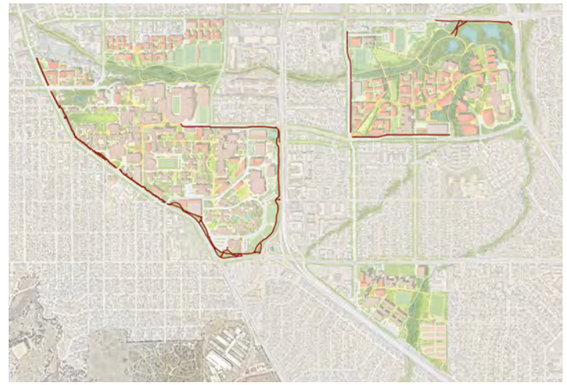
Mature Canopy

Campus Buffer Trail



Along the edge of campus, densely planted landscapes buffer the campus core from surrounding roads. These landscapes connect cyclists and pedestrians to transit stops and other key nodes. This trail system features pedestrian paths with separated bike lanes

Rocky Mountain Mesic Mixed Conifer Forest and Woodland species should be planted on north and east-facing slopes while Rocky Mountain Lower Montane-Foothill Shrubland species should be planted on drier, exposed sites with rockier substrates.



Material List

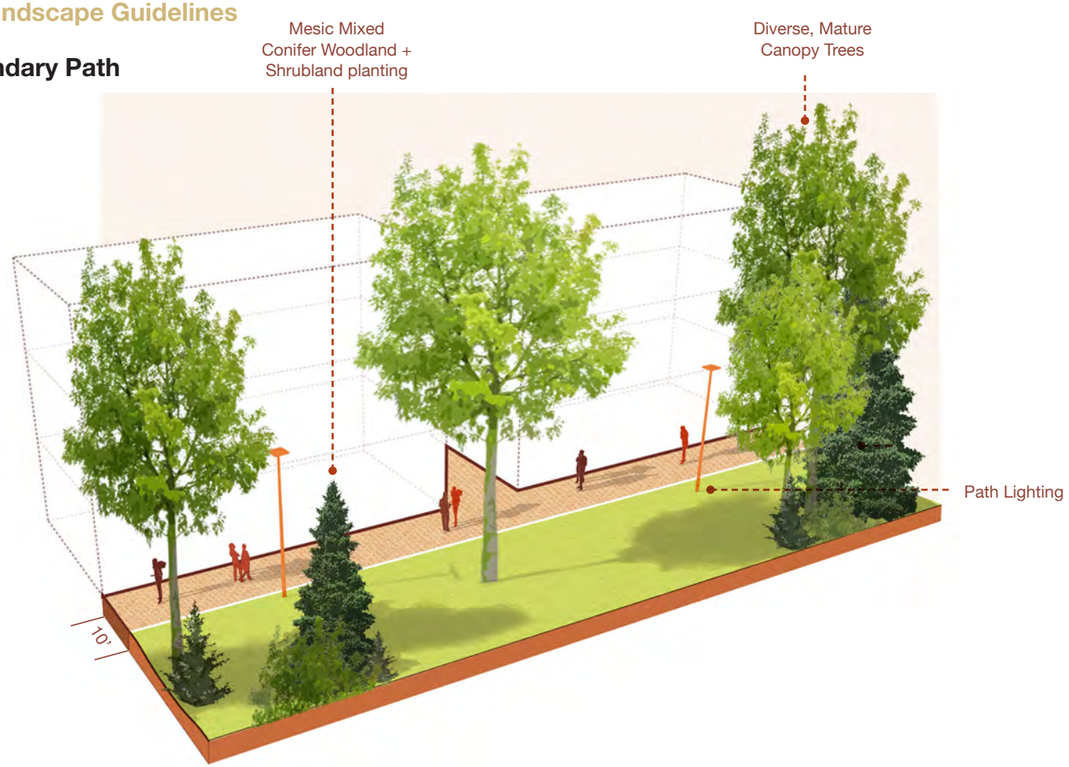
- *Cast in place concrete paths*
- *Aluminum, LED light fixtures*
- *Outdoor furnishings including benches, trash & recycling cans*

Mesic Mixed Conifer Woodland Sp.

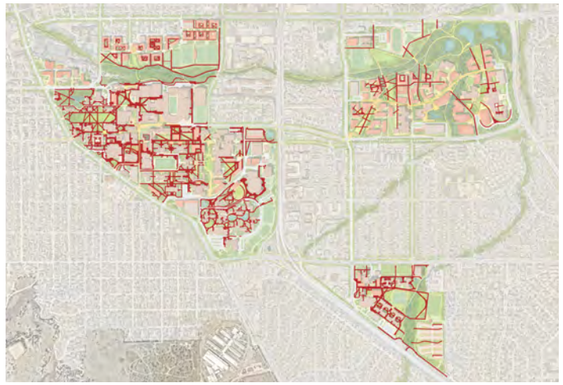
Shrubland Sp.

Mature Canopy

Secondary Path



Secondary paths connect low traffic pedestrian flows and are typically 8-10 feet wide. Regional canopy trees associated with the Rocky Mountain Mesic Mixed Conifer Forest and Woodland ecotone should be planted for shade, comfort, and habitat creation. The landscapes adjacent to these paths are ideal areas to incorporate low-maintenance landscapes with usable turf, shrubland, and shortgrass prairie species.




Shrubland Sp.

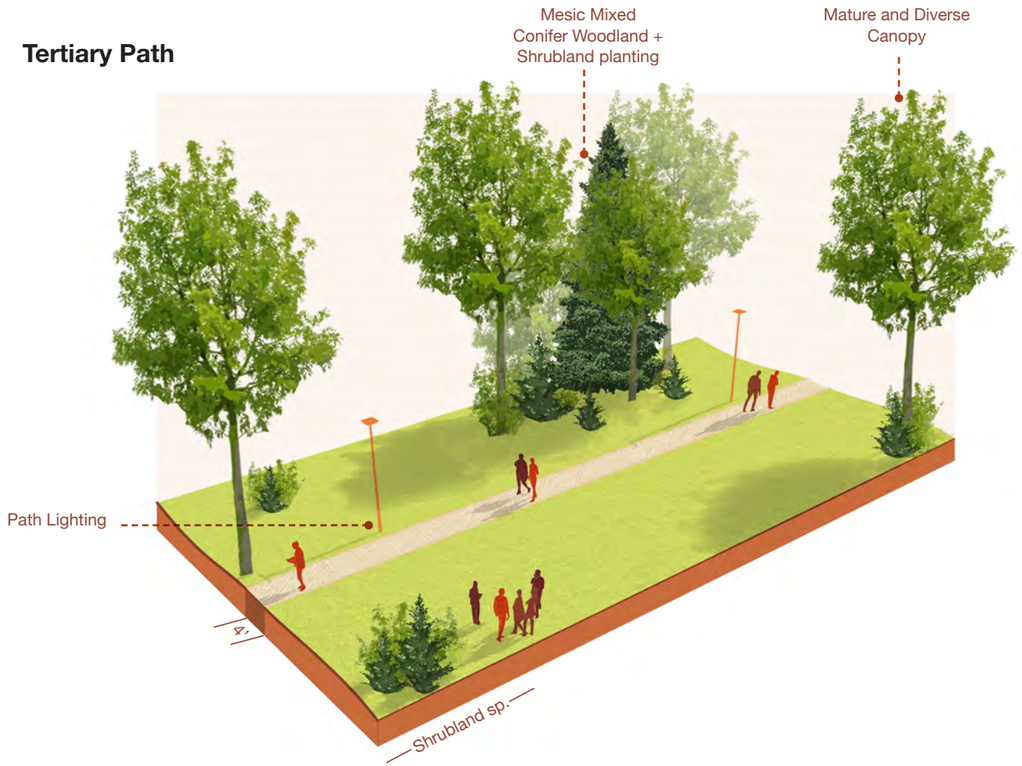

Mesic Mixed Conifer Woodland Sp.


Mature Canopy

Material List

- *Cast in place concrete paths*
- *Aluminum, LED light fixtures*
- *Outdoor furnishings including benches, trash & recycling cans*

Tertiary Path



Tertiary paths connect low traffic pedestrian flows throughout campus. These paths can be sandstone, and should be no less than 4 feet wide to meet accessibility standards.

The landscapes adjacent to these paths are ideal areas to incorporate a mix of usable turf along with low-maintenance landscapes that combine shrubland and shortgrass prairie plant species.


Mesic Mixed Conifer Woodland Sp.

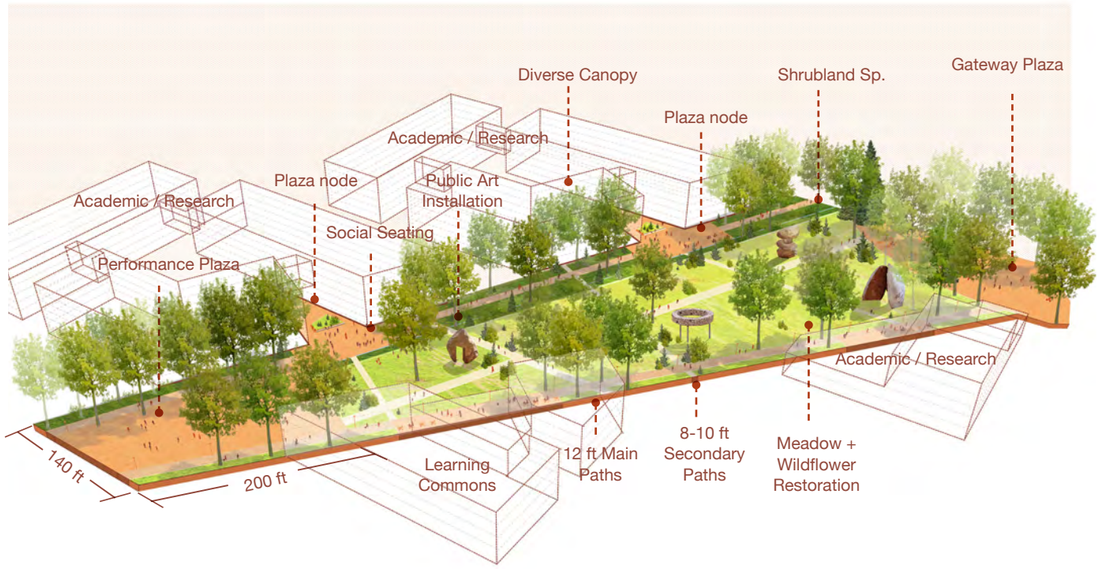

Shrubland Sp.


Mature Canopy

Material List

- *Cast in place concrete paths or sandstone pavers*
- *Aluminum, LED light fixtures*

Typology: Quad



Example: Gateway Green

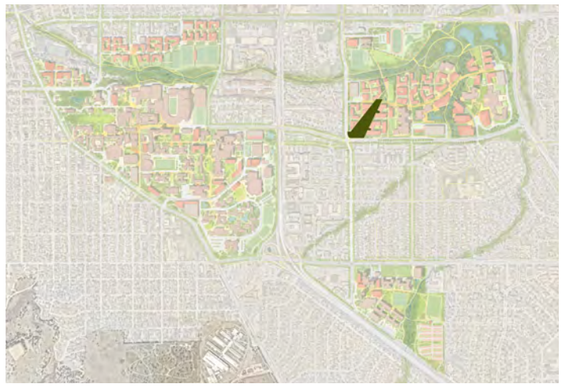
Quads function as central gathering spaces for students. The formal qualities of a Campus Quad create an iconic space for large crowds to gather while also providing passive recreation, aesthetic, and ecological value during other parts of the year.

Where possible, areas planted with shortgrass prairie species will be mixed in with usable turf.

Meadow Restoration

Shrubland Sp.

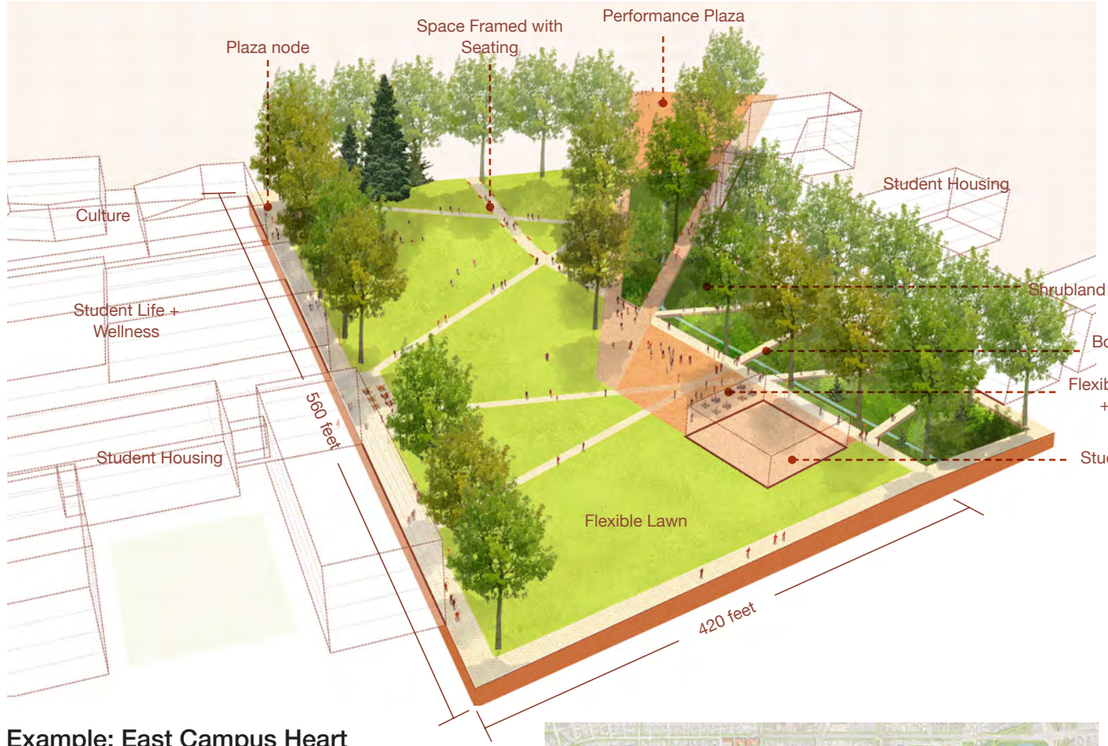
Mature Canopy



Material List

- *Cast in place concrete secondary paths*
- *Herringbone brick pervious pavers for plazas + primary paths*
- *Local roughcut sandstone permanent seating elements*

Typology: Quad



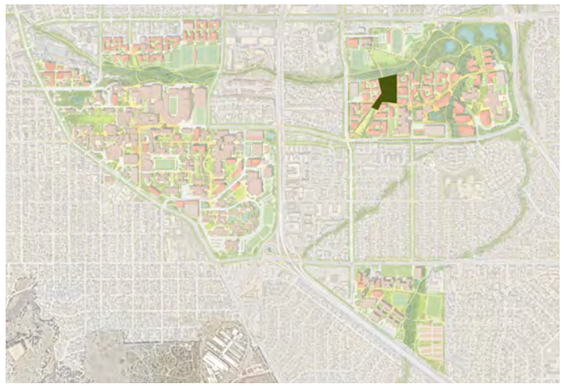
Example: East Campus Heart

The East Campus Heart is a new quad that functions as the campus backyard--the ideal place to play frisbee, lawn games, and hang out with friends. The East Campus Heart is composed of a lawn, allées of trees, a flexible plaza with ample seating shaded by a grove of trees, and a pavilion for hosting events. A wet meadow riparian garden with elevated boardwalks frames the Western edge of the quad and provides flood capacity for Boulder Creek.

Riparian Woodland

Bioswale

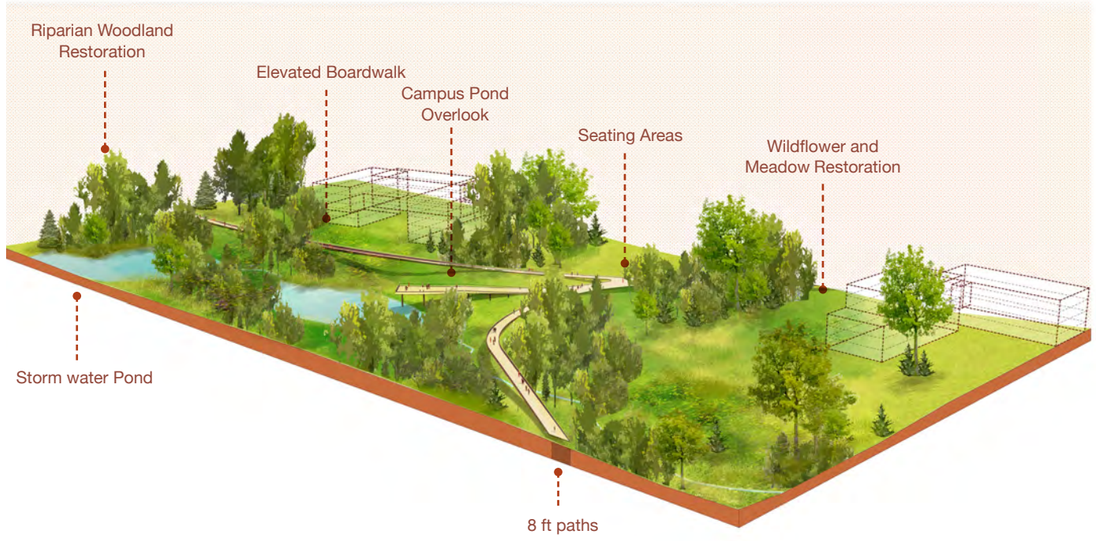
Mature Canopy



Material List

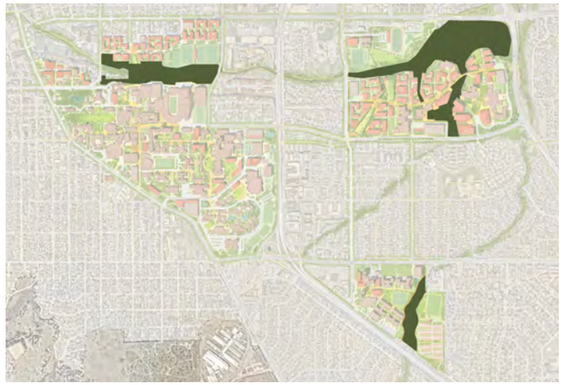
- *Cast in place concrete secondary paths*
- *Herringbone brick pervious pavers for plazas + primary paths*
- *Elevated boardwalk*

Typology: Riparian Landscape



The Western Great Plains Riparian Woodland and Shrubland ecosystem is a biodiversity corridor running through campus along Boulder and Bear Creeks. Today, sections of this landscape corridor require restoration including the removal of invasive species and planting of native and adaptive shrubs, grasses, and trees. Restoring this landscape will create more breeding ground for declining bird populations and expand the campus' capacity to serve as a carbon sink. Students will enjoy trails, picnic areas, and overlooks designed to highlight--and not interfere--in this sensitive habitat.

Meadow + Wildflower Restoration | Wet Meadow | Riparian Woodland



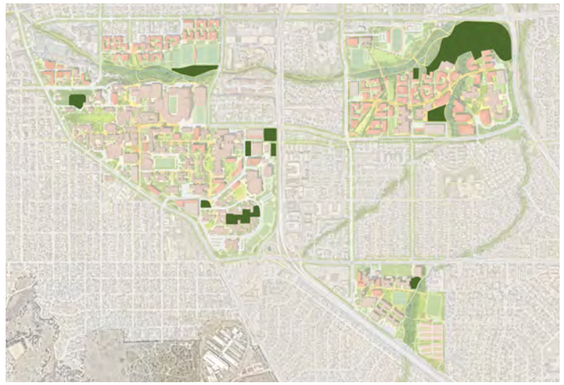
Material List

- *Cast in place concrete paths*
- *Overlook features and elevated boardwalks*
- *Rough cut local sandstone seating features*

Typology: Storm water Pond

Stands of trees and patches of shrublands, meadow restoration zones, and water features carve out scenic social spaces throughout this landscape typology. For shrublands on dry sites that require minimal irrigation, a mix of native and adaptive plant species--specifically drawing from the Rocky Mountain Lower Montane-Foothill Shrubland ecosystem-- should be planted. Landscape depressions and water bodies are ideal places for riparian and wet meadow restoration projects.

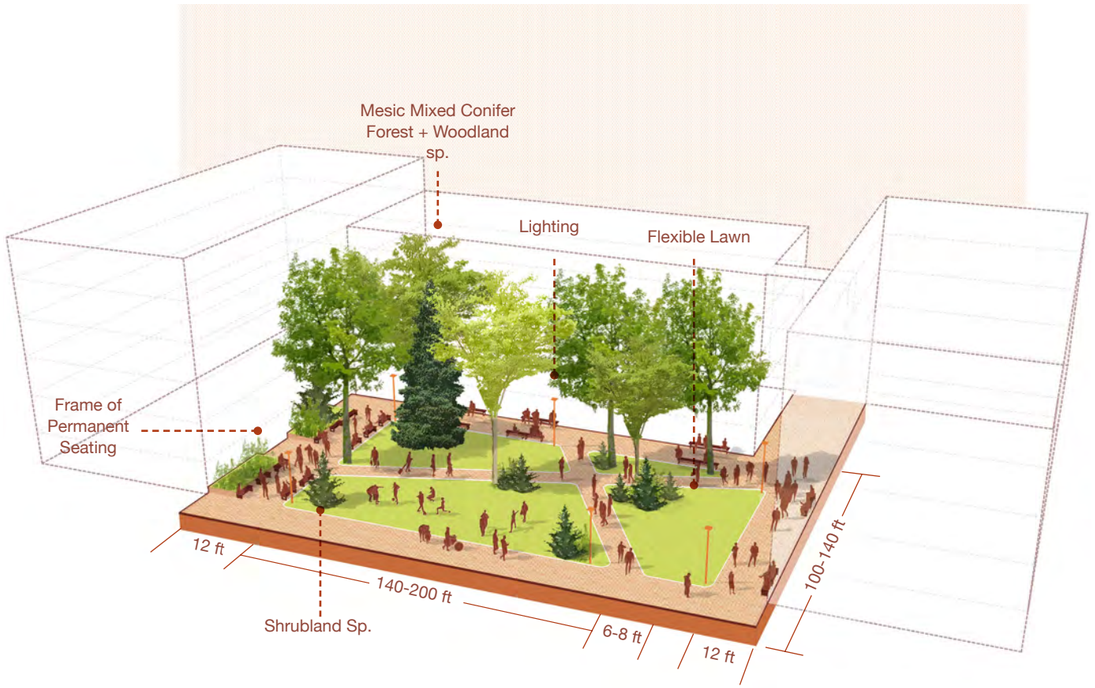
Meadow + Wildflower Restoration | Wet Meadow | Riparian Woodland



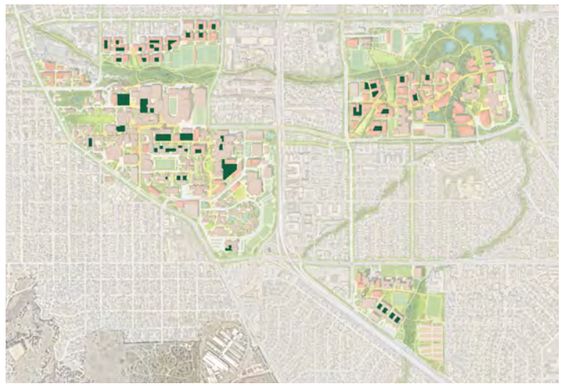
Material List

- *Cast in place concrete paths*
- *Rough cut local sandstone seating features*
- *Pervious herringbone brick plaza node*

Typology: Green Court



Green Courts are framed by residential buildings, student life buildings, and in a few cases, academic buildings. Deciduous canopy trees and conifers found commonly throughout Colorado's Rocky Mountain Mesic Mixed Conifer Forest and Woodland provide shade and create space in Residential Courtyards and Green Courts throughout Campus. These landscapes are mostly defined by clusters of canopy trees and flexible lawns that can hold up to foot traffic within residential areas.



