Three Rivers
COMMUNITY COLLEGE

CONNECTICUT STATE COLLEGES & UNIVERSITIES

THREE RIVERS COMMUNITY COLLEGE

MASTER PLAN UPDATE - TECHNICAL APPENDIX

JUNE 2018

PERKINS+WILL

Three Rivers
COMMUNITY COLLEGE

5 TECHNICAL APPENDIX

CONTENTS

ENROLLMENT

THREE RIVERS COMMUNITY COLLEGE - ENROLLMENT FTE BY PROGRAM (FALL)

Degree Program	Type	FALL12	FALL13	FALL14	FALL15	FALL16	FALL17	FALL18	FALL19	FALL20	FALL21	FALL22	FALL23	FALL24	FALL25	FALL26	FALL27
Accounting: Career	AS	45	44	45	44	43	39	39	39	40	40	41	41	41	42	42	43
Accounting: Transfer	AS	45	42	44	46	55	35	35	35	36	36	37	37	37	38	38	38
Architectural Design Tech	AS	35	35	28	27	15	4	4	4	4	4	4	4	4	4	4	4
Aviation Maintenance Tech	AS	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Banking	AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOT: Office Management Option	AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bus Office Tech: Admin Asst	AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Admin: Management	AS	63	71	72	67	73	90	90	90	91	91	92	93	94	95	96	97
Business Admin: Transfer	AS	38	38	34	41	35	30	30	30	30	31	31	31	31	32	32	32
Business Information Systems	AS	8	12	11	5	2	1	1	1	1	1	1	1	1	1	2	2
Civil Engineering Tech	AS	21	25	26	20	11	4	4	4	4	4	4	4	4	4	4	4
Computer Science Technology	AS	91	87	83	80	84	80	80	80	81	82	83	83	84	85	86	87
Construction Mngnmt Technology	AS	20	18	18	18	15	5	5	5	5	5	5	5	5	6	6	6
Construction Technology	AAS	0	0	0	0	4	30	30	30	31	31	31	31	32	32	32	33
COT: Engineering Science	AS	46	55	62	52	57	60	60	60	60	61	62	62	63	63	64	65
Criminal Justice	AS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Criminal Justice: Enforcement	AS	123	116	114	116	106	85	85	85	85	86	87	88	89	90	91	92
Criminal Justice: Treatment	AS	20	23	20	18	19	18	18	18	18	18	19	19	19	19	19	20
CSCU Transfer: Biology Studies	AA	0	0	0	0	0	28	28	28	29	29	29	29	30	30	30	31
CSCU Transfer: Comm Studies	AA	0	0	0	0	0	8	8	8	8	8	8	8	8	8	8	8
CSCU Transfer: Crim Studies	AA	0	0	0	0	0	15	15	15	15	16	16	16	16	16	16	17
CSCU Transfer: ECTC Studies	AA	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
CSCU Transfer: English Studies	AA	0	0	0	0	0	6	6	6	6	6	6	6	6	6	6	6
CSCU Transfer: History Studies	AA	0	0	0	0	0	8	8	8	8	8	9	9	9	9	9	9
CSCU Transfer: Math Studies	AA	0	0	0	0	0	3	3	3	3	3	4	4	4	4	4	4
CSCU Transfer: Physics Studies	AA	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
CSCU Transfer: Pol Sci Studies	AA	0	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3
CSCU Transfer: Psych Studies	AA	0	0	0	0	1	34	34	34	34	35	35	35	36	36	36	37
CSCU Transfer: Spanish Studies	AA	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
CSCU Transfer:Art Studies	AA	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
CSCU Transfer:Business Studies	AA	0	0	0	0	0	20	20	20	21	21	21	21	21	22	22	22
CSCU Transfer:ChemistryStudies	AA	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4
CSCU Transfer:Comp Sci Studies	AA	0	0	0	0	0	6	6	6	6	6	6	6	6	6	6	6
CSCU Transfer:Exer Sci Studies	AA	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
CSCU Transfer:SociologyStudies	AA	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5
CSCU Transfer:Socl Wrk Studies	AA	0	0	0	0	0	20	20	20	20	20	21	21	21	21	21	22
EARLY CHILDHOOD EDUCATION	AS	99	90	77	76	66	56	56	56	57	57	58	59	59	60	60	61
E-Commerce	AS	0	0	2	2	0	1	1	1	1	1	1	1	1	1	1	1
Electrical Engineering Tech	AS	41	42	40	40	30	27	27	27	27	27	28	28	28	28	29	29
Entrepreneurial Studies	AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Engineering Tech	AS	30	25	20	26	27	33	33	33	34	34	34	35	35	35	36	36
Exercise Science	AS	39	39	48	48	39	38	38	38	39	39	40	40	40	41	41	42
Finance & Banking	AS	12	8	13	9	7	2	2	2	2	2	2	2	2	2	2	2
Fire Tech & Administration	AS	9	13	12	8	2	0	0	0	0	0	0	0	0	0	0	0
General Engineering Technology	AAS	12	10	15	12	22	10	10	10	10	10	11	11	11	11	11	11
General Studies	AS	1093	1013	947	837	792	727	727	727	734	742	749	757	764	772	779	787
Graphic Design	AS	0	0	0	17	32	48	48	48	48	49	49	50	50	51	51	52
Hosp.Mgmt: Casino Management	AS	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Hosp.Mgmt: Hotel Management	AS	14	11	10	13	11	2	2	2	2	2	2	2	3	3	3	3
Hosp.Mgmt: Restaurant Manage.	AS	13	11	6	9	5	1	1	1	1	1	1	1	1	1	1	1
HUMAN SERVICES	AS	93	75	69	66	66	35	35	35	36	36	36	37	37	38	38	38
LAS: FINE ARTS	AA	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Laser & Fiber Optic Technology	AS	21	21	16	9	2	2	2	2	2	2	2	2	2	2	3	3
Liberal Arts & Sciences	AA	265	276	254	281	298	278	278	278	281	284	287	289	292	295	298	301
Manufacturing Engineering Tech	AS	3	3	6	6	5	14	14	14	14	15	15	15	15	15	15	16
Marketing	AS	8	9	10	10	9	4	4	4	4	4	4	4	4	4	4	4
Marketing: Transfer	AS	11	8	11	10	11	9	9	9	9	9	9	9	9	9	9	9
Mechanical Engineering Tech	AS	50	42	40	35	38	30	30	30	31	31	31	32	32	32	33	33
Mfg Eng Tech: Laser Mfg Opt	AS	0	0	1	0	2	1	1	1	1	1	1	1	1	1	1	1
Montessori Teacher Education	AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear Engineering Tech	AS	58	55	54	59	49	53	53	53	54	55	55	56	56	57	57	58
Nursing - CT - CCNP	AS	115	122	121	112	105	108	108	108	109	111	112	113	114	115	116	117
Pathway to Teaching Careers	AA	26	23	28	21	25	32	32	32	32	33	33	33	34	34	34	35
Small Bus & Entrepren Studies	AS	19	20	20	16	9	5	5	5	5	5	5	5	5	5	5	5
Sports and Leisure Management	AS	2	11	12	14	15	18	18	18	18	18	18	19	19	19	19	19
Tech Stds: Eng Technology Opt	AS	3	3	3	4	5	1	1	1	1	1	1	1	1	1	1	1
Tech Stds: Tech & Eng Ed Opt	AS	0	1	0	0	2	1	1	1	1	1	1	1	1	1	1	1
Tech Stds:Biomolecular Sci Opt	AS	7	6	9	10	6	5	5	5	5	5	5	5	5	5	5	5
Tech Studies: Electrical	AS	0	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1
Tech Studies: Wastewater	AS	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Studies	AS	5	9	5	2	2	2	2	2	2	2	2	2	2	2	2	2
TechStds:Comp-aided Design Opt	AS	5	8	7	7	4	4	4	4	4	4	5	5	5	5	5	5
TechStds:LeanMfg&Supply Opt	AS	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visual Fine Arts	AA	38	32	41	33	27	32	32	32	32	33	33	33	34	34	34	35
Degree Program Total		**2650**	**2561**	**2456**	**2331**	**2239**	**2230**	**2230**	**2230**	**2252**	**2274**	**2297**	**2320**	**2343**	**2367**	**2391**	**2414**

Basic Business Skills	CERT	0	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Business Administration Cert	CERT	1	2	2	0	11	2	2	2	2	2	2	2	2	2	2	2
Business Information Systems	CERT	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Management Core Cert *	CERT	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino Management	CERT	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Computer Aided Drafting Cert	CERT	5	3	4	5	9	11	11	11	11	11	11	11	11	12	12	12
Computer Applications Cert	CERT	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction Management Cert	CERT	1	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1
Criminal Justice Certificate	CERT	11	3	4	6	6	2	2	2	2	2	2	2	2	2	2	2
Customer Service Certificate *	CERT	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Early Childhood Education Cert *	CERT	2	4	4	3	1	2	0	0	0	0	0	0	0	0	0	0
E-Commerce	CERT	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Environ Health and Sfty Mgmt	CERT	3	3	2	1	8	6	6	6	7	7	7	7	7	7	7	7
General Studies Certificate	CERT	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Graphic & Communication Arts	CERT	6	7	9	5	5	3	3	3	3	3	4	4	4	4	4	4
Health Career Pathways Cert	CERT	2	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0
Hosp Comm & Cust Rel Cert	CERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Management	CERT	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1
Hum. Serv. Case Management	CERT	0	5	2	1	6	2	2	2	2	2	2	2	2	2	2	2
Intro to Manufacturing (Lev 1)	CERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laser & Fiber Optic Technology	CERT	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Lean Manufacturing Certificate	CERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Library Technology Cert	CERT	5	6	2	2	9	11	11	11	11	11	11	11	11	11	12	12
Manufacturing Intro to (Lev 1)	CERT	0	0	0	0	18	2	2	2	2	2	2	2	3	3	3	3
Marketing Certificate *	CERT	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0
Networking Technology	CERT	4	5	2	3	1	0	0	0	0	0	0	0	0	0	0	0
Precision Sheet Metal Mfg *	CERT	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
Restaurant Management	CERT	1	0	2	0	0	1	1	1	1	1	1	1	1	1	1	1
Retail Management	CERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Security/Loss Prevention Cert *	CERT	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Bus & Entrepren Studies	CERT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Supply Chain Management Cert	CERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surveying & Mapping Technician *	CERT	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
Sust Lndscp Ecol & Consrv Tech *	CERT	1	4	1	1	3	1	0	0	0	0	0	0	0	0	0	0
Sustainable Facilities Mgt *	CERT	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technical Writing Certificate	CERT	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wastewater Certificate	CERT	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Web Design and Development	CERT	4	4	4	2	1	2	2	2	2	2	2	2	2	2	2	2
Women's Studies	CERT	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Non-Degree Total		**57**	**68**	**52**	**46**	**102**	**84**	**55**	**55**	**55**	**56**	**56**	**57**	**57**	**58**	**59**	**59**

Non Degree Seeking	Type	FALL12	FALL13	FALL14	FALL15	FALL16	FALL17	FALL18	FALL19	FALL20	FALL21	FALL22	FALL23	FALL24	FALL25	FALL26	FALL27
NON DEG/MATRIC	000000	21	22	16	11	15	11	11	11	11	11	12	12	12	12	12	12
NON DEG/NON MATR	000000	119	101	106	102	104	111	111	111	112	113	114	115	116	117	119	120
Non-Degree Total		**139**	**123**	**122**	**113**	**120**	**122**	**122**	**122**	**123**	**124**	**126**	**127**	**128**	**129**	**131**	**132**

Program Name	Type	FALL12	FALL13	FALL14	FALL15	FALL16	FALL17	FALL18	FALL19	FALL20	FALL21	FALL22	FALL23	FALL24	FALL25	FALL26	FALL27
Grand Total		**2846**	**2752**	**2630**	**2490**	**2461**	**2436**	**2407**	**2407**	**2430**	**2454**	**2479**	**2504**	**2528**	**2554**	**2581**	**2605**

* Certificates decertified

1358	1289	1200	1118	1090	1005	1005	1005	1015	1025	1036	1046	1056	1067	1078	1088
48%	47%	46%	45%	44%	41%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%

THREE RIVERS COMMUNITY COLLEGE - ENROLLMENT CONTINUING EDUCATION (FALL)

Application Inquiry																
Blueprint/Metrology	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0
Business Financie & Tax CEDF *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAMI-Intro to Sheet Metal ***	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0
CAMI-Manufacturing Math ***	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0
CAMI-Sheet Metal BPR ***	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0
CEDF-Business Finance	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Certified Nurse Aide (CNA)	8	24	26	14	14	16	15	15	15	15	15	16	16	16	16	16
Challenging Work Conversations *	0	0	0	12	7	0	0	0	0	0	0	0	0	0	0	0
City of Norwich Training *	0	0	23	22	0	0	0	0	0	0	0	0	0	0	0	0
Communication Skills for Manag *	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Community Education ESOL	0	0	0	0	0	18	18	18	18	19	19	19	19	19	19	20
Contracts & Specifications *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CPT & HCPCS	0	0	0	0	0	7	7	7	7	7	7	7	7	8	8	8
CPT & HCPS II	0	0	0	0	10	0	7	7	7	7	7	7	7	8	8	8
Cultivating Resiliency *	0	0	3	0	6	0	0	0	0	0	0	0	0	0	0	0
Dental Assistant I	0	0	15	11	0	0	7	7	7	7	7	7	7	8	8	8
EB MTC Computer Applications	0	0	0	0	0	13	7	7	7	7	7	7	7	8	8	8
Effective Leadership *	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0
EKG Technician	0	0	12	8	8	0	7	7	7	7	7	7	7	8	8	8
Emotions in the Workplace *	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0
EMT *	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0
English & Lit Writing Class *	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESL Prep *	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finding Balance in Work & Life *	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
Fitness Fusion for Beginners *	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0
GIS and GIS Lab *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grant Writing *	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
History *	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Home School Programs *	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
InterGen Comm Styles S&S *	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intro to Supply Chain -*	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Introduction to Sheet Metal	0	0	0	20	0	0	7	7	7	8	8	8	8	8	8	8
Kids-Intro to College Courses	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0
Manufacturing Math	0	0	0	20	0	0	7	7	7	8	8	8	8	8	8	8
Medical Administrative Assistant **	0	0	0	0	0	0	10	11	12	13	15	16	18	19	21	24
Metrocast Training *	28	9	33	0	0	0	0	0	0	0	0	0	0	0	0	0
Mfg. Pipeline Design II	0	0	0	0	0	18	18	18	18	19	19	19	19	19	19	20
Mfg. Pipeline Intro fo Mfg.	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0
Mft. Pipeline Design III	0	0	0	0	0	18	18	18	18	19	19	19	19	19	19	20
Mft. Pipeline Welding V	0	0	0	0	0	21	21	21	21	22	22	22	22	23	23	23
Mft. Pipeline Welding VI	0	0	0	0	0	20	20	20	20	21	21	21	21	21	22	22
Mgmt Training 101 Part 2 Metr *	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MTC EB Computer Applications	0	0	0	0	0	15	15	15	15	15	16	16	16	16	16	16
Occupational Safety and Health *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Organizational Behavior *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametric Modeling CAD & Tutoring *	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Patient Care Technician	9	10	7	8	0	8	7	7	7	7	7	7	7	8	8	8
Pharmacy Technician	20	19	15	14	15	17	15	16	16	16	16	16	16	17	17	17
Phlebotomy	13	12	12	15	16	14	15	15	15	16	16	16	16	16	16	17
Pre Algebra *	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Real Estate Prin & Practices	17	16	31	22	20	25	23	23	23	23	23	24	24	24	24	25
Security Officer Training	0	0	9	0	7	12	7	7	7	7	7	7	7	8	8	8
SHRM *	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0
Solid Modeling II *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Software Applications Training *	54	36	37	12	11	0	0	0	0	0	0	0	0	0	0	0
The Art of Conversation *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TLC English	0	0	34	0	35	60	32	32	33	33	33	34	34	34	35	35
TLC Math	0	0	34	19	51	62	44	45	45	46	46	47	47	48	48	49
Understanding Health Insurance	0	0	0	0	10	7	7	7	7	7	7	7	7	8	8	8
Veterinary Assiting I and II	21	36	32	42	47	13	34	35	35	35	36	36	36	37	37	38
Welding Program	0	0	0	0	12	0	4	4	4	5	5	5	5	5	5	5
Wine *	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0
Writing Memoir&Personal Essay *	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Zumba Fitness *	35	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Continuing Education Total	**299**	**267**	**431**	**295**	**316**	**364**	**374**	**378**	**383**	**388**	**393**	**399**	**404**	**410**	**415**	**422**

Note - Continuing education expressed as headcounts

* Discontinued training

**New training 2018

***CAMI Program ended

PROGRAM

THREE RIVERS COMMUNITY COLLEGE - CONSOLIDATED ANALYSIS

Space Assessment — **Draft** 1-Mar-18
Three Rivers Community College — **Revised** 24-May-18
Connecticut State Colleges and Universities

Summary

Category	Existing Fall 2017	Current Need Fall 2017	Projected Need Fall 2022	Projected Need Fall 2027
Academic Space				
Classroom	23,749 sf	19,323 sf	20,276 sf	20,773 sf
Computer Labs	9,746 sf	8,633 sf	9,052 sf	9,241 sf
Business & Technologies	15,417 sf	13,545 sf	13,545 sf	13,545 sf
English & Communication	1,586 sf	1,325 sf	1,325 sf	1,325 sf
Humanities & Social Sciences	8,190 sf	9,242 sf	9,242 sf	9,242 sf
Nursing & Allied Health	9,215 sf	11,434 sf	11,509 sf	11,509 sf
Mathematics & Sciences	11,442 sf	13,220 sf	13,295 sf	13,295 sf
Shared Academic Space	2,632 sf	3,300 sf	3,300 sf	3,300 sf
Total Academic Space	*81,977 sf*	*80,022 sf*	*81,544 sf*	*82,230 sf*
ASF per Student FTE	*33.7 sf*	*32.8 sf*	*32.9 sf*	*31.6 sf*
Hosted Entities				
Central Connecticut State *(RN to BSN Program)*	0 sf	0 sf	3,600 sf	3,600 sf
Hosted Entities *(Middle College)*	4,971 sf	4,971 sf	4,971 sf	4,971 sf
Total Hosted Entities Space	*4,971 sf*	*4,971 sf*	*8,571 sf*	*8,571 sf*

Space Assessment — **Draft** 1-Mar-18
Three Rivers Community College — **Revised** 24-May-18
Connecticut State Colleges and Universities

Summary

Category	Existing Fall 2017	Current Need Fall 2017	Projected Need Fall 2022	Projected Need Fall 2027
Support				
Continuing Education & Work Force Development	6,075 sf	8,122 sf	8,122 sf	8,122 sf
Academic Support	4,704 sf	4,704 sf	4,704 sf	4,704 sf
Administrative Services	9,269 sf	10,234 sf	10,234 sf	10,234 sf
Assembly & Exhibition	5,711 sf	5,711 sf	5,711 sf	5,711 sf
Athletic & Recreation	5,309 sf	5,400 sf	5,400 sf	5,400 sf
Campus Services	9,021 sf	11,450 sf	11,450 sf	11,450 sf
Childcare Center	3,554 sf	4,235 sf	4,235 sf	4,235 sf
Library	13,235 sf	18,099 sf	18,419 sf	19,355 sf
Student Activities	18,373 sf	21,802 sf	22,187 sf	23,315 sf
Student Services	6,736 sf	8,342 sf	8,342 sf	8,342 sf
Technology	4,802 sf	4,802 sf	4,802 sf	4,802 sf
Total Support Space	*86,789 sf*	*102,902 sf*	*103,606 sf*	*105,670 sf*
ASF per Student FTE	*35.6 sf*	*42.2 sf*	*41.8 sf*	*40.6 sf*
Vacant Space	*1,749.2 sf*	*0.0 sf*	*0.0 sf*	*0.0 sf*
Total Assignable Square Feet	*175,487 sf*	*187,895 sf*	*193,721 sf*	*196,471 sf*
Student FTEs	*2,436.00*	*2,436.00*	*2,479.00*	*2,605.00*
ASF per Student FTE	*73 sf*	*77 sf*	*78 sf*	*75 sf*

THREE RIVERS COMMUNITY COLLEGE - BUILDING INVENTORY

Building / Wing	ASF	GSF	Year Built
Main Building			
A Wing	22,658	36,594	2010
B Wing	25,549	39,650	2010
C Wing	43,128	63,545	2010
D Wing	32,443	48,202	1962
E Wing	20,374	33,880	1962
F Wing	25,585	44,758	1962
Subtotal: Main Building	169,737	266,629	
CUP	7,637	15,954	2007
Total: TRCC	**177,374**	**282,583**	
		63%	

COST

35 Highland Circle, Needham, Massachusetts 02492

DRAFT

Three River Community College
Master Plan
Conceptual Estimate

Architect: Perkins & Will

June 22, 2018

Three River Community College
Master Plan
Conceptual Estimate

June 22, 2018

BASIS OF ESTIMATE

The estimate is based on the drawings and documents prepared by Perkins+Will including the following
TRCC Master Plan Project Scope Narrative for Cost Estimating - 06-10-2018

Qualifications / Clarifications:

1 Labor costs included at local prevailing wage labor rates.
2 The following mark ups are included:

General Conditions, General Requirements, Insurance & Bond, Permits	20.28%	
GC Fee	4.00%	
Design/Estimating Contingency	25.00%	
Construction Contingency (Carried by GC)	Excluded	
Construction Contingency (Carried by Owner)	Excluded	
Escalation	Excluded	
Project Cost markup on Construction Cost - Buildings (New & Renovated)	45.00%	per CSCU guidelines
Project Cost markup on Construction Cost - Site & Landscape Improvements	30.00%	per CSCU guidelines
Project Cost markup on Infrastructure Construction Cost	15.00%	

3 Project cost represents construction cost plus a 45% allowance as required by CSCU BOR for planning purposes for new and renovated building(s) projects
4 Project cost represents construction cost plus a 30% allowance for planning purposes for new and renovated sitework and landscape improvement projects. This is for projects that do not have any building(s) component(s) to their scope of work.
5 Projects are assumed to be procured through general contractor bid
6 Construction costs budgets are priced as stand alone construction projects. If projects can be combined and completed concurrently, potential savings can be realized.
7 Infrastructure improvements for existing SSC, AST and LCC buildings are assumed to be completed as part of any renovation/addition construction project for these are interdependent at each building location

The estimate excludes the following:

1 A-E Fees
2 Overtime
3 Phasing within renovation and new projects
4 Escalation - Pricing based on 3rd Qtr 2018
5 Owner Construction Contingency
6 Testing, removal and disposal of hazardous materials
7 Loose furniture and equipment. Part of Owner FF&E budget

NEAR-TERM PROJECTS	SF	Construction Cost	Construction Cost/SF	Project Cost
Renovation / Second Floor A & B Wings for Science and Nursing	9,909	$2,734,884	$276	$3,965,582
Renovations / D and E Wings for temperature and humidity control	NA	$419,432	NA	$608,176
Parking Lot Supplemental Lighting	NA	$383,703	NA	$498,814
Expanded Dining Area and Terrace	4,000	$1,440,000	$360	$2,088,000
Childcare Center Playground Upgrade	3,967	$158,680	$40	$206,284
Subtotal	13,876	$5,136,699		$7,366,856
10-YEAR PROJECTS				
Southwest Wing / New Construction	35,000	$21,000,000	$600	$30,450,000
Backfill Renovations Allowance	21,000	$7,413,000	$353	$10,748,850
Subtotal	60,000	$28,413,000		$41,198,850
Total		**$33,549,699**		**$48,565,706**

Three River Community College
Master Plan
Conceptual Estimate
22-Jun-18

DRAFT

ESTIMATED COST

AREA	LOC	Proposed Total Area	Proposed Estimated Construction Cost	A - Substructure	B - Shell	C - Interiors	D10 - Elevator	D20 - Plumbing	D30 - HVAC	D40 - Fire Protection	D50 - Electrial	E - Equipment	F - Demolition	G - Site (Sitework)	G - Site (Landscape)	Estimated Direct Cost/SF	General Conditions	Construction contingencies	Estimated Bldg. Cost/SF	NOTES
NEAR-TERM PROJECTS																				
Renovation / Second Floor A & B Wings for Science and Nursing		9,909	2,734,884	0.00	3.00	80.00	0.00	8.00	35.00	3.00	35.00	7.57	6.00	0.00	0.00	177.57	24.3%	25.0%	276.00	
Renovations / D and E Wings for temperature and humidity control		1	419,432	0.00	0.00	0.00	0.00	50,000.00	200,000.00	0.00	20,000.00	0.00	0.00	0.00	0.00	270,000.00	24.3%	25.0%	419,432.00	
Parking Lot Supplemental Lighting		1	383,703	0.00	0.00	0.00	0.00	0.00	0.00	0.00	187,000.00	0.00	0.00	50,000.00	10,000.00	247,000.00	24.3%	25.0%	383,703.00	
Expanded Dining Area and Terrace		4,000	3,124,000	60.00	160.00	80.00	0.00	10.00	60.00	6.00	45.00	18.75	30.00	22.50	10.00	502.25	24.3%	25.0%	781.00	
Childcare Center Playground Upgrade		3,967	158,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	12.60	1.26	7.56	2.52	25.21	24.3%	25.0%	40.00	
Total for NEAR-TERM PROJECTS			6,820,699																	
10-YEAR PROJECTS																				
Southwest Wing / New Construction		35,000	21,000,000	28.00	110.00	77.00	7.14	14.00	49.00	5.00	48.00	32.57	2.50	8.57	4.29	386.07	24.3%	25.0%	600.00	
Backfill Renovations Allowance		21,000	7,413,000	0.00	0.00	77.00	0.00	15.00	55.00	5.00	50.00	10.00	15.00	0.00	0.00	227.00	24.3%	25.0%	353.00	
Total for 10-YEAR PROJECTS			28,413,000																	

General Conditions including the following:

General Conditions, GC	10.00%
General Requirements, GC	4.50%
Insurances & bonds	3.25%
Permits	2.53%
Total for above General Conditions, CG	20.28%
GC Fee	4.00%

Construction Contingencies

Design/Estimating Contingency	25.00%
Construction Contingency (Carried by GC)	Excluded
Construction Contingency (Carried by Owner)	Excluded
Escalation	Excluded

Project Cost Contingencies (Added to construction costs)

Project cost mark-ups on building projects	45.00%
Project cost mark-ups on non-building projects	30.00%
Project cost mark-ups on infrastructure projects	15.00%

6.11 THREE RIVERS COMMUNITY COLLEGE

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LIST OF FIGURES

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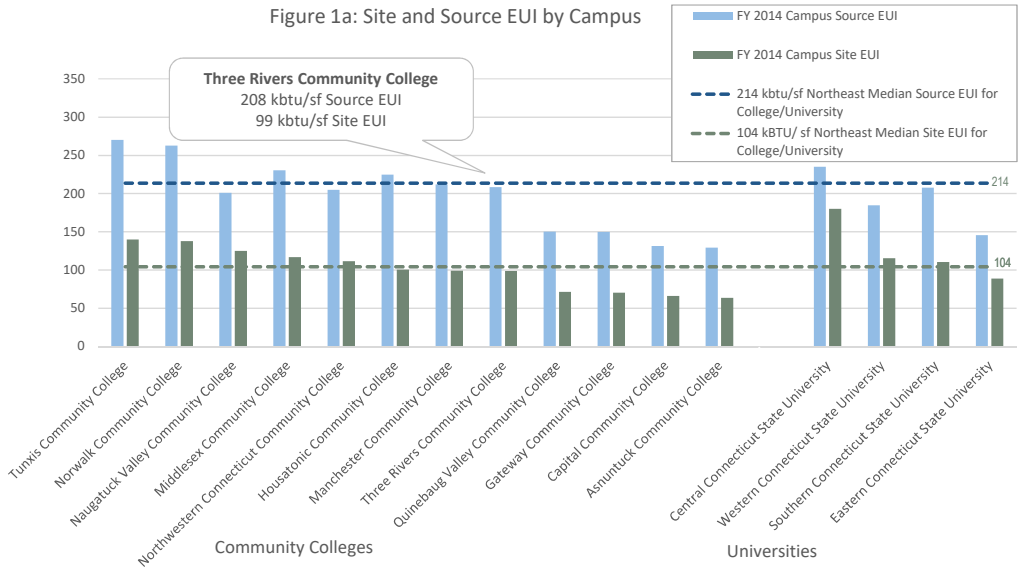
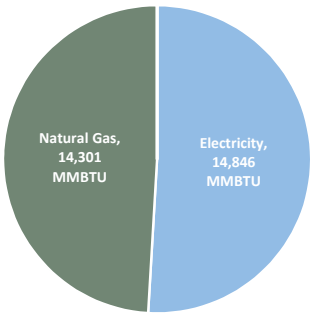
EXECUTIVE SUMMARY

The Three Rivers Community College (Three Rivers) Energy Master Plan aims to identify ways Three Rivers can improve energy use on campus, and be an active participant in Connecticut State Colleges & Universities (CSCU)'s energy management, reduction and conservation efforts. The utility data received indicates Three Rivers is a medium performing campus of the CSCU from an energy perspective (see Figure 1 Three Rivers Energy Dashboard). The energy use intensity (EUI) method is used for benchmarking and comparison purposes. Energy management efforts in the past have reduced Three Rivers' energy use, through effective use of the building management system (BMS), variable air volume (VAV) air handling units (AHUs), and central heating/cooling plant.





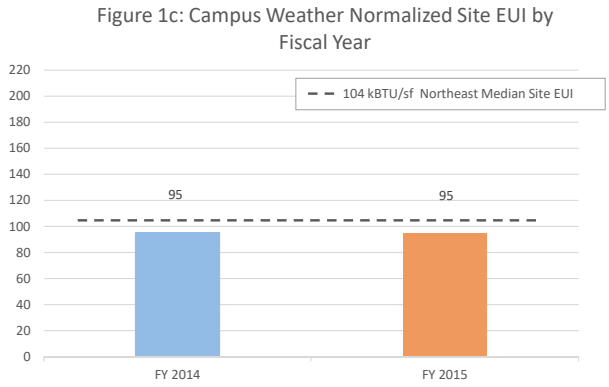


FIGURE 1: Three Rivers Community College Energy Dashboard

Improvements implemented after FY 2014 that are expected to further reduce Three Rivers' energy use include:

- Cascaded condensing natural gas boilers
- New windows
- LED exterior lighting

Energy Spend

Table 1 provides a summary of energy spending comparing to the average of CSCU campuses and the Northeast Region Commercial Sector.

	Three Rivers Community College	Average of CSCU Community College	Average of CSCU University	Northeast Region Commercial Sector
Cost per Square Feet	$ 2.50	$ 2.49	$ 2.08	$ 1.67
Cost per FTE Student	$ 268	$ 311	$ 677	$ -
Avg. Cost per kWh Electricity from Grid	$ 0.13	$ 0.14	$ 0.14	$ 0.15
Avg. Cost per MMBtu Natural Gas	$ 12.83	$ 10.06	$ 7.32	$ 10.03
Total Operating Expenses	$ 39,444,000	$ -	$ -	
Total Energy Spending	$ 736,721	$ -	$ -	
% of Operating Expenses	1.87%	1.95%	2.67%	

TABLE 1: Energy Cost Comparison (FY 2014)

Utility Incentives/ Develop Plan for Energy Efficiency Measures (EEMs)

Table 2 demonstrates a summary of the EEMs recommended for Three Rivers to pursue. Three Rivers should continue to collaborate with its utility provider Norwich Public Utilities to capture rebates and incentives for improving their energy use.

Opportunity ID	Energy Conservation or Efficiency Opportunity	App. Cost (Before Rebate)	Payback w/rebate (Years)	Priority
TRCC-1	Review Phoenix Controls settings for laboratory fume hoods so that fans do not run when unnecessary (recommission)	Minimal	Instantaneous	1
TRCC-2	Implement a fume hood sash management program to ensure that hoods are closed and turned off when not in use. Also conduct an audit to possibly lower the sash face velocity and in turn lower the volume of air unnecessarily removed from the building.	Varies	Varies	1
TRCC-3	Explore rooftop and parking canopy solar PPAs.	PPA	PPA	1
TRCC-4	Open triple-duty valve 100% when using VFDs.	None	Instantaneous	1
TRCC-5	Install all new LED interior lighting per scope developed with the utility.	Varies	2 - 6	1
TRCC-6	Recommission each building/wing HVAC system every 3-5 years to ensure building is functioning properly and efficiently. HVAC systems may not have been properly commissioned through testing and balancing (TAB), in which case retrocommission as soon as possible.	$0.5 - $3 per S.F.	Varies	1
TRCC-7	Complete on-site training for web-based BMS with operators.	Staff time	Varies	1
TRCC-8	Adding CO2 sensors for demand control ventilation (DCV) are recommended to improve air quality while not over ventilating.	$250 / Sensor+ Integration	Varies	2
TRCC-9	Install additional thermostat or adjust controls to reduce heating and cooling in the clock tower.	$300	Varies	2
TRCC-10	Explore continuous commissioning software package to monitor points until dedicated staff can be provided.	$40,000 per year	Varies	2

TABLE 2: Three Rivers Energy Efficiency Measures

Next Steps

In addition to the priority projects, next steps for Three Rivers are below:

Management

The BMS and operator understanding both play large roles in operating energy systems efficiently. Documenting system set points, such as outdoor temperature reset to enable condensing boiler operation and building comfort, should be a priority. The web-based BMS greatly improves the operator's or commissioning agent's ability to identify and correct operational issues. Training should be completed to familiarize operators with all of the building systems and the web-based functionality.

As part of the CSCU Energy Master Plan, CSCU should create a template for energy tracking applicable to all campuses. Three Rivers should track energy usage through such a template, as well as compare energy spend against available budgets, and verify consumption reports.

Fume Hoods

Although good practices were evident during the walk-through assessment, a fume hood sash management program should be implemented to ensure hoods are closed and turned off when not in use.

Renewable Energy

Explore solar power purchase agreements (PPAs) for portions of the building roof and/or parking canopies. Flood plains may prohibit a large solar array.

By continuing to focus on optimizing systems, and implementing the suggestions of the Energy Master Plan, Three Rivers has the opportunity to create local and cost-effective power through solar PV and increase energy efficiency operations.

INTRODUCTION

As part of the Connecticut State Colleges & Universities (CSCU) Energy Master Plan, Three Rivers Community College (Three Rivers)'s building infrastructure, energy use and energy management practices were assessed. The ultimate goal was to determine ways Three Rivers could improve its energy use on campus, and be an active participant in CSCU energy reduction efforts. This chapter identifies Three Rivers' historical energy use, future projected needs and energy recommendations.

1.1 THREE RIVERS OVERVIEW

Located at 574 New London Turnpike in Norwich, Connecticut, Three Rivers is a single-campus community college serving students throughout southeastern Connecticut. The commuter campus is located on approximately 39 acres of land and features a central plant and one large, multi-winged building. The 280,186 square foot facility supports all campus services, and features 37 state-of-the-art classrooms and a 13,000 square foot library. Amenities at Three River include a full-service dining room, 19 computer labs, a fitness center, bookstore, library commons, and nine conference rooms. The main campus building is organized into Wings A through F. The following list provides a description of the wings.

- **Wing A:** Student Services: Admissions/Welcome Center, Testing Center, Registration, Cashier, Financial Aid, Veteran's Affairs, Disabilities Services, Academic and Career Counseling, Bookstore, Continuing Education
- **Wing B:** Classrooms and technology labs
- **Wing C:** Library/Tutoring Center, Faulty and Administrative Offices
- **Wing D:** Liberal arts, technology, and science classrooms
- **Wing E:** Computer labs, Childcare center
- **Wing F:** Cafeteria, Student Program's Office, Student Lounge, Fitness Center

Three Rivers operates a central plant, which provides heating & cooling to the campus. Three Rivers also has leased an off-campus instructional center located at the Naval Submarine Base (Building 83) in Groton, Connecticut, not included in the current assessment.

Three Rivers' building information is displayed in Table 1.1.

Building	Year Built [Renovated]	Gross Square Feet	Building Function
Three Rivers / Thames II Campus Building	1962 [1964/1966/2009]	280,186	Multi-Use
Three Rivers / Thames II Central Utility Plant	2008	15,458	Facilities
Total		**295,644**	

TABLE 1.1: Three Rivers Campus Building Information

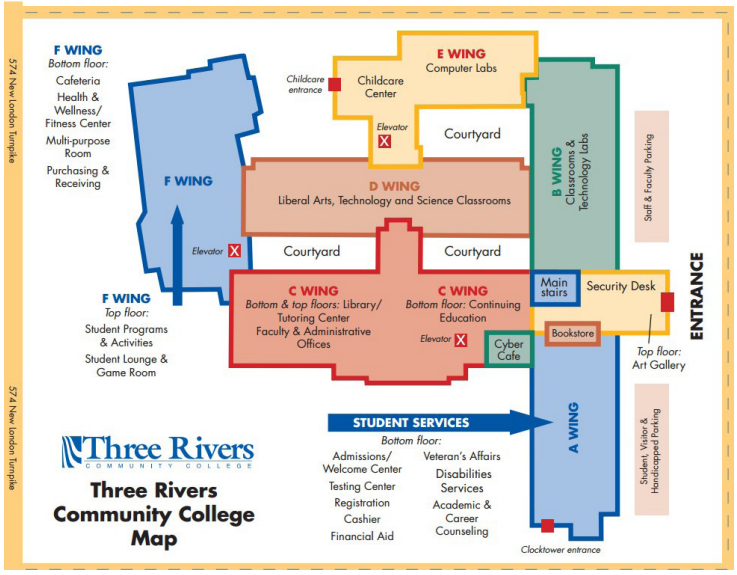


FIGURE 1.1: Building Map

FIGURE 1.2: Three Rivers Courtyard View

1.2 PREVIOUS ENERGY STUDIES & PROJECTS

Three Rivers has not participated in any past audits, other than a preliminary benchmarking study by the Institute for Sustainable Energy at Eastern. Regardless, the campus' facilities department stays cognizant of campus energy needs. Some energy projects resulted as pure necessity from equipment failure, which can often be the circumstance for smaller campuses with limited funds. The following is a list of recently completed energy-related projects:

NEW EXTERIOR WINDOWS
Year: 2013
Associated Building: C, D, E Wings

CONSTRUCTION OF CAMPUS CENTRAL PLANT-ONLY PUMPS AND CHW SYSTEM REMAIN
Year: 2008
Associated Building: Central Plant

NEW CONDENSING BOILERS DUE TO EQUIPMENT FAILURE
Year: 2015
Associated Building: Central Plant

ROOF (EPDM FIRESTONE)
Year: 2015
Associated Building: E Wing

OUTSIDE LIGHTING LED
Year: 2016
Associated Building: All

EXISTING CONDITIONS & RECOMMENDATIONS

Information on Three Rivers' existing conditions was captured from campus interviews, energy data and reports provided by the campus. A holistic view of existing practices, material on energy management, energy infrastructure and project implementation processes was reviewed. Analysis of the data and campus walkthroughs helped clarify recommendations with the goal of decreasing energy use, documented after each subheading.

2.1 FACILITY ENERGY BENCHMARKING AND ENERGY CONSUMPTION

Figure 2.1 provides a summary of Three Rivers' energy use. Appendix A documents information on the assumptions and data sources used for energy benchmarking purposes. Three Rivers' site EUI of 99 kbtu/sq ft is below the Northeast median of 104 kbtu/sq ft for colleges/universities.

Figure 2.1a: Site and Source EUI by Campus

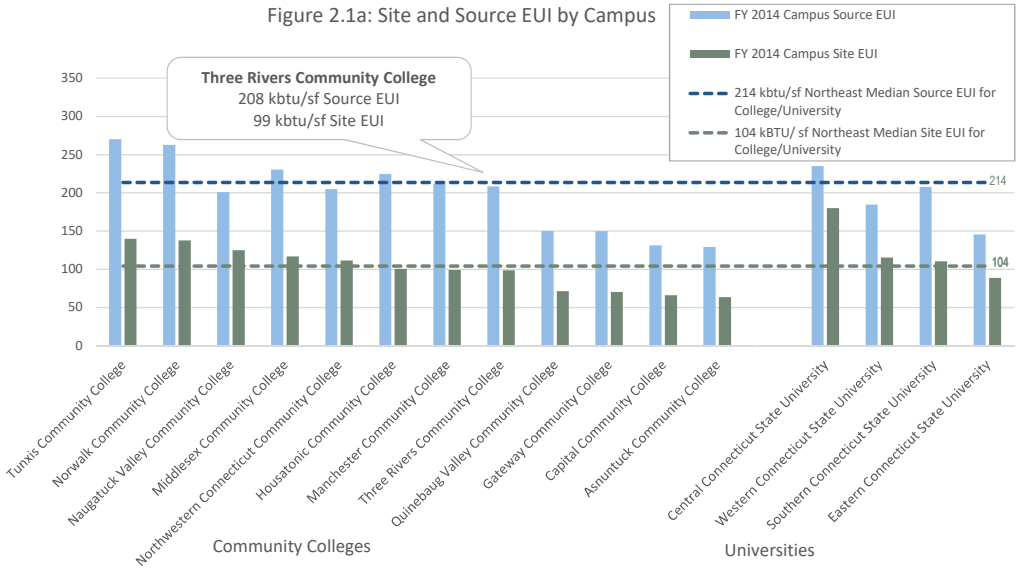


Figure 2.1b: Campus Energy Use by Type (FY 2014)

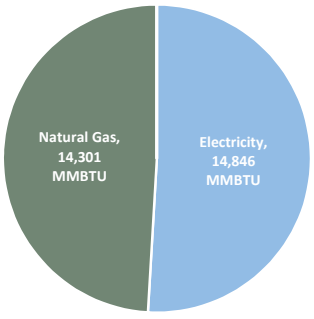


Figure 2.1c: Campus Weather Normalized Site EUI by Fiscal Year

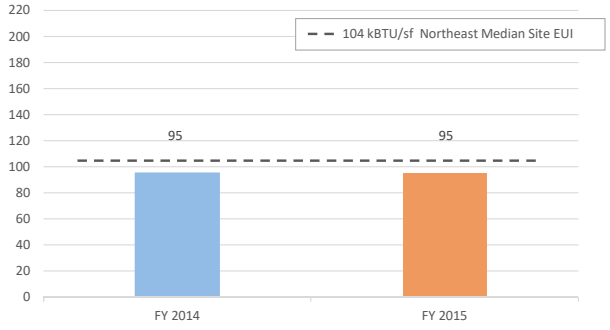


FIGURE 2.1: Energy Dashboard - Three Rivers Community College

	Three Rivers Community College	Average of CSCU Community College	Average of CSCU University	Northeast Region Commercial Sector
Cost per Square Feet	$ 2.50	$ 2.49	$ 2.08	$ 1.67
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Avg. Cost per MMBtu Natural Gas	$ 12.83	$ 10.06	$ 7.32	$ 10.03
Total Operating Expenses	$ 39,444,000	$ -	$ -	
Total Energy Spending	$ 736,721	$ -	$ -	
% of Operating Expenses	1.87%	1.95%	2.67%	

TABLE 2.1: Energy Spend Comparison

Three Rivers' natural gas unit cost is approximately 28% higher than the CSCU Community College average. Three Rivers is the only campus supplied by Norwich Public Utilities (NPU) and may explain the higher than average cost. A charge called "Gas Capital Tracker" accounts for most of the difference. Combining meters may be a way to reduce the natural gas costs, as has been show at other campuses, however the utility has not favored the option in the past.

Three Rivers has a more favorable unit cost for electricity than the average CSCU community college and pays a smaller portion of the operating budget on energy.

2.2 CAMPUS UTILITIES AND DISTRIBUTION

Three Rivers is located in Norwich Connecticut, which operates its own municipal utility, NPU. The utility provides both electricity and natural gas to the campus. Unlike with the other CSCU campuses which are served by the state regulated investor-owned utilities, NPU is owned by the Norwich municipality and governed by a local commission.

The Central Plant has a separate natural gas and electric feed.

2.3 ENERGY PROCUREMENT

All of Three Rivers' electricity and natural gas supplies are provided by NPU.

2.4 OPERATIONAL AND ENERGY MANAGEMENT PRACTICES

2.4.1 CURRENT CONDITIONS

Three Rivers takes prides in their new campus facilities and has dedicated facility staff to ensure the proper upkeep of campus infrastructure. However, the campus is still in need of additional staff; facilities had a 22-member team and has since decreased to 13 members which are comprised of mainly custodians.

Most staff effort is placed on repairing systems and correcting problems rather than optimizing. Often, problems are not noticed unless due to failure or complaint. Typical operating hours for the campus are:

Monday – Thursday : 8AM-8PM

Friday : 8AM to 4PM

Saturday : 9AM-1PM

Sunday : 7PM-10PM

However, over the last two years, the campus has been closed on weekends in order to reduce operating costs. Scheduling of equipment can take place in the building management system (BMS), but achieving optimal room air quality year round is difficult.

The campus has a BMS, but energy management system (EMS) aspects of the system are either not used or available. Other than monthly totalized reporting to the CSCU, energy tracking and monitoring has not been standard practice.

ENERGY USE INFORMATION MANAGEMENT SYSTEM

The BMS and operator understanding both play large roles in operating energy systems efficiently. The system is web-based and allows maintenance staff to adjust equipment set points to conserve energy or address building component dysfunctions through remote access.

2.4.2 RECOMMENDATIONS

Adding a dedicated and properly trained staff member to monitor the building and plant energy systems is recommended. The costs associated with the additional staff would likely be offset by operational and maintenance savings; both energy savings and prolonged equipment life could be realized.

For the BMS, documenting system set points, such as outdoor temperature reset to enable condensing boiler operation and building comfort, should be a priority. Adding CO2 sensors for demand control ventilation (DCV) are recommended to improve air quality while not over ventilating.

EMSs can offer an excellent way to track energy use of specific equipment such as an air handler, pump, or boiler. The implementation of an EMS is recommended to track detailed energy usage, in addition to the macro view of looking at bills regularly.

As part of the CSCU Energy Master Plan recommendations in Section 5.2.2, it is recommended that the System Office create a template for energy tracking applicable to all campuses. Three Rivers should use this template to track energy over time, at a minimum on a monthly basis. Energy tracking should also include monitoring spending against available budgets.

2.5 EXISTING BUILDING COMMISSIONING

2.5.1 CURRENT CONDITIONS

No recent building commissioning efforts were reported. As the campus is currently understaffed, the need for commissioning becomes apparent generally after a problem is noticed due to failure or complaint. According to the campus, new HVAC equipment was installed in 2006 and has not worked as optimally as was expected.

There have been air quality and balancing issues since installation. They have been unable to commission the equipment at this time.

2.5.2 RECOMMENDATIONS

Existing building commissioning (EBCx) is needed based on indoor air quality (IAQ) and temperature complaints. Energy savings may be a side benefit with the primary reason being building air quality.

Recommissioning should include a thorough review of all BAS screens and settings. For example, from the screenshot below, recommissioning may find a leaking heating valve by noticing a rise in temperature across the coils when in economizer mode or the valve is closed. (Note: +/- 2°F air temperature sensor calibration and temperature rise across fan may account for the 6°F rise in this example).

Another recommissioning example may be to analyze the supply and return temperature set points for the boiler system. The return temperature of 128°F is allowing the boilers to condense, but not optimally. If the boiler outlet temperature can be further reduced to allow a lower discharge temperature, and therefore a lower return temperature, perhaps at 120°F, the efficiency will increase from approximately 87% to 91%.

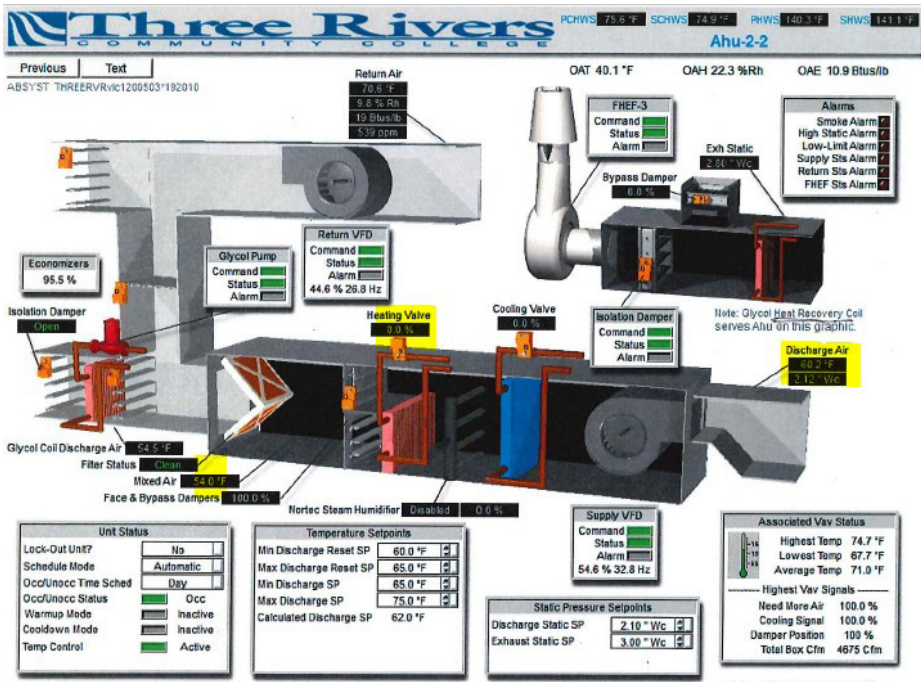

FIGURE 2.2: Three Rivers BMS

Buildings with BMS systems with measurable points stand to benefit the most from recommissioning. A properly commissioned building should be turned over with a thorough commissioning report, complete with checklists and testing and balancing (TAB) reports for each piece of equipment, even windows and lighting. If this documentation is not available, it is a good indication the building was not properly commissioned. Newer buildings with a higher than average EUI are also indicative of a poorly commissioned building.

As a general rule of thumb:

- Recommission existing building systems every 3-5 years.

2.6 MECHANICAL SYSTEMS

2.6.1 CURRENT CONDITIONS

The Three Rivers campus has an immaculate state-of-the-art central heating and cooling plant with six cascaded condensing natural gas boilers integrated into a BMS. Three centrifugal chillers are also located in the central plant. Domestic hot water is generated with two natural gas hot water heaters.

All boilers and one of the hot water heaters are new as of fall 2015 due to failure of the original equipment which were less than ten years old. Water quality and/or condensing of the flue gases are possibilities for the premature equipment failures.

Three Rivers uses a four pipe heating/cooling system for the building, meaning hot water and chilled water each have their own independent supply and return pipe.

Most air handling equipment is new as of 2006, but as previously stated, has not be operating well and have many issues with air quality, humidity, and temperature.

FIGURE 2.3: Centrifugal Water Cooled Chillers

One of the air handling units has had water collecting underneath the unit. Some of the roof top units use natural gas for heating where other units use hot water from the central plant.

FIGURE 2.4: Cascaded Benchmark Condensing Boilers

The following lists are recommendations by system type that would aid in optimizing efficiency, and reducing energy.

BOILER SYSTEM

- Reduce heating system temperature via outdoor temperature reset when the climate is warmer than design (worst case) conditions. The return temperature to the boilers should be as low as possible to enable condensing. The figure in the commissioning section which shows the effect of return temperature on efficiency.
- Open triple duty valves to 100% as the variable frequency drives (VFDs) should be used to control the flow rather than adding the unneeded pressure drop with the balance valves.

CHILLER SYSTEM

- Open triple duty valves to 100% as the VFDs should be used to control the flow rather than adding the unneeded pressure drop with the balance valves.
- Employ a cooling water temperature reset strategy so the water temperature is only as cool as needed by the building.

HVAC AIR SIDE

- Retrocommission equipment.
- Install demand control ventilation (DCV).
- Install additional thermostat or adjust controls to reduce heating and cooling in the clock tower.

FUME HOODS

- Implement a fume hood sash management program to ensure that hoods are closed and turned off when not in use.
- Conduct audit to possibly lower the sash face velocity and in turn lower the volume of air unnecessarily removed from the building. Factoring heating and cooling degree days, as well as CSCU's average fuel costs, the campus could see savings of approximately $2 per SCFM-year.
- Review Phoenix Controls settings for fume hoods so that fans do not run when unnecessary.

FIGURE 2.5: Fume Hoods

2.7 LIGHTING

2.7.1 CURRENT CONDITIONS

Three Rivers is coordinating with NPU for support and incentives in an initiative to upgrade existing lighting to LED. All exterior lighting was replaced with LED in May and June of 2016. The campus also had a lighting audit and is in the process of creating a scope of work for all interior lighting, where there is much room for improvement. The lighting audit should be referenced for additional information.

Most lights are controlled either manually or with a timer. Some rooms have limited occupancy controls.

2.7.2 RECOMMENDATIONS

The campus should consider the following recommendations:

- Add occupancy based lighting (and ventilation) controls to auditorium.
- All exterior lighting should have photo sensors installed to replace timers.
- Daylight sensors

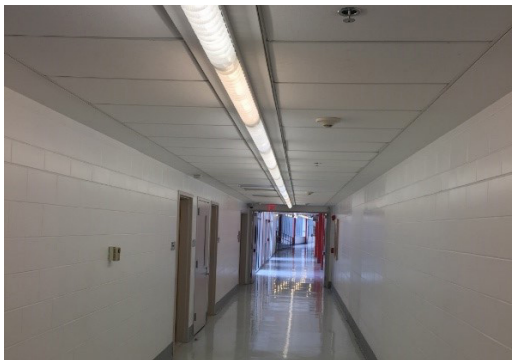

FIGURE 2.6: Indoor Lighting

2.8 BUILDING ENVELOPE

2.8.1 CURRENT CONDITIONS

In FY 2013, Three Rivers' completed renovations in the "C," "D," and "E" wings to replace existing doors and exterior windows. These kinds of renovations help tighten the building envelope and maintain better consistency of temperatures needed for building heating and cooling. A large courtyard contributes natural light, although at a cost of increased heating and cooling costs due to the additional surface area.

In general, apply energy efficiency measures in the following order:

- Reduce internal loads;
- Reduce building envelope loads;
- Reduce HVAC distribution system losses;
- Decrease HVAC equipment energy consumption; and
- Make major HVAC reconfigurations.

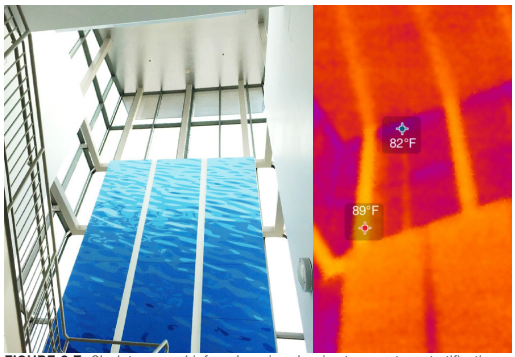

FIGURE 2.7: Clock tower and infrared version showing temperature stratification more than 10 degrees higher than the setpoint

2.9 DISTRICT ENERGY / COGENERATION

2.9.1 CURRENT CONDITIONS

There is no district energy or cogeneration at Three Rivers.

2.9.2 RECOMMENDATIONS

As there is limited summer thermal use, a cogeneration application is unlikely to provide additional benefit over the existing boilers.

