

24/7 STADIUMS

THEIR IMPACT ON SURROUNDING COMMUNITIES

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ABSTRACT

4 INTRODUCTION

THE PURPOSE OF THIS THESIS IS TO PROVIDE A CLEAR LOOK INTO THE IMPACT OF THE THEORY OF 24/7 STADIUMS ON COMMUNITIES. WITH THAT, THIS THESIS WILL IN TURN SHOW HOW THE STADIUM CAN BE USED AT ALL TIMES OF THE DAY INSTEAD OF BEING A VENUE USED A COUPLE TIMES A WEEK. IN THEORY, THE STADIUM WILL PROVIDE JOBS, NEW ESTABLISHMENTS, AN INCREASE IN REVENUE, AND AN OVERALL LARGE SPACE TO BE ENJOYED BY ITS COMMUNITY WHICH IN TURN, CREATES A STRONG AND GREATER COMMUNITY.

ARCHITECTS OFTEN LEAD THEIR USERS ON A JOURNEY THROUGH THEIR DESIGN. KEEPING THAT IN MIND, 24/7 STADIUMS ARE A GREAT WAY TO INCLUDE THE USER MORE OFTEN THAN A DAY OR TWO FOR A FEW HOURS. WHILE THERE ARE SPACES THAT ARE MORE USER DEPENDENT LIKE A CLINIC OR DATA CENTERS, USING THE DESIGNED ENVIRONMENT AT ALL TIMES ALLOWS USERS TO ACCOMMODATE THE SPACE WHENEVER THEY PLEASE. CONCOURSES ARE HUNDREDS OF THOUSANDS OF SQUARE FEET THAT OFFER MANY USES BESIDES CIRCULATION. UNDERSTANDING SUCH IS KEY TO A SUCCESSFUL STADIUM AND EVEN MORE PREVALENT IN 24/7 STADIUMS.



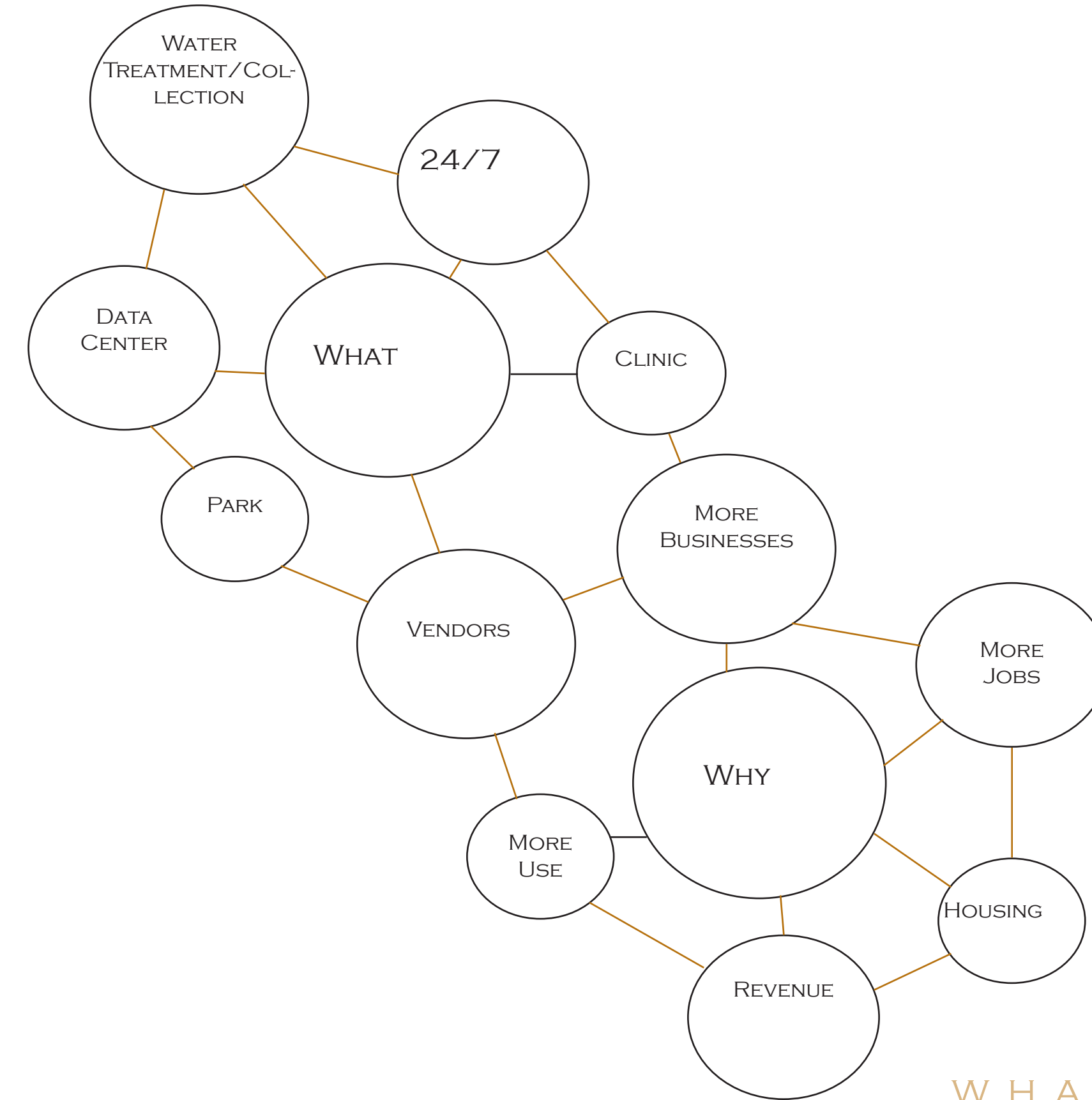
24/7

INTRODUCTION

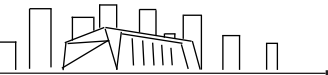
THIS RESEARCH REPORT DIVES INTO THE IDEA OF STADIUMS BEING OPERABLE AT ALL TIMES, 24/7 AND HOW THEY IMPACT THE SURROUNDING COMMUNITY. THE STUDIES CONDUCTED WILL PROVIDE ME WITH ENOUGH QUANTITATIVE DATA TO THEN ANALYZE HOW MUCH OF A DIFFERENCE A 24/7 STADIUM WILL HAVE ON A COMMUNITY, SMALL OR LARGE. IF THERE IS A POSITIVE DIFFERENCE, 24/7 STADIUMS MAY BE A POSSIBLE NEW ALTERNATIVE FOR FUTURE STADIUMS.

PROJECT GOALS

THE ESSENTIAL GOAL OF THIS RESEARCH PROJECT IS TO SEE IF THE IMPACT A 24/7 STADIUM HAS ON A SURROUNDING COMMUNITY. THIS RESEARCH COULD PROVIDE ENOUGH DATA TO PROVIDE FUTURE ARCHITECTS WITH INSIGHT ON 24/7 STADIUMS AND THEIR OVERALL IMPACT THEY HAVE ON THE COMMUNITY TO DESIGN SUCH A STADIUM. PROVIDING ENOUGH CIRCULATION SPACE ALONG WITH OPERATIONAL SPACE WHILE ALLOWING NEW 24/7 SPACES WILL BE KEY TO SUCCESS. IF ALL 24/7 SPACES DON'T INTERFERE, THE RESEARCH WILL PROVIDE CLEAR POSITIVE IMPACTS ON THE COMMUNITY.



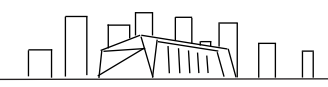
WHAT / WHY WEB



METHODOLOGY

IN THE FIELD OF ARCHITECTURAL DESIGN, 24/7 STADIUMS AREN'T SOMETHING USED AS THE TYPICAL STADIUM DESIGN. TODAY, MODERN STADIUMS ARE DESIGNED WITH MULTIFUSE ASPECTS WHICH HAVE SIMILAR PURPOSES AS 24/7 STADIUMS. HOW THESE STADIUMS CAN BE USED EFFICIENTLY AT ALL TIMES OF THE DAY, ALL YEAR AROUND HAS NOT BEEN STUDIED BEFORE. USING 24/7 STADIUMS CAN PROVIDE MANY BENEFITS THAT ARE BEING LEFT OUT IN THE MODERN DESIGN OF STADIUMS. ACHIEVEMENT IN THE USE OF 24/7 STADIUMS WILL BRING A NEW ASPECT OF THE BUILT ENVIRONMENT AND PROVIDE MORE USES THAN A TYPICAL STADIUM.

THIS RESEARCH REPORT STUDIES TIME MATRIX'S/SCHEMATIC DESIGNS, CASE STUDIES, AND NAICS CODES. THE TIME MATRIX'S AND SCHEMATIC DESIGNS FEATURE AS THE BASIS FOR THE NAICS CODES. USING 3 SCHEMATIC DESIGNS OF DIFFERENT SIZED STADIUMS IN DIFFERENT CITIES OF DIFFERENT SIZES, THE DATA FROM THE NAICS CODES CAN THEN BE APPLIED. WITHIN THE CASE STUDIES, DIFFERENT ASPECTS ARE COVERED FROM SUSTAINABILITY, 24/7 ASPECTS, AND OVERALL STADIUM DESIGN, ETC.. ALL THESE TOPICS LEAD TO THE DEVELOPMENT OF THIS RESEARCH REPORT AND PROVIDES THE FACTS SURROUNDING THE IDEA OF 24/7 STADIUMS.