Material List

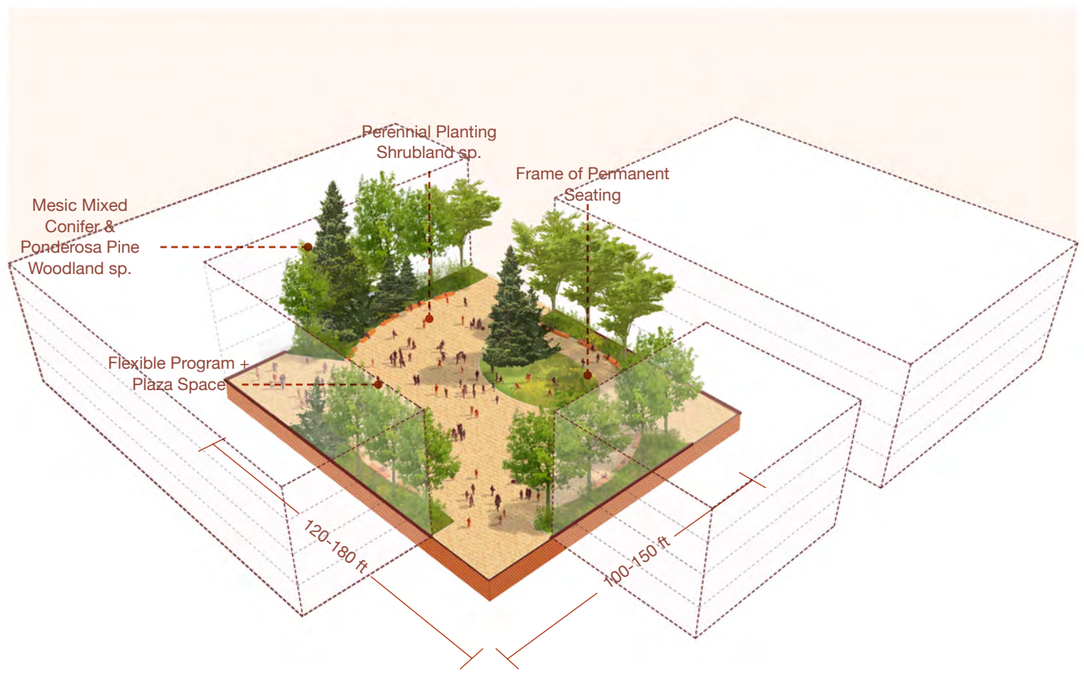
- *Pervious herringbone brick pavers*
- *Sandstone edging*
- *Outdoor furnishings including benches, table & chairs, and trash & recycling cans*

Mesic Mixed Conifer Woodland Sp.

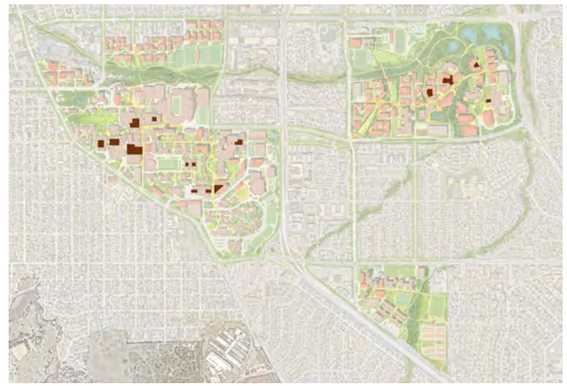
Shrubland Sp.

Mature Canopy

Typology: Plaza Court



Plaza courts feature flexible surfaces and are typically framed by canopy trees to create shade and a sense of enclosure around gathering spaces. In shaded, cooler regions of courtyards, tree and shrub species associated with the Rocky Mountain Mesic Mixed Conifer Forest and Woodland ecosystem should be planted.



Material List

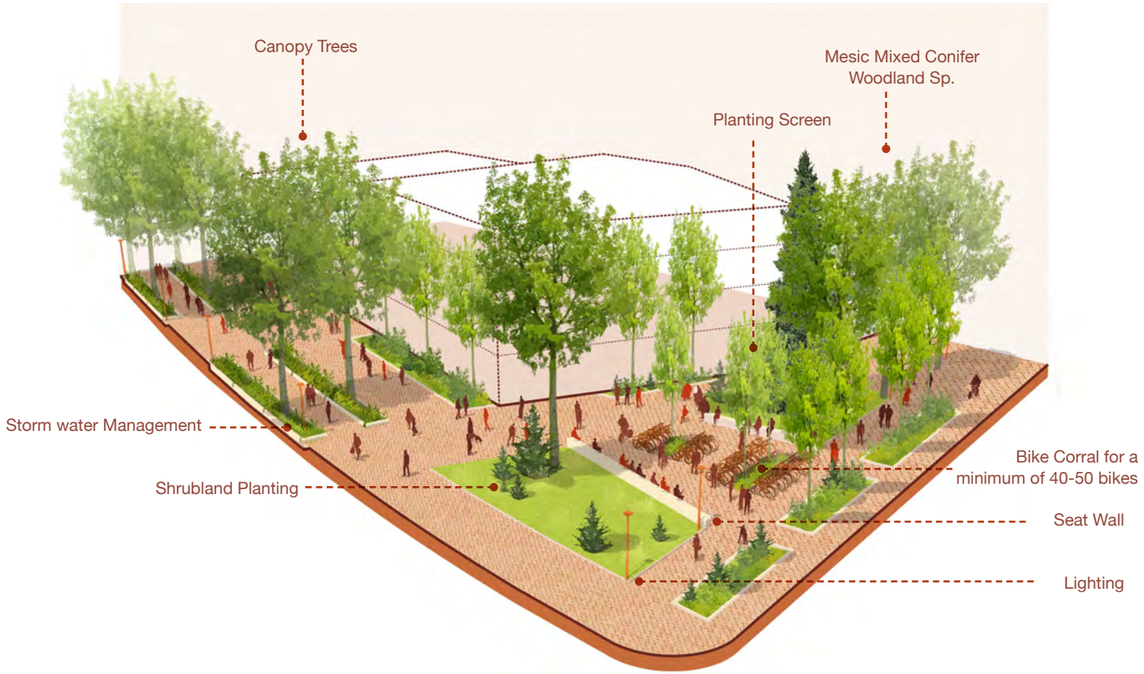
- *Pervious herringbone brick pavers*
- *Local sandstone masonry walls and seating elements*
- *Precast concrete capstone*
- *Flexible furnishings*

Mesic Mixed Conifer Woodland Sp.

Ponderosa Pine Woodland

Shrubland Sp.

Typology: Bike Corral

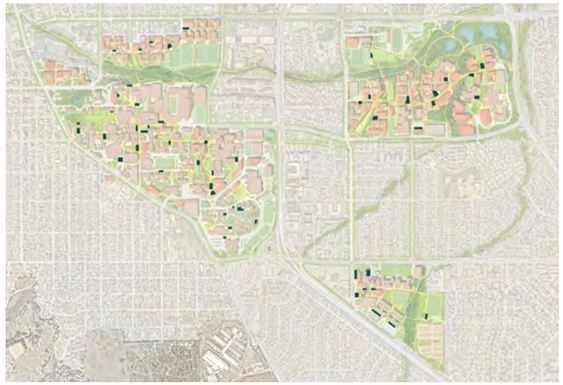


Every major campus cluster should include a bike corral that accommodates a minimum of 40 parked bicycles and a maximum of 150 parked bicycles. Bike corrals will use pervious surfaces for additional stormwater management in most locations. Permanent seating in the form of seat walls frames this node and planting screens create shade, protection from wind, and provide aesthetic and ecological value. Trees should be carefully selected so their fruits and leaf litter do not interfere with bike performance.

Mesic Mixed Conifer Woodland Sp.

Native + Adaptive Perennial Planting

Mature Canopy



Material List

- *Cast in place concrete paths*
- *Rough cut local sandstone seating features*
- *Pervious herringbone brick plaza nodes*

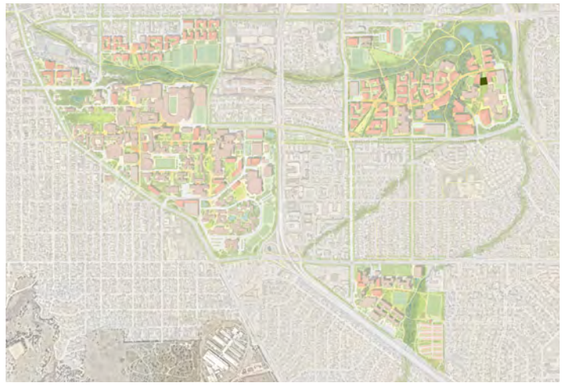
Typology: Tree Bank

As East Campus is developed, a permanent nursery could be folded into the landscape north of Innovation Plaza. This nursery can be tied to and complement academic programming and research goals from SEEC while also serving as a campus resource for succession planting. The riparian landscape at East Campus will remain undeveloped through the 30-year master plan and can begin ecological restoration treatments now. Through a phased planting approach, East Campus will begin developing a mature canopy while boosting the biodiversity and beauty of the campus in the interim.

Mesic Mixed Conifer Woodland Sp.

Riparian Restoration

Mature Canopy

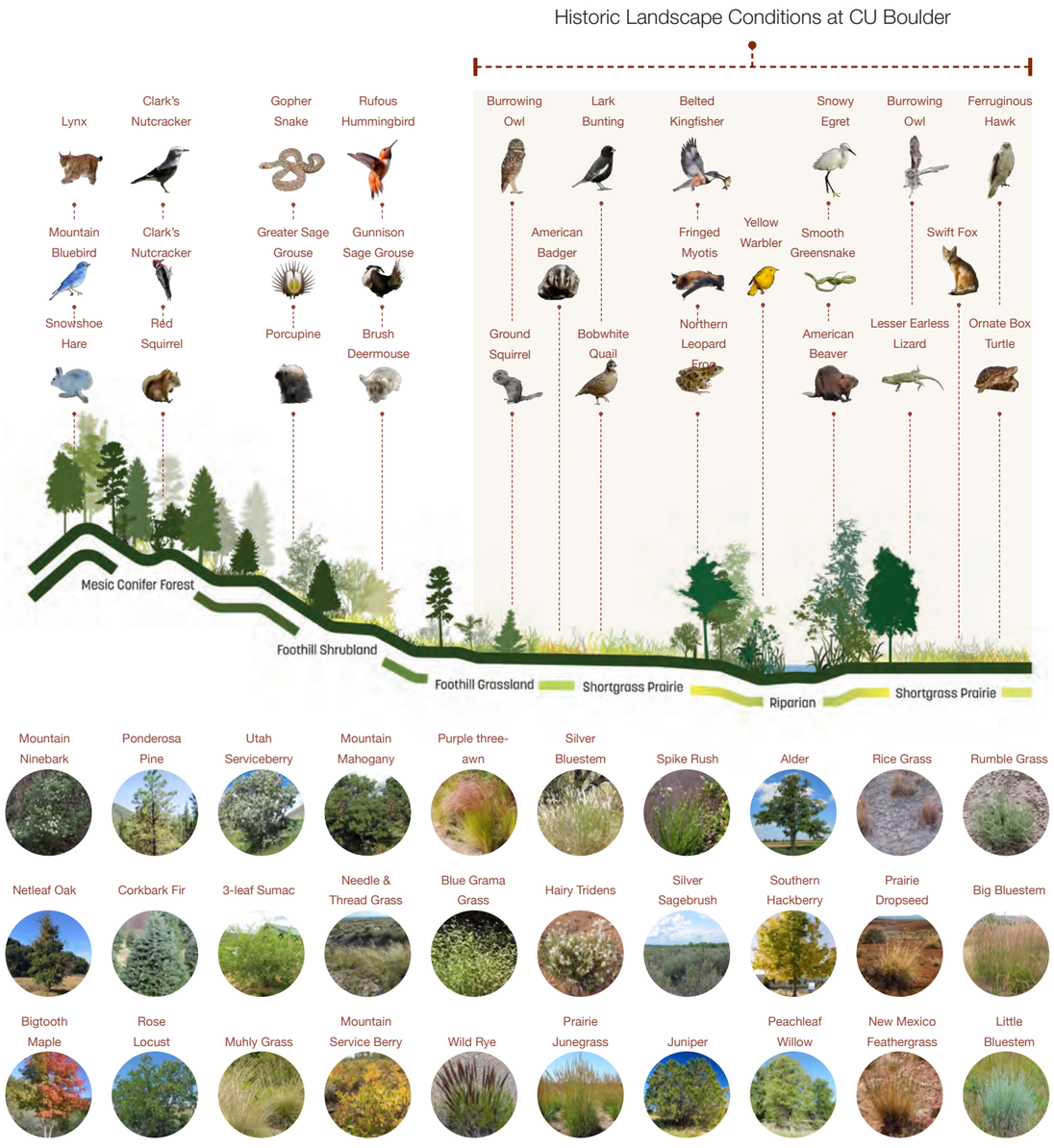


Material List

- *Crushed gravel paths*
- *Site walls*

Planting Palette

*A representative, and not comprehensive, list of plant species



Historic and Contemporary Planting Palette

The University of Colorado Boulder sits at the base of the foothills in what used to be a High Plains prairie landscape. Overtime, the campus was gradually planted with trees that borrow from neighboring ecotones and regions which shape the campus's present-day character. The planting at CU today represents a diverse palette of native and adaptive plant species. There are opportunities for meadow restoration projects, specifically on East Campus, which will recall the historic landscape of Boulder while also creating habitat for important animal species.

Boulder and Bear Creeks shape the two riparian corridors that run through campus. Today, some stretches of these riparian corridors need invasive species removal and restoration projects to boost the beauty and biodiversity of the campus landscape.

CU Boulder has been recognized for many years with the Tree Campus USA designation and is engaged in tree preservation efforts against threats such as the Emerald Ash borer. Continued tree monitoring and strategic succession planting of at-risk trees will ensure that the cultivated forests and canopy networks continue to provide shade, comfort, and shape the identity of campus well into the future.

Boulder Creek Riparian Corridor at Main Campus

Historic Campus Material Palette

The Historic sections of campus consistently utilize a palette of sandstone walls, vitreous clay barrel tile, variegated limestone trim and decorative pieces, black wrought iron light fixtures, sign posts, and railings. Sandstone is sourced locally from Front Range quarries and unites the vernacular landscape with the campus. Limestone is quarried in Indiana, Kansas, and Texas and is used to contrast the warmth of the sandstone and red tiles. For capstones and retaining wall details, precast concrete can be used or sandstone with skate rail deterrents.

Materiality of the Historic Campus Core

CU bike corrals, cast-in-place concrete paths, sandstone seat walls, light fixtures, and wrought iron benches + trash receptacles

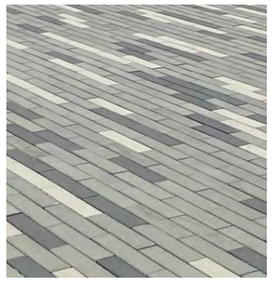
New Development and Open Space Material Palette

As new sections of campus are developed, material choices will integrate new development and open spaces with the historic campus core. Modern material updates such as coated aluminum light fixtures and railings will complement the historic black wrought iron details on Main Campus while requiring less maintenance. In residential courts, plaza courts & nodes, and along primary paths, benches can offer a comfortable place to rest while offering a modern alternative to metal fixtures.

Flexible seating can function as a visual counterpart to the buff, pink, and reddish tones of local stone and brick.

Herringbone pattern pavers can be used to highlight pedestrian zones while other paving patterns may be used in plazas and gathering nodes. Elevated paths can be used for lookout features to provide recreation opportunities in ecologically sensitive landscapes—particularly on East Campus.

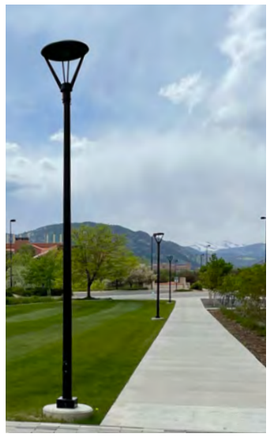
Today, the trail system on East Campus features several rough-cut local sandstone seats. These seating elements can be repeated throughout East Campus, Will Vill, and NBC to celebrate local geology while mimicking the color and texture of the sandstone masonry walls of Main Campus. Roughly textured paving can be integrated throughout paved areas to signal to students and cars when there is a shared mobility corridor threshold.