2.10 RENEWABLE ENERGY

2.10.1 CURRENT CONDITIONS

Three Rivers has not implemented any renewable energy projects on campus.

2.10.2 RECOMMENDATIONS

Three Rivers' campus provides substantial opportunities for solar through multiple installations of roof-top, as well as potential ground-mount solar PV. The rooftop available space on the main building (Figure 2.8) totals approximately 80,000 GSF; assuming 90% availability of space for mechanical equipment setbacks, there is a potential of an estimated 333-434 kW. The Central Utility Plant, constructed in 2008, also has potential for roof-top solar. With any roofing improvements, implementation of solar PV should also be considered at the same time. Integrating solar simultaneously with new roofing can help streamline both projects into one and mitigate issues the insurance provider may have for existing roofs. Solar PV should be incorporated into future capital planning building design.

The campus is surrounded by parking lots which may present a possibility for parking canopies, in particular for the southeast parking lot. However, permitting requirements would need to be explored as the southeast parking lot is within the 100 year flood plain.

Table 2.2 provides an overview of the buildings that may be considered for solar PV in the future. Following the table are images of each of the sites.

Building Name	Year Built [Renovated]	GSF [FY 2015]	Building Roof sq. ft.	Roof Install/ Replacement Date	Roof Type	Array Size Potential (kW DC)[1]	Annual Generation Potential (MWh)[2]	Solar Suitability Comments
HIGH PRIORITY PROJECTS								
Three Rivers / Thames II Campus Building	1962 [1964/ 1966/ 2009]	280,186	80,412	-	EPD M	333-434	434-557	Only portions of the roof suitable due to mechanical equipment. The building square foot reflects the available space, at 90% availability accounting for set backs
Three Rivers / Thames II Central Plant	2008	15,458	11,104	-	-	51-67	67-86	
Total		**295,644**	**91,516**			**384-501**	**501-643**	

TABLE 2.2: Three Rivers Potential Areas for Solar PV

[1] Assumes that each sf of panels can generate between 4.6 and 6 Watts DC (about a third of the PVWatt Output Assumptions). Actual generation values would be calculated if a solar PV study was performed.
[2] Assumes that each sf of panels can generate between 6 and 7.7 kWh annually (about a third of the PVWatt Output Assumptions).Actual generation values would be calculated if a solar PV study was performed.

FIGURE 2.8: Three Rivers Campus Solar Potential

2.11 CAPITAL PLANNING

2.11.1 CURRENT CONDITIONS

The System Office and State financing is necessary to support capital projects such as Three Rivers' 2006 multi-phased campus expansion project . The System Office provides annual code compliance and infrastructure funds. Most recently, in fiscal year 2013, Three Rivers' completed renovations in the "C," "D," and "E" wings to replace existing doors and exterior windows. Larger capital projects are also funded under CSCU 2020, as of FY 2015. The State Legislature allocates bonds for campus improvement projects.

More information on campus expansion projects is found in Section 3.1.

2.11.2 RECOMMENDATIONS

In addition to existing funding methods, Three Rivers should collaborate with NPU for all major building renovations and all new construction.

2.12 COLLABORATION / PARTNERSHIP

2.12.1 CURRENT CONDITIONS

Three Rivers' utility company has an energy efficiency fund in which customers pay a portion of their monthly bill to the fund. The fund helps support energy efficiency projects for the municipal utility's customers. NPU has been supportive of Energy Efficiency Measures (EEMs) the campus has pursued, including building controls, HVAC upgrades, and lighting. Future planned upgrades include further BMS upgrades (from Bacnet to web base) and upgrading to LED lighting.

The System Office Facilities Department is also available to provide assistance in budgeting, capital planning and technical support for the community college projects, including Three Rivers.

2.12.2 RECOMMENDATIONS

Three Rivers should continue to collaborate with NPU and the System Office for capital planning.

2.13 SUMMARY OF RECOMMENDED ENERGY EFFICIENCY OPPORTUNITIES

As a result of the campus walk through energy assessment, and interviews with campus staff, a list of potential EEMs is presented in Table 2.3. These projects represent both low cost, immediate action measures, as well as projects that may require larger capital and therefore be longer-term.

Both of Three Rivers' utilities are through NPU. Previous discussions indicate there is an open channel of communication between Three Rivers and NPU on custom EEM projects and Three Rivers should continue to involve the utility on any new projects or upgrades connected to energy use.

Since incentives are often based on incremental energy savings, further analysis and collaboration with NPU is required to determine rebate amounts for each opportunity. To help Three Rivers navigate and prioritize the energy opportunities identified, a summary of EEMs were identified

The simple payback in most cases cannot be reasonably estimated without detailed building models and/or more operating data. The payback periods provided are based upon the performance of past similar projects and are not necessarily indicative of future results.

Opportunity ID	Energy Conservation or Efficiency Opportunity	App. Cost (Before Rebate)	Payback w/rebate (Years)	Priority
TRCC-1	Review Phoenix Controls settings for laboratory fume hoods so that fans do not run when unnecessary (recommission)	Minimal	Instantaneous	1
TRCC-2	Implement a fume hood sash management program to ensure that hoods are closed and turned off when not in use. Also conduct an audit to possibly lower the sash face velocity and in turn lower the volume of air unnecessarily removed from the building.	Varies	Varies	1
TRCC-3	Explore rooftop and parking canopy solar PPAs.	PPA	PPA	1
TRCC-4	Open triple-duty valve 100% when using VFDs.	None	Instantaneous	1
TRCC-5	Install all new LED interior lighting per scope developed with the utility.	Varies	2 - 6	1
TRCC-6	Recommission each building/wing HVAC system every 3-5 years to ensure building is functioning properly and efficiently. HVAC systems may not have been properly commissioned through testing and balancing (TAB), in which case retrocommission as soon as possible.	$0.5 - $3 per S.F.	Varies	1
TRCC-7	Complete on-site training for web-based BMS with operators.	Staff time	Varies	1
TRCC-8	Adding CO2 sensors for demand control ventilation (DCV) are recommended to improve air quality while not over ventilating.	$250 / Sensor+ Integration	Varies	2
TRCC-9	Install additional thermostat or adjust controls to reduce heating and cooling in the clock tower.	$300	Varies	2
TRCC-10	Explore continuous commissioning software package to monitor points until dedicated staff can be provided.	$40,000 per year	Varies	2

TABLE 2.3: Three Rivers Recommended Energy Efficiency Measures

ENERGY NEEDS

3.1 FUTURE DEVELOPMENT

Campus construction and expansion often has an impact on energy use and energy infrastructure needs. Starting in 2006, Three Rivers underwent a major multi-phased campus expansion project, completed in 2009. There are no current plans for expansion and portions of the property are in the flood plain, which inhibits large expansions.

Based on future development plans, it is not anticipated that any additional energy infrastructure such as electric feeders or new meters will be needed. The campus is a part of a microgrid with NPU, giving it islanding capabilities should a power outage occur. The campus does not frequently experience issues with outages. Three Rivers also has three standby generators, which provide power for IT needs, emergency lighting, and the cafeteria refrigerator.

3.2 ENERGY RESILIENCY RECOMMENDATIONS

Three Rivers partook in system-wide hazard mitigation initiative. The CSCU Multi-Hazard Mitigation Plan provided recommendations surrounding energy resiliency that are also applicable for the Energy Master Plan. The hazard mitigation plan suggested additional building envelope improvements, which would aid in energy conservation.

CONCLUSION / NEXT STEPS

Three Rivers is being proactive to address energy upgrades by coordinating with NPU. As supported by the campus utility data, Three Rivers is performing well and has an EUI below average in comparison to Northeast College and University available data.

The biggest opportunity for the campus relates to building commissioning. As occurred in the past, even recently purchased equipment may not have been properly commissioned and should be recommissioned regularly. More easily implemented energy saving opportunities include upgrading interior lighting as planned and optimizing ventilation rates for fume hoods, bathrooms, and common areas. Other top priority initiatives include:

- *Management:* Three Rivers should take a more active role in tracking energy use and comparing energy spend to available budgets. Additional staff may be needed to focus solely on energy use and efficiency with O&M.
- *Renewable Energy:* Explore PPAs for solar on the main building and central plant.
- *Utility Incentives/ Develop Plan for EEMs:* Three Rivers should maximize incentive funding for EEMs by working with NPU.

A summary of further projects and priorities for the campus are listed in Table 2.3. While Three Rivers has a lower than average EUI among CSCU, there are still opportunities to capture savings, decrease energy use and increase energy reliability and sustainability.

4.1 CONTACT INFORMATION FOR KEY STAKEHOLDERS

Collecting all the necessary information for this planning effort required a collaborative effort. Below are the stakeholders that were active in providing their expertise about campus current conditions and future needs, and energy related decisions.

THREE RIVERS COMMUNITY COLLEGE

ARNIE DELAROSE
Director of Facilities
adelarosa@trcc.commnet.edu
860-215-9236

APPENDIX A: THREE RIVERS DATA METHODOLOGY, ASSUMPTIONS AND NOTES

All three fiscal years have complete consumption data. No information to indicate that the campus uses propane, fuel oil, purchased chilled water or steam.

Electricity Utility Bill Summaries (FY13,14,15)

Natural Gas: Utility Bill Summaries(FY13,14,15)

CMPAC PRESENTATIONS

AGENDA

1. Introduction
2. Planning Context
3. The Campus Today
4. Physical Analysis
5. Preliminary Space Assessment
6. Next Steps

Discussion

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INTRODUCTION

PROJECT TEAM

Master Planners / Architects	
Perkins+Will	
Bill MacIntosh, AIA LEED AP	*Managing Principal / Lead Planner*
Mike Aziz, AIA LEED AP	*Project Manager*
Lois S.K. Suh	*Campus Planner*

Specialist Consultants

Space Programming	MEP Infrastructure	Cost
Scott B. Page	**AKF Group**	**VJ Assoc.**

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COLLEGE + UNIVERSITY MASTER PLAN UPDATES

COMMUNITY COLLEGE MASTER PLAN UPDATES

	Start
Naugatuck Valley Community College	Fall 2015
Housatonic Community College	Fall 2015
Northwestern Community College	Spring 2016
Manchester Community College	Spring 2017
Asuntuck Community College	Summer 2017
Three Rivers Community College	Winter 2017
Quinebaug Community College	Winter 2017
Norwalk Community College	
Gateway Community College	
Tunxis Community College	
Middlesex Community College	
Capital Community College	

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MASTER PLAN

Project Goals

Through a **collaborative** effort, between college stakeholders, the system - office representation and the consultant team, the Master Plan Update will **integrate** the college mission and ACC's Strategic Plan, as well as recognize system-wide goals into a **comprehensive vision** that promotes the **advancement of higher education** through state-of-the-art planning projections over a 10-year projection.

Concepts will reinforce current and institute new **long-term strategies** that guide college decision making for capital investment.

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MASTER PLAN
Project Objectives

1. The Master Plan will respond to the college's **strategic plan**, **mission**, **demographics** and projected **future enrollment**.

2. Program space needs will reflect **best practice standards** and address emerging higher education goals.

3. Land planning will balance **guidance** and **flexibility**, long-term development capacity and stewardship.

4. The Master Plan will **optimize** the use of existing facilities in the utilization of space, the location of functions, and the renewal of buildings to meet future needs.

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MASTER PLAN

Project Objectives

8. The Master Plan will **integrate sustainability** throughout and identify strategies for energy conservation.*

9. Campus **infrastructure** needs will be addressed to support college operations.

10. The resulting Master Plan Update will be a comprehensive vision comprised of a series of capital projects, with associated **institutional priorities** and **phasing strategies**.

*Including the CSCU system-wide Energy Master Plan

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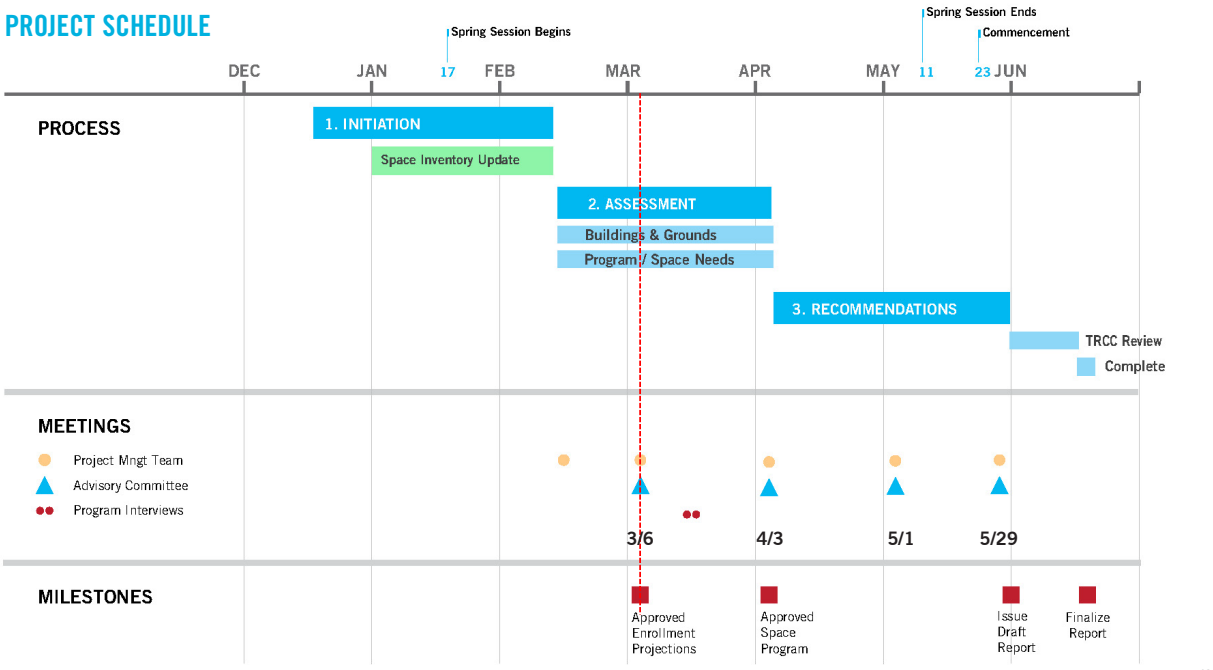
PROJECT SCHEDULE



12

PLANNING CONTEXT

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PLANNING CONTEXT

- Strategic Plan 2009-2014
- System Technology Plan (Transform 2020)
- Connecticut Community Colleges Information Technology System Strategic Plan 2004-2006
- Academic Plan 2016-2017
- Development Plan 2015-2017
- Enrollment Plan 2017
- General Education Assessment Plan 2013-2018
- Master Plan 2005

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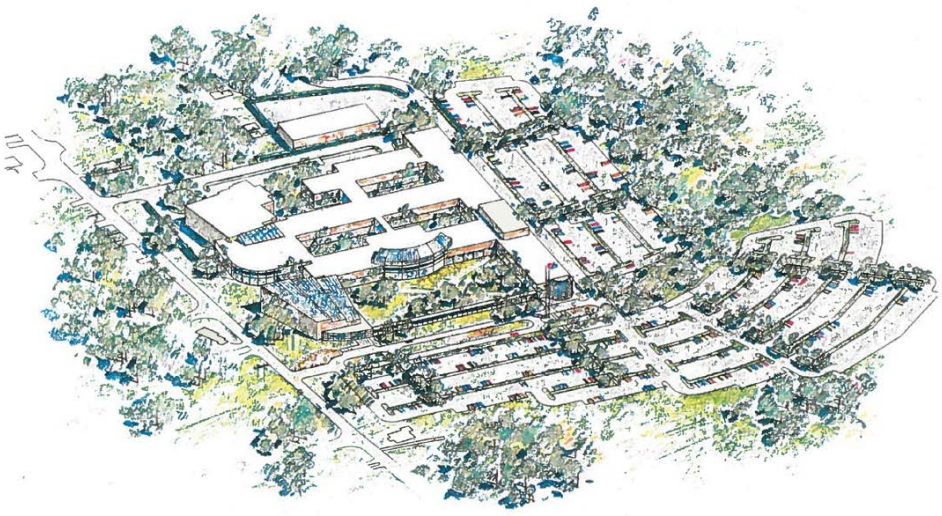
PREVIOUS MASTER PLAN / CONTEXT

Master Plan 2005

Fletcher-Thompson, Inc.
Mitchell / Giurgola Architects



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15

MASTER PLAN 2005

Key Recommendations

- Consolidate two locations into one at the Thames Valley Campus (current College location).
- Program based on 2003 Campus Master Plan Update completed by Rickes Associates
- Existing Building: 108,000 SF
- Recommended Expansion of 205,000 SF (current A, B, C & portion of F wing)
- College “Front Door” with new entry boulevard
- Additional parking with improved vehicular circulation pattern around main building.
- Remove the building vacated by the Norwich Regional Vocational Technical School.

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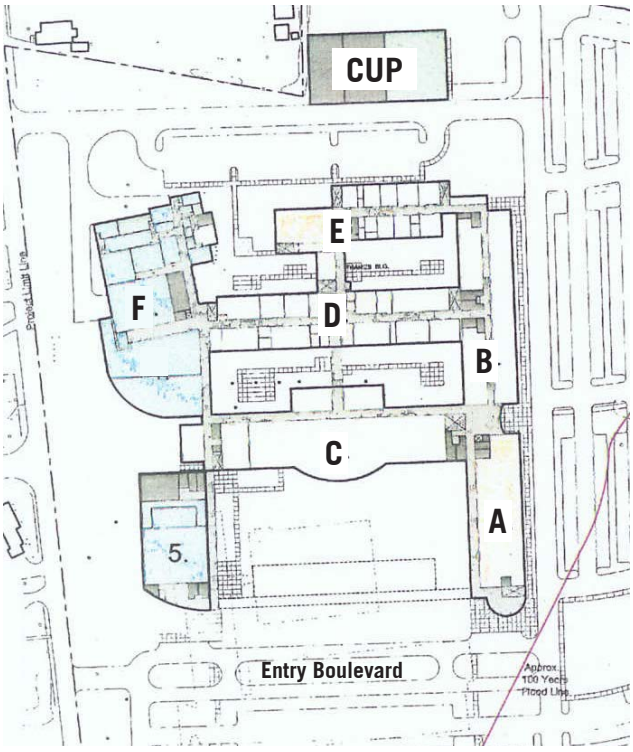

STRATEGIC PLAN 2009-2014

I. Expanding Access to Educational Opportunities by Supporting Student Success

II. Maintaining Affordability: Tuition. Financial Aid and Resource Development

III. Improving Accountability

IV. Improving Learning and Assessment

V. Ensuring a Safe, Secure, and Inclusive Campus Environment

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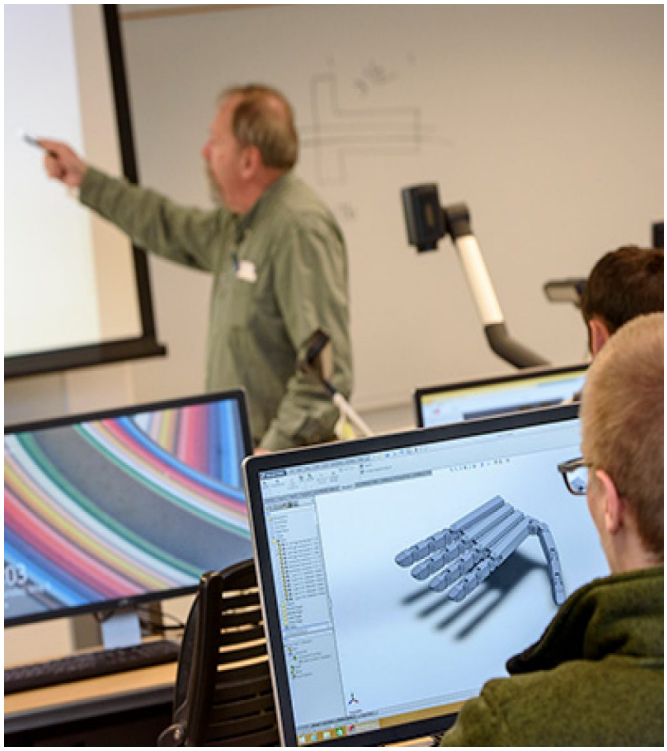

STRATEGIC PLAN 2009-2014

Planning Assumptions / Guiding Principles:

I. TRCC will maintain NEASC and Program **accreditations** that further the institutional mission, enhance program quality, and maintain consistency with college resources.

2. Connecticut's economic climate will have a major bearing on college operations regarding **enrollments and program demand**. TRCC will need to frequently and effectively adjust its priorities to meet these challenges. Bond funding as a separate State funding source for college capital projects and code compliance will be provided as projected.

3. Moving into and adapting to **new facilities and continuing construction activities** will play an ongoing role in all college activities for the next few years.

4. TRCC's new facilities will become an important **community resource** which will be in greater demand.

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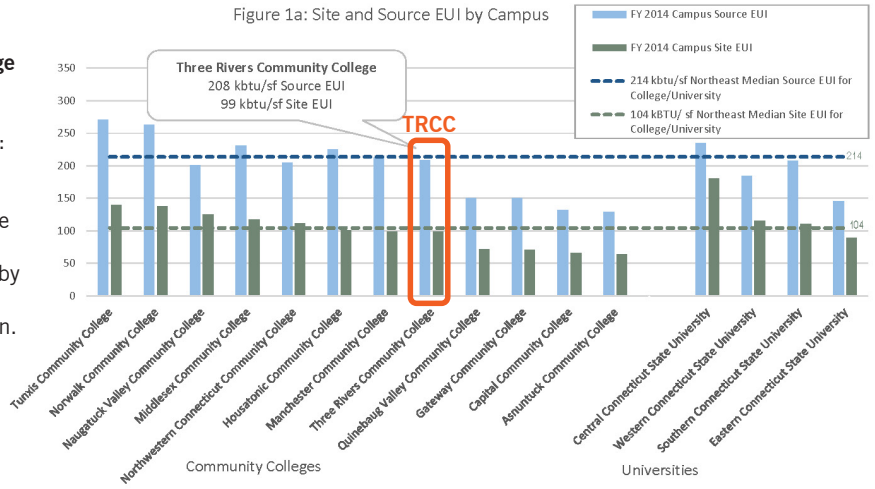
CSCU ENERGY MASTER PLAN

Key Findings

- TRCC's energy use is on **average** with CSCU peers.
- Campus Utilities / Distribution: **Electricity & Natural Gas**
- TRCC is the only campus in the system supplied by Norwich Public Utilities (**NPU**), owned by the Norwich municipality and governed by a local commission.

Figure 1a: Site and Source EUI by Campus



CSCU ENERGY MASTER PLAN

Select Recommendations

- **Management:** Review and track energy bills and use.
- **Renewable Energy:**
  Explore PPAs for roof-top mount solar / PV arrays and PV parking canopy.
- **Fume Hoods**
  Although good practices were evident during the walk-through assessment, a fume hood sash management program should be implemented to ensure hoods are closed and turned off when not in use.
- **Utility Incentives / Develop Plan for EEMs:**
  TRCC should maximize incentive funding for EEMs by working with NPU. Future planned upgrades include further BMS upgrades (from Bacnet to web base) and upgrading to LED lighting.

THE CAMPUS TODAY

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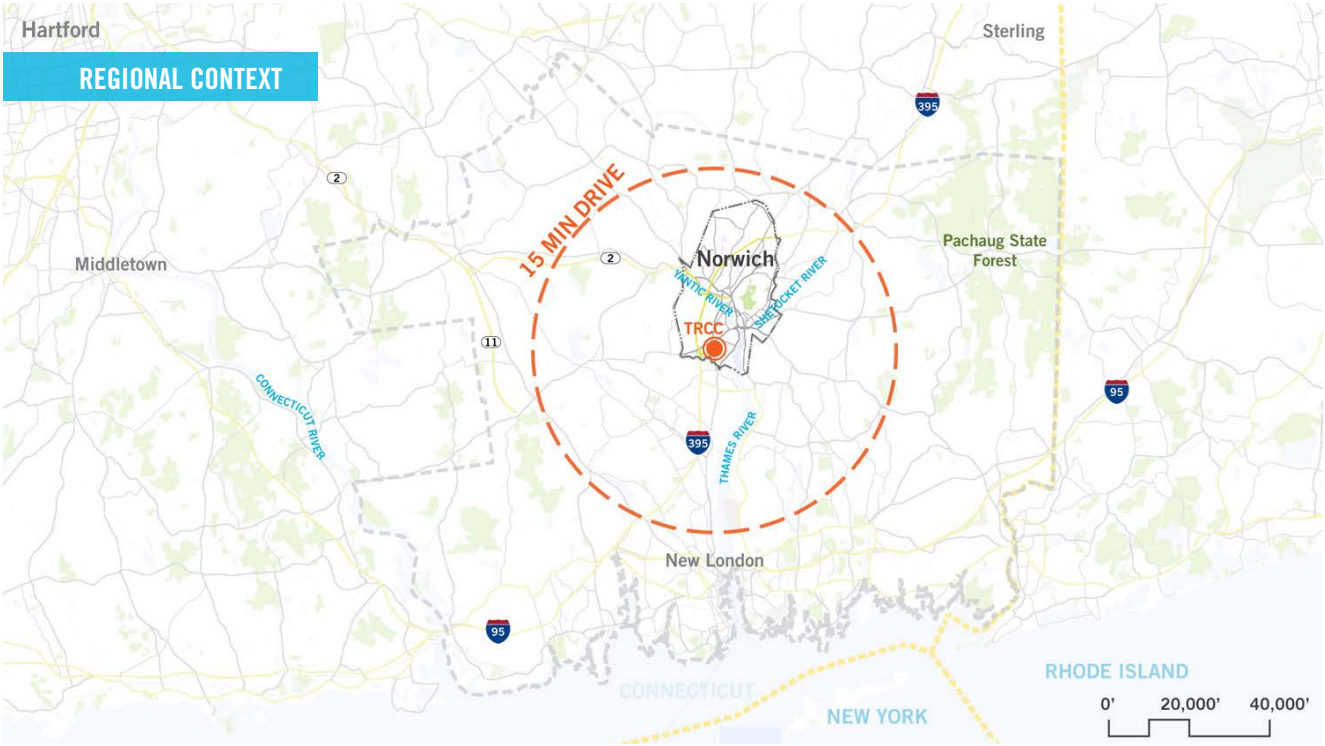

CAMPUS METRICS

PROPERTY	46 acres
FLOOR AREA	279,300 GSF
BUILDING COVERAGE	8.6%
ZONING	Planned Development
LENGTH (N/S)	1,600 Feet (approx.)
LENGTH (E/W)	1,575 Feet (approx.)
LOW POINT	+80 Elev.
HIGH POINT	+122 Elev.

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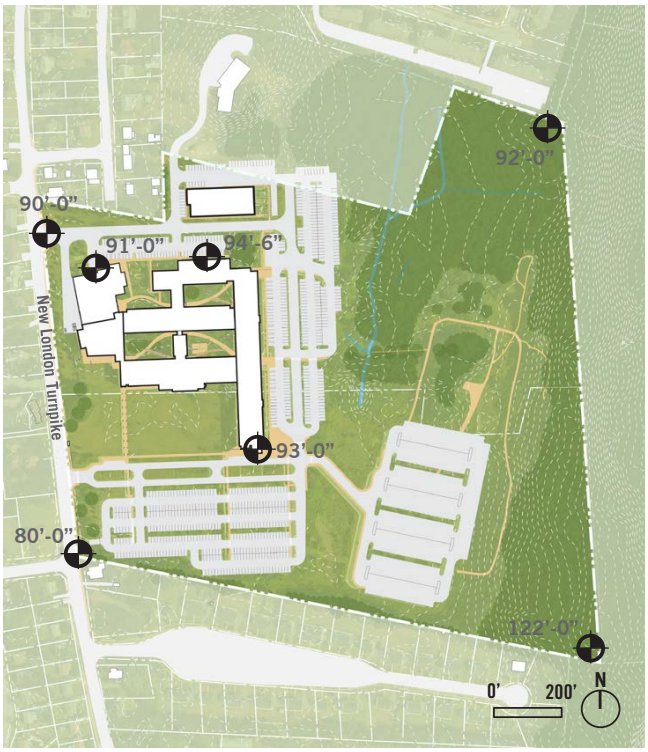
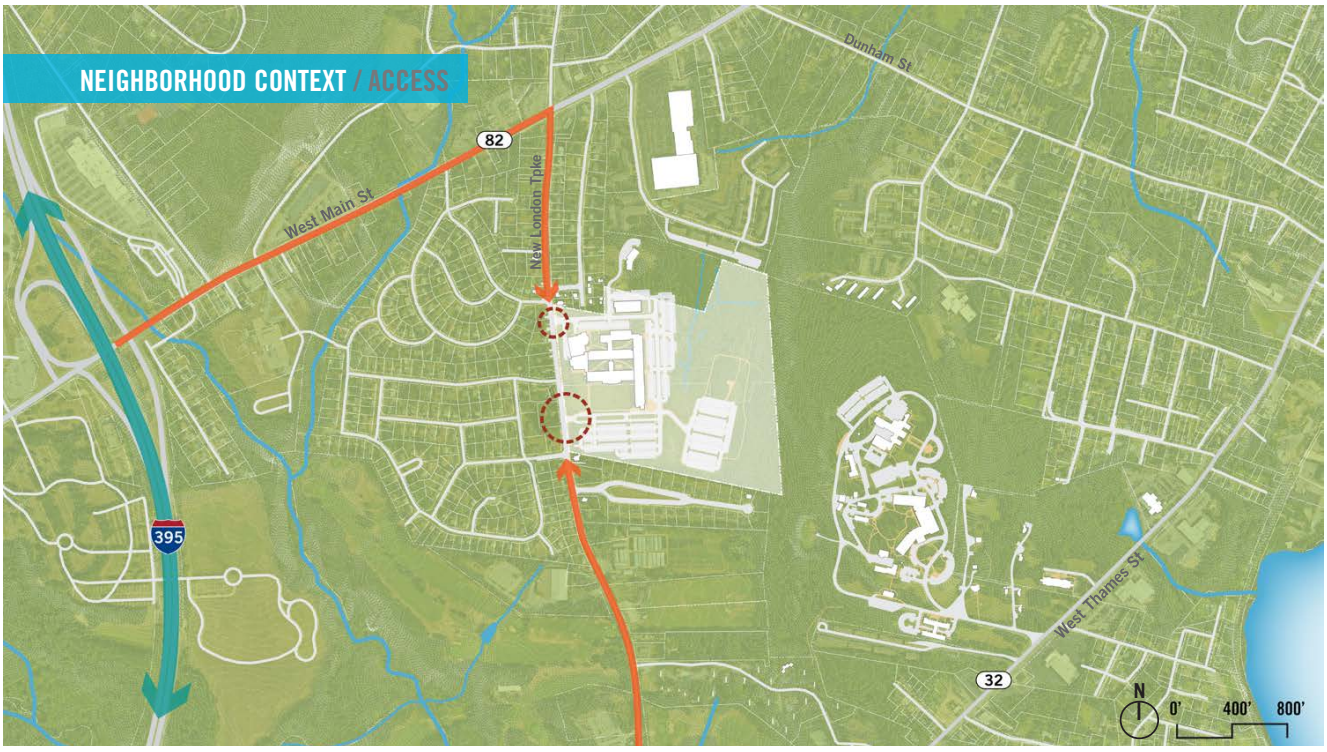
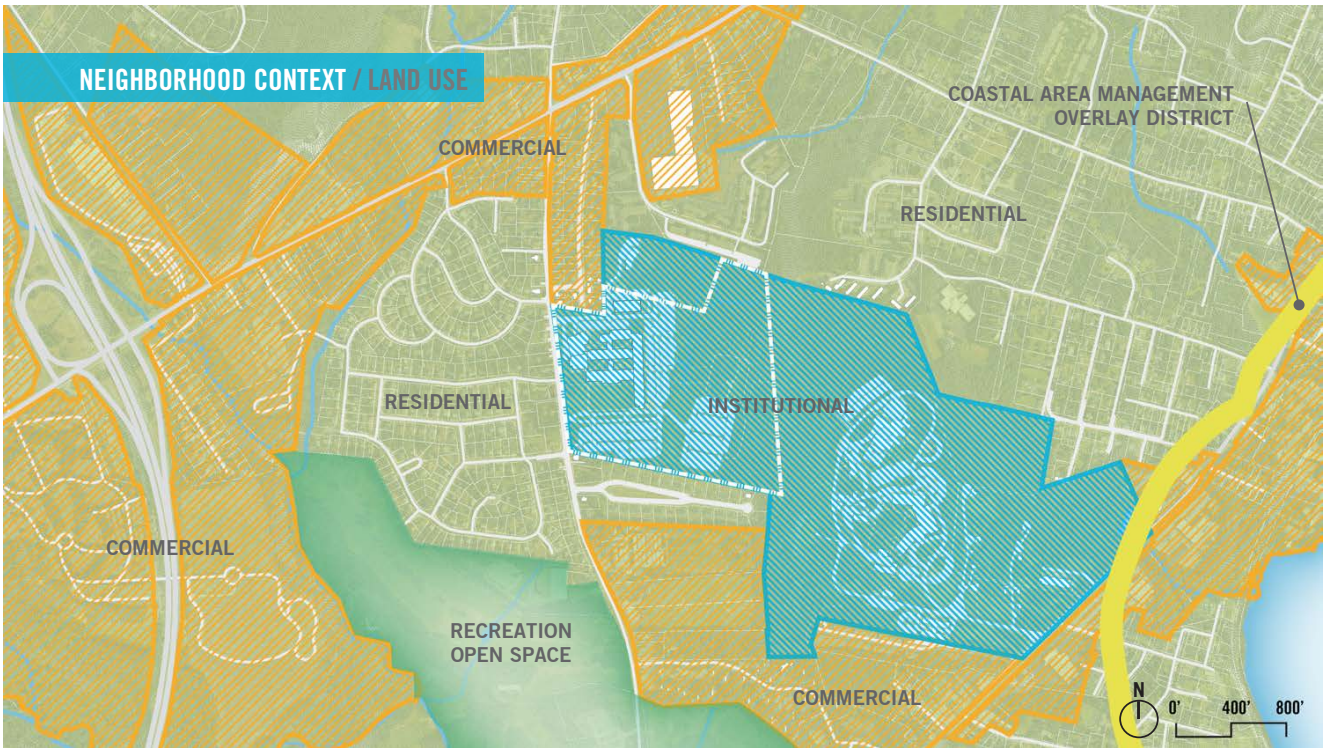
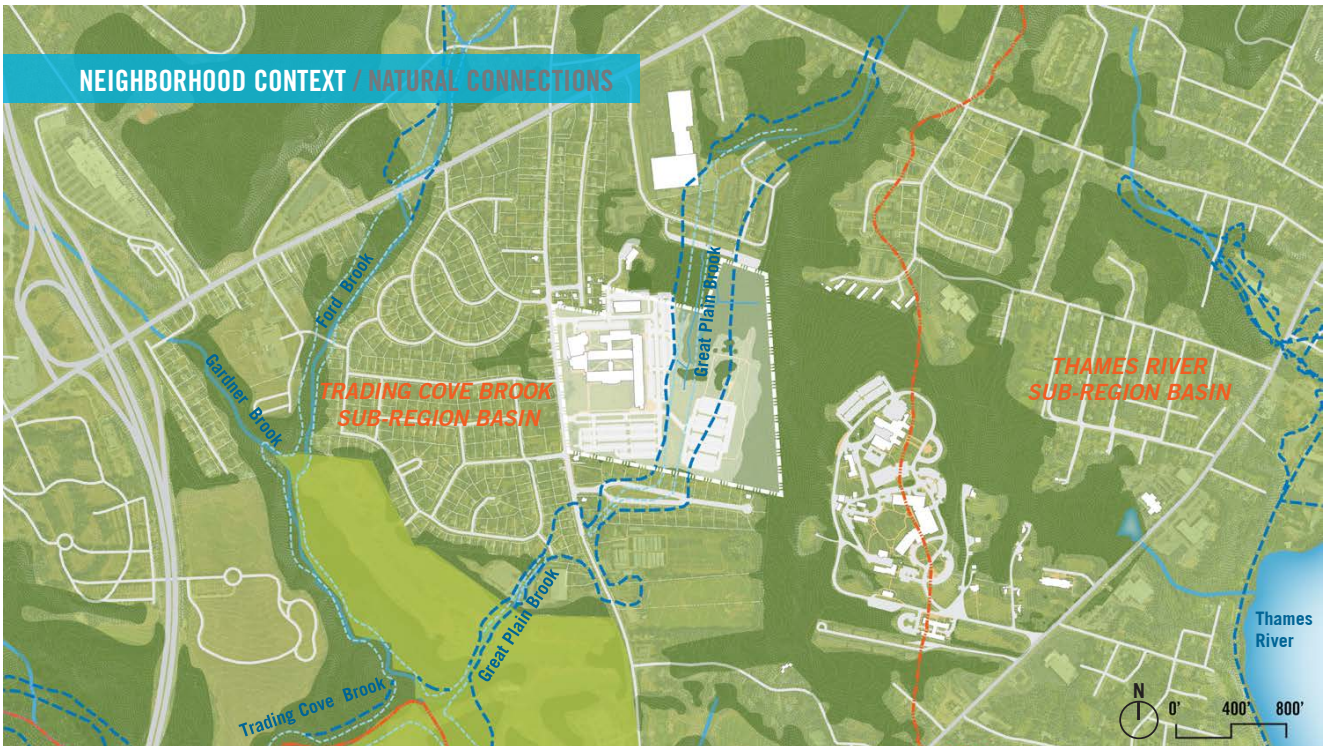
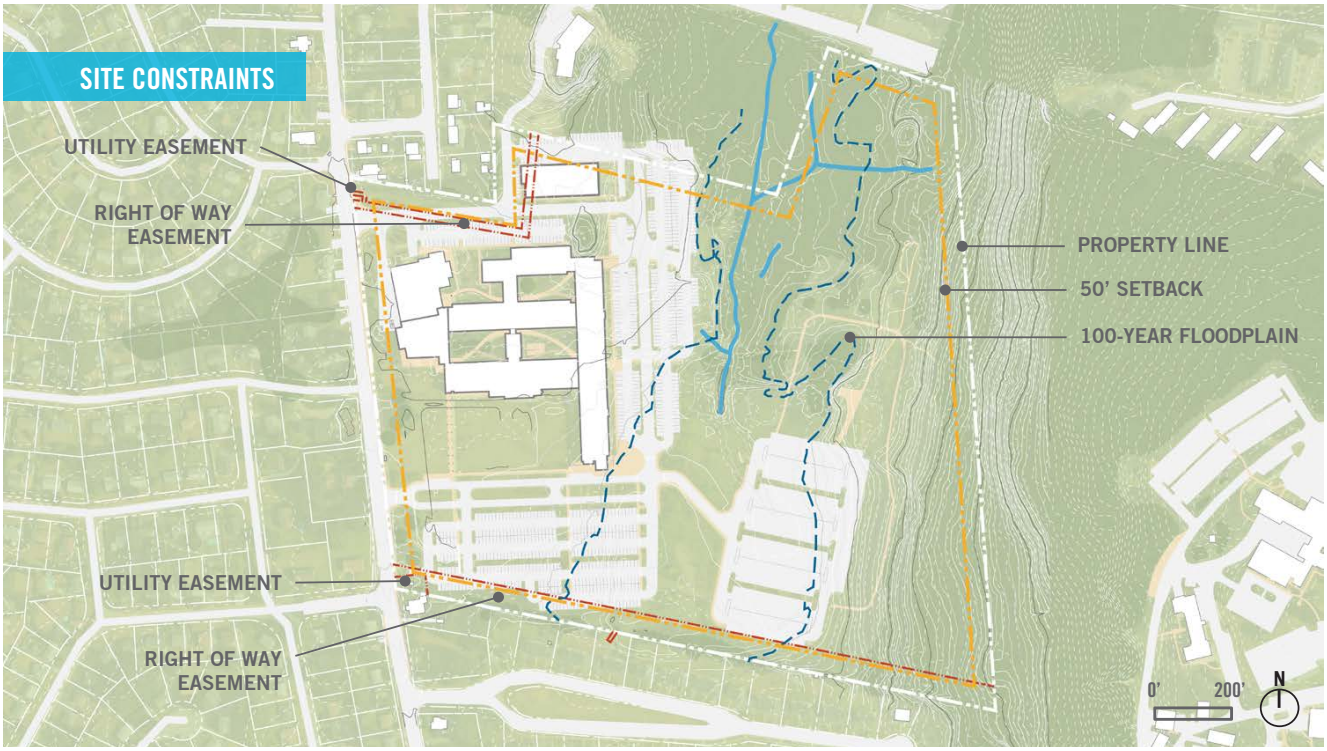


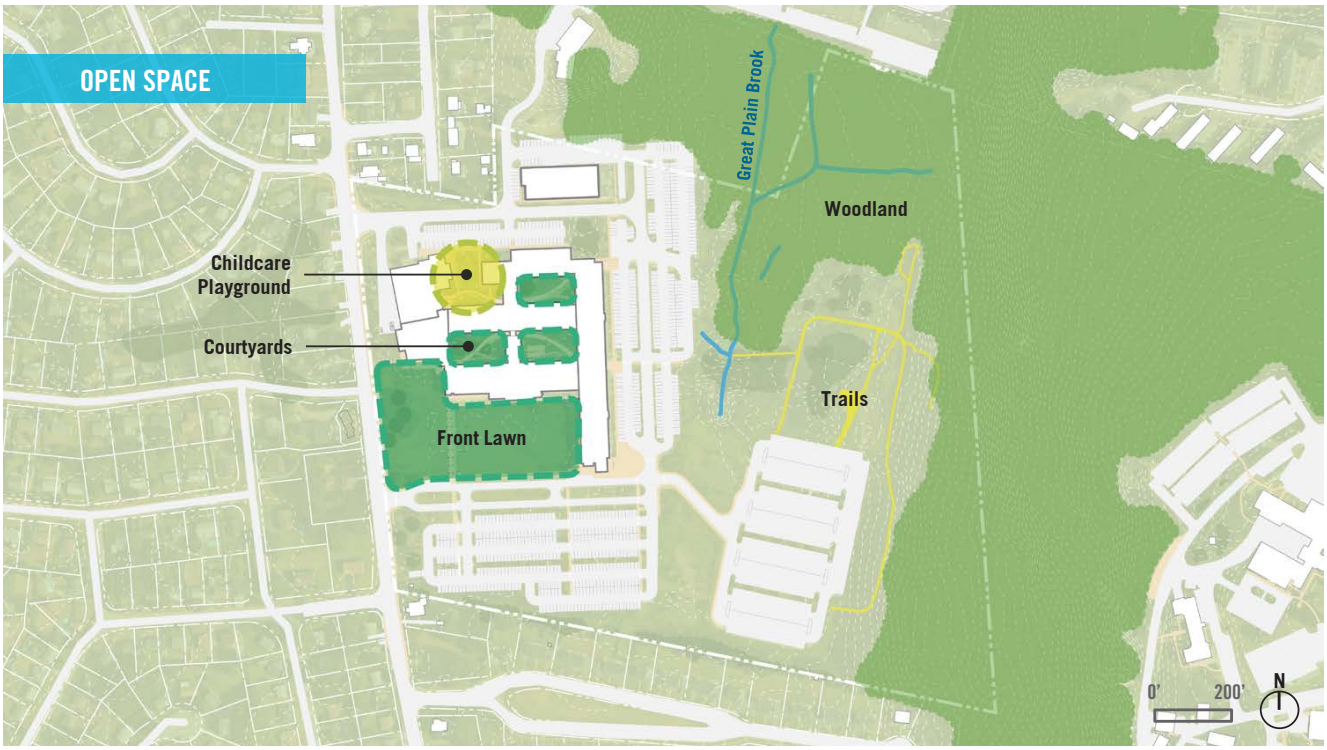
NEIGHBORHOOD CONTEXT / ACCESS



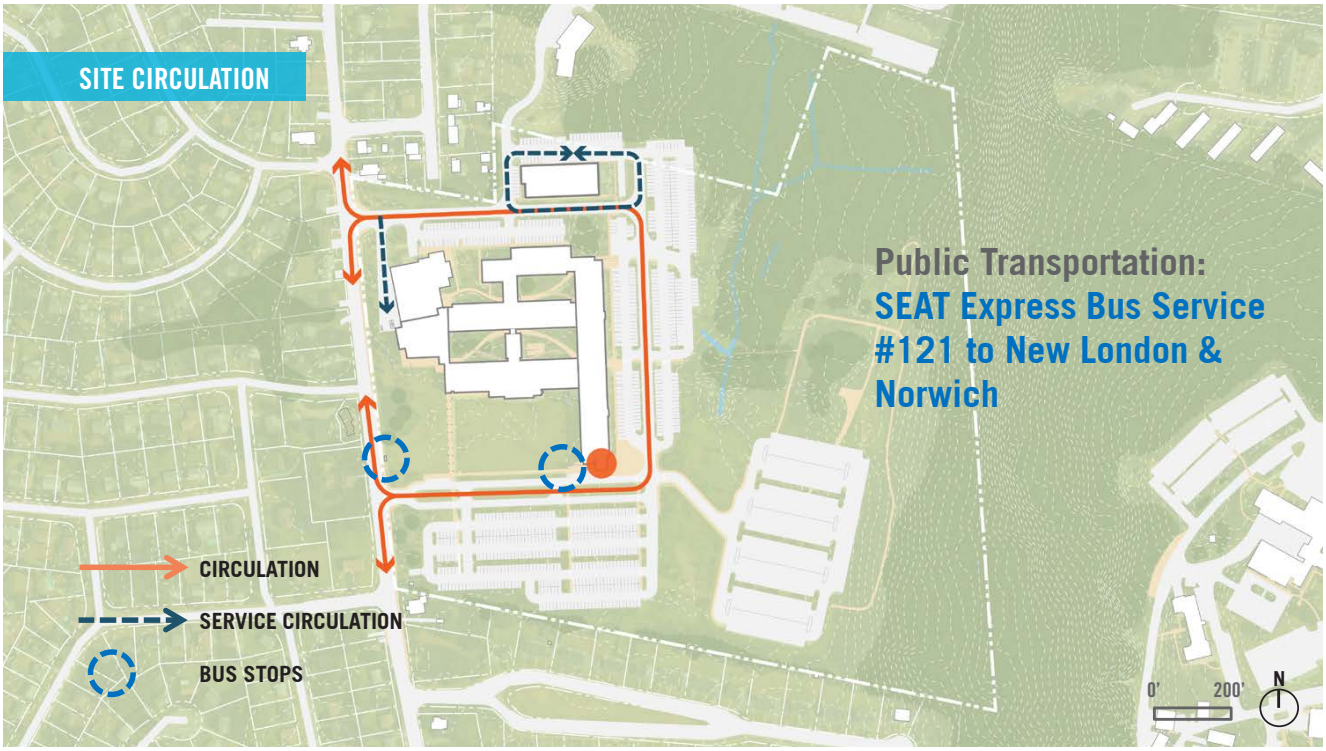

NEIGHBORHOOD CONTEXT / LAND USE
COMMERCIAL
COASTAL AREA MANAGEMENT
OVERLAY DISTRICT
RESIDENTIAL
RESIDENTIAL
INSTITUTIONAL
COMMERCIAL
RECREATION
OPEN SPACE
COMMERCIAL
N
0'
400'
800'


NEIGHBORHOOD CONTEXT / NATURAL CONNECTIONS
Ford Brook
Gardner Brook
TRADING COVE BROOK
SUB-REGION BASIN
Great Plain Brook
THAMES RIVER
SUB-REGION BASIN
Great Plain Brook
Trading Cove Brook
Thames
River
N
0'
400'
800'

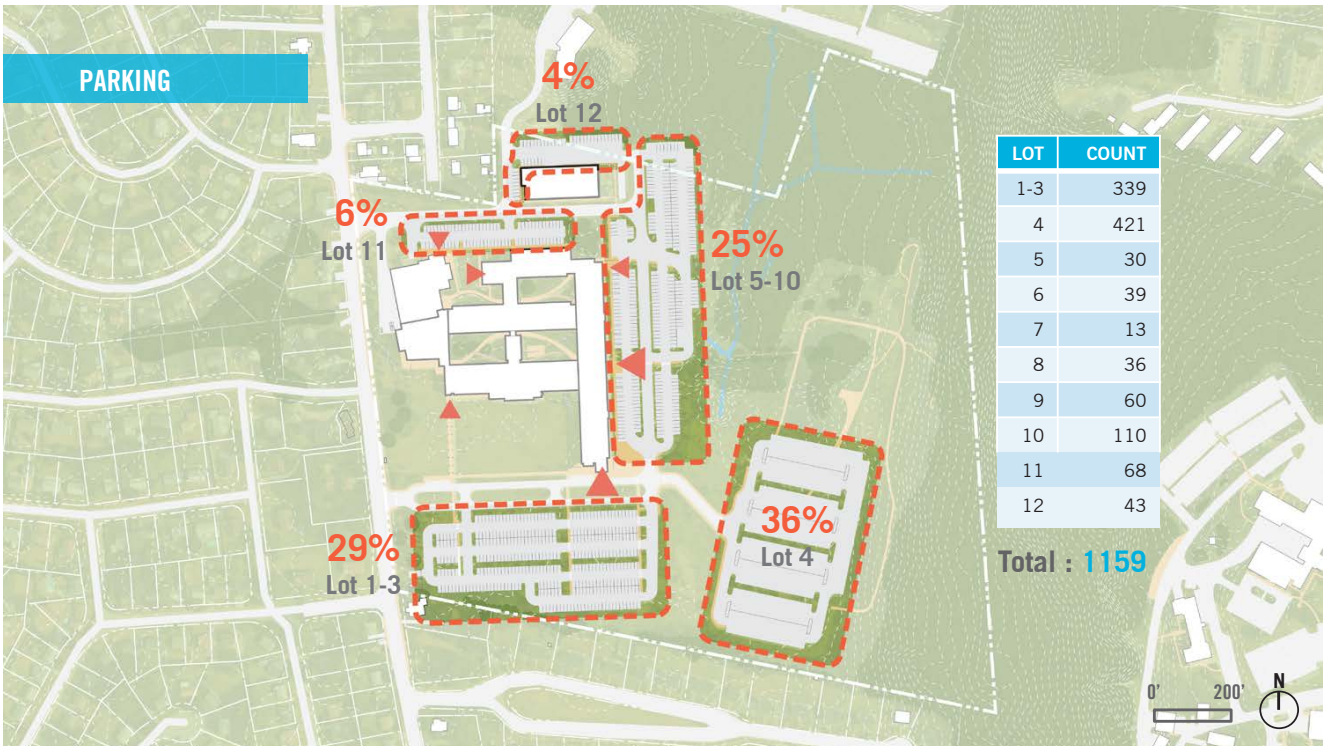

SITE CONSTRAINTS
UTILITY EASEMENT
RIGHT OF WAY EASEMENT
PROPERTY LINE
50' SETBACK
100-YEAR FLOODPLAIN
UTILITY EASEMENT
RIGHT OF WAY EASEMENT
0'
200'
N


OPEN SPACE
Great Plain Brook
Woodland
Childcare Playground
Courtyards
Trails
Front Lawn
0'
200'
N

SITE CIRCULATION

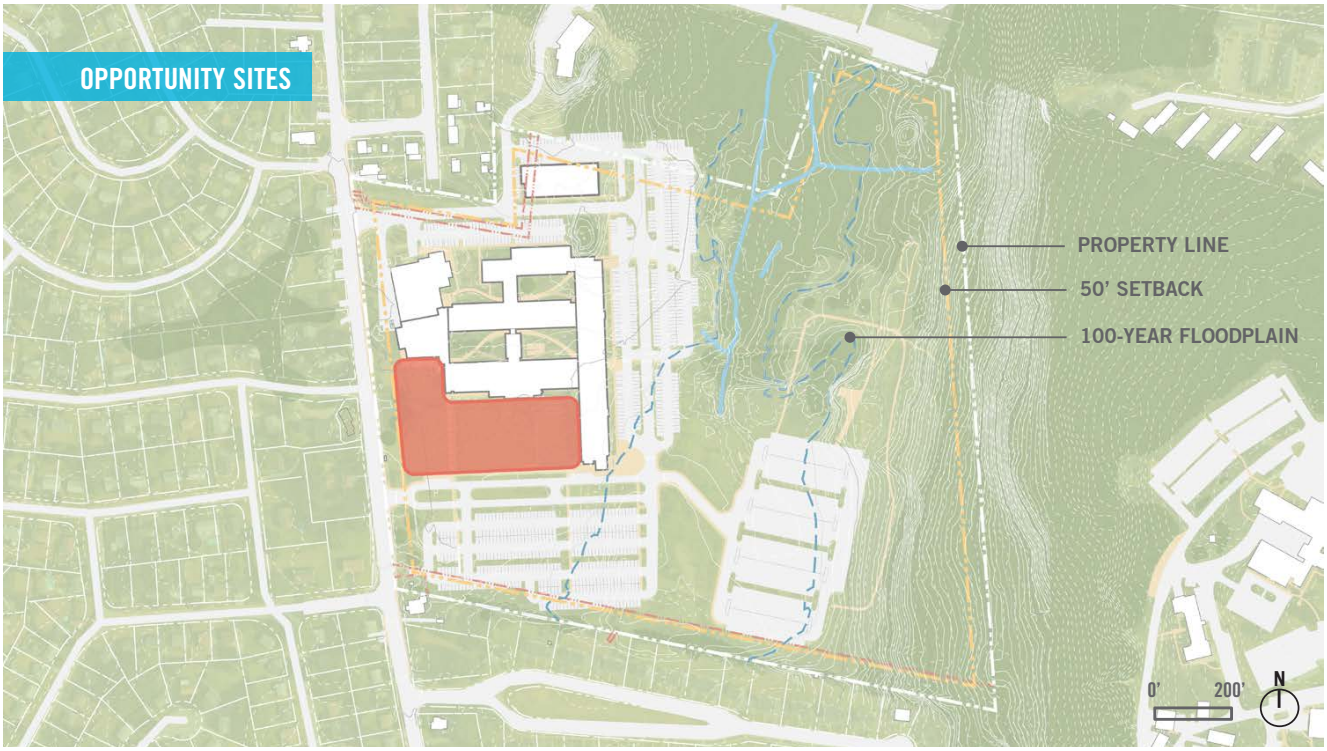


PARKING



LOT	COUNT
1-3	339
4	421
5	30
6	39
7	13
8	36
9	60
10	110
11	68
12	43

Total : 1159



BUILDING ANALYSIS

- BUILDING PROJECTS
- CAMPUS CONTEXT / INITIAL IMPRESSIONS
- PROGRAM DISTRIBUTION
- WAYFINDING &CIRCULATION

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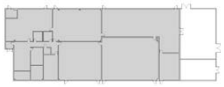
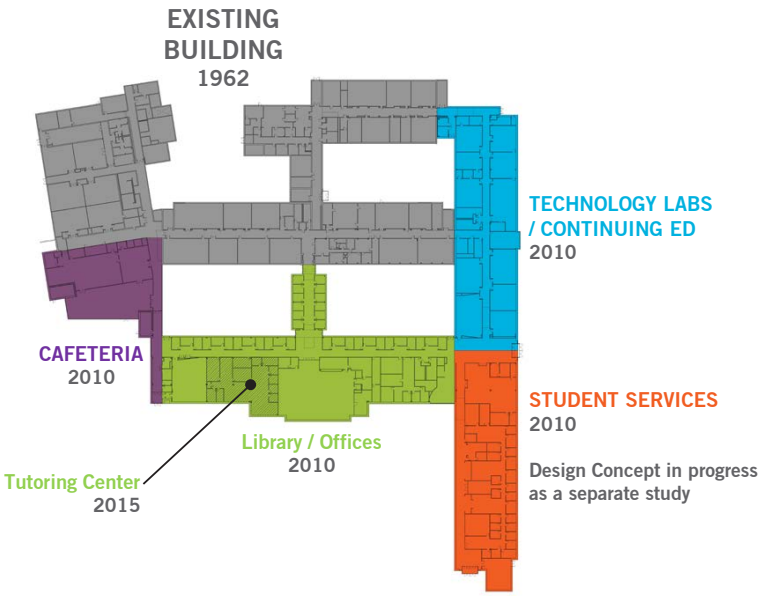
EXISTING AND PLANNED BUILDING PROJECTS