CASE STUDY - LINCOLN NATIONAL FIELD

LOCATED IN PHILADELPHIA, PENNSYLVANIA, LINCOLN FINANCIAL FIELD IS A MULT-HUSE STADIUM HOME THE NFL (NATIONAL FOOTBALL LEAGUE) TEAM, THE PHILADELPHIA EAGLES. WHEN THE STADIUM IS NOT USED BY THE EAGLES, THE STADIUM IS USED FOR COLLEGIATE FOOTBALL, COLLEGIATE LACROSSE, MLS (MAJOR LEAGUE SOCCER), MONSTER JAM, AND MANY TYPES OF CONCERTS/EVENTS. THE STADIUM FEATURES SEATING FOR 68,500 PEOPLE AND WAS OPENED ON AUGUST 3RD, 2003. ONCE THE STADIUM WAS FINISHED, LINCOLN FINANCIAL FIELD STARTED ITS 'GO GREEN' PROGRAM WITH THE HELP OF THE NATIONAL RESOURCES DEFENSE COUNCIL (NRDC). JEFFERY AND CHRISTINA LURIE, THE OWNERS OF LINCOLN FINANCIAL FIELD, HAVE STRONG PHILANTHROPIC VALUES WHICH LED TO THE OVERALL BEGINNING OF THE GO GREEN PROGRAM. ACCORDING TO DON SMOLENSKI, THE CURRENT CHIEF OPERATING OFFICER OF THE EAGLES, "OUR OWNERS ARE PHILANTHROPIC BY NATURE; IT'S A VERY IMPORTANT PART OF WHO THEY ARE. THAT PHILANTHROPY CARRIES OVER IN THEIR PERSONAL LIVES AS WELL AS WITH THE TEAM," ... "THE GREEN MESSAGE RESONATES WITH OUR OWNERS. THEY RECOGNIZE THE INCREDIBLE PLATFORM THAT PROFESSIONAL SPORTS AND THE PHILADELPHIA EAGLES MUST DEMONSTRATE SOCIAL GOOD. THEY MADE A STRONG GREEN COMMITMENT AND FULLY BELIEVE THAT THE EAGLES CAN MAKE A DIFFERENCE BY REDUCING OUR ENVIRONMENTAL IMPACTS." IN 2018, LINCOLN FINANCIAL FIELD BECAME LEED GOLD CERTIFIED AND BEFORE THAT, WAS LEED SILVER CERTIFIED IN 2012.



GREEN ACCOMPLISHMENTS

LINCOLN FINANCIAL FIELD HAS MANY GREEN ACCOMPLISHMENTS IN ITS DESIGN AND USE. SOME OF THESE ACCOMPLISHMENTS ARE THE EAGLES HAVE INSTALLED 11,000 SOLAR PANELS AND 14 ON SITE WIND TURBINES TO GENERATE ALL OF ITS ELECTRICITY ON SITE, HAVING MULTIPLE ENERGY CONSERVATION PROGRAMS TO REDUCE ENERGY CONSUMPTION BY 33%, THE EAGLES' ENERGY CONSERVATION AND GREEN POWER INITIATIVES FROM 2003 TO 2010 WERE ENOUGH TO POWER 7,150 AVERAGE AMERICAN HOMES FOR A YEAR, THE EAGLES' EFFORTS TO REDUCE PAPER USAGE AND PURCHASE RECYCLED PAPER FROM 2003 TO 2010 SAVED APPROXIMATELY 6,000 TREES, AND THE EAGLES' RFPs MANDATE THAT ALL VENDORS INCLUDE GREEN-CERTIFIED MATERIALS IN THEIR PROPOSALS AS THE DEFAULT OPTION.

CHALLENGES

THE AVERAGE PERSON CREATES 4.5 POUNDS OF WASTE A DAY. WITH THAT IN MIND, SMOLENSKI SAID "WE'RE A BIG BUILDING. WE CAN FIT CLOSE TO 70,000 PEOPLE. WE USE A LOT OF ENERGY AND WATER AND GENERATE A LOT OF WASTE, BUT THAT DOESN'T MEAN WE HAVE TO BE WASTEFUL,". RECYCLING EFFORTS BEGAN BY PUTTING UP SIGNS AT TAILGATING TO HELP USERS KNOW WHERE TO RECYCLE, PAIR RECYCLING AND NORMAL TRASH BINS NEXT TO EACH OTHER, A 'GREEN TEAM' THAT HELPS RECYCLE WASTE AFTER TAILGATING, TRANSFORMING THEIR WASTE STREAM FROM TRASH TO RECYCLING. ALL THESE NEW INITIATIVES HAVE HELPED LINCOLN FINANCIAL FIELD TO DIVERT 75% OF THEIR WASTE FROM LANDFILL IN 2011 AND IN FEBRUARY 2012, WENT UP TO 99% WASTE DIVERSION FROM LANDFILL. LINCOLN FINANCIAL FIELD ALSO HAD VENDORS TO HELP WITH THE DIVERSION RATE. EACH VENDOR HAD EVERYTHING FROM CUTLERY, PLATES, NAPKINS, TO WRAPPERS FOR THE FOOD TO BECOME COMPOSTABLE BY 2012. WITH SUPPORT FROM ALL THE MANAGERS IN LINCOLN FINANCIAL STADIUM AND A DETAILED TIMELINE, A STADIUM CAN BE A COUPLE STEPS CLOSER TO BECOMING SELF-SUSTAINABLE.



OFFSETTING TEAM TRAVEL

In 2022, with the help of The Ocean Foundation and Ocean Conservancy, the Eagles offset 100% of their team travel carbon emissions through seagrass and mangrove restoration in Puerto Rico's Jobos Bay National Estuarine Research Reserve. The Eagles are the first U.S. professional sports team to offset team travel through the support of Ocean Conservancy's Blue Playbook.



CLOSED-LOOP RECYCLING PROGRAM

As partners in recycling, the Eagles and Braskem collect bottle caps and other plastic products and turn them into new material for use at Lincoln Financial Field through a closed-loop recycling program. Some featured items include a six-foot tall replica Lombardi Trophy, bicycles, pellets for dry wall and park benches.



SUSTAINABLE RAIN GEAR

With the help of Braskem, the Eagles purchase sustainable rain ponchos for gameday staff. Made from sugarcane ethanol, a renewable raw material that has a carbon-negative life cycle, the ponchos were produced by GreenGear Supply Company and can be reused or recycled through the Eagles Go Green program.



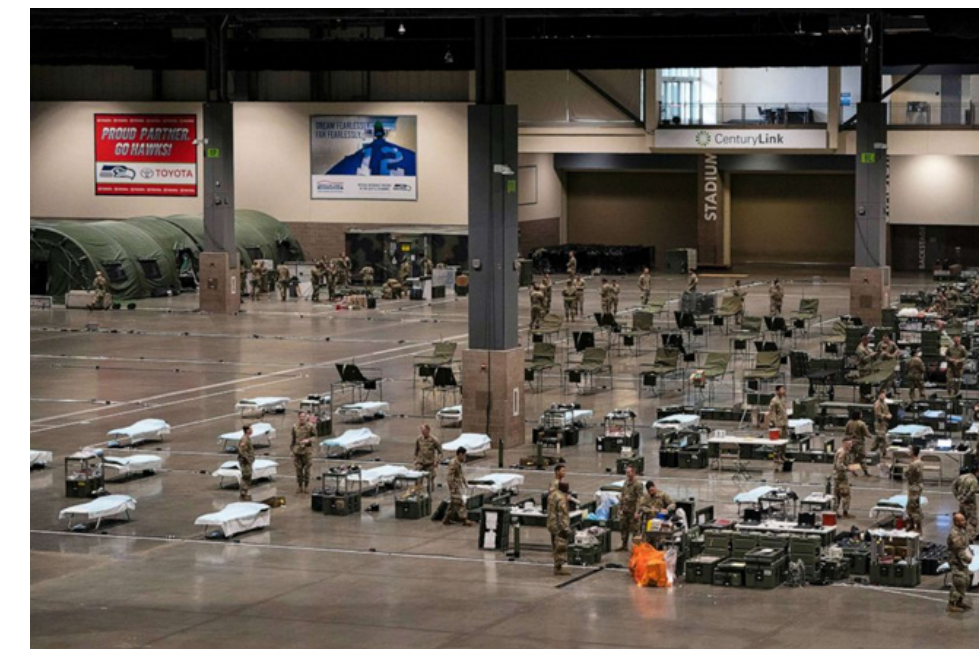
WATER CONSERVATION

Since 2015, the Eagles have saved more than one million plastic water bottles with the installation of water filtration fountains at the team's facilities. In addition, the installation of simultaneous flush urinals throughout Lincoln Financial Field saved more than 5,000 gallons of water per event during the 2022 season.