New Pavers on East Campus

Rough Cut Sandstone

Bioswale + New Permanent Seating on East Campus



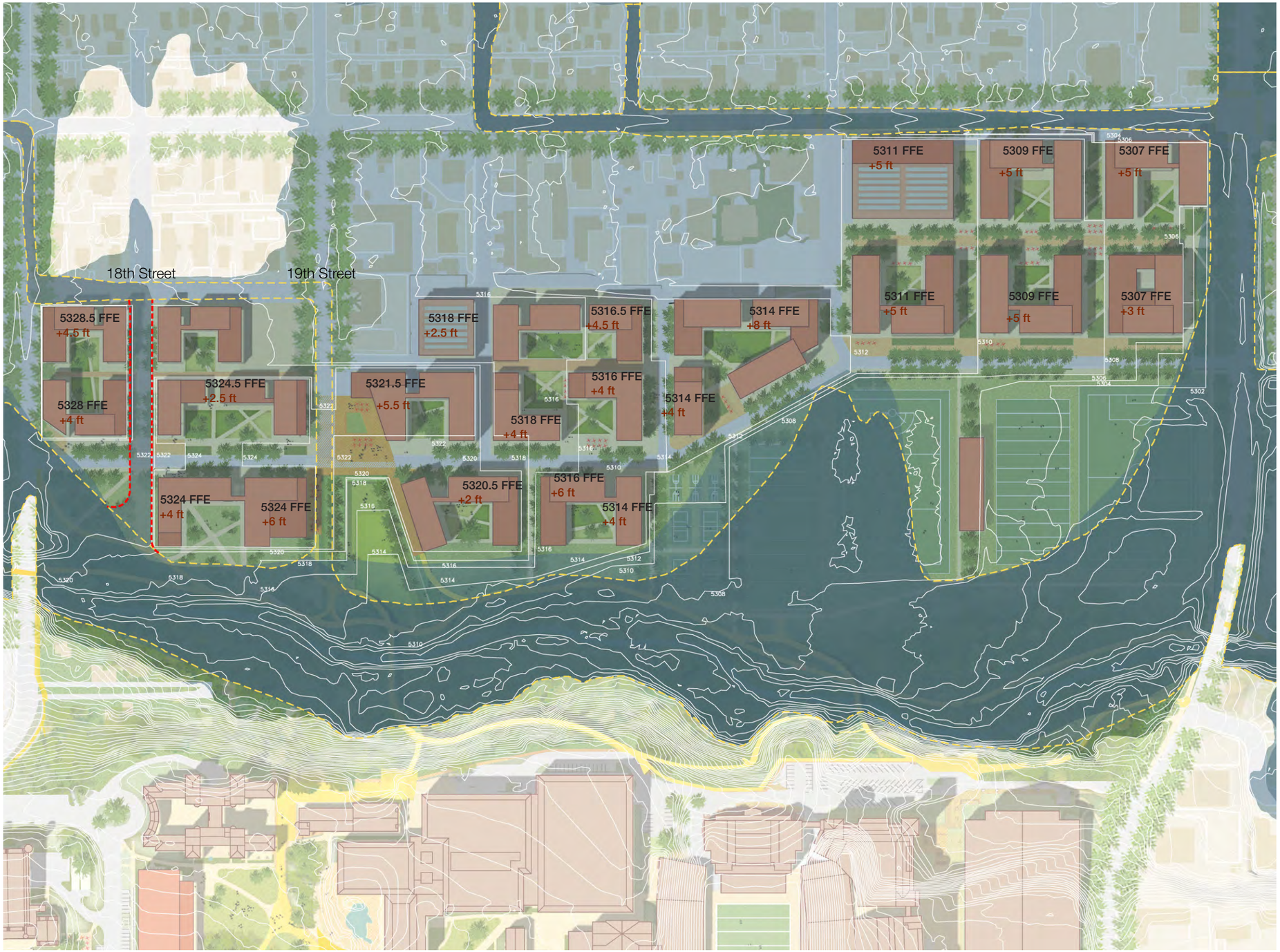
Light Fixtures + Concrete

Existing Meadow at East Campus

Pervious Pavers at Farrand Field

Flexible Seating at Plaza Nodes

NBC Floodplain

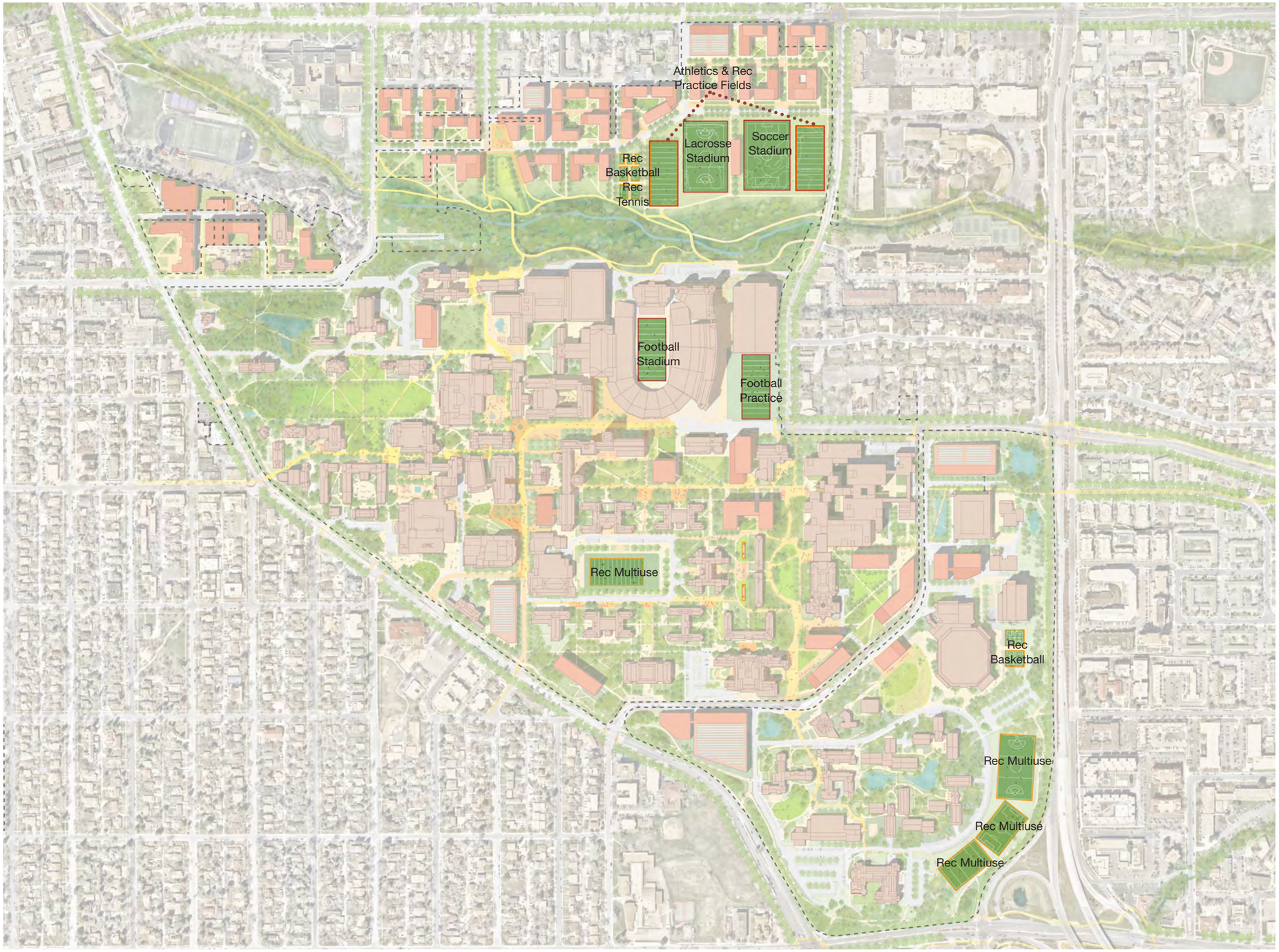


Today NBC sits within the 100-year floodplain. Future construction will need to be raised two feet above the 100-year base flood elevation to be at the Flood Protection Elevation (FPE) required by the City of Boulder Land Use Code. For this masterplan, First Floor Elevations (FFE) calculated in the 2020 NBC Design Guidelines and Master Site Development Plan were used as a guide for interpolating the FFE of the 30-year masterplan footprints and the conceptual grading of the site.

This masterplan assumes that the city will vacate the ROW along Athens, Grandview, 19th and 20th Streets. Through CU’s acquisition of these streets, the Conveyance Zone along 19th Street can be relocated to 18th Street in coordination with FEMA and the City of Boulder. Relocating the conveyance zone to 18th Street will create a flush condition between the proposed open space heart at NBC with the first floor of the adjacent buildings and the streetscape. Throughout NBC, this master plan proposes to elevate most of the streetscapes to be flush with the FFE of the new buildings to create a desirable urban condition and then slope down to meet existing grade at property edges. The two proposed buildings in the northwest corner of NBC that sit west of 18th Street will be the only place at NBC where the buildings are planned to sit several feet higher than the adjacent street in order to accommodate the new conveyance zone.

The drawing to the left describes the interpolated FFE and the change in elevation in needed to meet this height.

Athletic and Recreation Fields: NBC and Main Campus



The adjacent and following field maps designate outdoor spaces for both recreation and athletic activities. The CMP team has proposed uses and activities for these spaces, but specific programming and ownership of these fields and courts shall be determined by the university and key stakeholders such as Athletics, Recreation Services, and Housing Facilities Services.

On Main Campus, Farrand Field and Folsom Field are preserved along with the practice football field next to Folsom Stadium, the basketball courts east of CU Events Center, and the three fields in Kittredge. At NBC, four fields shared by Athletics and Recreation are reorganized to allow for the proposed new Lacrosse Stadium to be located outside of the conveyance and high hazard flood zones. Additional space for outdoor sports courts, such as recreational basketball and tennis courts, is also included in this area.

Athletics:

1 Football Stadium 360' x 160'

1 Football Practice Field 360' x 160'

2 Athletics & Rec Practice Fields 360' x 160'

1 Lacrosse Stadium 400' x 250'

1 Soccer Stadium 400' x 265'

Recreation:

4 Multiuse Fields (varying dimensions)

7 Basketball Courts

4 Tennis Courts

Athletic and Recreation Fields: East Campus

At East Campus, the Track & Field Stadium and Ski facilities are relocated to the northern portion of this campus to accommodate new development occurring to the south. These facilities are strategically positioned outside of the High Hazard and Conveyance Flood Zones. To the west, a new recreation soccer field and 4 recreation tennis courts are potential uses that could reside in this area with more restrictive flood designations.

The existing Athletics soccer field on East Campus is relocated to NBC.

Athletics:

Track & Field Stadium with Ski Facilities

Recreation:

1 Soccer Field 400' x 265'

4 Tennis Courts

Athletic and Recreation Fields: Williams Village

At Williams Village, the two existing multiuse recreation fields will remain while two new multiuse fields for recreation and intramural sports will be introduced on what was formerly surface parking lots along Baseline road.

Rugby will be moved from the Business Field on Main Campus to the Eastern edge of Williams Village. Existing volleyball and basketball courts in the South of Williams Village will be preserved while new bocce ball courts will be added to main promenade.

Athletics:

None

Recreation:

4 Multiuse Fields 296' x 124'

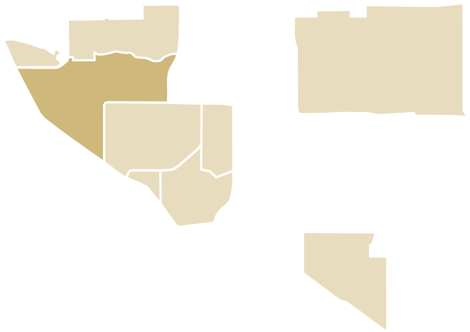
1 Rugby Field 440' x 263'

1 Volleyball Court

2 Basketball Courts

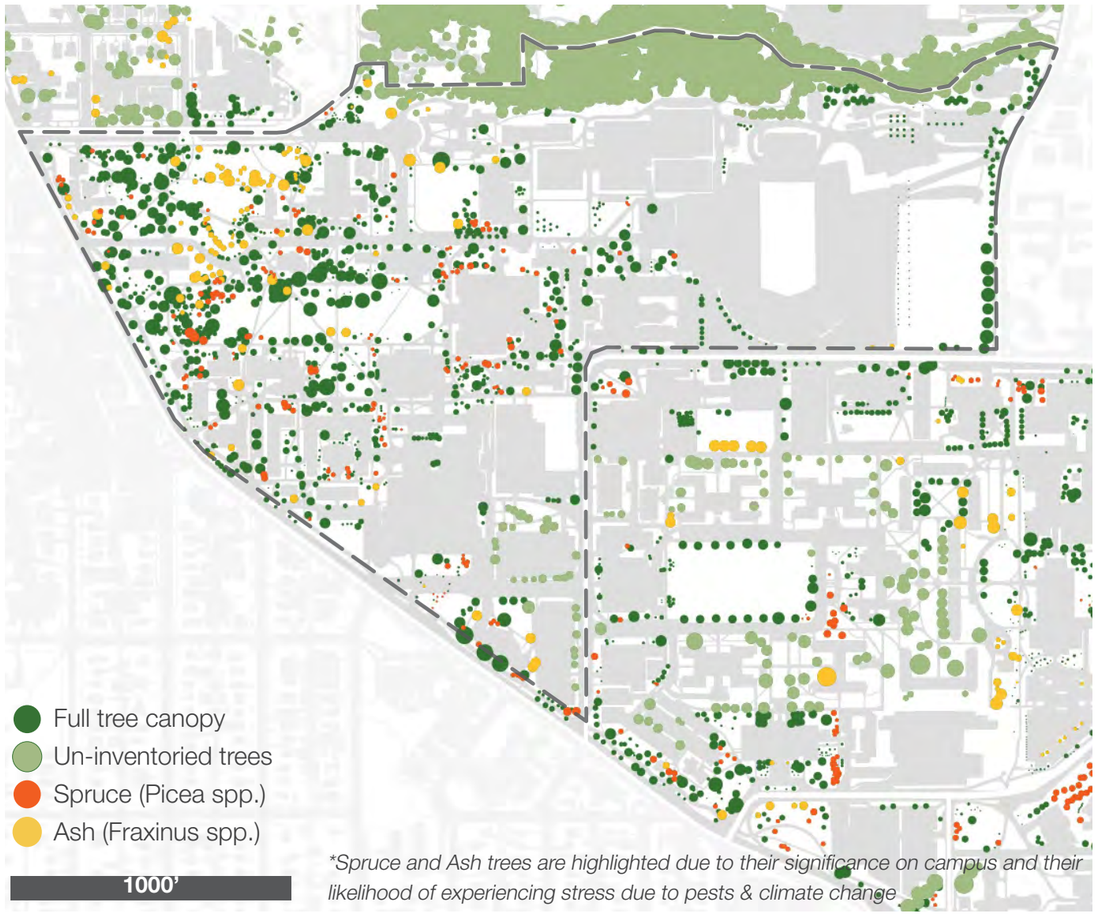
2 Bocce ball Courts

Canopy Analysis | Historic District



Within the Historic District, the existing buildings create microclimates allowing for more diverse tree planting than Colorado planting zones may suggest.

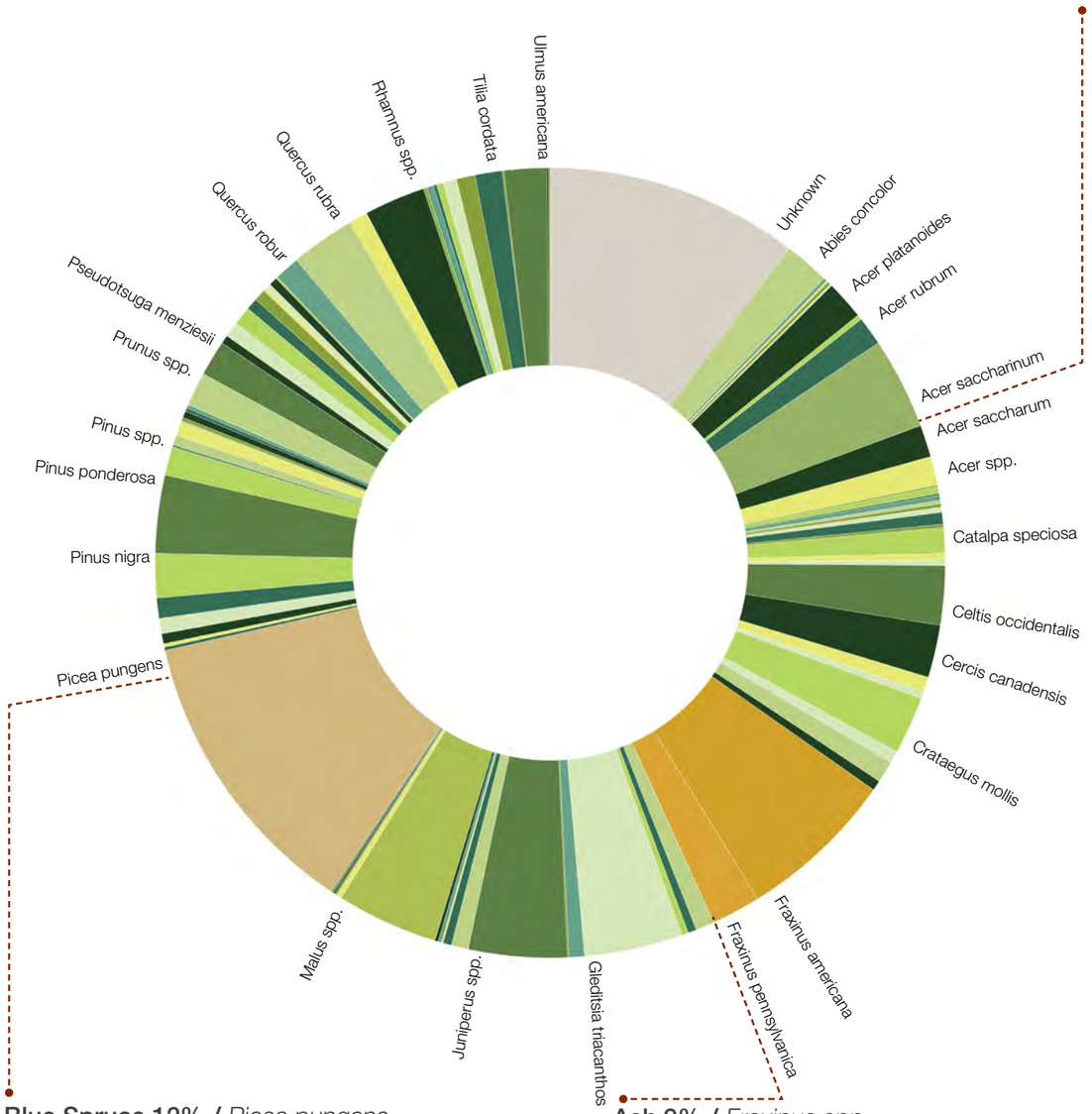
The Pinaceae family, which includes cedar, pine, and spruce, is the most prevalent tree family in the Historic District—comprising 26% of the canopy. To ensure long-term canopy resilience, it is important to keep each tree family under 30%. In total, over 90 different tree species are represented in the Historic district—with blue spruce the most common, comprising 12% of the canopy.



**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Silver Maple 4% / *Acer saccharinum*

Silver Maple is a historic planting that is in the process of being replaced with other tree varieties more suited to Colorado.



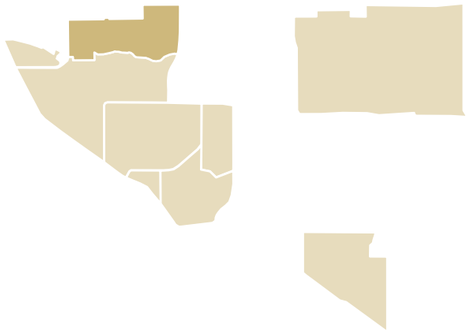
Blue Spruce 12% / *Picea pungens*

Blue spruce is found growing in USDA plant hardiness zones 1-7. As plant hardiness zones shift northward, Blue Spruce is likely to experience increased stress and slower growth. Spruce trees are more sensitive to climate change than fir trees.

Ash 9% / *Fraxinus spp.*

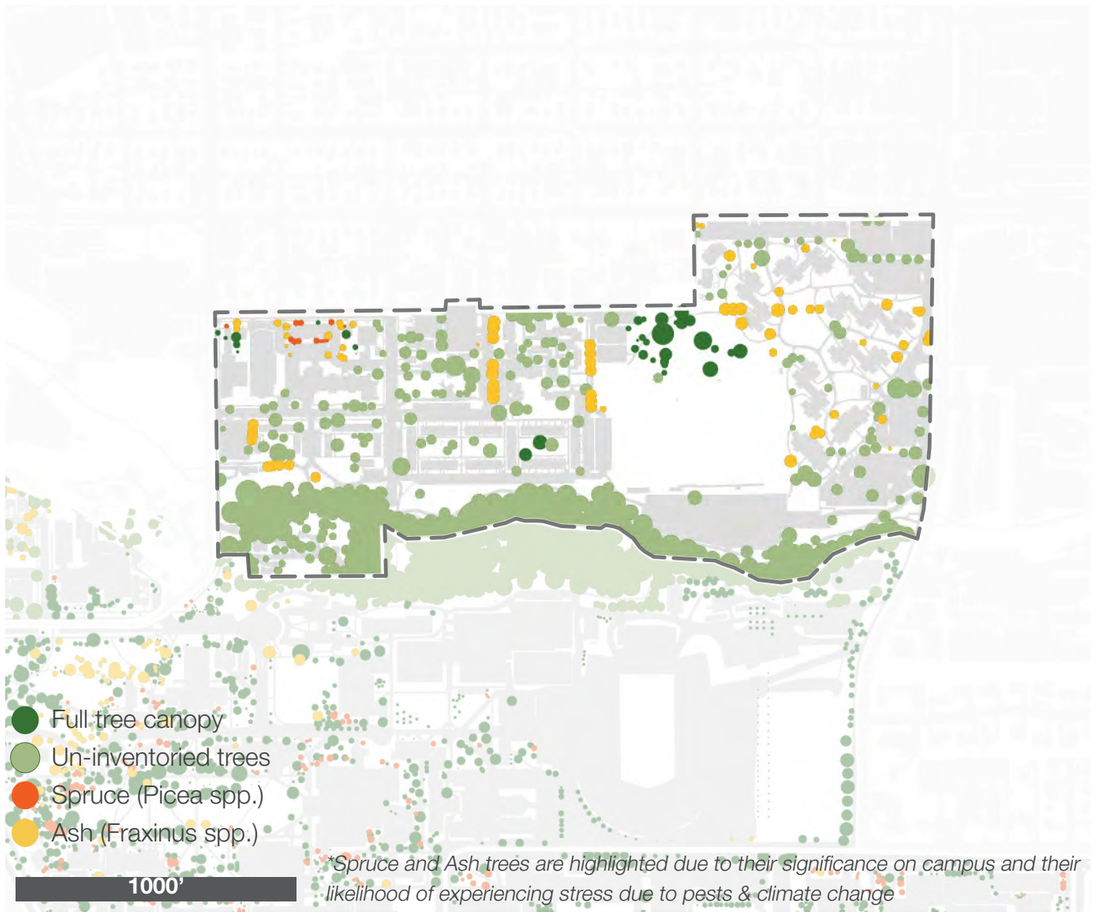
CU is currently treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.

Canopy Analysis | NBC



Today NBC has many un-inventoried trees along Boulder Creek. According to the 2020 NBC Design Guidelines and Master Site Development Plan, there is a need for ecological restoration and invasive species removal along Boulder Creek at this location.

Out of the inventoried trees, over 60% of them are Ash trees which will need continued EAB treatment until construction begins for the new development at NBC. For these new structures to meet floodplain requirements, few of the existing trees will be able to remain.



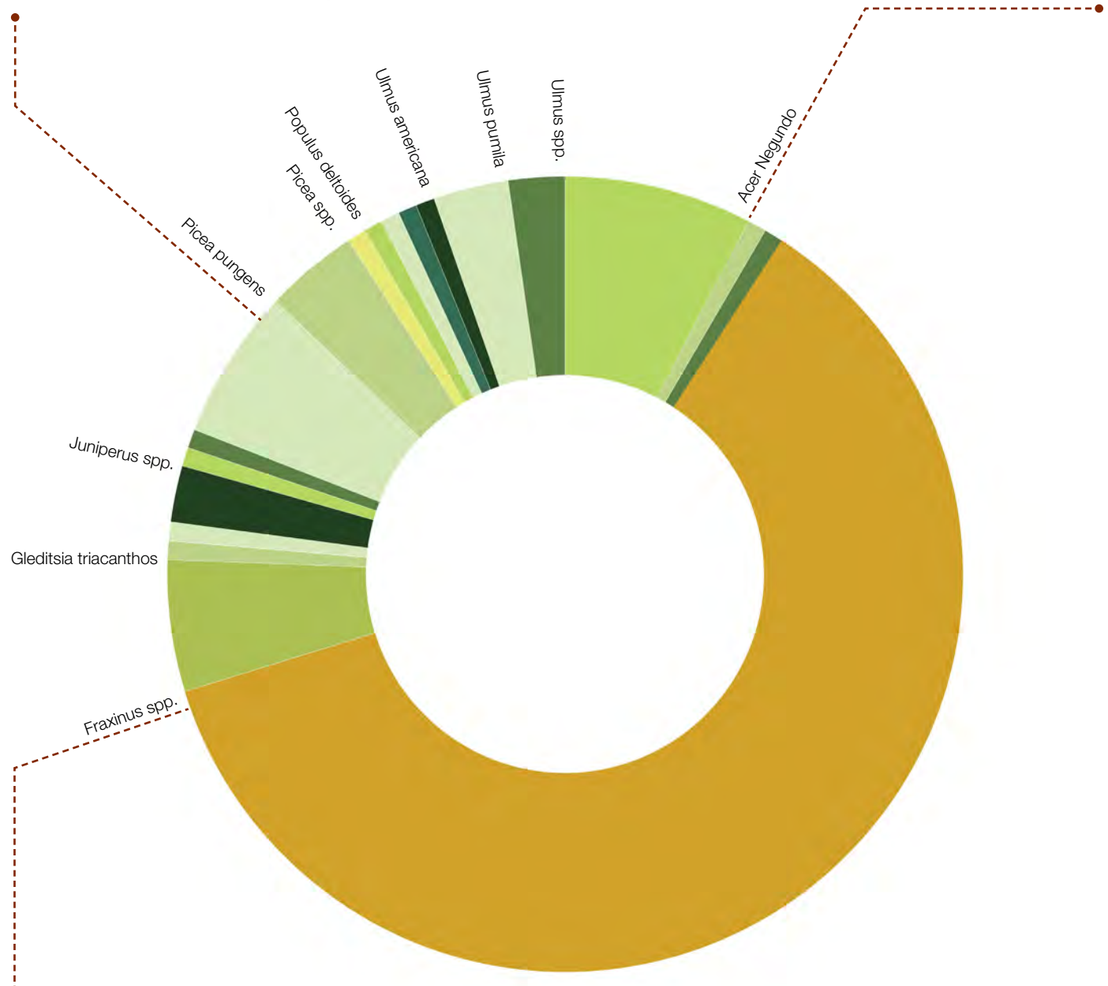
*Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change

Blue spruce 6% / *Picea pungens*

Blue spruce is found growing in USDA plant hardiness zones 1-7. As plant hardiness zones shift northward, Blue Spruce is likely to experience increased stress and slower growth. Spruce trees are more sensitive to climate change than fir trees.