CUP
2007



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CAMPUS CONTEXT / INITIAL IMPRESSIONS

Architecture

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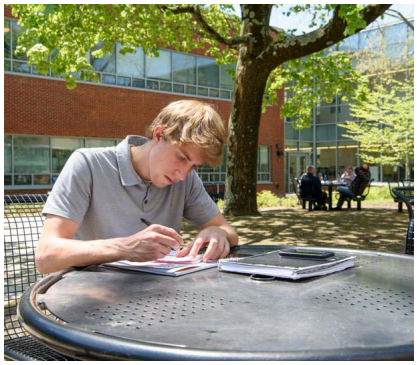
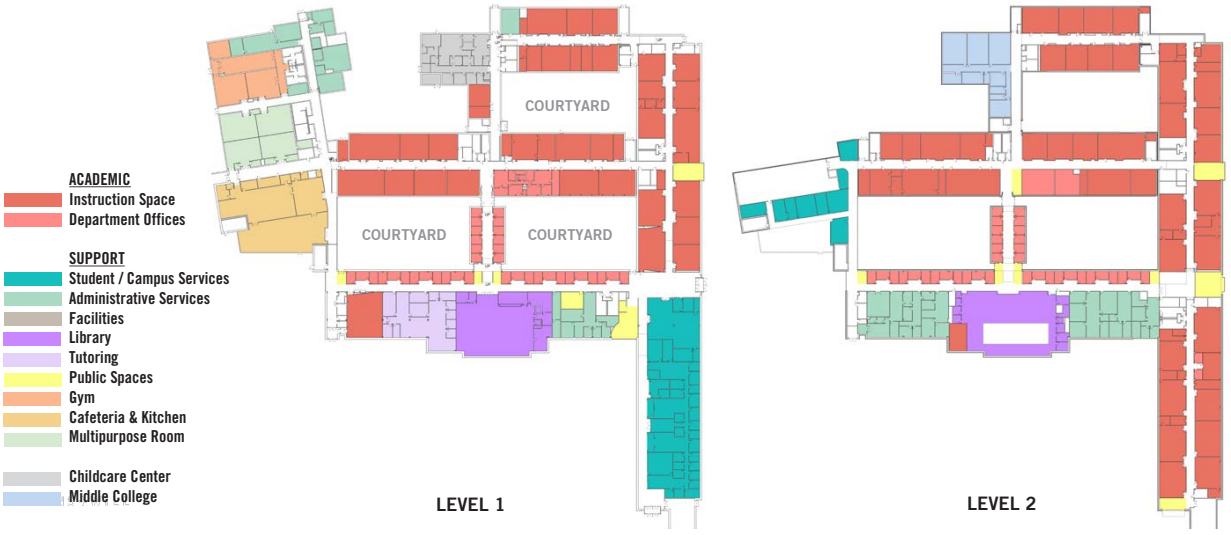
CAMPUS CONTEXT / INITIAL IMPRESSIONS

Open Space

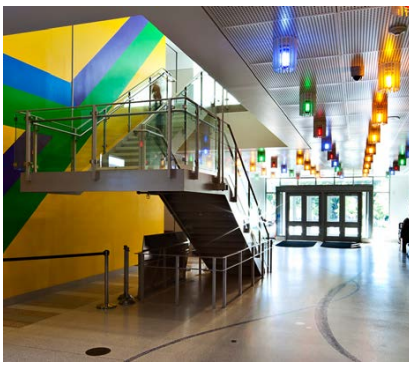


PROGRAM DISTRIBUTION



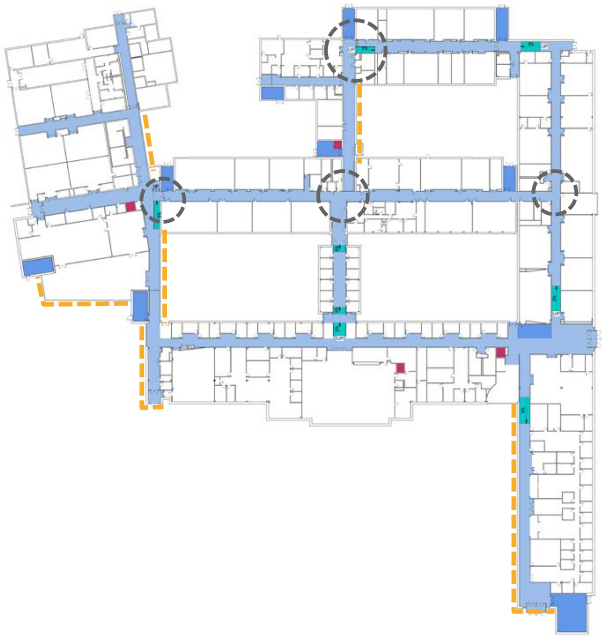
PROGRAM DISTRIBUTION

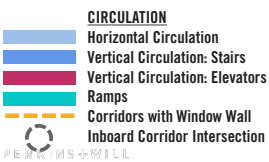
Signature Spaces



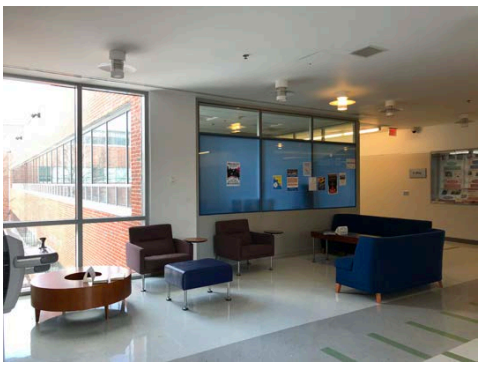
WAYFINDING & CIRCULATION

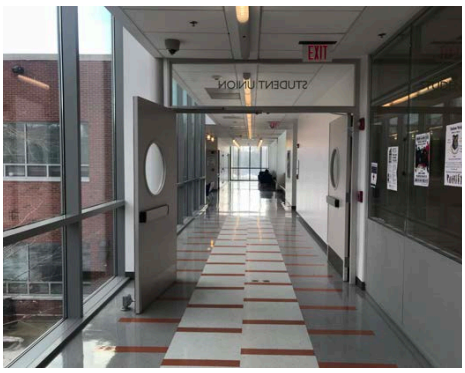
- Clear and prominent **Front Door** of College
- Overall circulation layout is simple and straightforward
- **Daylight and Exterior Views** in the corridor: great indoor quality and easy sense of **orientation**



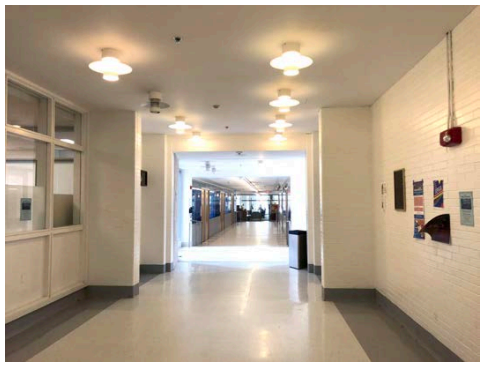


WAYFINDING & CIRCULATION





WAYFINDING & CIRCULATION



SPACE ASSESSMENT
PRELIMINARY THOUGHTS & COMPARISONS

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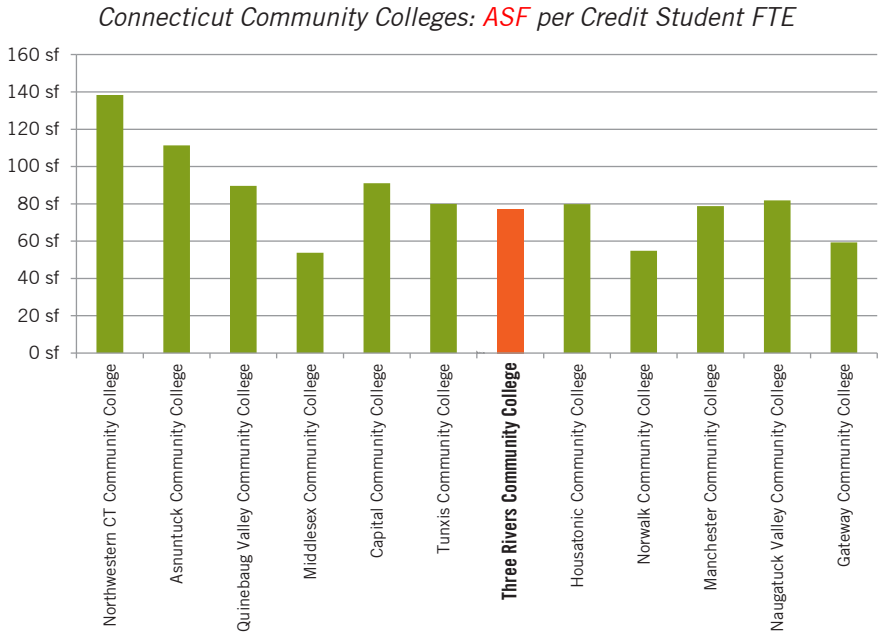
BENCHMARKING



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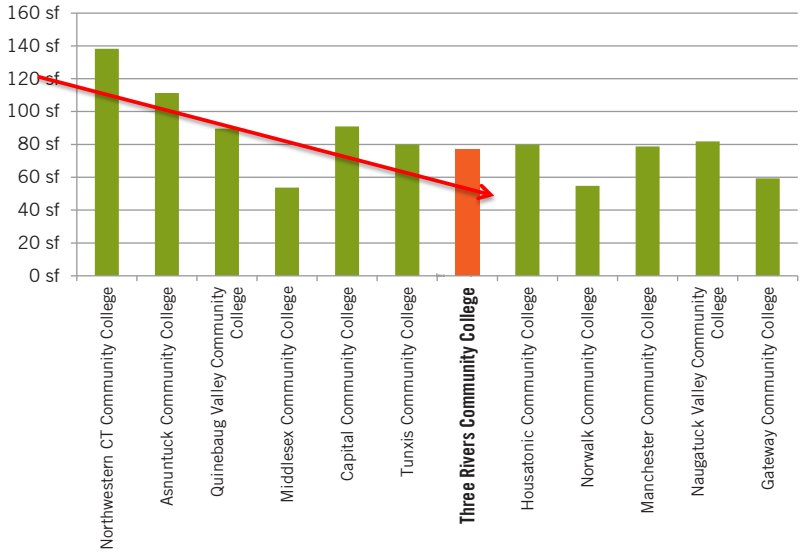
BENCHMARKING

Connecticut Community Colleges: ASF per Credit Student FTE



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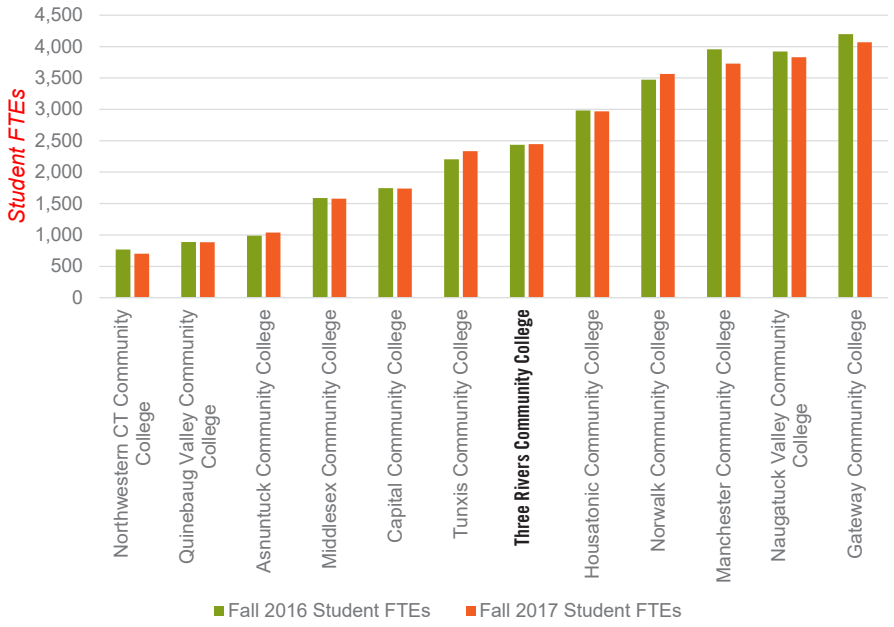
BENCHMARKING

Fall over Fall Credit Enrollment



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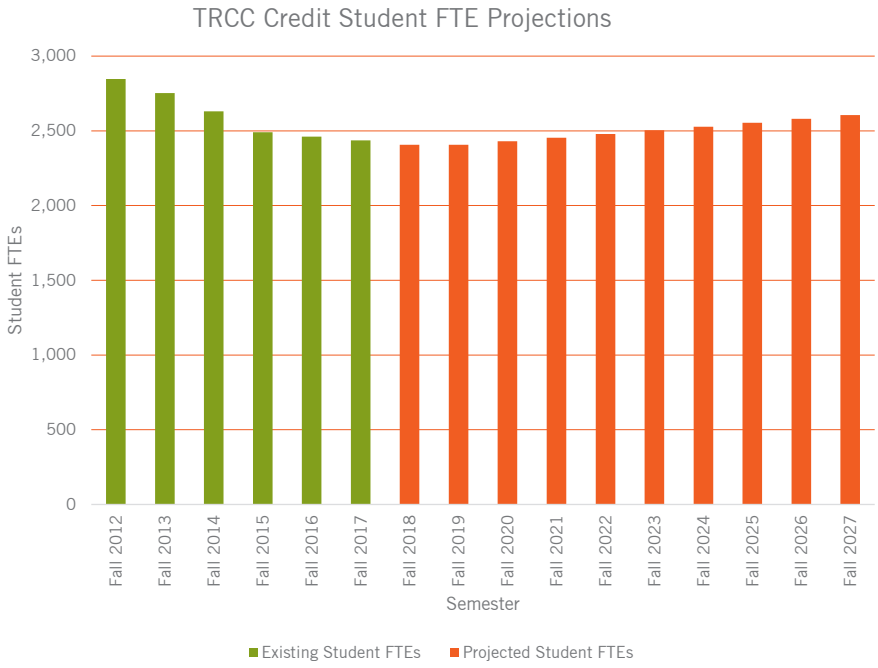
ENROLLMENT PROJECTIONS



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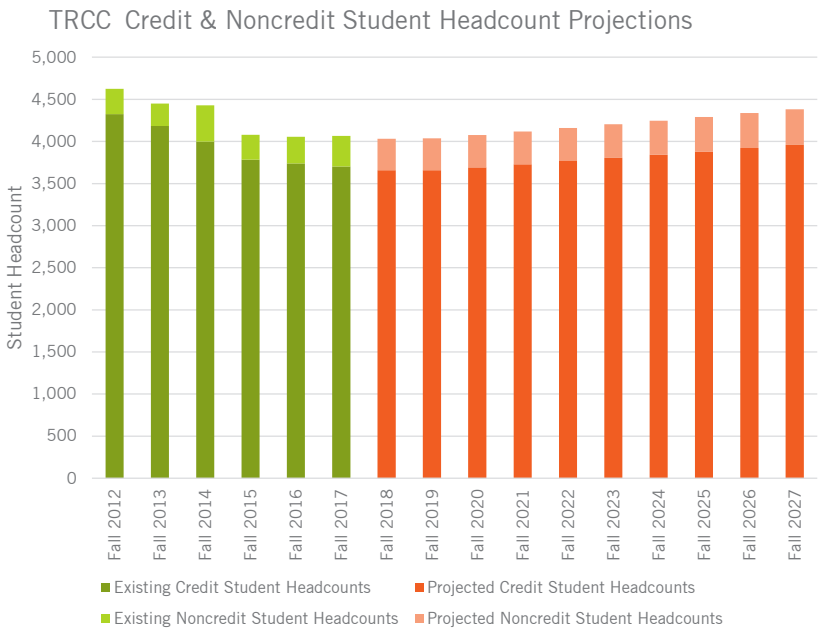
ENROLLMENT PROJECTIONS



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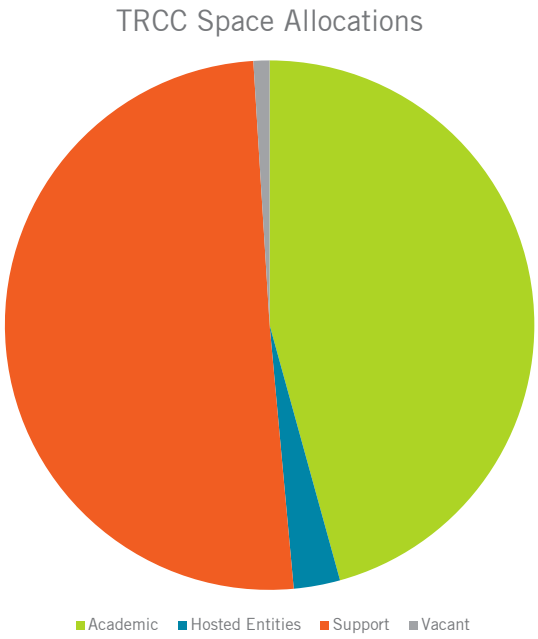
ENROLLMENT PROJECTIONS



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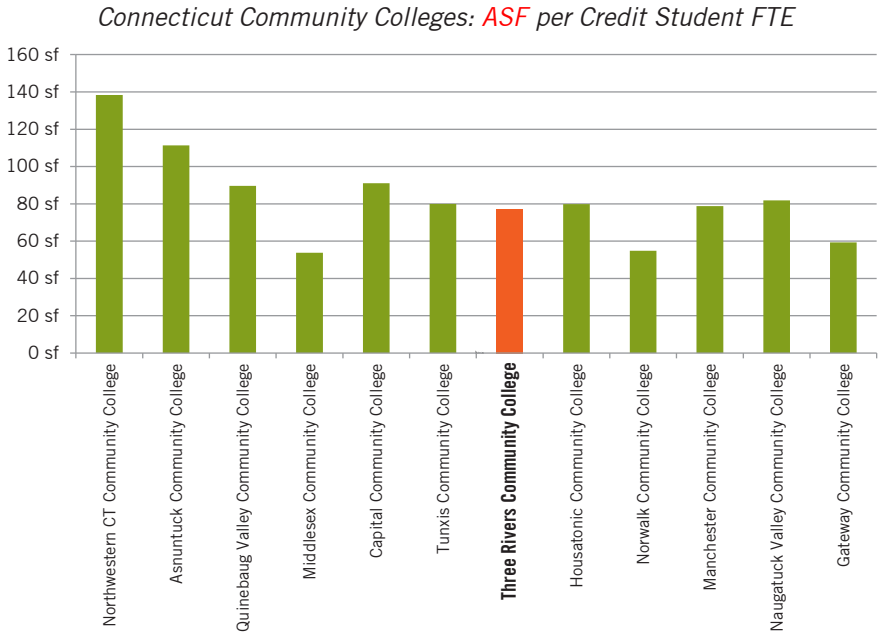
BENCHMARKING



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CRITICAL QUESTIONS GOING FORWARD

How to equate non credit and incumbent worker enrollment with credit FTEs?

What are specific facilities only required for Noncredit enrollment?

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NEXT STEPS

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REQUESTED UPCOMING PROGRAM INTERVIEWS

1. Admissions
2. Dean of Academics
3. Dean of Administration
4. Dean of Student Services
5. Disability Services
6. Information Services
7. Institutional Advancement
8. Library
9. Office of the President
10. Registrar's Office
11. Student Government Office
12. Student Programs Office
13. Student Services
14. Tutoring Center

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NEXT STEPS / SCHEDULING COLLEGE MASTER PLAN ADVISORY COMMITTEE MEETINGS

PROGRAM INTERVIEWS – Dates TBD

CMPAC 2 – April 3rd
- Space Needs Analysis
- Recommended 10-year space program
- Program interview findings
- Discussion and committee input on program recommendations
- Review preliminary Master Plan alternative approaches
- Discussion and confirmation of recommended approach
- Potential student engagement sessions

CMPAC 3 – May 1st
- Review and comment on Master Plan concepts in progress
- Potential Student Input
- Frame project priorities

CMPAC 4 – May 29th
- Review final draft Master Plan recommendations
- Phasing, Cost and Implementation discussion
- Town Hall meeting (optional)

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DISCUSSION

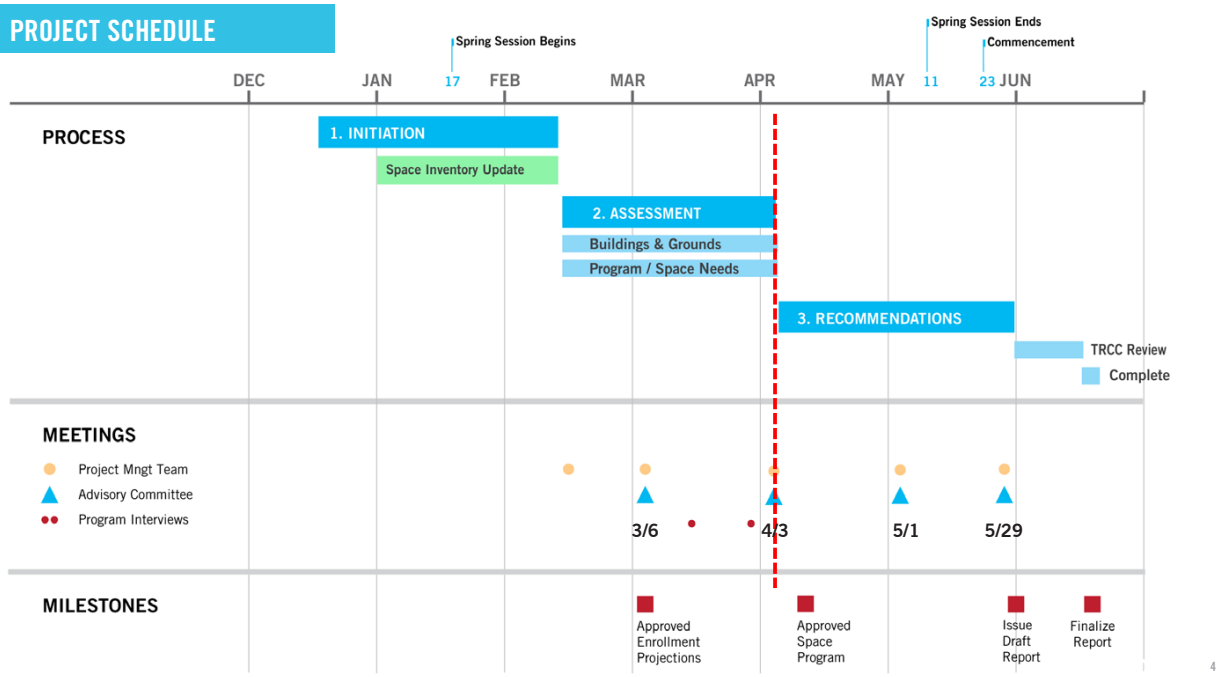
AGENDA

1. Introduction
2. Draft Space Assessment
3. Classroom Utilization Analysis
4. Building Condition & Analysis
5. MEP Systems Overview
6. Online Survey Findings
7. Next Steps

Discussion

INTRODUCTION

PROJECT SCHEDULE



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PROGRESS UPDATE

Since our last meeting:

- Conducted (15) interviews with key stakeholders
- Created the draft Space Needs Assessment
- Analyzed classroom utilization
- Assessed current building conditions
- Assessed initial MEP system overview
- Conducted college-wide online survey on campus facilities

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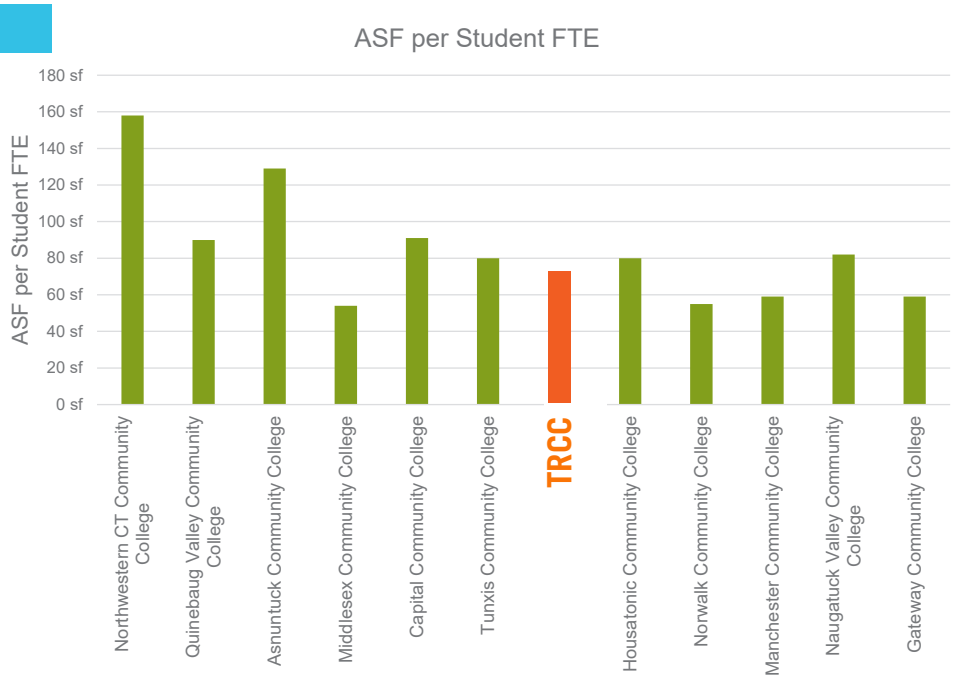
DRAFT SPACE ASSESSMENT

BENCHMARKING



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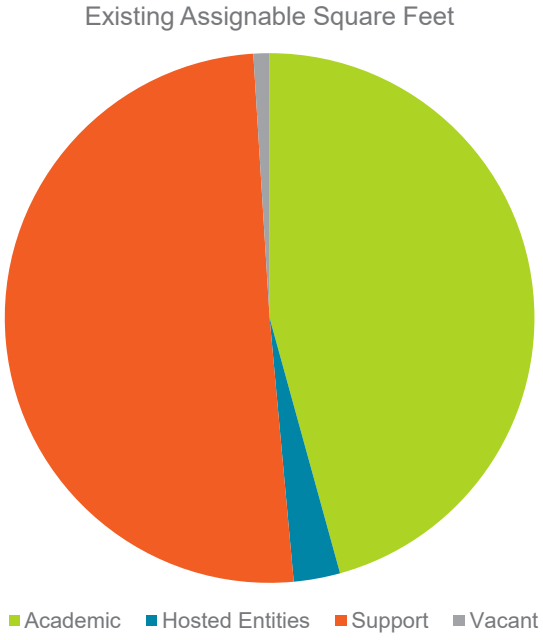

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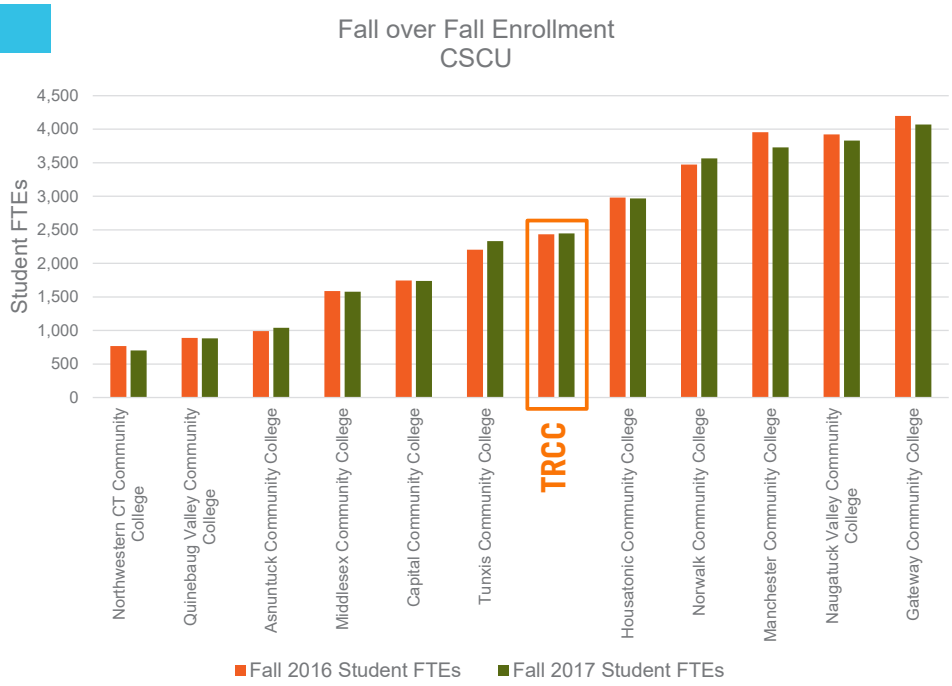
BENCHMARKING



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PROCESS - INTERVIEWS

- Student Services
- Registrar
- Tutoring Center & Writing Center
- Institutional Advancement
- Library Services
- Academics Division
- Student Government
- Workforce Development
- Office of the President
- Information Technology
- Enrollment Management
- Administrative Services
- Facilities
- Student Programs
- Admissions

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KEY ISSUES

- Orientation space is needed
- Group advising space needed
- Lack of toilets in A Wing
- No privacy in the Registrar's Office
- Testing Center has two few terminals

- The College needs a better loading dock
- Expanded charging stations
- The restrooms are dark and hard to clean
- A separate laundry is needed for catering
- More custodial storage is required across campus

- Sciences is a bottleneck
- Chemistry is a prerequisite to Biology
- Transfers place pressure on science offering
- Expanded resources for non credit allied health
- Bring offsite manufacturing on campus
- Faculty overload is over 20%

- New Tutoring Center is fabulous
- More group rooms are needed in the Library
- Library lighting is problematic
- The Library needs more computers

KEY ISSUES

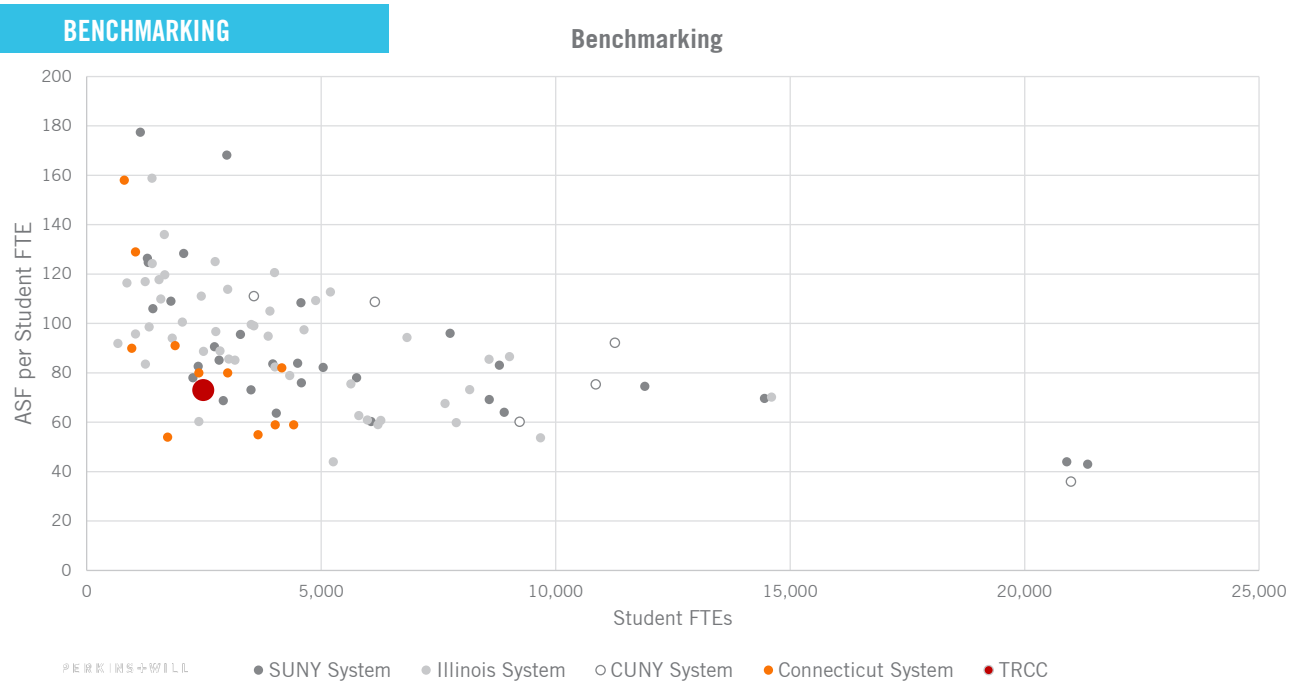
- The College needs to focus on retention.

- College functions on a four day workweek
- The College could make better use of Friday
- The weekend is an opportunity for WFD
- Unused capacity on Friday

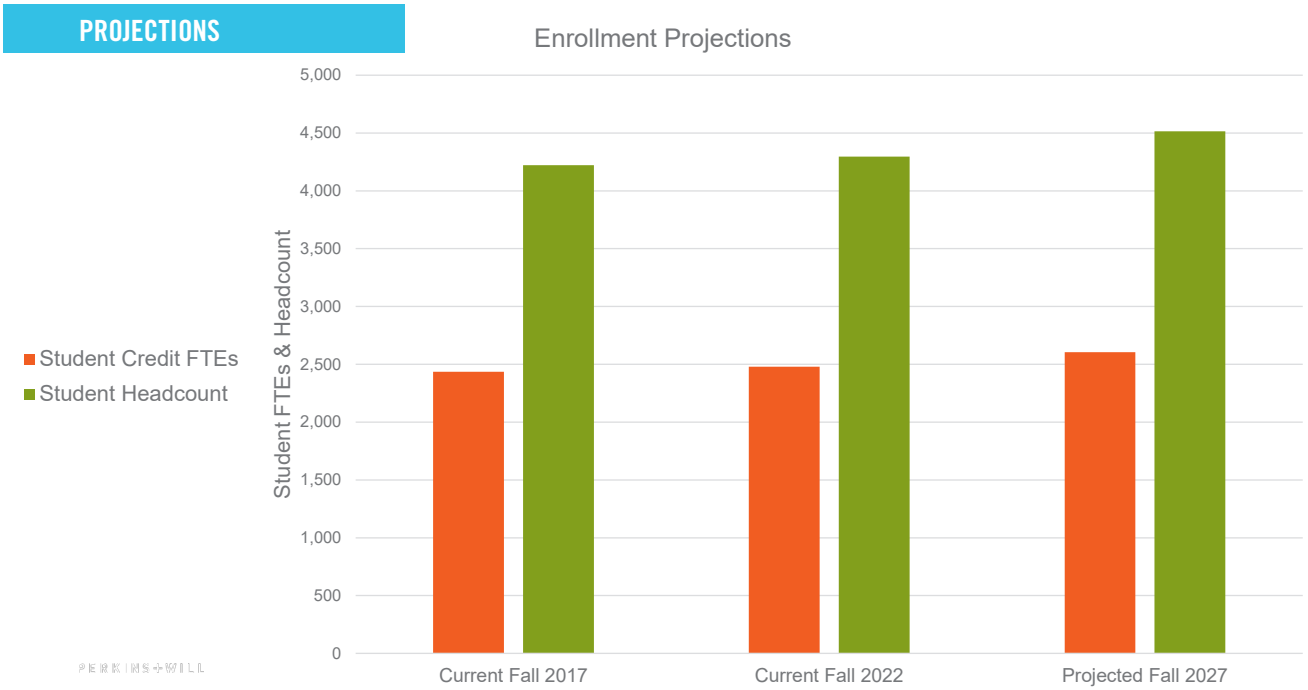
- HVAC in the D & E Wing needs to be resolved
- Child Care playground is run down

- The College needs a better means than bulletin boards for campus communication
- More lounge space allowing noisy activities
- Need a gender/culture diversity center
- More student club space
- Need alternative to the cafeteria
- An amphitheater was discussed outside the cafeteria
- Expand food pantry
- Need lactation room

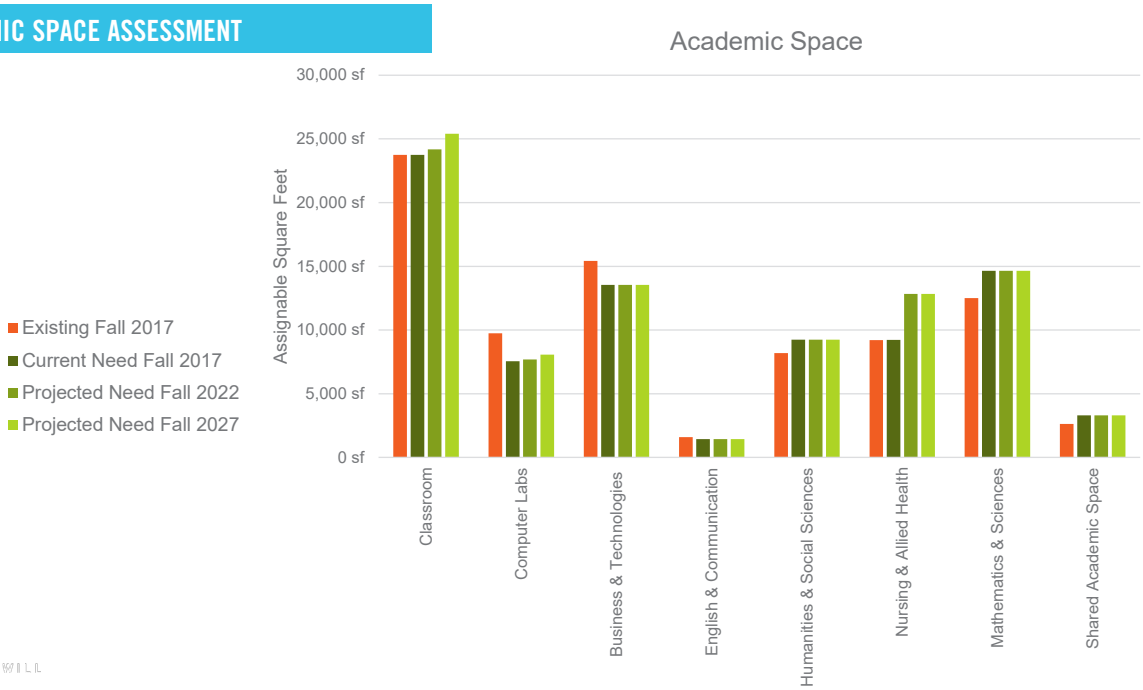
BENCHMARKING



PROJECTIONS



ACADEMIC SPACE ASSESSMENT



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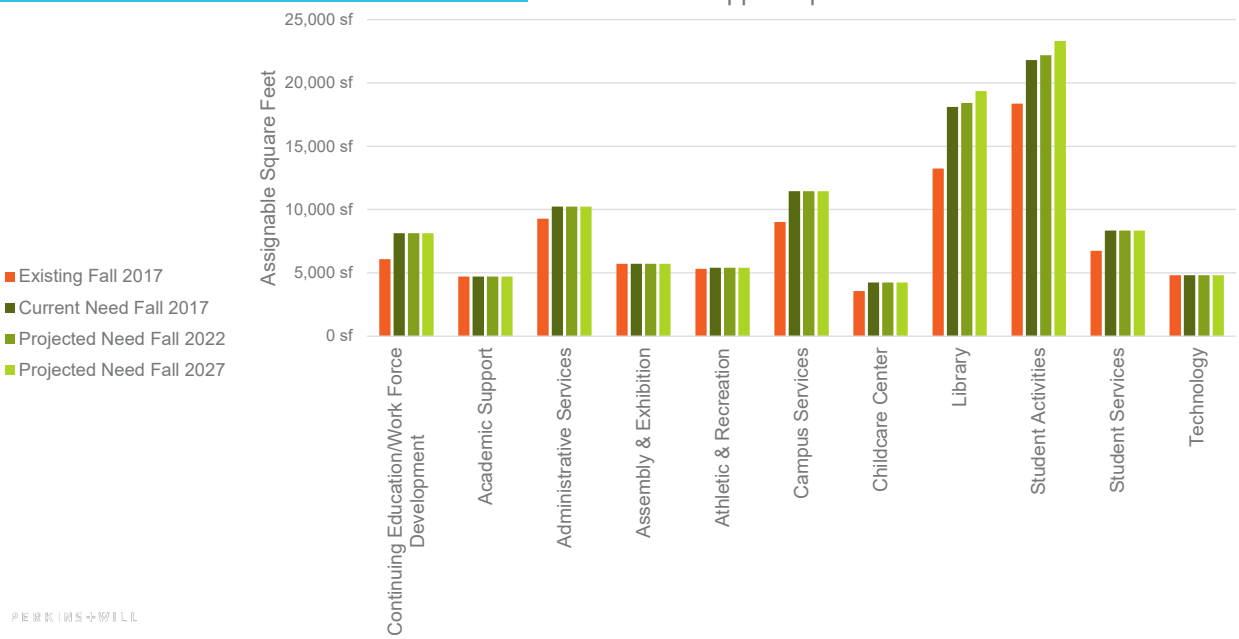
ACADEMIC SPACE ASSESSMENT



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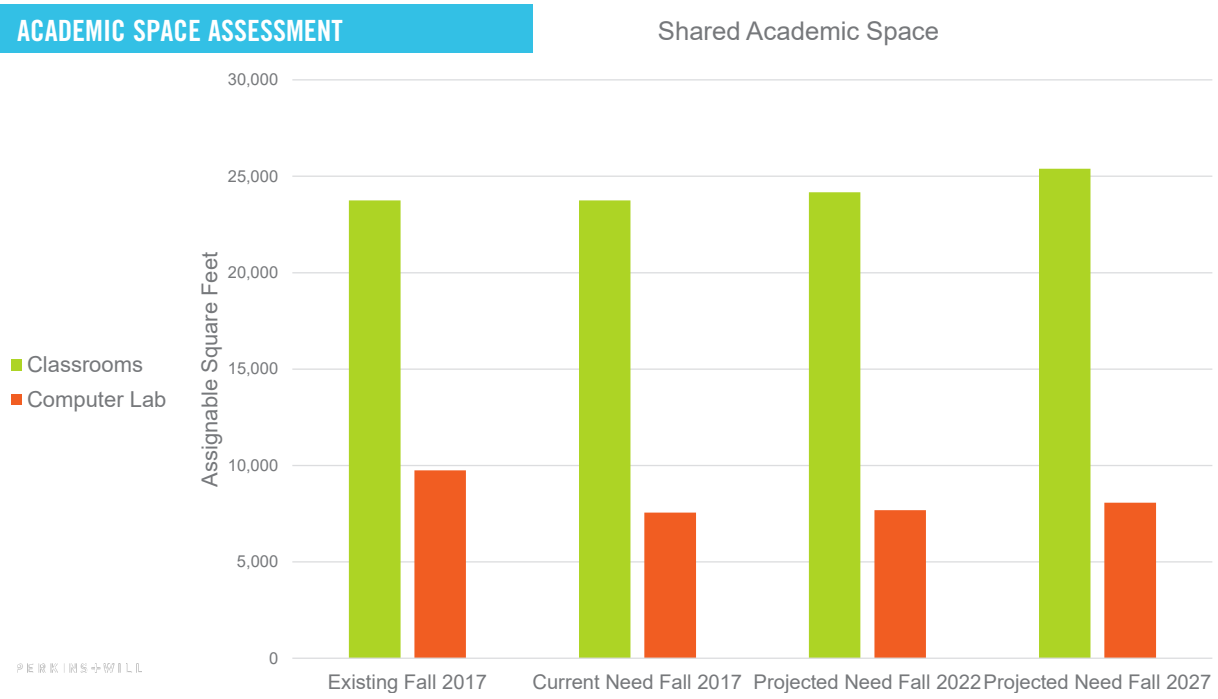
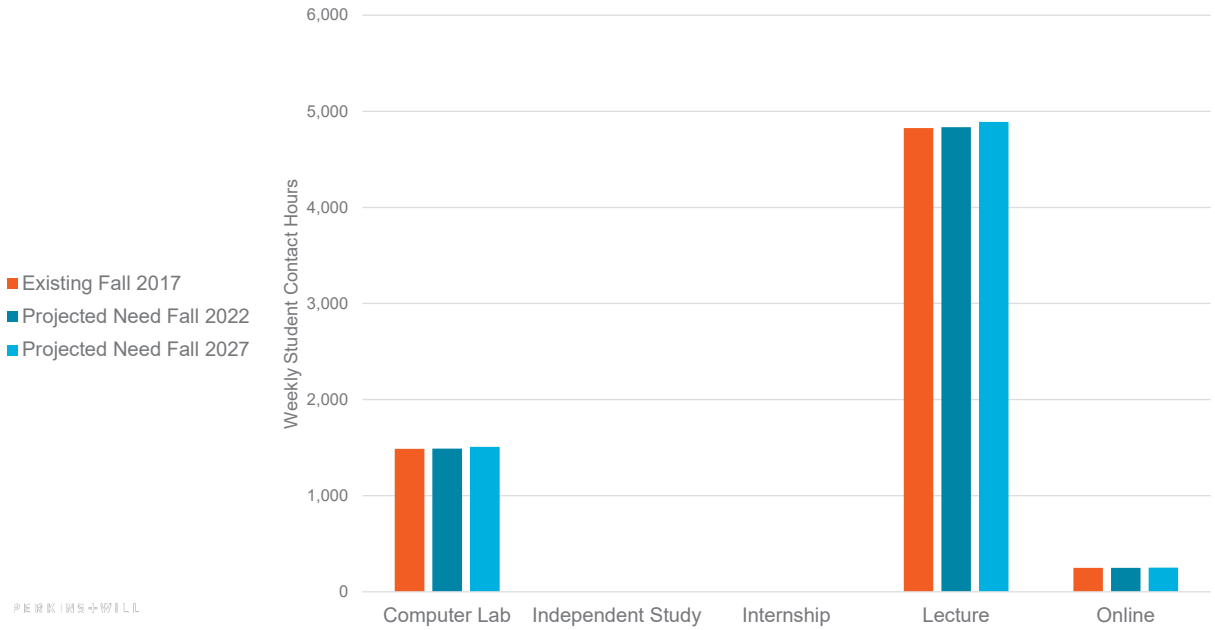
ACADEMIC SPACE ASSESSMENT



CLASSROOM SPACE ASSESSMENT



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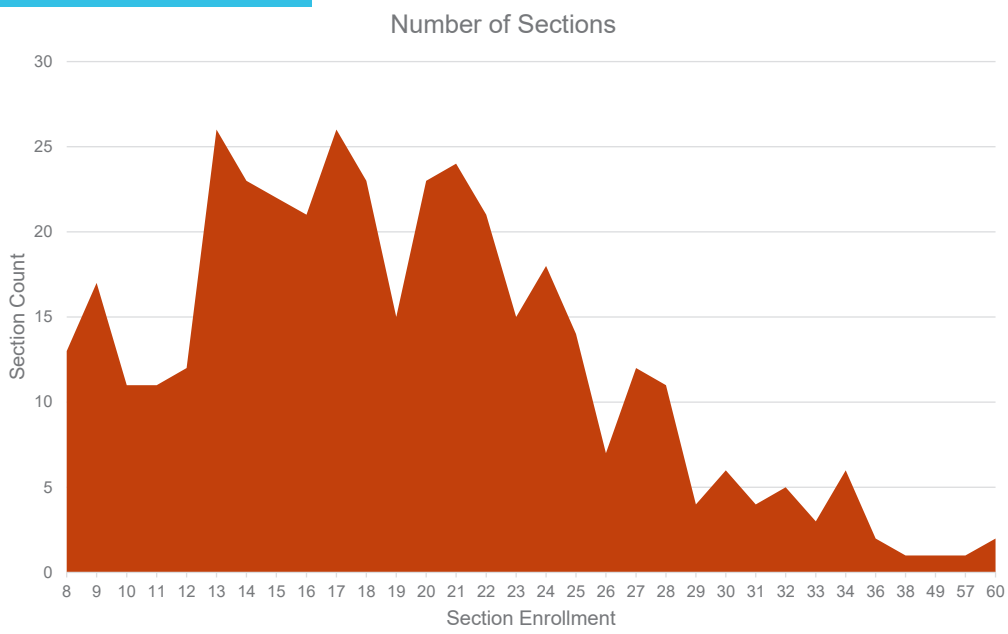

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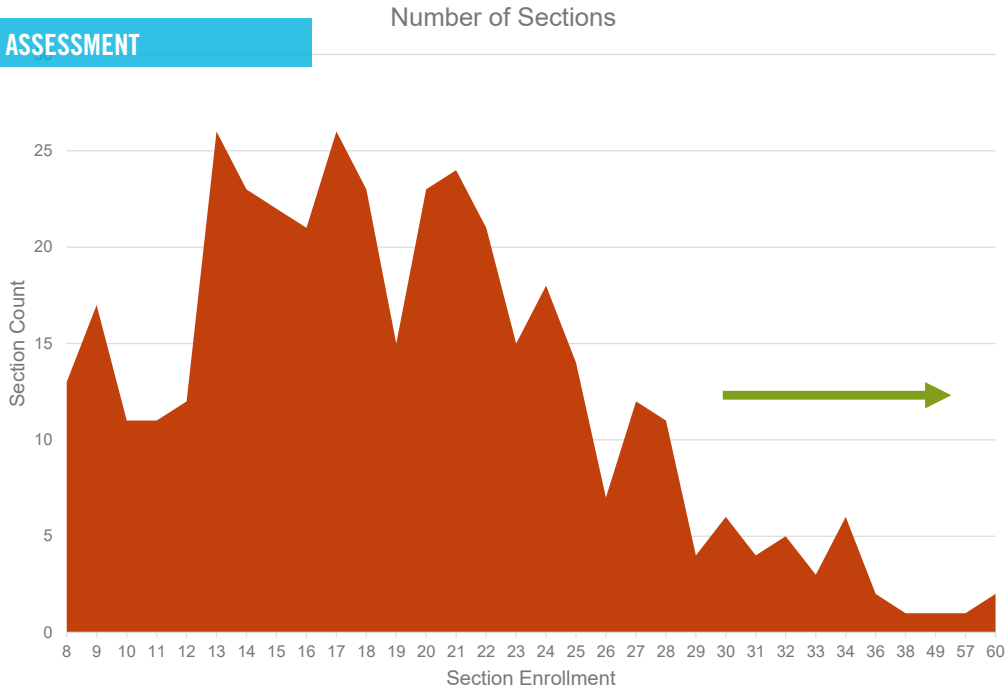
CLASSROOM SPACE ASSESSMENT



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ACADEMIC SPACE ASSESSMENT

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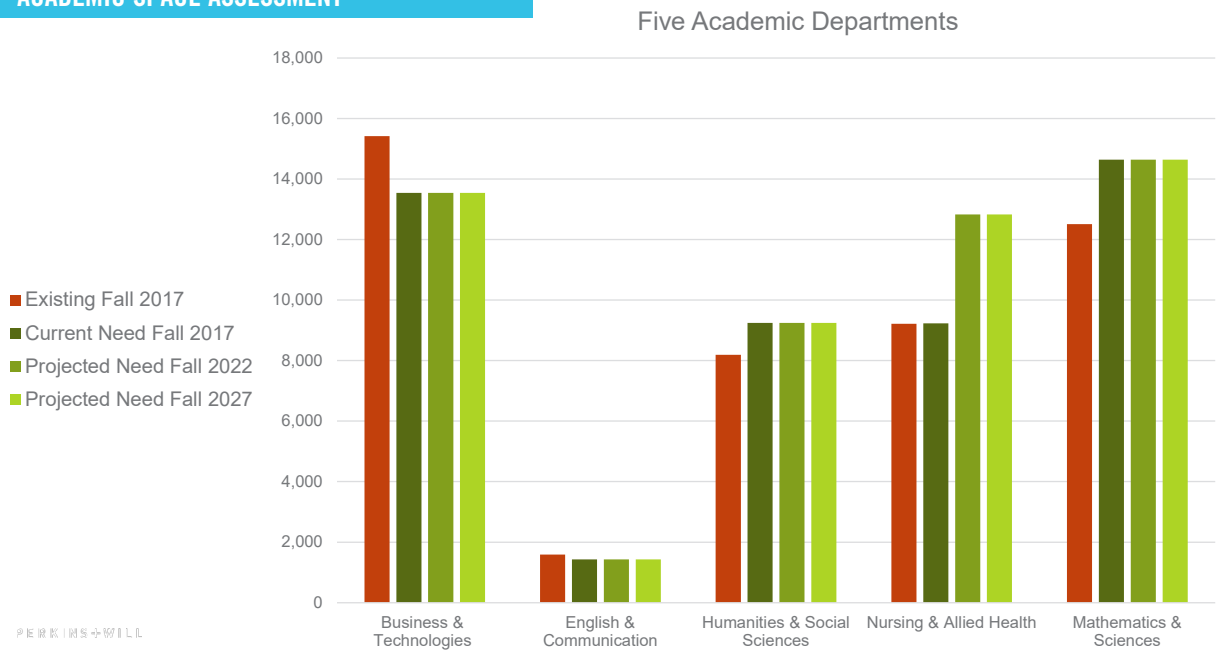

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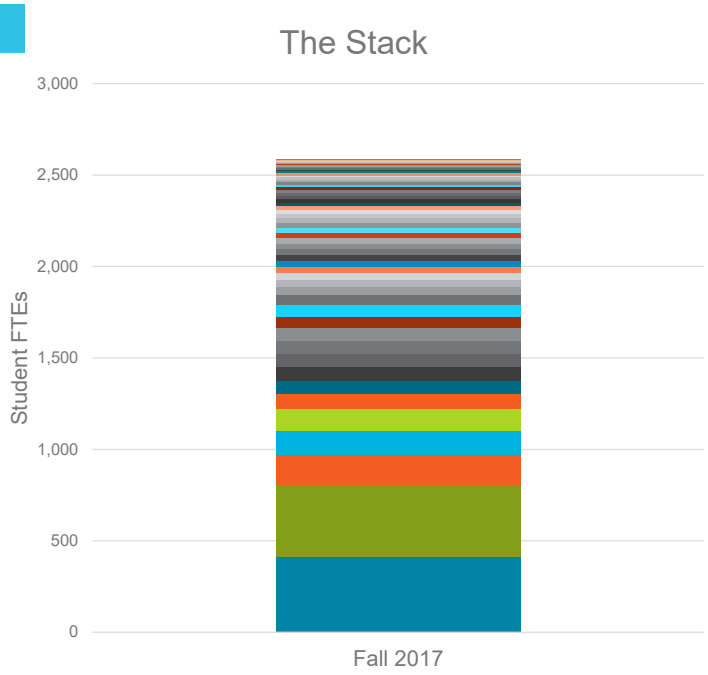