CLINIC / FIELD HOSPITAL

WHILE DATA CENTERS ARE A GREAT WAY TO KEEP A STADIUM FUNCTIONAL 24/7, CLINICS/FIELD HOSPITALS CAN BE ANOTHER USE TO PROVIDE ALL YEAR-ROUND OPERATION. MOST STADIUMS IN THE U.S. SERVE AS FIELD HOSPITALS OR CLINICS WHEN IN TIME IN NEED. IN 2020, THE CORONA VIRUS STRUCK THE WORLD AND CAUSED HOSPITALS TO FILL UP WITH THOSE AFFECTED BY THE VIRUS. NEEDING SPACE WITHIN THE CITIES TO CREATE FIELD HOSPITALS WAS NEEDED TO KEEP UP WITH THE INFECTION RATE. IN TURN, THIS CAUSED STADIUMS TO OPEN THEIR DOORS AND ALLOWED 100,000 SQUARE FEET OF THE STADIUM TO BE USED AS A HOSPITAL AND HOUSE THOSE WHO NEED CARE. BY BILL DE BLASIO, THE NEW YORK MAYOR. ANOTHER EXAMPLE CREATING 350-BED FACILITIES THAT WAS DEEMED A "...LIFESAVING PLACE" BY BILL DE BLASIO, THE NEW YORK MAYOR. ANOTHER EXAMPLE OF WHEN A STADIUM WAS USED AS A CLINIC / FIELD HOSPITAL WAS IN 2005 WHEN HURRICANE KATRINA HIT NEW ORLEANS, LOUISIANA. THE NFL TEAM, THE SAINTS, OPENED THEIR STADIUM DOORS TO THOSE WHO HAD NO HOME OR SHELTER AFTER / DURING THE STORM. WHILE THIS MAY NOT BE A TYPICAL USE OF THE STADIUM, IT STILL ADDS THE FACT THAT THIS CAN BE DONE AT ANY TIME OF THE YEAR. KEEPING THE STADIUM FUNCTIONAL AND WITH THE CORRECT AMENITIES TO ACT ON AT A MOMENT'S NOTICE WILL BRING MORE 24/7 ASPECTS INTO THE STADIUM.



APARTMENTS / LIVING

TO MAKE A STADIUM TRULY 24/7, THE STADIUM NEEDS TO BE ALWAYS USED. ONE OF THE WAYS THIS CAN BE DONE IS BY DESIGNING APARTMENTS TO BE PART OF THE STADIUM ITSELF. IN APRIL 2016, THE COOLEY LAW SCHOOL STADIUM IN LANSING, MICHIGAN, DEVELOPED AN OUTFIELD PORTION TO BE USED BY GUESTS DURING AND AFTER BASEBALL GAMES. THIS OUTFIELD PORTION WILL CREATE A NEW CONCOURSE FOR THE STADIUM WITH A COVERED PICNIC AREA, A CRAFT BEER BAR, AND A YEAR-ROUND BANQUET SPACE THAT CAN BE RENTED OUT. IT WILL ALSO SERVE AS THE BASE FOR THE NEW APARTMENT COMPLEX.

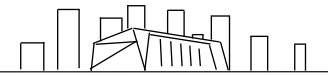
THE APARTMENT COMPLEX HAS 84 ROOMS FEATURING 1- AND 2-BEDROOM HOUSING AS WELL AS MICRO UNITS THAT ARE 380 SQUARE FEET. THE DESIGNER, GILLESPIE, HAD TO FOCUS ON THE OVERALL BENEFITS OF THE ADDED APARTMENTS SUCH AS REVENUE TO THE CITY AS WELL AS A BALANCE BETWEEN LIFE FOR TENANTS WHILE A BASEBALL GAME IS PLAYING. THIS TOOK MANY DISCUSSIONS WITH THE CITY TO DECIDE, ESPECIALLY IN COST. THE IMPROVEMENT COST WAS \$13.8 MILLION AND AT THE TIME WAS ONLY GENERATING \$875,000. BUT AFTER SOME TIME, EVERYONE CAME TO AN AGREEMENT. THE TENANTS OF THE STADIUM WOULD NOT BE ALLOWED TO USE THE PUBLIC AREAS OF THE STADIUM WHILE THE GAME WAS IN PLAY. HOWEVER, TENANTS COULD WATCH THE GAME FROM THEIR BALCONY FREE OF CHARGE ALONG WITH ANY GUESTS THEY HAD. GILLESPIE ALSO DESIGNED THE APARTMENT WITH SHATTERPROOF GLASS AND OTHER DAMAGE RESISTANT MATERIALS IN CASE A BALL WAS TO HIT SUCH. AFTER CONSTRUCTION, THE TOTAL REVENUE INCREASED \$515,000 TO \$1,390,000 PER YEAR.



DATA CENTERS

ANOTHER WAY TO INCLUDE 24/7 ASPECTS INTO A STADIUM INCLUDES DATA CENTERS. ONE SPECIFIC WAY THIS IS SHOWN IS BY LOOKING AT SOFI STADIUM. SOFI INCLUDED A DISTRIBUTED ANTENNA SYSTEM (DAS) DATA CENTER TO HELP BROADCAST THE EVENTS AT SOFI AS WELL AS PROVIDE CELLULAR DATA AND WI-FI TO THOSE IN THE STADIUM. THE AVERAGE USER IN THE STADIUM USES 538 MG (MEGABYTES) OF DATA ADDING UP TO 18 TB (TERABYTES) OF DATA BEING USED DURING AN NFL GAME AND 24 TB BEING USED DURING A CONCERT. WHILE NO EVENTS ARE BEING HELD AT THE STADIUM, THE DATA CENTERS ARE STILL WORKING PROVIDING CELLULAR DATA TO THE SURROUNDING COMMUNITY ALONG WITH BROADCASTS AT HOME. THE FACILITY IS 13,500 SQUARE FEET AND HAS A 2.5-MEGAWATT CRITICAL CAPACITY.





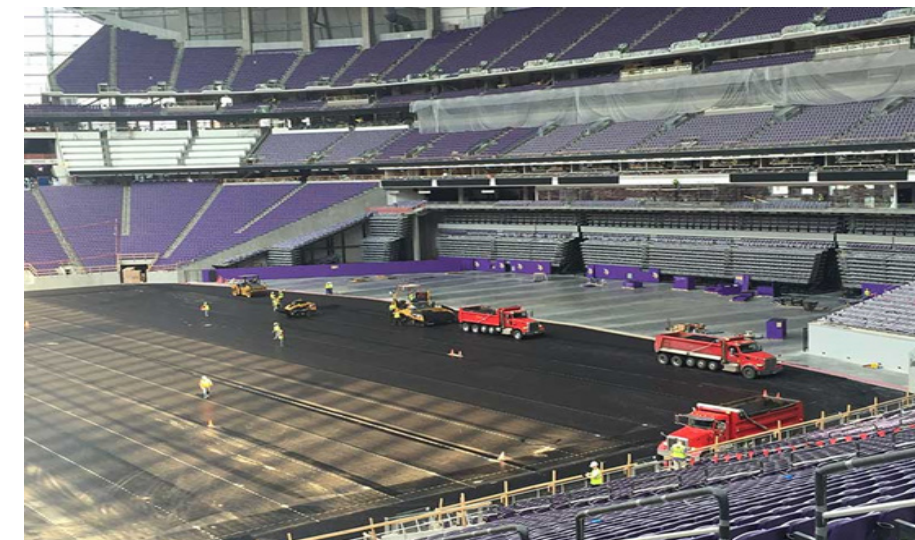
CASE STUDY - U.S. BANK STADIUM

THE U.S. BANK STADIUM WAS BUILT IN MINNEAPOLIS, MINNESOTA IN 2016 FOR THE NFL TEAM THE MINNESOTA VIKINGS BUT IS A MULTI-PURPOSE STADIUM. THE STADIUM WAS DESIGNED BY HKS ARCHITECTS AND FEATURES 66,200 SEATS INCLUDING 7,500 CLUB SEATS, 125 SUITES, A PARTY PLAZA, AND A HALL OF FAME MUSEUM ALL SPREAD OVER 1.8 MILLION SQUARE FEET. THE STADIUM WAS BUILT TO REFLECT THE CULTURE, CLIMATE, AND CONTEXT OF THE CITY, BRINGING IN INSPIRATION FROM ICE FORMATIONS ON ST. ANTHONY'S FALLS AND OTHER DESIGN TECHNIQUES SUCH AS SCANDINAVIAN DESIGN LIKE VIKING LONGBOATS. THE STADIUM IN MINNEAPOLIS IS A VERSATILE VENUE THAT CAN BE USED FOR A VARIETY OF EVENTS THROUGHOUT THE YEAR SUCH AS BASEBALL, HIGH SCHOOL AND COLLEGE ATHLETICS, CONCERTS, FESTIVALS, CONVENTIONS, AND NFL GAMES. THIS HELPS TO ATTRACT VISITORS AND BUSINESSES TO THE CITY, WHICH DRIVES ECONOMIC GROWTH AND REAL ESTATE DEVELOPMENT. AS MENTIONED BY HKS, 2 OF THE STADIUMS NOTABLE DESIGN INNOVATIONS INCLUDE THE LEGACY GATE THAT IS COMPRISED OF 5 PIVOTING GLASS DOORS RANGING FROM 75-95 FEET TALL, AND THE FIRST EVER ETFE ROOF IN A UNITED STATES STADIUM. THIS ALLOWS USERS TO HAVE PLENTY OF NATURAL SUNLIGHT, MAKING IT FEEL AND LOOK LIKE THEY ARE OUTSIDE, BUT AREN'T SUBJECTED TO THE ELEMENTS. ALONG WITH ALL THIS INFORMATION, THE U.S. BANK STADIUM WAS CERTIFIED LEED GOLD IN 2018.