Box elder 8% / *Acer negundo*

Box elder is a fast-growing plant that can thrive in understories, full sun, and drought conditions. The Box elder is considered a highly adaptable tree to climate change. The biggest mortality risk for Box Elders in CO is fire.

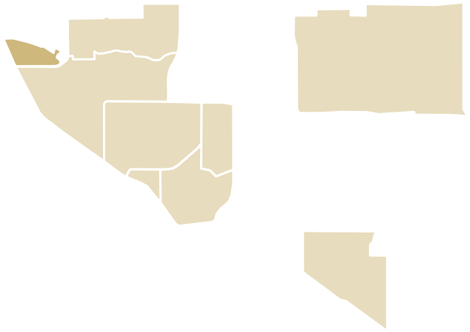


Ash 60%

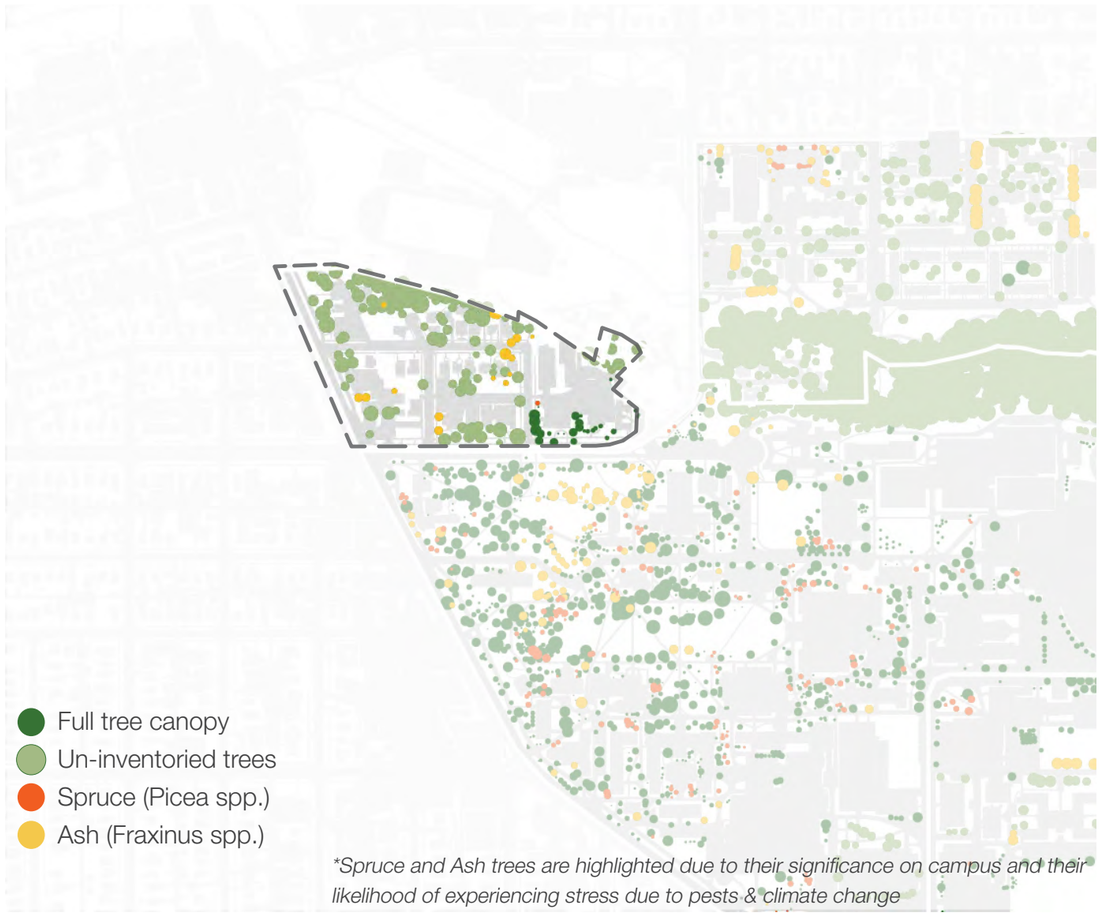
Fraxinus spp.

CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into

Canopy Analysis | Grandview



Grandview is another district that features a large number of Ash trees—making up over 32% of the total canopy cover. Continued EAB treatment and succession planting in this district will minimize potential canopy loss.



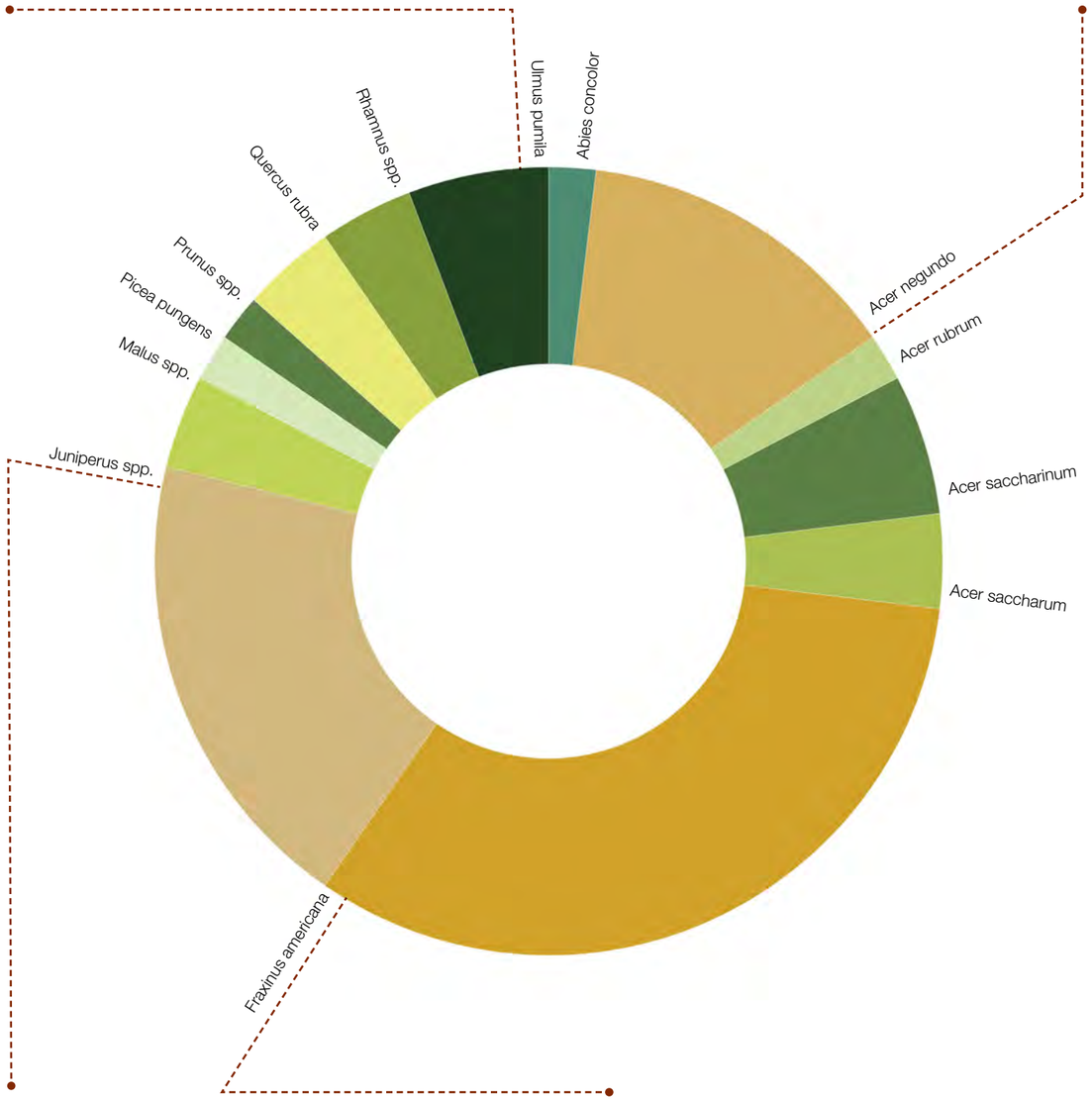
**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Siberian Elm 6% / *Ulmus pumila*

Siberian Elm trees are considered to be invasive in Colorado—growing quickly and creating toxic conditions for other plants. In winter, heavy branches are prone to breaking and can cause damage to the campus. Planting Hybrid American Elms and Chinese Elms are a better choice moving forward.

Box elder 13% / *Acer negundo*

Box elder is a fast-growing plant that can thrive in understories, full sun, and drought conditions. The Box elder is considered a highly adaptable tree to climate change. However, given it's existing prevelance in this neighborhood, future plantings should be minimized.



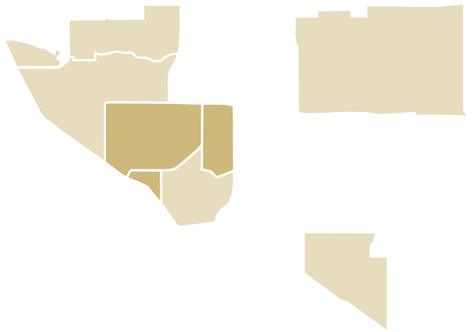
Juniper 19% / *Juniperus spp.*

Juniper trees show more climate sensitivity when planted at lower elevations. Drought-induced juniper diebacks are predicted as a result of climate change but can be mitigated with irrigation. Given their sensitivity to temperature fluctuations, it will be important to limit Juniper plantings going forward.

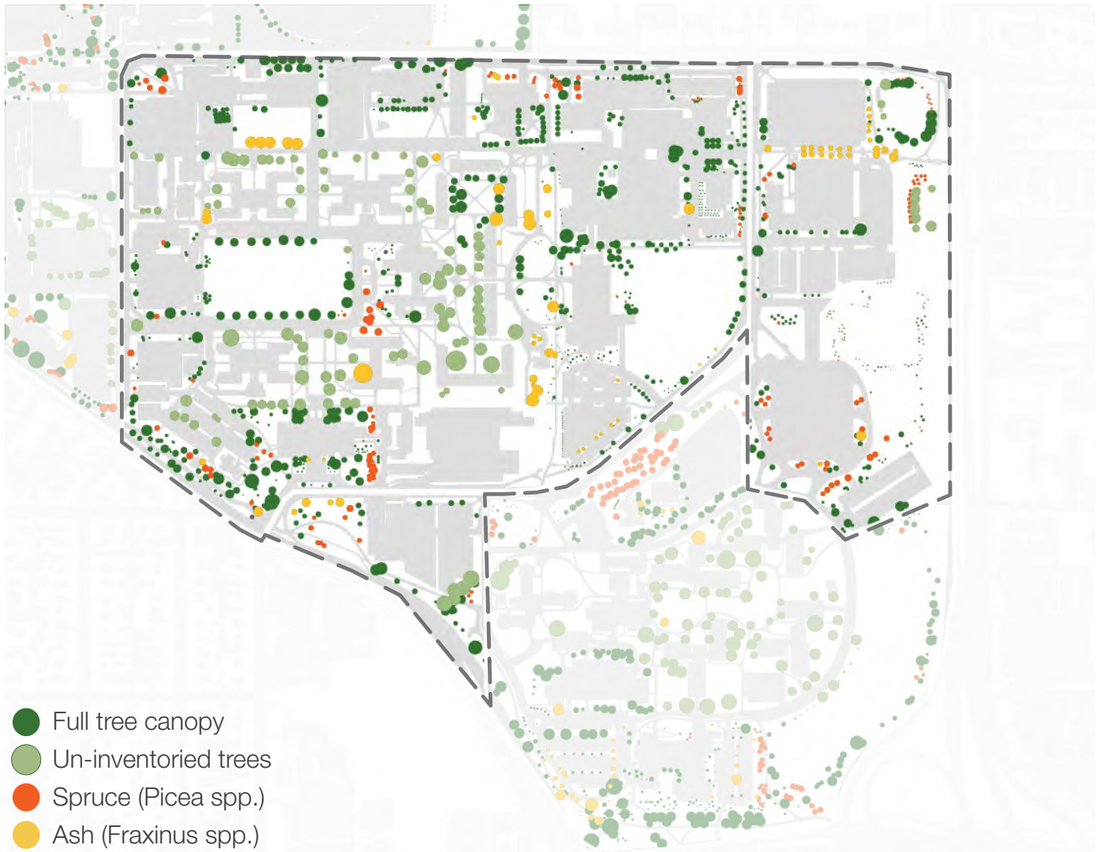
Ash 32% / *Fraxinus spp.*

CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.

Canopy Analysis | Farrand



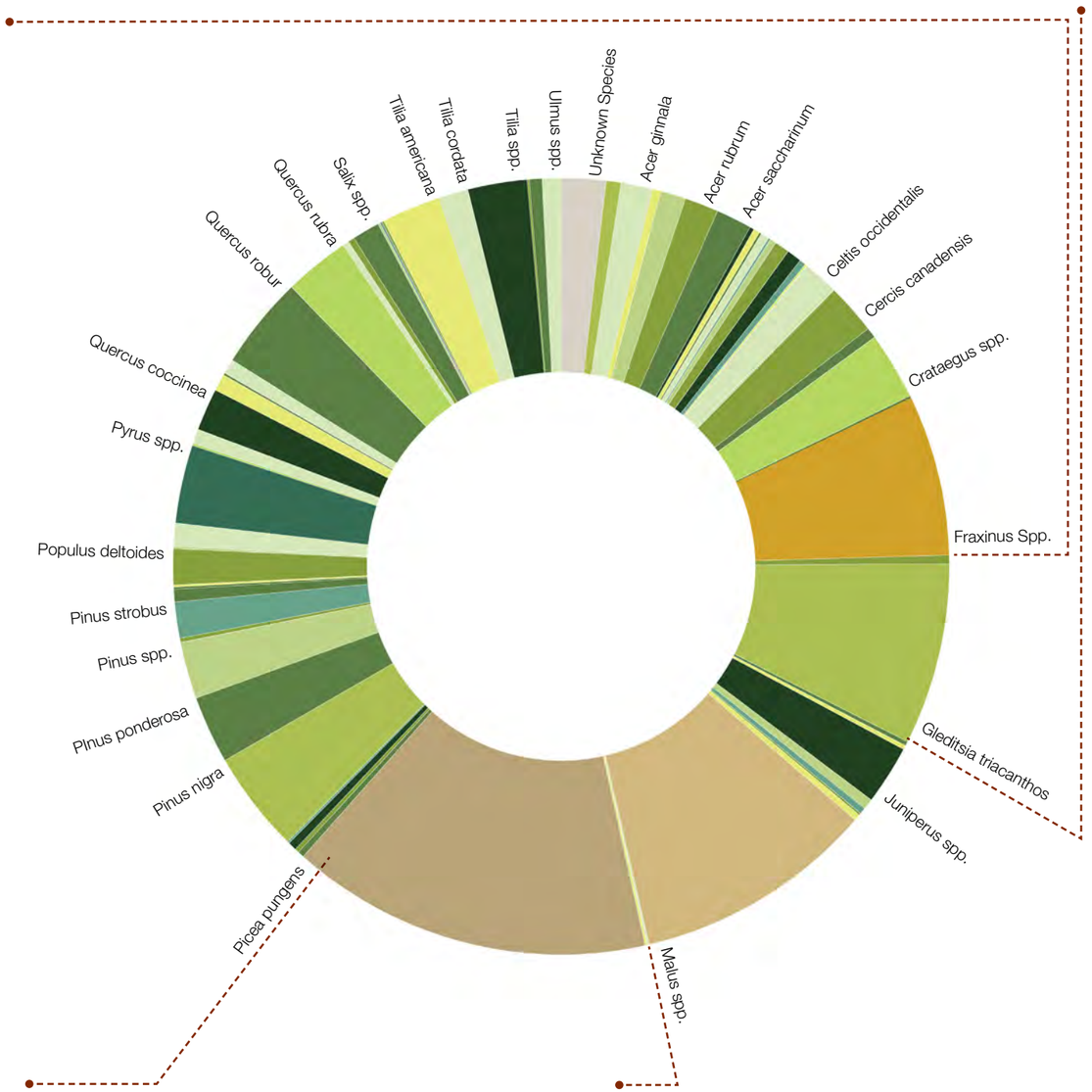
The Pinaceae family, which includes cedar, pine, and spruce, is the most prevalent tree family in the Farrand District—comprising 28% of the canopy. Future plantings should make limited use of trees in the Pinaceae family to ensure adequate tree family diversity. In particular, blue spruce makes up 15% of the canopy in Farrand and should be sparingly used in the future as it is likely to be stressed due to climate change.



**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Ash 5% / *Fraxinus spp.*
CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.

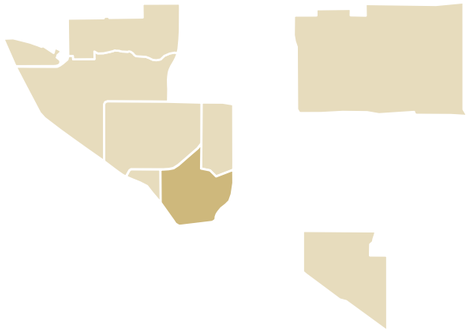
Honey Locust 8% / *Gleditsia triacanthos*
With an ability to tolerate high temperatures, Honey Locust trees are well suited for rising temperatures. This tree can tolerate drought, although it grows best in moist valleys and streams.



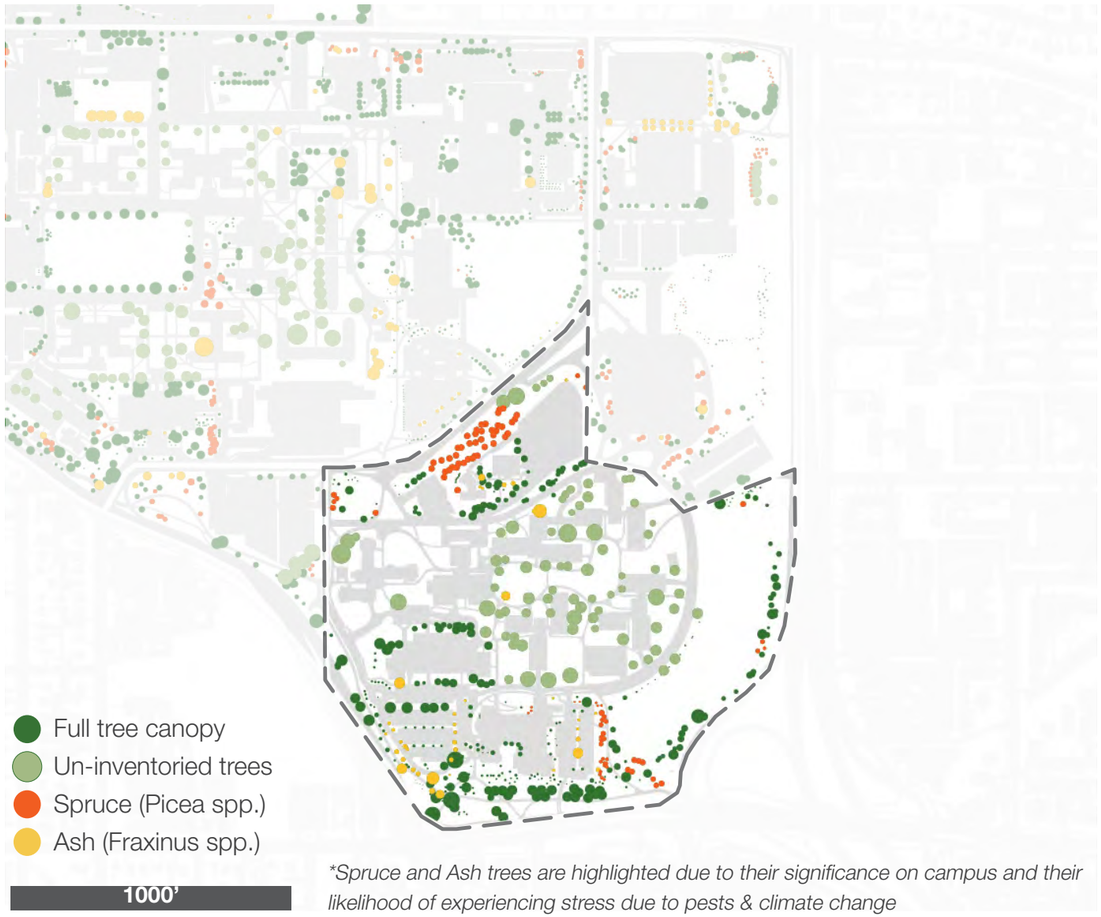
Blue Spruce 15% / *Picea pungens*
Blue spruce is found growing in USDA plant hardiness zones 1-7. As plant hardiness zones shift northward, Blue Spruce is likely to experience increased stress and slower growth. Spruce trees are more sensitive to climate change than fir trees.

Apple 10% / *Malus spp.*
Apple trees are relatively drought-tolerant and perform well in CO. Apple trees tend to flower later in the season, and if winter chilling periods become warmer, they are likely to experience an even later budbreak.

Canopy Analysis | Kittredge



The Pinaceae family, which includes cedar, pine, and spruce, is the most prevalent tree family in Kittredge—comprising 37% of the canopy. In future plantings, trees from other families should be selected in lieu of the Pinaceae family to create more canopy diversity in this district. Given that blue spruce, which makes up 18% of the canopy at Kittredge, and other trees in the Pinaceae family are likely to experience stress with climate change, more varied plantings will ensure the sylvan character of Kittredge remains for many more generations.