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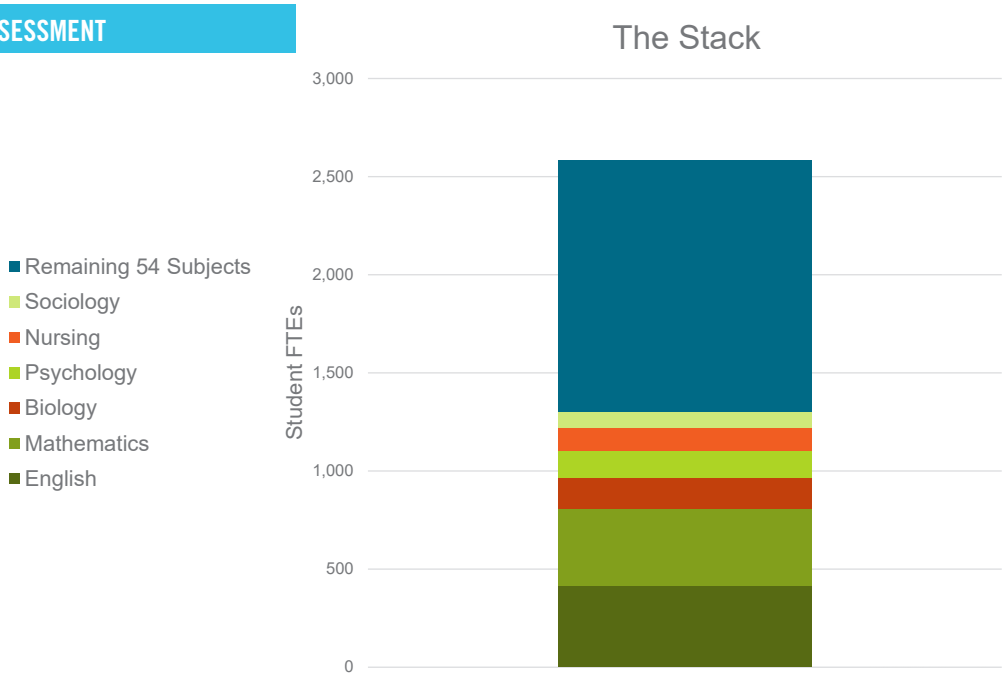

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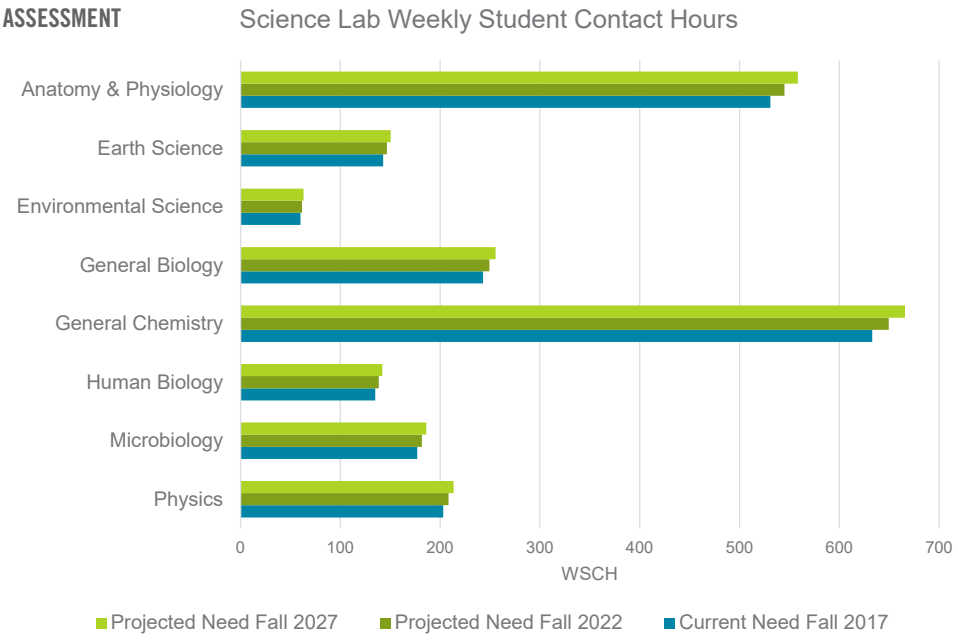
ACADEMIC SPACE ASSESSMENT

MATHEMATICS & SCIENCES ASSESSMENT



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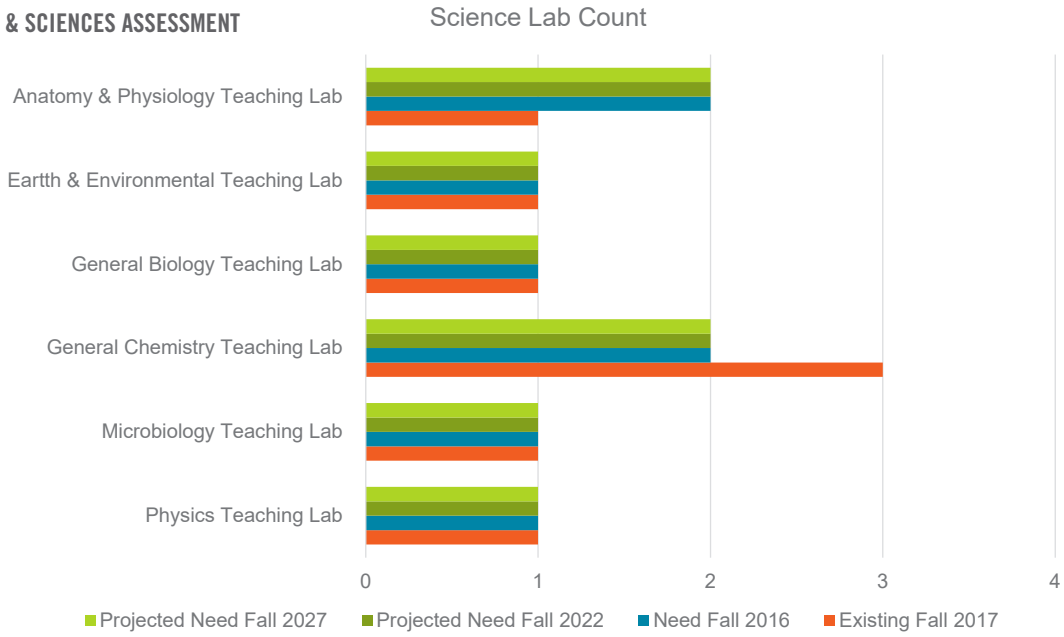
ACADEMIC SPACE ASSESSMENT

MATHEMATICS & SCIENCES ASSESSMENT



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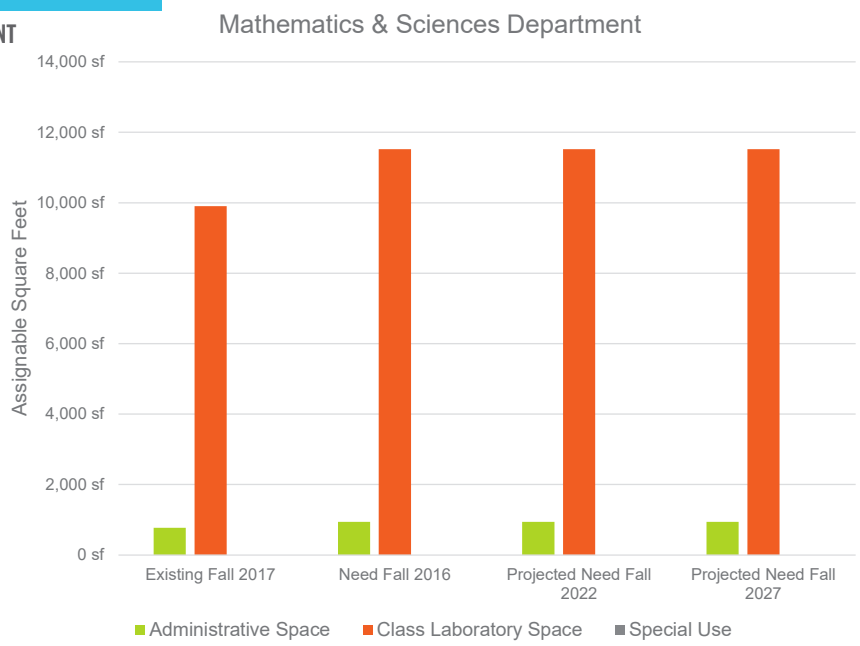
ACADEMIC SPACE ASSESSMENT

MATHEMATICS & SCIENCES ASSESSMENT



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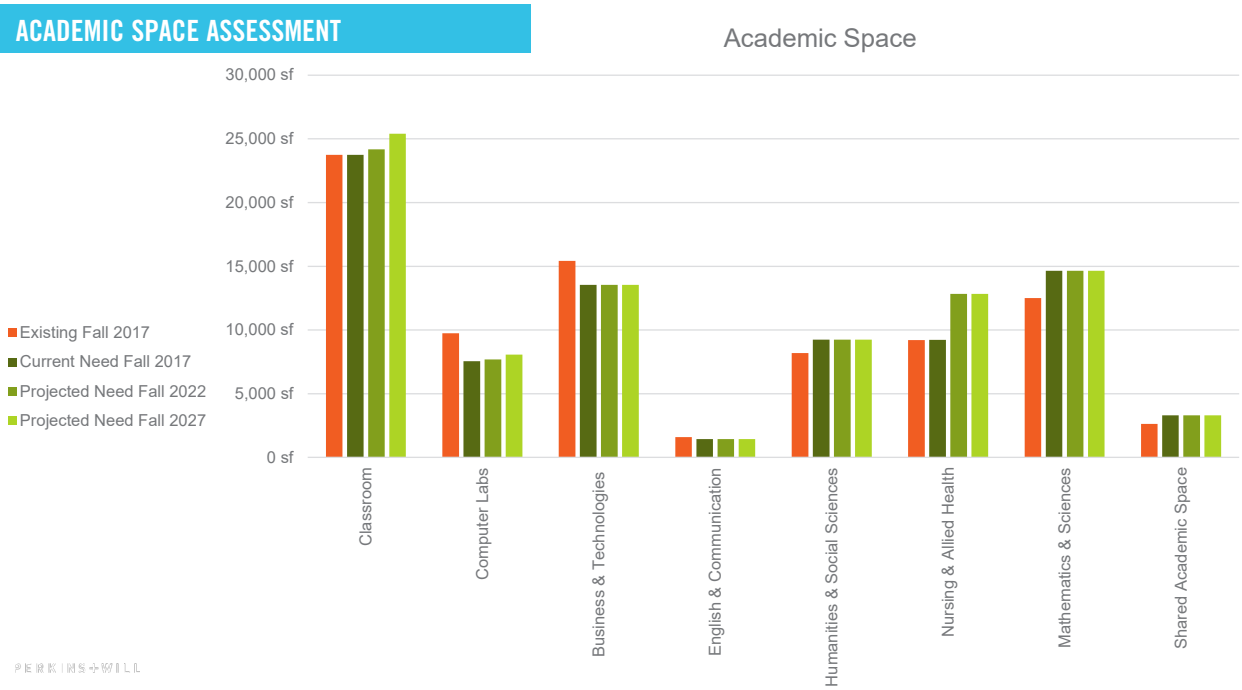

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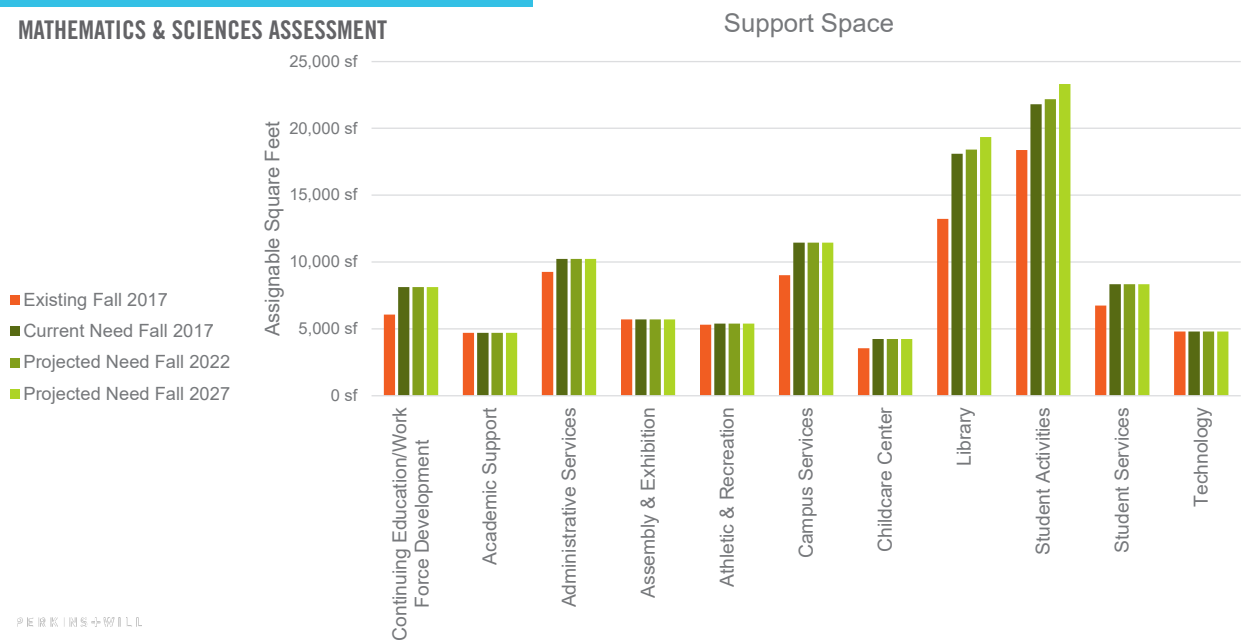
ACADEMIC SPACE ASSESSMENT

MATHEMATICS & SCIENCES ASSESSMENT



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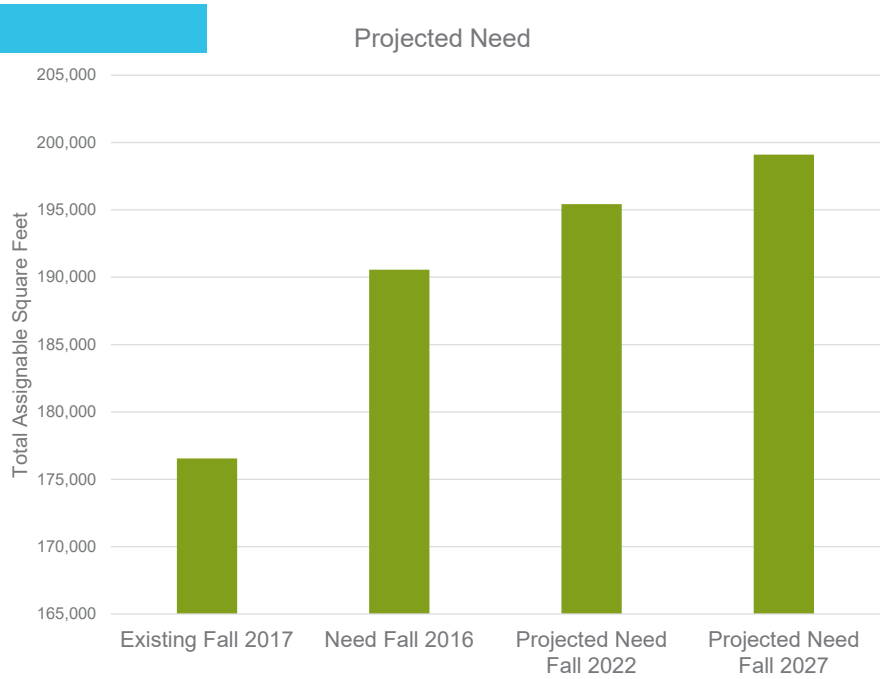

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SPACE ASSESSMENT

You do not build the "NUMBERS"

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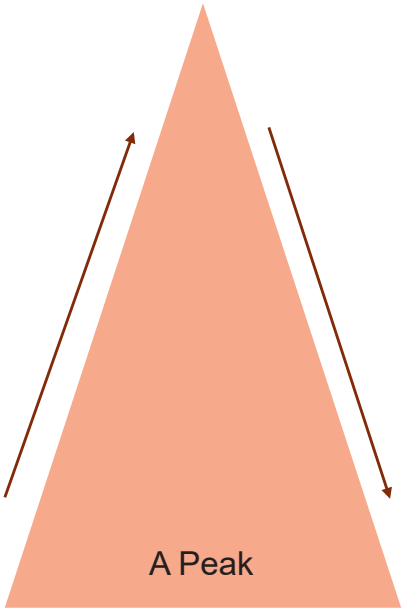
SPACE ASSESSMENT



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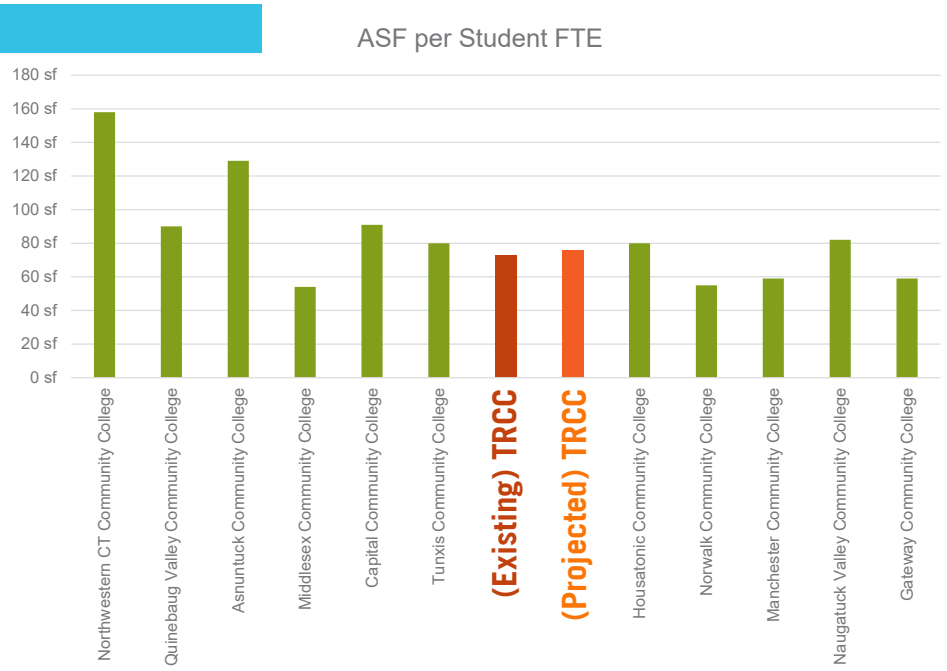

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CLASSROOM UTILIZATION ANALYSIS:
PROGRESS REPORT

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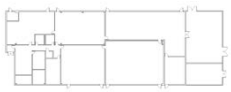
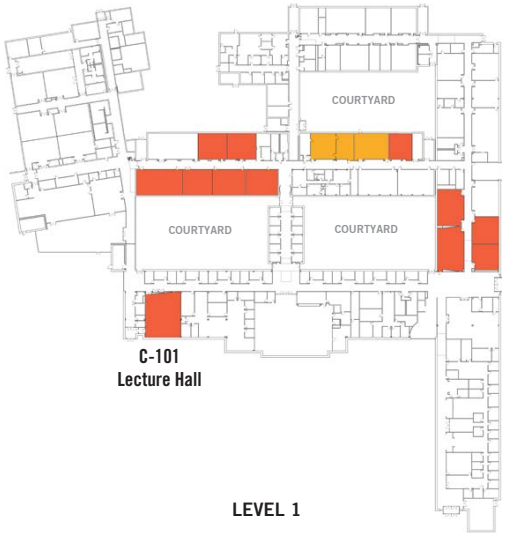
CLASSROOMS



Classrooms
Drafting Classrooms



CLASSROOMS BY THE NUMBERS

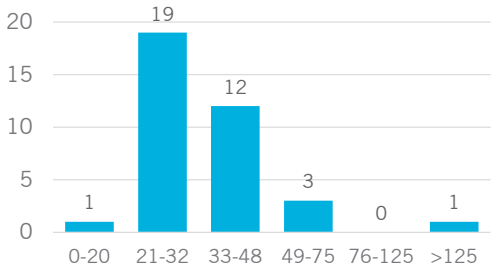
Total course delivery per the Fall 2017 credit courses course schedule

Space Type	Number of Rooms	Total Weekly Hours	Total Weekly Student Contact Hours
Classroom	36	951	18,286
Lab	33	459	6,739
Other – Fitness Rooms	3	8	99
Grand Total	**72**	**1,418**	**25,124**

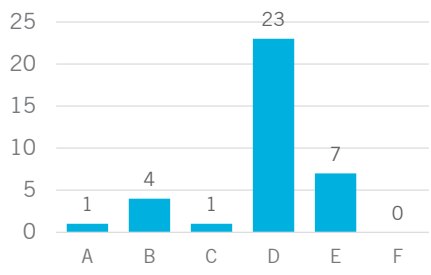
Classroom Data Summary

Total # of Classrooms: 36
Total Classroom Seats: 1,315
Total Classroom ASF: 33,040
Avg. Classroom Room Seat Capacity: 37
Avg. Classroom ASF / Station: 28

Number of classrooms by size



Number of classrooms by Wing



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CLASSROOM UTILIZATION
Summary by Wing

Wing	Number of Classrooms	Total ASF	Total Seats	Average ASF Per Station	Average Seat Capacity per Room	Total Weekly Hours of Courses	Average Weekly Hours per Room	Average Fill Rate Per Room	Total Weekly Student Contact Hours
A	1	960	48	20	20	11	11	41%	192
B	4	4,191	212	22	53	86	21	60%	1,839
C	1	1,893	136	14	136	26	26	20%	694
D	23	20,468	711	30	31	661	29	61%	12,605
E	7	5,528	208	28	29	168	24	61%	2,956
F	0	-	-	-	-	-	-	-	-
Grand Total	**36**	**33,040**	**1,315**	**28**	**37**	**951**	**26**	**59%**	**18,286**

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CLASSROOM UTILIZATION
Summary by Room Size

Room Size	Number of Classrooms	Total ASF	Total Seats	Average ASF Per Station	Average Seat Capacity per Room	Total Weekly Hours of Courses	Average Weekly Hours per Room	Average Fill Rate Per Room	Total Weekly Student Contact Hours
0-20	1	558	20	28	20	4	4	35%	35
21-32	19	15,893	511	32	27	556	29	68%	9,898
33-48	12	11,359	461	25	38	302	25	53%	6,298
49-75	3	3,337	187	18	62	63	21	53%	1,367
>125	1	1,893	136	14	136	26	26	20%	694
Grand Total	**36**	**33,040**	**1,315**	**28**	**37**	**951**	**26**	**59%**	**18,286**

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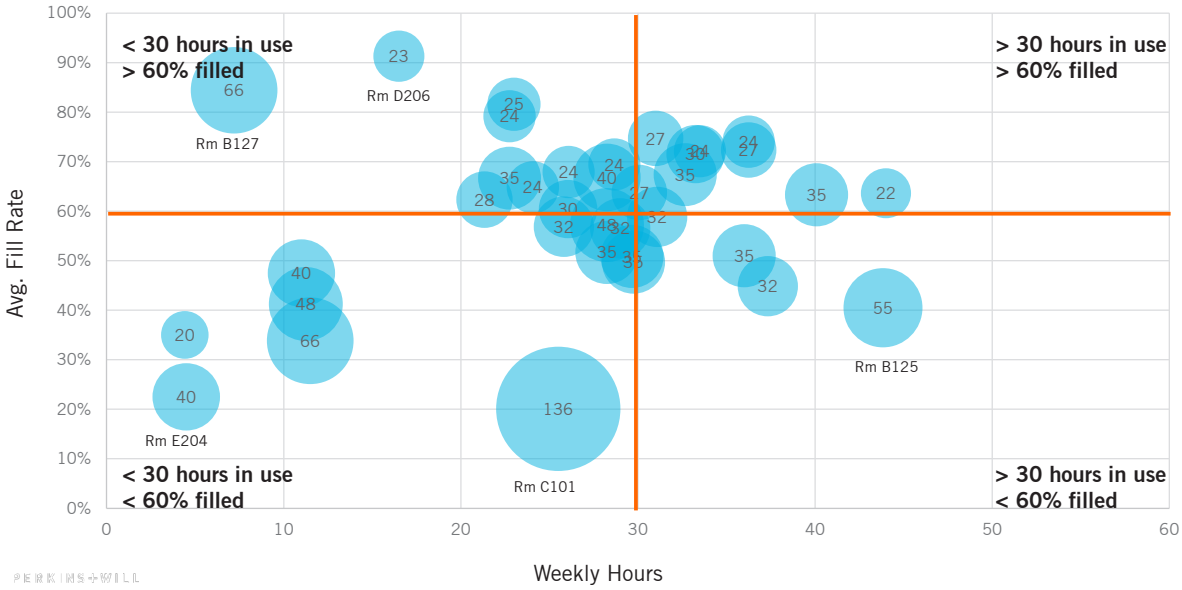
CLASSROOM UTILIZATION

Hours in Use vs Fill Rate by Room (Fall 2017 credit courses)



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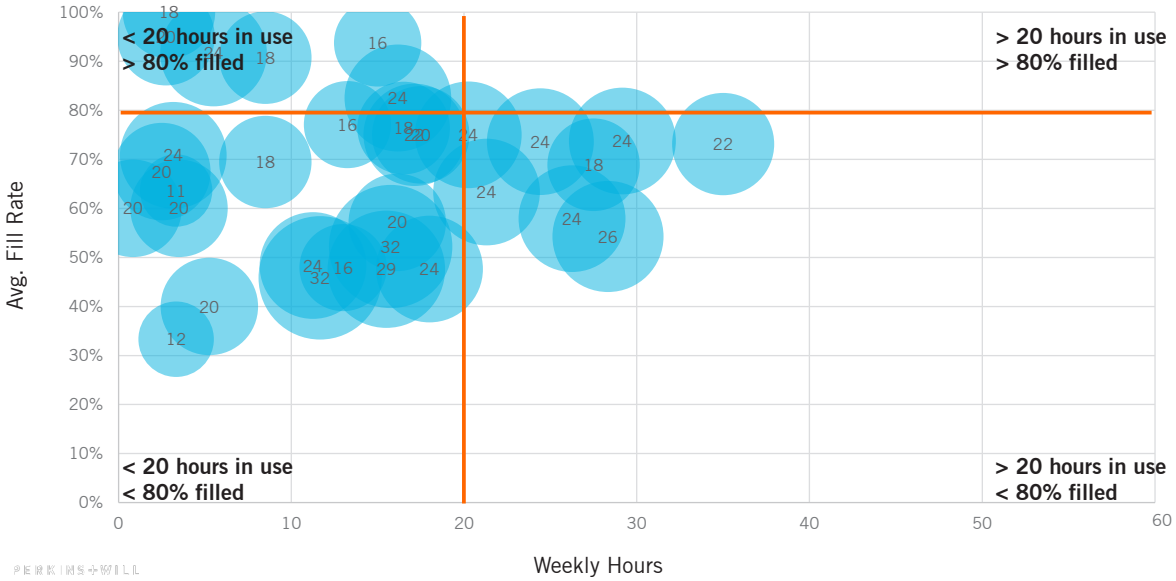
LAB UTILIZATION

Hours in Use vs Fill Rate by Room (Fall 2017 credit courses)



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UTILIZATION
Benchmarking

State	Classroom Hours	Classroom Fill	Class Lab Hours	Class Lab Fill
Alaska	30	60%	20	80%
Arizona	35	65%	25	85%
California	42	71%	25	80%
Colorado	30	67%	20	80%
Florida	40	60%	20	80%
Kansas	30	60%	20	80%
Kentucky	38	67%	23	80%
Louisiana	30	60%	20	80%
Maryland	30	70%	21	79%
Nebraska	30	65%	20	65%
New Hampshire	30	60%	18	70%
New York	30	60%	22	75%
North Carolina	35	65%	20	75%
Ohio	31.5	67%	22.5	80%
Oklahoma	30	40%	24	80%
Oregon	33	60%	16	75%
South Carolina	35	60%	18	75%
South Dakota	30	60%	20	85%
Tennessee	30	67%	18	80%
Texas	38	67%	25	80%
Utah	34	67%	22.5	80%
Wisconsin	30	67%	24	80%
Wyoming	33	60%	20	75%
Average	**33**	**63%**	**21**	**78%**

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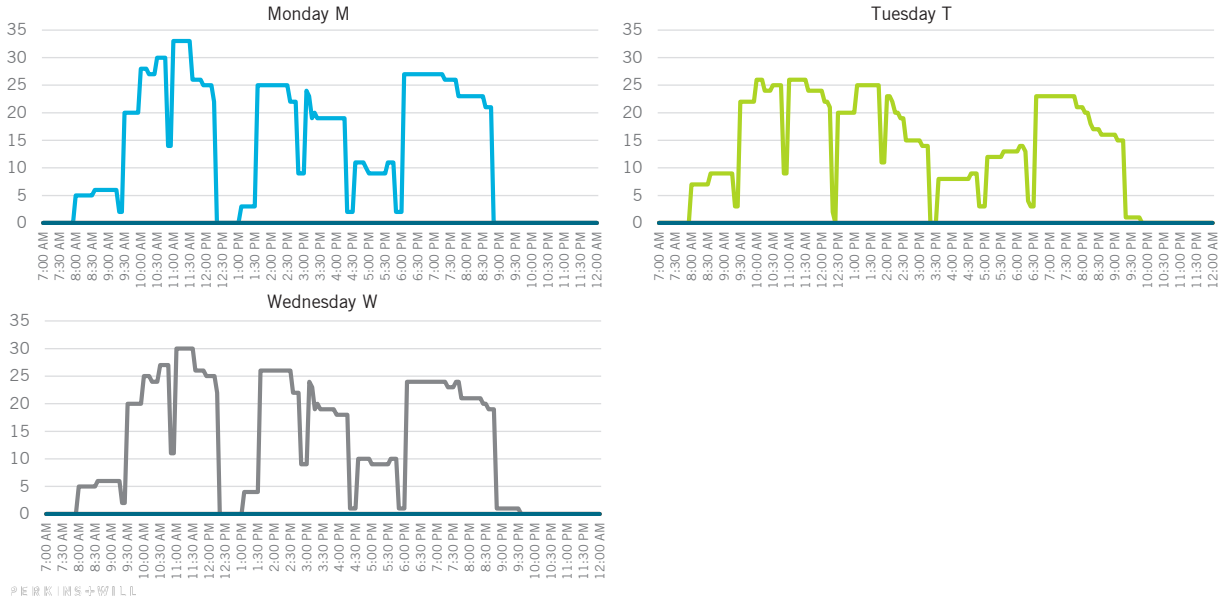
CLASSROOM UTILIZATION
Rooms in Use by Day and Time (Fall 2017 credit courses)



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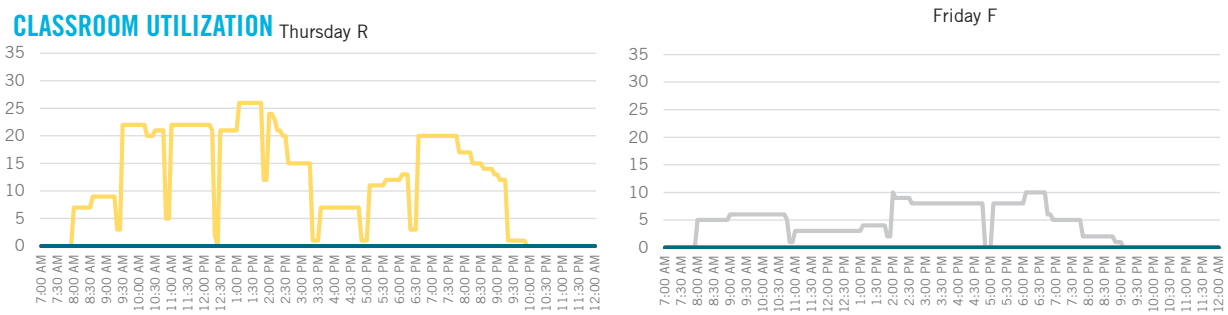
Rooms in Use by Day and Time (Fall 2017 credit courses)



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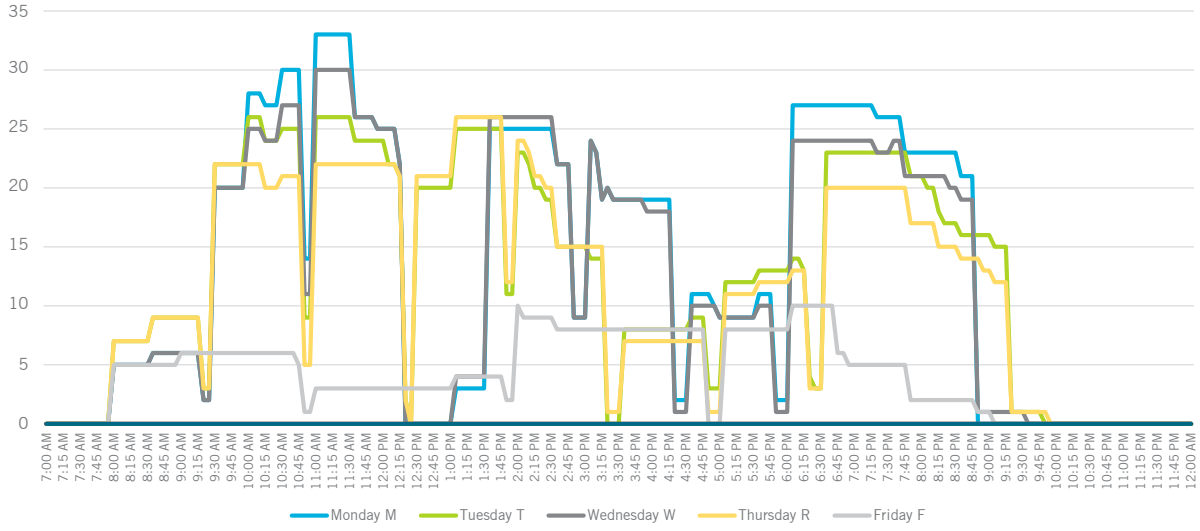
CLASSROOM UTILIZATION
Rooms in Use by Day and Time (Fall 2017 credit courses)



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CLASSROOM UTILIZATION
Courses by Semester & Time of Day

FALL 2017		
DAY	Total hours/week # sessions/week Avg. # sessions/hour	**344** **221** **4.9**
EVENING	Total hours/week # sessions/week Avg. # sessions/hour	**264** **113** **4.5**

Classes that ended by five pm considered “day classes”; classes that ended after five pm considered “evening classes”. Calculations based on credit courses only that had at least 1 person enrolled. Only course that meet in classrooms (not lab, etc.) included. Online courses not included. Number of hours during day assumed to be 9 (8am – 5pm) ; number of hours during evening assumed to be 5 hours (5pm-10pm).

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BUILDING CONDITION & ANALYSIS

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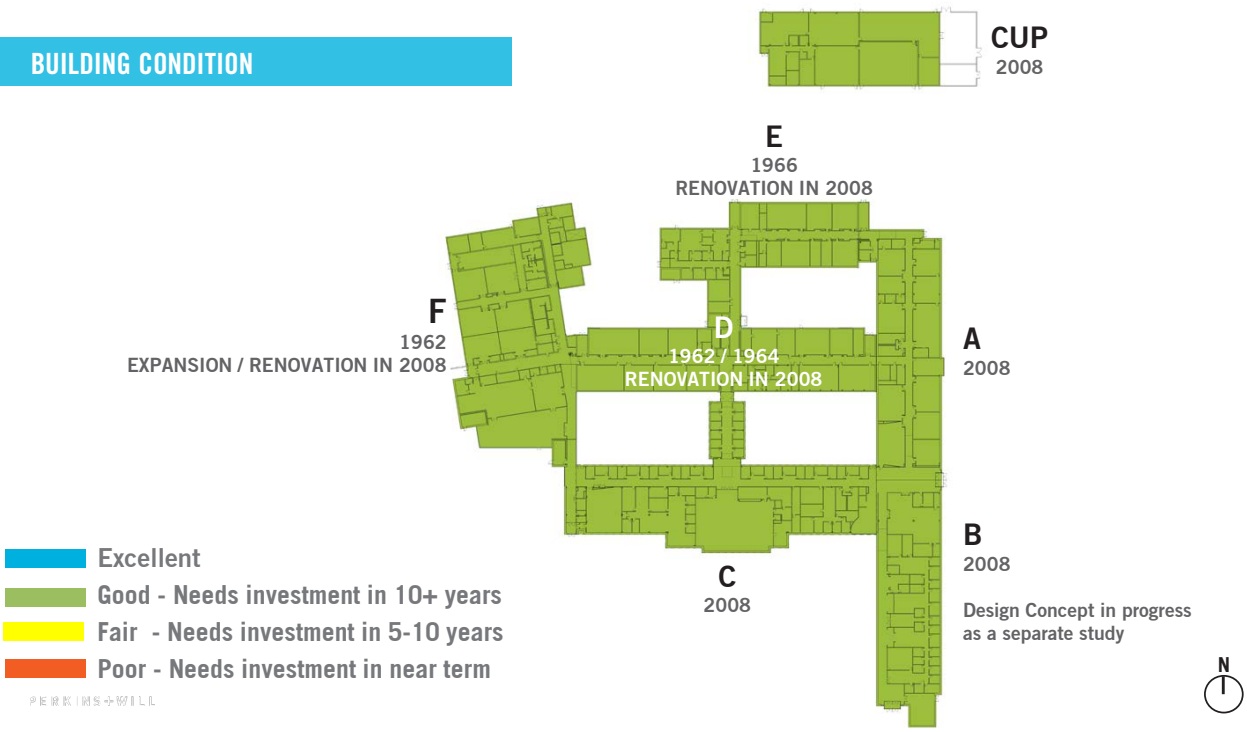
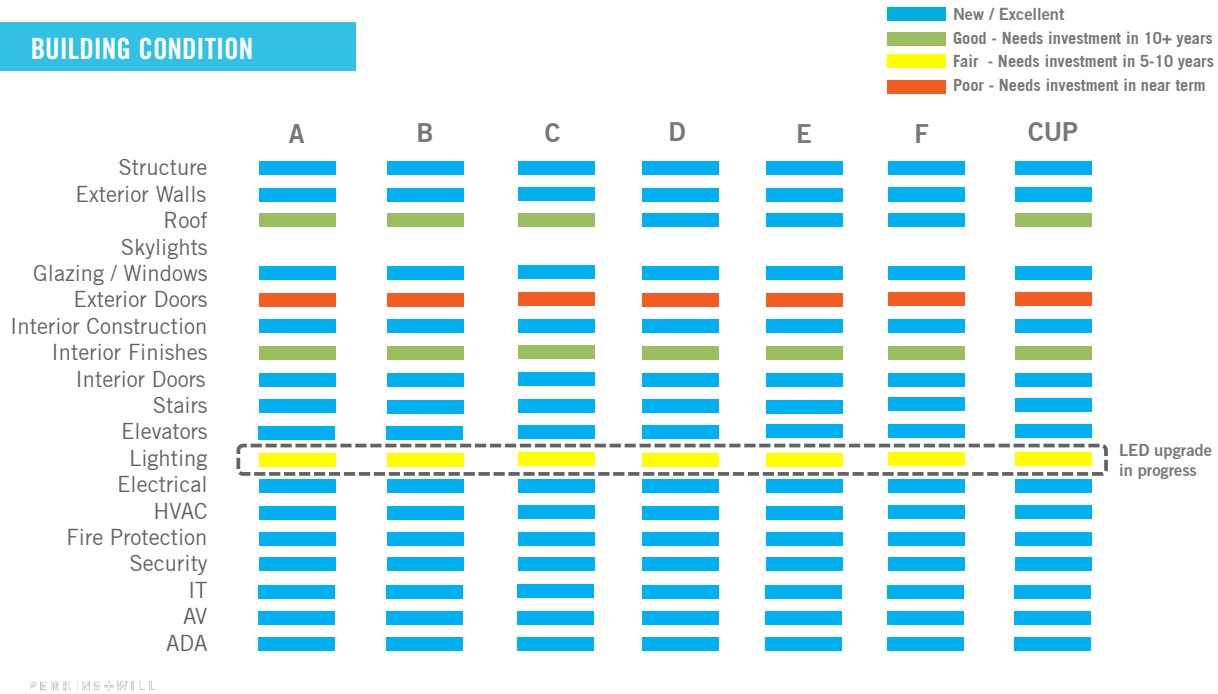
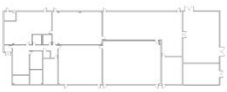
BUILDING CONDITION

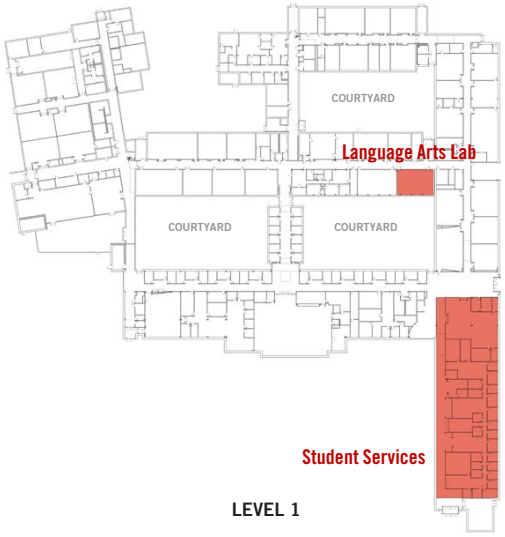


BUILDING CONDITION

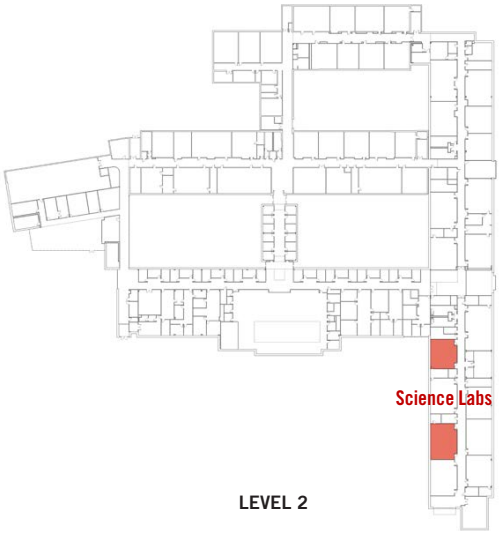


PLANNED PROJECTS





LEVEL 1

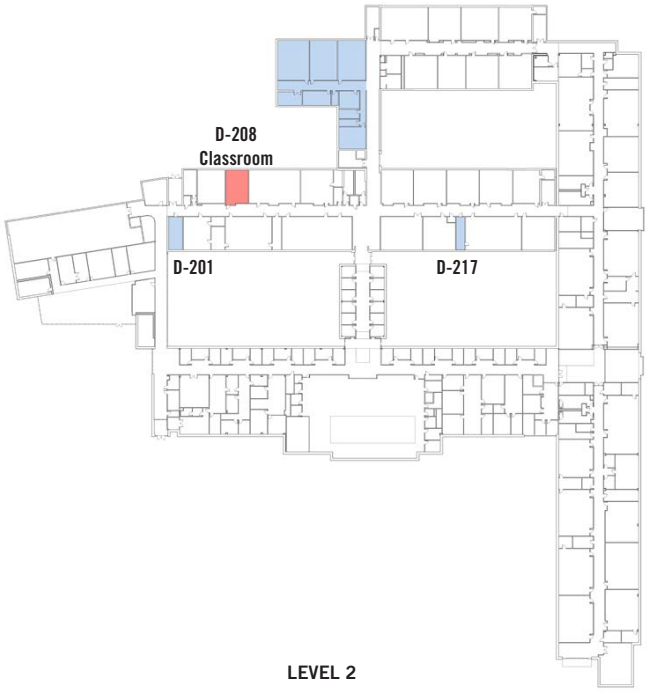


LEVEL 2

N

MIDDLE COLLEGE

Middle College
Shared Classroom



LEVEL 2

N

RESTROOMS

- Men's Room
- Women's Room
- Private Toilet
- Women's Locker
- Men's Locker

LEVEL 1

LEVEL 2

- Only one handicap-accessible restroom?
- Not enough staff / faculty bathrooms

N

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MEP SYSTEMS OVERVIEW

CAMPUS UTILITIES

Heating Ventilation and Air Conditioning (HVAC)
Central Plant & Air Distribution

- Six new high-efficiency Heating Hot water boilers, with primary only pumping, & Three Chillers, with primary secondary operation, in a stand alone building circulating water through the campus.
- Condenser water system is currently drained down during the winter.
- There are 12 air handling units on campus in various mechanical rooms that distribute air to local zones for cooling and heating.

Boiler Plant

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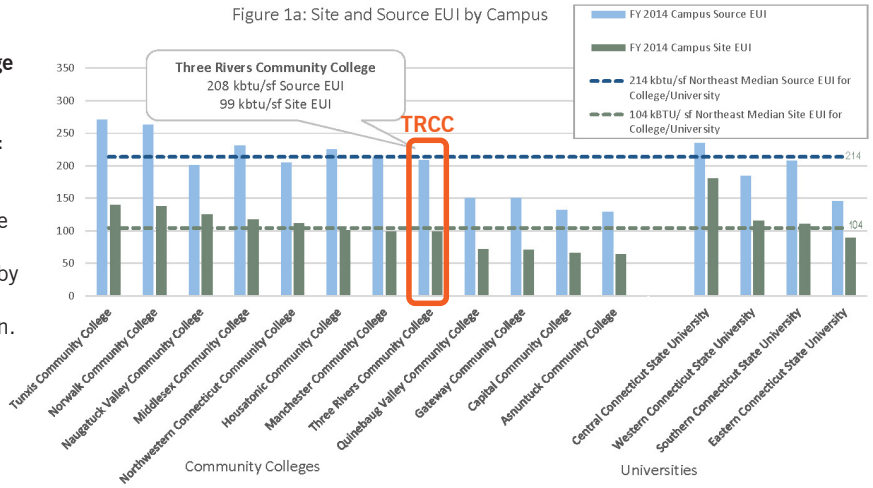
CSCU ENERGY MASTER PLAN

Key Findings

- TRCC's energy use is on **average** with CSCU peers.
- Campus Utilities / Distribution: **Electricity & Natural Gas**
- TRCC is the only campus in the system supplied by Norwich Public Utilities (**NPU**), owned by the Norwich municipality and governed by a local commission.

Figure 1a: Site and Source EUI by Campus



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CAMPUS UTILITIES

Electrical Systems Overview

- Main Building is fed from the main electrical room which has a 277/480V, 3 Phase, 2500 Amp service.
- CUP (Central Utility Plant) building has a 277/480V, Phase, 2000 Amp service.
- There are three existing Generac Generators Onsite two of which are rated at 400 KW and the third generator is rated at 250 KW.
- All on Campus lighting are Fluorescent/Incandescent. Upgrading to LED lighting is recommended.
- Building Electrical System need to undergo an NFPA 70E (Short Circuit and Arc Flash) study.

2000 Amp Switchboard

Existing Generators

CAMPUS UTILITIES

Plumbing Systems Overview

- The campus is provided with high pressure natural gas service from the local utility company.
- The buildings domestic water, sanitary and storm drain sewers are served by the local municipality.
- Main building Domestic hot water is generated by two 400 gallon gas fired heaters. The Daycare area hot water is generated by a 80 gallon electric hot water heater.

Domestic Gas Fired Hot Water Heaters

CAMPUS UTILITIES

Fire Protection Systems Overview

- All incoming fire protection water services are equipped with a backflow preventers.
- All buildings are provided throughout with sprinkler protection.

Fire Service Backflow Preventer

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CAMPUS UTILITIES

Major Operational Issues Identified By Facilities Group Or Observed By AKF

- There are issues with **humidity and temperature control in the D & E wings** that need to be addressed.
    - 2016 Indoor Air Quality HVAC Investigation recommended a series of permanent modifications and interim measures.
- The cooling tower is drained down every winter to prevent freezing but limits the cooling availability on warm winter days. Installation of a plate and frame heat exchanger and basin heaters would allow for **winter cooling availability along with additional energy savings**.

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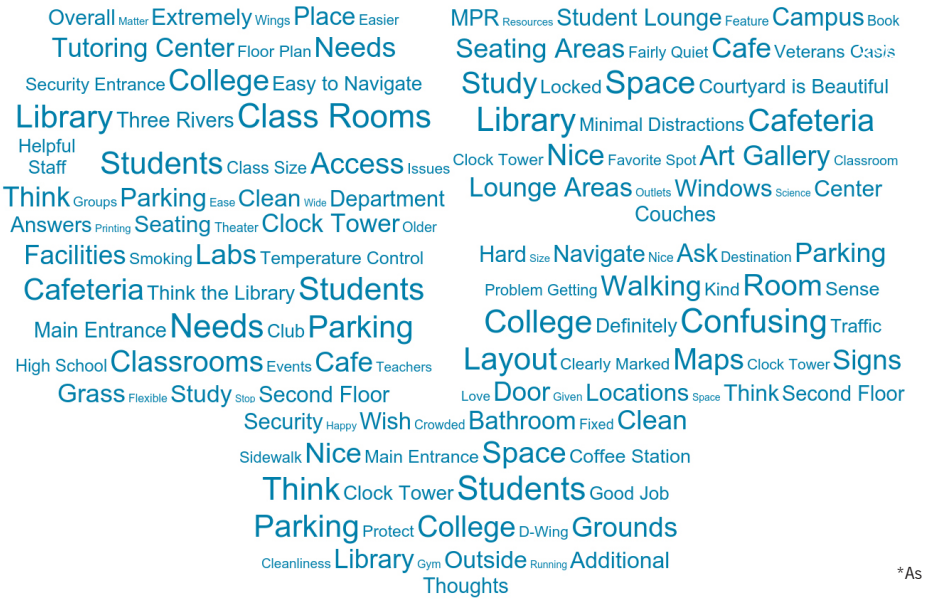
CAMPUS SURVEY RESULTS

CAMPUS SURVEY

Total Participants: 213*



*As of 3/28/2018

CAMPUS SURVEY

1. Are you A) Faculty B) Staff C) Student
2. Do you commute to campus by
3. What area or aspect of the College facilities do you think works the best? Why?
4. What area or aspect of the College facilities do you think most needs improvement? Why?
5. What is your favorite indoor or outdoor space at the College? Why?
6. Do you find it easy to get around the College? If not, why?
7. Please share any additional comments or thoughts regarding the College facilities and grounds

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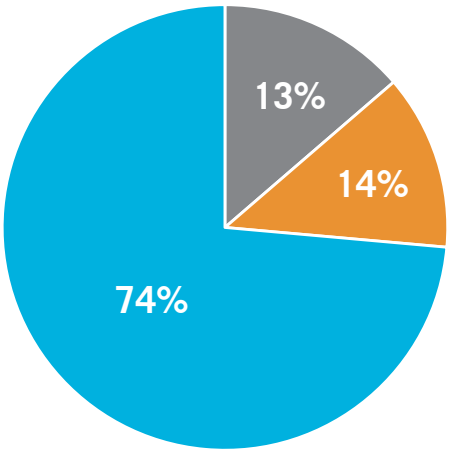
CAMPUS SURVEY

Participation Scan



Student
Staff
Faculty

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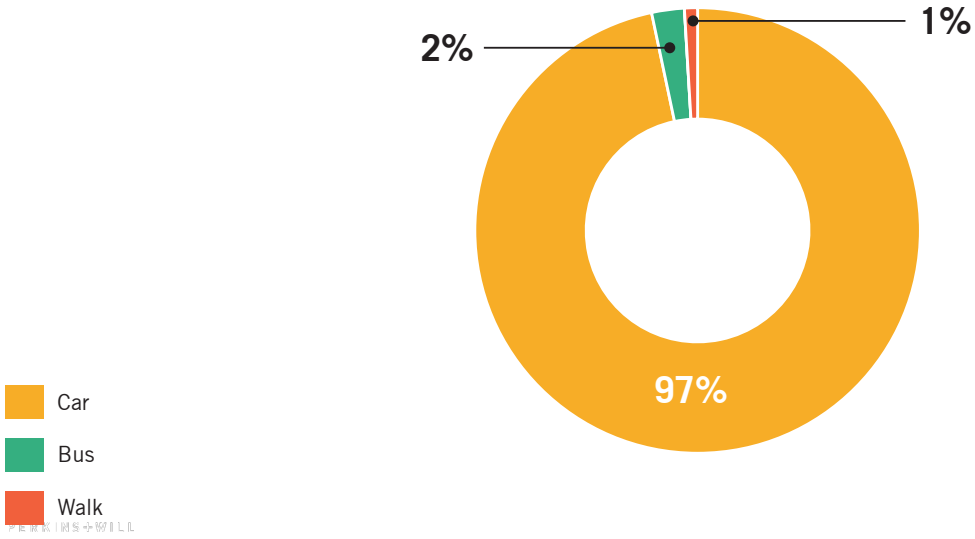
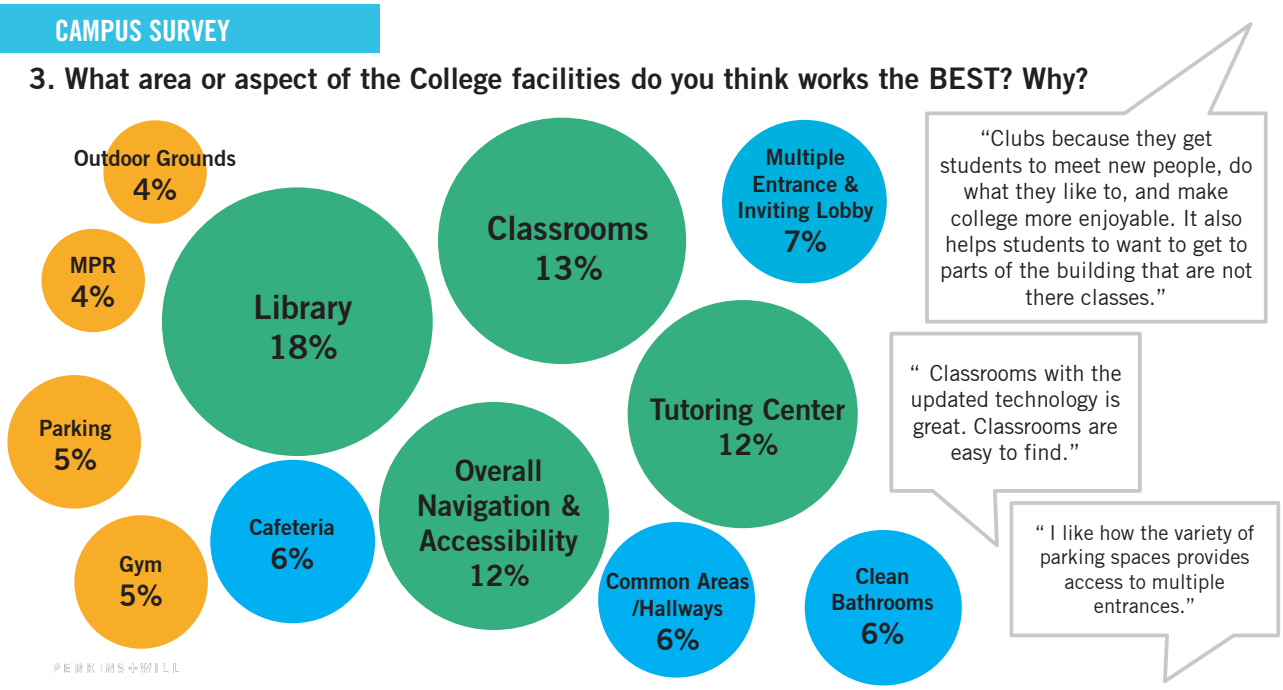
CAMPUS SURVEY

I commute to campus by



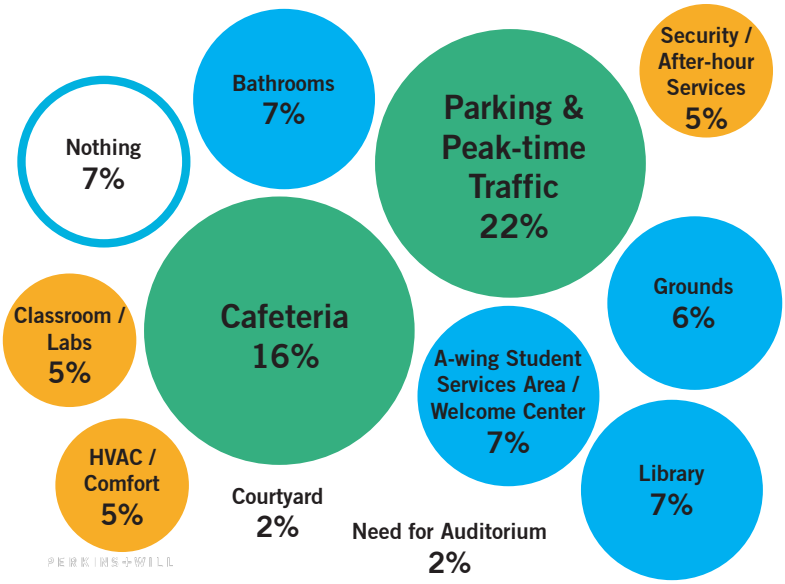
CAMPUS SURVEY

3. What area or aspect of the College facilities do you think works the BEST? Why?



CAMPUS SURVEY

4. What area or aspect of the College facilities do you think most needs improvement? Why?



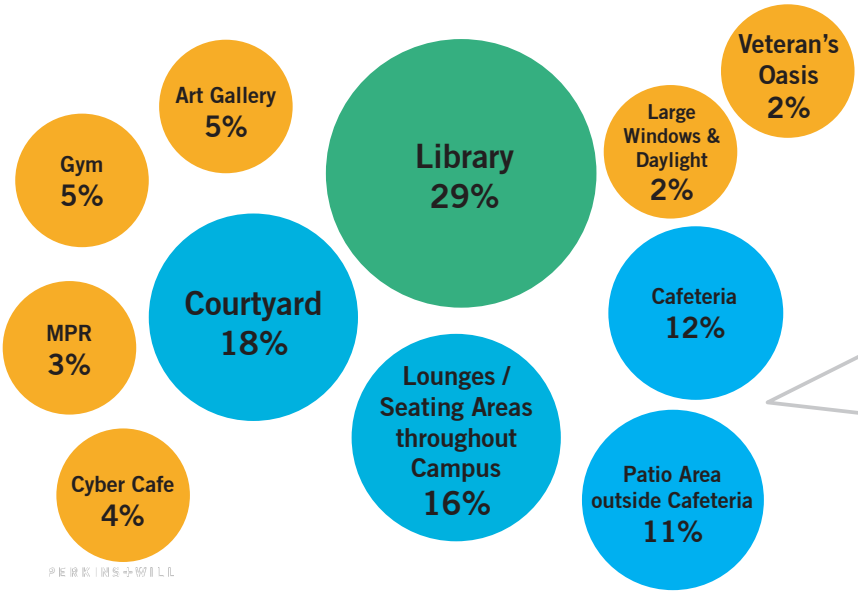
Parking can be kind of a hassle, especially when all the good parking is almost impossible to get and the parking lot farthest away likes to flood

Cafeteria is too crowded during lunch time when everyone is there. sometimes there is no seats available

One last area that needs improvement is the Mohegan Mound that is between the CUP building and E-wing - we really should landscape that area better. It needs a facelift and a sign indicating its cultural and historical significance.