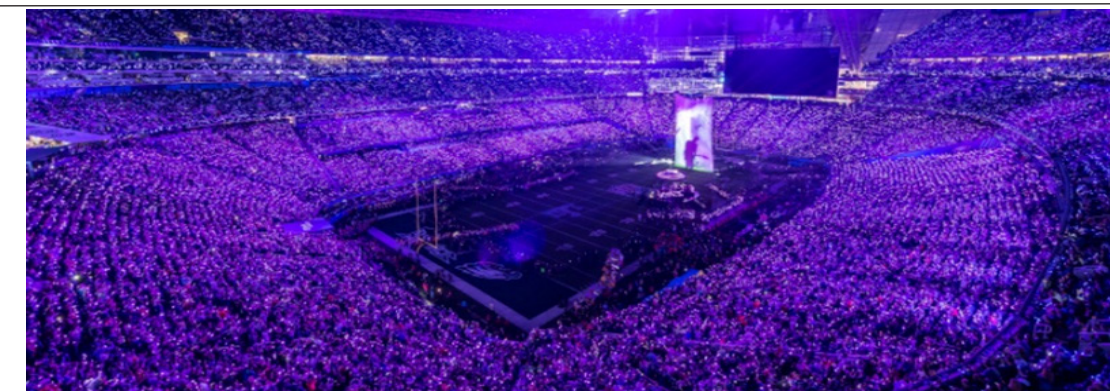


STADIUM SEATING

WITH SEATING BEING A LARGE ASPECT OF A STADIUM, HKS ARCHITECTS WENT WITH A UNIQUE TECHNIQUE FOR U.S. BANK STADIUMS SEATING. SEATING WILL BE THE CLOSEST SEATS (41 FEET) AND CLOSEST TURF SUITES (25 FEET) FROM THE SIDELINE IN THE NFL. TYPICAL SEATS RANGE FROM 19-22 INCHES WIDE AND 33-35 INCHES BETWEEN ROWS. THESE SEATS ARE WIDER WITH MORE LEGROOM COMPARED TO OTHER STADIUMS, ALLOWING USERS CIRCULATION TO MOVE MORE SMOOTHLY AND COMFORTABLY. AS MENTIONED EARLIER, THE STADIUM FEATURES 66,200 SEATS. 6,000 OF THESE SEATS, HOWEVER, ARE COMPLETELY RETRACTABLE. THESE SEATS WERE PLACED ON A RAIL SYSTEM WHICH HAS A FASTER INSTALLATION PROCESS AND PROVIDES FLEXIBILITY TO REMOVE SEATS OR MOVE THEM CLOSER TOGETHER TO ALLOW FOR ADDITIONAL SEATING. ON THE NORTH SIDE OF THE STADIUM THERE IS MORE RETRACTABLE SEATING WHICH ALLOWS THE STADIUM TO BE RECONFIGURED FOR OTHER EVENTS SUCH AS THE HUNDREDS OF HIGH SCHOOL AND COLLEGE BASEBALL GAMES

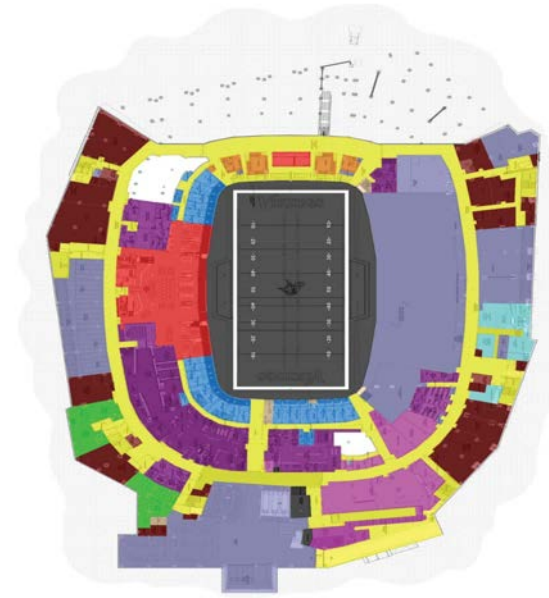


WHILE THE U.S. BANK STADIUM PROVIDES A HOME FOR THE MINNESOTA VIKINGS, THE STADIUM ITSELF IS HOME TO OVER 600 EVENTS A YEAR. THESE EVENTS ARE HELD FOR BASEBALL (COLLEGE AND HIGH SCHOOL), FOOTBALL (COLLEGE AND HIGH SCHOOL), CONCERTS, CONVENTIONS, TRADE SHOWS, PRIVATE/CORPORATE EVENTS, AND COMMUNITY EVENTS. THE STADIUM ITSELF WAS BUILT UPON THE SAME SITE AS THE STADIUM IT REPLACED. THE AREA BEFORE THE U.S. BANK STADIUM WAS RUN DOWN AND HAD LITTLE TO OFFER TO THE COMMUNITY. ALLOWING ALL THESE EVENTS TO HAPPEN BROUGHT IN MORE BUSINESSES TO THE AREA AS WELL AS INCREASED HOUSING. WITH OVER 600 EVENTS A YEAR, THE U.S. BANK STADIUM BRINGS IN HUNDREDS OF THOUSANDS OF PEOPLE TO THE SURROUNDING BUSINESSES. THE STADIUM IS OPEN TO THE PUBLIC FOR PRIVATE RENTALS, ALLOWING THE STADIUM TO BE USED AT ALMOST ALL TIMES OF THE DAY, ANY DAY OF THE WEEK. WITH GENERAL EVENTS ALLOWING FOR MULTI-PURPOSE, THE U.S. BANK STADIUM ALSO HAS A DATA CENTER IN THE STADIUM. THIS ALLOWS THE STADIUM TO PROVIDE DATA AND WI-FI TO THOSE IN THE STADIUM AND NOT OVERWORK THE COMMUNITY DATA CENTERS. BESIDES EVENTS, THE STADIUM ITSELF HAS OTHER VENDORS. MOST STADIUMS HAVE ACCESS TO VENDORS TO OF COURSE FEED/SUPPLY THE USERS OF THE STADIUM. KEEPING THESE VENDORS OPEN AFTER EVENTS CAN BE A GREAT WAY TO KEEP THE STADIUM FUNCTIONING 24/7 WHILE NOT TAKING UP UNNECESSARY SPACE.



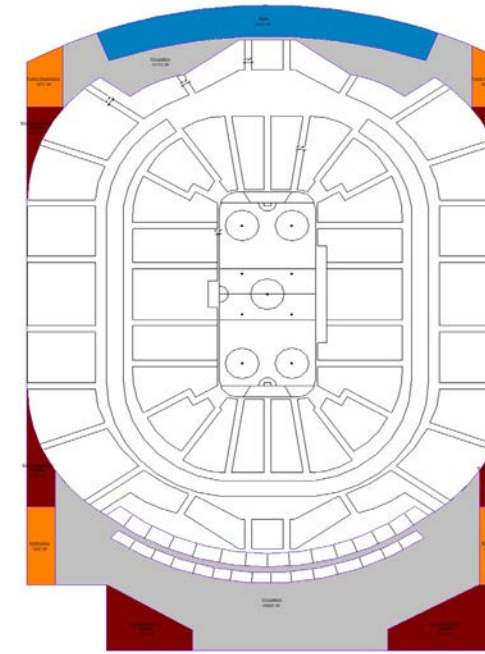
SUSTAINABILITY

THE U.S. BANK STADIUM IS LEED (LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN) CERTIFIED GOLD AND WITH THAT COMES A HUGE BENEFIT TO THE SURROUNDING COMMUNITY. THE STADIUM IS ABLE TO MEET THIS CERTIFICATION BY FOLLOWING A FEW SUSTAINABLE IDEAS. FIRST, U.S. BANK STADIUM BUILT A 2.5-ACRE GREEN ROOF THAT REDUCES THE URBAN HEAT ISLAND EFFECT, INSULATES THE BUILDING, AND CAPTURES RAINWATER FOR IRRIGATION. FOLLOWING SUCH, THE STADIUM IS DESIGNED TO USE ENERGY AS EFFICIENTLY AS POSSIBLE, WITH FEATURES SUCH AS A LOW-ENERGY HVAC SYSTEM, LED LIGHTING, AND A BUILDING AUTOMATION SYSTEM THAT OPTIMIZES ENERGY USE BASED ON OCCUPANCY. NEXT IS RENEWABLE ENERGY; THE STADIUM HAS A 2.25-MEGAWATT SOLAR ARRAY INSTALLED ON ITS ROOF, GENERATING ENOUGH ELECTRICITY TO POWER ITS LED LIGHTING SYSTEM. IN ADDITION, THE STADIUM HAS A PARTNERSHIP WITH A LOCAL UTILITY COMPANY TO PURCHASE WIND ENERGY CREDITS, WHICH OFFSET THE STADIUM'S ENERGY CONSUMPTION. WHILE RENEWING ENERGY, THE U.S. BANK STADIUM ALSO HAS A WATER CONSERVATION ASPECT IN THAT THE ROOF COLLECTS RAINWATER FOR THE GREEN ROOF ALONG WITH OTHER NON-POTABLE APPLICATIONS. A SMALL BUT USEFUL WAY ALONG WITH RAINWATER IS THE PLUMBING FIXTURES AND SYSTEMS THAT RECYCLES WATER FROM ICE-MAKING MACHINES. ON THE TOPIC OF RECYCLING, THE STADIUM HAS TAKEN STEPS TO REDUCE ITS ENVIRONMENTAL IMPACT BY IMPLEMENTING A COMPREHENSIVE RECYCLING AND WASTE MANAGEMENT PROGRAM, INCLUDING RECYCLING STATIONS THROUGHOUT THE FACILITY AND A SYSTEM FOR COMPOSTING FOOD WASTE. LASTLY, THE STADIUM HAS BIKE RACKS AND BIKE VALET SERVICE TO ENCOURAGE USERS TO BIKE RATHER THAN DRIVE TO THE STADIUM.