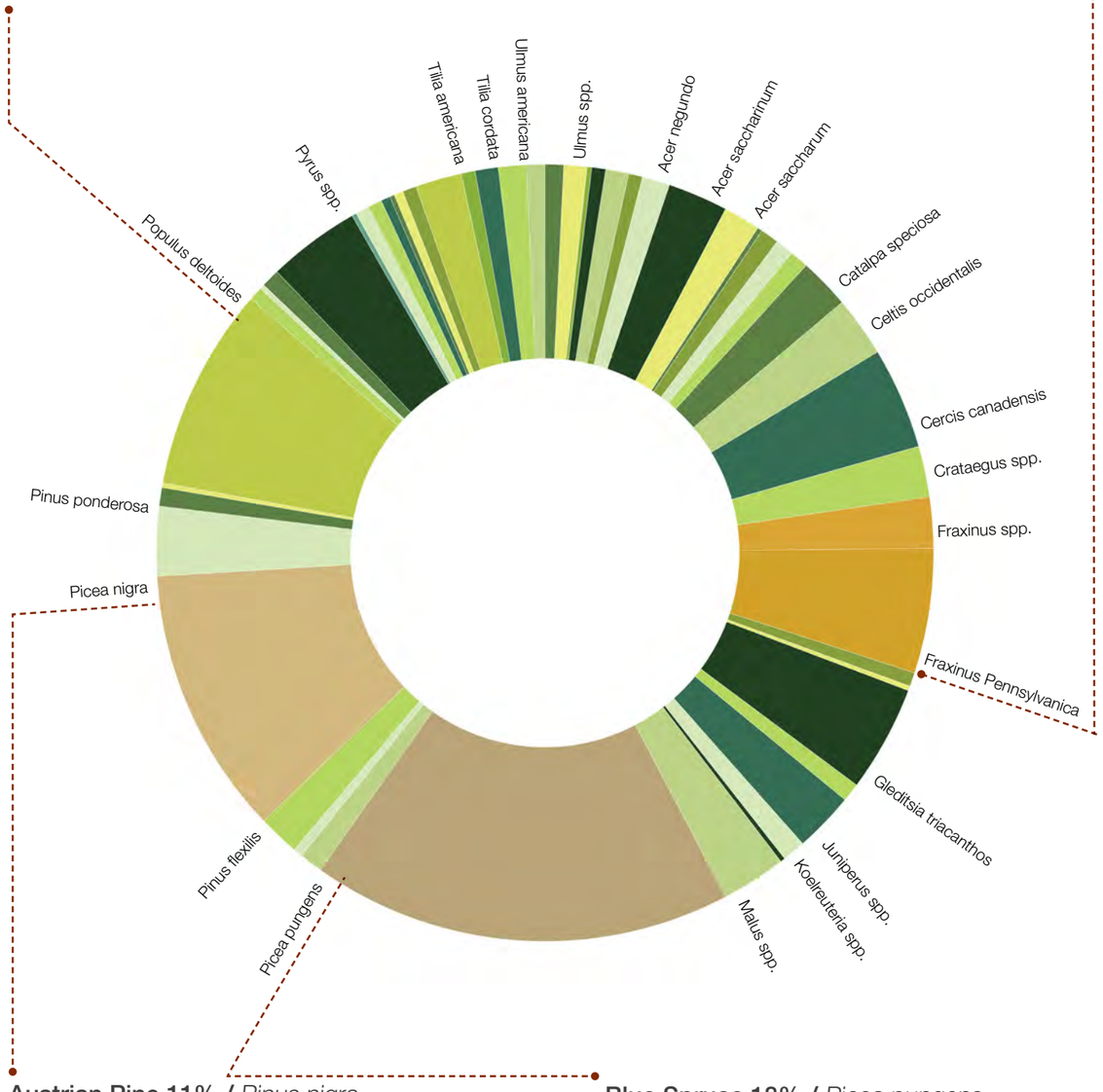
**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Eastern Cottonwood 8% / *Populus deltoides*

Eastern Cottonwood is less adaptable to climate change than other trees due to its susceptibility to pest outbreaks, drought, disease, and fire. It is best suited to riparian corridors and depressions with consistent moisture.

Ash 8% / *Fraxinus spp.*

CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.



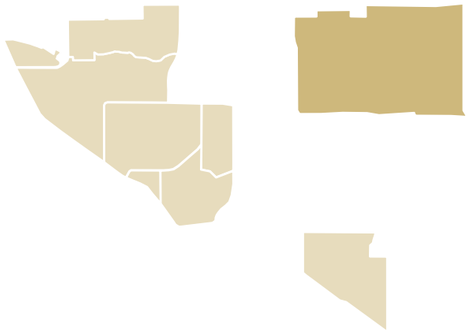
Austrian Pine 11% / *Pinus nigra*

This tree is known to thrive in urban conditions and to survive periods of drought. Due to the tree's susceptibility to tip blight in the Midwest, along with Dothistroma needle blight, it is recommended to limit planting of this tree going forward.

Blue Spruce 18% / *Picea pungens*

Blue spruce is found growing in USDA plant hardiness zones 1-7. As plant hardiness zones shift northward, Blue Spruce is likely to experience increased stress and slower growth. Spruce trees are more sensitive to climate change than fir trees.

Canopy Analysis | East Campus



The most common tree on East Campus is the Ash tree, comprising 10% of the canopy. Many of the existing Ash trees line the roads and parking lots and will gradually be removed as the 30-year masterplan is constructed. Planting a diverse palette of trees equipped to adapt to the stresses of climate change throughout East Campus will go far to shape the long-term character of this district. Today, riparian restoration projects throughout the Boulder Creek corridor can begin immediately to add more beauty and biodiversity to the Campus. Until East Campus is developed, native trees should be exclusively planted in this area to withstand the harsher climatic conditions of this district.

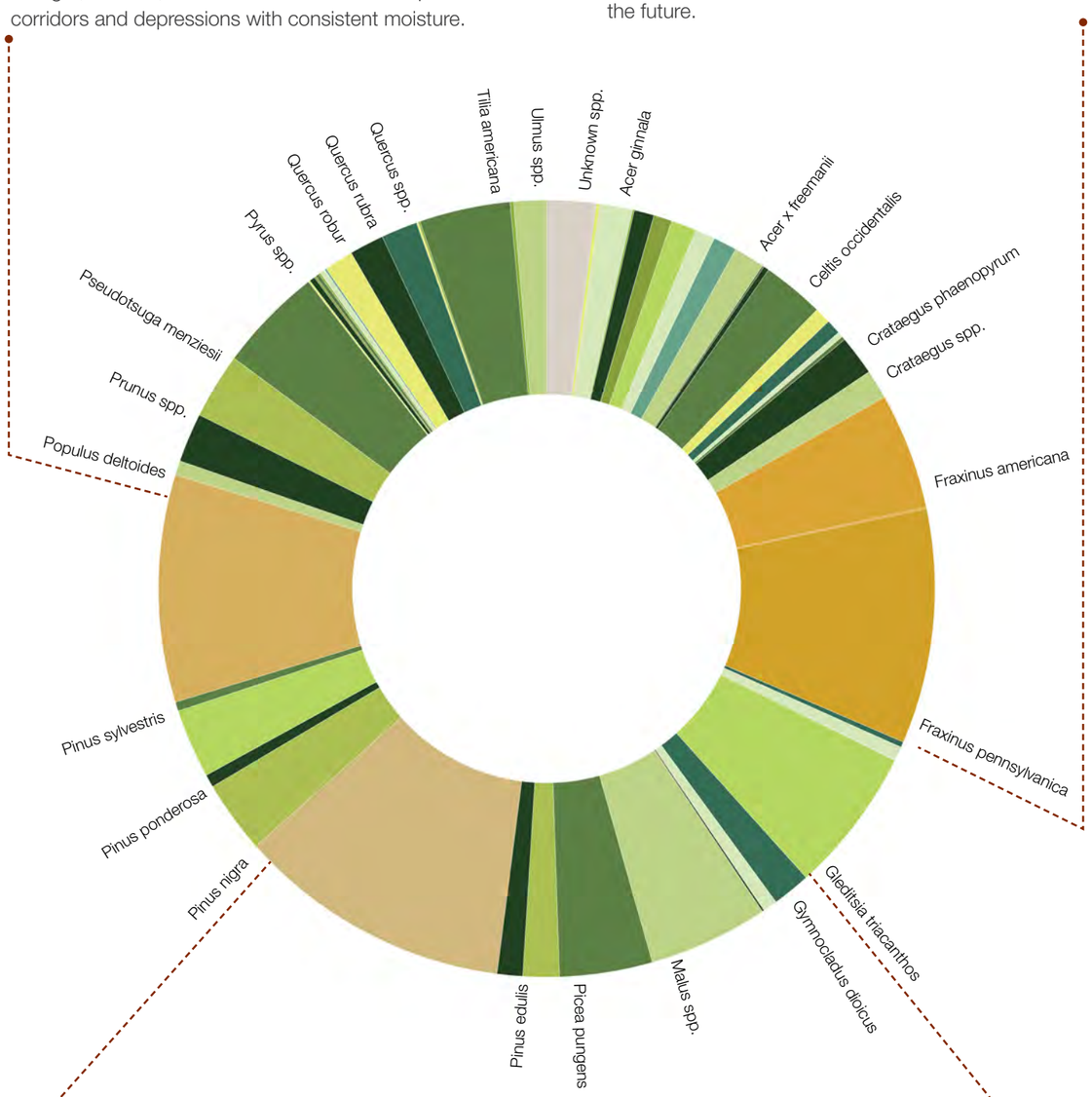
**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Eastern Cottonwood 9% / *Populus deltoides*

Eastern Cottonwood is less adaptable to climate change than other trees due to its susceptibility to pest outbreaks, drought, disease, and fire. It is best suited to riparian corridors and depressions with consistent moisture.

Ash 10% / *Fraxinus spp.*

CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.



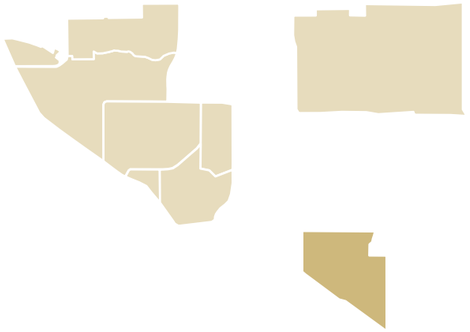
Austrian Pine 11% / *Pinus nigra*

This tree is known to thrive in urban conditions and to survive periods of drought. Due to the tree's susceptibility to tip blight in the Midwest, along with Dothistroma needle blight, it is recommended to limit planting of this tree going forward.

Honey Locust 6% / *Gleditsia triacanthos*

With an ability to tolerate high temperatures, Honey Locust trees are well suited for rising temperatures. This tree can tolerate drought, although it grows best in moist valleys and streams.

Canopy Analysis | Williams Village

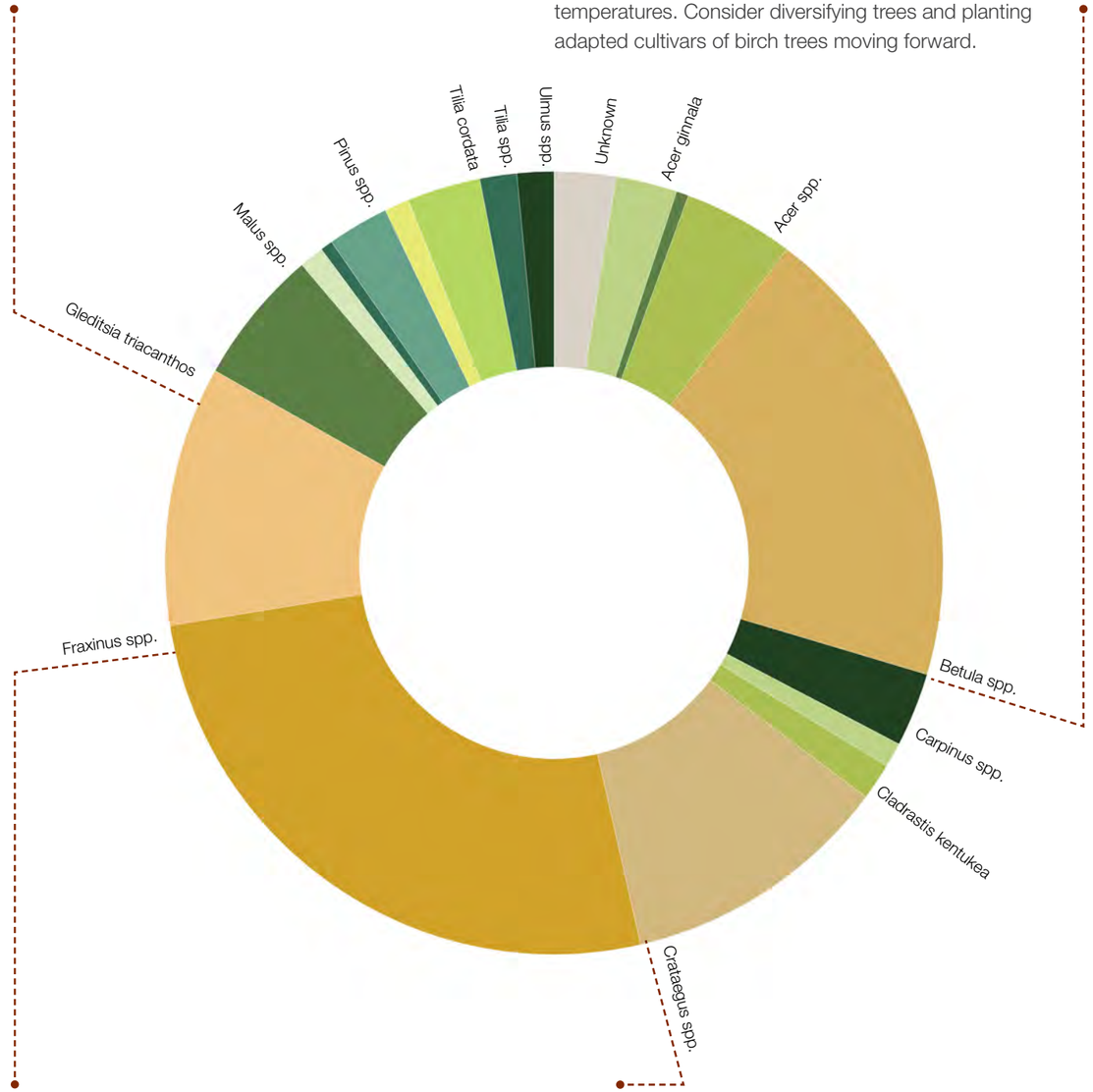


A large portion of the trees at Williams Village are un-inventoried, so the actual percentages of the tree species breakdown may differ from this analysis. There are several Ash trees in the South-West corner of the district which will need continued monitoring and treatment for EAB. Several of the other tree species commonly found at Williams Village, such as the Honey Locust and Hawthorne trees, are equipped to adapt to rising temperatures and periodic drought. Other species commonly found here, such as Birch trees, should be limited or avoided in future plantings as they are likely to be stressed by elevated temperatures.

**Spruce and Ash trees are highlighted due to their significance on campus and their likelihood of experiencing stress due to pests & climate change*

Honey Locust 11% / ***Gleditsia triacanthos***
With an ability to tolerate high temperatures, Honey Locust trees are well suited for rising temperatures. This tree can tolerate drought, although it grows best in moist valleys and streams.

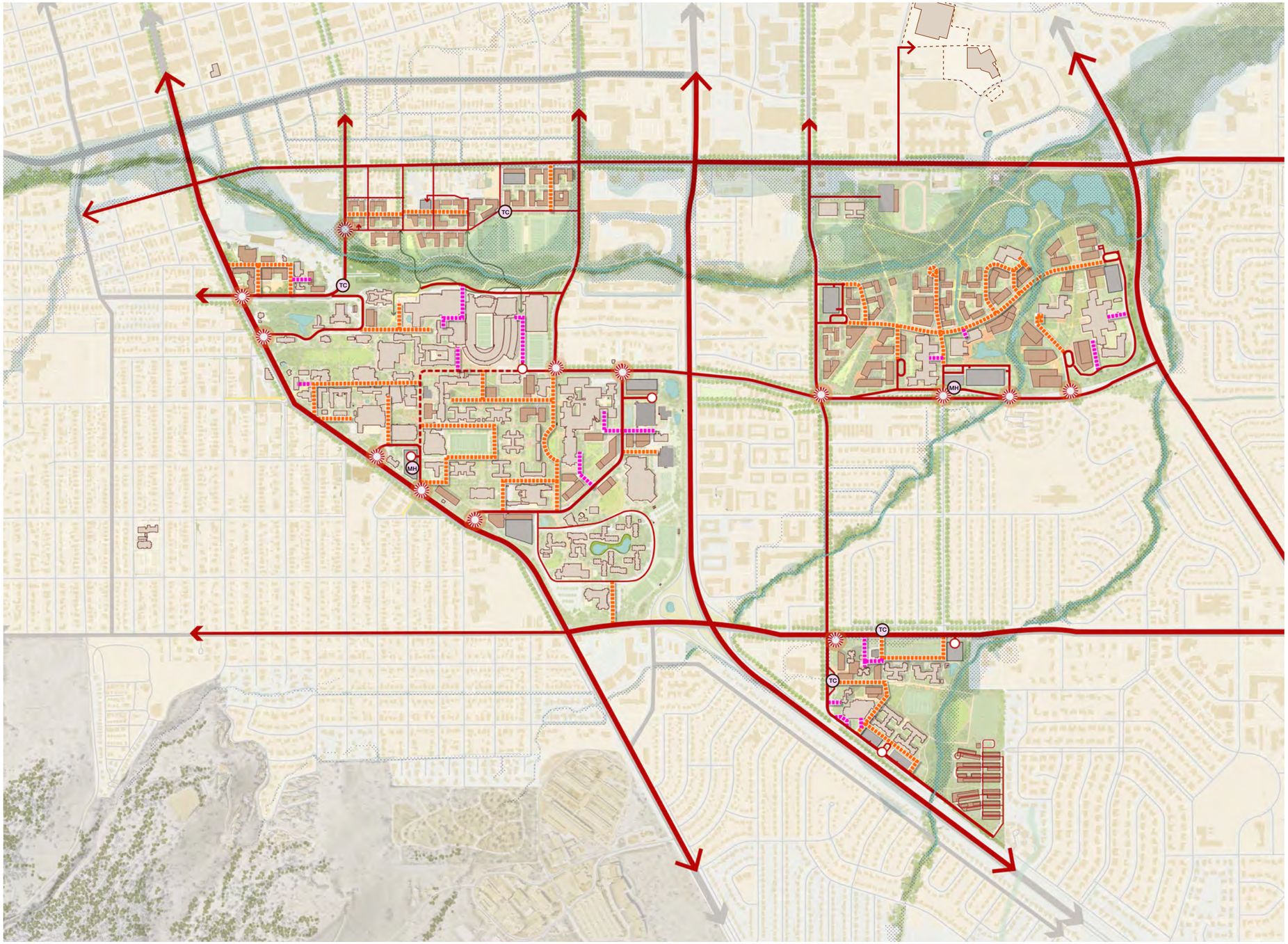
Birch 19% / ***Betula spp.***
Today, Boulder sits in the Plant Hardiness Zone 6a. with a projected rise of 5.4 F by 2060, the average Plant Hardiness Zone will shift towards 6b. This means that trees historically found growing at higher elevations, like the birch, may be particularly stressed by elevated temperatures. Consider diversifying trees and planting adapted cultivars of birch trees moving forward.



Ash 26% / ***Fraxinus spp.***
CU currently is treating select Ash trees in anticipation of the Emerald Ash borer. Continued preventative efforts and succession planting will ensure the campus tree canopy remains robust into the future.

Hawthorne 11% / ***Crataegus spp.***
Hawthorne sp. are suited to adapt to rising temperatures and periodic drought. They are commonly found in Colorado along canyons, dry hillsides, and streams.

Service and Emergency Routes



6.7
Utility Considerations

CONFLICTS AND PHASING

CONFLICTS DIAGRAM

INFRASTRUCTURE EXHIBITS

Affiliated Engineers, Inc.
1726 Champa Street, Suite 100
Denver, CO 80202
Tel 720.580.8510

University of Colorado Boulder Master Plan: Thermal, Data and Power Utilities

Introduction

This memo accompanies the July 2021 draft presentation of the University of Colorado Boulder comprehensive master plan (Sasaki Associates). It explains the investments needed in thermal, data and power utilities to provide for demolitions and new construction illustrated in the Sasaki plan.

The presentation of utility investments supports the university's commitment to eliminate its greenhouse gas emissions by 2050. The recommendations for energy systems that follow assume that all new buildings illustrated in the master plan will be highly energy efficient with energy use intensities by building type as described in the university's *Energy Master Plan*, or better. Each new building should meet these requirements:

- Where hydronic heating and cooling systems are implemented, systems should be designed to use district supplied 130°F hot water at 150psi (even if steam serves the building at time of construction) and district supplied 44°F chilled water at 150psi,
- Energy Recovery for all exhaust and relief air,
- Natural gas shall not be used for space conditioning or hot water heating,
- Building submetering of all utilities, and
- Include energy performance standards into all external lease agreements for any CU owned properties.

This memo:

1. Explains the utility investment phasing needed for East Campus and the North Boulder Creek District of Main Campus to conform to the development illustrated in the master plan. The extent of projected development suggests the opportunity for a partnership of university and developer(s) specific to utilities or accompanying a larger partnership for campus growth.
2. Identifies potential conflicts between existing utilities and the locations for new construction illustrated in the Sasaki master plan.

Main Campus

The Sasaki plan generates underground utility conflicts on Main Campus, but most can be accommodated with slight modifications to the illustrated building footprints. There are two buildings on the plan that would cause major utility conflicts and can be seen in the attached CMP Utility Conflicts drawing. Utility Conflict #1) The new building on the western edge of the Business Field and located south of the ITLL (Building 445) and, Utility Conflict #2) the new building south of Koelbel (Building 430) are above a network of thermal, data, and power utilities. AEI suggests that as development is pursued in these areas, further investigation is needed to resolve these utility conflicts.

Williams Village

Conflicts between the Sasaki plan's illustration of new buildings and existing power, data, and thermal utilities are minor with the exception of Utility Conflict #3) immediately south of the Heating Plant (Building 611). AEI recommends that future design efforts in this area modify the building footprint to resolve this conflict

Grandview Development

The plan for the Grandview development lacks the density to justify a free standing district energy system and the distance of this campus to the Main Campus makes it impractical to establish a satellite energy system. Therefore, the university's carbon reduction commitment is best pursued through design of energy buildings efficient buildings in this area.

The Sasaki illustration for the Grandview development shows power and IT utility conflicts of a significant magnitude. Should the Grandview development be constructed as illustrated, it necessitates design of a new utility pathway network. If the university determines a new utility pathway network in this area is cost prohibitive, the proposed development scheme will need to be modified.