CAMPUS SURVEY

5. What is your favorite Indoor or Outdoor Space at the College? Why?

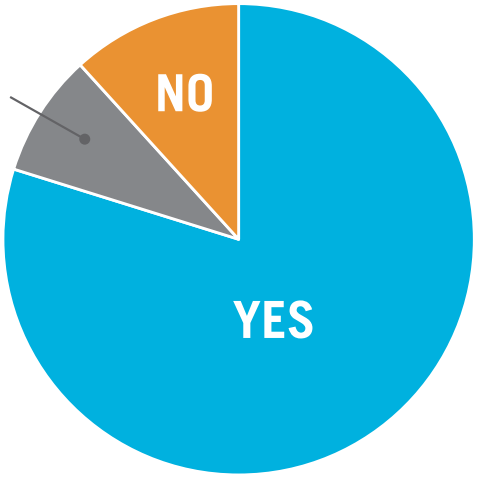


Courtyard and the area outside of the cafeteria. It is wonderful to be able to congregate outside and they are student-friendly spaces. Often times you'll even see students in the courtyard playing music. I'd like to see more of that.

The library and the outdoor/indoor seating areas. Almost all seating areas are quiet and comfortable to sit and relax and do homework. The library has a lot of helpful resources as well.

CAMPUS SURVEY

6. Do you find it easy to get around the College? If not, Why?



At first I would get lost I, but have received kind assistance from maintenance, security and professors. Once I had a good grasp on the layout of the school, getting around was quite easy.

The "D" wing room numbers confusing. Many people are lost and ask for help finding a room, some ask to be escorted to the room they need.

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CAMPUS SURVEY

7. Additional thoughts regarding the College facilities and grounds.

"The **landscape** at the school could be improved."

"The **Tutoring Center** has some wonderful new upgrades. it would be great to integrate some of those ideas with the current library and create 'digital commons' type space which unites library with technology in an open and 'gathering-friendly' space."

"**Parking** is my only concern, especially for students who have to park far away earlier in the day, but leave late at night when it is dark. For me, it's a **safety** concern. Better lighting in the parking lots would be helpful."

"I like very much the transformation of the former **cafe** into a study lounge with a microwave for heating food. That space is perfect for many of us who come to campus after work and want to study for a bit while grabbing a meal before class begins. The microwave can be kept cleaner, however."

"more **outdoor seating** maybe benches or picnic tables in the green to utilize that space in the warmer months"

"An **entrance to the library on the second floor**, as well as an additional computer area would be useful."

"I wish we had a track field outside or a bigger area to do **outside sports activities**."

"The college is always clean when I arrive and I have never heard any complaints from my students either. Keep up the hard work."

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NEXT STEPS

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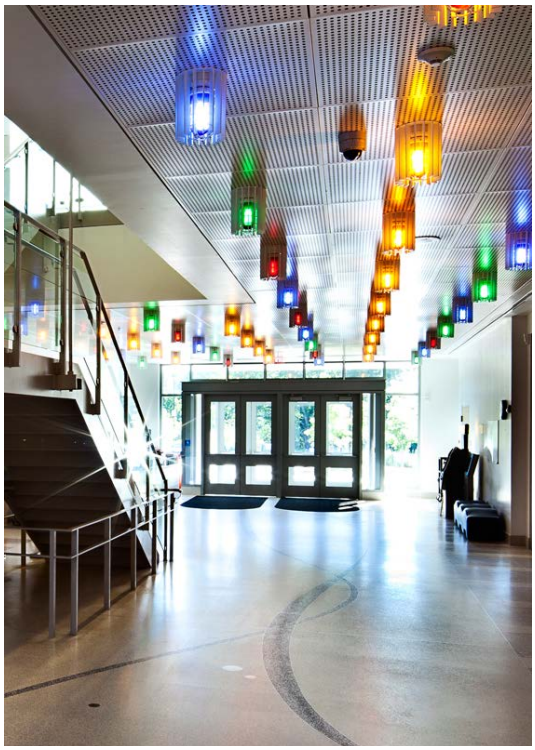
NEXT STEPS

CMPAC 3 – May 1st

- Review final space assessment
- Review and comment on Master Plan concepts in progress
- Frame project priorities

CMPAC 4 – May 29th

- Review final draft Master Plan recommendations
- Phasing, Cost and Implementation discussion
- Town Hall meeting (optional)



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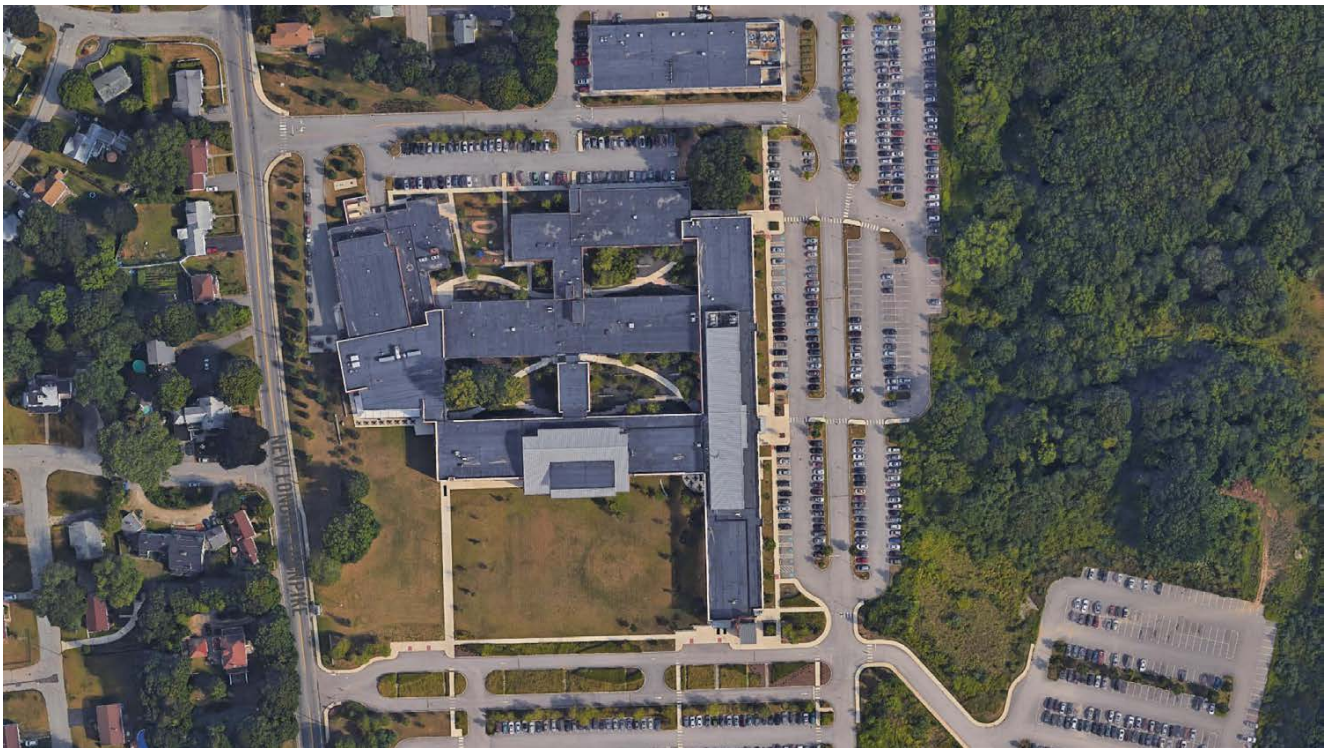
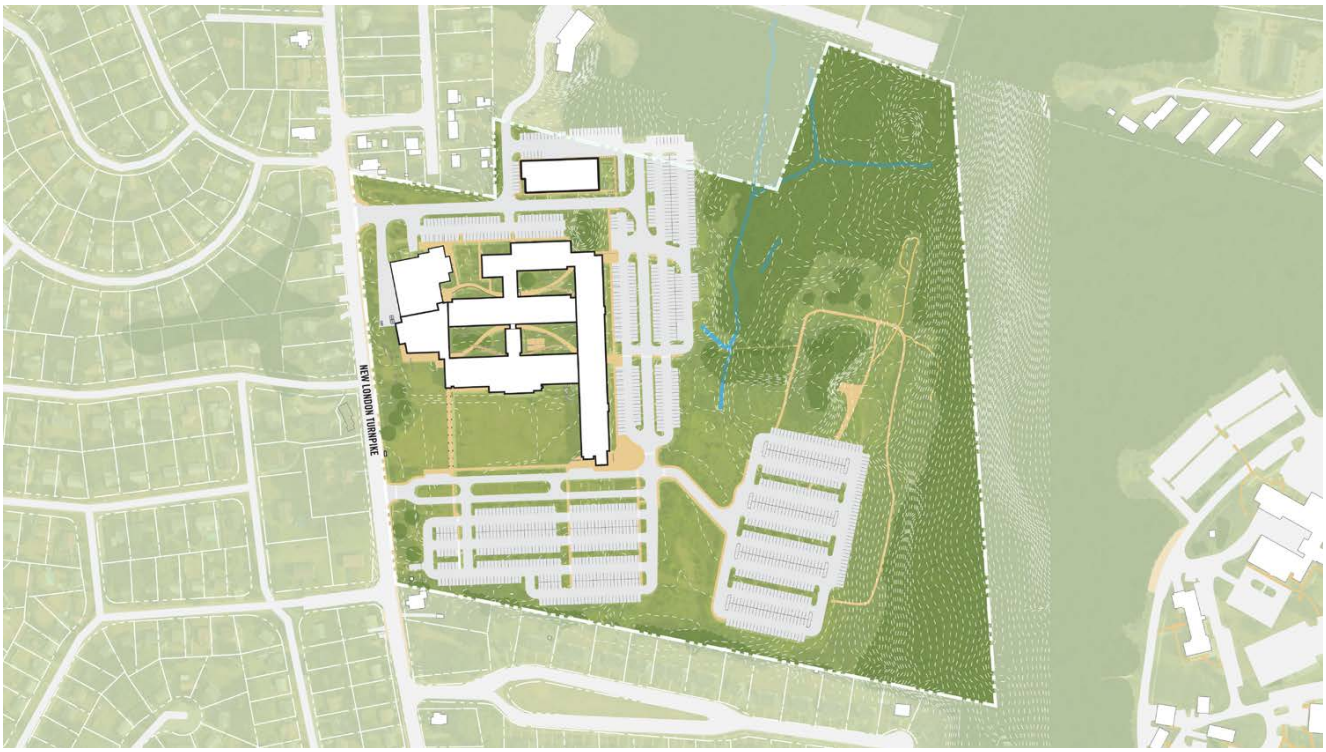


DISCUSSION


NEW LONDON TURNPIKE

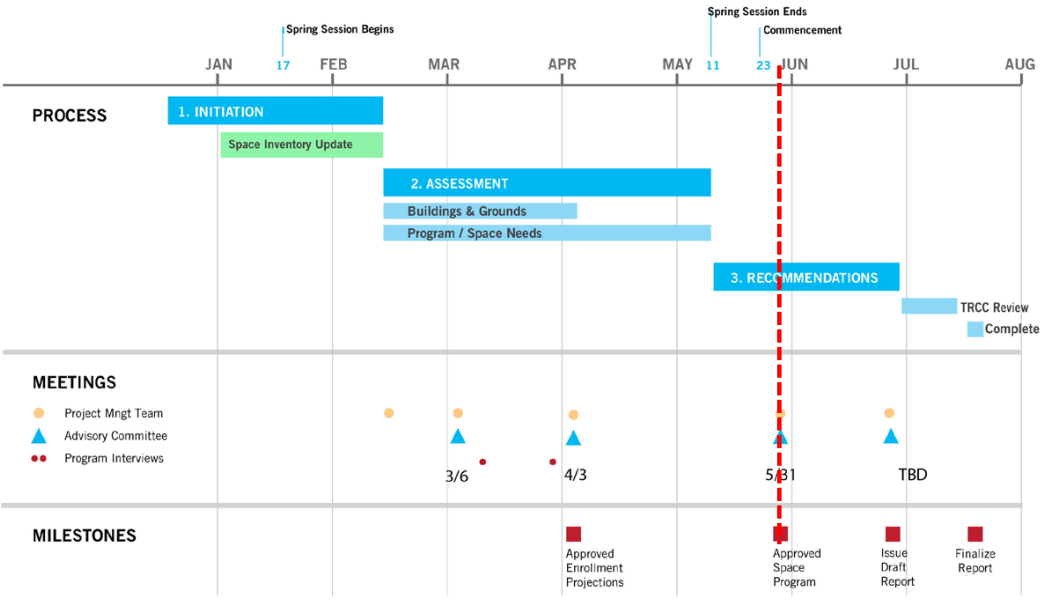
AGENDA

1. Introduction
2. Final Space Assessment
3. Draft Recommendations
   - Pipeline Program
   - Technology Programs
   - Library
   - Sciences
   - Site and Infrastructure
   - Expansion (10-year)
4. Project Priorities
5. Next Steps

Discussion

INTRODUCTION

PROJECT SCHEDULE



PROGRESS UPDATE

Since our last meeting:

- Detailed review of course data
- Follow up meetings with
    - Sciences
    - Manufacturing, Technology
    - Nursing / Allied Health
    - Registrar
- Finalized Space Needs Assessment
- Studied Expansion Concept
- Coordination, Pipeline Program / Id3A Study
- Coordination, Library Phase 2

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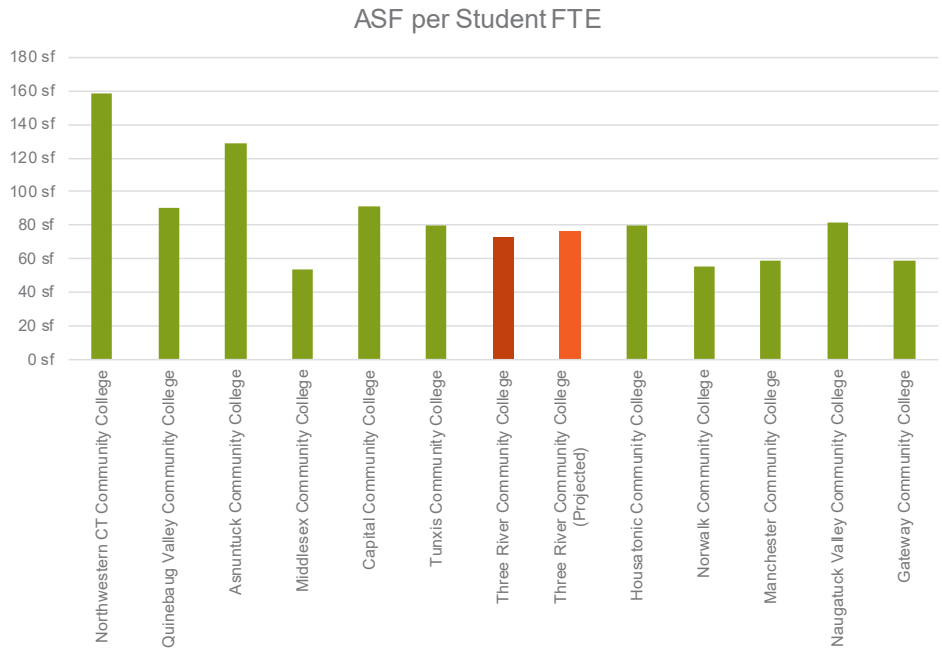
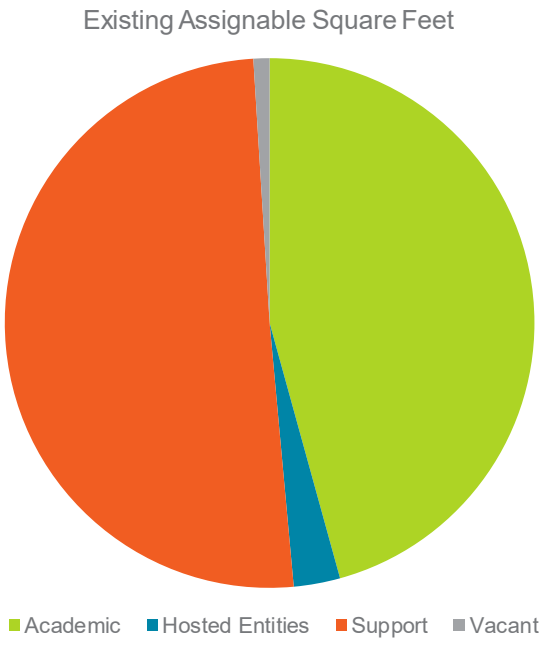
SPACE ASSESSMENT

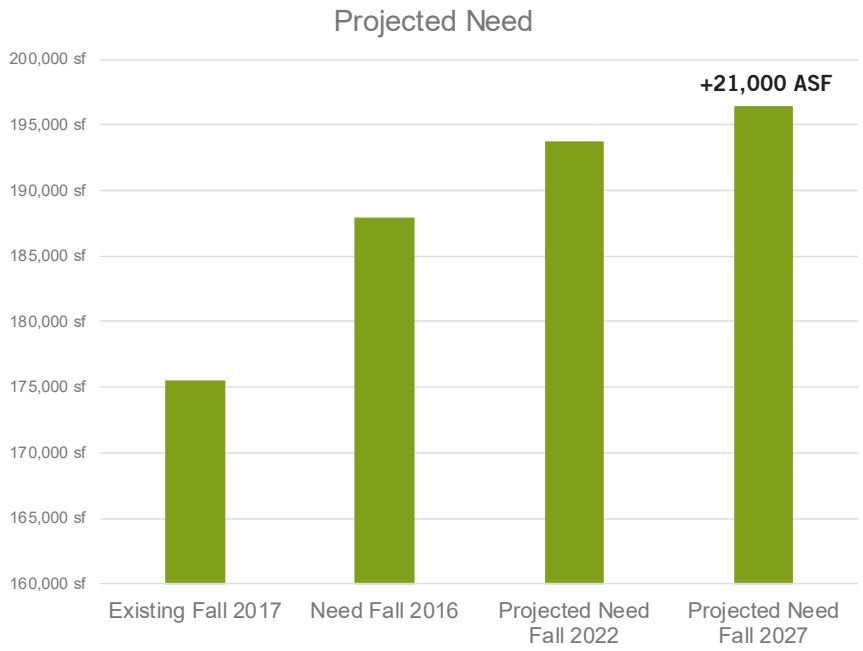
SPACE ASSESSMENT



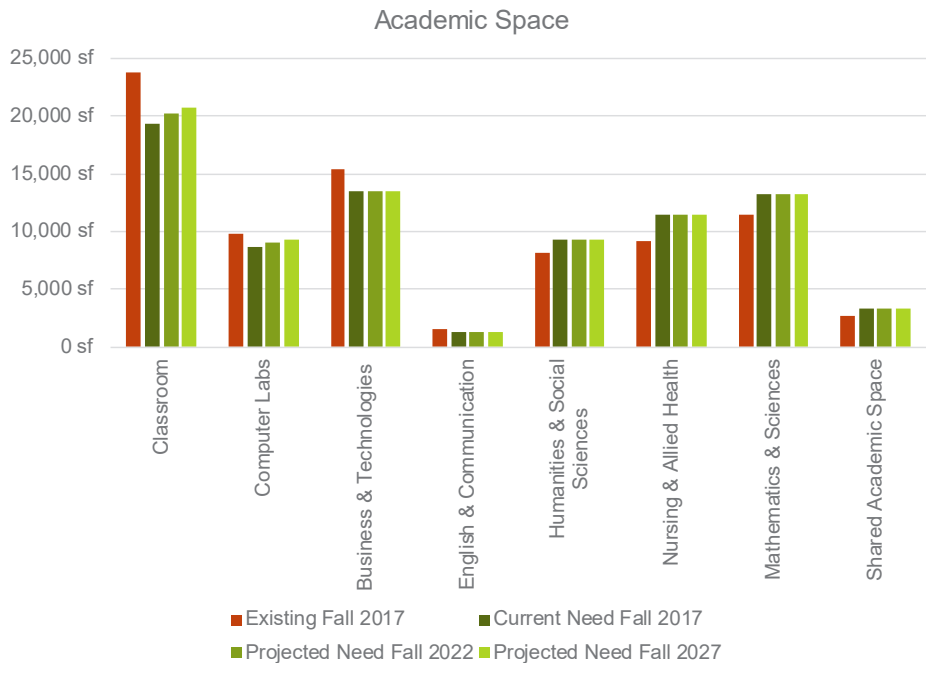
BENCHMARKING



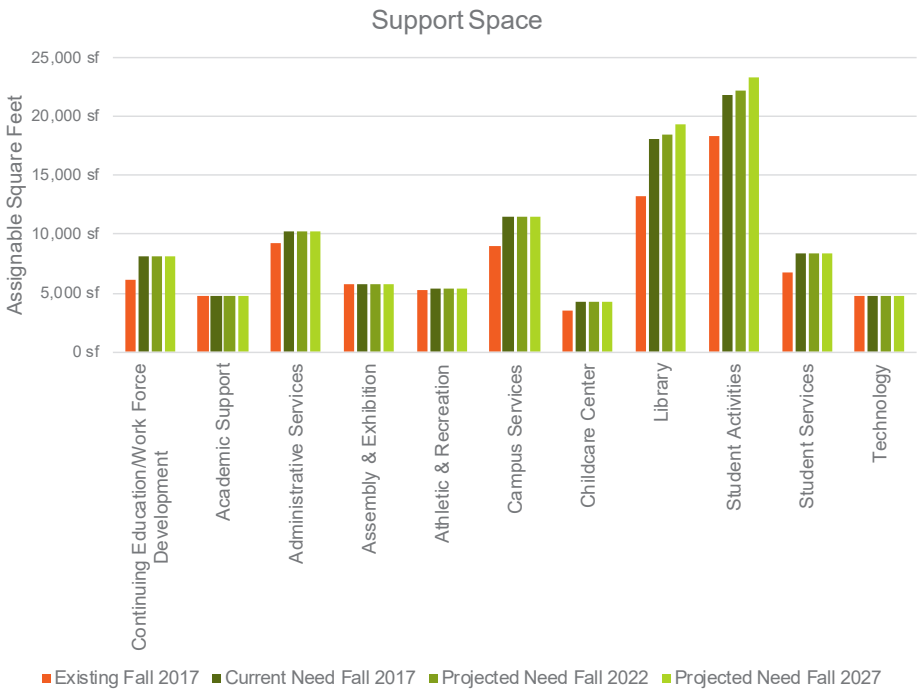
SPACE ASSESSMENT



ACADEMIC SPACE ASSESSMENT



ACADEMIC SPACE ASSESSMENT



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SPACE ASSESSMENT

Four Components
Classrooms
Sciences
Nursing
Technologies

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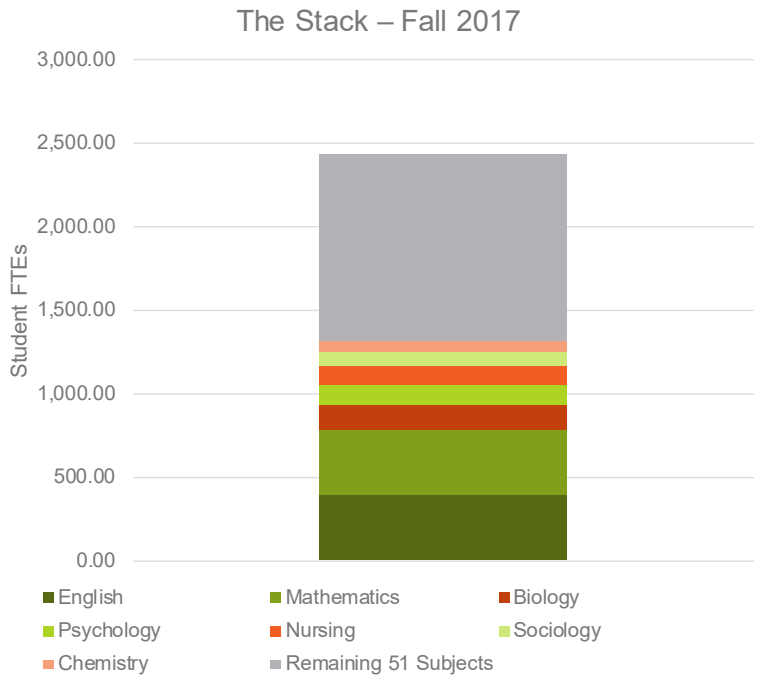
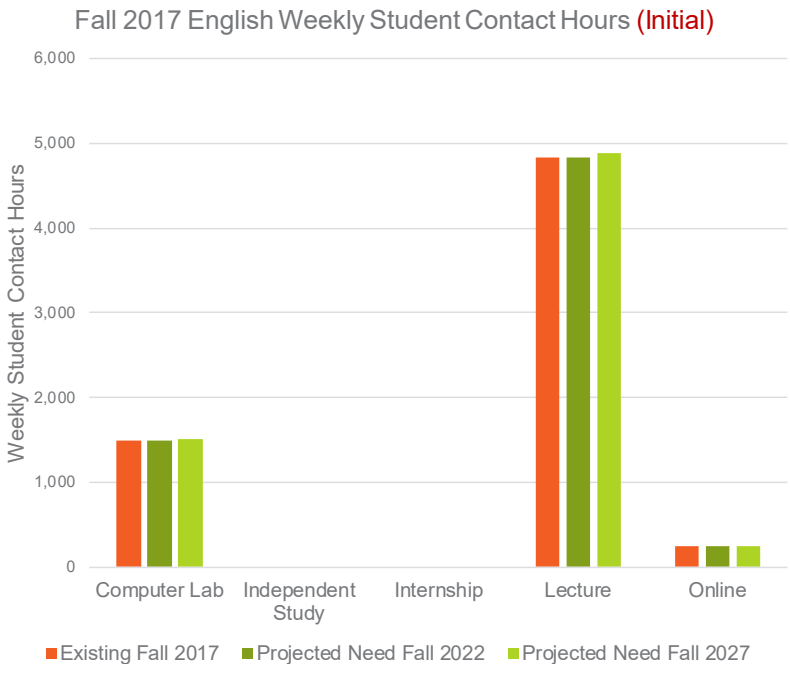
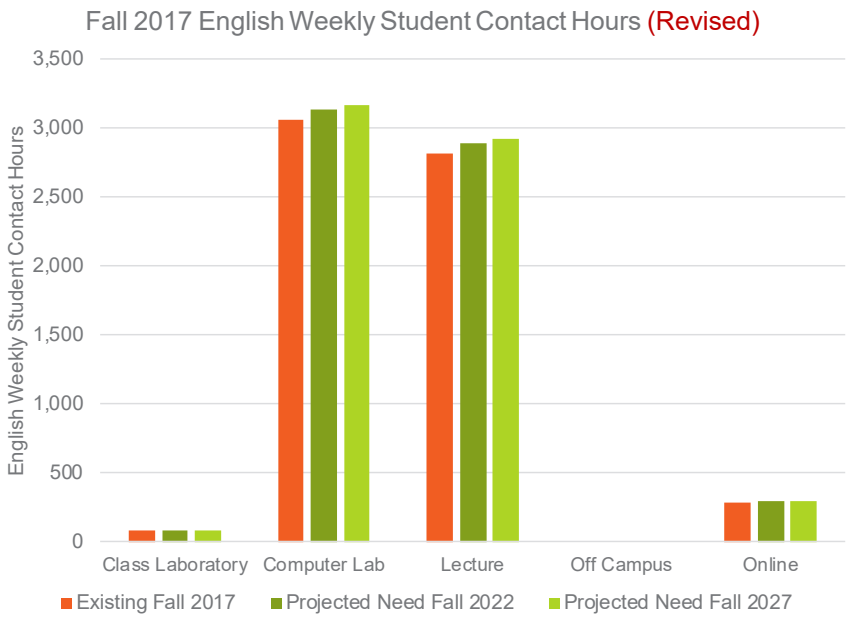
PARETO PRINCIPLE



CLASSROOM SPACE ASSESSMENT



CLASSROOM SPACE ASSESSMENT



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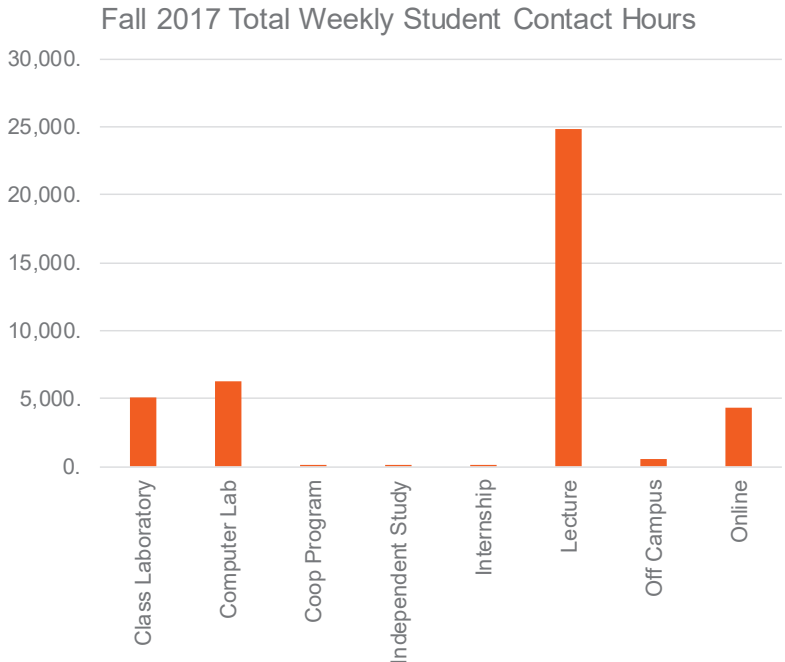
CLASSROOM SPACE ASSESSMENT



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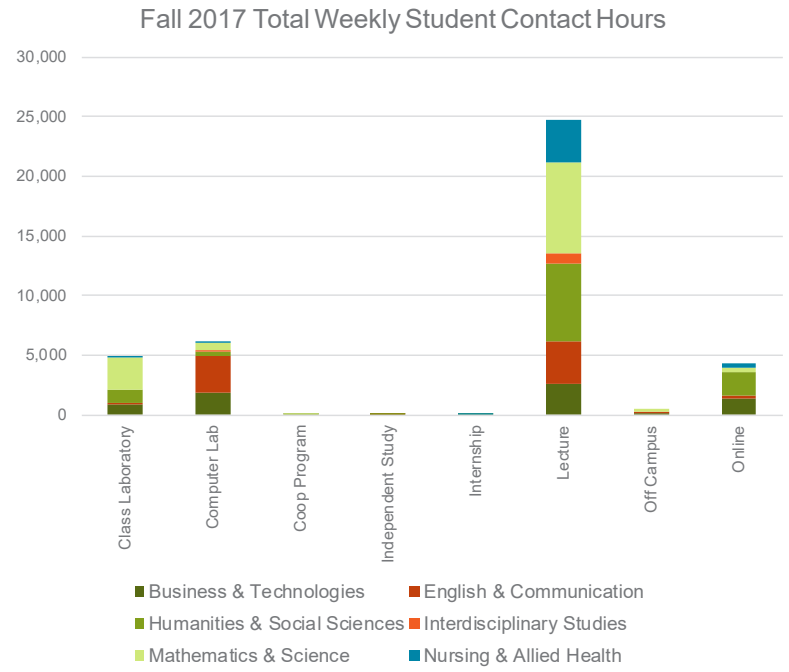
CLASSROOM SPACE ASSESSMENT



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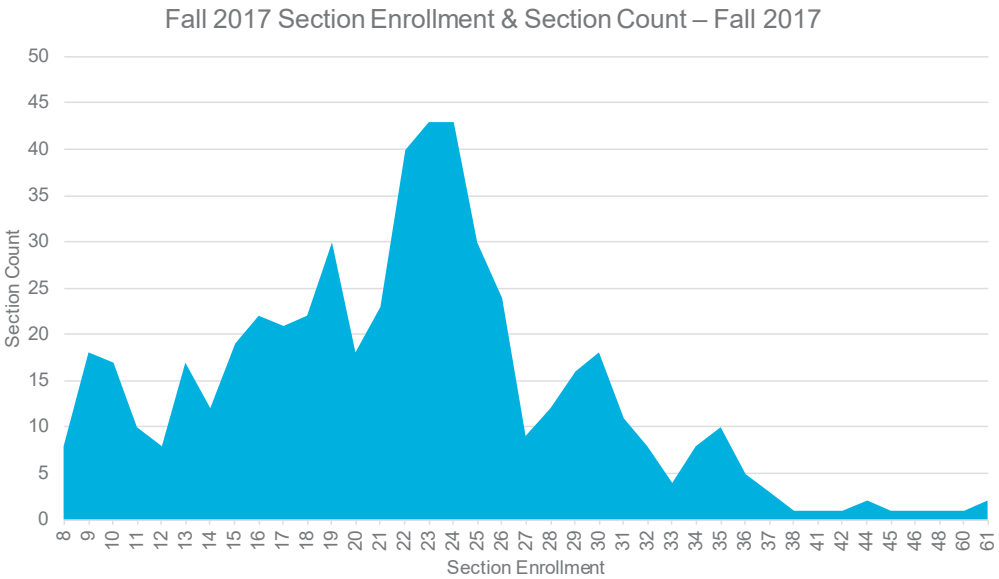
SECTION SIZE DISTRIBUTION



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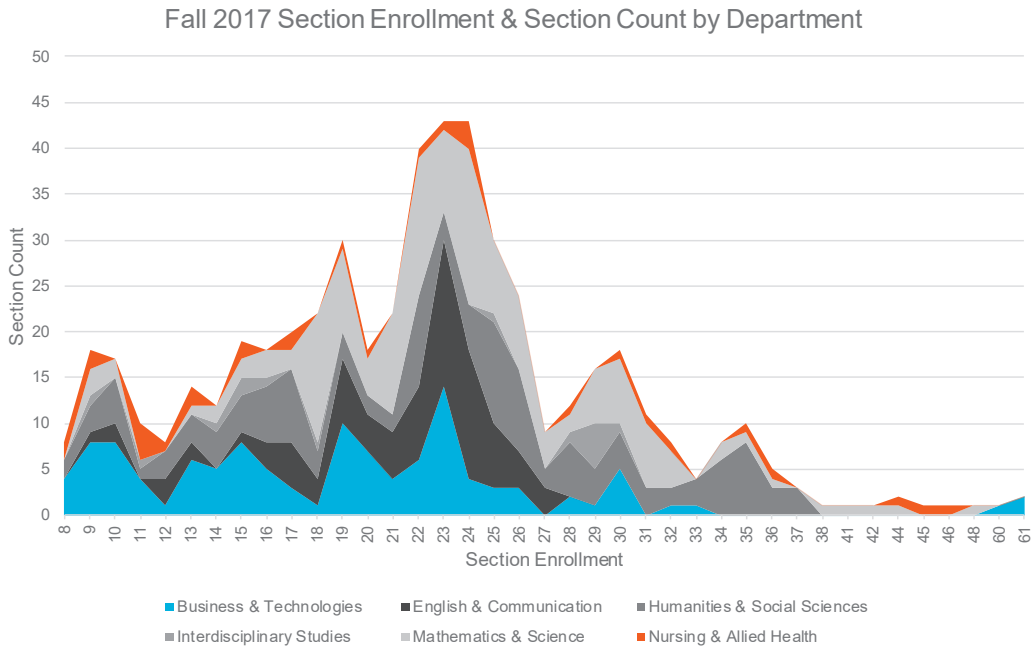
SECTION SIZE DISTRIBUTION



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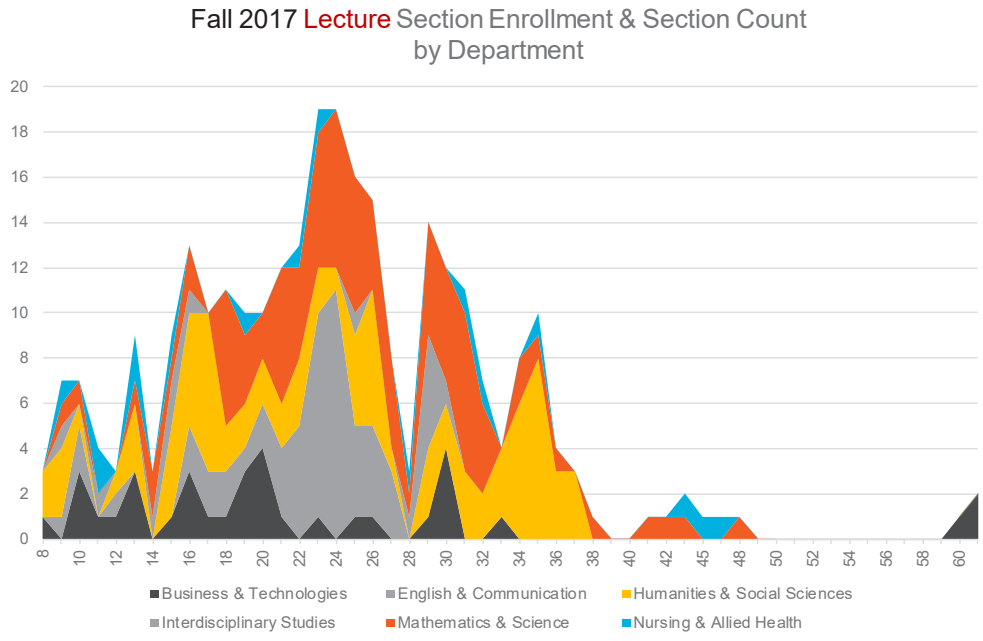
SECTION SIZE DISTRIBUTION



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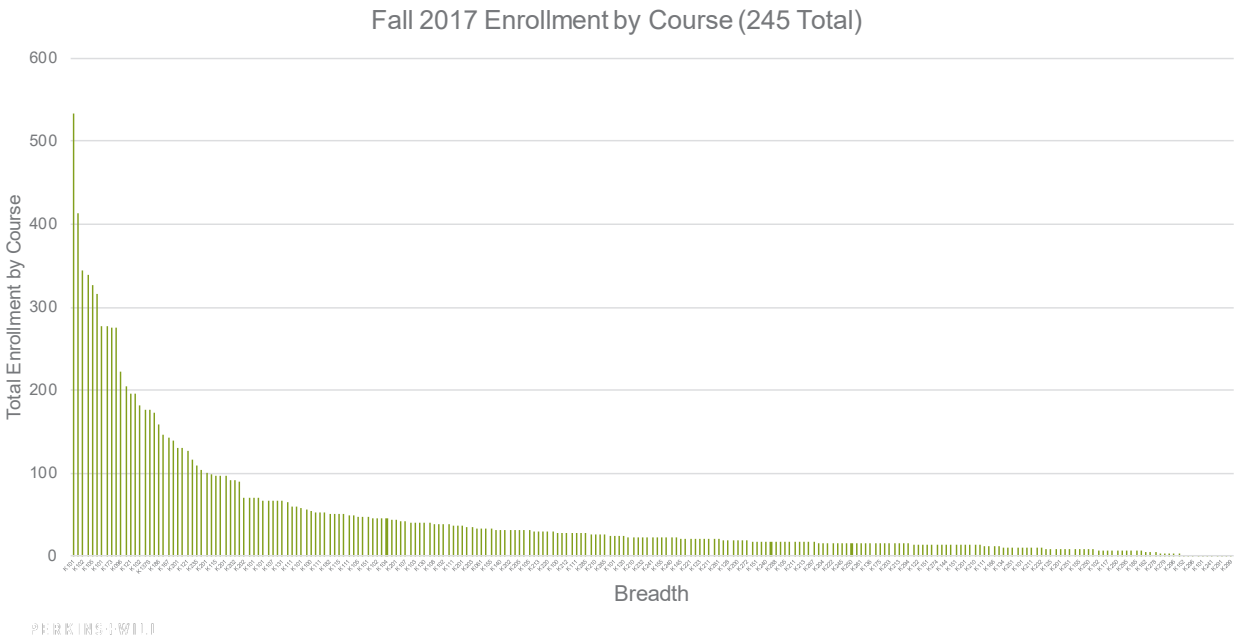
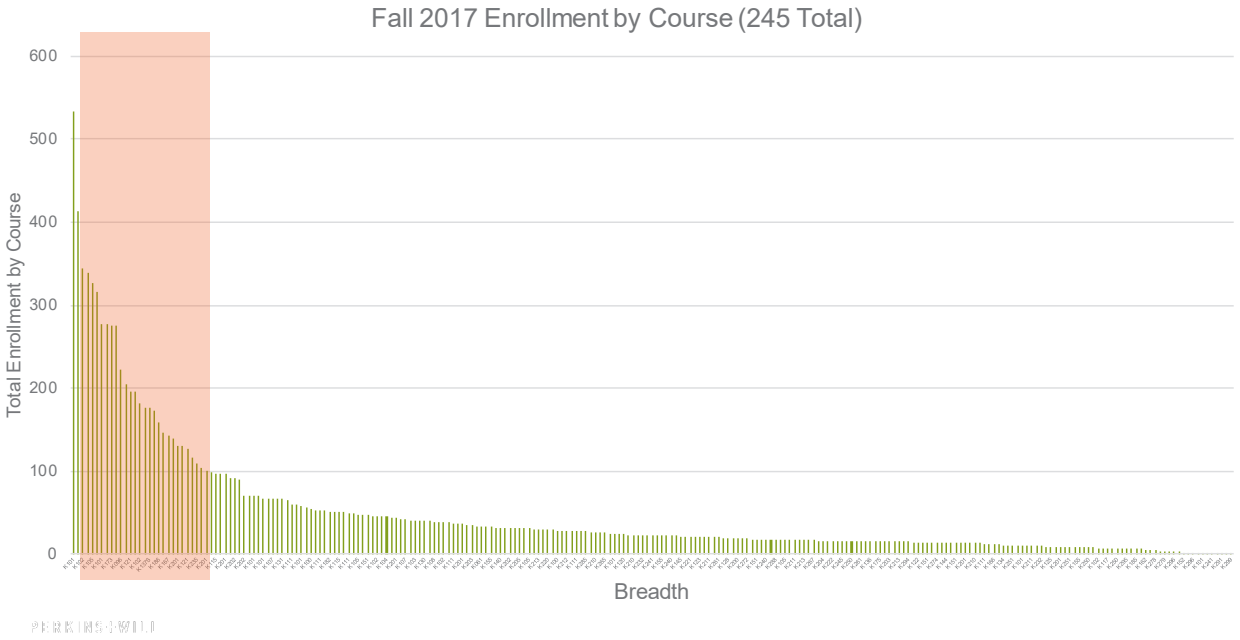
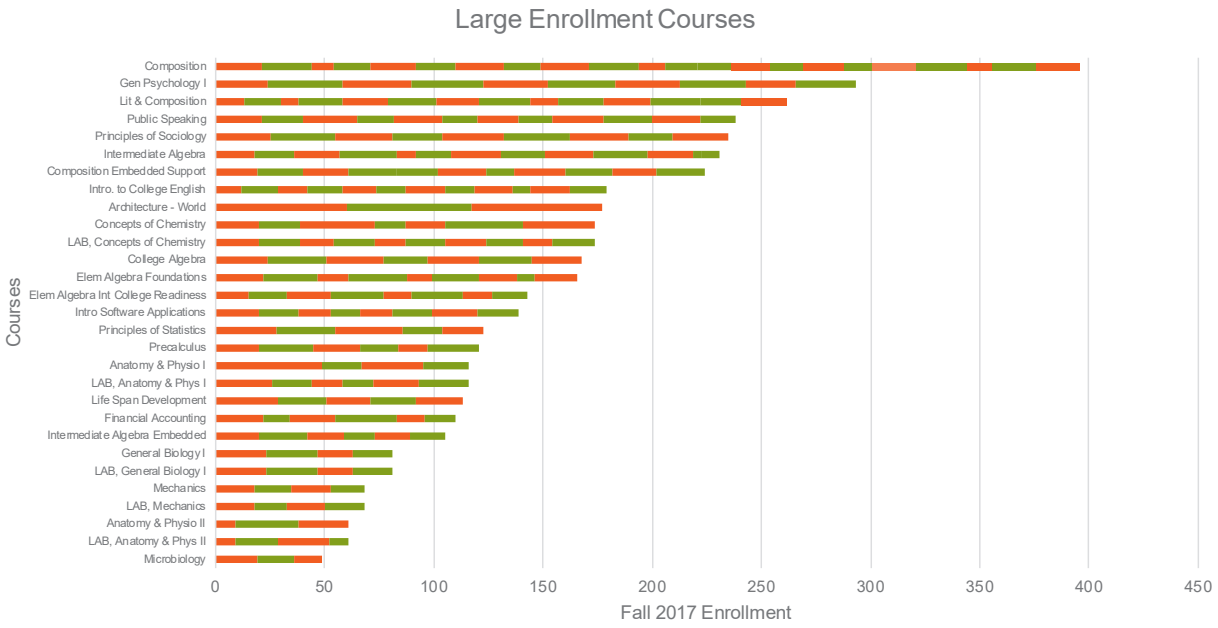
ENROLLMENT DISTRIBUTION BY COURSE



ENROLLMENT DISTRIBUTION BY COURSE



SECTION SIZE DISTRIBUTION LARGE ENROLLMENT COURSES



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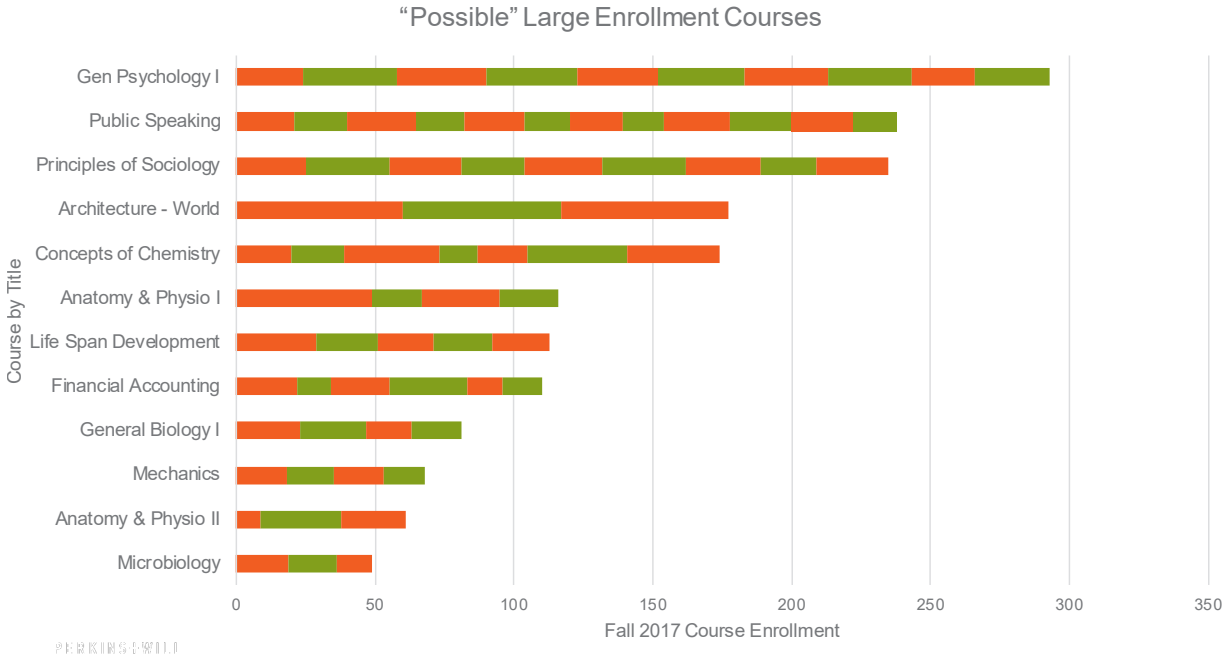
SECTION SIZE DISTRIBUTION LARGE ENROLLMENT COURSES



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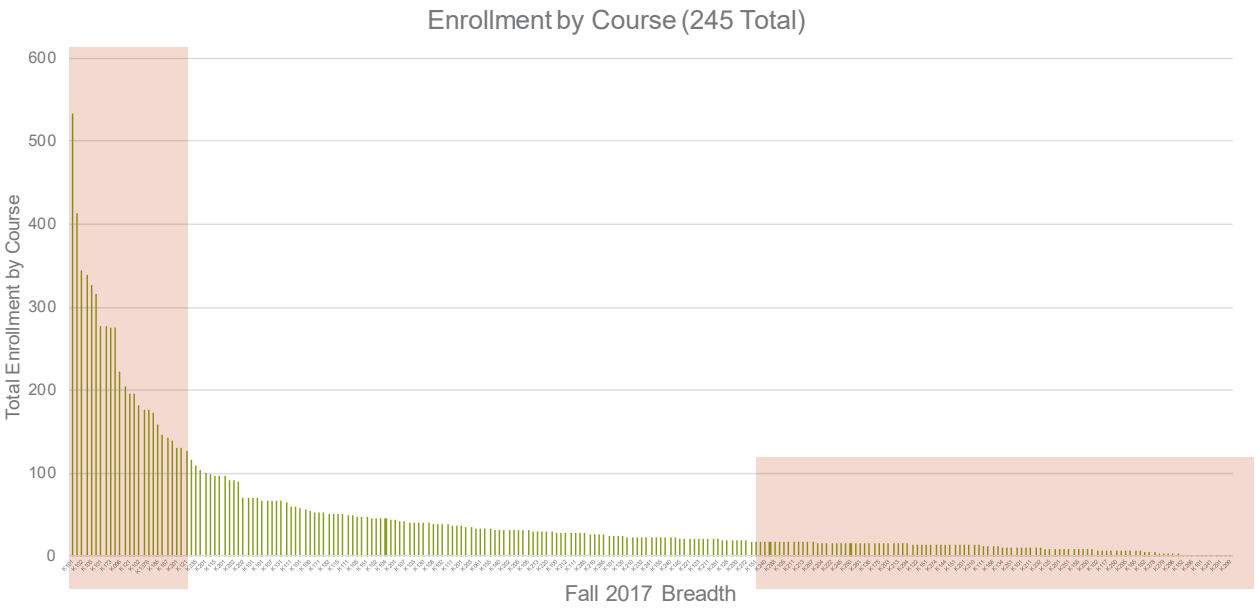
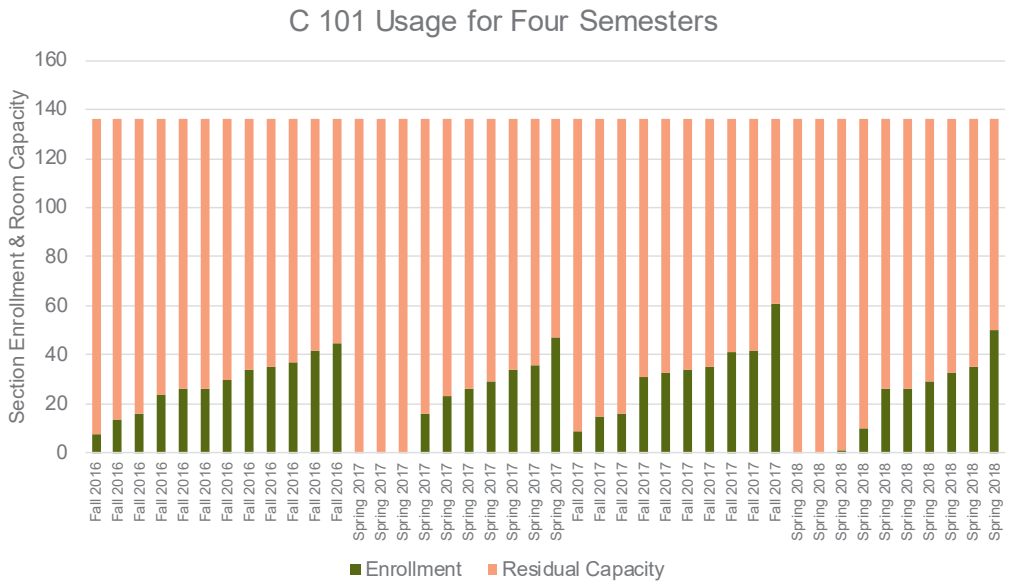
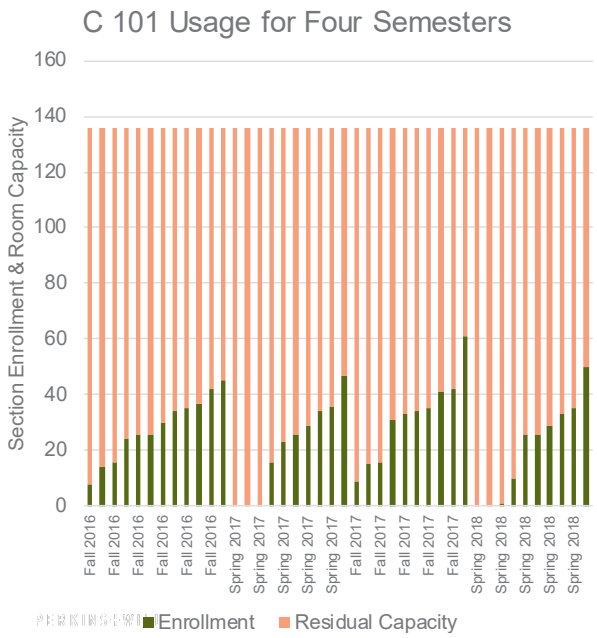
SECTION SIZE & VARIABLES