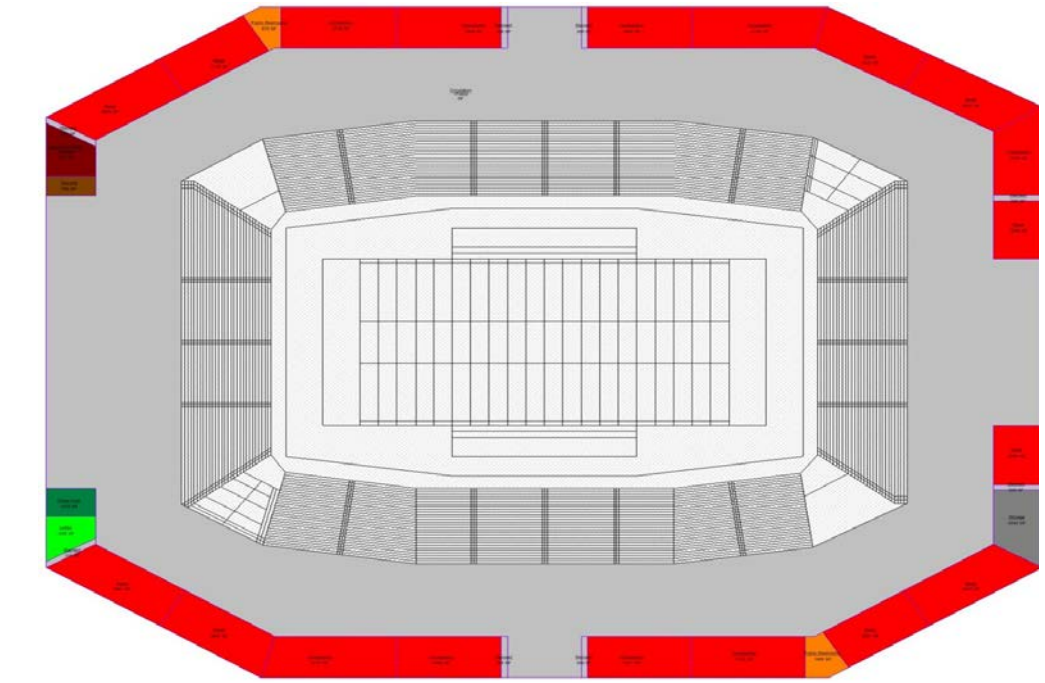
TIME MATRIX

THE TIME MATRIX ALLOWS ME TO SEE JUST WHAT EXACTLY IS HAPPENING AT WHAT TIMES PER EACH STADIUM. ALL THE STADIUMS DO HAVE SIMILAR ASPECTS SUCH AS DATA CENTERS, EVENTS, WATER COLLECTION SYSTEMS, CLINICS, WIND TURBINES, AND SOLAR PANELS. ALL THESE ASPECTS TOGETHER ALLOW THE STADIUM TO BE USED AT ALL TIMES OF A DAY. THE TIME MATRIX WILL OVERALL ALLOW ME TO TAKE THESE IDEAS AND FIND THEIR NAICS CODE TO GIVE ME GENERAL DATA BASED ON EACH ASPECT. IN TURN, I WILL BE ABLE TO SEE JUST HOW MUCH ONE OF THESE ASPECTS CAN IMPACT THE COMMUNITY. THE SPECIFIC ASPECTS WERE SELECTED DUE TO THEIR SQUARE FOOTAGE AND APPLICABILITY TO THE STADIUM. WHILE STADIUMS ARE LARGE, THEY NEED SPACE TO OPERATE CORRECTLY. TAKING TOO MUCH SPACE AWAY FROM SPACES REQUIRED FOR OPERATION WILL IN TURN OF COURSE, NOT ALLOW THE STADIUM TO FUNCTION. THE LARGEST OF THE SPACES ARE THE WATER TREATMENT PLANT AND THE DATA CENTER. THIS DOES NOT INCLUDE THE SOLAR PANELS OR THE WIND TURBINES AS THESE ARE LOCATED ON THE ROOF'S OF THE STADIUMS AND DON'T INTERFER WITH THERE OEPRATION OF THE STADIUM. HOUSING AND HOTEL ARE AMONG THE TARGETS AS WELL.



SCHEMATIC DESIGNS

THE SCHEMATIC DESIGN OF THE STADIUMS ALLOWED ME TO SEE JUST HOW MANY SPACES WOULD BE TAKEN FOR THE NAICS CODES, BUT ALSO TO SEE IF THERE WOULD BE SPACE FOR 24/7 ASPECTS. SINCE THERE ARE NO 24/7 STADIUMS IN THE WORLD, I HAVE TO COME UP WITH DESIGNS FOR EACH OF THE STADIUMS OR MODIFY THE FLOOR PLANS OF AN EXISTING STADIUM. THESE STADIUMS RANGE FROM SMALL TO LARGE, FEATURED IN SMALL TO LARGE COMMUNITIES. THE HIGH SCHOOL STADIUM IS LOCATED IN PROSPER, TX. MEDIUM SIZED IN TEMPE, AZ. LARGE SIZE IS IN MINNEAPOLIS, MN AND IS THE U.S. BANK STADIUM. THESE DESIGNS WILL ALLOW ME TO COMPARE JUST HOW MUCH OF AN EFFECT THE STADIUMS WILL HAVE ON THEIR SURROUDNING COMMUNITY BASED ON ECONOMICS FROM THE NAICS CODES. WITHOUT THIS, THE WHOLE RESEARCH PROJECT/THESIS WOULD FAIL. HOUSING WAS MENTIONED IN THE LAST PAGE. HOUSING/HOTEL I BELIEVE IS A HUGE ASPECT THAT IS MISSED OUT ON IN STADIUMS. ENTHUSED FANS I KNOW WOULD WANT TO LIVE OR STAY IN THEIR FAVORITE TEAMS HOME STADIUM AND NOT HAVING TO TRAVEL FAR FOR A GAME IS ANOTHER GREAT SELLER. KEEPING THE STADIUM OPEN TO THE PUBLIC AND ACTING AS A MALL WILL ALLOW THE SPACE TO BE USED AT ALL TIMES AND LET VENDORS BECOME 24/7.



NFL STADIUM

DAY (8AM - 8PM)	NIGHT (9PM-7AM)
HOTEL	HOTEL
VENDOR(S)	VENDOR(S)
DATA CENTER	DATA CENTER
WATER COLLECTION SYSTEM	EVENT (S)
CLINIC	WATER COLLECTION SYSTEM
EVENT (S)	CLINIC
PARK	PARK
SOLAR PANELS	WIND TURBINE
WIND TURBINE	

NHL STADIUM

DAY (8AM - 8PM)	NIGHT (9PM-7AM)
HOTEL	HOTEL
VENDOR(S)	VENDOR(S)
DATA CENTER	DATA CENTER
WATER COLLECTION SYSTEM	EVENT (S)
WATER TREATMENT PLANT	WATER COLLECTION SYSTEM
CLINIC	WATER TREATMENT PLANT
EVENT (S)	CLINIC
PARK	PARK
SOLAR PANELS	WIND TURBINE
WIND TURBINE	

HIGH-SCHOOL STADIUM

DAY (8AM - 8PM)	NIGHT (9PM-7AM)
HOUSING	HOUSING
VENDOR(S)	VENDOR(S)
DATA CENTER	DATA CENTER
WATER COLLECTION SYSTEM	EVENT (S)
CLINIC	WATER COLLECTION SYSTEM
EVENTS	CLINIC
PARK	PARK
SOLAR PANELS	WIND TURBINE
WIND TURBINE	