East Campus

The Sasaki plan illustrates many and significant conflicts between proposed new building locations and power and IT utilities. AEI proposes that power and IT pathways be modified to follow the pathways that will be created for the anticipated hot water and chilled water. Infrastructure elements on East Campus that constrain development are noted below with recommended means of resolving them:

- Much of the existing high voltage distribution from the East Campus Power Distribution Center (ECPDC) conflicts with the footprint of new buildings and will need to be relocated.
- The illustrated growth of East Campus will trigger the need for additional power capacity.
- There are high voltage distribution lines from the ECPDC to the Electrical Supply Building (ESB) on Marine Street. It is anticipated that the power distribution in the ESB will be sufficient for the northern part of the East Campus.
- The network core router for East campus is located in the Biotech building (BIOT). Two additional core routers are located on main campus in the Engineering (ECOT) complex and the Information Science (INFO) building. The Space Science building (SPSC) and Computing Center (COMP) also host critical data centers.
- Computing Center (COMP) contains a BRAN fiber rack, and BRAN fiber routes through the Computing Center from the Engineering building (ECOT), then north and west towards the vicinity of 33rd and Pearl Street.CU has also allocated a portion of the fiber strands in this BRAN assembly, which feed the Center for Innovation & Creativity (CINC) building and the High Performance Computing Facility (HPCF – supercomputer).
- The existing IT infrastructure entrance points onto East Campus are at the TB16 “hut” at the northeast corner of 30th Street and Colorado Avenue, and from the north via BRAN into the Computing Center. Also see CU Boulder -CMP Utility Conflicts exhibit indicating additional east campus buildings with 3rd party IT infrastructure as of September 2021.
- Most buildings on the UCB campus also have a copper presence from Lumen/CenturyLink.

The following recommends utilities investment phasing to support the Sasaki master plan illustration of building, road, and landscape development on East Campus.

Phase 1

- All three East Campus thermal plants in Jennie Smoly Caruthers Biotech, Sustainability, Energy, and Environment Community Building (SEEC), AERO, and LASP Space Technology Research Center (LSTR) will be employed. They will be linked to start the process of creating a single, districtwide energy system. SPSC should be connected to this system early in development so the consistent cooling demand can be supported by the district system. Thermal and power pathways will be direct buried.
- Pathways for chilled water, hot water, power, and data should be laid out (and reserved) to protect continued access as the campus is built out.
- To avoid disruption of the IT corridor on the south portion of 33rd Street for planned development, an alternate route and new fiber will be installed as an enabling project.

Phase 2

- Building development will occur at the southwest corner of East Campus. As today’s plants serving that area reach the end of their useful lives (are retired), a new district energy plant will be constructed on the campus centrally located to the Phase 1 loop, and it will use heat recovery chillers and electric or natural gas hot water generators. The plant will be designed to be zero combustion ready. The plant could be situated in numerous East Campus locations, but the parking garage is an ideal location given its centrality to the existing plants and the fully built out campus. If this plant is paired with geothermal, it could be buried into the bottom of the parking garage and would not need to be provisioned for industrial steam boilers, combustion turbines or large cooling towers.
- To avoid disruption of the BRAN fiber route for planned development in the 33rd Street area, an alternate route and new fiber will be installed as an enabling project. It should follow the new thermal energy and power pathways.

- Power and IT will be designed to follow the layout of hot water and chilled water piping pathways.

Phases 3 and 4

- The master plan development generally goes from west to east. Thermal utilities will be expanded to the northwest and northeast to support campus buildout. The district energy plant may be connected to a geothermal system to allow the plant to deliver heating and cooling with zero combustion. Specific geothermal field site boundaries will require further refinement and factor in preservation of existing natural vegetation along the Boulder Creek corridor.
- Thermal utility capacity will be expanded to serve campus growth.

North Boulder Creek District of Main Campus

The Sasaki plan illustrates many and significant conflicts between proposed new building locations and power and IT utilities. AEI proposes that power and IT pathways be modified to follow the pathways that will be created for the anticipated hot water and chilled water. Infrastructure elements on North Boulder Creek District that constrain development are noted below with recommended means of resolving them:

- Existing overhead power lines (owned by Xcel) bring power to an underground location near the practice facility, and existing below grade power lines (owned by Xcel) that bring power to an underground location near the practice facility.
- The illustrated growth of North Boulder Creek District of Main Campus may trigger the need for additional power capacity.
- Underground distribution on the north side of the Kruce-Boedecker Field (a major utility corridor).
- Data feed from Willard Distribution Router.

The following recommends utilities investment phasing to support the Sasaki master plan illustration of building, road, and landscape development on the North of Boulder Creek District of Main Campus. The ownership for these utilities could be structured similar to Williams Village.

Phase 1

- Pathways for chilled water, hot water, power, and data should be laid out to protect continued access as the campus is built out.
- Establish an easement and relocate the existing overhead power lines underground. Power for buildings will be provided from Main Campus. Power will follow technology pathways to the utility pathway and feed buildings as they are constructed.
- Provide new dedicated data feed from Willard Distribution Router to distribution node in small chiller plant. All new fiber to be from this node and follow thermal utility pathways. Fiber can also be provided to campus from the east from the Folsom Street IT feed and follow established utility pathways.
- Steam from main campus will be converted to hot water and pumped to the development via existing pumphouse on the south end of the site. A small chiller plant sized to serve the first development will be incorporated with chilled water and hot water pathways established for future developments.
- Depending on the scale of the next development, chilled water and hot water can be served from this network.

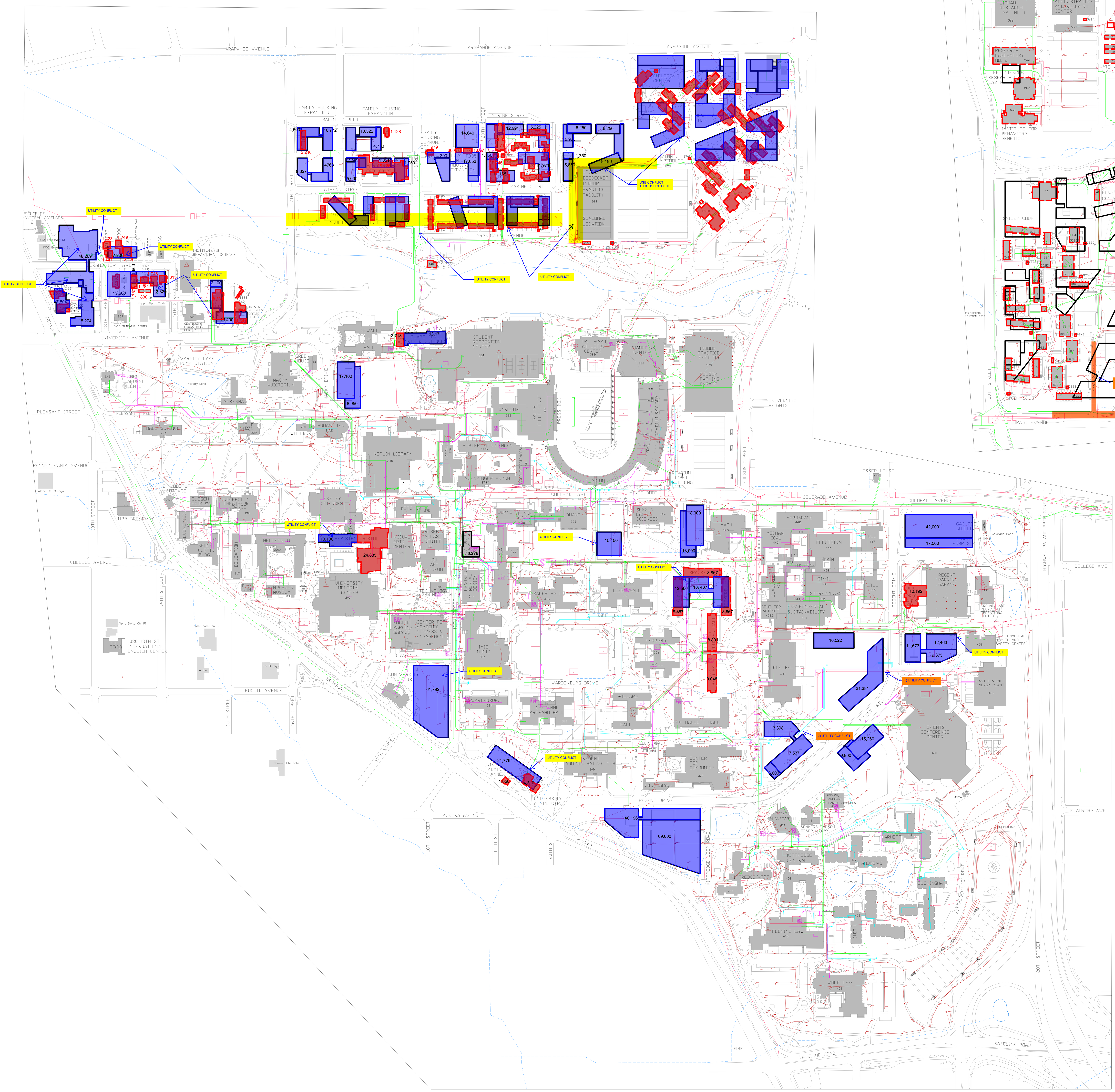
Phase 2

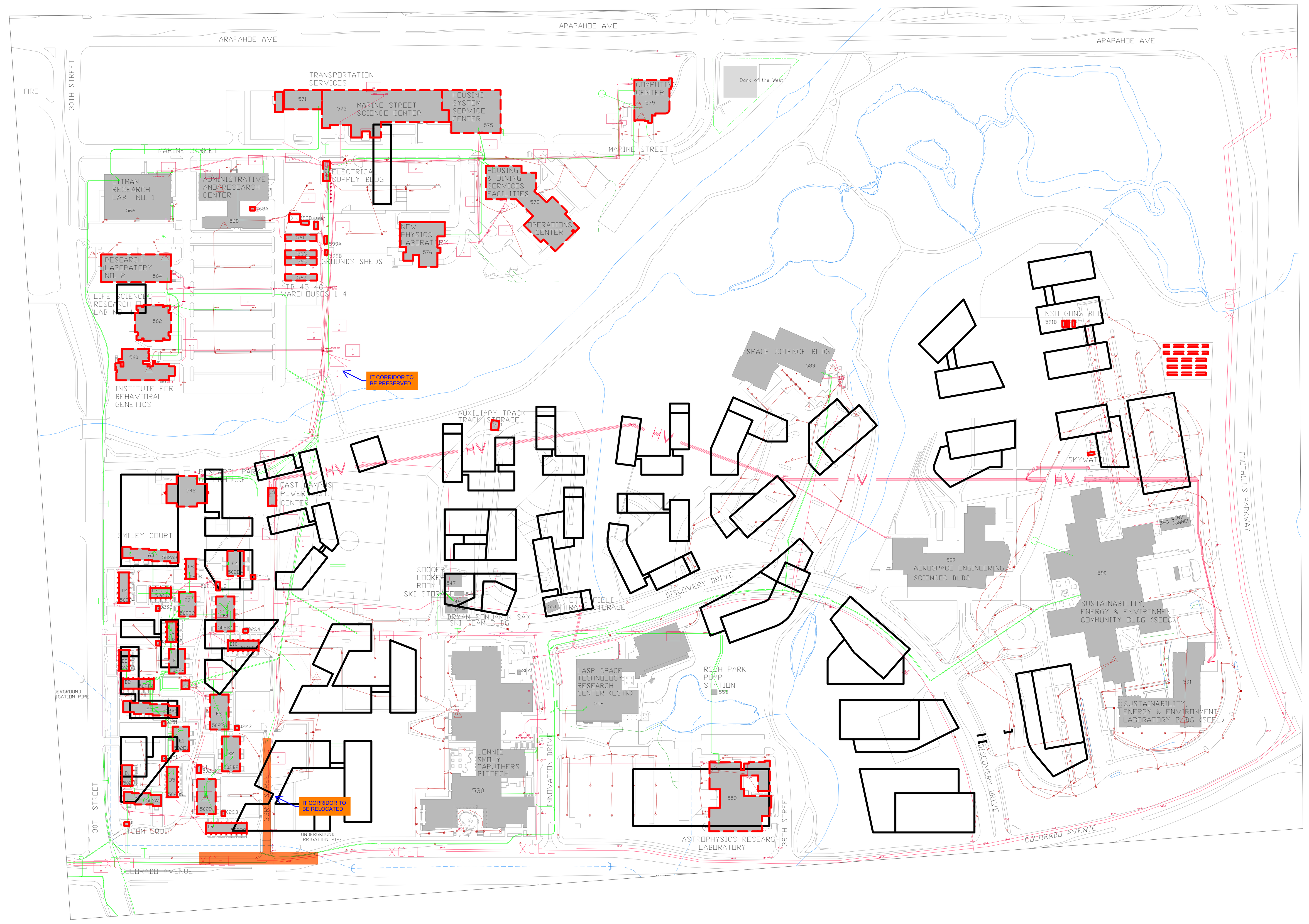
- A new district energy plant will be constructed to serve increased demand for chilled water and hot water. This plant will use heat recovery chillers and electric or natural gas hot water generators. The plant will be designed to be zero combustion ready.
- Thermal and power pathways will be direct buried and/or incorporated as tunnel systems in buildings.
- The athletic field's construction does not necessarily trigger the need to install the geothermal system which allows for zero combustion. The cost of the geothermal is substantial in comparison to repairs made for the field if it is constructed before the site is utility system is ready to connect to it. Additionally, another location could be found at a later date since the field is small relative to the green space in this area of campus.

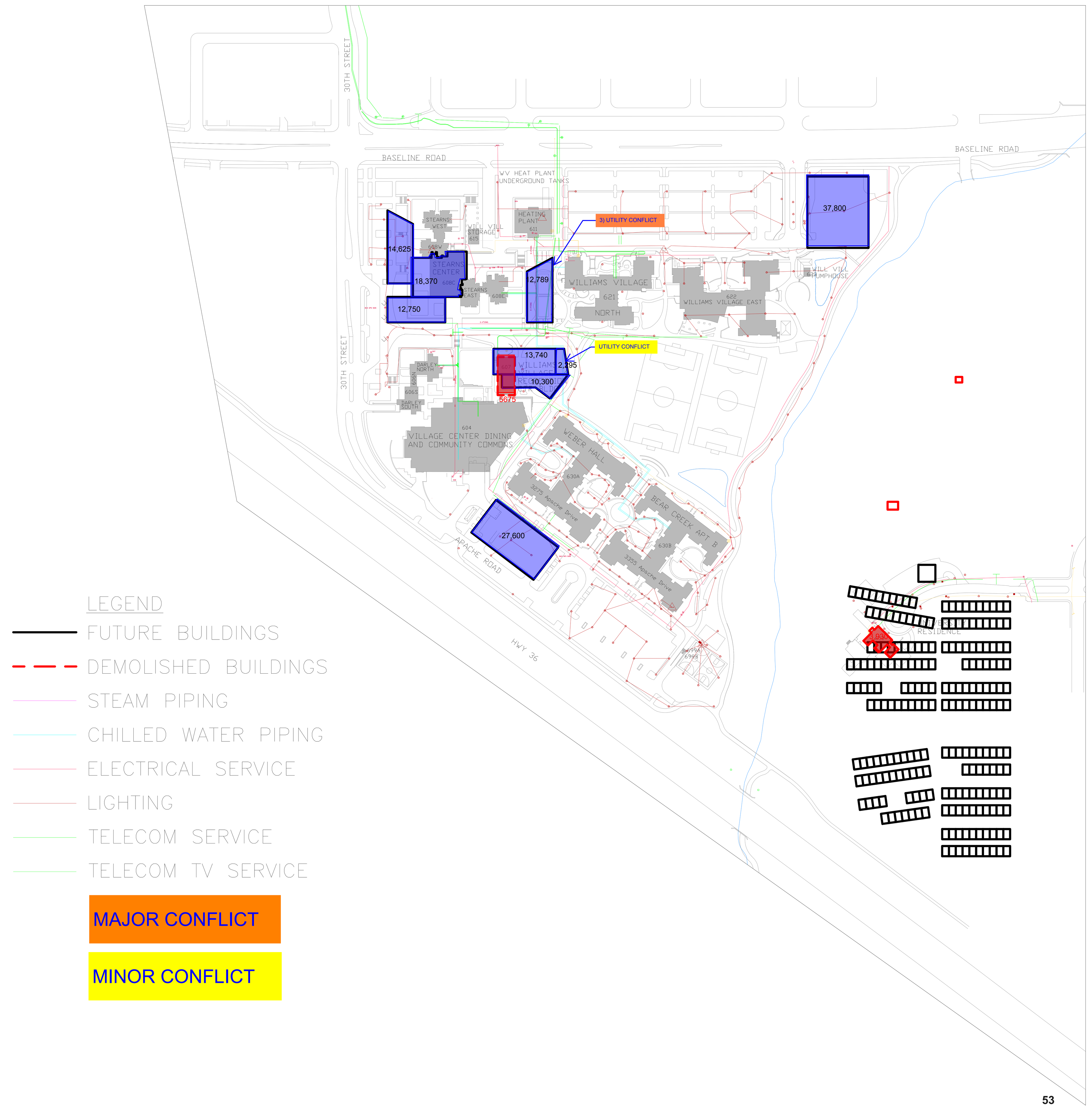
Phase 3

- Relocate the underground distribution on the north side of the Kruce-Boedecker Field as development reaches this portion of the site.
- The district energy plant will be connected to a geothermal system to allow the plant to deliver heating and cooling with zero combustion.
- Thermal utility capacity will be expanded to serve campus growth.

MECHANICAL & ELECTRICAL







North Boulder Creek District and East Campus Phasing

This exhibit explains the utility investment phasing needed for East Campus and the North Boulder Creek District of Main Campus to conform to the development illustrated in the master plan. The extent of projected development suggest the opportunity for a partnership of university and developer(s) specific to utilities or accompanying a larger partnership for campus growth. As the university pursues new development and utility planning to support that development, intra-university collaboration will be required to coordinate utility pathways with circulation, green space, and tree planting plans.

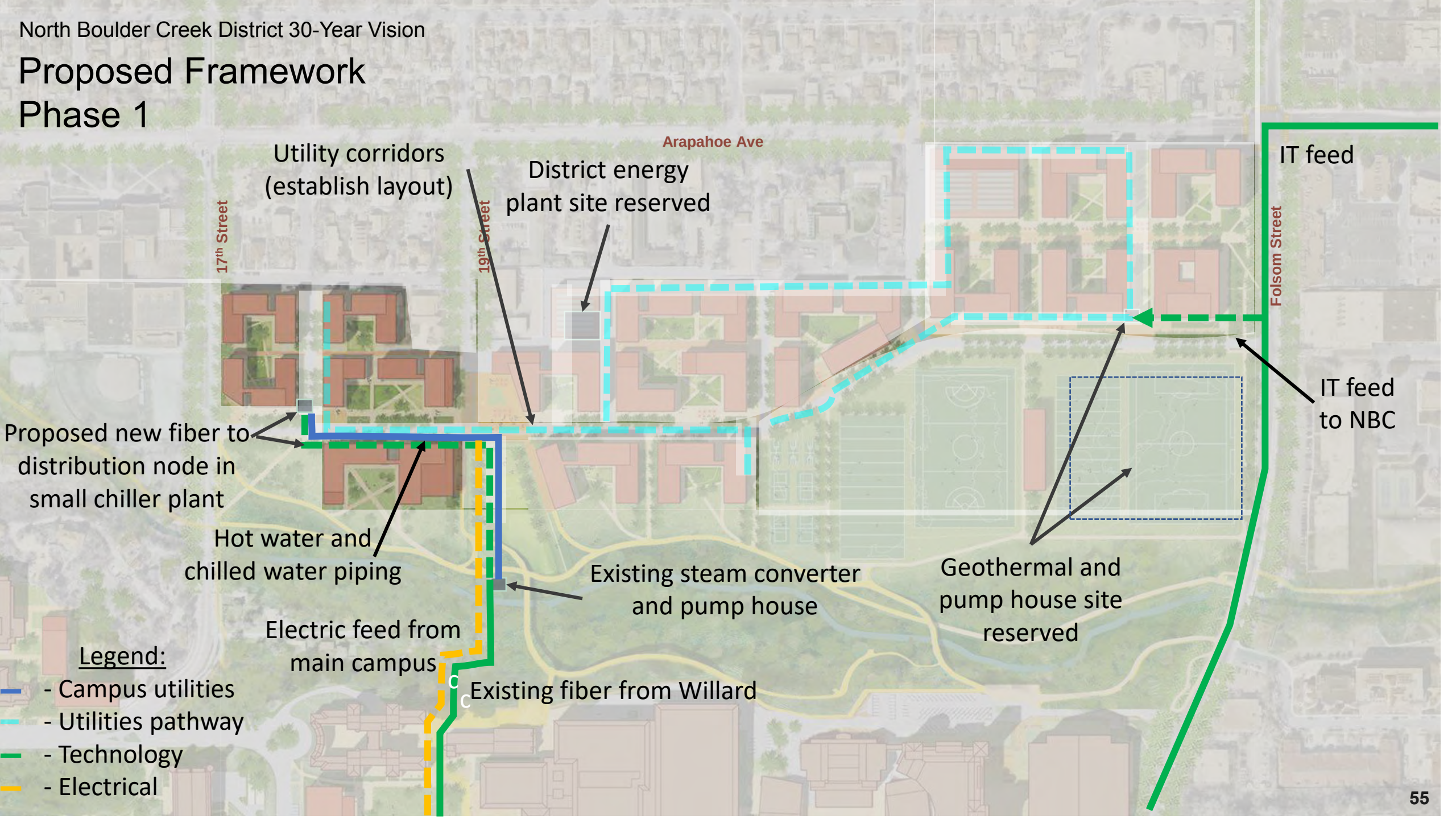
The exhibit highlights the following for each campus:

1. Phase 1 - Utility pathways and plant locations established and installed thermal utilities
2. Phase 2 - Installed thermal utilities and plant
3. Phase 3 – Installed thermal utilities (East Campus only)
4. Full build – the final state including geothermal field, pump house, plant, and thermal utilities