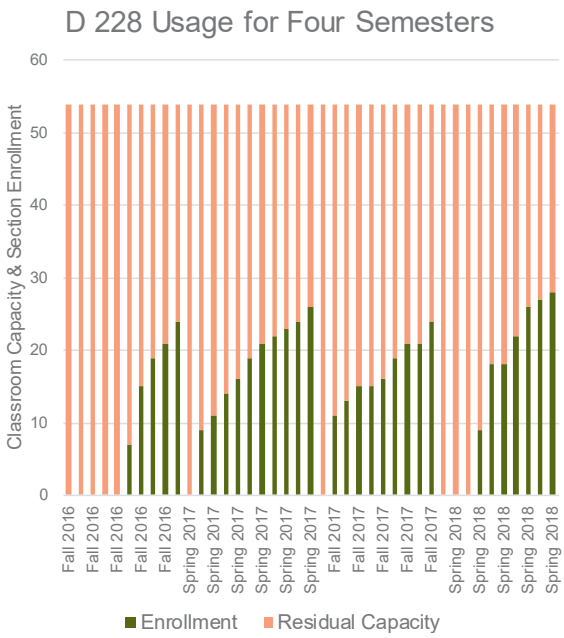


LARGE CLASSROOM UTILIZATION

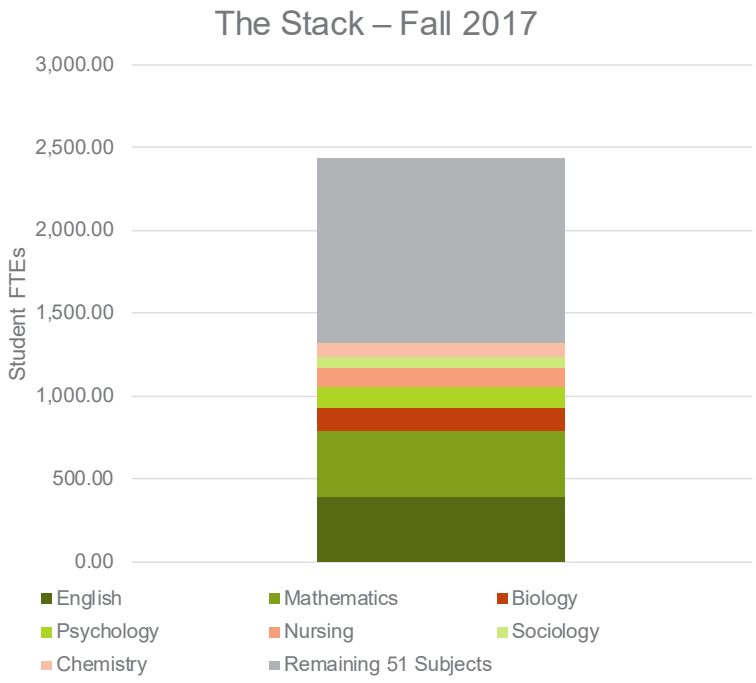


LARGE CLASSROOM UTILIZATION

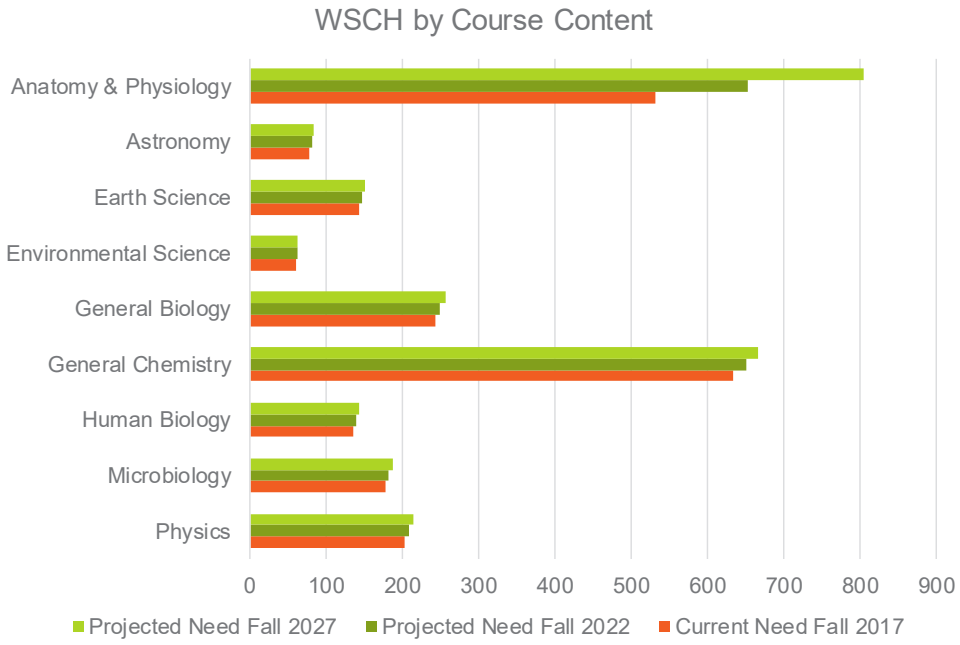




MOVING UP THE STACK



MATHEMATICS & SCIENCES ASSESSMENT



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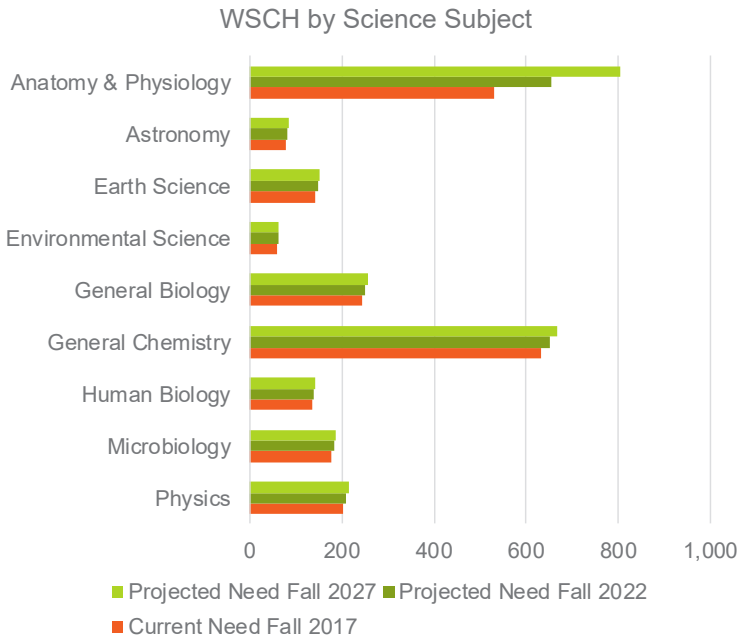
MATHEMATICS & SCIENCES ASSESSMENT

- Anatomy & Physiology
- General Chemistry
- Microbiology
- Biology Overall



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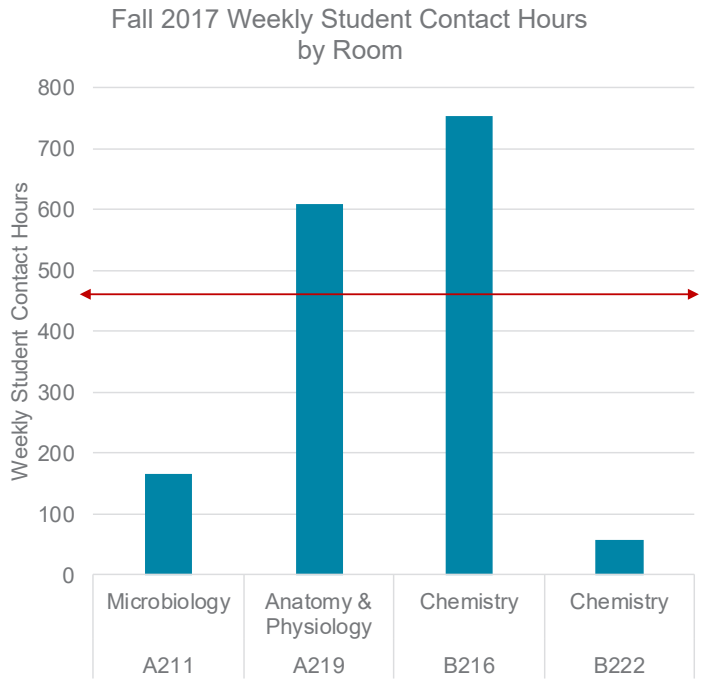
MATHEMATICS & SCIENCES ASSESSMENT



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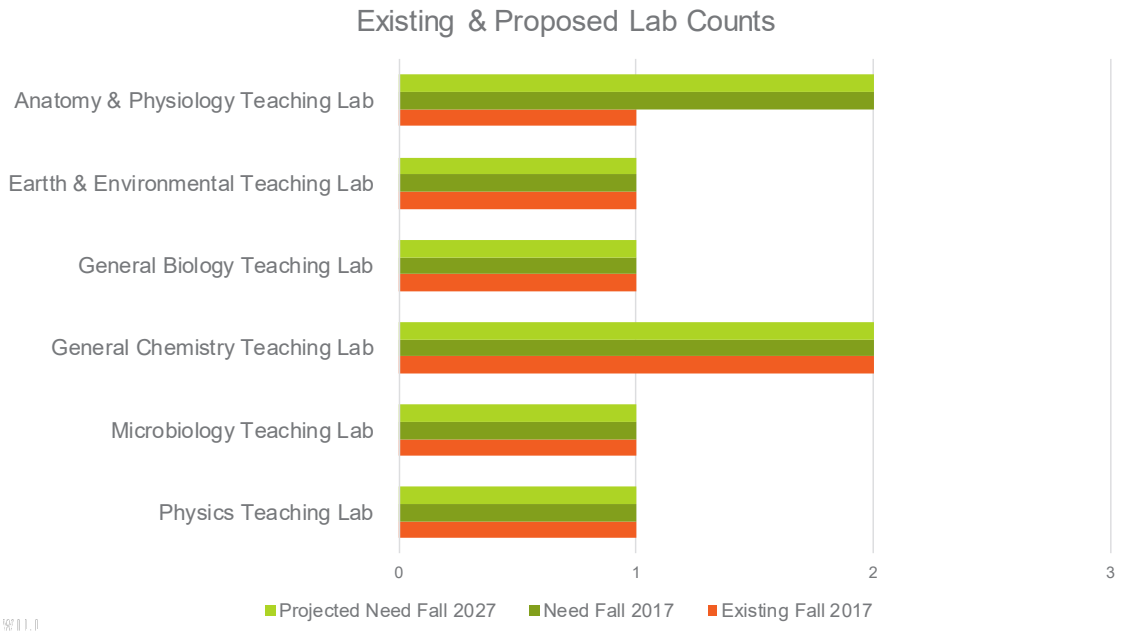
MATHEMATICS & SCIENCES ASSESSMENT



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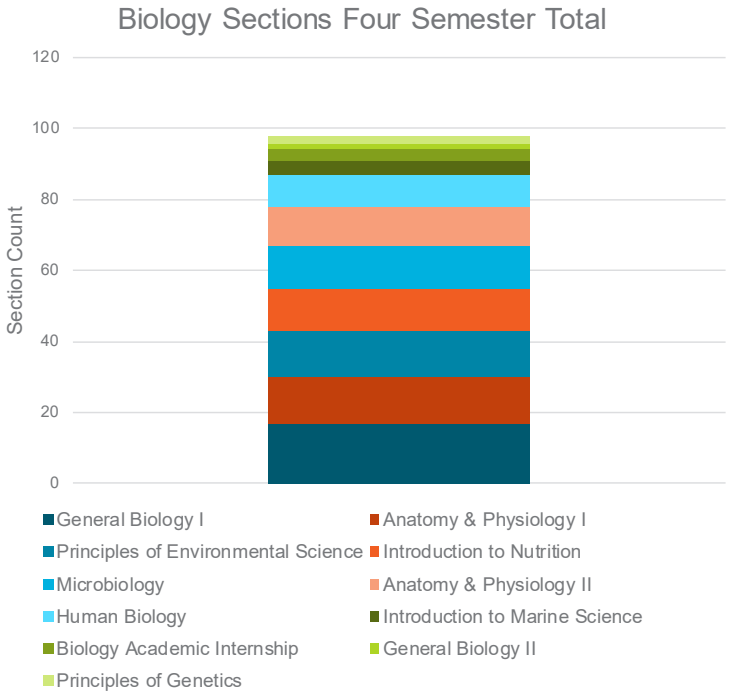
MATHEMATICS & SCIENCES ASSESSMENT

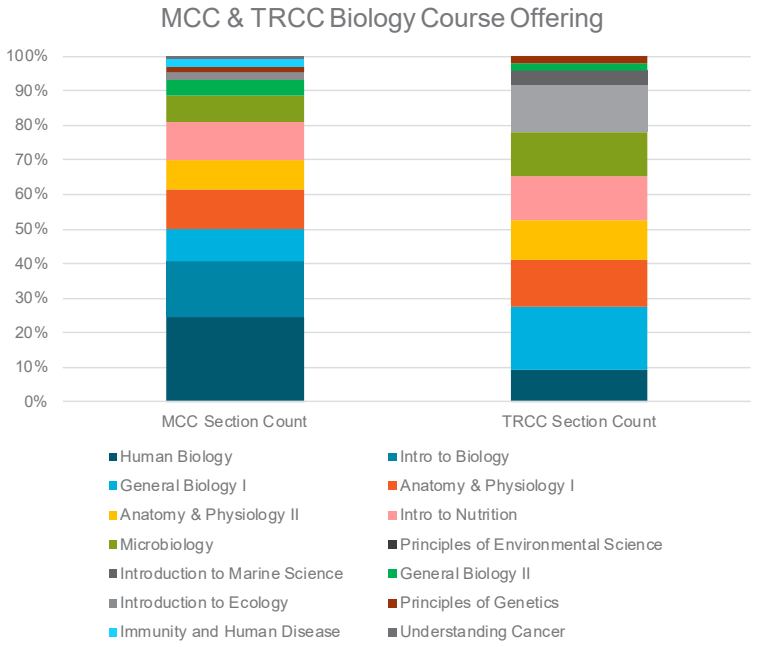
Biology



PERKINS-IWD

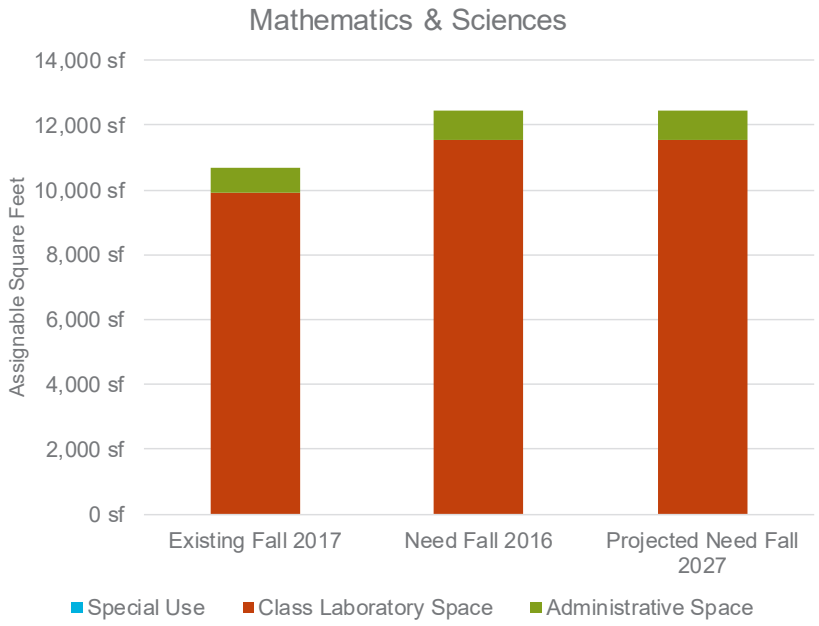
MATHEMATICS & SCIENCES ASSESSMENT

Biology



PERKINS-IWD

MATHEMATICS & SCIENCES ASSESSMENT



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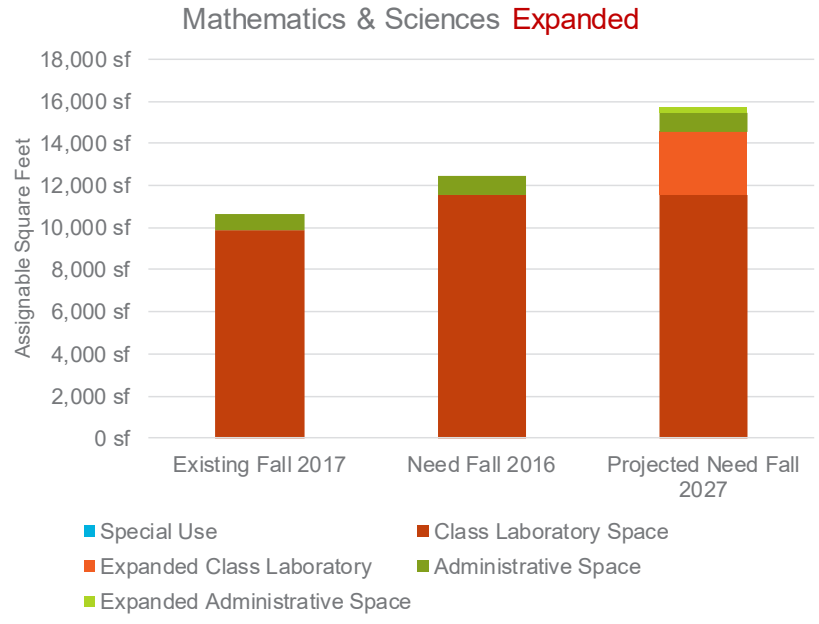
MATHEMATICS & SCIENCES ASSESSMENT



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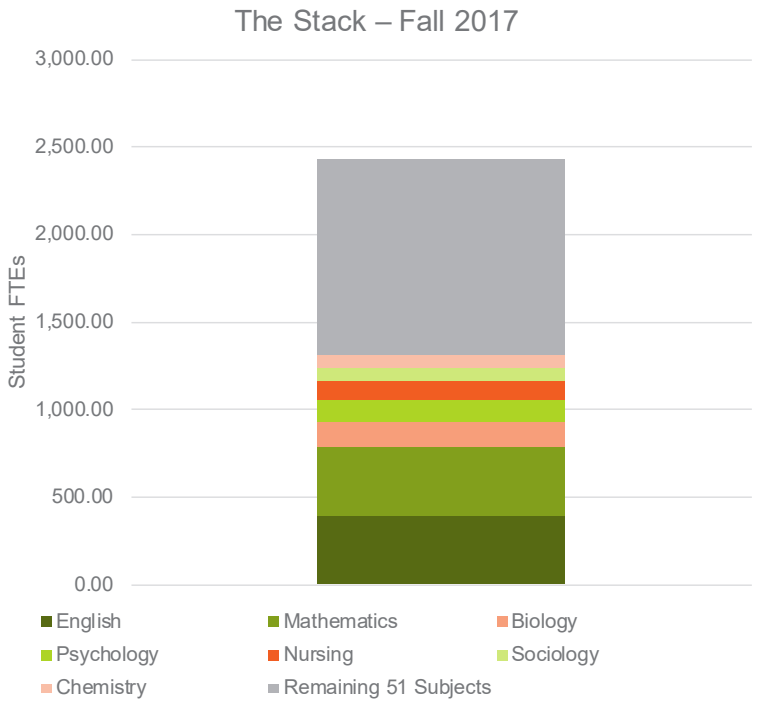
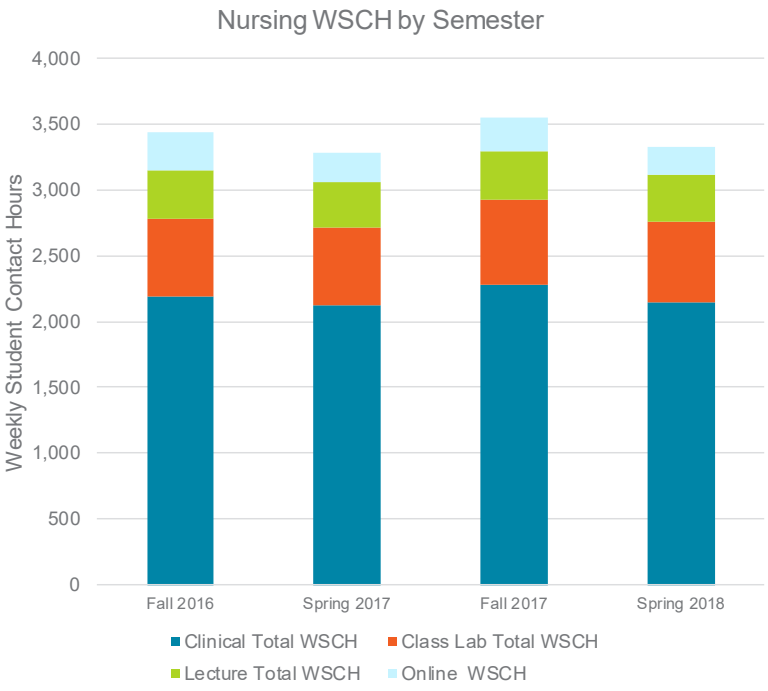
MOVING UP THE STACK



NURSING FACILITIES



NURSING FACILITIES

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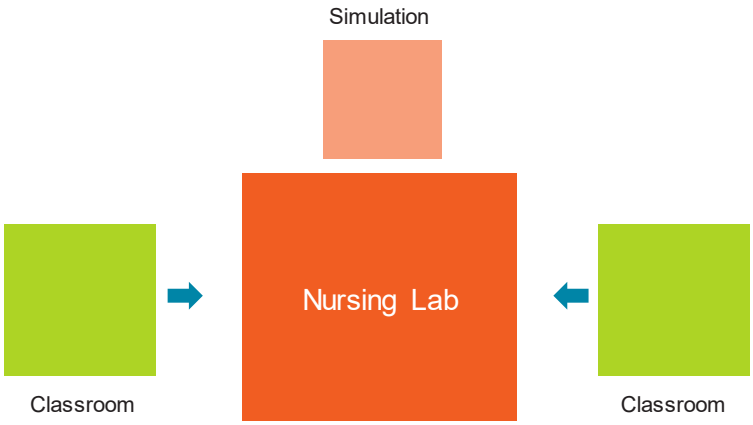
NURSING FACILITIES



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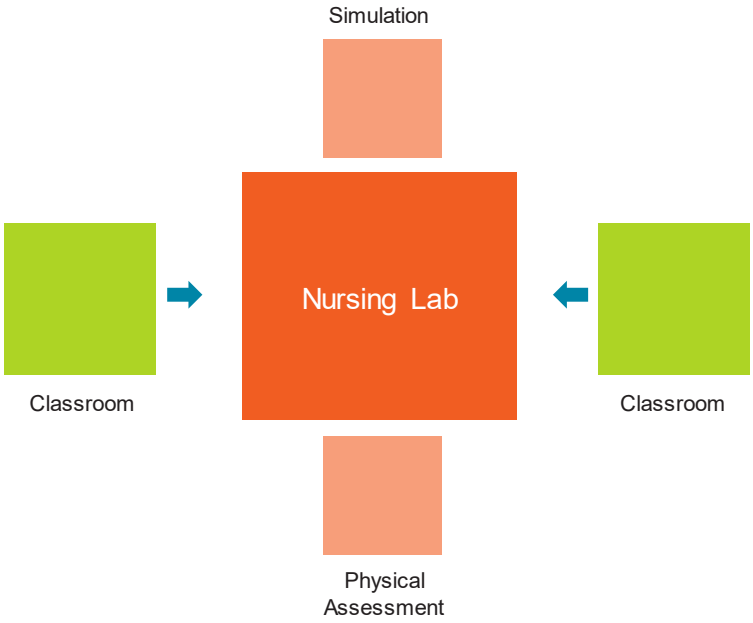
NURSING FACILITIES



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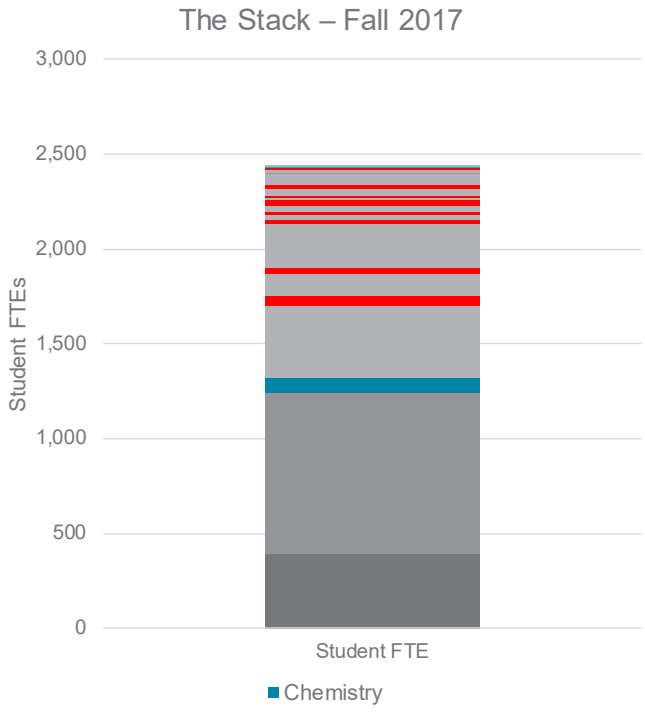
MOVING UP THE STACK



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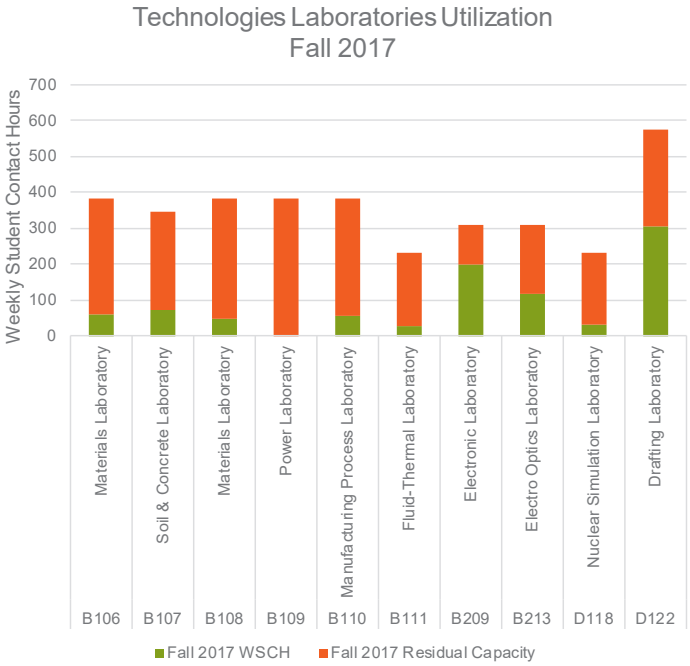
TECHNOLOGIES & LABORATORY UTILIZATION



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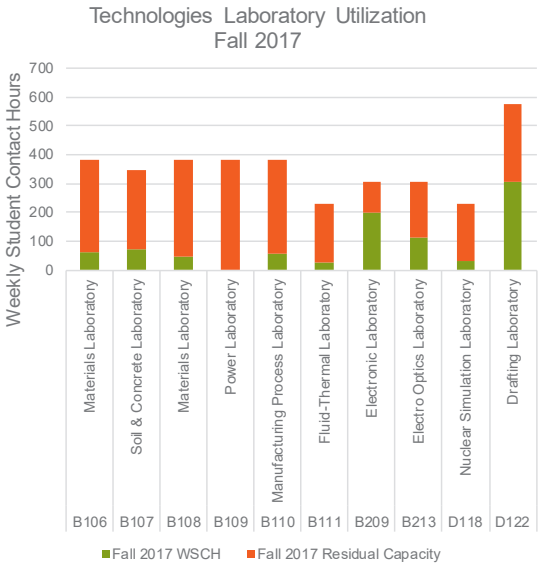
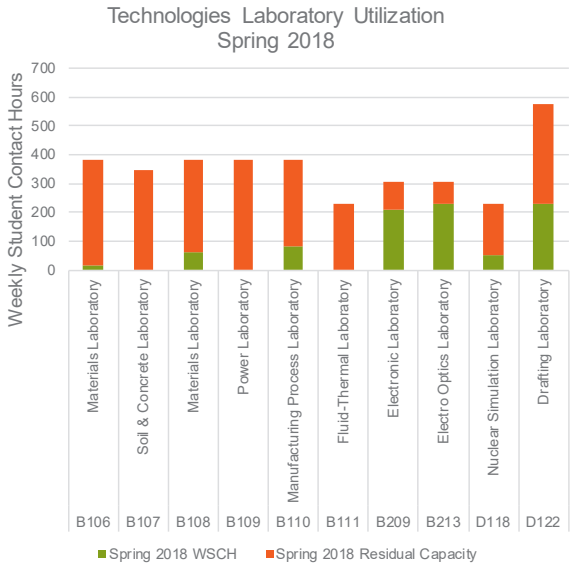
TECHNOLOGIES & LABORATORY UTILIZATION





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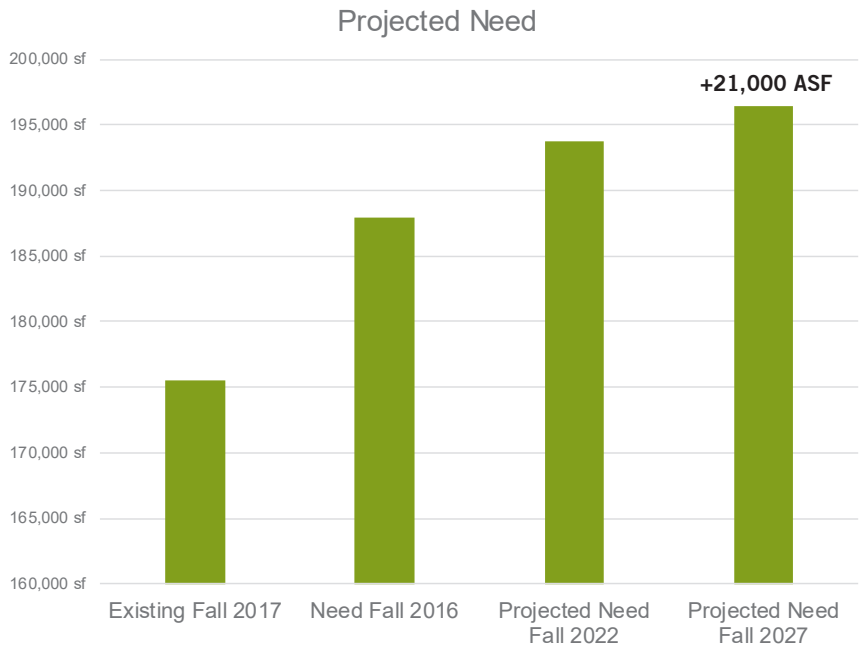
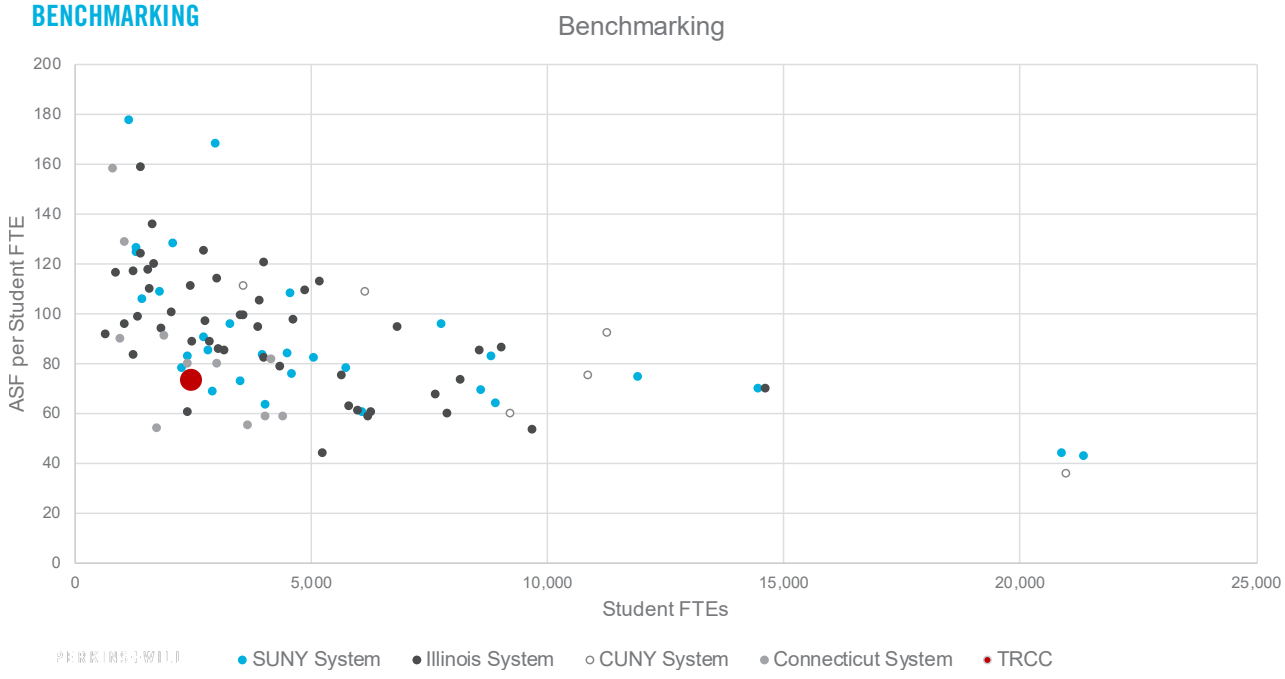
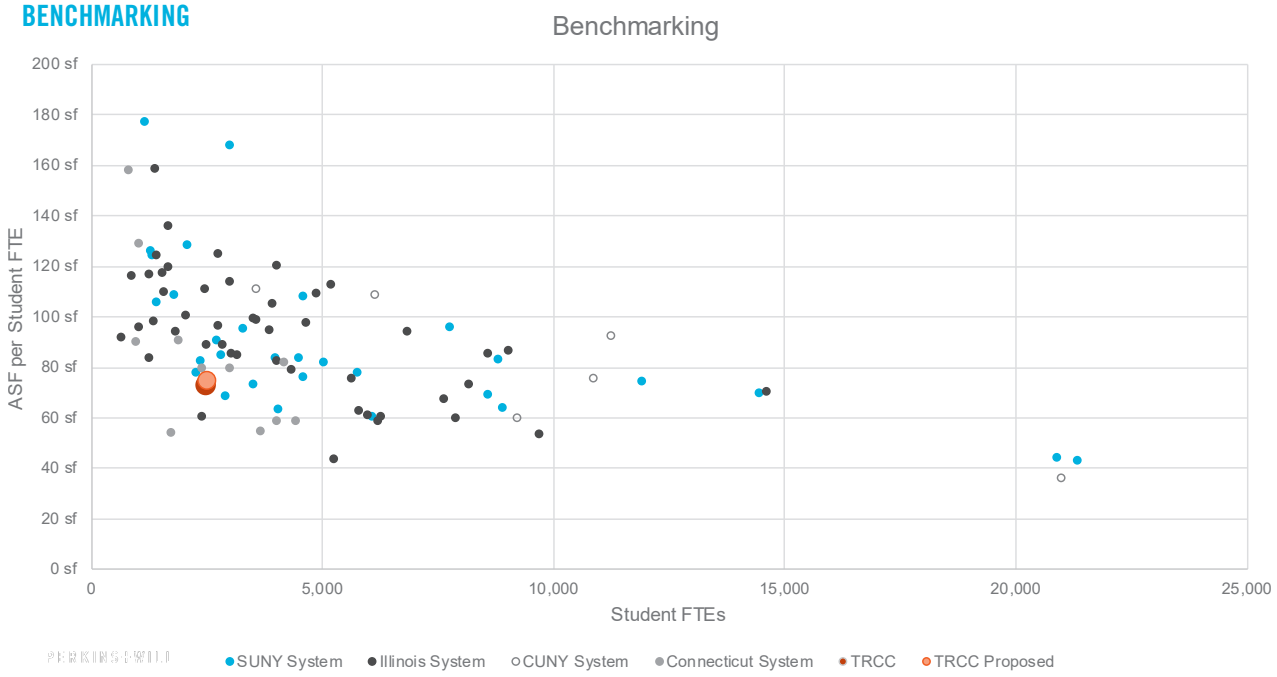
OVERALL NEED



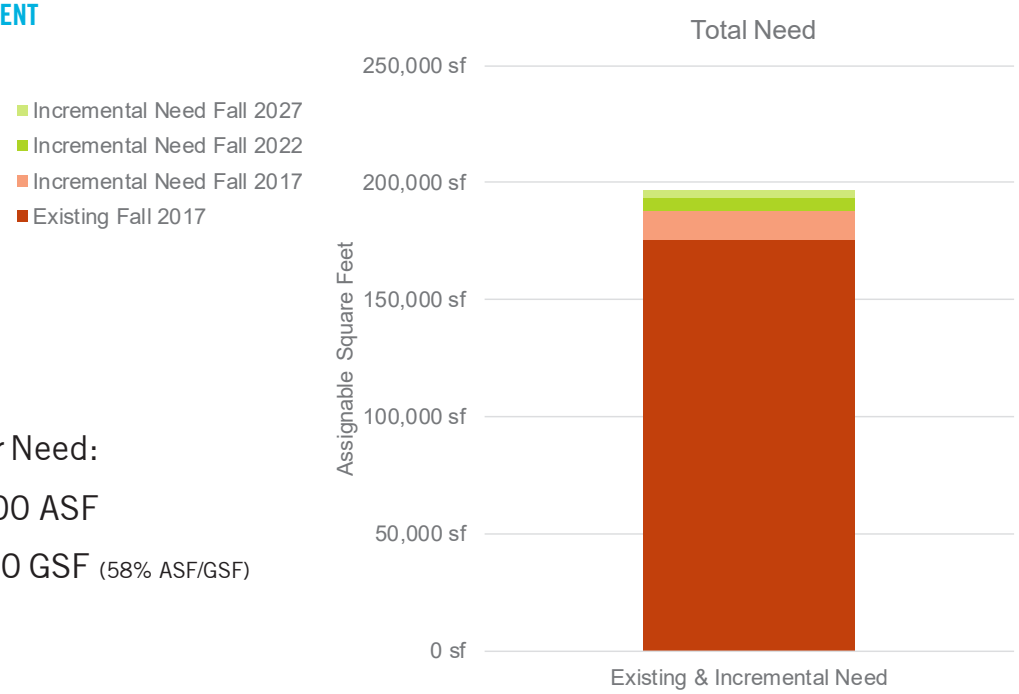
BENCHMARKING



BENCHMARKING



SPACE ASSESSMENT



10-Year Need:

+ 21,000 ASF

+36,000 GSF (58% ASF/GSF)

SPACE ASSESSMENT

How do you do build ‘something’ that satisfies an incremental need that is distributed across an entire campus?

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SPACE ASSESSMENT

			change	
	Existing	10-Year Projection	ADD	%
Enrollment (FTE)	2,450	2,600	150	6%
Floor Area (ASF)	176,000	197,000	21,000	12%
Floor Area / Student (ASF/FTE)	72	76	4	5%

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EXPANSION (10 YEAR)

ACADEMIC SPACE	PROGRAM AREA (SF) EXISITNG FALL 2017	PROJECTED NEED FALL 2027	CHANGE SQ. FT.	%
CLASSROOM	23,749	20,773	(2,976)	-13%
COMPUTER LABS	9,746	9,241	(505)	-5%
BUSINESS & TECHNOLOGIES	15,417	13,545	(1,872)	-12%
ENGLISH & COMMUNICATION	1,586	1,325	(261)	-16%
HUMANITIES & SOCIAL SCIENCES	8,190	9,242	1,052	13%
NURSING AND ALLIED HEALTH	9,215	11,509	2,294	25%
MATHEMATICS & SCIENCE	11,442	13,295	1,853	16%
SHARED ACADEMIC SPACE	2,632	3,300	668	25%
TOTAL ACADEMIC SPACE	**81,977**	**82,230**	**253**	**0%**
HOSTED ENTITIES				
CENTRAL CT STATE (RN TO BSN)	-	3,600	3,600	100%
MIDDLE COLLEGE	4,971	4,971	-	0%
TOTAL HOSTED ENTITIES SPACE	**4,971**	**8,571**	**3,600**	**72%**

EXPANSION (10 YEAR)

SUPPORT SPACE	PROGRAM AREA (SF) EXISITNG FALL 2017	PROJECTED NEED FALL 2027	CHANGE SQ. FT.	%
CONTINUING ED & WORK FORCE DEV.	6,075	8,122	2,047	34%
ACADEMIC SUPPORT	4,704	4,704	-	0%
ADMINISTRATIVE SERVICES	9,269	10,234	965	10%
ASSEMBLY & EXHIBITION	5,711	5,711	-	0%
ATHLETIC & RECREATION	5,309	5,400	91	2%
CAMPUS SERVICES	9,021	11,450	2,429	27%
CHILDCARE CENTER	3,554	4,235	681	19%
LIBRARY	13,235	19,355	6,120	46%
STUDENT ACTIVITIES	18,373	23,315	4,942	27%
STUDENT SERVICES	6,736	8,342	1,606	24%
TECHNOLOGY	4,802	4,802	-	0%
TOTAL SUPPORT SPACE	**86,789**	**105,670**	**18,881**	**22%**

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DRAFT RECOMMENDATIONS

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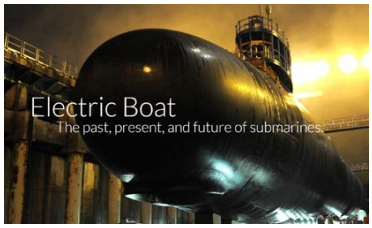
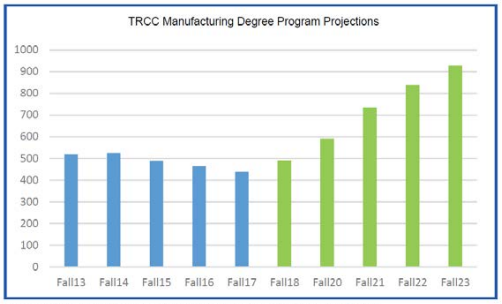
perkinswill.com 53

PIPELINE PROGRAM





from TRCC Demand & Projections Report: Manufacturing Programs, April 9, 2018

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PIPELINE PROGRAM FACILITY STUDY

US Department of Labor

Trade Adjustment Assistance Community College and Career Training (TAACCCT)

$15,000,000 CT Consortium award

$1,283,000 to TRCC

Based on the survey results, the priority is to provide a contiguous, hands-on learning space to support training programs in the following career paths:

Training Program	Approximate SF
Introduction to Manufacturing	2,500
Outside Machinist	
Welding	4,200
Design Engineering	1,800
Total	8,500

PIPELINE PROGRAM

- Option 1: All Non-credit Mnfct. Programs in CUP Building
- Option 2: Hybrid / Non-credit Mnfct. Programs in B Wing Level 1, Welding in CUP
- Option 3: All Non-credit Mnfct. Programs in B Wing Level 1
- Option 4: All Non-credit Mnfct. Programs in Off Site Facility

PIPELINE PROGRAM

- Option 1: All Non-credit Mnfct. Programs in **CUP Building**
- Option 2: Hybrid / Non-credit Mnfct. Programs in **B Wing Level 1, Welding in CUP**
- Option 3: All Non-credit Mnfct. Programs in **B Wing Level 1**
- Option 4: All Non-credit Mnfct. Programs in Off Site Facility - **MP Recommendation**

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TRCC TECHNOLOGY PROGRAMS

Computer Science Technology

Construction Technology

Electrical, Laser, and Robotics Engineering Technology

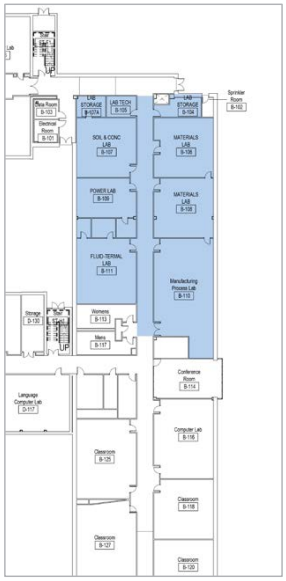
General Engineering Technology

Manufacturing Engineering Technology

Mechanical Engineering Technology

Nuclear Engineering Technology

Technology Studies



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TECHNOLOGY PROGRAMS

Recommendation:

Conduct a detailed Facility Need Study

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LIBRARY

Existing Space	13,235 ASF
CWA 2015 Library Plan, Phase 2	13,235 ASF
10-year Space Recommendation	19,355 ASF
	+6,120 (+46%)

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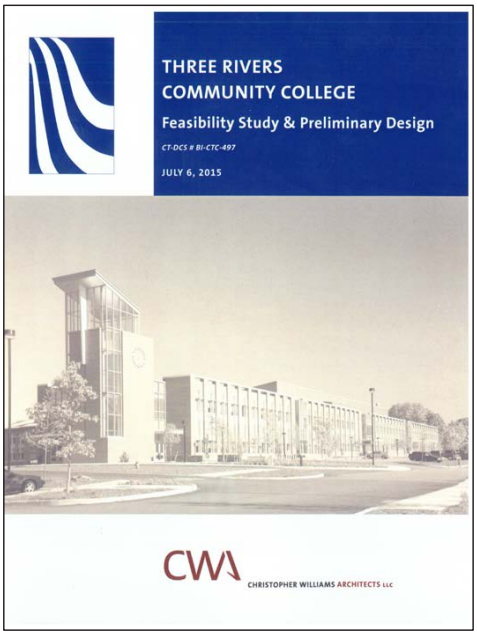
LIBRARY

- Phase 2 Library Renovation pending
- 2015 Feasibility Study, preferred option remains current



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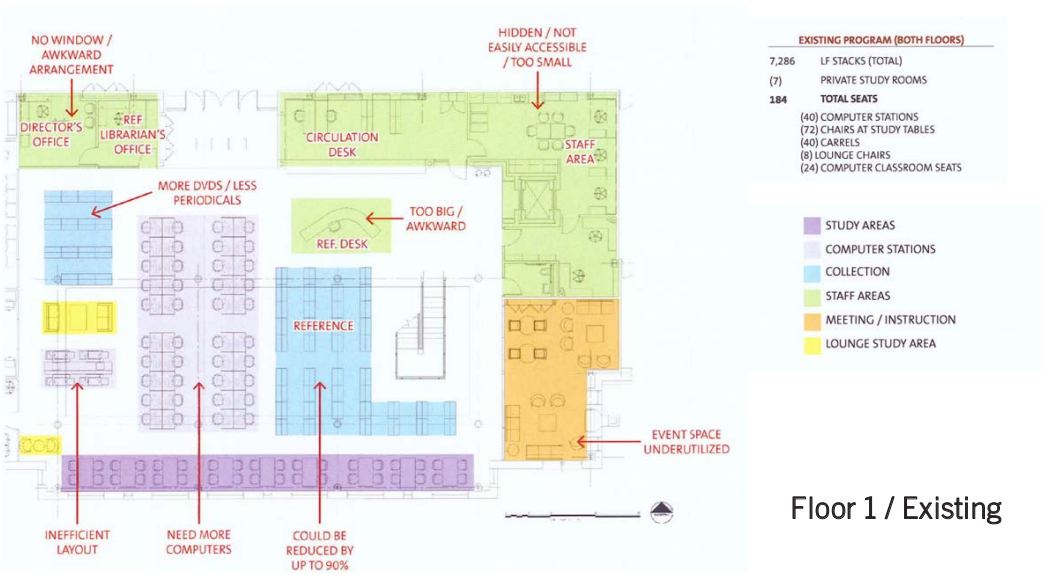
THE LIBRARY TODAY



Floor 1 / Existing

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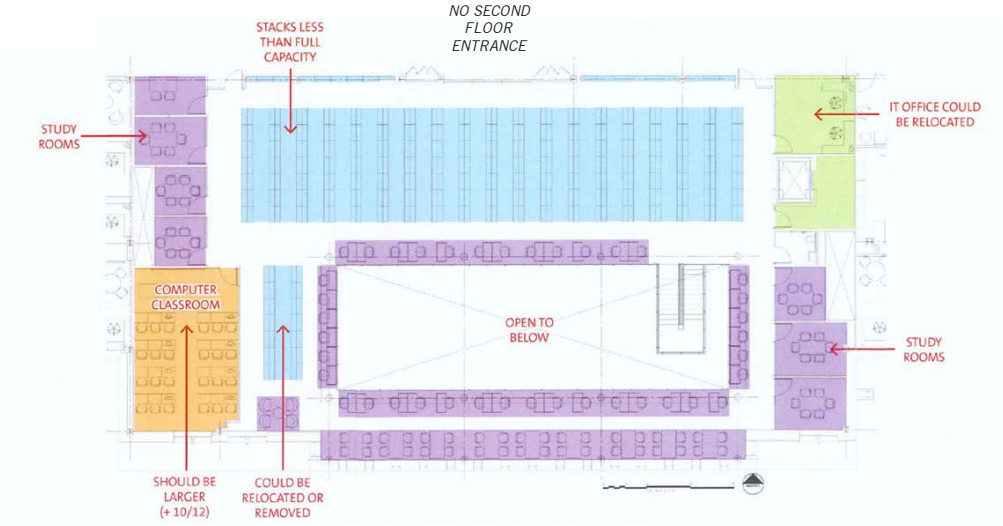
THE LIBRARY TODAY



EXISTING PROGRAM (BOTH FLOORS)

7,286	LF STACKS (TOTAL)
(7)	PRIVATE STUDY ROOMS
184	**TOTAL SEATS**
	(40) COMPUTER STATIONS
	(72) CHAIRS AT STUDY TABLES
	(40) CARRELS
	(8) LOUNGE CHAIRS
	(24) COMPUTER CLASSROOM SEATS

- STUDY AREAS
- COMPUTER STATIONS
- COLLECTION
- STAFF AREAS
- MEETING / INSTRUCTION
- LOUNGE STUDY AREA

Floor 2 / Existing

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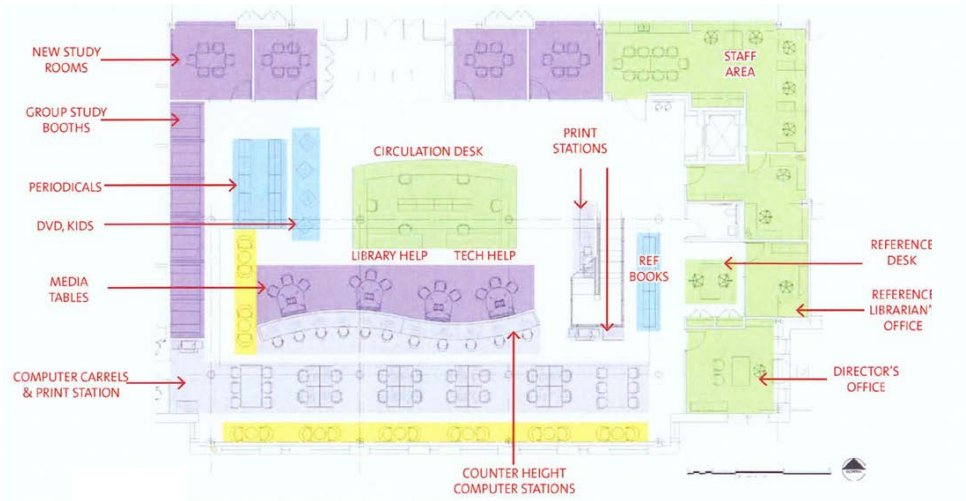
LIBRARY PROPOSED



PROPOSED PROGRAM (BOTH FLOORS)

5,033	LF STACKS (TOTAL) **-2,253**
(12)	PRIVATE STUDY ROOMS **+5**
197	**TOTAL SEATS +37**
	(39) COMPUTER STATIONS **-1**
	(56) CHAIRS AT STUDY TABLES **-16**
	(46) CARRELS **+6**
	(24) LOUNGE CHAIRS **+16**
	(32) COMPUTER CLASSROOM SEATS **+8**

NO CHANGE IN FLOOR AREA.