High School Stadium – Texas (2021) (B-Billion) (T-Trillion)									
Code:	National Revenue	State Revenue	National Number of Establishments	State Number of Establishments	National Employment (Jobs)	State Employment (Jobs)	Number of Establishments in the Stadium	Revenue from Stadium	Number of Jobs Provided from Stadium
531110 - Housing	\$753.2 B	\$35.2 B	1,665,674	81,415	3,189,315	148,723	75	\$432,352	2
722330 – Vendors	\$23.5 B	\$1.2 B	87,992	5,492	467,120	18,294	80	\$218,499	120
518210 – Data Center	\$220.3 B	\$4.5 B	28,400	568	371,100	7,422	1	\$7.9 M	12
221310 – Water Collection System	\$120.9 B	\$10.5 B	115,500	7,800	467,700	38,500	1	\$1.3 M	8
621111 - 24/7 Clinic	\$663.8 B	\$86.4 B	227,400	33,100	1,318,600	180,100	1	\$2,610,237	~10
221114 – Solar Panels	\$31.6 B	\$3.1 B	2,483	423	13,521	2,748	1	\$7,328,605	4
221115 – Wind Turbines	\$21.6 B	\$1.7 B	734	153	8,452	1,234	1	~\$11,111,111	8
N/A Code Events (Due to High School)	~50k – 10 M	~50k – 10 M	Unknown	1267	Unknown	~4,000	1	\$1M - 10M	~50
N/A Code Stadium Workers (No vendors)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	~50

Total Cost to Operate
~ \$4 Million

Total Revenue per Year
\$36,551,655

Total Jobs Provided
293

NFL Stadium – Arizona (2017) (B-Billion) (T-Trillion)									
Code:	National Revenue	State Revenue	National Number of Establishments	State Number of Establishments	National Employment (Jobs)	State Employment (Jobs)	Number of Establishments in the Stadium	Revenue from Stadium	Number of Jobs Provided from Stadium
721110 – Hotel	\$ 170.3 B	\$6.4 B	54,000	2,154	2.3 M	72,245	1	\$3 M	33
722330 – Vendors	\$16.9 B	\$175.5 M	152,000	887	221,800	3,356	200	\$197,857	760
518201 – Data Center	\$220.3 B	\$3.2 B	28,400	464	371,100	10,102	1	\$6.9 M	21
221310 – Water Collection System	\$120.9 B	\$540 M	115,500	1,900	446,700	9,200	1	\$284,210	5
621111 - 24/7 Clinic	\$138.3 B	\$5.8 B	227,400	1,900	1,318,600	9,200	1	\$3.05 M	~15
221114 – Solar Panels	\$10.3 B	\$556 M	2,483	50	13,521	270	1	\$ 11.1 M	5
221115 – Wind Turbines	\$14.3 B	\$370 M	734	14	8,452	169	1	\$26.4 M	12
711211 - Events	\$88.8 B	\$992.7 M	10,423	158	942,300	5,333	1	\$6.3 M	35
624130 – Crisis Center	\$15.9 B	\$318 M	4,374	87	153,700	3,074	1	\$3.6 M	35
221310 - Water Treatment	\$52.9 B	1.06 B	12,583	252	234,900	4,698	1	\$4.2 M	19
N/A Code Stadium Workers (No vendors)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	130

Total Cost to Operate
~ \$40 Million

Total Revenue per Year
\$65,032,067

Total Jobs Provided
1,070

NFL Stadium – Minnesota (2017-2021) (B - Billion) (M – Million)									
Code:	National Revenue	State Revenue	National Number of Establishments	State Number of Establishments	National Employment (Jobs)	State Employment (Jobs)	Number of Establishments in the Stadium	Revenue from Stadium	Number of Jobs Provided from Stadium
721110 – Hotel	\$ 170.3 B	\$2.7 B	54,000	1,329	2.3 M	33,444	1	\$2 M	25
722330 – Vendors	\$16.9 B	\$78.3 M	152,000	461	221,800	1,846	250	\$169,848	1,500
518201 – Data Center	\$220.3 B	\$1.4 B	28,400	600	371,100	8,442	1	\$2.3 M	15
221310 – Water Collection System	\$120.9 B	\$748.4 M	115,500	327	446,700	4,583	1	\$2.3 M	15
621111 - 24/7 Clinic	\$138.3 B	\$3.8 B	227,400	2,098	1,318,600	18,424	1	\$1.8M	~10
221114 – Solar Panels	\$10.3 B	\$124.3 M	2,483	48	13,521	246	1	\$2.6 M	5
221115 – Wind Turbines	\$14.3 B	\$395.9 M	734	20	8,452	204	1	\$19.5 M	10
711211 - Events	\$88.8 B	3.6 B	10,423	159	942,300	11,461	1	\$22.6 M	75
624130 – Crisis Center	\$15.9 B	\$318 M	4,374	87	153,700	3,074	1	\$3.6 M	35
221310 - Water Treatment	\$52.9 B	571.5 M	12,583	148	234,900	4,060	1	\$3.9 M	28
N/A Code Stadium Workers (No vendors)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50

Total Cost to Operate
~ \$40 Million

Total Revenue per Year
\$60,769,848

Total Jobs Provided
1,768

RESULTS



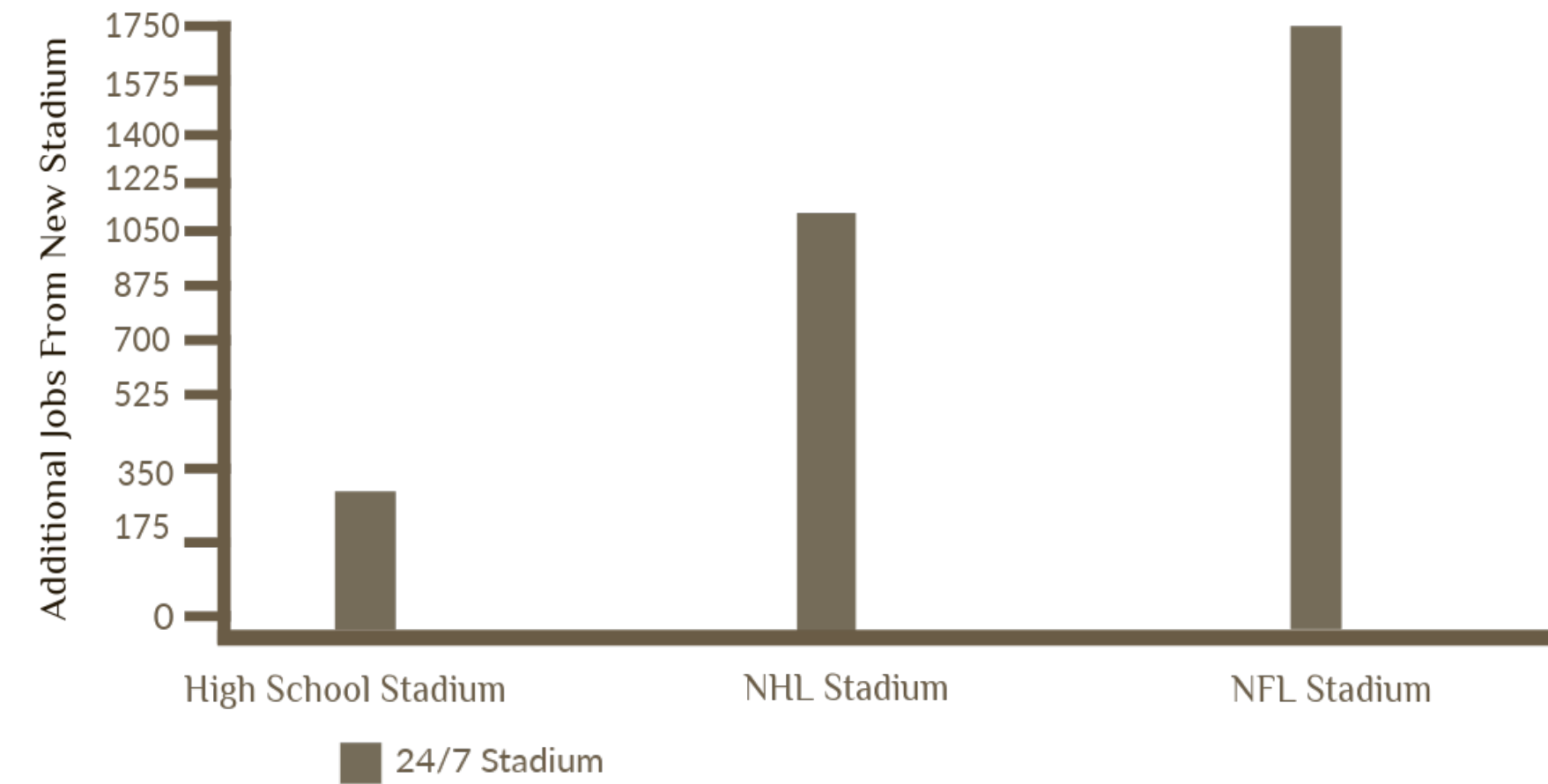
24/7 STADIUMS CLEARLY HAVE AN IMPACT ON THE SURROUNDING COMMUNITY WHICH MAY LEAD TO FUTURE DEVELOPMENTS OF 24/7 STADIUMS AND EVEN THE “NORM” OF STADIUM DESIGN TO BE FOCUSED AROUND THE IDEA OF 24/7.