Affiliated Engineers

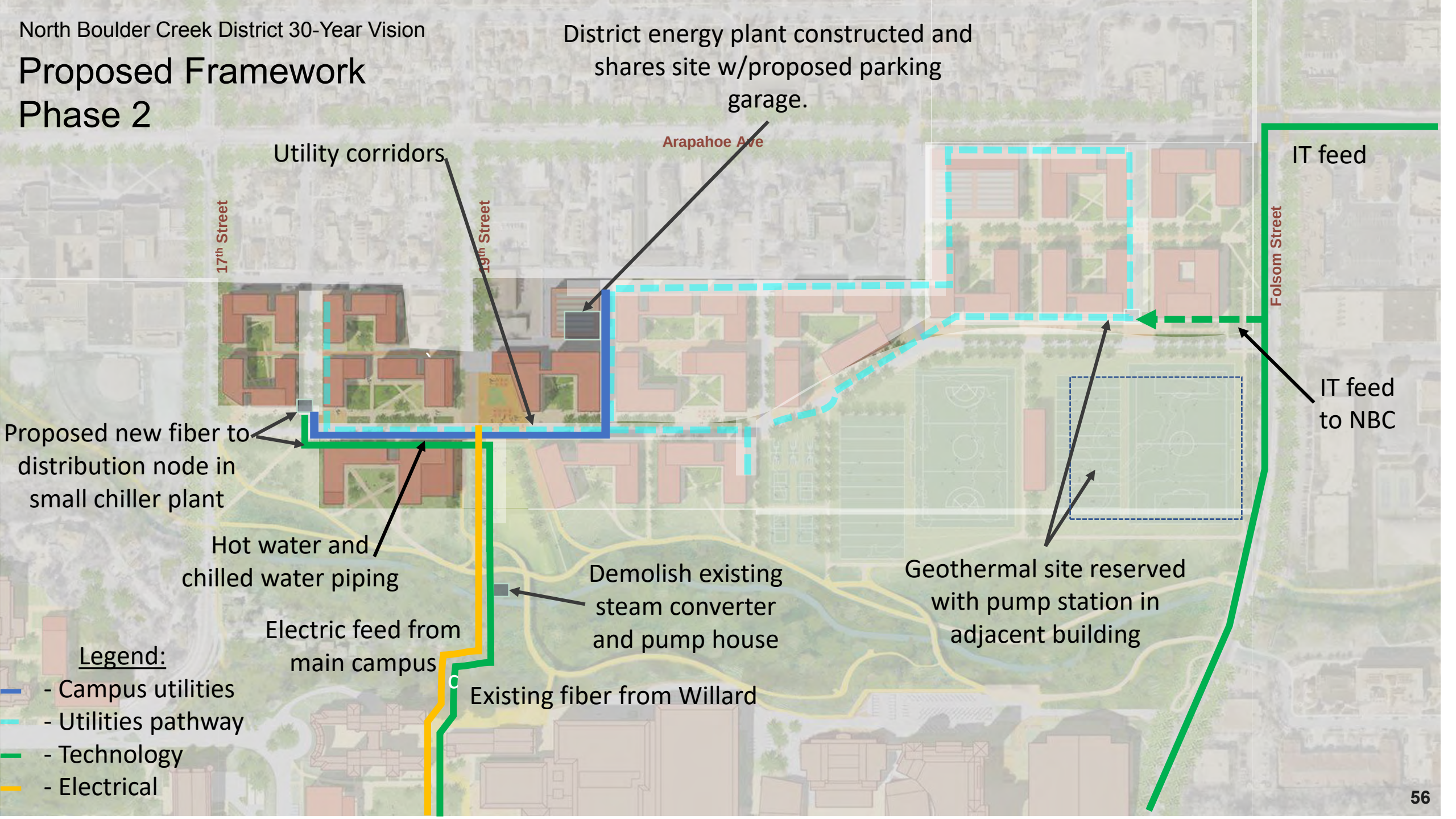
Affiliated Engineers, Inc.
1726 Champa Street, Suite 100
Denver, CO 80202
Tel 720.580.8510

Proposed Framework Phase 1

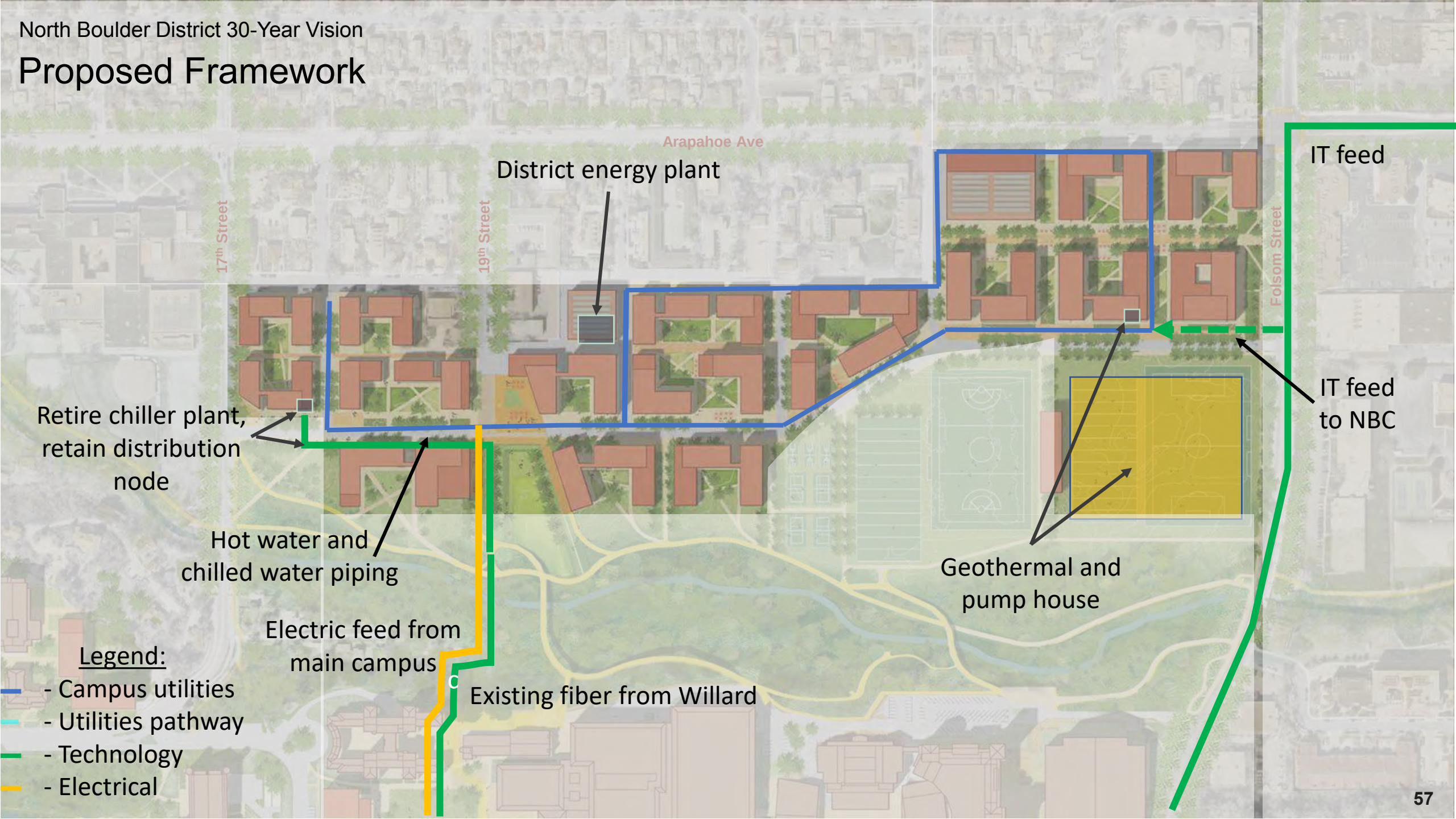


North Boulder Creek District 30-Year Vision

Proposed Framework Phase 2

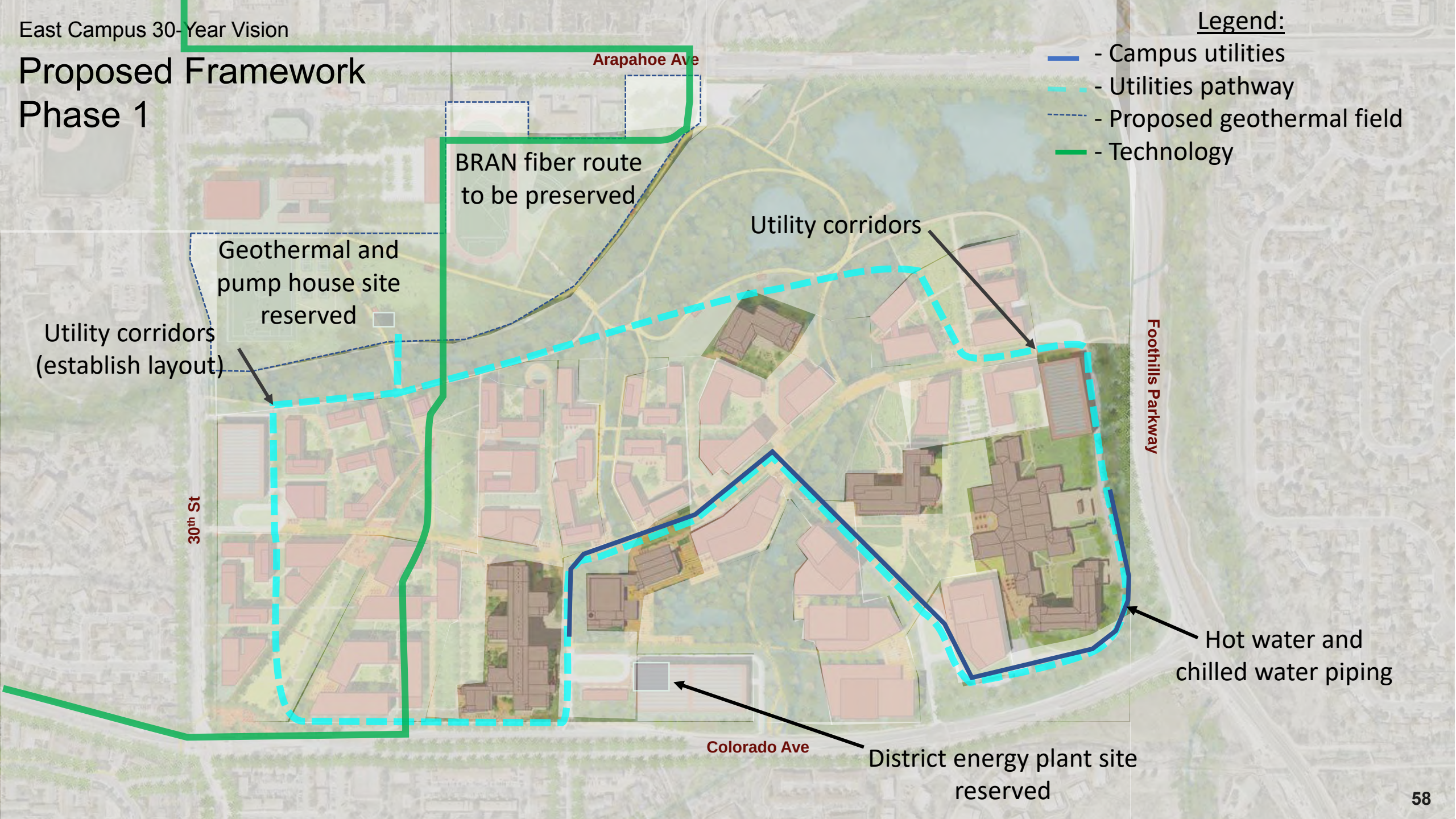


Proposed Framework



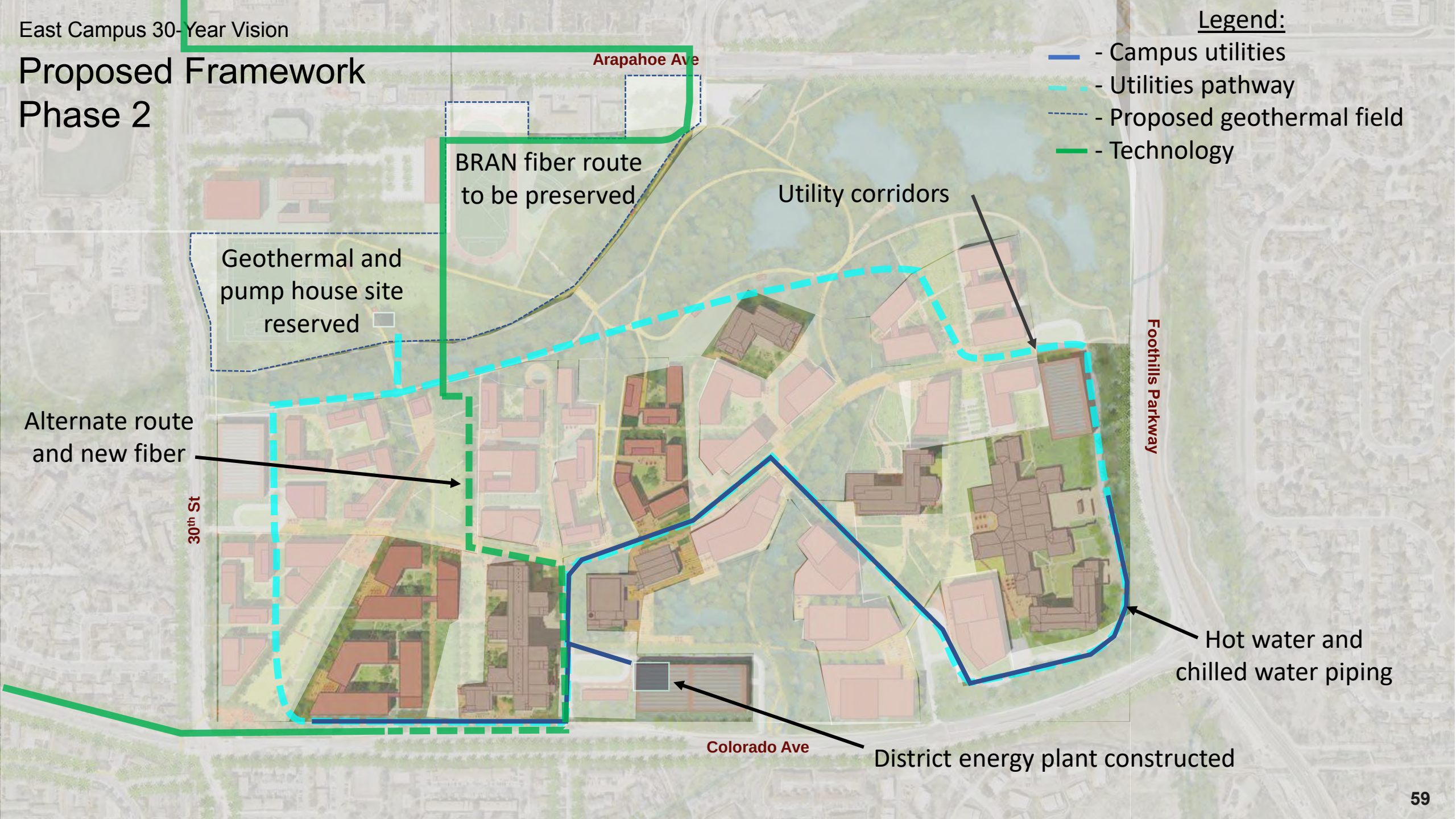
East Campus 30-Year Vision

Proposed Framework Phase 1



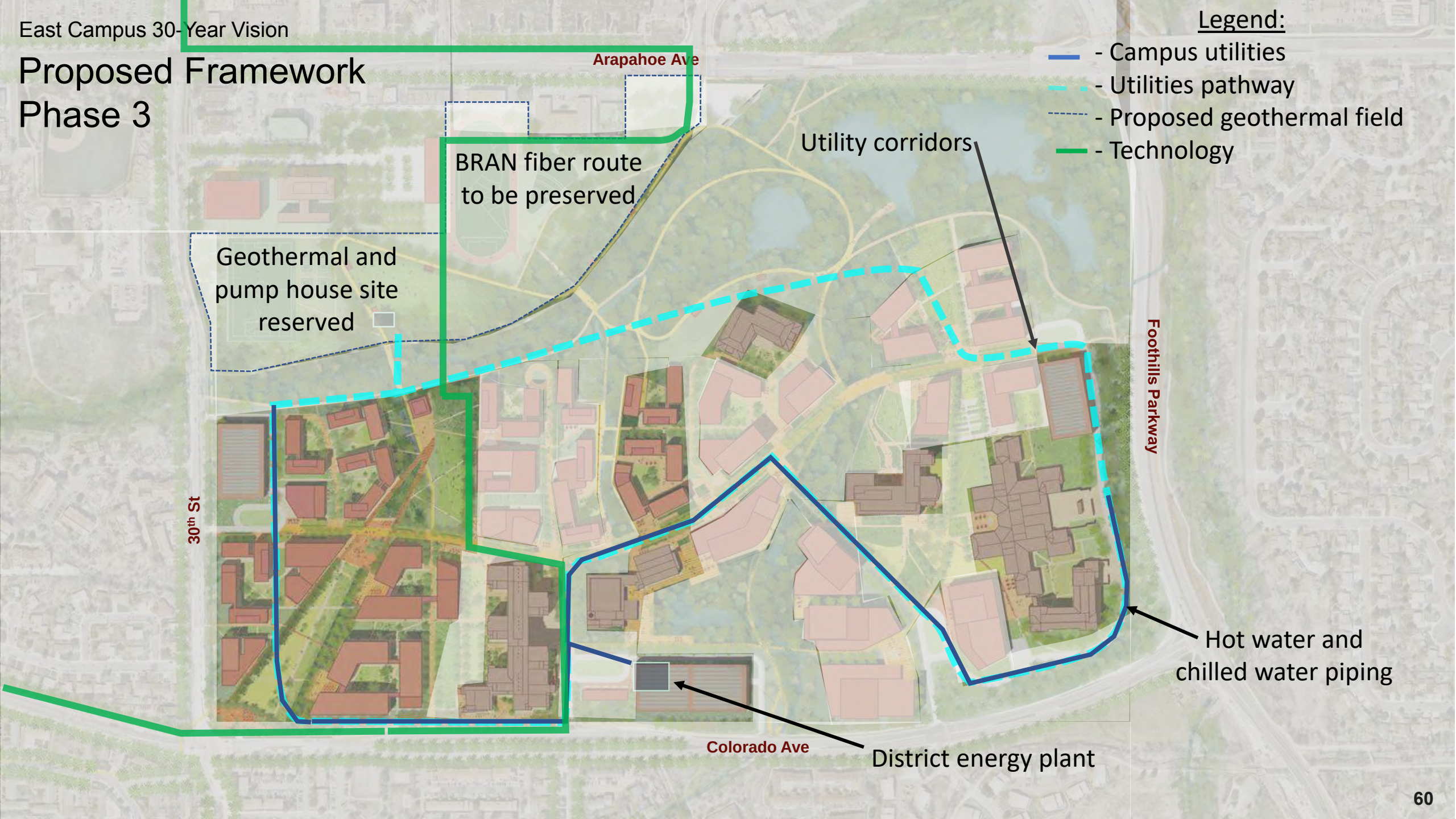
East Campus 30-Year Vision

Proposed Framework Phase 2



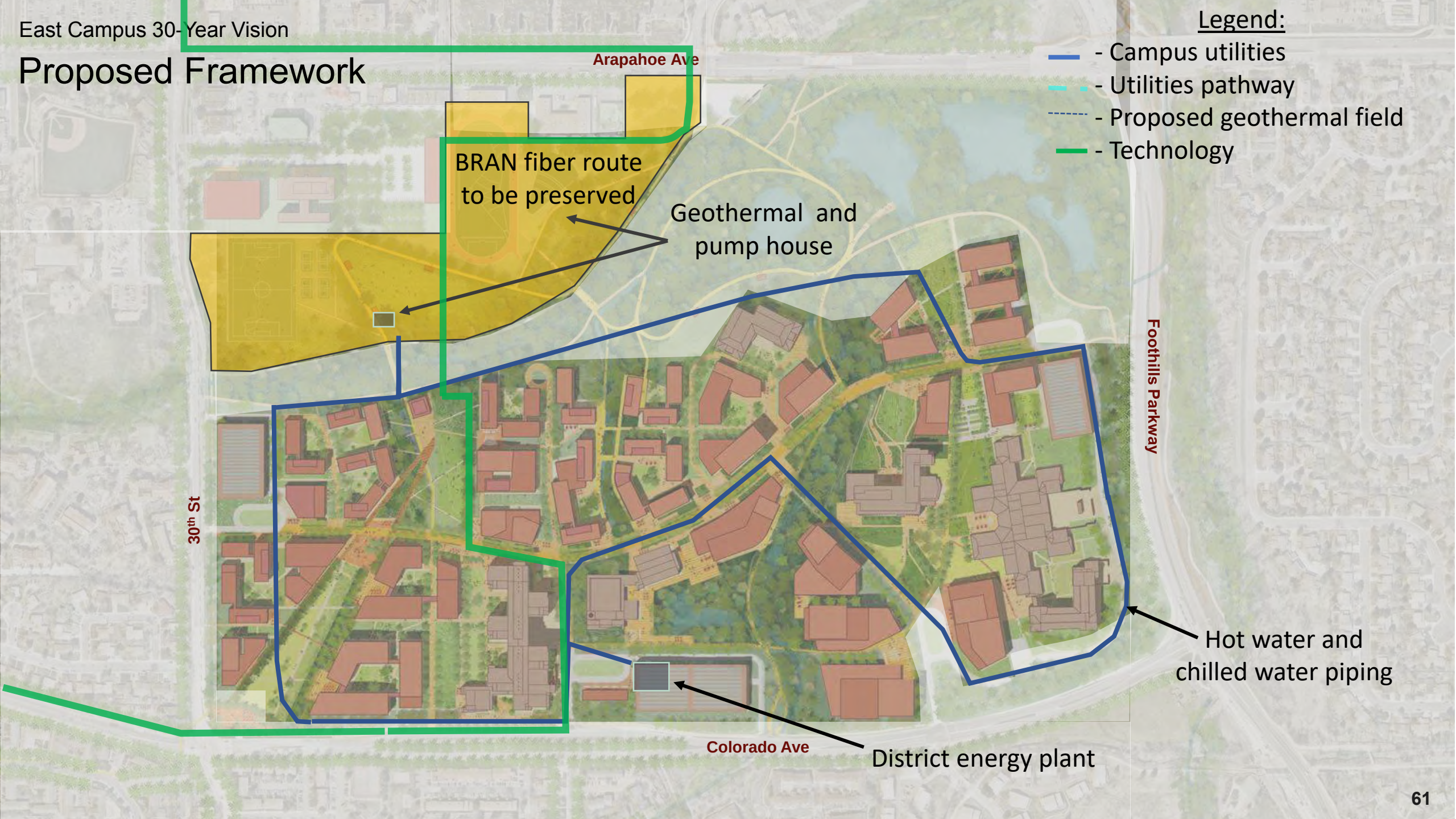
East Campus 30-Year Vision

Proposed Framework Phase 3



East Campus 30-Year Vision

Proposed Framework



6.8 Design Studies

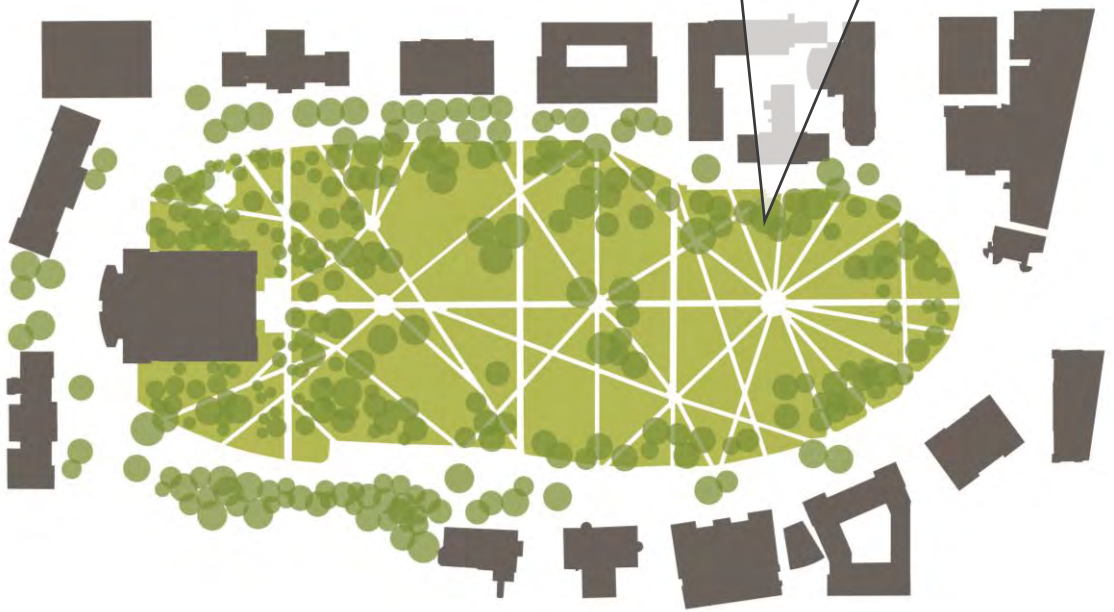
Landscape Scale Comparisons

These landscape scale comparisons are intended as a reference for understanding the scale of future open spaces compared to historic open spaces on main campus.