- STUDY AREAS
- COMPUTER STATIONS
- COLLECTION
- STAFF AREAS
- MEETING / INSTRUCTION
- LOUNGE STUDY AREA

Floor 1 / Proposed

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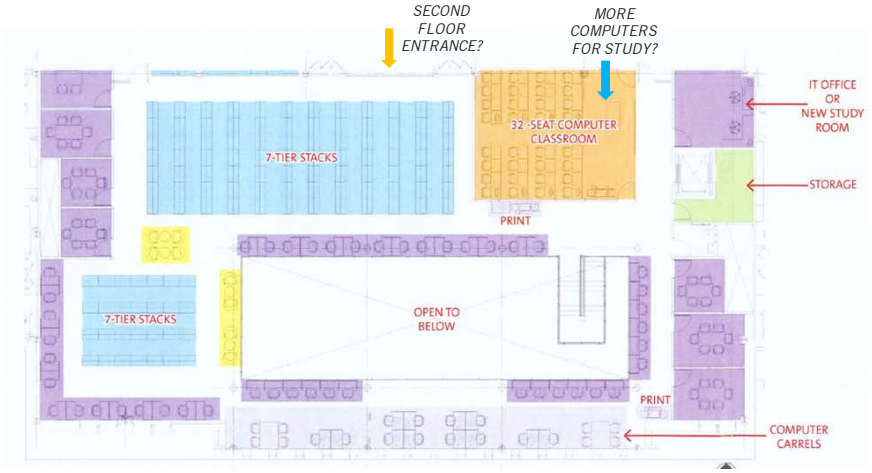
LIBRARY PROPOSED



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	(32) COMPUTER CLASSROOM SEATS **+8**

NO CHANGE IN FLOOR AREA.

STUDY AREAS
COMPUTER STATIONS
COLLECTION
STAFF AREAS
MEETING / INSTRUCTION
LOUNGE STUDY AREA

Floor 2 / Proposed

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ADDITIONAL BIOLOGY LAB

Consider converting Computer Classroom B-227 to a Biology Lab (Anatomy & Physiology) to relieve curriculum bottleneck

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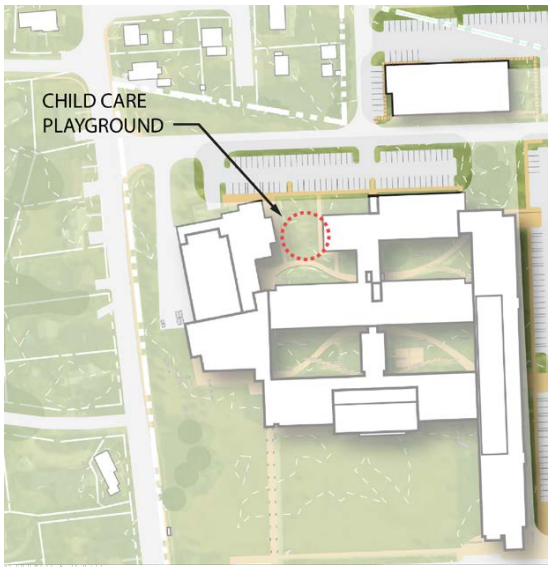
NEW PLAYGROUND AT CHILDCARE CENTER



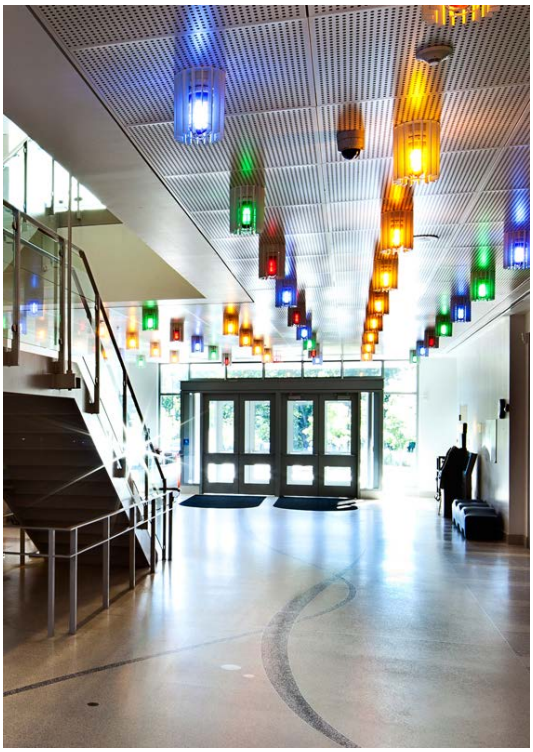
ADDED PARKING LOT LIGHTING

East Parking Lot

Existing exterior light fixtures

MEP RECOMMENDATIONS

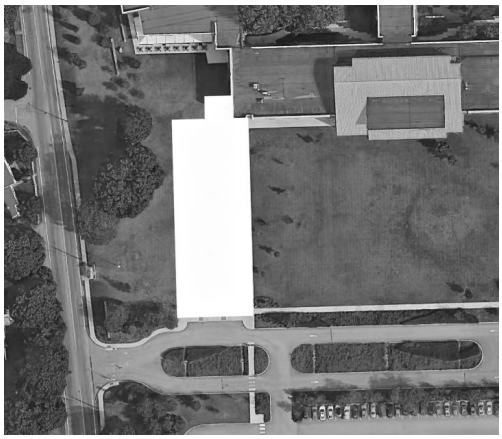
- Implement recommendations to address **humidity and temperature control in the D & E wings** from 2016 Indoor Air Quality HVAC Investigation (permanent modifications)
- Install a plate and frame heat exchanger and basin heaters to allow for **winter cooling availability along with additional energy savings**.

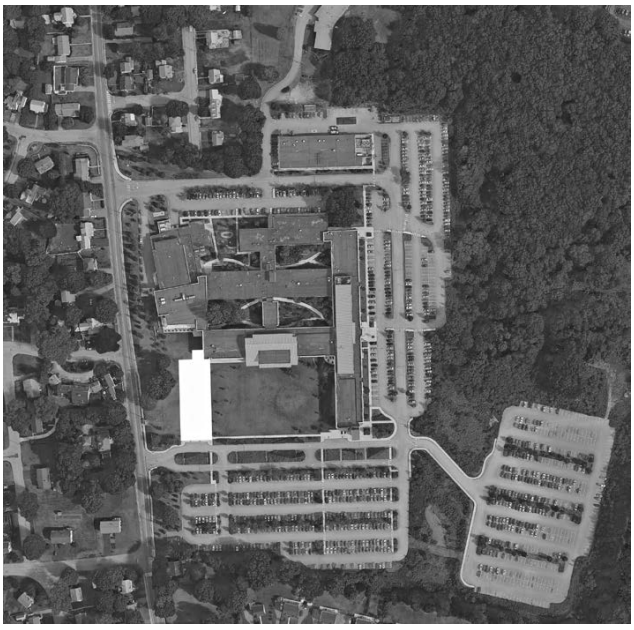


10-YEAR EXPANSION CONCEPT

21,000 ASF
36,000 GSF

2 stories
partial basement
Width: 80’
Length: 190’

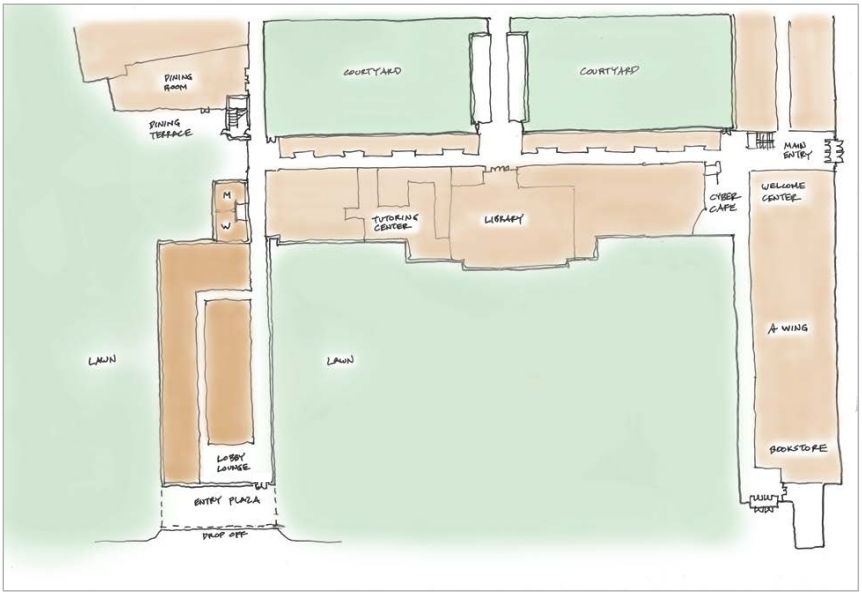




2005 TRCC MASTER PLAN

10-YEAR EXPANSION CONCEPT

Option A – Perimeter Corridor



10-YEAR EXPANSION CONCEPT

Option B – Double-Loaded Corridor

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10-YEAR EXPANSION CONCEPT

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10-YEAR EXPANSION CONCEPT

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10-YEAR EXPANSION CONCEPT

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PROJECT PRIORITIES

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PRIORITY CATEGORIES

Pending Project (A "Given")	Projects where design is in progress
Priority 1	Highest need
Priority 2	Secondary need
10-Year Need	Longer-term need (36,000 GSF Expansion)

PRIORITY CATEGORIES

Pending Projects

- Student Services, A Wing Level 1 Renovation
- Science Lab Renovations (A-211, A-219)
- Library, Phase 2
- Off-site Facilities for Pipeline Program

PRIORITY CATEGORIES /FOR DISCUSSION

Priority 1

Priority 2

Projects to Assign Priority:

- Additional Biology Lab
- Added parking lot lighting
- Childcare Playground
- Temperature and humidity, D, E wings
- Cooling tower upgrades
- Courtyard enhancements, tree removal
- Expand Nursing space
- Further expansion of Science Space
- Advanced Manufacturing, Technologies

NEXT STEPS

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NEXT STEPS

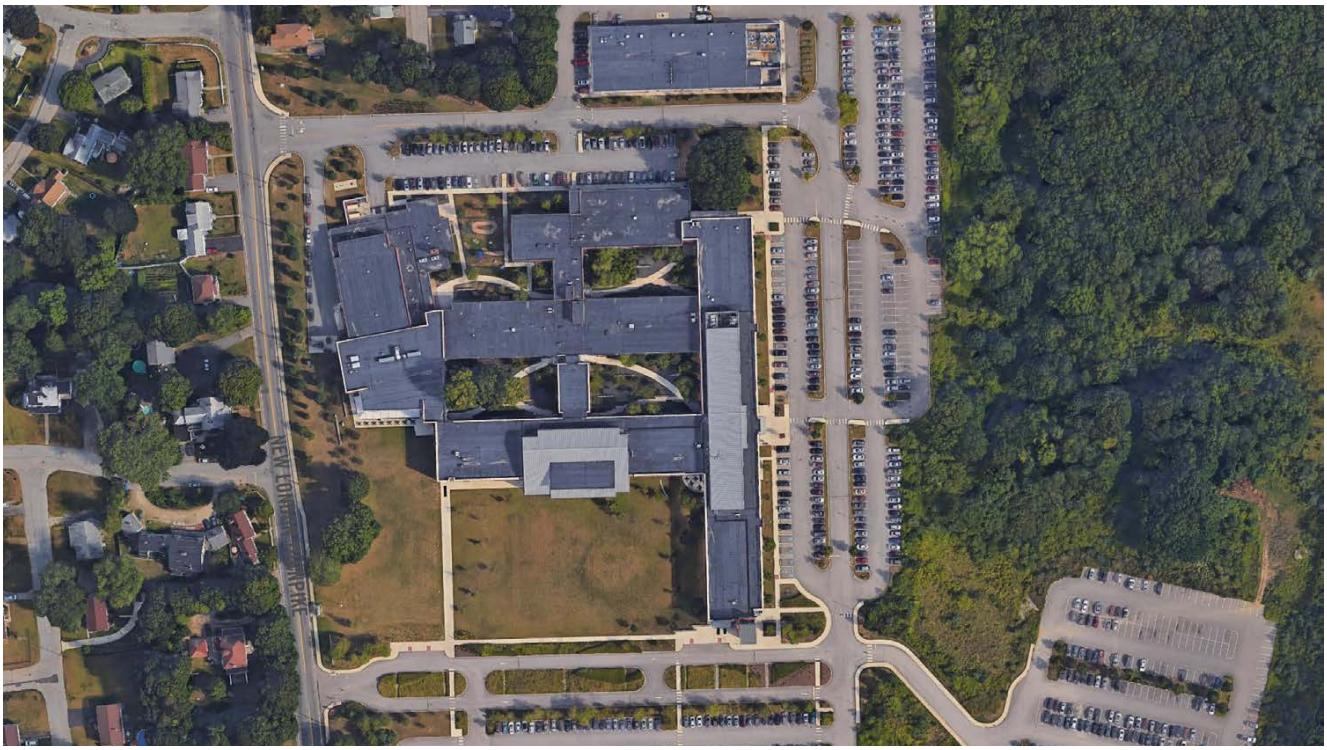
CMPAC 4 – TBD

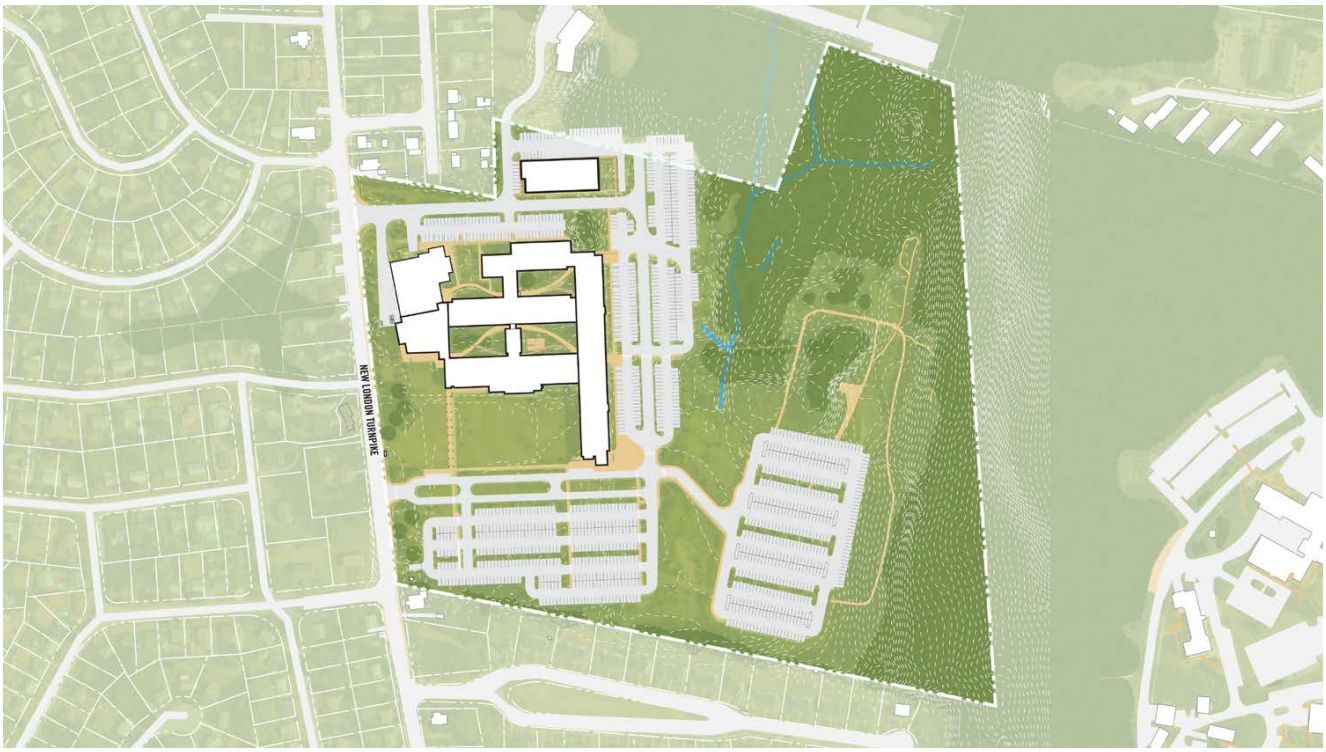
- Review final draft Master Plan recommendations
- Phasing, Cost and Implementation discussion

- Draft Final Report
- Submit for Review and Comment
- Finalize Report

- Town Hall meeting (optional)

DISCUSSION




NEW LONDON TURNPIKE

AGENDA

1. Introduction
2. Space Assessment
3. 10-Year Master Plan Recommendations
4. Project Priorities
5. Cost Estimate
6. Next Steps

Discussion

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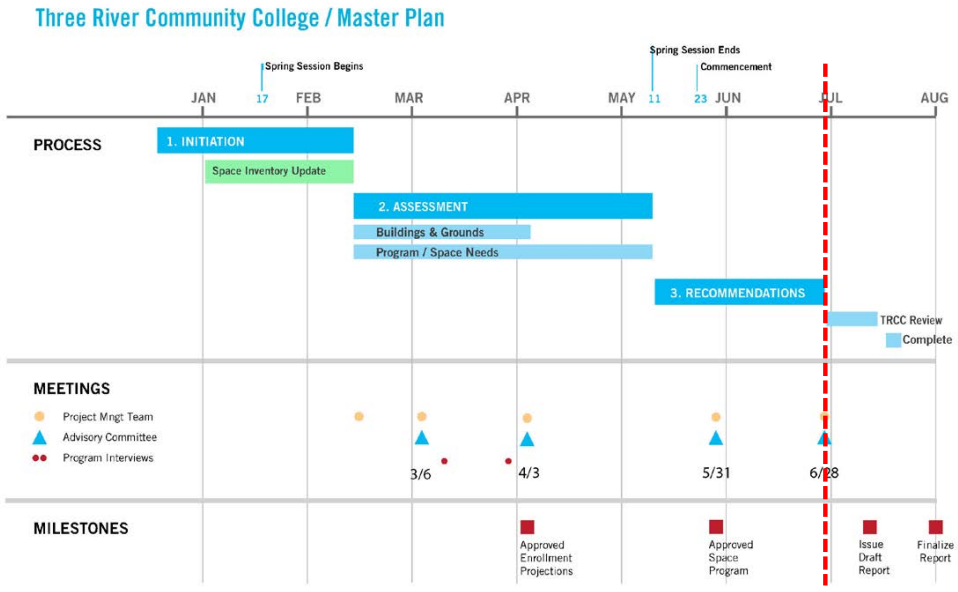
INTRODUCTION

PROJECT SCHEDULE



PROGRESS UPDATE

Since our last meeting:

- Detailed review of course data
- Follow up meetings with
    - Sciences
    - Manufacturing, Technology
    - Nursing / Allied Health
    - Registrar
- Finalized Space Needs Assessment
- Studied Expansion Concept
- Coordination, Pipeline Program / Id3A Study
- Coordination, Library Phase 2

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CURRENT AND PENDING PROJECTS

Current Projects

- Student Services, A Wing Level 1 Renovation
- Science Lab Renovations (A-211, A-219)

Pending Projects

- Library, Phase 2
- Off-site Facilities for Pipeline Program

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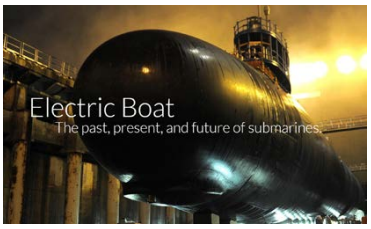
EB PIPELINE PROGRAM

- Master Plan Recommendation:

  All Non-credit Manufacturing Programs in Off Site Facility



Based on the survey results, the priority is to provide a contiguous, hands-on learning space to support training programs in the following career paths:

Training Program	Approximate SF
Introduction to Manufacturing	2,500
Outside Machinist	
Welding	4,200
Design Engineering	1,800
Total	**8,500**

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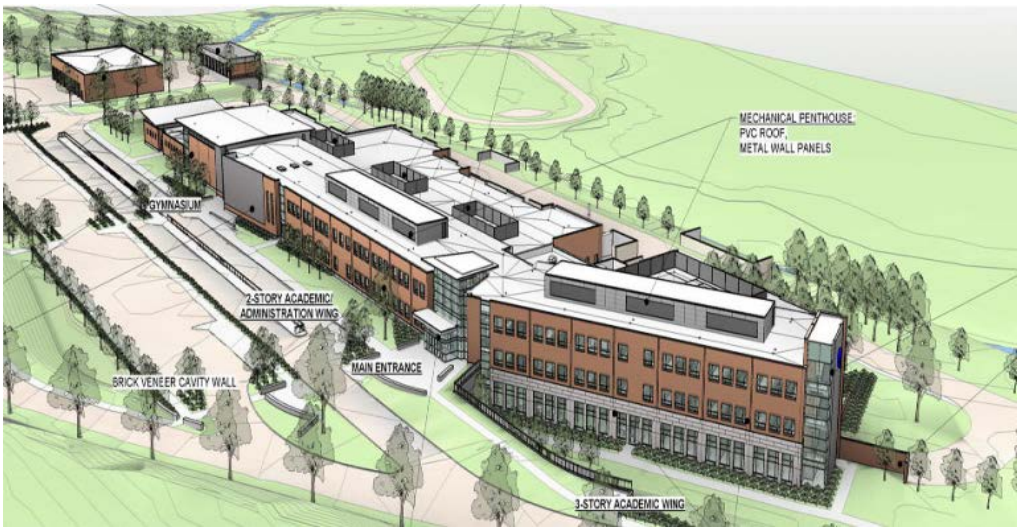
EB PIPELINE PROGRAM

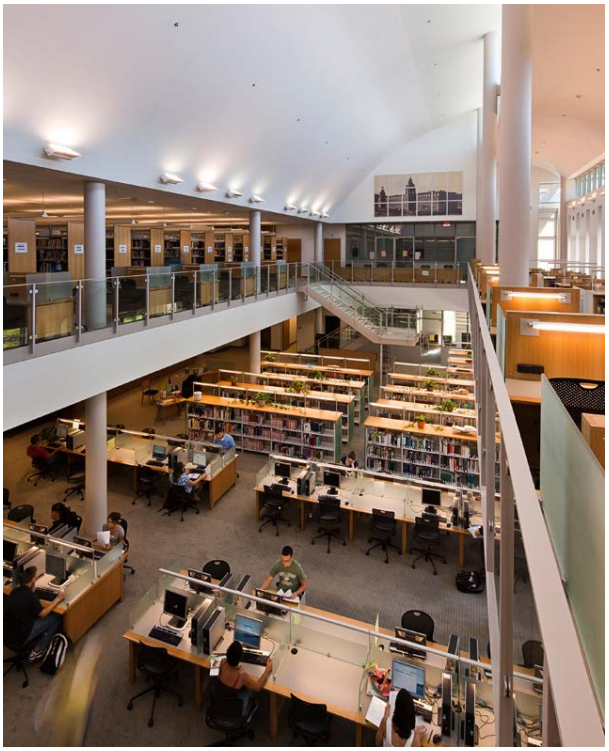
- Potentially at Ella Grasso Tech, Groton



Moser Pilon Nelson Architects

LIBRARY

Existing Space	13,235 ASF
CWA 2015 Library Plan, Phase 2	13,235 ASF
10-year Space Recommendation	19,355 ASF
	+6,120 (+46%)



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LIBRARY / SECOND FLOOR

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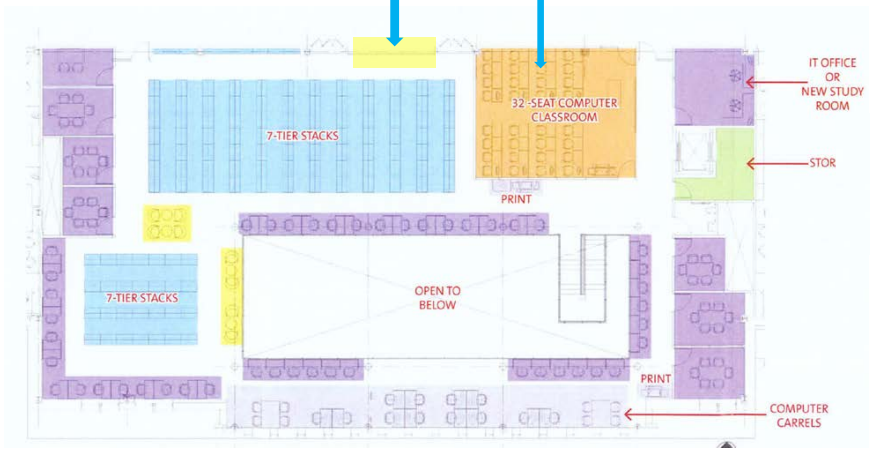
LIBRARY RENOVATIONS / PHASE 2

Recommend Change to floor to ceiling glazing: second floor entrance or treatment to show this is not an entrance.

Recommend Eliminating Computer Classroom, replacing with computer stations for research, study



PROPOSED PROGRAM (BOTH FLOORS)

5,033	LF STACKS (TOTAL) **-2,253**
(12)	PRIVATE STUDY ROOMS **+5**
197	**TOTAL SEATS +37**
	(39) COMPUTER STATIONS **-1**
	(56) CHAIRS AT STUDY TABLES **-16**
	(46) CARRELS **+6**
	(24) LOUNGE CHAIRS **+16**
	(32) COMPUTER CLASSROOM SEATS **+8**

NO CHANGE IN FLOOR AREA.

- STUDY AREAS
- COMPUTER STATIONS
- COLLECTION
- STAFF AREAS
- MEETING / INSTRUCTION
- LOUNGE STUDY AREA

Floor 2 / Proposed

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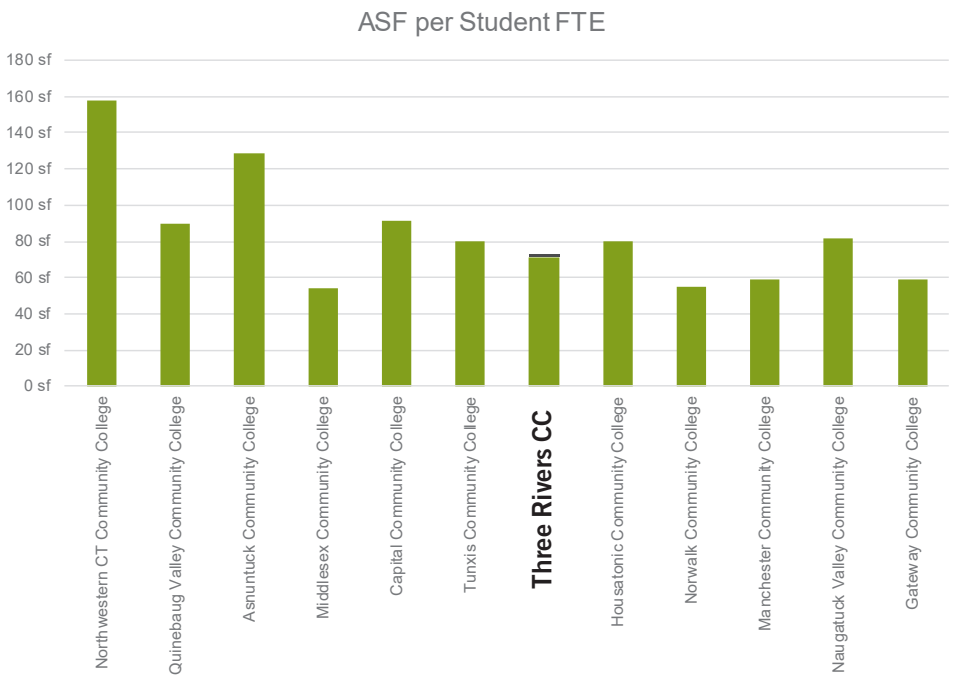
Christopher Williams Architects

SPACE ASSESSMENT

SPACE ASSESSMENT



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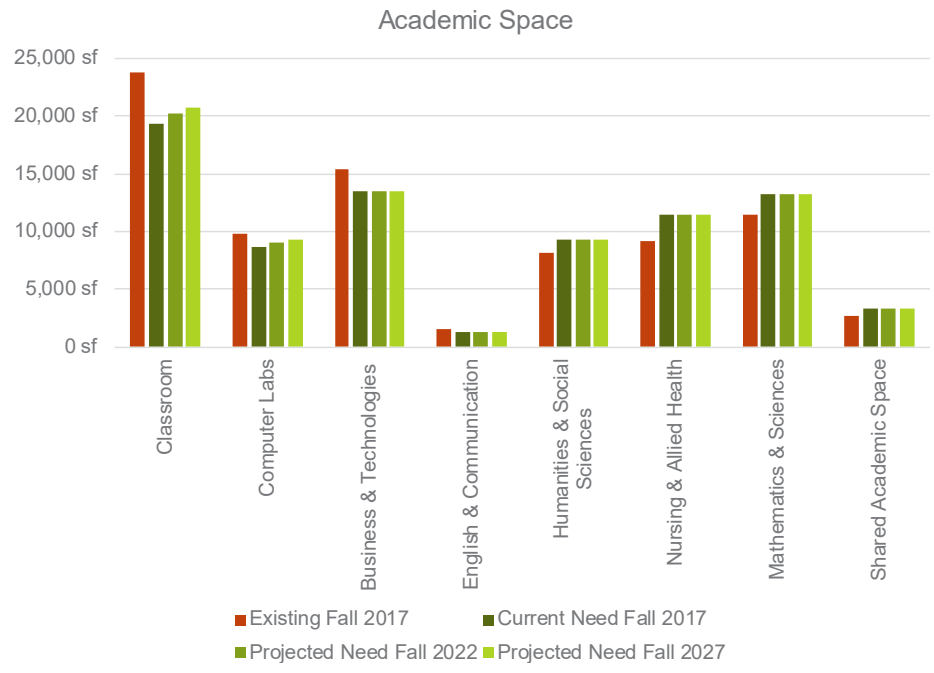
ACADEMIC SPACE ASSESSMENT



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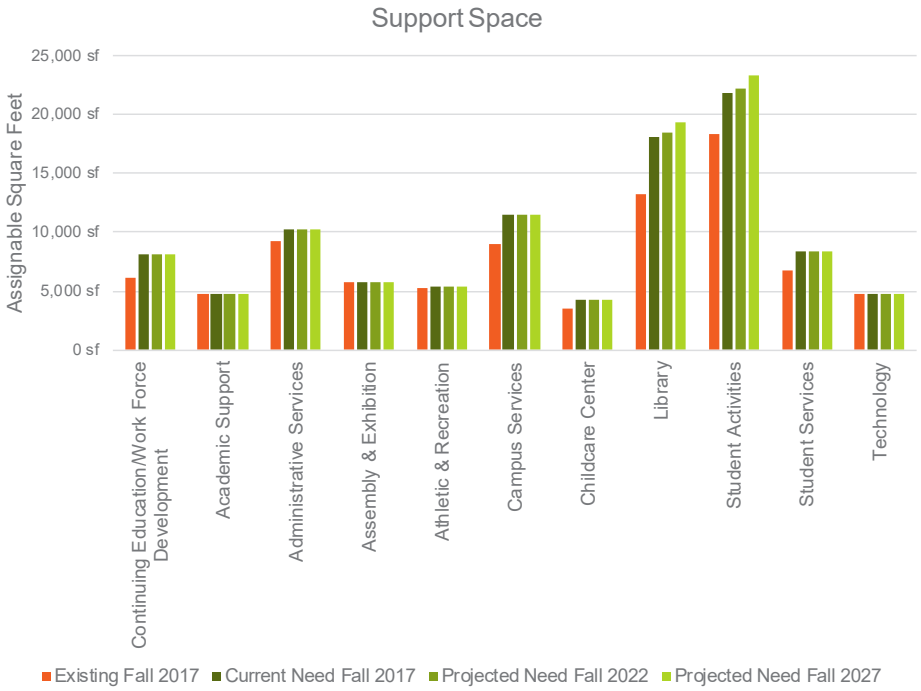
SUPPORT SPACE ASSESSMENT



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SPACE ASSESSMENT

Four Areas of Focus
Classrooms & Section Sizes
Science Labs & Bottlenecks
Nursing & Current Configuration
Technologies & Surplus Capacity

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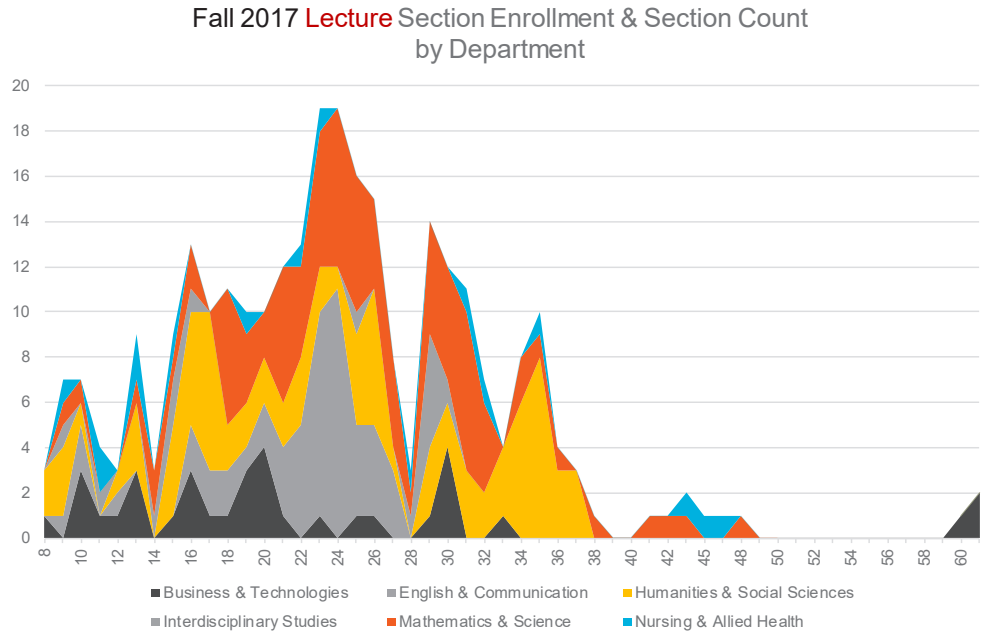
SECTION SIZE DISTRIBUTION



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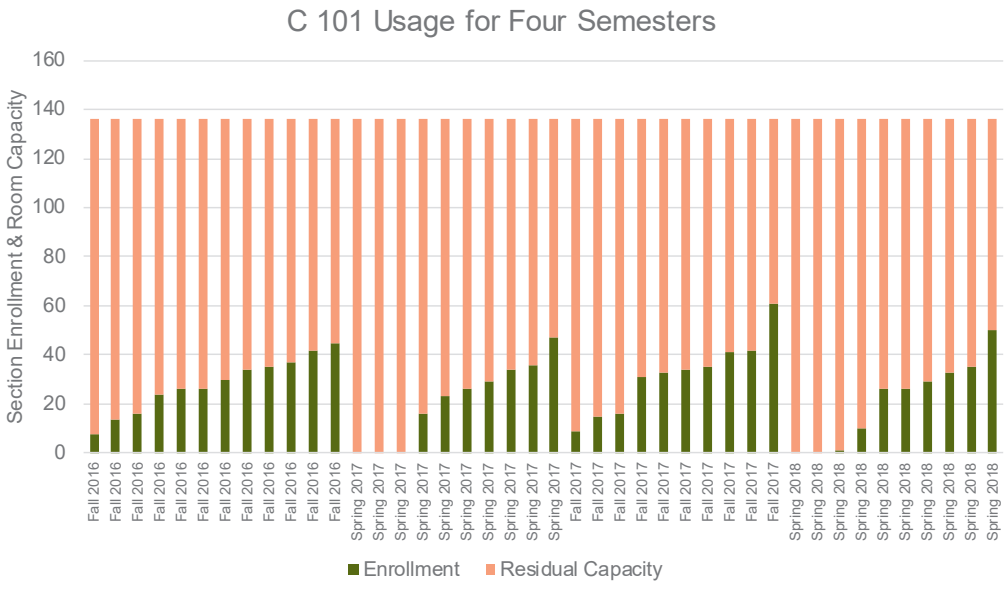
LARGE CLASSROOM UTILIZATION



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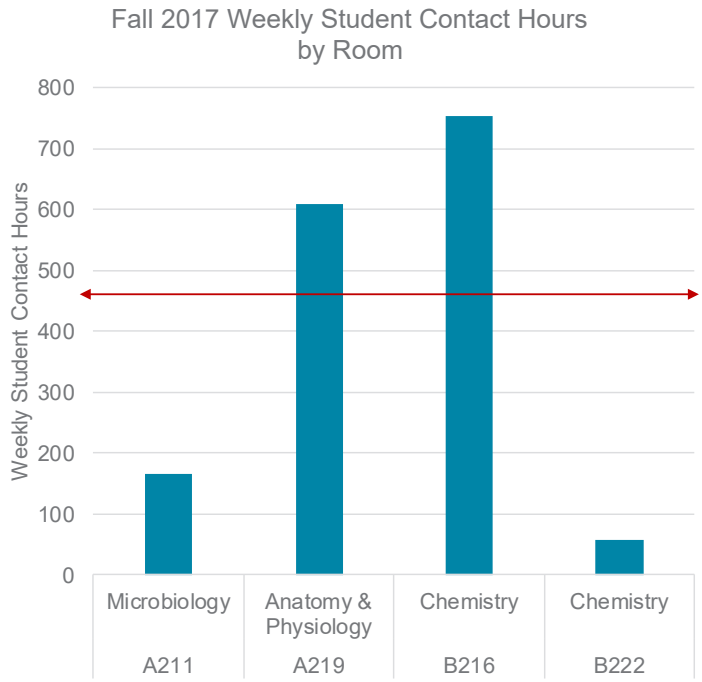
MATHEMATICS & SCIENCES ASSESSMENT



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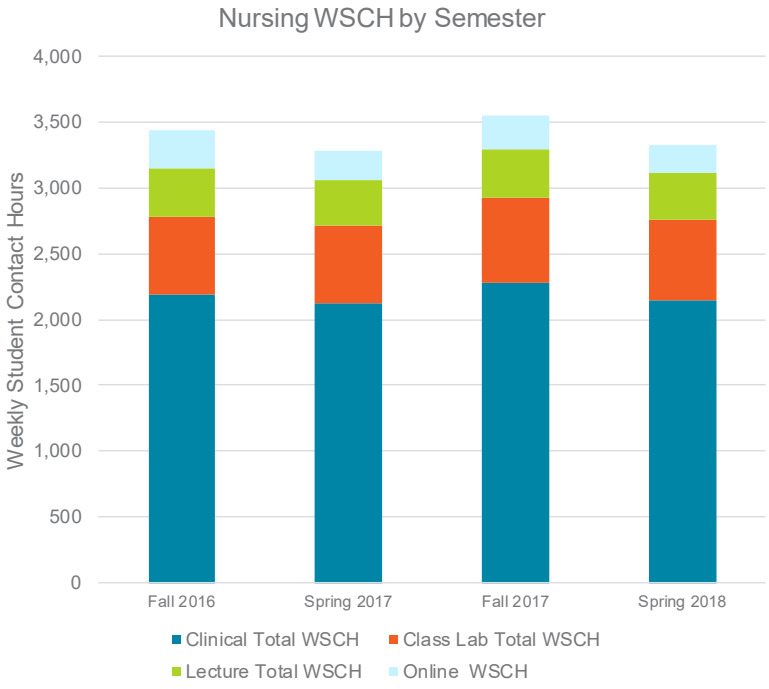
NURSING FACILITIES



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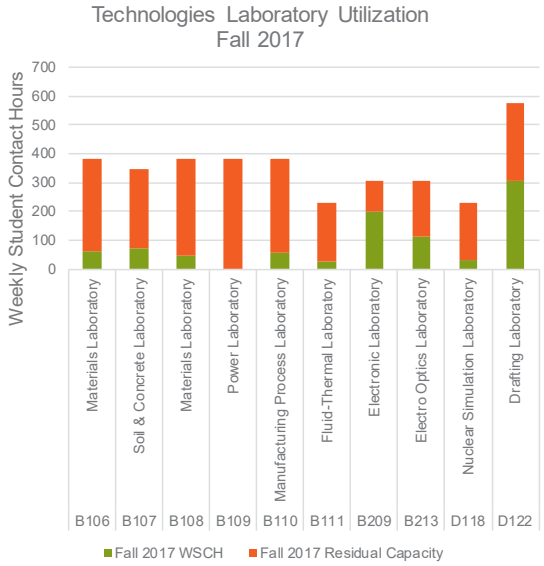
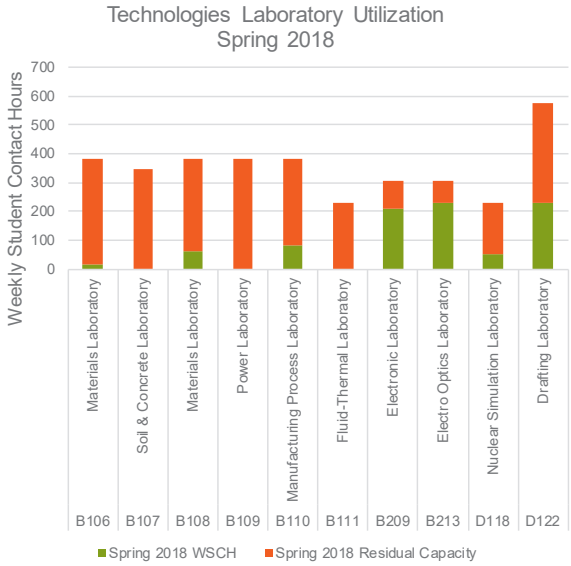
TECHNOLOGIES & LABORATORY UTILIZATION





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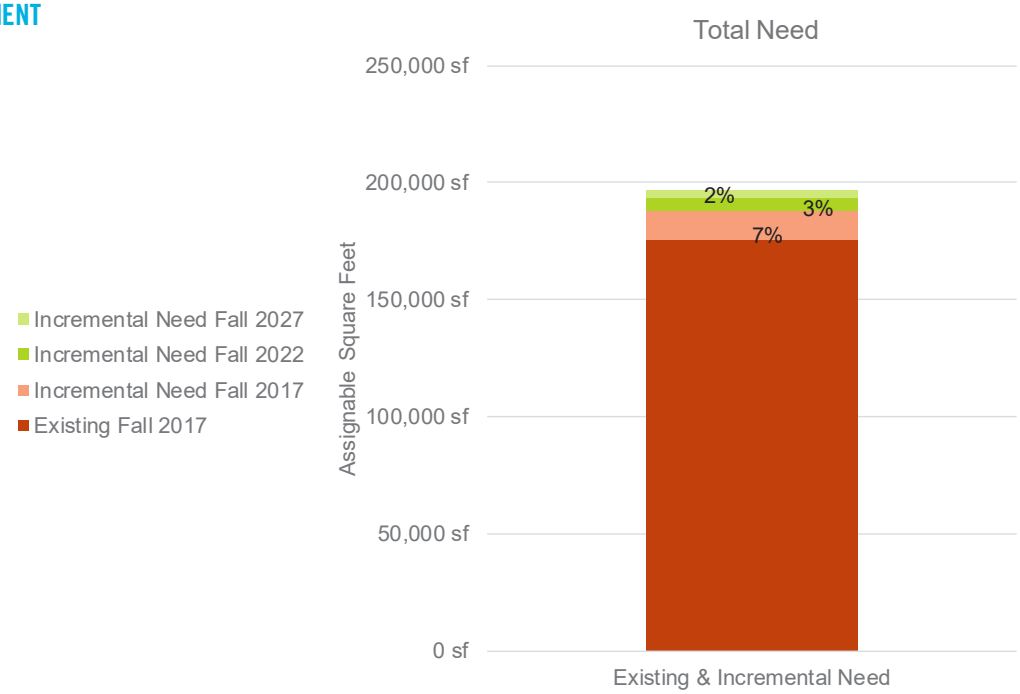
SPACE ASSESSMENT



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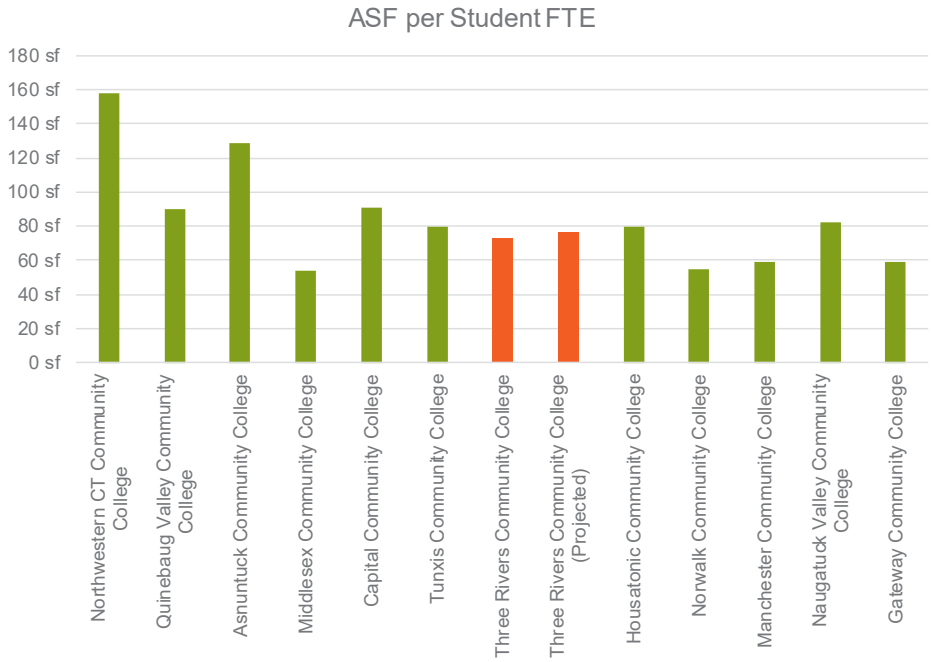
SPACE ASSESSMENT



EXPANSION (10 YEAR)

	PROGRAM AREA (SF)		CHANGE	
ACADEMIC SPACE	EXISITNG FALL 2017	PROJECTED NEED FALL 2027	SQ. FT.	%
CLASSROOM	23,749	20,773	(2,976)	-13%
COMPUTER LABS	9,746	9,241	(505)	-5%
BUSINESS & TECHNOLOGIES	15,417	13,545	(1,872)	-12%
ENGLISH & COMMUNICATION	1,586	1,325	(261)	-16%
HUMANITIES & SOCIAL SCIENCES	8,190	9,242	1,052	13%
NURSING AND ALLIED HEALTH	9,215	11,509	2,294	25%
MATHEMATICS & SCIENCE	11,442	13,295	1,853	16%
SHARED ACADEMIC SPACE	2,632	3,300	668	25%
TOTAL ACADEMIC SPACE	**81,977**	**82,230**	**253**	**0%**
HOSTED ENTITIES				
CENTRAL CT STATE (RN TO BSN)	-	3,600	3,600	100%
MIDDLE COLLEGE	4,971	4,971	-	0%
TOTAL HOSTED ENTITIES SPACE	**4,971**	**8,571**	**3,600**	**72%**

EXPANSION (10 YEAR)

SUPPORT SPACE	PROGRAM AREA (SF) EXISITNG FALL 2017	PROJECTED NEED FALL 2027	CHANGE SQ. FT.	%
CONTINUING ED & WORK FORCE DEV.	6,075	8,122	2,047	34%
ACADEMIC SUPPORT	4,704	4,704	-	0%
ADMINISTRATIVE SERVICES	9,269	10,234	965	10%
ASSEMBLY & EXHIBITION	5,711	5,711	-	0%
ATHLETIC & RECREATION	5,309	5,400	91	2%
CAMPUS SERVICES	9,021	11,450	2,429	27%
CHILDCARE CENTER	3,554	4,235	681	19%
LIBRARY	13,235	19,355	6,120	46%
STUDENT ACTIVITIES	18,373	23,315	4,942	27%
STUDENT SERVICES	6,736	8,342	1,606	24%
TECHNOLOGY	4,802	4,802	-	0%
TOTAL SUPPORT SPACE	**86,789**	**105,670**	**18,881**	**22%**

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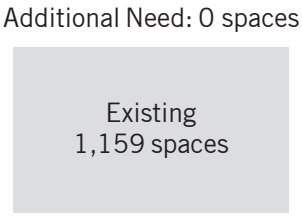
PROGRAM SUMMARY

Academic and Support Space



Parking

*Space Need provided by Others for Off-Site Facility
**Excluding Off-Site Facilities

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RECOMMENDATIONS / 10-YEAR MASTER PLAN

PLANNING PRINCIPLES

- Expand and modernize Sciences, Allied Health, Nursing,
- Optimize facility use to meet overall space needs
- Support student success and community engagement
- Address key non-credit program needs with off-site solution
- Enhance sustainability and environmental quality inside and outside
- Provide flexibility in implementation

DRAFT
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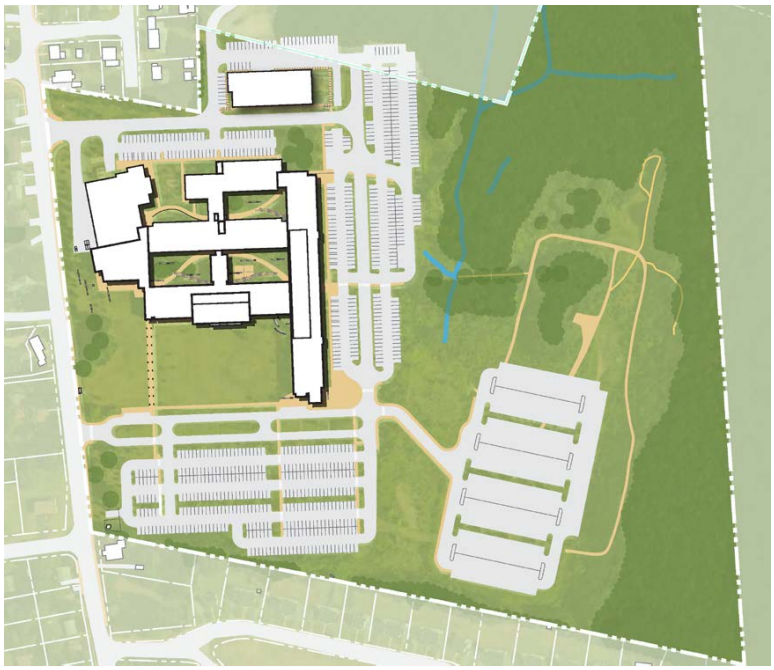
EXISTING SITE PLAN



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10-YEAR MASTER PLAN

Key

A. Detailed Study for Technologies Programs

B. Near-term Renovations for Sciences, Nursing

C. MEP Upgrades, D and E Wings

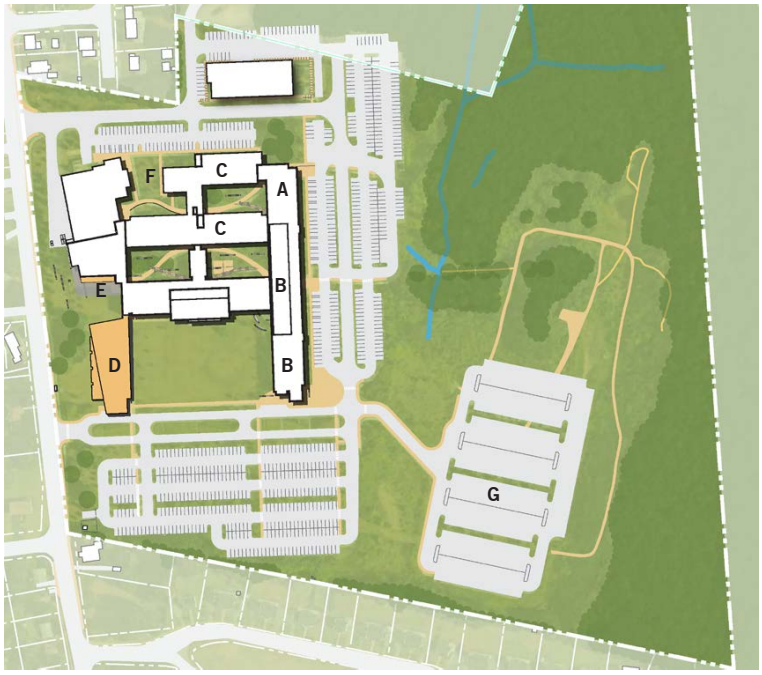
D. New Academic Wing (G Wing)

E. Expanded Dining Hall and Patio

F. Playground Upgrade

G. Additional Outdoor Lighting

Backfill Renovations following opening of new Academic Wing (Wing) (location TBD)



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TRCC TECHNOLOGY PROGRAMS

Computer Science Technology

Construction Technology

Electrical, Laser, and Robotics Engineering Technology

General Engineering Technology

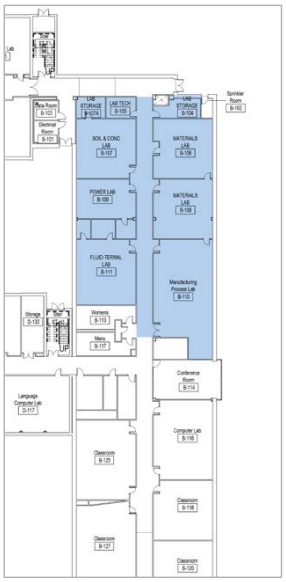
Manufacturing Engineering Technology

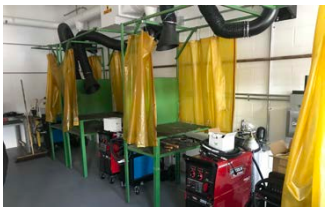
Mechanical Engineering Technology

Nuclear Engineering Technology

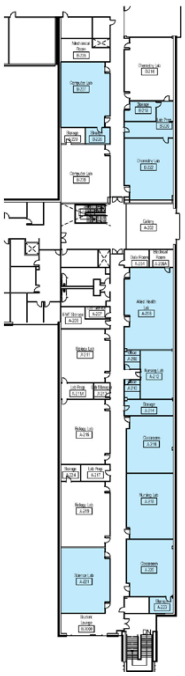
Technology Studies

Recommendation: Detailed Programming and Facility Assessment to follow the comprehensive Master Plan





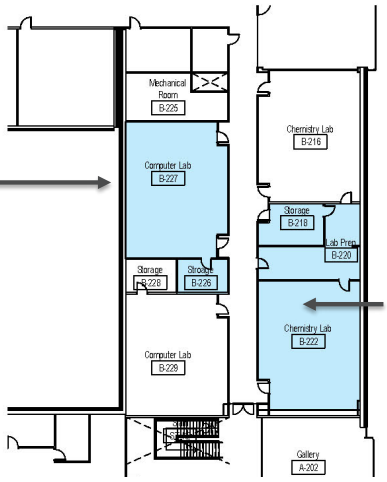
NEAR-TERM RENOVATIONS / SCIENCES, NURSING



A and B Wing second floor

ADDITIONAL BIOLOGY LAB

Convert Computer Classroom B-227 to a Anatomy & Physiology Lab to relieve curriculum bottleneck



Convert Advanced Chemistry Lab B-222 to General Chemistry Lab to meet demand

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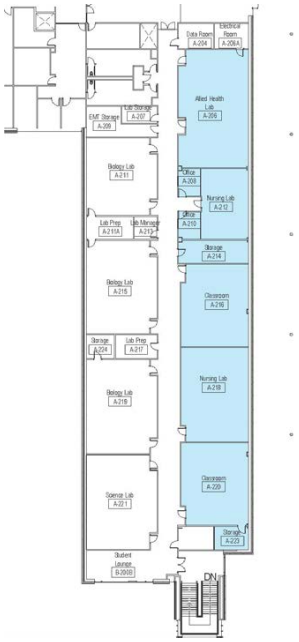
NURSING RENOVATIONS



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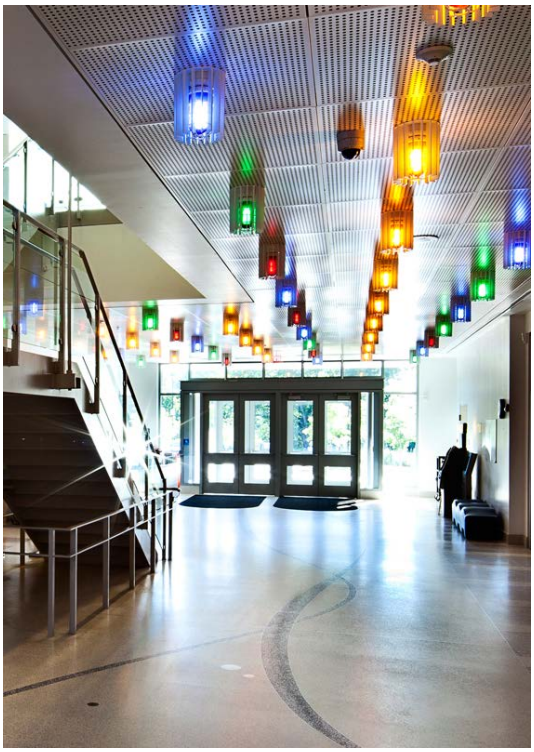
MEP RECOMMENDATIONS

- Implement recommendations to address **humidity and temperature control** in the D & E wings from 2016 Indoor Air Quality HVAC Investigation (permanent modifications)
- Install a plate and frame **heat exchanger and basin heaters** to allow for winter cooling availability along with additional energy savings.