BAR GRAPHS

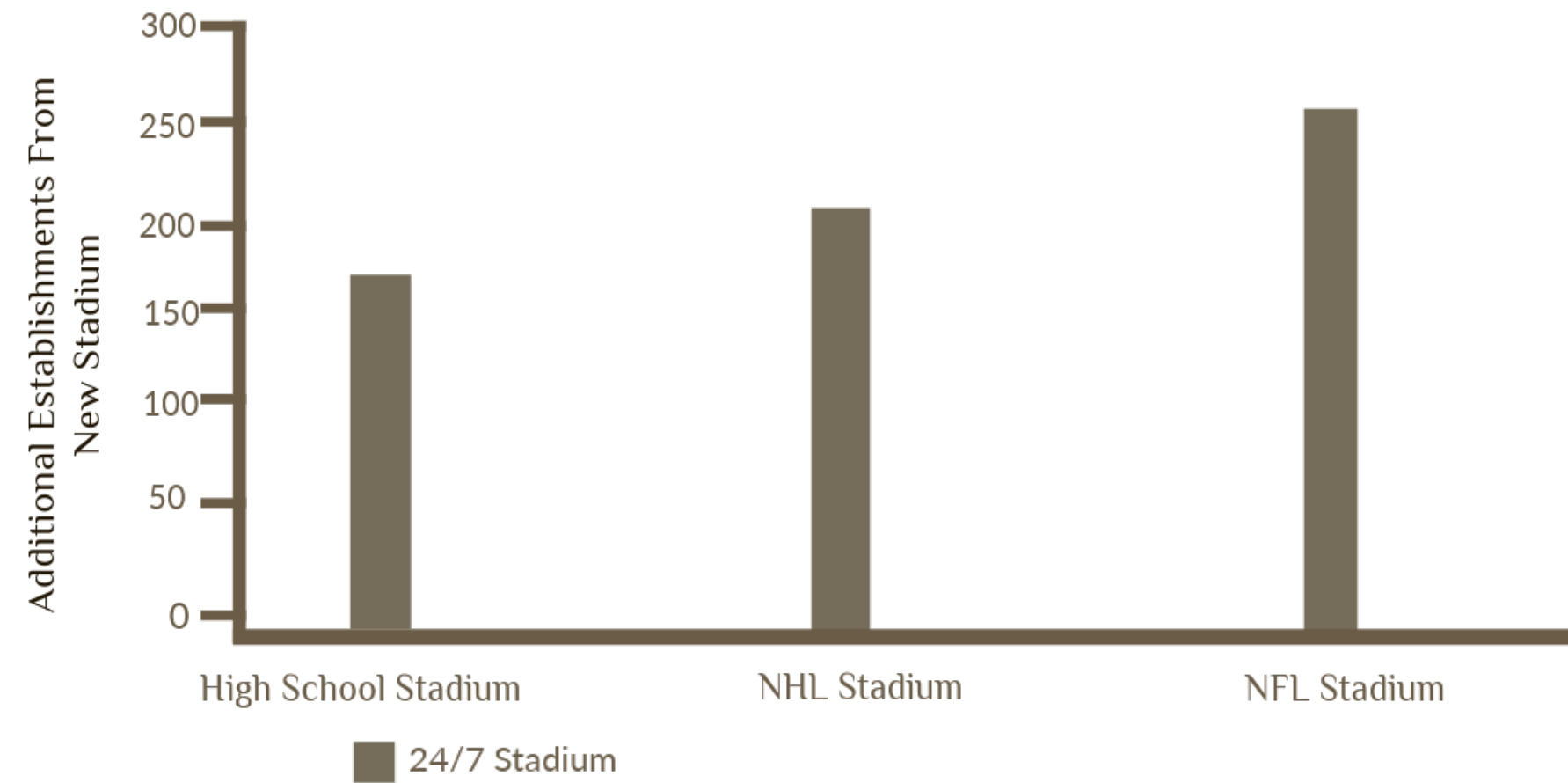
24/7 STADIUMS CLEARLY HAVE A POSITIVE IMPACT ON THEIR SURROUNDING COMMUNITIES AND THE RECOGNITION OF THIS CAN BE THE FUTURE OF STADIUM DESIGN IN ALLOWING ACCESS AT ALL TIMES AND PROFITING FROM SUCH. IN THE BAR GRAPH 'AVAILABLE JOBS', THERE ARE ONLY AN INCREASE IN JOBS AVAILABLE. HIGH SCHOOL STADIUM WILL BE LOWER DUE TO THE OVERALL SIZE OF SUCH AS THE LARGER THE STADIUM, THE MORE JOBS NEEDED. THE NFL STADIUM HAS THE LARGEST AMOUNT OF JOBS AVAILABLE ALLOWING FOR 1,750 NEW JOBS. THIS GOES HAND IN HAND WITH ESTABLISHMENTS/BUSINESSES AS THE NFL STADIUM ALLOWS FOR AN ADDITIONAL 267 BUSINESSES. REVENUE HOWEVER IS DIFFERENT IN THAT THE NHL STADIUM PRODUCED MORE REVENUE. THIS IS DUE TO MORE SQUARE FOOTAGE BEING AVAILABLE FOR 24/7 ASPECTS WHEREAS THE NFL STADIUM HAD LESS SPACE FOR SUCH. THESE BAR GRAPHS HELP FURTHER THE DATA GATHERED BY SHOWING JUST HOW MUCH OF AN IMPACT THEY CAN HAVE AND THE OVERALL PROFIT EACH ONE CAN MAKE.