Norlin Quad – Scale Comparison

NORLIN QUADRANGLE
PLAN DIMENSIONS: 1200’ X 580’
AREA: 3.5 ACRES

THE OHIO STATE OVAL
PLAN DIMENSIONS: 1250’ X 600’
AREA: 15+ ACRES



UNIVERSITY OF VIRGINIA THE LAWN
PLAN DIMENSIONS: 950’ X 200’
AREA: 2.9 ACRES

East Campus 30-Year Vision

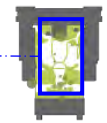
Scale Comparisons

Dalton Trumbo Fountain

Baker Hall & Libby Hall

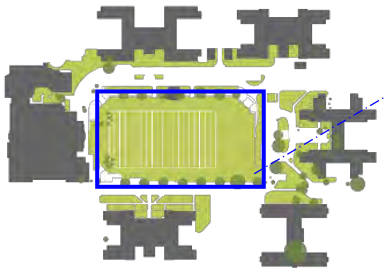
Dalton Trumbo Fountain

Mary Rippon Theater



Sewall Field

Farrand Field

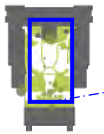


Scale Comparisons

Farrand Field

Dalton Trumbo Fountain

Mary Rippon Theater



Baker Hall & Libby Hall

JILA Connections

MyCampus survey results identified the East-West sidewalk between JILA and Engineering as a corridor of pedestrian-vehicular conflict, mostly due to bike traffic. The following explorations aimed to design a safer connection between JILA and Engineering for both pedestrians and bicyclists.

Main Campus 30-Year Vision

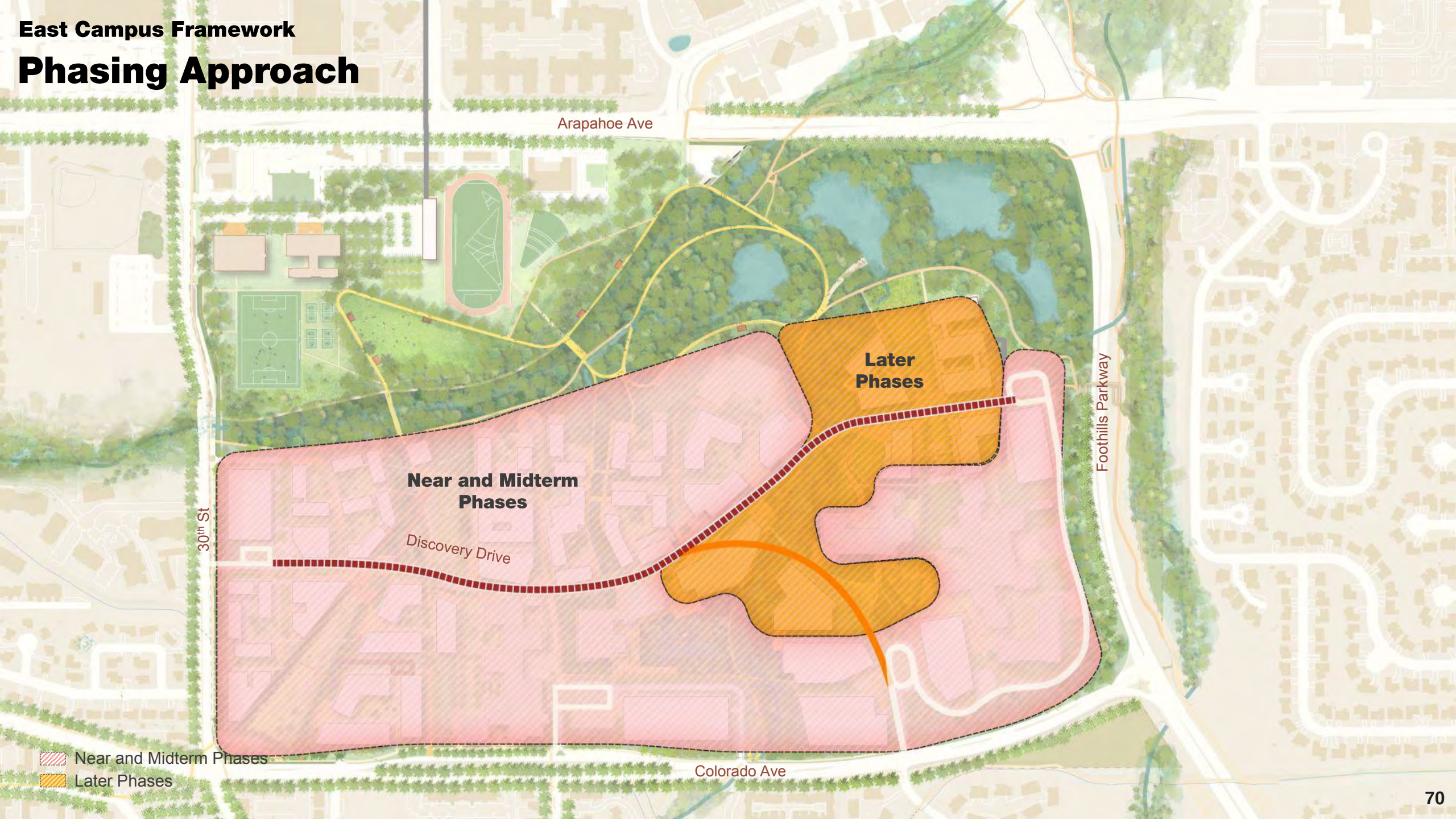
Engineering and JILA Sidewalk Connector

East Campus Road Realignment

A defining element of the proposed framework for East Campus is the realignment of Discovery Drive to serve as a central pedestrian-priority spine that connects the campus from West to East. The following slides look at a phasing approach for existing and proposed buildings and roads.

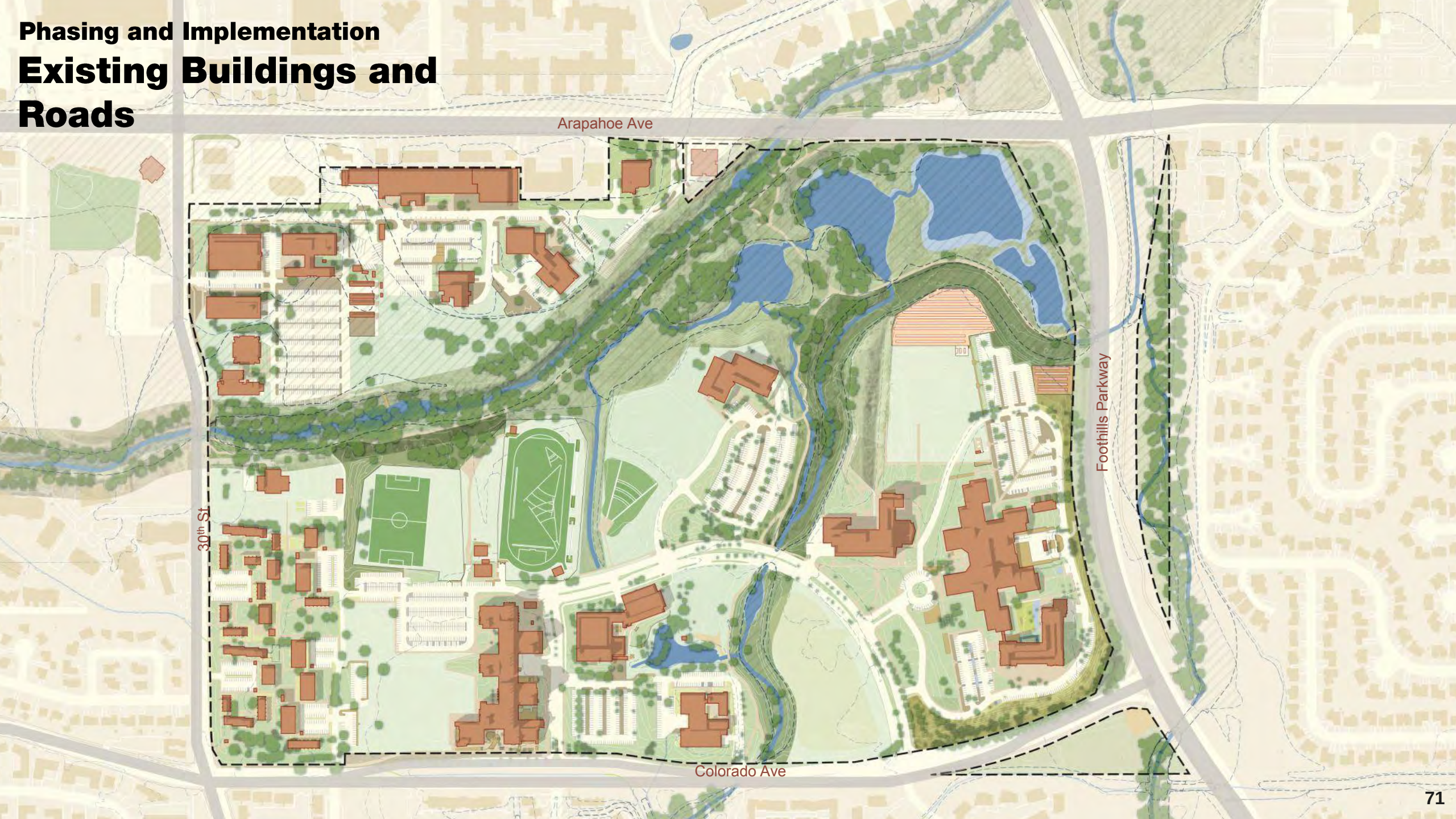
East Campus Framework

Phasing Approach



Phasing and Implementation

Existing Buildings and Roads



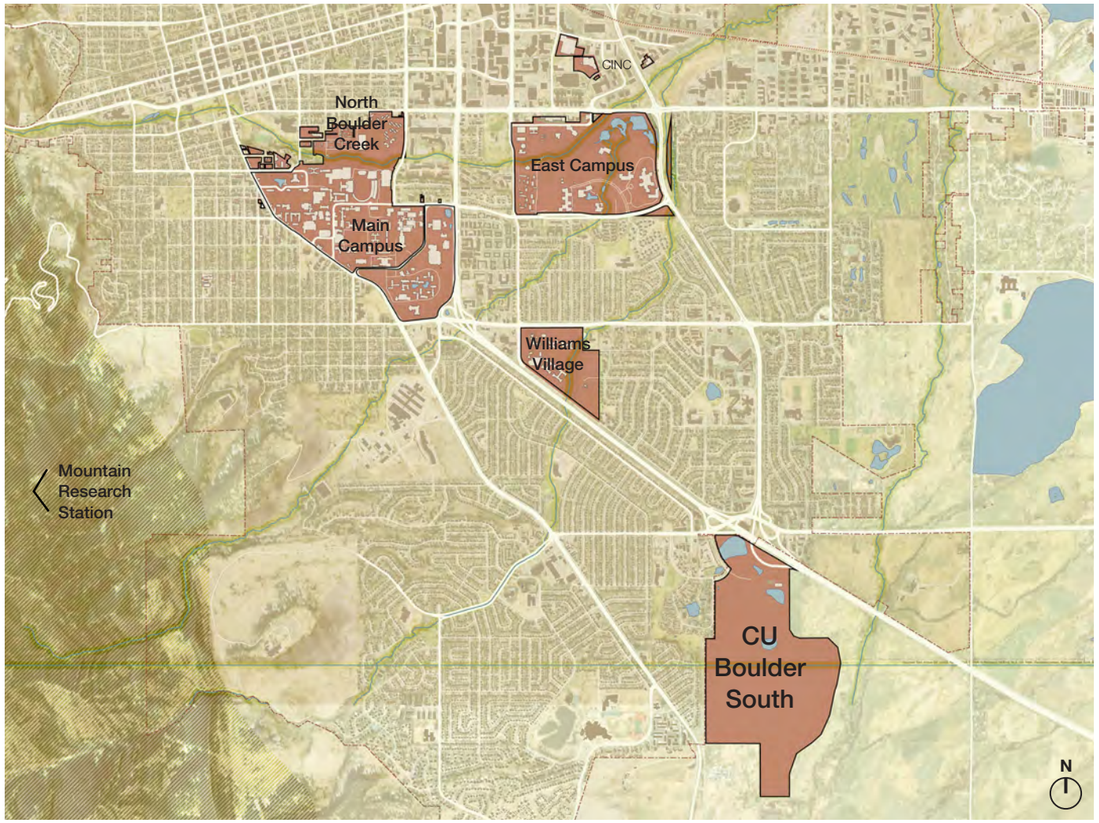
Phasing and Implementation

Proposed Buildings and Roads

6.9

CU Boulder South

CU Boulder South



CU Boulder South Context

CU Boulder South is a 308-acre parcel at the southeast edge of the city acquired by the university in 1996 with no particular immediate use in mind. In September 2021, and in the final stages of the writing of this document, Boulder City Council approved the annexation of the property into the Boulder city limits. One provision of the annexation is the ability for the city to use a portion of the site to build flood protection for downstream residents. University development at CU Boulder South is contingent upon the city's ability to receive permitting approval for flood mitigation work on the site. Consistent with the annexation agreement, the CMP anticipates development at CU Boulder South to include project types such as housing, transportation, and recreation and athletic facilities, in addition to academic and research space. CU Boulder acknowledges the CU Boulder South Guiding Principles from the 2015 Boulder Valley Comprehensive Plan as the mutually agreed development concepts for the property. A micro master plan specific to the CU Boulder South site will be developed as the city's flood mitigation plans are further developed and gain permitting approvals.

At the time of the writing of this document, there are multiple potential avenues through which deannexation of the site could occur, which would remove the property from city limits, eliminate the ability for the university to connect to city utilities, and undo any land transfer, flood protection and open space provisions. These possibilities include:

- As part of the annexation agreement, the city holds a three-year deannexation option period. If the city is unable to move forward with the construction of flood protection due to permitting or other issues, the city has the option to deannex the site. This option period carries with it two one-year extension options.
- City Council's approval of the annexation faces a potential referendum. If a petition submitted by opponents of the annexation gains certification, the referendum would put deannexation before the voters, likely as part of the November 2022 election.
- The annexation could face potential legal challenges from opponents that could delay CU Boulder's ability to develop on the site or cause deannexation.

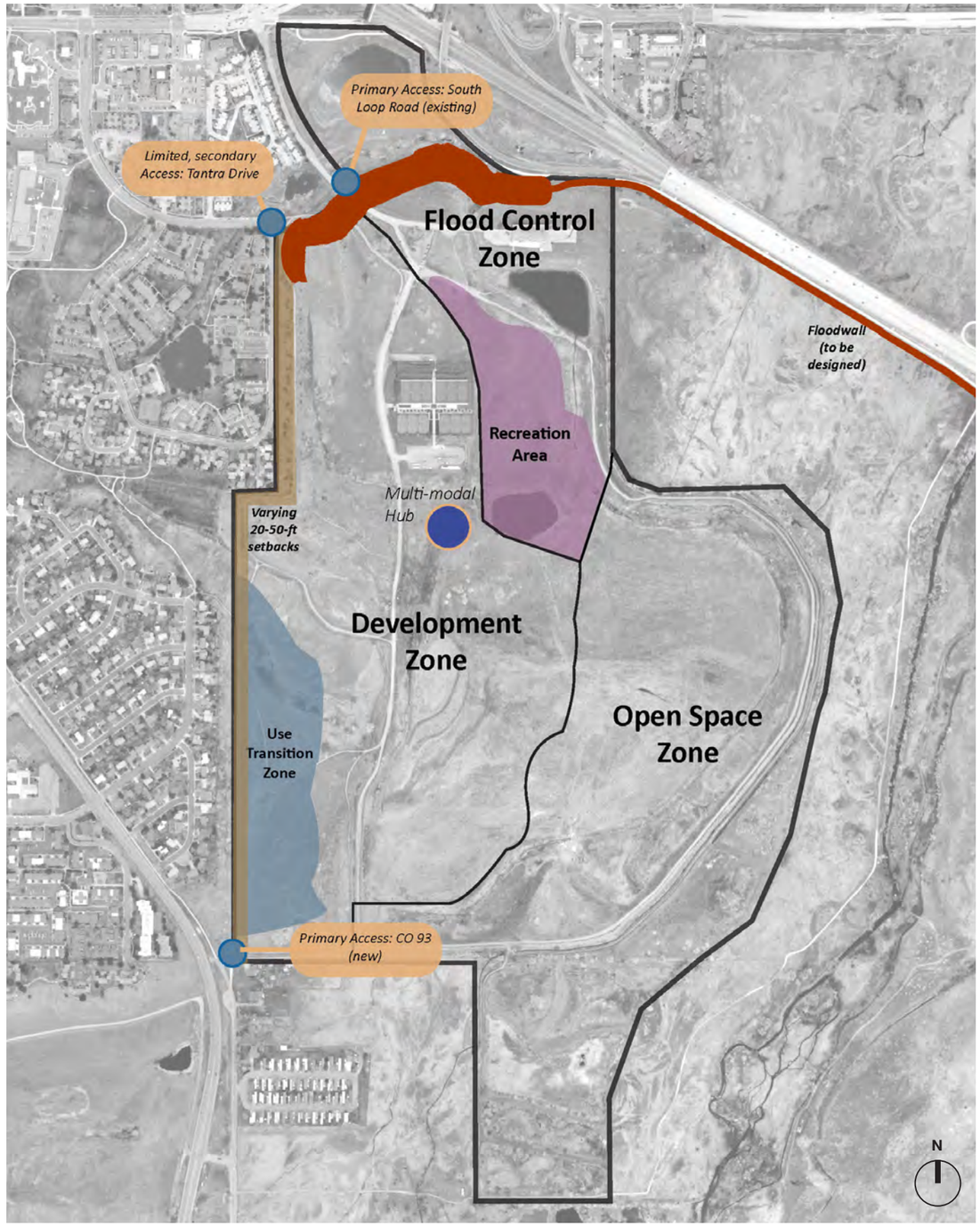
The University of Colorado Board of Regents in August 2021 authorized CU Boulder leadership to execute the annexation agreement once finalized with the city. As approved, the CU Boulder South annexation carries with it multiple provisions aimed at providing mutual benefits for both the university and community of Boulder. These include flood protection for 2,300 downstream Boulder community members, protection and restoration of critical riparian habitat and well-planned housing-centered development on a limited portion of the site. The annexation agreement explicitly sets for the requirements and conditions for the annexation, including numerous binding covenants that set limits on building sizes, heights and locations, as well as an actively managed multimodal traffic plan.

Key provisions of the annexation agreement include:

- The university's commitment to the transfer of 155 acres to the city for flood protection and open space.
- City construction of flood protection for 2,300 downstream Boulder residents and 1,100 homes.
- The preservation of 119 acres for permanent open space, and the transfer of the needed water rights for habitat restoration and maintenance.
- A limit on future development to 129 acres of the 308-acre parcel, with no development of habitable spaces allowed within the 500-year floodplain, except for accessory uses to serve visitors to the recreation fields.

- A required minimum 2-to-1 square footage ratio of housing to non-housing buildings to ensure that housing will always be the predominant use.
- A 750,000-square-foot cap on the amount of non-housing development allowed.
- No non-residential development is allowed prior to the construction of at least 150 units of housing.
- The dedication of five acres for the development of permanently affordable housing available to community members who qualify, not just university affiliates.
- Preservation and protection of valuable wetlands and natural habitat, including lands near the sensitive state habitat area.
- The implementation of performance-based transportation plans and trip caps to limit future traffic.
- The creation of a multimodal hub with connections to the larger transportation network.
- Dedication of two acres of land for a public safety facility.
- Provision of continued shared recreation uses for the community and university, including parks, trails and fields.
- A prohibition on the university connecting to utilities prior to the expiration of the city's de-annexation option period.
- A limit on the number of nighttime events at lighted recreation facilities.
- A requirement that all lighted recreation and event facilities must comply with a minimum setback of 250 feet from the state natural area and existing dwelling units on adjacent properties.
- A requirement that the university employs physical and technological measures, such as radio frequency identification (RFID)-activated gates, to prevent use of the roadways on the property as a bypass between Highway 93 and Foothills Parkway.
- A requirement that development of the site be phased from north to south and that construction of access to the site from Highway 93 will not occur until development occurs on the southern half of CU Boulder's developable area.
- A commitment by the university and city that the Vision Zero Action Plan will inform future design and construction of State Highway 93 access.

The university will embark on a micro master planning effort around its future site plans before any development begins. CU Boulder development at the site will not occur until after the city's flood protection project is built. The city maintains review and comment periods for those site plans as well as for each phase of future development at CU Boulder South to ensure compliance with the binding annexation agreement.



Not to Scale
July 14, 2021