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THE PLAYGROUND TODAY

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PLAYGROUND UPGRADES

Input from Sheila Skahan

- Install surfaces to meet standards
- Reevaluate current sprinkling system does not work
- Extend preschool fencing to sidewalk to increase square footage and to incorporate trees for shading
- Increase current playground to include 3rd infant/toddler playground – currently there are 4 classes of children under the ages of 2.9 using one
- Paint fencing black for visual appeal or replace.
- Plant "Real" Shade via Trees
- Remove blue shade apparatuses
- Child care feels riding path is important feature even if a new one needs to be installed.
- Pathway in existent infant and toddler space is illogical – eliminate or recreate.
- Install Preschool Climbing structure (See Kompan Playgrounds - https://www.kompan.us/)
- Install Infant and Toddler structures (see Kompan Playgrounds)
- Install building systems by Community Playthings (https://www.communityplaythings.com/products/outdoor)

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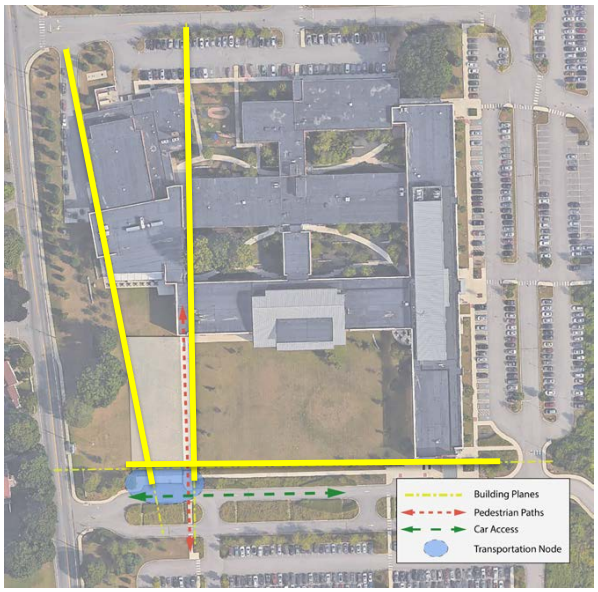
EXPANSION CONCEPT



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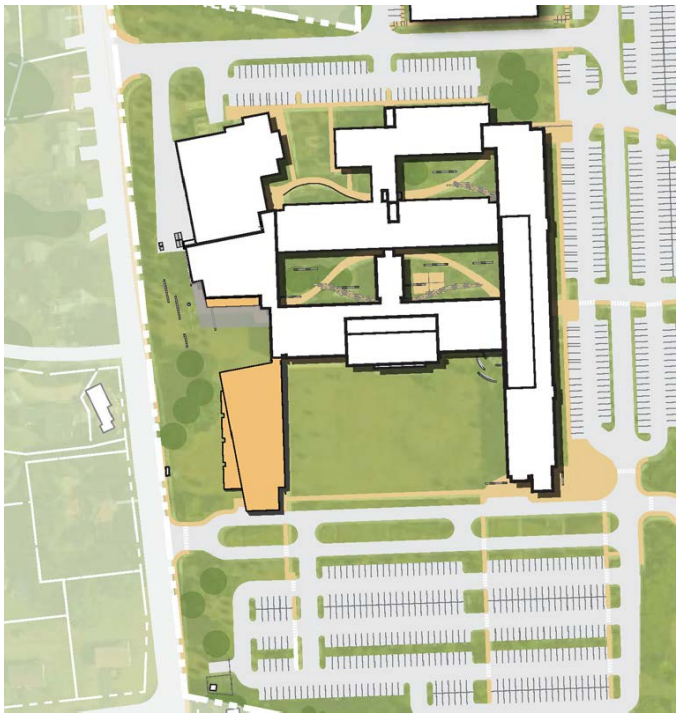
10-YEAR EXPANSION CONCEPT



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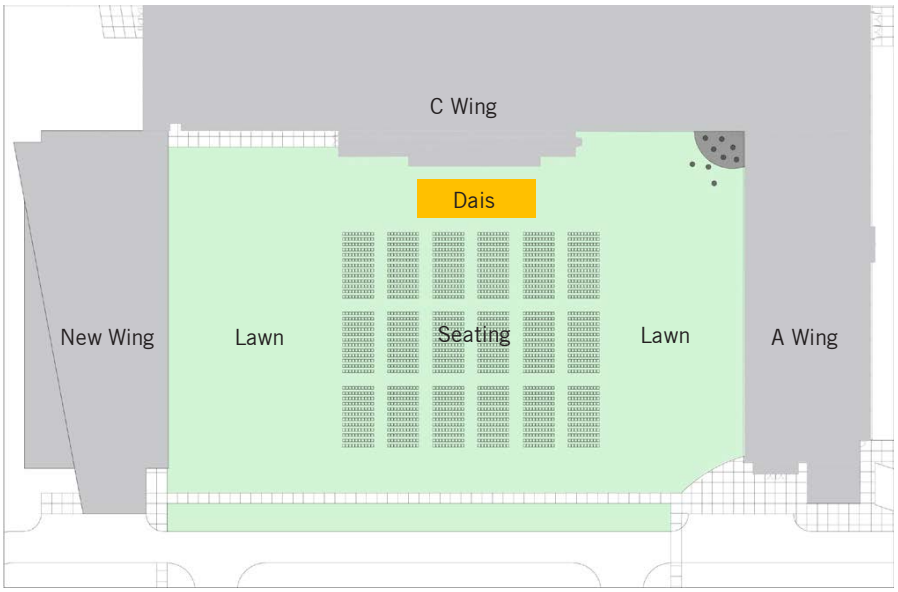
COMMENCEMENT SEATING CAPACITY STUDY

Seats Shown: 2,200

Rows: 36" (back to back of chairs)

Width: 21" per chair



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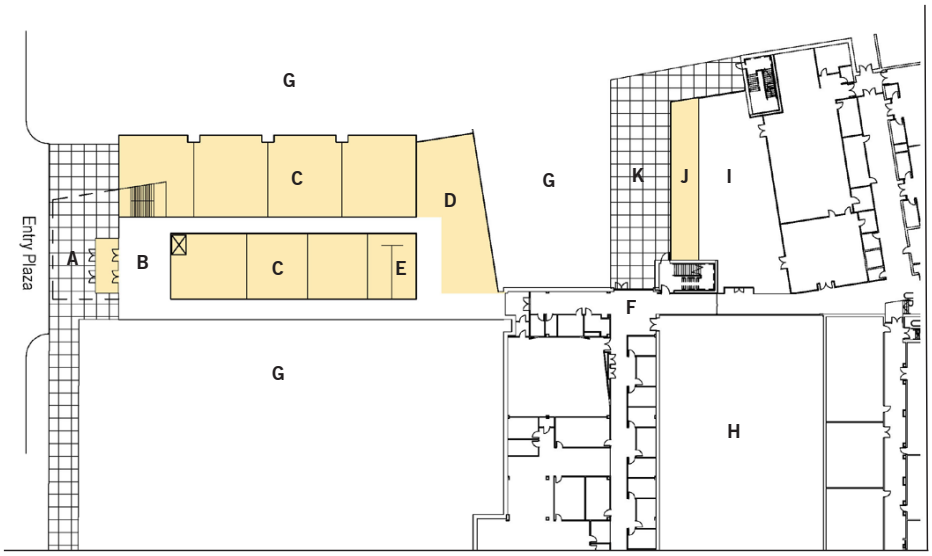
NEW ACADEMIC WING / FIRST FLOOR

Key

A. Entry Plaza
B. Lobby
C. New Academic Space
D. Lounge
E. Restrooms
F. Connection to C Wing
G. Lawn / Exterior
H. Existing Courtyard
I. Existing Dining
J. Expanded Dining
K. Reconfigured Terrace



North

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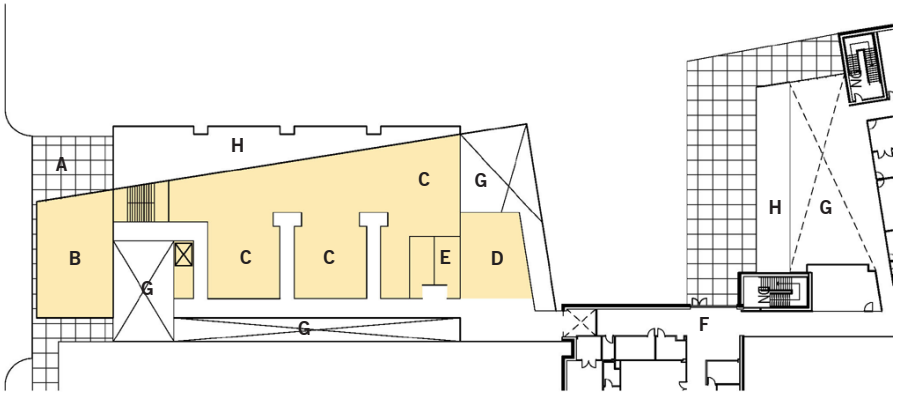
NEW ACADEMIC WING / SECOND FLOOR, OPTION 1

Key

A. Entry Plaza Below
B. Multi-Purpose Room
C. Academic / Support Space TBD
D. Lounge
E. Restrooms
F. Connection to C Wing
G. Open to Below
H. Roof



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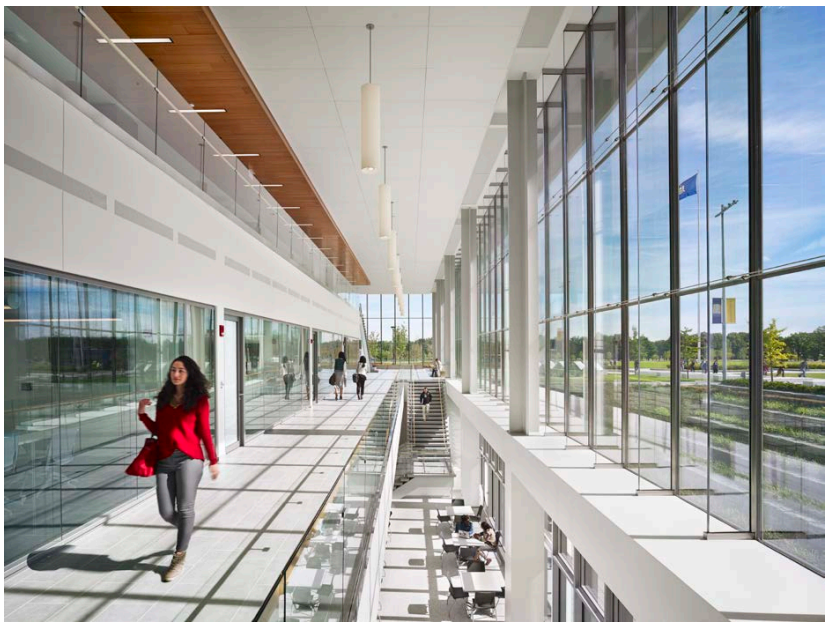
STEPPED CIRCULATION / OPTION 1



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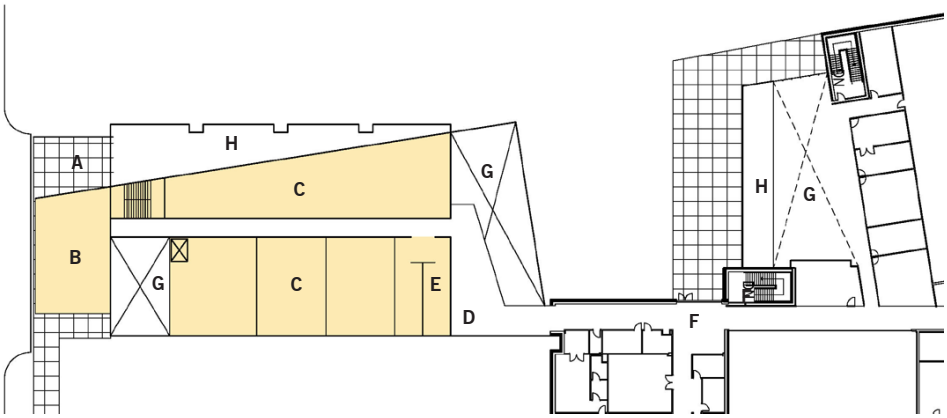
NEW ACADEMIC WING / SECOND FLOOR, OPTION 2

Key

A. Entry Plaza Below
B. Multi-Purpose Room
C. Academic / Support Space TBD
D. Lounge
E. Restrooms
F. Connection to C Wing
G. Open to Below
H. Roof



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Preliminary


Preliminary

PROJECT PRIORITIES

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PRIORITIES

Current and Pending Projects	Projects where design is in progress
Priority 1	Next Highest need
Priority 2	Secondary need
10-Year Need	Longer-term need (36,000 GSF Expansion)

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PROJECT PRIORITIES

Priority 1

- Additional Biology Lab / Convert Second Chemistry Lab to General Chemistry
- Temperature and humidity control in D and E wings
- Expanding Allied Health to accommodate the new Medical Assistant Program
- Expand Sciences
- Expand Nursing
- Expand Technologies

Priority 2

- Added parking lot lighting
- Childcare Playground
- Cooling tower upgrades
- Courtyard enhancements, tree removal

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COST ESTIMATE

COST ESTIMATING BACKGROUND

Basis of the construction estimate

- Preliminary, order-of-magnitude
- 25% design contingency
- 5% estimating contingency
- Includes markups for General Conditions, general requirements, permits
- Based on 2018 bid
- Local union rates

- Based on master plan drawings, space program, engineering and landscape data

- By VJ Associates, professional estimator

Basis of Project Cost

For Buildings

- Construction Cost + 45% per CSCU Guidelines

For Open Space / Roads / Infrastructure

- Construction Cost + 30% per CSCU Guidelines

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COST ESTIMATE

NEAR-TERM PROJECTS	SF	Construction Cost	Construction Cost/SF	Project Cost
Renovation / Second Floor A & B Wings for Science and Nursing	9,909	$2,734,884	$276	$3,965,582
Renovations / D and E Wings for temperature and humidity control	NA	$419,432	NA	$608,176
Parking Lot Supplemental Lighting	NA	$383,703	NA	$498,814
Childcare Center Playground Upgrade	3,967	$158,680	$40	$206,284
Subtotal	13,876	$3,696,699		$5,278,856
10-Year Projects				
Southwest Wing / New Construction	35,000	$21,000,000	$600	$30,450,000
Backfill Renovations Allowance	21,000	$7,413,000	$353	$10,748,850
Expanded Dining Area and Terrace	1,600	$1,440,000	$900	$2,088,000
Subtotal	57,600	$29,853,000		$43,286,850
Total		**$33,549,699**		**$48,565,706**

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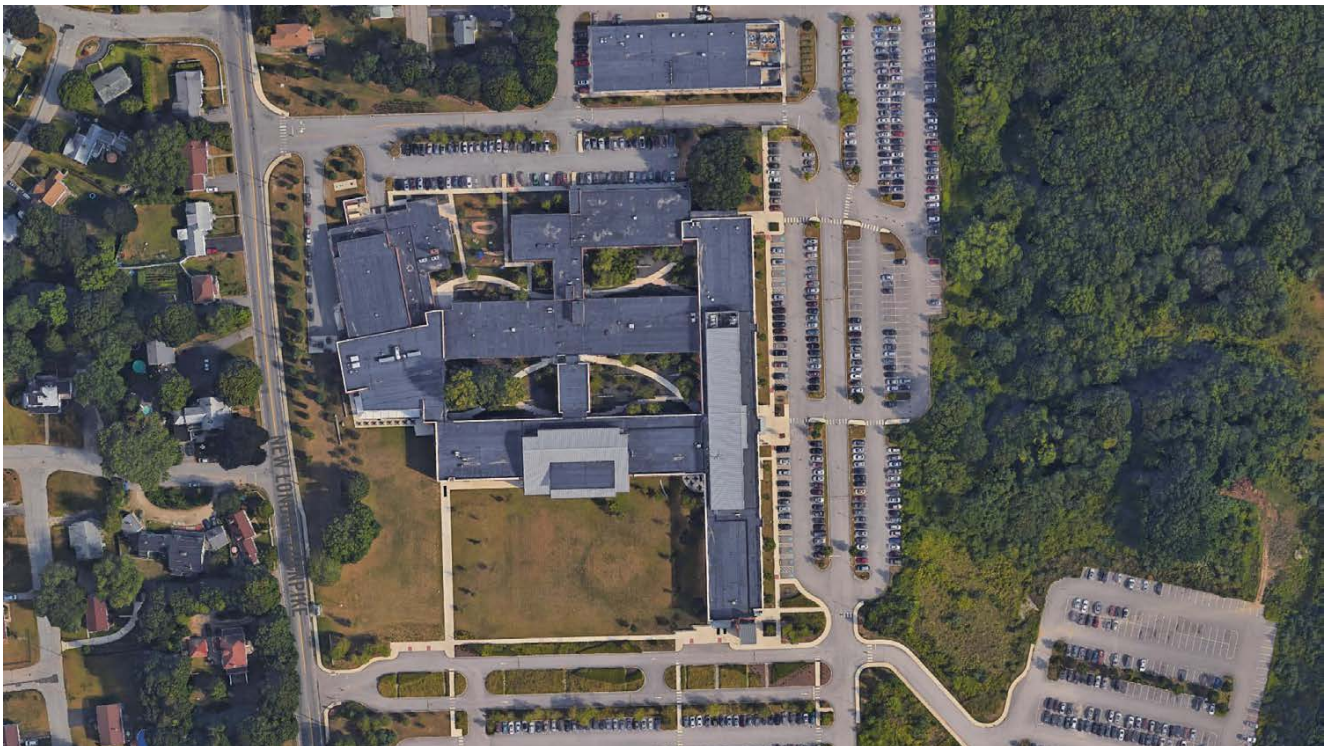
NEXT STEPS

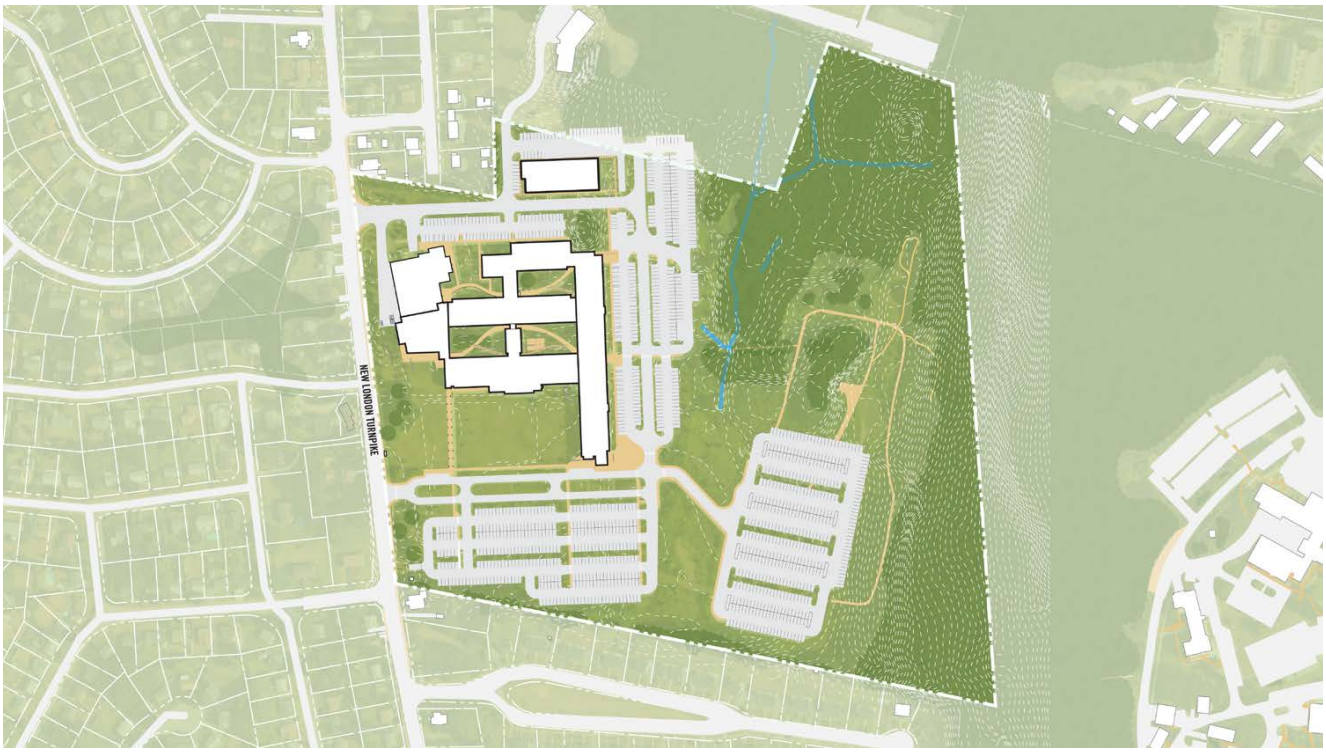
NEXT STEPS

- Draft Final Report
- Submit for Review and Comment
- Finalize Report

- Master Plan Presentation, September 21
  Professional Development Day, Location TBD

DISCUSSION

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MEETING NOTES

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Meeting Minutes

By:	Mike Aziz	Date	March 8, 2018
Meeting Date:	March 6, 2018	Project Name:	TRCC Master Plan Update
Meeting Time:	10:00 am – 12:00pm	Project No.:	031551.600
Meeting Location:	TRCC	Next Meeting:	CMPAC Meeting #1
Attendees:	*TRCC: CMPAC* – Patrick Keller Jerry Ice Steve Goetchius Arnie DeLaRosa Kem Barfield Heather Dyer Mary Ellen Jukoski April Hudson Steve Finton Zack Truelson	Mary Ellen Jukoski April Hudson Steve Finton Zack Truelson	*Board of Regents* – Keith Epstein Armen Beerman *Perkins+Will* – Bill MacIntosh, Mike Aziz *Academic Planning Consult.* Scott Page

Draft – for Review and Comment by Project Management Team

1. Introduction and Planning Context

- Bill MacIntosh (BM) reviewed the Master Plan scope, objectives and process
- President Mary Ellen Jukoski, Ed. D (PJ) confirms that faculty/staff still on contract for May 29th final CMPAC meeting
- PJ confirms that strategic plan has been updated, TRCC to send copy (received)
- Many community organizations like to use multi-purpose rooms for fundraisers and other events
- Keith Epstein (KE): Solar cells have been explored for this campus, however they have not been found to be economically feasible, since Norwich Electric, the utility provider, does not offer subsidies that make PPAs feasible.

2. The Campus Today and Physical Analysis

- Mike Aziz (MA) presented initial campus analysis and observations
- Traffic and Access
    - Arnie DeLaRosa (ADR) suggests that City of Norwich wants to install roundabouts on West Main St from 395 to the Marina.
    - Traffic backs up at Main and New London Turnpike. State DOT has not been responsive to request for signal changes.
        - BM: Could put recommendation for signaling in Master Plan
    - PJ: Main entrance visibility not an issue after people's first visit
    - ADR: Access through residential neighborhood an issue with neighbors. There have been local discussions of possibly blocking through-access in the neighborhood using a jersey barrier. Not implemented.
    - Congestion coming out of campus is only when classes let out.
    - Steve Goetchius (SG): Very few pedestrians cross NL Turnpike
- Transit
    - Steve Finton (SF): A number of students use the buses. Direct from New London/Groton. Flag down route.
    - UPass program entitles students to access.
    - SF would like to see routes to more areas around TRCC
    - State budget cuts plan 15% transit reduction. Will likely impact TRCC students.
    - Given demographics, affordable transportation alternatives to car is important for TRCC students.
- Parking
    - PJ: The parking supply is adequate.
    - There are no issues with distribution of faculty / staff / daycare spaces.
    - Monday and Wednesday are most congested days at campus, Friday is the lightest.
- Parcel Boundary
    - ADR: Parcel to the east is a state social services, mental health institution, Uncas on the Thames. It is largely underutilized with some vacant facilities. Their failure to complete a left hand turn transportation project instigated the separation of the parcel into two lots.
- Open Space / Infrastructure
    - Main walking trail shown in site survey is used for cut through from Melrose to shopping center.
    - Another path extends north from near the CUP.
    - The South Lawn is used often for a variety of activities- outdoor movies, exercise, and frisbee and casual recreation. Also used for commencement in May.
    - PJ: Playground needs an upgrade, not state of the art. Project underway to look upgrades, but no funding available.
    - ADR: There is an underground stormwater detention system in Lot 2 and Lot 9.
    - Swale in bottom left of Lot 4. Will follow-up with assistance on mapping.
    - ADR: Flooding generally not an issue for Lot 4.
    - PJ: Concerned with the age of the courtyard trees and potential for damage.
    - ADR: They are 80+ years old and their limbs have fallen on nearby roofs. This could lead to roof penetrations and flooding at roof drains.
    - The SW courtyard is most often due to proximity to student support spaces. Other courtyards less used.

- Building Analysis
  - SF: Would like to explore all Student Services in one place, moving student spaces down from second floor (SGA, OASIS, Lounges, over packed storage room) to first floor A wing.
  - PJ believes the current remote location may be preferable, given the noise generated by student activity spaces on the second floor.
  - PJ: Wayfinding in the wings can be improved. Perhaps by color coding. Current colors in flooring too subtle to be intuitive. Would like to see images of Manchester Community College's recent wayfinding project.

3. Preliminary Space Assessment

- Scott Page (SP) gives overview of initial enrollment projections and space usage analysis.
- Space per student at TRCC today is reasonable given its scale – high 70's ASF/FTE.
- KE: BOR previously had 90 ASF/FTE as standard, but they no longer want to use an average. It does not reflect the diversity of program mixes across institutions.
- SP: Less non-credit at TRCC than sister institutions.
- SF: We train non-credit off campus, TRCC does not have capacity on campus for Advanced Manufacturing, currently using high school for that purpose.
- SF: One or two year projections for non-credit and incumbent workers can be provided
- SP: Daycare space is considered a support (not a hosted entity) even though it is outsourced
- SP: Interested in the effect of the Middle College on space usage and needs. Described as hosted entity in space analysis.
- PL: Middle College is 60-65 students (Junior/Senior year) and not likely to grow, perhaps because of declining funds.
- BM: We will prepare a map of all the spaces used by Middle College
- SP: Some follow-ups from program interviews will be likely. Additional program drill down may not be needed for master plan, but will be helpful during implementation.
- PJ: Future space need priorities include welding space and sciences
- Jerry Ice: Consider that TRCC effectively runs a 4 day schedule, a huge impact on space usage and faculty time

4. Next Steps

- College Master Plan Advisory Committee (CMPAC) Meeting #2 Committee confirmed April 3rd
- Program Interviews May 20th and 21st
- CMPAC Meeting # 3 confirmed for May 1st
- CMPAC #4 confirmed for May 29th

END

The foregoing constitutes our understanding of matters discussed and conclusions reached. Other participants are requested to review these items and advise the originator in writing of any errors or omissions.

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Meeting Minutes

By:	Bill MacIntosh	Date	April 4, 2018
Meeting Date:	April 3, 2018	Project Name:	TRCC Master Plan Update
Meeting Time:	10:00 am – 12:00pm	Project No.:	031551.600
Meeting Location:	TRCC	Next Meeting:	CMPAC Meeting #2
Attendees:	*TRCC: CMPAC* – Patrick Keller Jerry Ice Steve Goetchius Arnie DeLaRosa Kem Barfield Mary Ellen Jukoski April Hudson Steve Finton Will O'Hare Zack Truelson		*Board of Regents* – Armen Beerman *Perkins+Will* – Bill MacIntosh, Lois Suh *Academic Planning Consult.* Scott Page

Draft – for Review and Comment by Project Management Team

- **Introduction**
  - Bill MacIntosh (BM) gave an overview of progress on the Master Plan since the last meeting.
  - The project is on schedule.

- **Preliminary Space Needs Assessment**
  - Scott Page (SP) presented findings from the program interviews and the draft space needs assessment.
  - The projections show current need, 5-yr need, 10-yr need
  - Shared academic space includes adjunct spaces as well as conference rooms.
  - Tutoring center included in academic support.
  - Library is included in support space.
  - As an outdoor area, the playground is not represented in the ASF for the childcare center.
  - Library and student activities have large needs. Student activities include club spaces, diversity/gender center, etc.
  - SP to look at the possibility of adding larger capacity classrooms and what the effect would be. Fall 2017 large enrollment courses. Courses like sociology, psychology, architecture + world (about 12 classes from the list) could be run in larger sections in order to help with under-utilization.

- Scale of English / Math / Psychology / Sociology / Biology / Nursing compared to remaining 54 subjects. Constraints with the first 6 subjects are more problematic than constraints with the remaining subjects.
- Existing space revised to exclude the Middle College. 73 ASF/FTE
- More space recommended for library, science, allied health.
- Discussion of effect of nursing program on demand for science courses.
- Overall need of an additional 20-25,000 ASF, approx. 40,000 GSF
- Recognition an alternative to new construction is needed for the near-term given financial situation.
- SP: the expansion need is distributed widely across many areas. An addition alone will not meet the expansion need.
- Consultant team to look to prioritize needs for projects that directly benefit recruitment and retention.
- Discussion of the need to get more use on Fridays. Could be possible to repurpose some classrooms this way.

- **Classroom Utilization Analysis**
  - BM presents classroom utilization analysis.
  - Fill rate / contact hours are right on target mostly except for a few classrooms. On Fridays there is very little academic building use.
  - Reflects credit courses only.

- **Building Condition and Analysis**
  - TRCC building complex is mostly in good condition
  - Exterior doors need attention.
  - Lighting is fair, but in process of being upgraded to LED.
  - Middle College occupies about 4,700 ASF. Built for the college (not purpose-built by Dept. of Ed like Manchester)
  - President Jukoski: Middle College to remain. Do not use this space for college in the Master Plan.
  - Steve Finton: Middle College does not contribute directly to TRCC enrollment.
  - BM: the master plan will explore better distribution of restrooms.
  - Arnie: gender neutral restroom is not shown on the plan. (plans to be sent to P+W)
  - SF: Revise plan to switch labels women's / men's locker rooms.

- **MEP Systems Overview**

  - BM presented an overview of AKF Group's analysis of existing MEP systems and infrastructure.
  - New, high-efficiency boilers should yield a better energy use intensity (EUI) than shown in the Energy Master Plan, done just prior to installation of the new boilers.
  - Consultant team is aware of the issue with humidity in D & E wings and the previous studies. Will include concept-level recommendations and cost estimate in the Master Plan to address.
  - Power is fairly reliable. No recent electrical outages. Emergency power covers exit lighting and coed-requirements.

- **Online Survey Findings**

  - Lois Suh (LS) presented campus survey findings.
  - Good participation, 213 respondents including students, faculty and staff.
  - Cafeteria got positive reviews, but also noted as congested at times.

April 20, 2015
Re: **031551.600 Meeting Minutes**

- **Discussion**
  - Landscape / grounds
    - BM asks the committee their thoughts on campus grounds / landscape.
    - Area south of C wing to remain lawn so it can serve for graduation.
    - President Jukoski, Arnie: upkeep / maintenance is always an issue. Not looking to add gardens, plantings that will require more attention.
    - Ornamental grass in the median of the entry drive grows tall enough to interferes with sight lines. Need trimming. Some have been relocated but overall very expensive to relocate completely.
    - Armen Beerman: as part of consolidation, the system office is looking at getting contractors to take care of custodial services and potentially landscaping and snow removal.
  - Parking / lighting
    - There is sufficient parking to meet demand.
    - But survey notes safety concerns for those using remote east lot, which does not have lighting
    - Bill: master plan will include adding exterior lighting to parking lots where needed.
    - Arnie noted potential groundwater issue. There may have been DEP issues with adding more lighting in lot 4 because of floodplain. Not enough in most lots.
    - DEP issues to be investigated / addressed during implementation.
  - Northeast corner site
    - The raised mound with a circle of trees north of B wing, by oral tradition is a sacred / historic site for the local Native American community.
    - While an archeology survey found no artifacts, the consensus was that this site will be left as-is, not considered for future expansion.
  - Student Service / A Wing Study
    - Christopher Williams Architects is finalizing the renovation plan.
    - SG noted that the Testing Center will now stay – a recent change.
  - Library Studies
    - Done in 2015 by Christopher Williams Architects, as a phase 3 project
    - SG believes current bonding includes funds for a more detailed study
  - Advanced Manufacturing Technology
    - BM: Will get the study now being done to address this need and coordinate the master plan accordingly
    - The consultant team understands the importance of expanding the welding training, and bringing this on-site.
  - Larger course section sizes
    - Will O'Hare notes these would require TAs, and a different way to teach.
    - One of the advantages of an education at TRCC is the appeal of smaller sections
    - SP notes perhaps 12 courses would be candidates for larger section sizes; not the entire curriculum
  - Departmental offices
    - Dean Ice notes there are no departmental offices now.
    - As a result, many students come to his office, rather than a department chairman.
    - Dean Ice: 3 Associate Deans are planned

The foregoing constitutes our understanding of matters discussed and conclusions reached. Other participants are requested to review these items and advise the originator in writing of any errors or omissions.

Temperature and Humidity Improvements / D and E Wings; Other MEP upgrades

- Will include as an important project, in consultation with AKF Group.
- Will look at detailed recommendations in earlier study.

Dining Area

- There is a need to expand the seating area of the cafeteria.
- Recommendation is a porch-like enclosure where the exterior dining terrace and canopy are now.

- 10-Year Expansion

  - BM reviewed a concept for a 2-story addition to provide an additional 36,000 GSF
  - The addition is at the southwest corner of the complex.
  - Rather than a partial basement, there will be a partial mechanical penthouse.
  - MEJ: 2,200 seats are needed for graduation on the lawn. Concern if the addition will prevent this, as some spill-over seats now occupy the location of the proposed addition.
  - PW to do a takeoff to make sure the seating capacity can fit.
  - The dais will be moved from in front of A Wing to in front of C Wing (Library).

- Priorities

  The following were considered Priority 1 Tier Projects:
  - Additional Biology Lab / Convert Second Chemistry Lab to General Chemistry
  - Temperature and humidity control in D and E wings
  - Expanding Allied Health to accommodate the new Medical Assistant Program
  - Expand Sciences
  - Expand Nursing
  - Expand Technologies

- Next Steps

  - Perkins+Will to refine the master plan recommendations, prepare cost estimates and renderings, and draft the report.
  - CMPAC Meeting # 4, June 28, 10:00 – 11:30
  - All College / Professional Development Day: Master Plan Presentation September 21

  END

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Meeting Minutes

By:	Bill MacIntosh	Date	June 1, 2018
Meeting Date:	May 31, 2018	Project Name:	TRCC Master Plan Update
Meeting Time:	10:00 am – 12:00pm	Project No.:	031551.600
Meeting Location:	TRCC	Next Meeting:	CMPAC Meeting #3
Attendees:	TRCC: CMPAC – Patrick Keller Jerry Ice Arnie DeLaRosa Kem Barfield Mary Ellen Jukoski Kacey McCarthy-Zaremba Gail O'Neill Heather Dyer April Hudson Steve Finton Zack Truelson		Board of Regents – Armen Beerman Perkins+Will – Bill MacIntosh, Academic Planning Consult. Scott Page cc. Keith Epstein, CSCU Steve Goetchius, TRCC

Draft – for Review and Comment by Project Management Team

- Introduction
  - Bill MacIntosh (BM) gave an overview of progress on the Master Plan since the last meeting.
  - The project is on schedule to complete the draft report at the end of June.
  - At the prior College Master Plan Advisory Committee (CMPAC) meeting, the consultant team noted that many areas of TRCC need modest expansion. Mindful of the current financial situation, this expansion will be framed as occurring in a later timeframe, with near-term projects not requiring expansion recommended to address the most acute needs to support recruitment and retention.

- Space Needs Assessment
  - Scott Page (SP) presented final recommendations for the Space Needs Assessment, reflecting additional information on classrooms, the Sciences, Nursing, and thre Technologies.
  - Library space at TRCC is relatively modest relative to peers –actually smaller than QVCC's.
  - English at TRCC is an anomaly utilizing computer labs for approximately 50% of the department's course delivery.

- SP: TRCC had 245 unique courses with 585 total sections. But when analyzing the potential to run larger sections (enrollment) the potential is limited. Within the total only 12 courses are potential candidates for aggregation. That assumption is based two factors: sufficient total course enrollment and amenable as far as pedagogy.
- SP: TRCC has the facilities to run some larger section sizes. C101 and C 228 both have unused seating capacity.
- These two classrooms, C101 and C 228, present a problem in the classroom assessment. With the assessment identifying a 3,000 surplus in classrooms, unless those specific two classrooms are renovated to some other purpose, two thirds of the surplus are not available.
- SP: A closer analysis of the Sciences reveal three teaching lab issues that need to be resolved.
- First, an additional Anatomy and Physiology Lab is a critical need.
- Second, the Advanced Chemistry Lab needs to be renovated to the arrangement within the General Chemistry Lab. The College is currently generating almost 800 WSCH in the General Chemistry Lab, which is almost physical limit, not a planning limit.
- Third, the Microbiology Lab should be relocated to provide 24 stations. This is a much lower priority than the new Anatomy & Physiology Lab or the conversion of the Advanced Chemistry Lab.
- SP: Raised the issue of the Chemistry prerequisite and corequisite for taking General Biology. He stated that he believed that this requirement, along with pre-Nursing enrollment was channeled through General Biology results in depressing the entire Biology Offering. He compared the distribution of the course content at TRCC to Manchester Community College.
- Nursing classes do not show up in Banner. All enrollment attributed to 2 classrooms. Consultant team had to drill down to better understand space use.
- The current large Nursing lab is being overwhelmed with both scheduled activities and walk-in student activity. The space needs to be expanded to accommodate the need and eliminate concurrent yet incompatible activities. The issue is not as serious an issue as Biology, but requires a resolution.
- Consultants have a follow up meeting scheduled with Nursing after the committee meeting to continue.
- SP believes when there is a BSN program on campus, then a physical assessment space will be needed.
- Technology Labs: SP notes there appears to be an ability to consolidate uses is some labs and gain space for other activities.
- The overall space need for expansion is approximately 23,575ASF / 40,000 GSF. Based on the current and minimal 10-year projected enrollment growth, this reflects a chance from 73 ASF/FTE to 76 ASF/FTE.

- Near-Term Recommendations

Eastern CT Manufacturing Pipeline Program

- Bill MacIntosh (BM) reviews iD3A Study for non-credit manufacturing training targeted for Electric Boat (EB).
- That study identified a need for 8,500 ASF.
- Study assessed 4 options. iD3A did not advance a preferred option.
- Perkins+Will believes Option 1: Manufacturing in CUP is not advisable. Most costly. Requires a new facility for Maintenance / Facilities.
- Option 4: An Off-Site Facility is preferred by EB.
- At this time, it appears there may be space available in the Ella Grasso Technical High School expansion, due to open Fall 2019, for considerably less cost, which would meet EB's location preference.
- Feasibility remains to be determined.

TRCC Technology Program

- In order to understand detailed needs better, the consultant team recommends a detailed programming study for the TRCC Technology program following the Facilities Master Plan. CSCU system office concurs.

Library

- BM reviews Phase 2 Library Concept Plan from 2015 by Christopher Williams Architects. This is the most current plan which will be developed to be bid early 2019.
- Discussion of current library shortcomings. President Jukoski: dated.
- BM notes glass at second floor implies entrance. Recommends either studying feasibility of creating a second entrance with technology (not additional staff) or else a different architectural treatment.
- CWA Plan includes a 35-seat computer classroom in the library. Is this needed? If not, this could be used for more needed student study space, including student computers.
- Kasey McCarthy-Zaremba: the English Department has agreed to use Chrome books going forward. Will need less computer classroom access.
- Plus, OK for librarian to go to computer classroom elsewhere to teach. Will make better use of available space.
- Long-term, when expansion becomes possible, the consultant team recommends the library expand 46% to serve its current enrollment. There is no reason to delay the planned current renovation since upgrades are very needed and since the renovation can be compatible with later expansion.

Science Labs

- KMZ: Computer Lab B 229 is clunky. Few want to use it. (computers are on former science lab benches, not furniture designed for computers.)
- Renovation of Lab A-221. Will have 16 students. SP stated that all science labs need to accommodate 24 students, requiring a room approaching 1,200 ASF. Without the 24 seats, there is no reason to add the second lab.
- Priority #1: Additional A&P Lab with 24 seats.
- Priority #2: Conversion of the Advanced Chemistry Lab to 24 seats.
- Priority #3: Microbiology Lab with 24 seats.
- Heather: Is anything being done to improve ventilation in A&P Lab? Arnie: yes, this is a driving factor for the renovation. New system will have updraft with a snorkel vent.

Childcare Center Playground

- Master Plan will include a recommendation for a new playground surface and equipment given current muddy conditions.
- TRCC owns the facility, leases to an operator. TRCC Early Childhood Education Program director to be consulted on phone call.

Exterior Lighting / Interior Lighting

- Additional lighting is needed at the East Lot. 14 tall poles; 8 lower poles.
- Arnie: interior lighting upgrades to LED about to occur.

The foregoing constitutes our understanding of matters discussed and conclusions reached. Other participants are requested to review these items and advise the originator in writing of any errors or omissions.

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  - All College / Professional Development Day: Master Plan Presentation September 21

  END

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Meeting Minutes

By:	Bill MacIntosh	Date	July 2, 2018
Meeting Date:	June 28, 2018	Project Name:	TRCC Master Plan Update
Meeting Time:	10:00 am – 12:00pm	Project No.:	031551.600
Meeting Location:	TRCC	Next Meeting:	CMPAC Meeting #4
Attendees:	*TRCC: CMPAC* – Mary Ellen Jukoski Steve Goetchius Jerry Ice Arnie DeLaRosa Kem Barfield Gail O'Neill Kathryn Gaffney April Hudson Steve Finton Zack Truelson		*Board of Regents* – Keith Epstein *Perkins+Will* – Bill MacIntosh,

Draft – for Review and Comment by Project Management Team

- **Introduction / Current and Pending Projects**
  - Bill MacIntosh (BM) provided an overview of the project status and current projects.
  - EB Pipeline Initiative
    - Keith Epstein reported that since the last meeting there has been progress towards confirming an agreement for use of some space at the Ella Grasso Technical High School by TRCC for this program. Use primarily 4:00 – 10:00 PM and weekends.
    - Advantages for EB: they want to train high school students, and close proximity.
    - KE to confirm square footage for reference in the Master Plan report. (This is not a master plan project.)
  - Library Phase 2 Renovation / CWA Architects
    - Perkins+Will recapped the recommendation to convert the proposed second floor computer classroom to be general computer study space (since computer classrooms elsewhere can meet this instructional need).
    - P+W also recommends treatment of the second floor glazing at the library to eliminate the current design flaw which makes it seem like an entry. Solution could either be to make it a

second entry (if feasible with technology, operations) or to change the floor-to-ceiling glass to eliminate the entrance feel.
    - KE confirmed best way to convey this information is a memo from P+W to CWA, copying TRCC and CSCU.

- **Space Needs Assessment**
    - BM presented an overview of the updated Space Needs Assessment
    - Since the last committee meeting, Scott Page has met with Nursing, Allied Health, Sciences and the Registrar.
    - Continuing Education / Workforce Training: question on why growth need. Does this include EB Pipeline? Bill to check with Scott. If not, TRCC does not believe more space is needed for Continuing Ed and WFT.
    - Dean Finton: would like to check with Scott Page to learn more about the new Allied Health needs. President Jukoski notes that Nursing and Continuing Ed need to work together with Allied Health.

Master Plan Recommendations

- P+W presented draft **Planning Principles**. There were no comments / additions.
- P+W recommended a detailed facility needs study be done for the **Technologies Programs** following the master plan. Illustrated low utilization of these labs in general.
- Recommendation to convert 2 existing spaces to serve high-priority capacity needs for the **Sciences**:
    - Convert B-227 Computer Lab to be second Anatomy and Physiology Lab
    - Convert B-222 Advanced Chemistry Lab to be General Chemistry Lab
    - Convert B-
- P+W recommends comprehensive renovation of the existing suite of **Allied Health / Nursing Space** (east of the corridor) which totals approximately 5,500 ASF, to address key needs of these programs in the near-term. Detailed programming needed to confirm layout and scope. Bill M noted one strategy could be to take classroom activities out of this space to other areas, so the space can be renovated for more specialized nursing labs.
- President Jukoski (MEJ): need more clinical training space at TRCC, including nursing sim labs. She recently saw a very relevant facility in this regard, Northern Maine Community College, during an accreditation visit.
- MEJ: Has P+W done nursing education clinical labs? Bill: yes, including at Gateway, Long Island University, others.
- Dean Jerry Ice: TRCC wants to distance itself from the crowd. Potential to expand enrollment using live video for nursing classes. Need to look at how some classrooms can be adapted. Not every classroom needs to be equipped. Road in the future will be more distance education in a simulation environment.
- **10-Year Expansion / SW Addition**
- Label “H Wing” since CUP is also called the G Wing.
- Discussion of geometry and entrance. Would this be a new main entrance? No – there is not one main entrance, nor a need for this. The entrance at the new addition will be a direct path for visitors to the existing Multi-Purpose Space beyond.
- Arnie notes concern about traffic stacking up if many use this for drop off. President Jukoski concurs. Can be addressed through signage, traffic / event management.
- Renderings and overall design: President Jukoski: You did a great job of listening. Arnie DeLarosa: design has a nice balance.

April 20, 2015
Re: **031551.600 Meeting Minutes**

- What goes in the new wing: candidate clusters include Nursing, Allied Health or Sciences, plus other functions. Consensus that there is no need to decide at this time. Should be decided later closer to the time the project is implemented when priorities can be reassessed.
- **Library long-term expansion**: Question: what type of space is needed? If group study, could this be in a different location? Already study space in tutoring center.
- Expanding library on first floor to the east into IT, nor west into Tutoring Center not desirable.
- President Jukoski: consider more stacks on ground level, more study areas above, expanded. Could permit second floor access.
- Kathryn: need a space that can be used as a **Video Studio**. Can be in an existing space, with lighting, furniture. Would be for student "DIY" video, not sophisticated video equipment requiring trained staff.
- **Signage**: Kathryn: need better directional signage to the Multipurpose Space for visitors. Pres. Jukoski: could be from the ceiling.
- **Trees in Courtyard:** Arnie notes arborist said they are near end-of-life. Beyond a pruning solution. Need to come down and be replaced. President Jukoski: opposed in general to cutting down trees, but in this case recognizes it as a safety issue which needs to be addressed. Others not how the trees make the courtyards.
- **Faculty Offices / Department Chairs:** Dean Ice notes this issue not dealt with. It is difficult for students to find their department chairs for sign-offs. Ready access is important. He advocates co-locating all the chairs in one place, rather locating separately with each of their departments.
- President Jukoski recommends a directory in the entry lobbies that students can reference.
- Dean Ice: there are 2 ways to do it: separate or together. He recommends consideration of a department chair complex.
- President Jukoski: Linear nature of offices does not foster community. Originally, concept was to assign faculty randomly to promote interaction.
- Steve Goetchius: Offices were originally shared. Now more departments clustered. Can reevaluate. Notes Nursing faculty likes to be together.

- **Priorities**

  - President Jukoski confirms leaving "Expand Technologies" in the high priority column, relative to EB Pipeline space and pending confirmation in recommended detailed study.
  - Add Dining Expansion to priority 1, per President Jukoski.
  - President Jukoski: can we do D and E Wing Temp and Humidity measures now? Keith Epstein: has the fees for design now. Wants this to be in the deferred maintenance budget for next year. Pres. Jukoski: #1 priority.
  - KE notes hard to get funding now for new construction; easier for renovations. The proposed Nursing/Allied Health/Science renovations are very desirable projects. Might be able to be in the next biennium budget.

- **Cost Estimate**
  - Bill MacIntosh reviewed the cost estimate.

The foregoing constitutes our understanding of matters discussed and conclusions reached. Other participants are requested to review these items and advise the originator in writing of any errors or omissions.

- Gail questions cost for dining expansion at $900/SF. Bill will look into it.

- **Next Steps**

  - Perkins+Will to draft the Master Plan report in coming weeks and submit for review and comment.
  - All College / Professional Development Day: Master Plan Presentation September 21
    - There will be other agenda items. SF: Possible to keep to 1 hour? Bill confirms. 30 min presentation + 30 Q&A.

END

MASTER PLAN REPORT GRAPHICS

TRCC MP GROUND LEVEL VIEW

TRCC MP AERIAL VIEW

MEP REPORT

External Memorandum

Issue Date: 06/11/2018

To: Bill MacIntosh
Perkins + Will
215 Park Ave S
New York, NY 10003

From: Tom Ruggiero
Three Rivers CC Master Plan
180234-000

A. Purpose & Background

Based on the draft Phasing plans and report provided by Perkins + Will, as well as AKF's survey of the campus on March 5, 2018, AKF recommends the following items be included in a cost estimate based on our understanding of the space types included in each phase and existing capacities of the campus.

B. Projects

Phase 1 Architectural Renovations

A1.A Library Renovation

Mechanical:

- Rezone air distribution system to accommodate architectural layout (about 10-15 zones)

Electrical

- Provide new lighting and receptacles to accommodate the architectural layout.
- Provide additional addressable fire alarm zones.

Fire Protection:

- Provide new sprinkler heads to accommodate the architectural layout.

A1.B Biology Lab Conversion

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AKF

Electrical:

- Provide new lighting and receptacles to accommodate the architectural layout.

Plumbing:

- Provide infrastructure for three (3) new sinks.

A1.C Humidity Issues in Wings D&E

Mechanical:

- Provide four (4) new 100% outside air roof top units sized for 3500 CFM each, installed on the roof, provide with chilled water cooling coils, hot water pre-heat and reheat coils, energy recovery, direct drive supply and exhaust fans, and new supplemental steel.
- Provide supply and return ductwork as required for distribution to the individual classrooms. New soffits should be included to conceal the ductwork distribution.
- Block up existing unit ventilator louvers and remove all above ceiling transfer ducts.
- As an alternate, provide (4) new 25,000 CFM roof top units and remove the existing unit ventilators. Units should be provided with chilled water cooling coils, hot water pre-heat coils, energy recovery, direct drive supply and exhaust fans. Provide new terminal units for above 60 zones with hot water reheat coils with new supply and return ductwork distribution, and new supplemental steel.
- Provide all controls required to integrate with the campus Alerton system.

Phase 2 Architectural Renovations

A2.A New Wing

Mechanical:

- Provide two (2) 27,000 CFM air handling unit with chilled water cooling coils, hot water pre-heat coils, energy recovery, and direct drive supply and exhaust fans to be installed within the building.
- Provide new ductwork distribution as required.
- Provide new 4” chilled water and 3” hot water piping from the existing building distribution.
- Provide VAV’s with hot water reheat coils for each zone (approx. 30-35).
- Provide a new exhaust fan for general exhaust sized for 2000 CFM at 1.0” SP.
- Provide all controls required to integrate with the campus Alerton system.

Electrical:

- Provide new circuiting and new sub-panels.

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- Provide new power source for the Mechanical equipment.
- Install LED lighting and controls.
- Provide additional addressable fire alarm zones in the existing fire alarm control panel.
- The Existing on site generator will need to increase in capacity to accommodate the additional square footage. Assume a new 300 KW generator for the purpose of this pricing exercise.

Plumbing:

- New 6 inch sanitary and two 8 inch storm services will be required for the new addition.
- Provide new 10 roof drains and overflow drains
- Modify and extend existing hot, cold and hot return from existing mains in wing 4.
- Modify and extend existing gas to serve new science labs.

Fire Protection:

- New wing addition will require sprinkler service from existing site fire main, new backflow preventer, sprinkler alarm valve, new branch piping distribution and sprinkler heads.

COPIES TO:

Brian Harris

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CAMPUS UTILITIES

Heating Ventilation and Air Conditioning (HVAC)

Central Plant & Air Distirbution

- Six Heating Hot water boilers, with primary only pumping, & Three Chillers, with primary secondary operation, in a stand alone building circulating water through the campus.
- Condenser water system is currently drained down during the winter.
- There are 12 air handling units on campus in various mechanical rooms that distribute air to local zones for cooling and heating.

Boiler Plant

CAMPUS UTILITIES

Electrical Systems Overview

- Main Building is fed from the main electrical room which has a 277/480V, 3 Phase, 2500 Amp service.
- CUP (Central Utility Plant) building has a 277/480V, Phase, 2000 Amp service.
- There are three existing Generac Generators Onsite two of which are rated at 400 KW and the third generator is rated at 250 KW.
- All on Campus lighting are Fluorescent/Incandescent. Upgrading to LED lighting is recommended.
- Building Electrical System need to undergo an NFPA 70E (Short Circuit and Arc Flash) study.

2000 Amp Switchboard

Existing Generators

CAMPUS UTILITIES
Plumbing Systems Overview

- The campus is provided with high pressure natural gas service from the local utility company.
- The buildings domestic water, sanitary and storm drain sewers are served by the local municipality.
- Main building Domestic hot water is generated by two 400 gallon gas fired heaters. The Daycare area hot water is generated by a 80 gallon electric hot water heater.

Domestic Gas Fired Hot Water Heaters

CAMPUS UTILITIES
Fire Protection Systems Overview

- All incoming fire protection water services are equipped with a backflow preventers.
- All buildings are provided throughout with sprinkler protection.

Fire Service Backflow Preventer

CAMPUS UTILITIES

Major Operational Issues Identified By Facilities Group Or Observed By AKF

- There are issues with humidity control and mold in the D&E wings that need to be addressed.
- The cooling tower is drained down every winter to prevent freezing but limits the cooling availability on warm winter days. Installation of a plate and frame heat exchanger and basin heaters would allow for winter cooling availability along with additional energy savings.