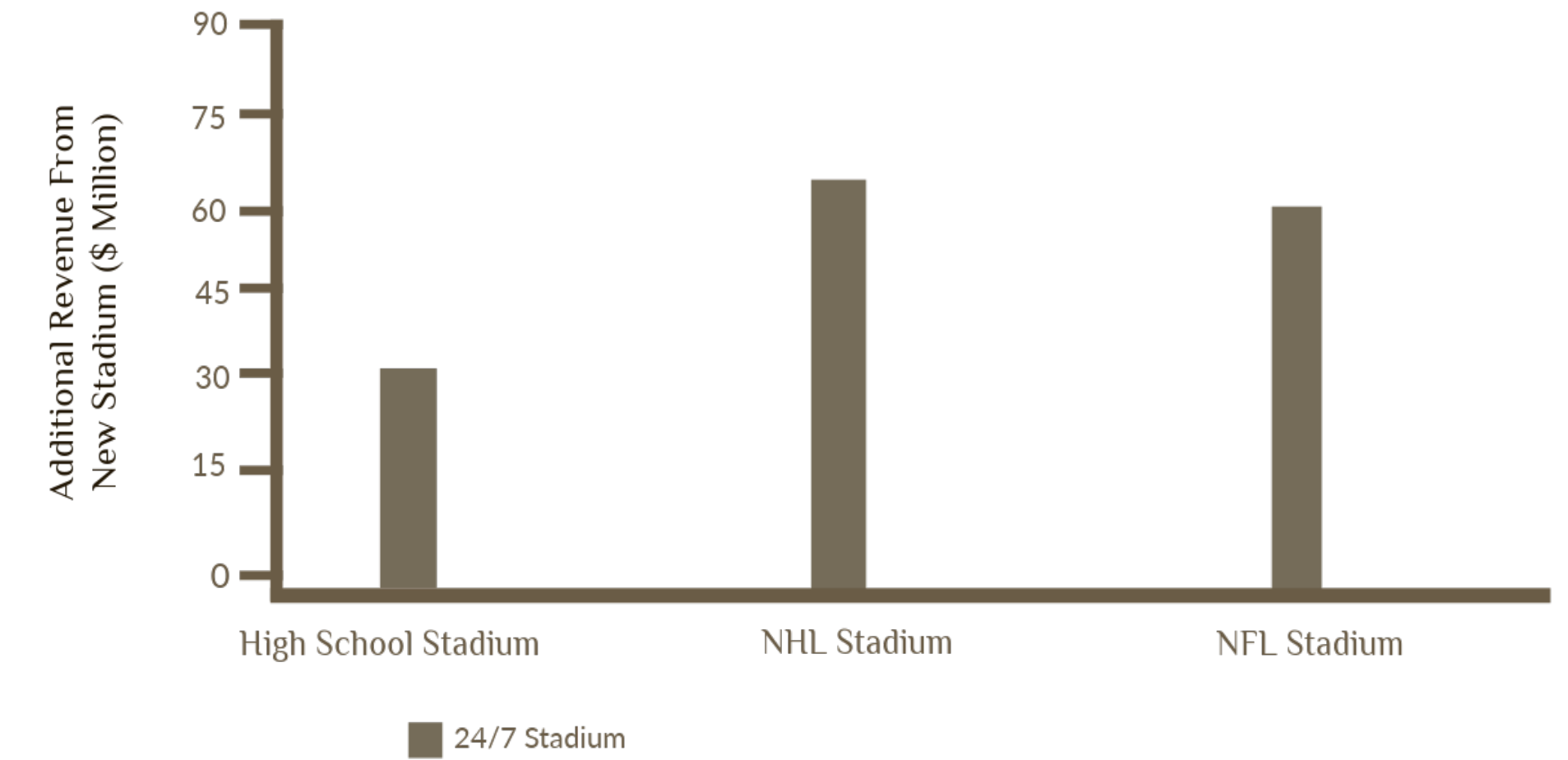
Available Jobs



Available Establishments



Revenue



THE OVERALL PROFIT FROM THE STADIUMS WERE POSITIVE. 20+ FOR NHL AND NFL AND 30+ FOR HIGH SCHOOL. THIS IS DUE TO HIGH SCHOOL STADIUMS NOT BEING USED TYPICALLY FOR ANYTHING ELSE OTHER THAN HIGH SCHOOL SPORT GAMES. OPENING THEIR DOORS TO MORE EVENTS AND 24/7 ASPECTS WILL BRING IN PLENTY OF PROFIT WHILE BEING SMALLER IN SIZE. THE OVERALL OPERATIONAL COST IS MUCH LOWER FOR A HIGH SCHOOL STADIUM RATHER THAN A PROFESSIONAL STADIUM LIKE NHL AND NFL. AS STATED BEFORE, THE STATISTICS PROVIDED ARE NOT THE TOTAL AMOUNT OF REVENUE BROUGHT IN, BUT IS THE PROFIT MADE FROM THE 24/7 ASPECTS. STADIUMS BRING IN NEARLY \$500 MILLION OR MORE IN REVENUE BUT LACK THE 24/7 ASPECTS. IF YOU TAKE THE 24/7 ASPECTS AND ADD THEM TO THE \$500+ MILLION, IT ADDS MORE REVENUE, JOBS, AND BUSINESSES TO THE COMMUNITY. IF STADIUMS WERE TO INCLUDE THE 24/7 ASPECTS AND DESIGN THE BUILT ENVIRONMENT TO BE OPEN AT ALL TIMES, THE GENERATED PROFIT FROM SUCH WOULD EQUAL TO THE PROFITS SHOWN FROM THE 3 SCHEMATIC STADIUMS IN THIS REPORT.



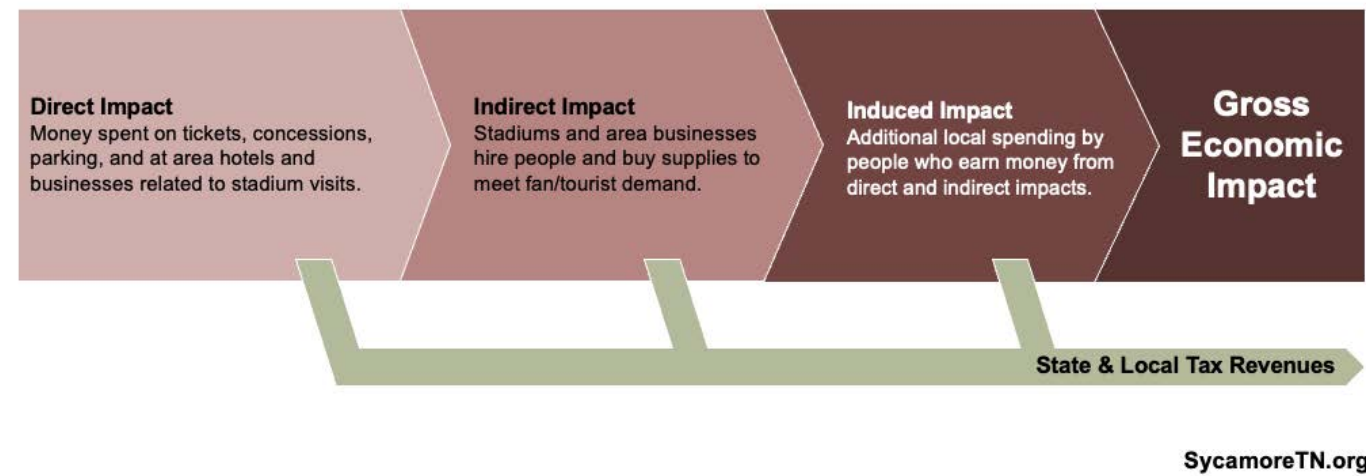
“ARCHITECTURE SHOULD SPEAK OF ITS TIME AND PLACE, BUT YEARN FOR TIMELESSNESS.”
- FRANK GHERY

C O N C L U S I O N

C O N C L U S I O N

ALL TOGETHER, THE IDEA OF A 24/7 STADIUM IS ONE THAT BRINGS A POSITIVE IMPACT ON ANY COMMUNITY, NO MATTER ITS SIZE. THE CASE STUDIES COVER ALL DESIGN ASPECTS THAT WILL BE INVOLVED WITH SUCH A PROJECT SUCH AS SUSTAINABILITY, DATA CENTERS, CLINICS, AND MANY MORE TO ALLOW THE 24/7 STADIUM TO TRULY BE OPERABLE AT ALL TIMES. TIME MATRIX'S AND SCHEMATIC DESIGNS ALLOW FOR AN IDEA OF THE USE OF SPACE AND OVERALL HELP FIND JUST HOW MANY JOBS, ESTABLISHMENTS, AND TOTAL REVENUE FROM EACH SIZED STADIUM FOR THE 3 COMMUNITIES. NAICS CODES FURTHERED THE RESEARCH BY COMPARING HOW THE THE UNITED STATES OF AMERICA COMPARES TO THE STATES WITHIN AND THE OVERALL POTENTIAL IMPACT THE 24/7 STADIUM CAN HAVE. THIS LED TO THE BAR GRAPHS WHICH SHOW AN OVERALL INCREASE IN ALL 3 AREAS, PROVING 24/7 STADIUMS HAVE A POSITIVE IMPACT ON SURROUNDING COMMUNITES. IN THIS STUDY, I FOCUSED ON THE FINANCIAL ASPECTS TO PROVIDE A CLEAR IMPACT ON SURROUNDING COMMUNITIES. WHILE THIS STILL PROVIDES ENOUGH RESEARCH, THERE ARE OTHER WAYS OF PROVIDING MORE RESEARCH. SUSTAINABILITY WAS BRIEFLY TOUCHED ON IN THIS RESEARCH REPORT BUT WAS NOT EXPLORED DEEPLY. RESEARCH ON HOW STADIUMS CAN BE SUSTAINABLE AND EVEN PROVIDE FOR COMMUNITIES CAN BE ANOTHER SOURCE OF RESEARCH TO SHOW HOW AND WHY 24/7 STADIUMS IMPACT SURROUNDING COMMUNITIES.

Estimates of Stadiums' Economic Impact Try to Quantify Direct and Downstream Effects



EACH STADIUM PROVIDES A PROFIT EVEN WITH ITS 24/7 ASPECTS. THE NFL AND NHL STADIUM'S PROVIDE \$20+ MILLION PROFIT AFTER OPERATING COSTS ARE TAKEN OUT OF THE YEARLY REVENUE. WHILE THIS MAY NOT BE THE OVERALL PROFIT AND OPERATING COST, SEEING THE COSTS AND PROFIT FROM SPECIFIC 24/7 ASPECTS WILL ALLOW THE POSITIVE IMPACTS TO SHOW WHILE NOT NEEDING TO FOCUS ON TYPICAL STADIUMS. CONTINUING ON, THE HIGH SCHOOL STADIUM NETS A \$30+ MILLION REVENUE DUE TO THE FACT THAT THE STADIUM DOESN'T TAKE AS MUCH MONEY TO RUN AS THE STADIUM IS MUCH SMALLER THAN THE OTHER 2 STADIUMS. WHILE THE NHL AND NFL STADIUM MAKE TWICE AS MUCH IN REVENUE, THE OPERATING COSTS SINK THEIR NET PROFIT BY 61% WHILE THE HIGH SCHOOL STADIUM LOSES ONLY 11% OF IT'S PROFIT. EVEN THOUGH THE LARGER STADIUMS RECEIVE LESS PROFIT, TYPICAL MODERN DAY STADIUMS DON'T EVEN BRING IN ANY REVENUE DUE TO THEIR OPERATING COSTS AND REPAIRS. MOST STADIUMS DON'T MAKE A PROFIT OR LOSE ANY REVENUE LEAVING MOST STADIUMS TO NOT HAVE AN IMPACT ON THE SURROUNDING COMMUNITY BASED ON ECONOMICS.

THE END OF THIS RESEARCH PROJECT BRINGS THE INTRODUCTION TO THE CONCLUSION RELATING TO THE WHAT AND THE WHY. WHY A 24/7 STADIUM? WHAT IS A 24/7 STADIUM? ALL OF WHICH WERE ANSWERED IN THIS REPORT AND HOW THEY PROVIDE A BENEFIT TO THE COMMUNITY. CREATING NEW HOUSING OPPORTUNITIES, NEW JOBS, NEW BUSINESSES, MORE REVENUE, ALL DUE TO 1 BUILDING, THE 24/7 STADIUM. WITH THIS RESEARCH PROJECT, THERE IS CLEAR PROOF THAT 24/7 STADIUMS CAN WORK AND PROVIDE MORE THAN THE MODERN STADIUM CAN TODAY. IN THE FUTURE, 24/7 STADIUMS MAY HIT THE MARKET AND WILL NOT ONLY BE A BOOST FOR THE SPECIFIC SPORTS TEAM, BUT WILL PROVIDE MANY BENEFITS TO THE SURROUNDING COMMUNITY.

DRAFT

Economic and Fiscal Benefits of the NFL Stadium

Economic Impacts Summary		
\$620 million Annual Economic Impact	450,000 New Annual Visitors	708,000 Additional Room Nights
18,700 Construction Jobs	6,000 Permanent Jobs	\$38,500 Avg. Wage of New Jobs

EXAMPLE OF PROPOSED BENEFITS OF AN NFL STADIUM ON THE STATE OF NEVADA

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